St. Elizabeth HEALTHCARE

2023 SPORTS MEDICINE CONFERENCE

Event sponsored by:

Smith+Nephew

All speakers, Adam Metzler, MD, John Fritch, MD, Kevin Bonfield,MD, Amit Rattan, MD, Matthew S. Grunkemeyer, MD, Kathy Boehmer, and Stephanie James disclosed that they have nothing to disclose. All planners, Holly Groneck, Tasha Riddell, Courtney Steele, Tony Hyott and Karen Tepe have disclosed that they have nothing to disclose.

CLINICAL ANATOMY OF THE HIP

Dr. John Fritch

OrthoCincy™
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OUTLINE

- Overview
- Bony anatomy
- Capsular anatomy
- Muscular attachments
- Neurovascular structures
- Applied anatomy

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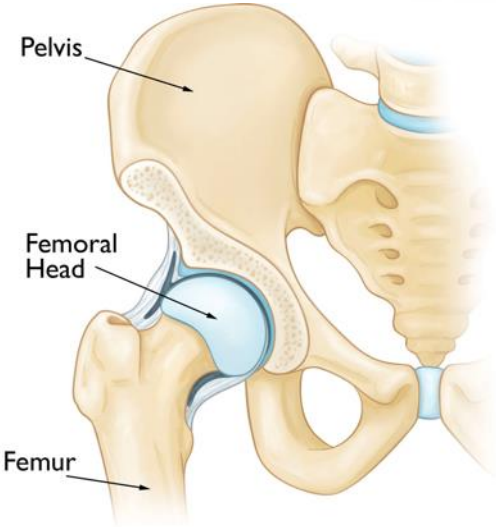
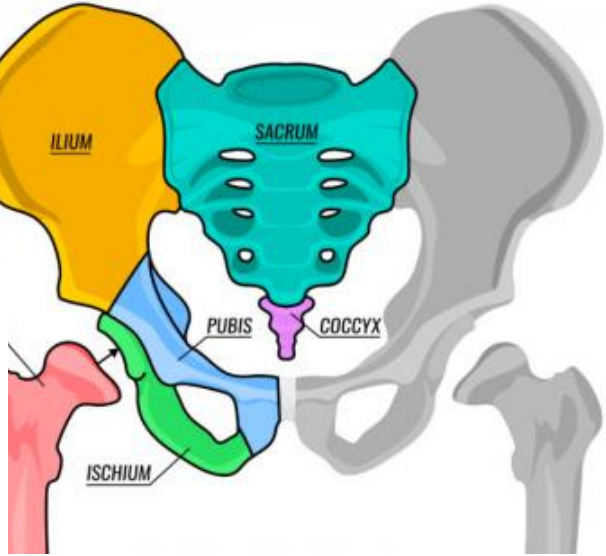
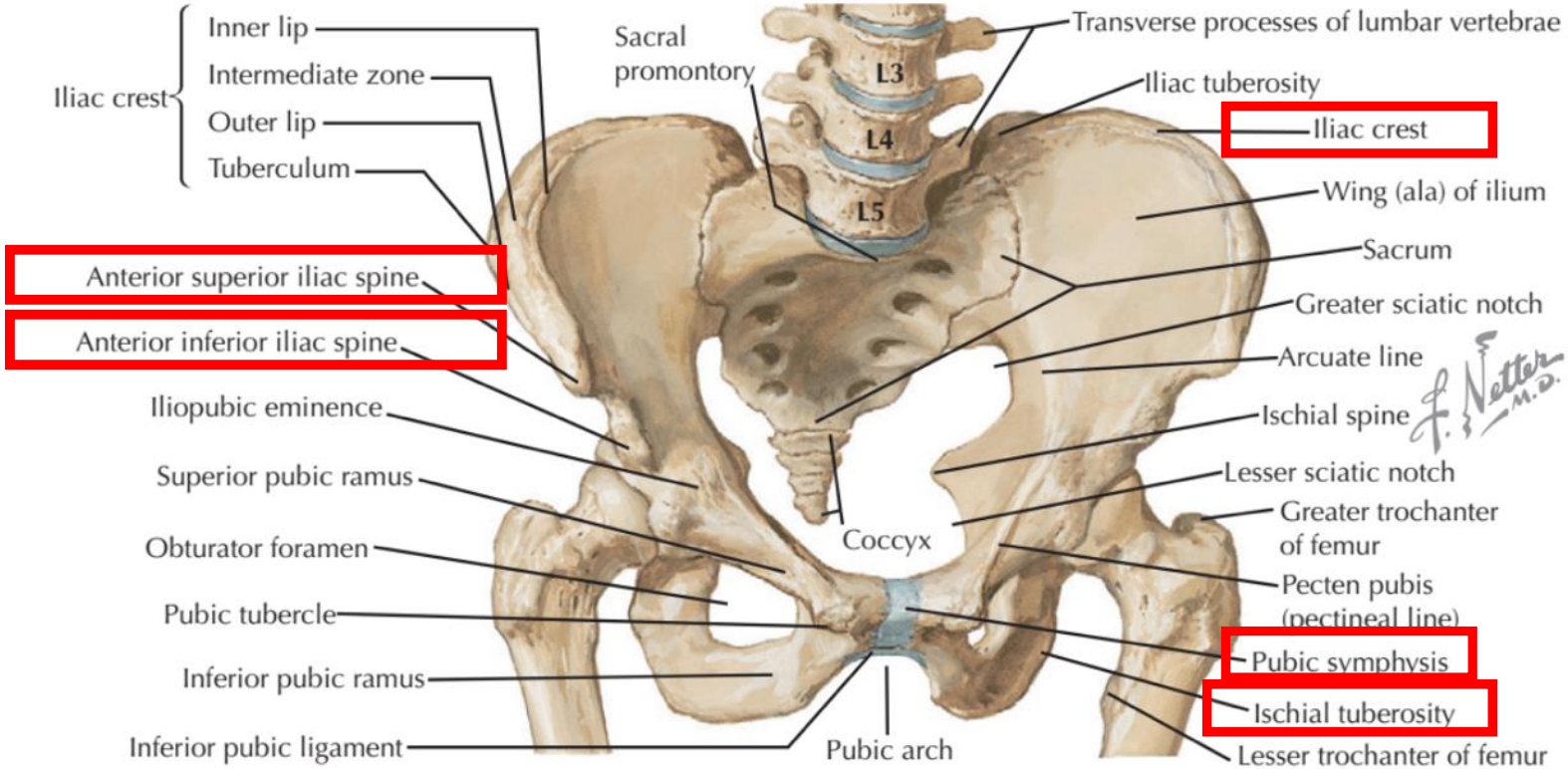
OVERVIEW

- Ball and socket joint
- Stability
  - Bony
  - Labrum and capsule
  - Dynamic muscular stabilize
- Acetabulum
  - Ilium
  - Ischium
  - Pubis

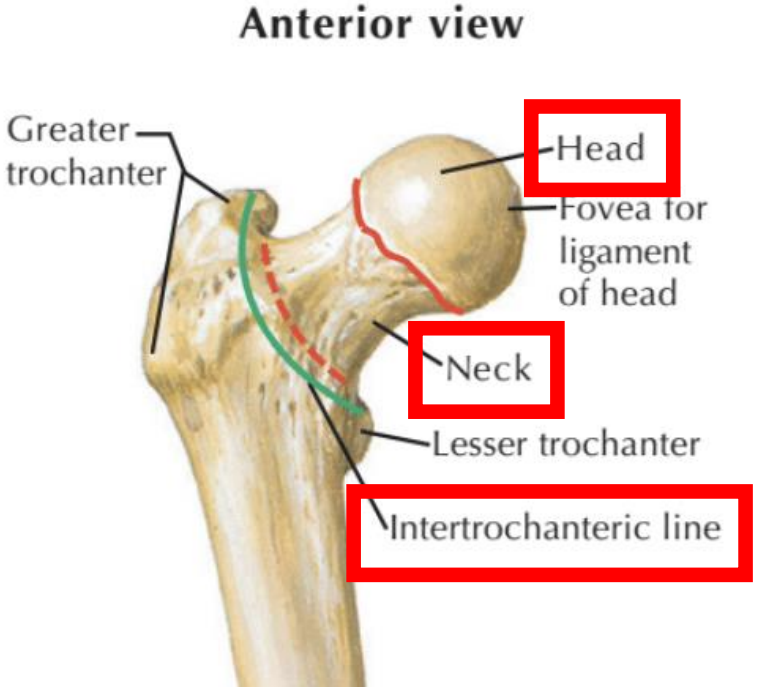


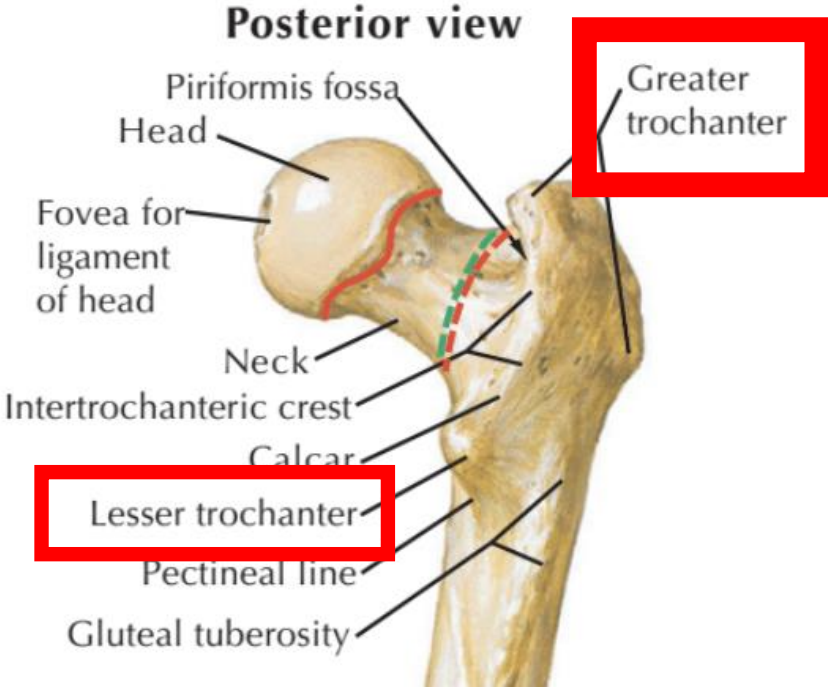


BONY PELVIS ANATOMY



BONY HIP ANATOMY





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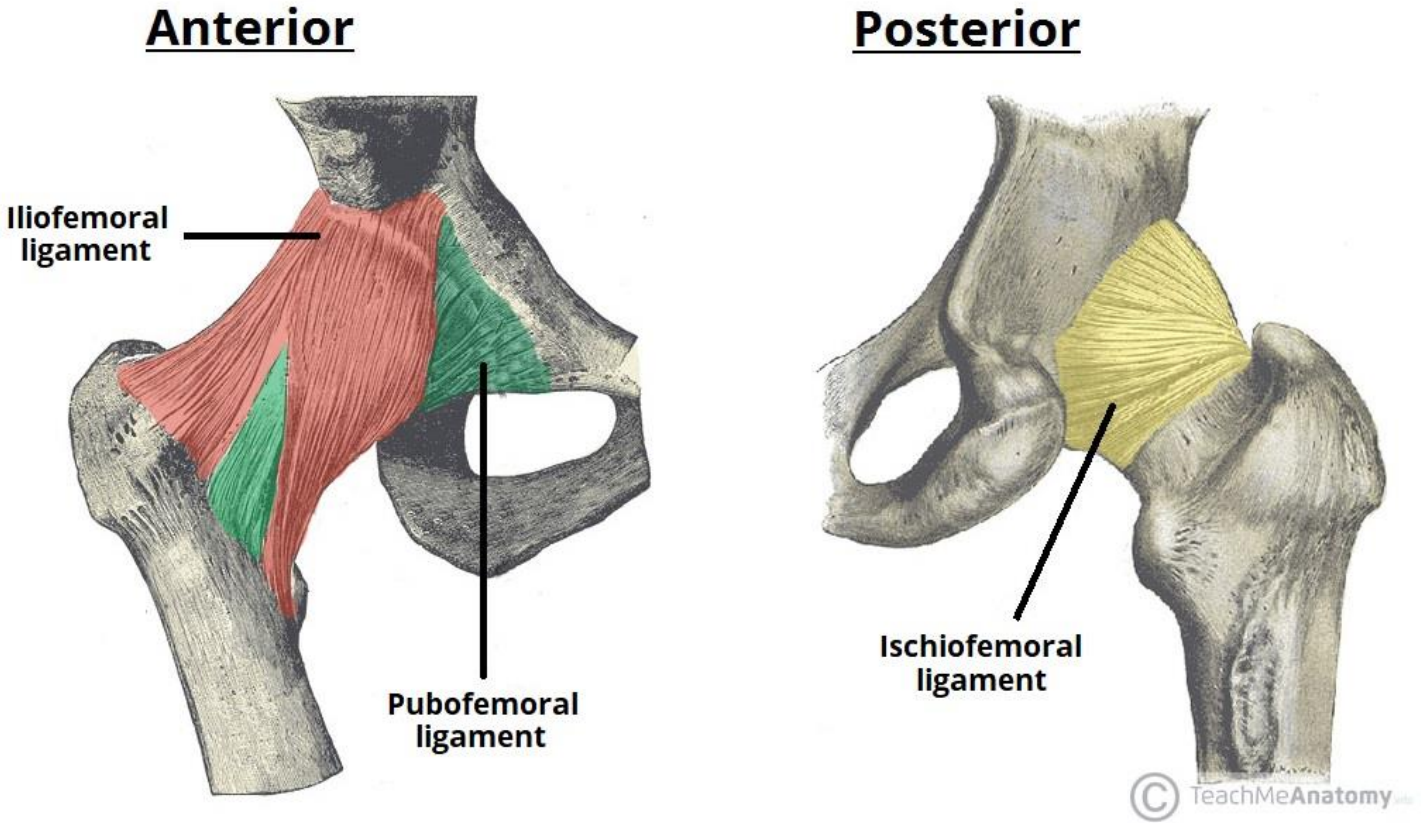

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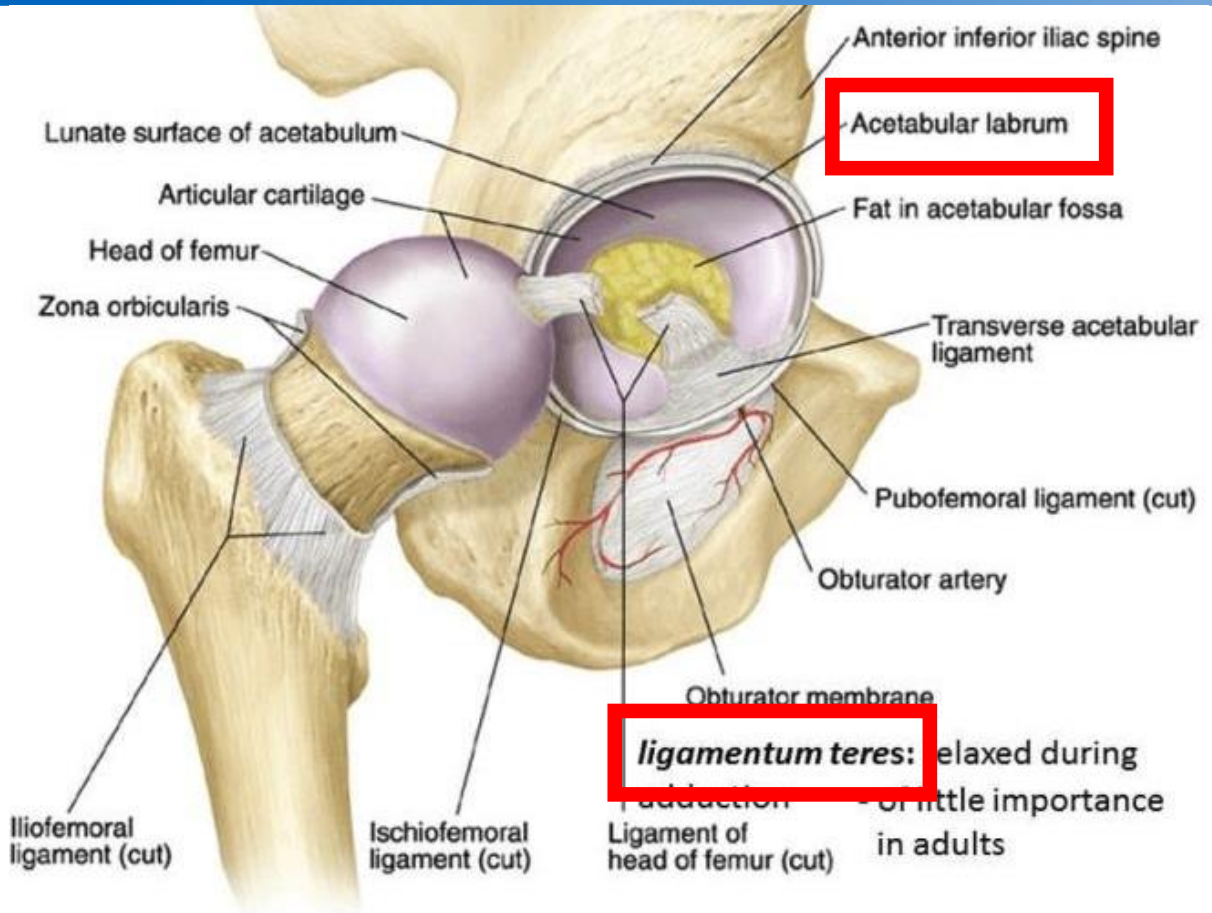
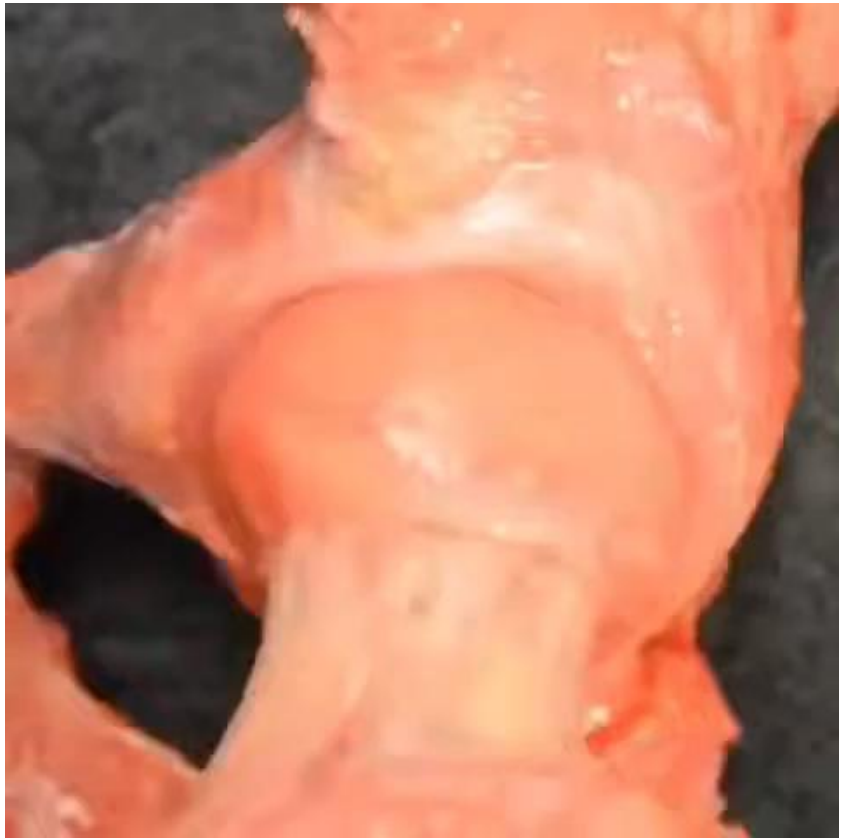


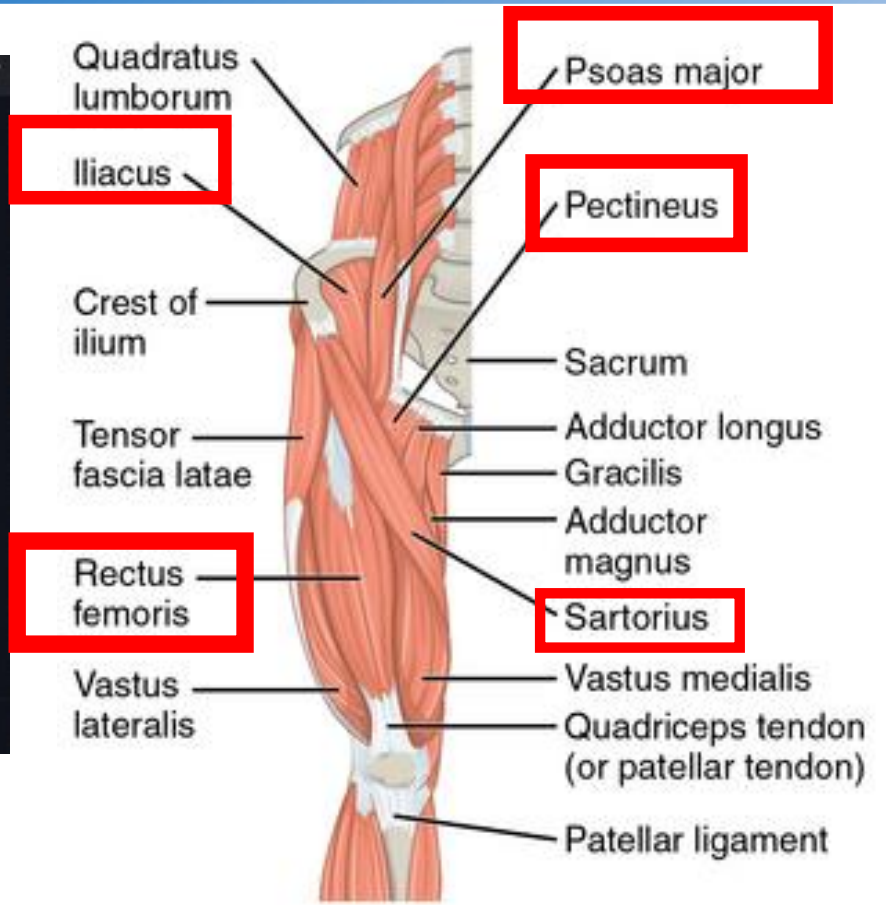
ligamentum teres: elaxed during
- of little importance in adults

LABRAL SUCTION SEAL

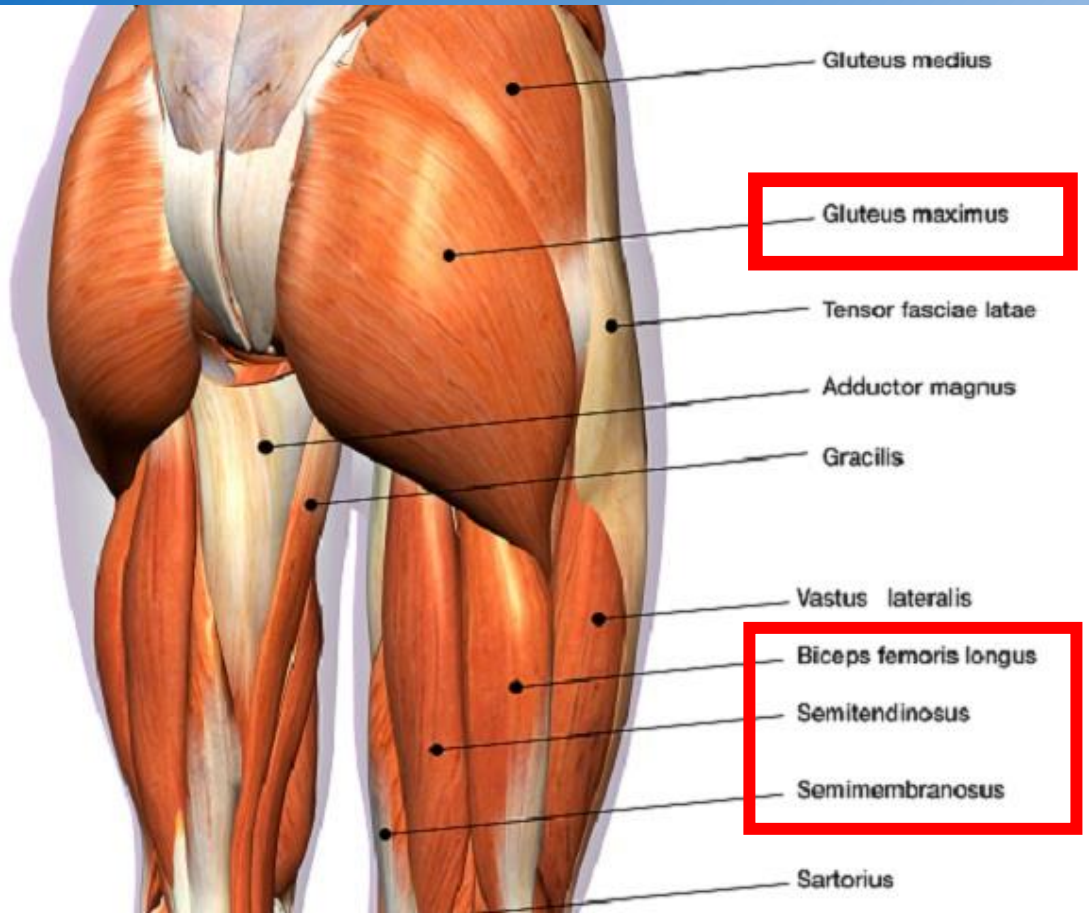


HIP FLEXORS

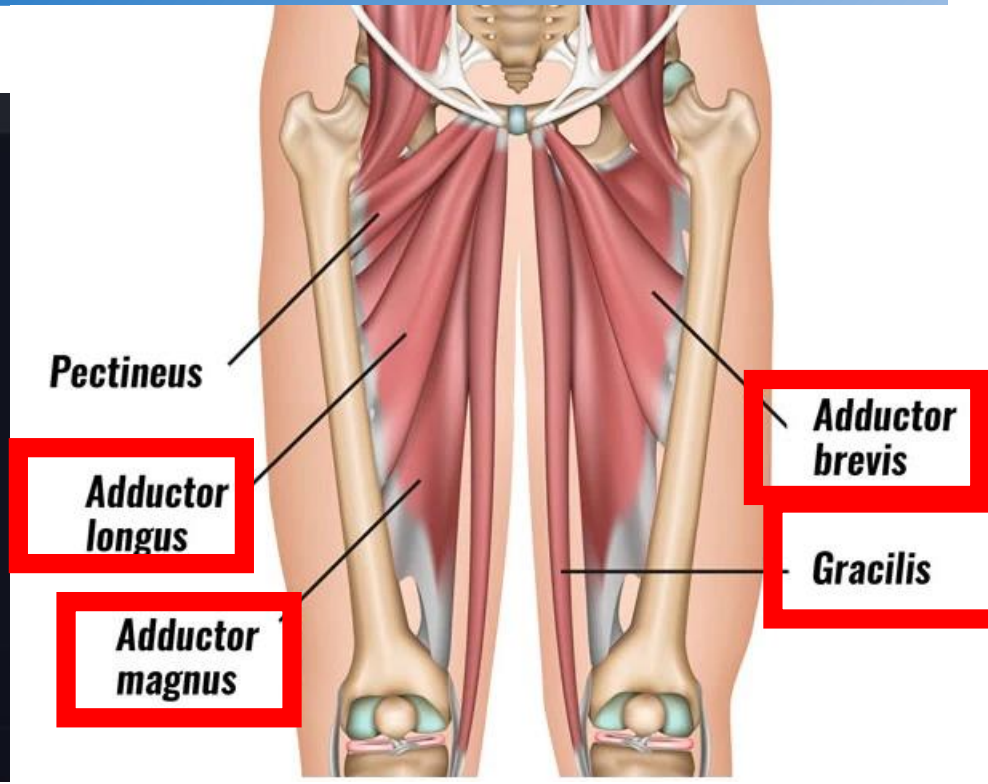

Hub
Motion Mode: Pectineus Muscle (Right)
Pectineus - Hip Adduction
Pectineus - Hip Medial Rotation
Pectineus - Hip Flexion
OTHER MUSCLES IN MOTION
FADE ALL
Adductor Brevis Muscle (Right)
Adductor Longus Muscle (Right)
Adductor Magnus Muscle (Right)
Iliacus Muscle (Right)
Iliotibial Tract (Right)
Patellar Ligament (Right)
Psoas Major Muscle (Right)
Flexion: 13°
Articulation: Hip Joint
Range of Motion: Flexion 0° - 140°


Quadratus lumborum
Iliacus
Crest of ilium
Tensor fascia latae
Rectus femoris
Vastus lateralis
Psoas major
Pectineus
Sacrum
Adductor longus
Gracilis
Adductor magnus
Sartorius
Vastus medialis
Quadriceps tendon (or patellar tendon)
Patellar ligament

HIP EXTENSORS



HIP ADDUCTORS



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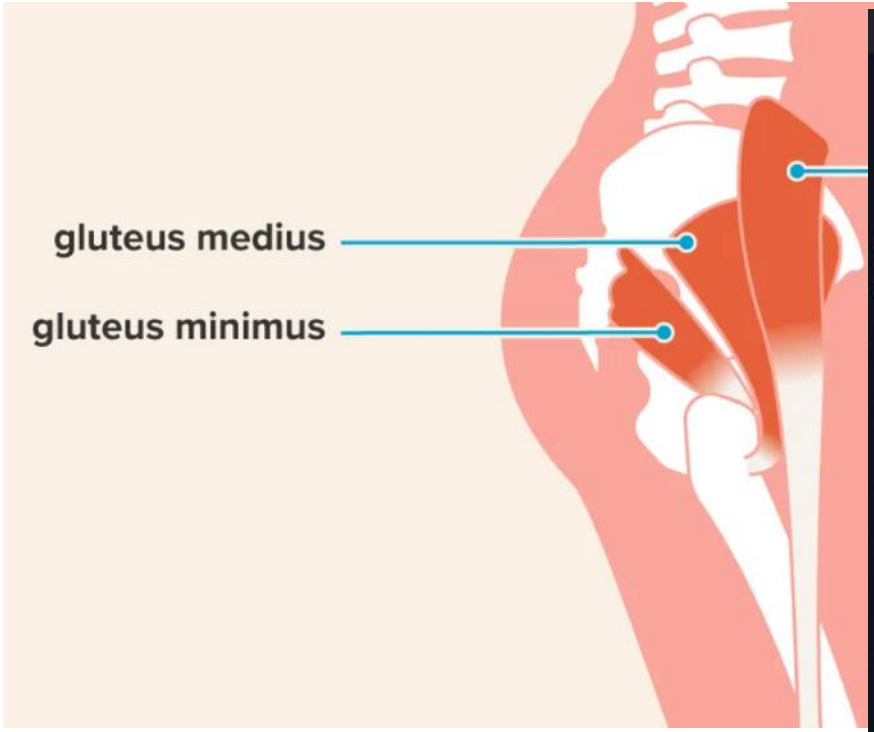
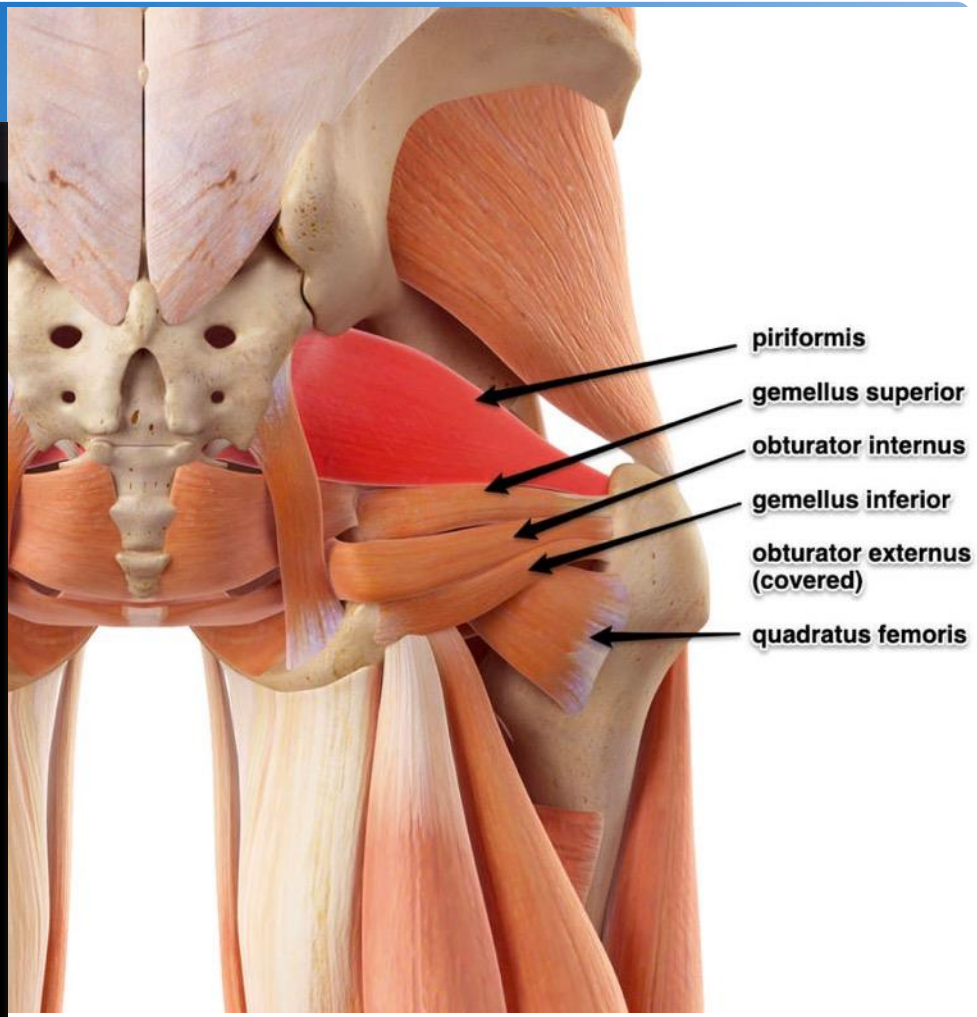
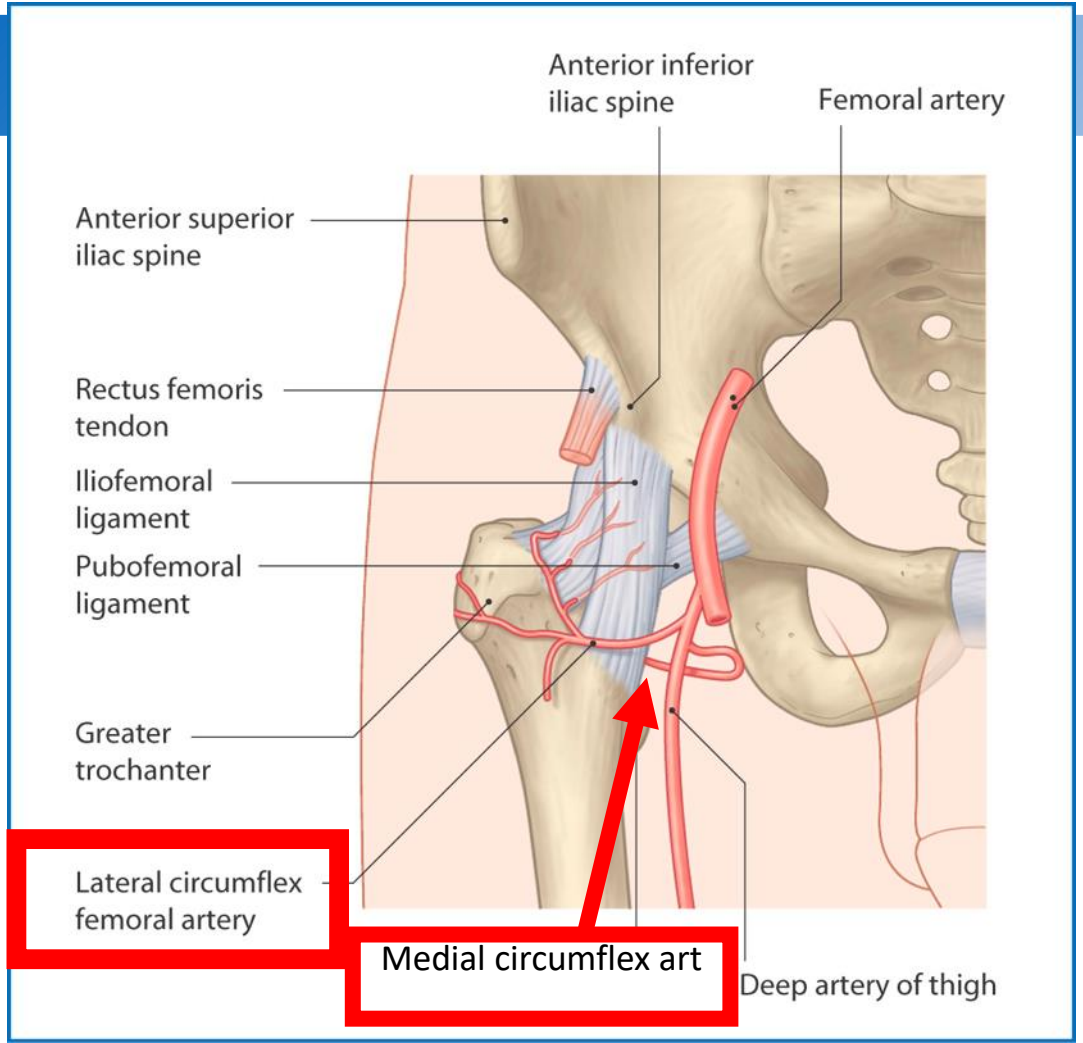


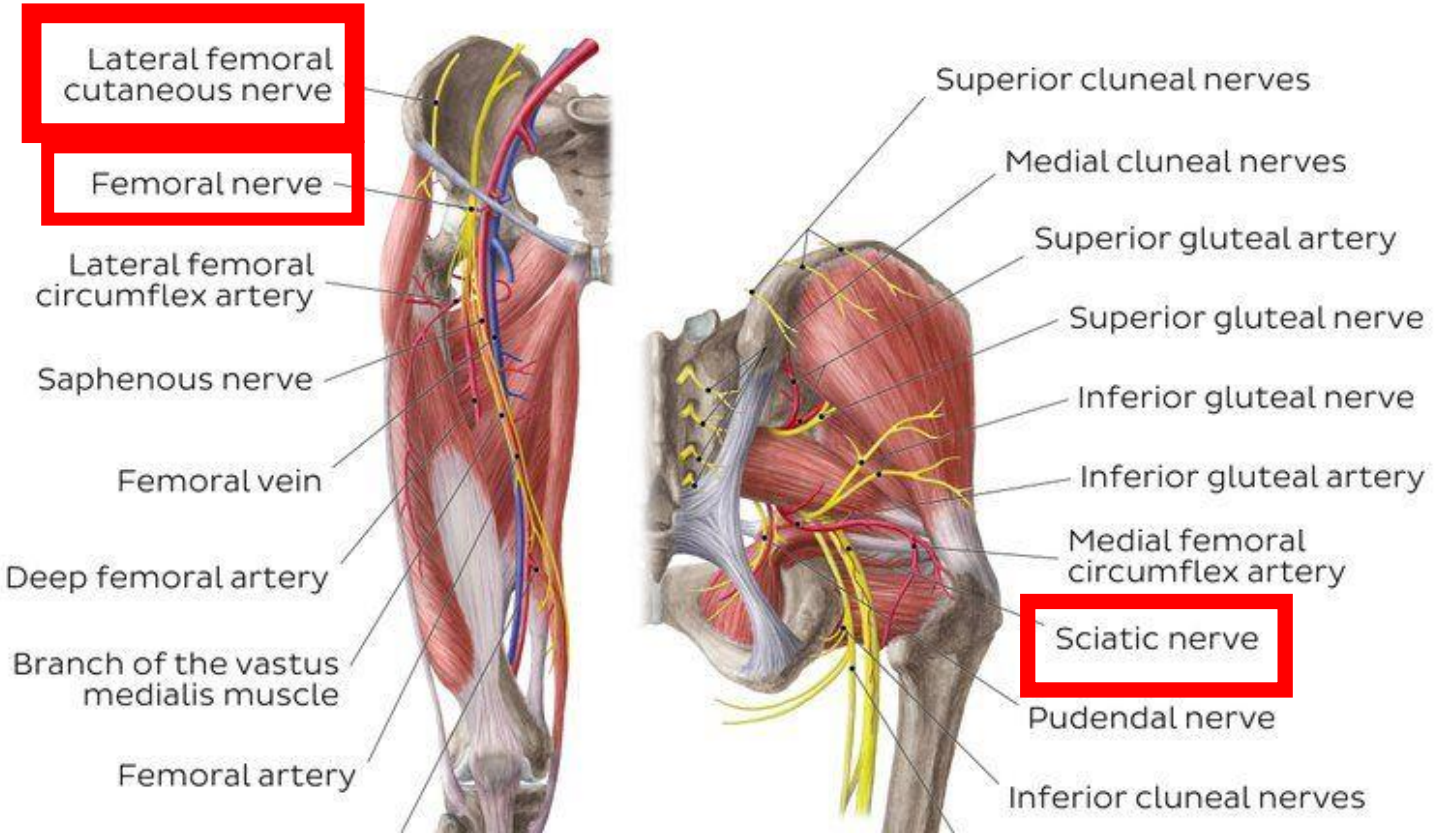
HIP EXTERNAL ROTATORS



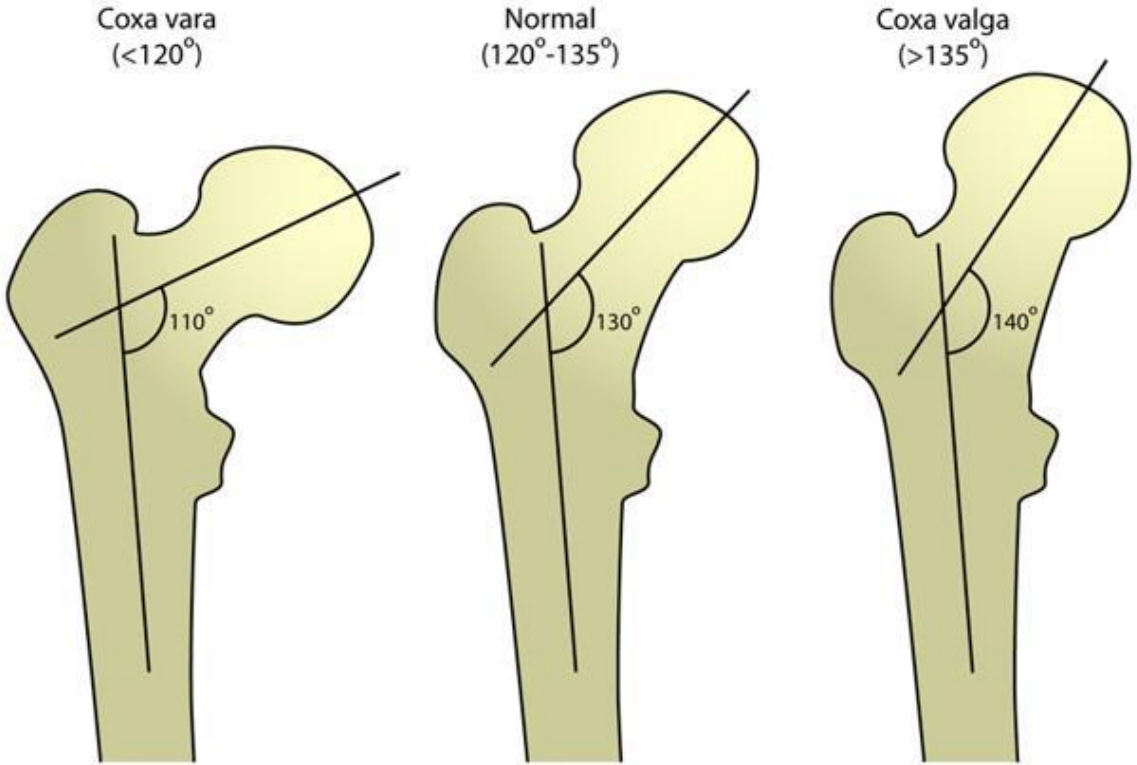
VASCULAR ANATOMY



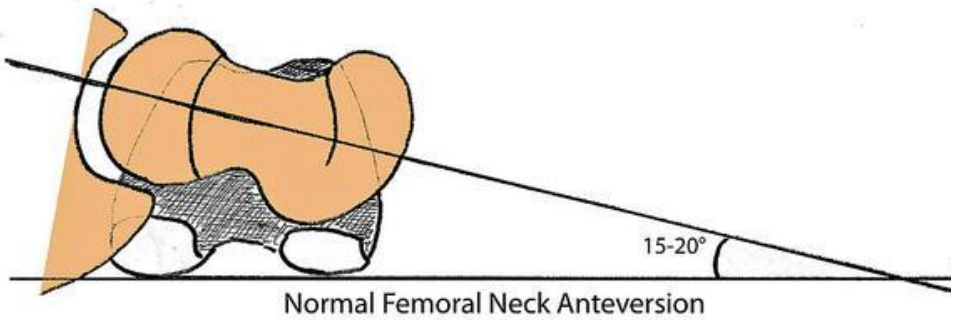
NERVE ANATOMY



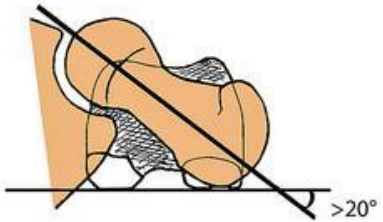
FEMORAL NECK SHAFT ANGLE



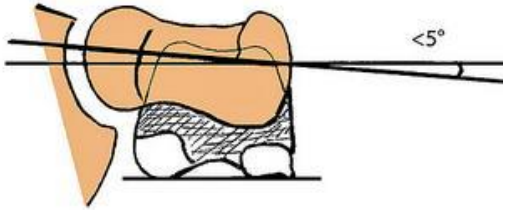
FEMORAL ROTATIONAL ANATOMY



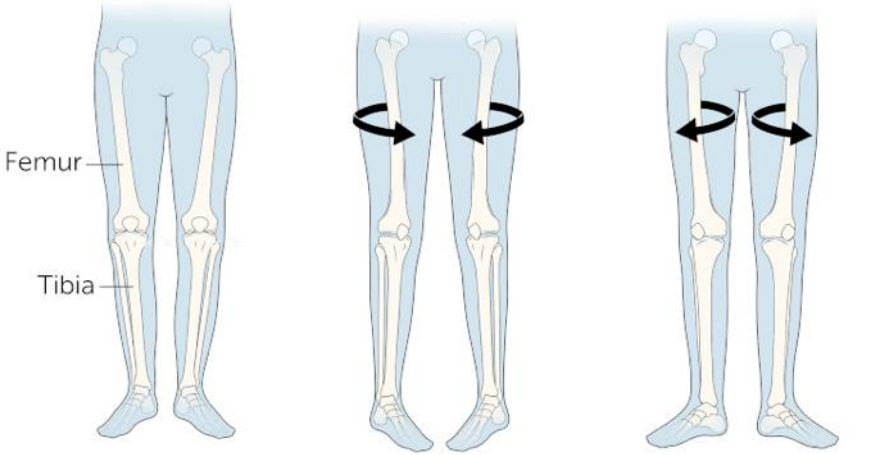
Normal Femoral Neck Anteversion



Increased Femoral Neck Anteversion



Femoral Neck Retroversion

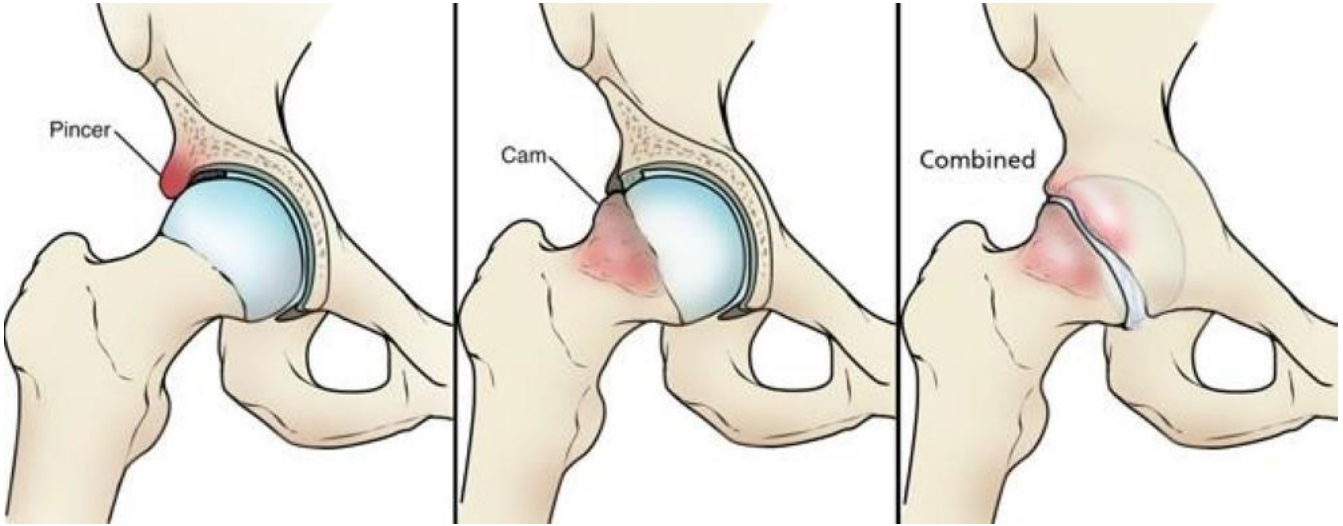


Typical

Femoral anteversion

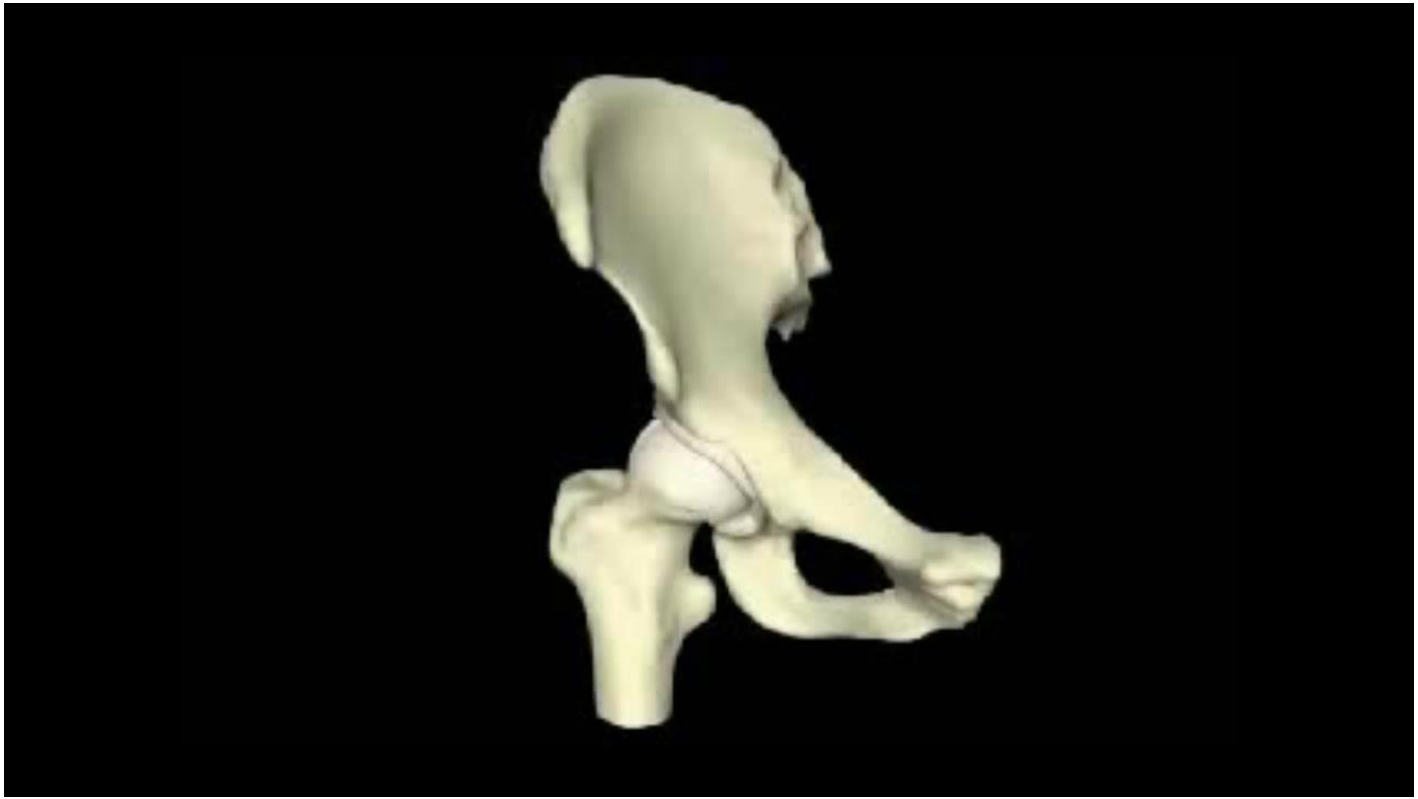
Femoral retroversion

FEMOROACETABULAR IMPINGEMENT

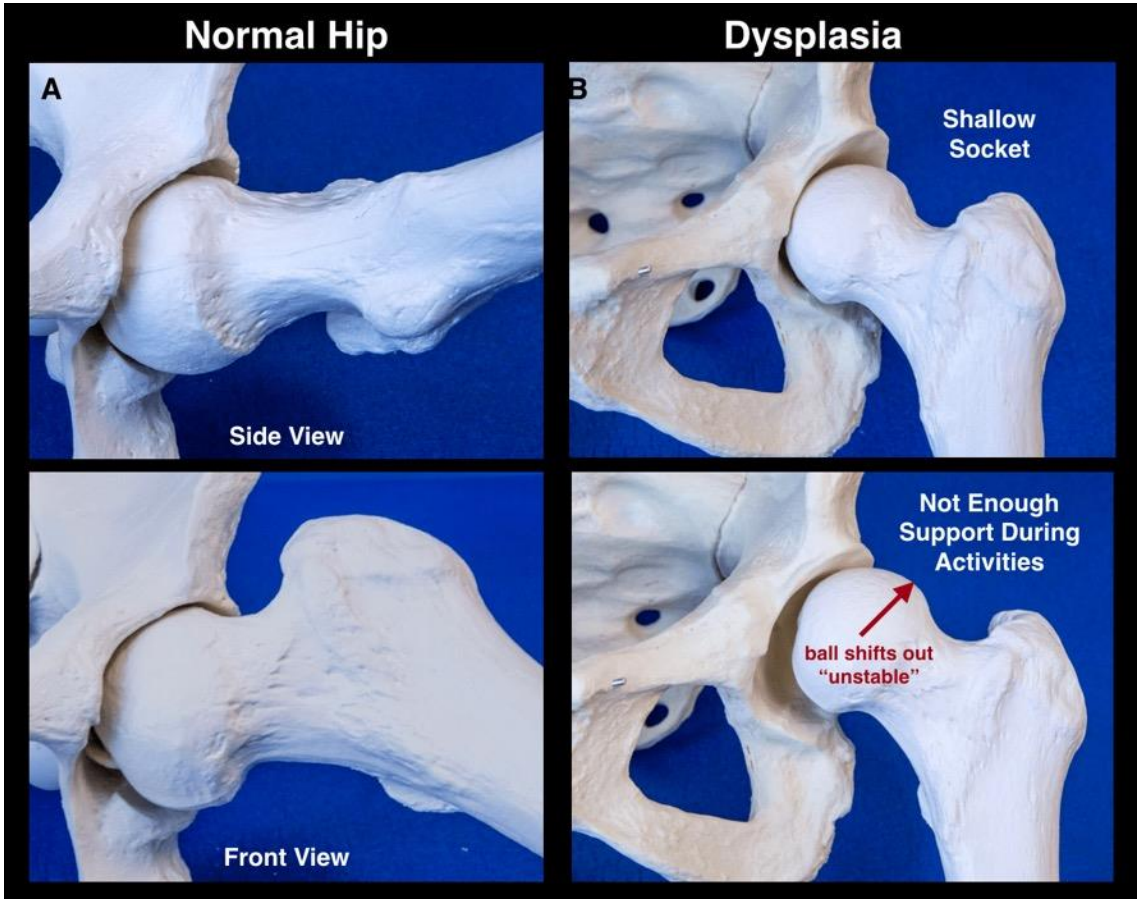


CAM IMPINGEMENT

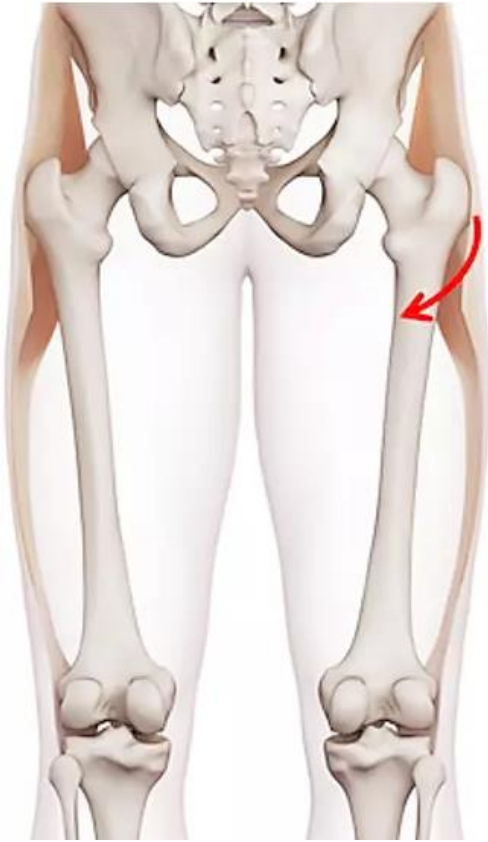
PINCER IMPINGEMENT

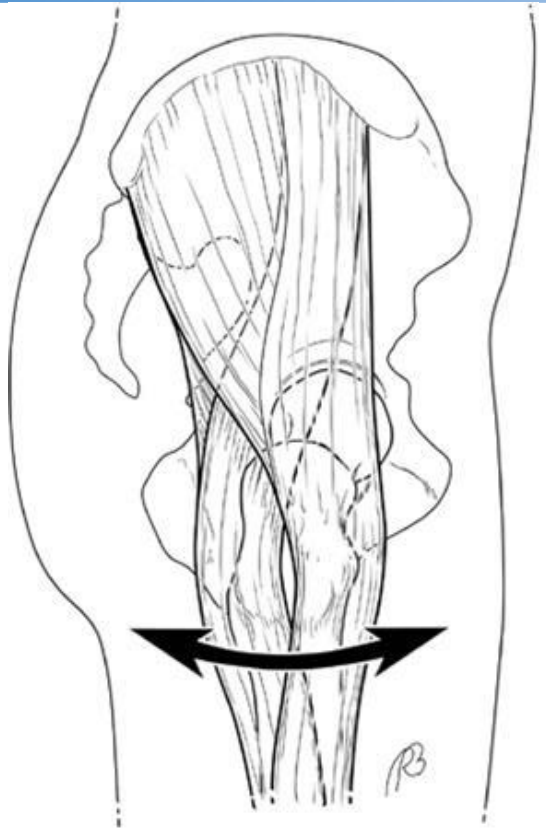


HIP DYSPLASIA

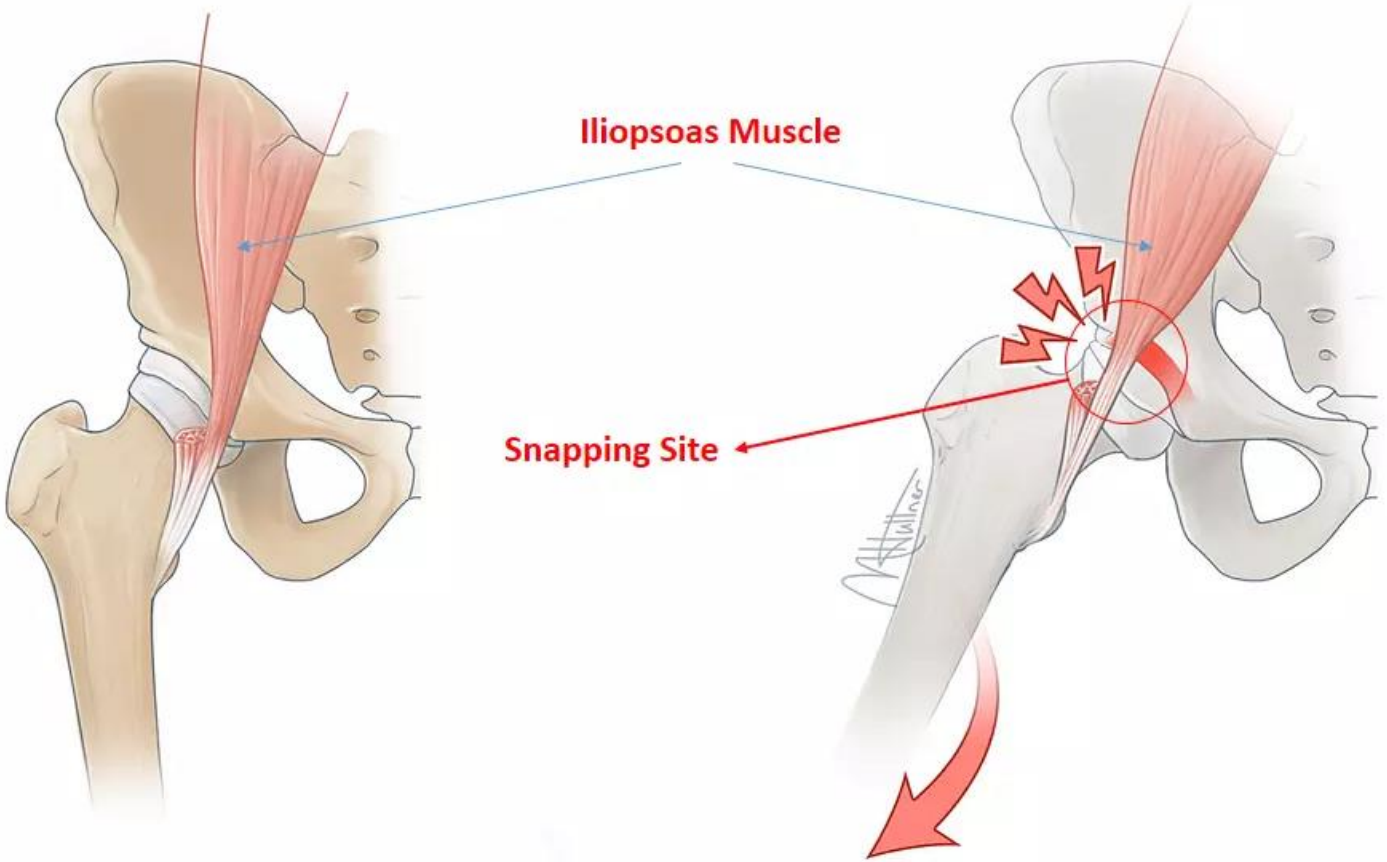


EXTERNAL SNAPPING HIP (COXA SALTANS)

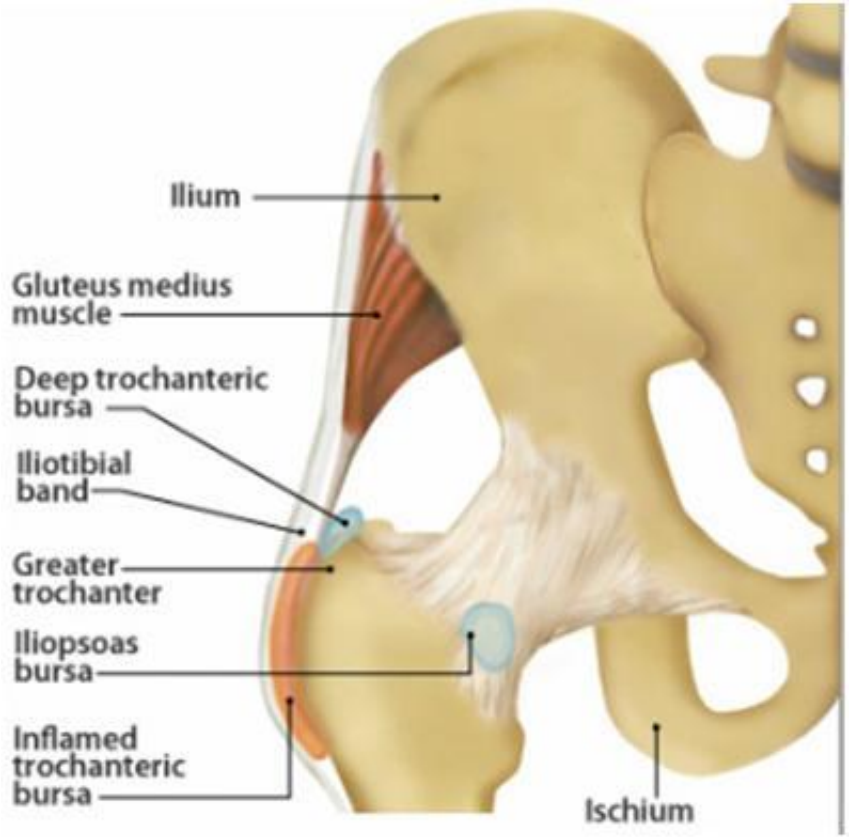




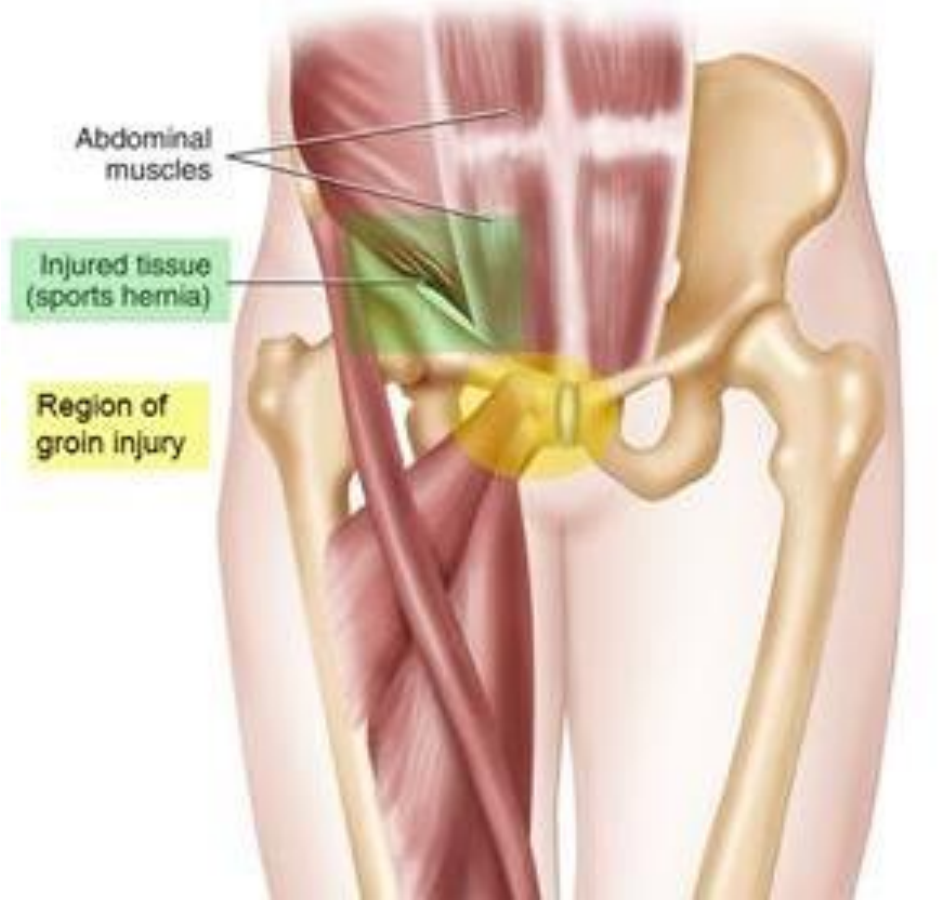
INTERNAL SNAPPING HIP (COXA SALTANS)



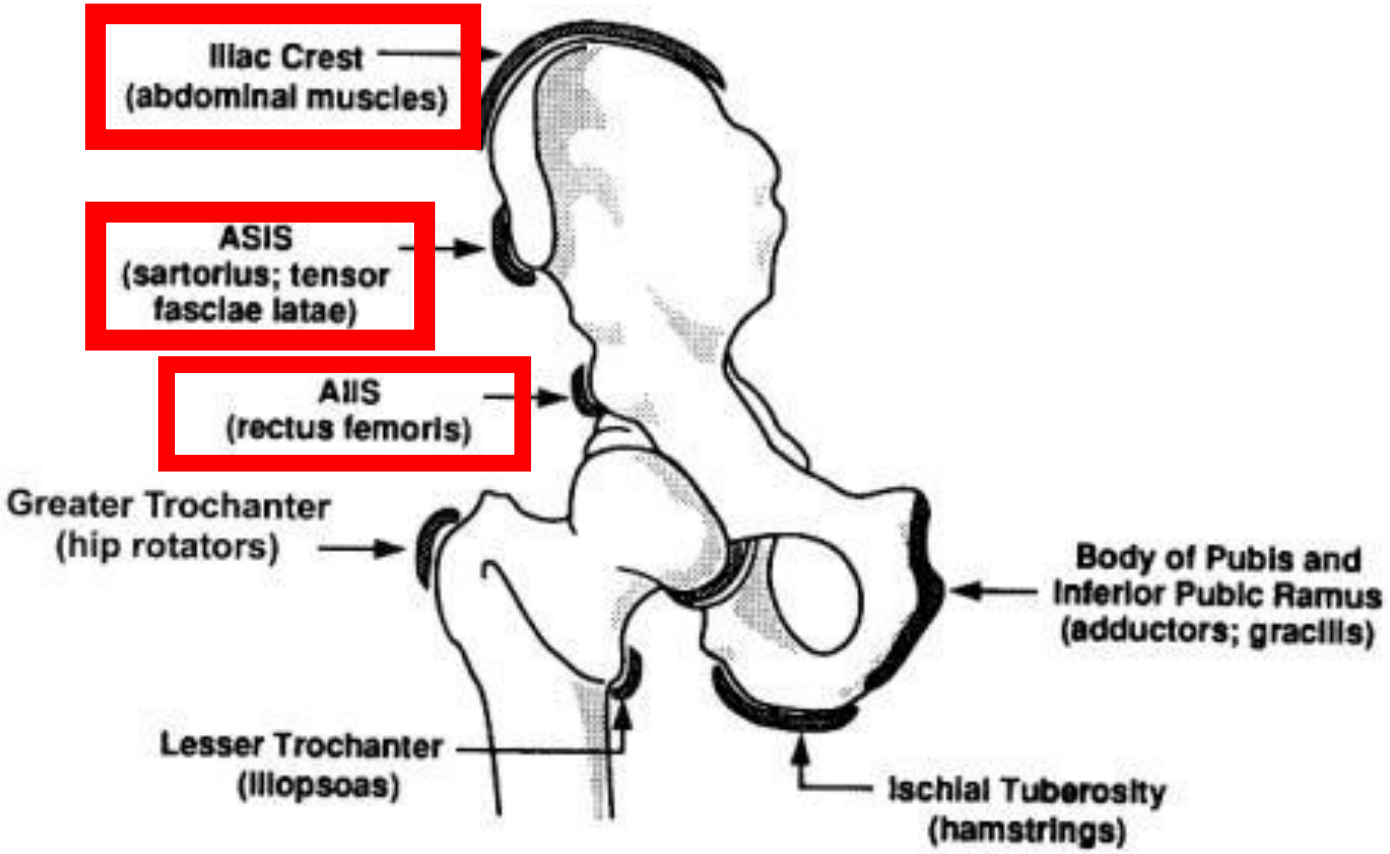
TROCHANTERIC BURSITIS



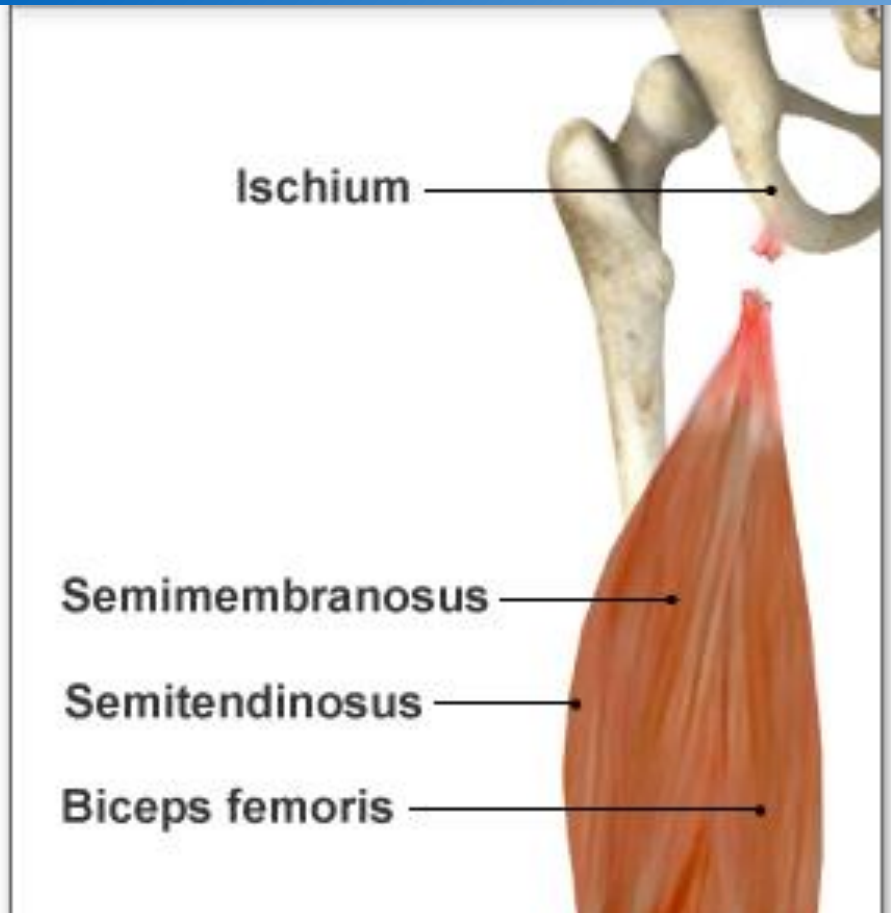
ATHLETIC PUBALGIA “SPORTS HERNIA”



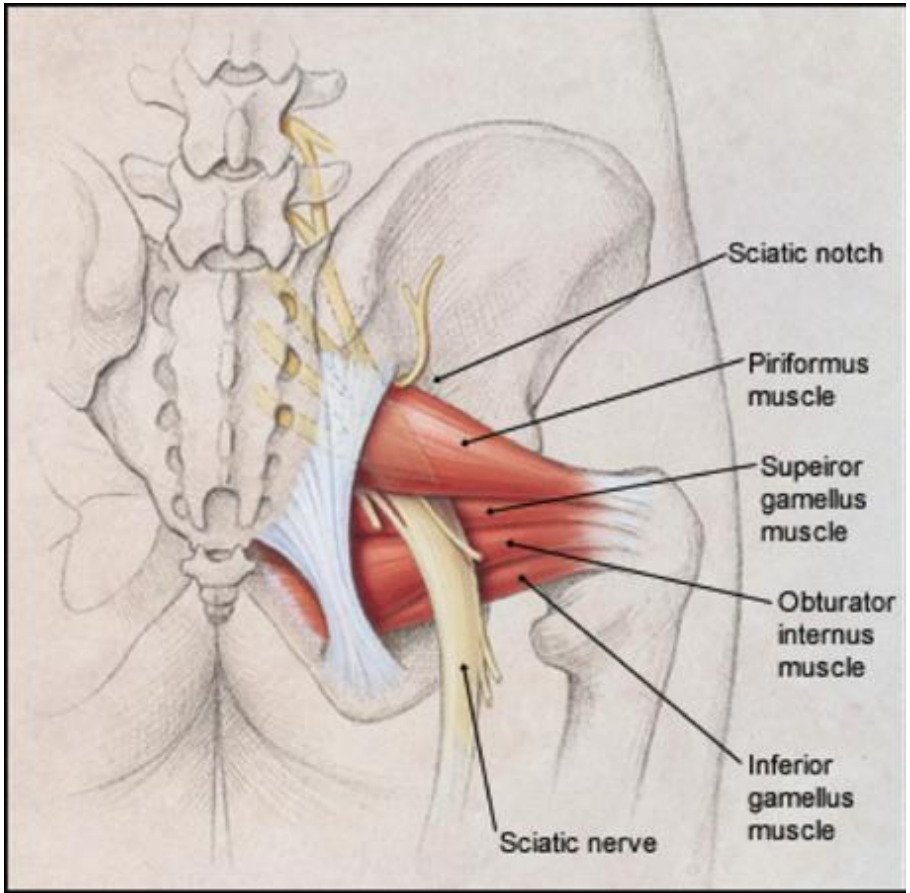
HIP AVULSION INJURIES



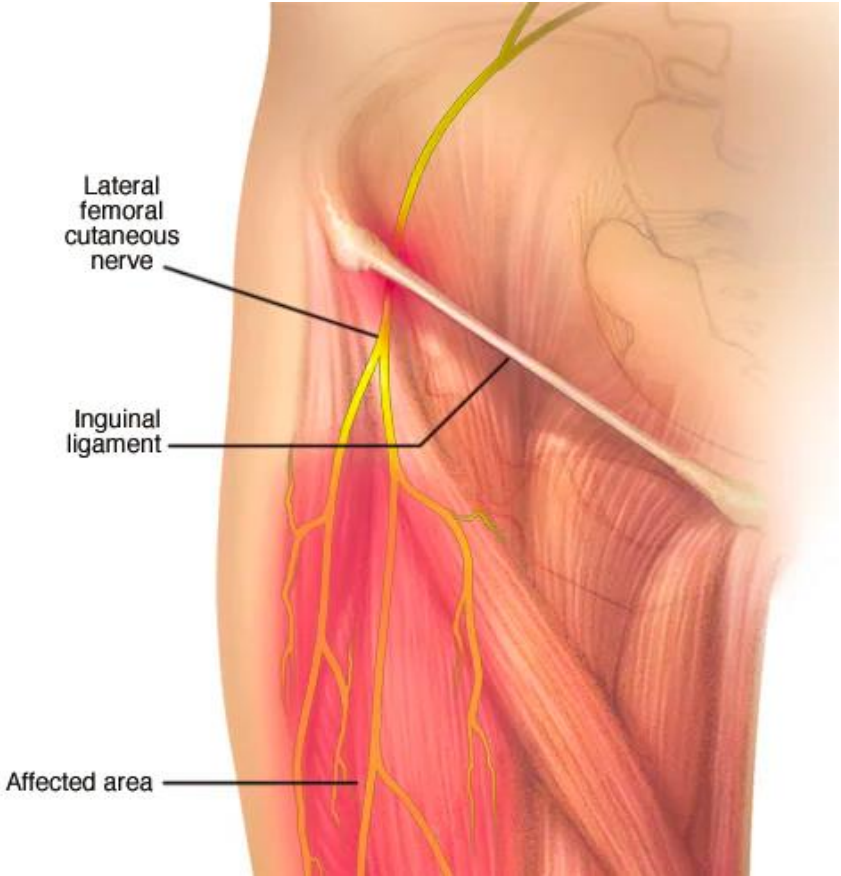
PROXIMAL HAMSTRING INJURY

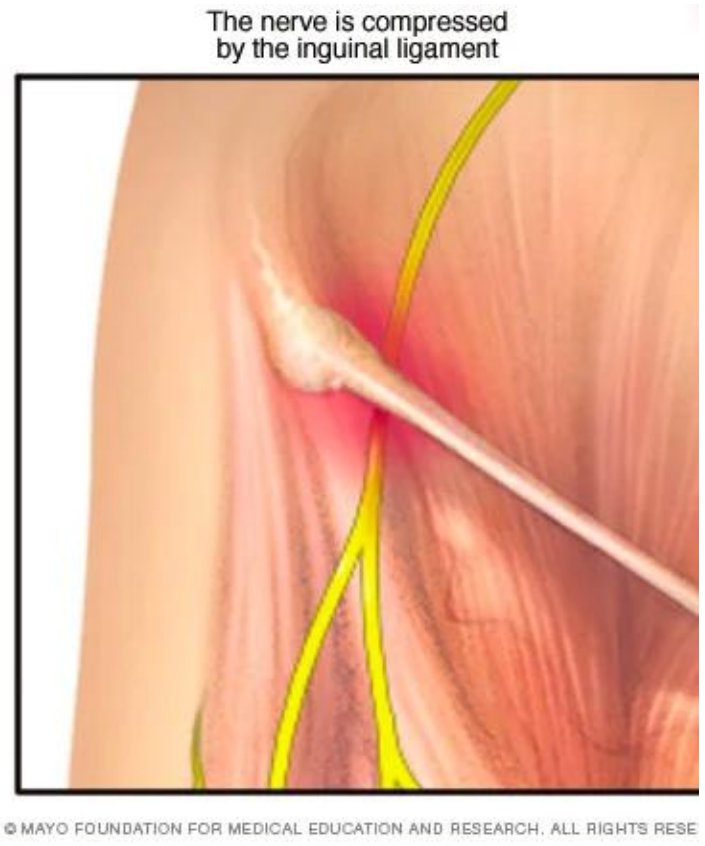


PIRIFORMIS SYNDROME

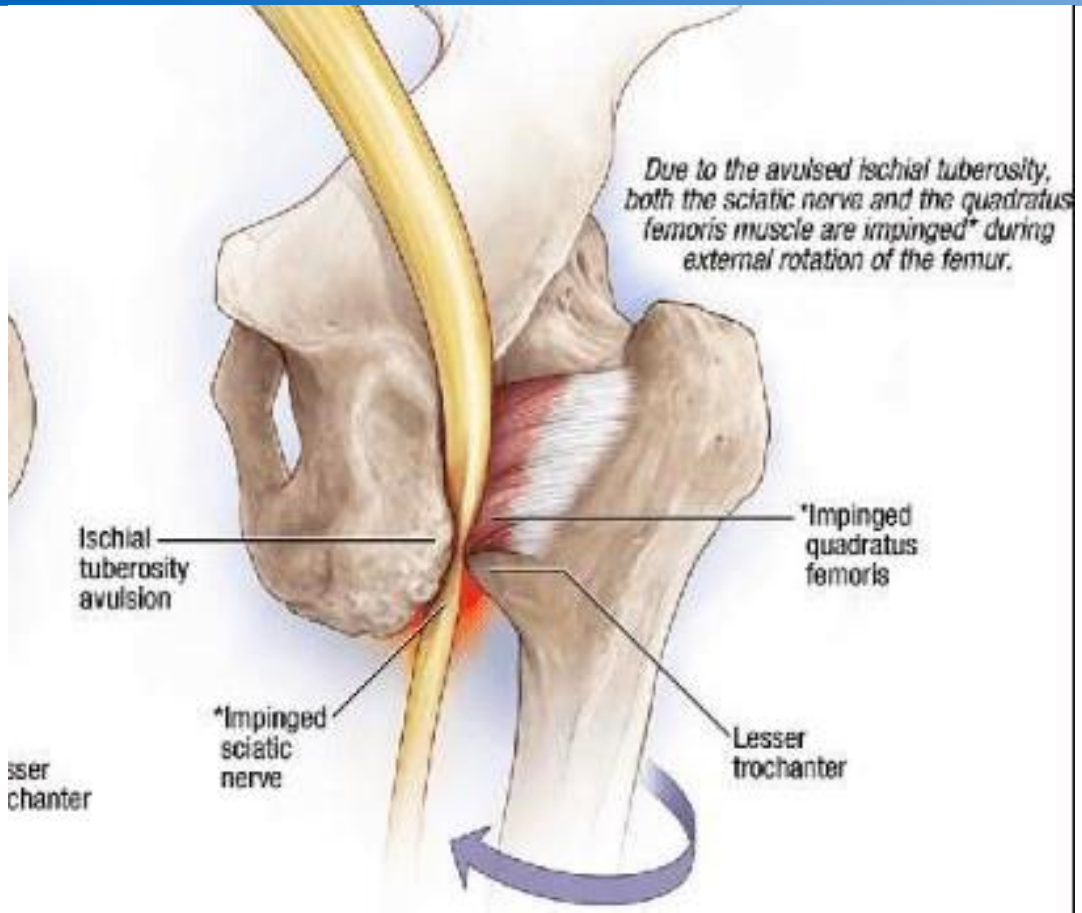


MERALGIA PARESTHETICA





ISCHIOFEMORAL IMPINGEMENT



PHYSICAL EXAMINATION OF THE HIP

Dr. Kevin Bonfield

St. Elizabeth PHYSICIANS

FIRST…

- Not all “hip pain” is hip pain
- Consider the 5 MSK sources of “hip pain”
  - ✓ Lumbar spine
  - ✓ Sacroiliac joint
  - ✓ Symphysis pubis joint
  - ✓ Thigh/ knee
  - ✓ Hip
- Consider other non-MSK sources of “hip pain”
  - ✓ GU - UTI, kidney stone, torsion, etc.
  - ✓ GI - Appendicitis, diverticulitis, hernia, etc.
  - ✓ Other - zoster, soft tissue infection, meralgia paresthetica, etc.
- History & Physical: “rule out” sources of pain
- Understand anatomy & what observe on physical exam

HIP BASICS

- **Ball and socket, synovial joint**
  - ✓ Femoral head & acetabulum
- **Acetabulum is made up of 3 bones of the pelvis**
  - ✓ Ischium, ilium, pubis
  - ✓ Depth is increased by fibrocartilaginous labrum
- **Pelvis provides a stable platform for this joint to function**
  - ✓ Sacroiliac & symphysis pubis - little to no movement
- **Many muscles contribute to provide a great range of motion**
  - ✓ Flexion / Extension*
  - ✓ Adduction / Abduction*
  - ✓ Internal / External rotation
  - ✓ Combination = Circumduction

HISTORY BASICS

- **Onset** (sudden, gradual, traumatic or nontraumatic)
- **Provocative & palliating factors** (increased pain with weight-bearing)
- **Quality**
- **Radiation** (to or from the low back)
- **Site** (lateral, anterior, or posterior hip)
- **Symptoms associated with pain** (paresthesia, mechanical symptoms such as catching, systemic symptoms such as fever)
- **Time course** (overall duration, length of episodes)

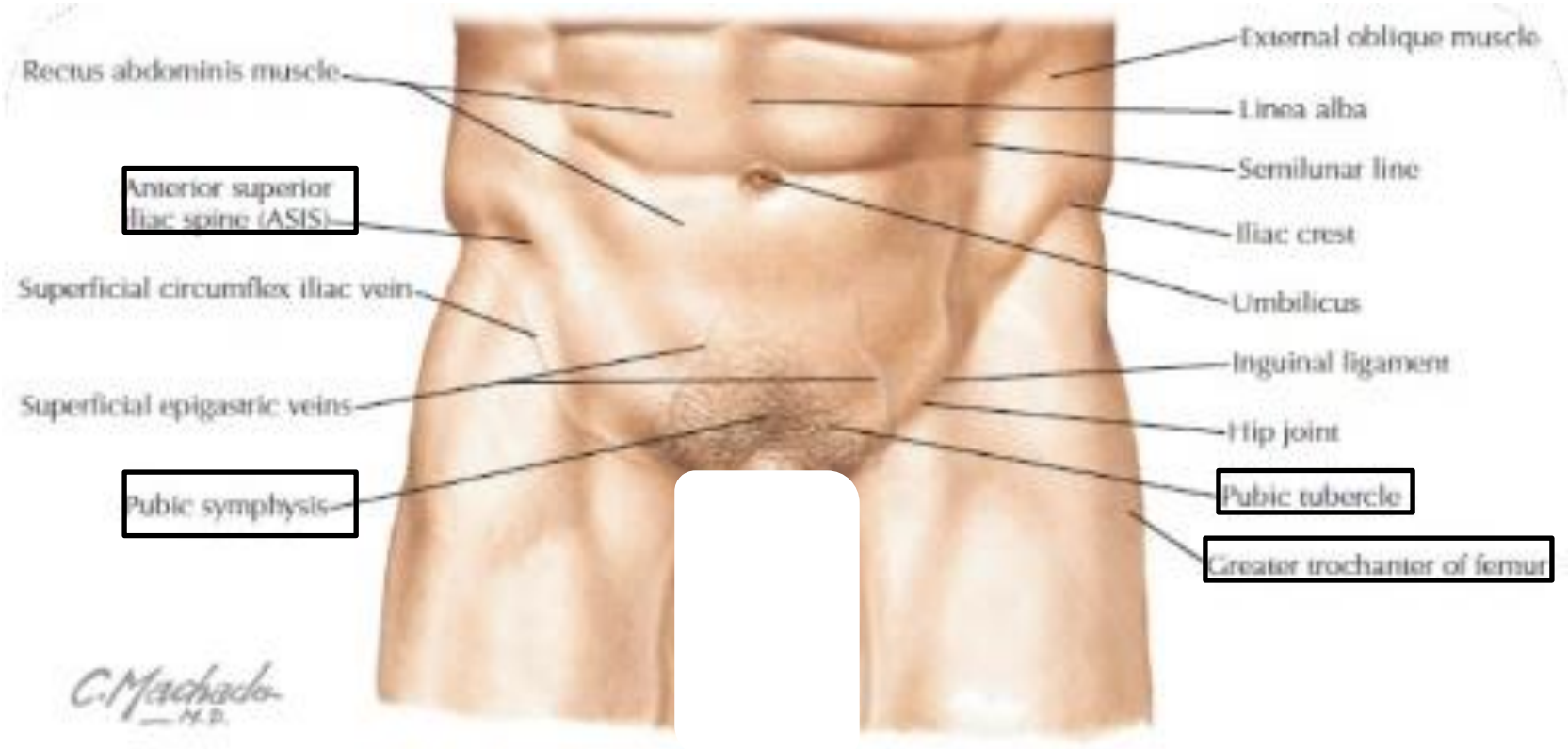
ADDITIONAL QUESTIONS

- Family history of rheumatological disease?
- Any additional joint pains? Rashes?
- Other systems involved? GI? Eyes?
- Mechanical symptoms?
- Color change? Consistent with amount of work/effort?

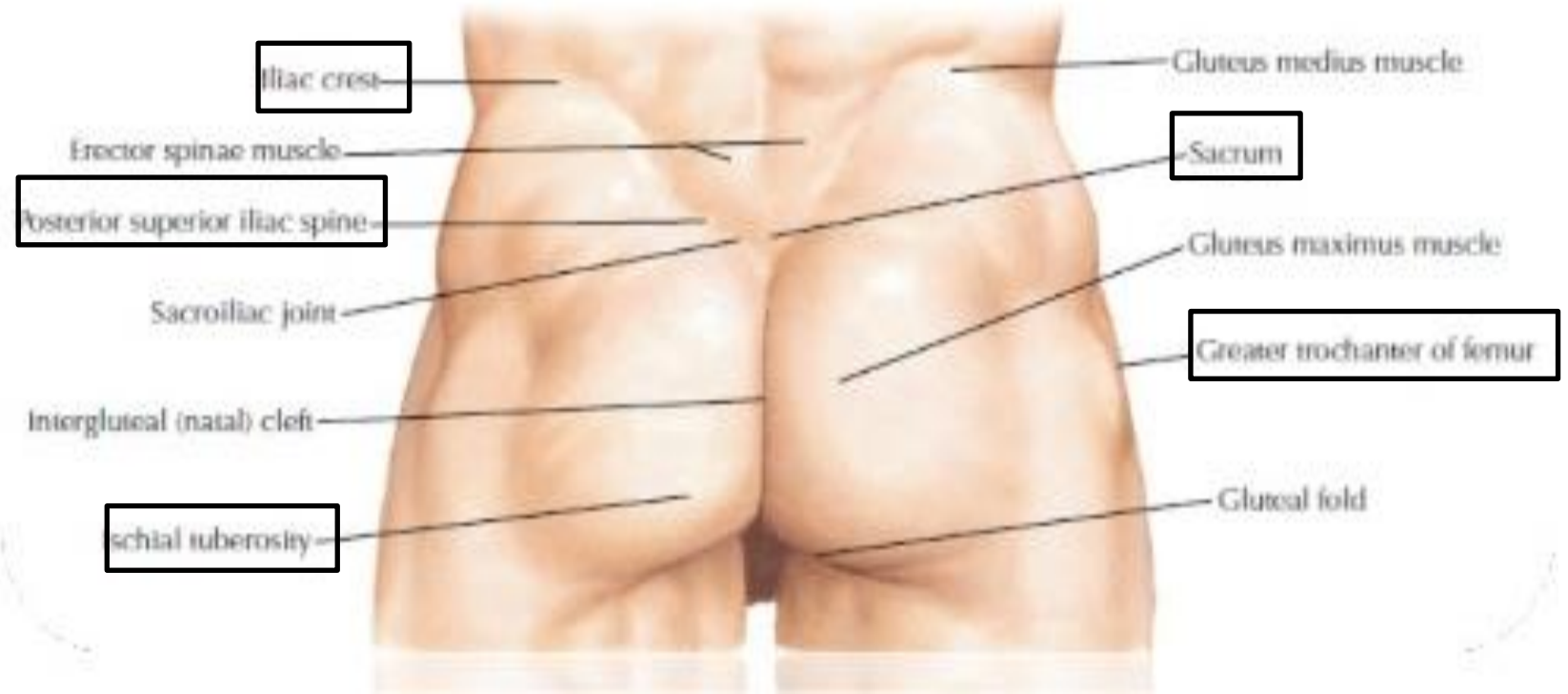
EXAMINATION BASICS

- Inspection, palpation, range of motion, strength & special tests
- Note gait as patient stands or walks
  - ✓ Watch for abnormal gait, uneven pelvis, and range of motion
- Explain what you are going to do prior - helps with anxiety for a potentially painful/sensitive exam
- Evaluate asymptomatic/less painful side first
- Palpate key bony structures & soft tissues to assess for tenderness
- Systematically test flexion, extension, adduction / abduction range of motion & strength, comparing sides
- Allow patient to demonstrate active range of motion / mobility to help determine possible limitations of exam
- Modify exam as needed to cater to needs of the patient (e.g., seated)
- Use of a goniometer & a standardized approach allows for reliably reproducible exams

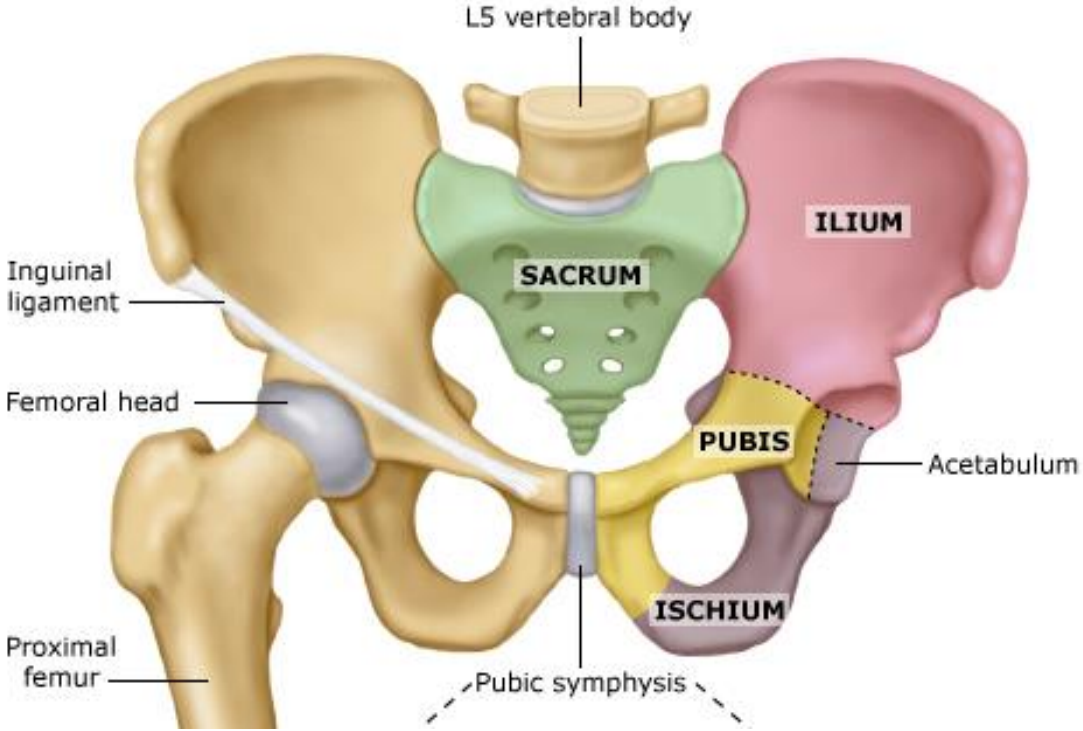
ANATOMY - TOPOGRAPHIC



ANATOMY - TOPOGRAPHIC



ANATOMY - PELVIS



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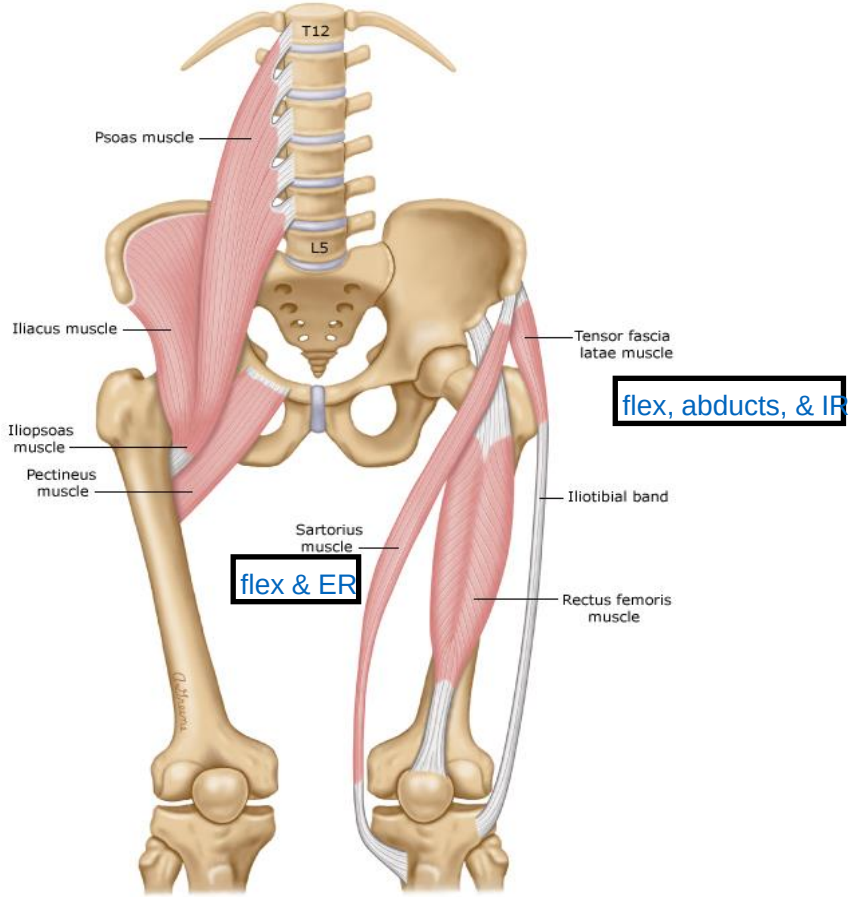
ANTERIOR ANATOMY - HIP FLEXORS



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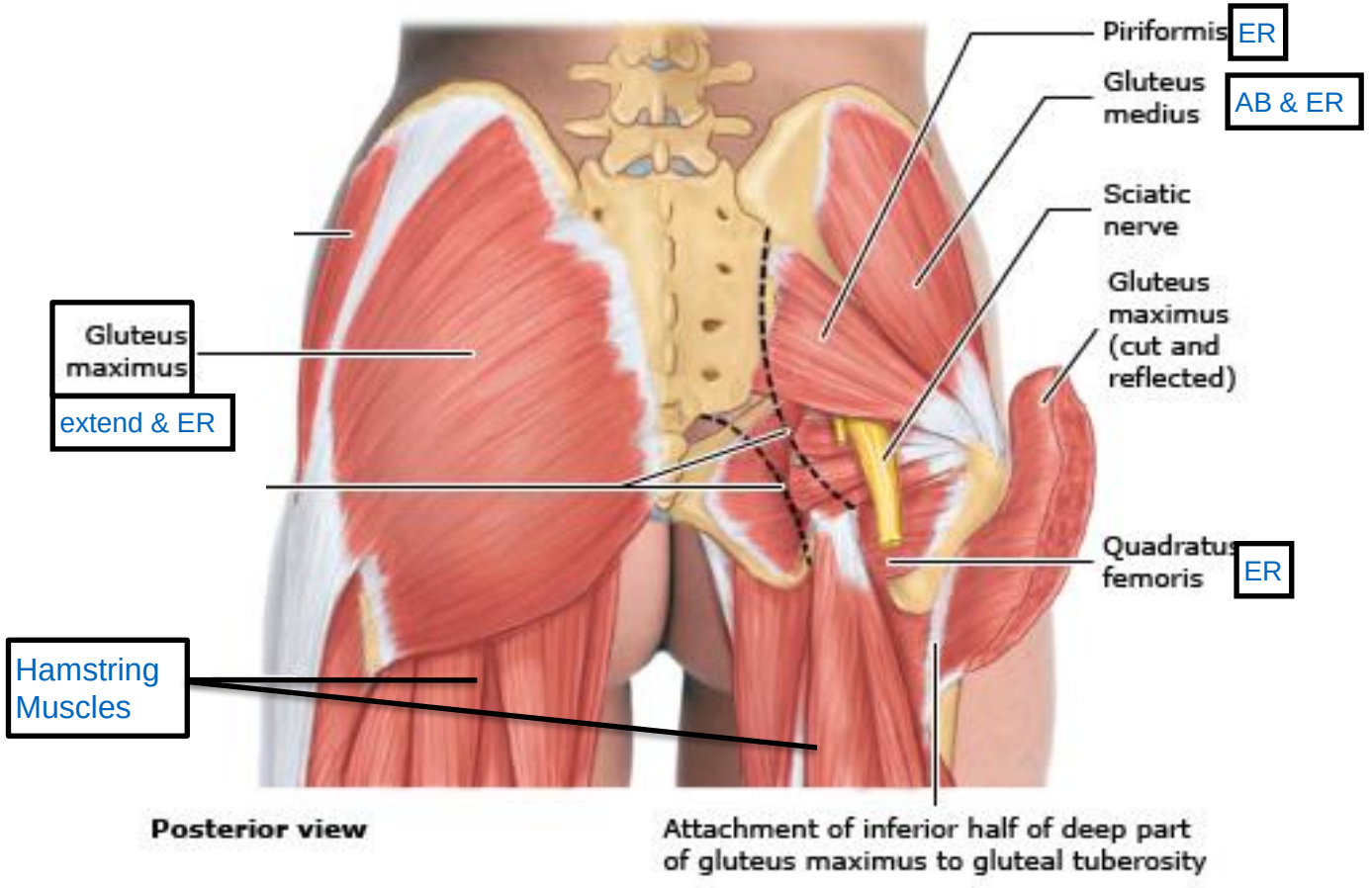
POSTERIOR ANATOMY - HIP EXTENSORS+



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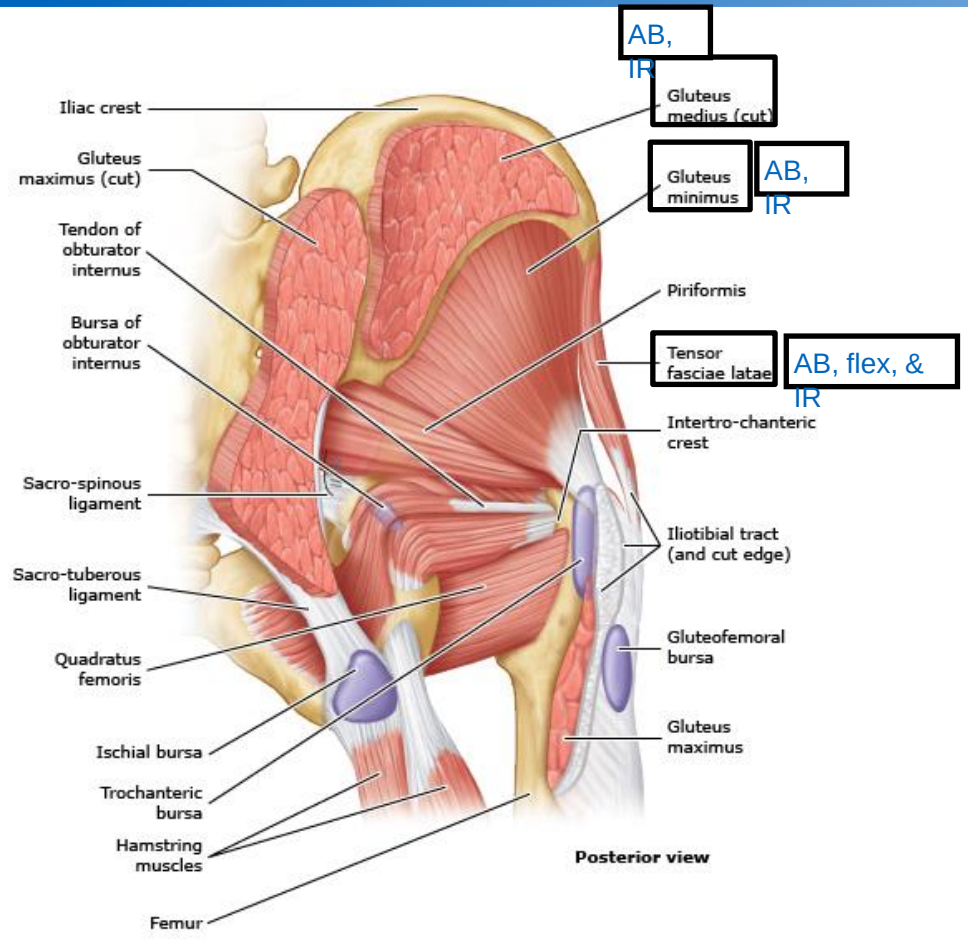
LATERAL ANATOMY - HIP ABDUCTORS



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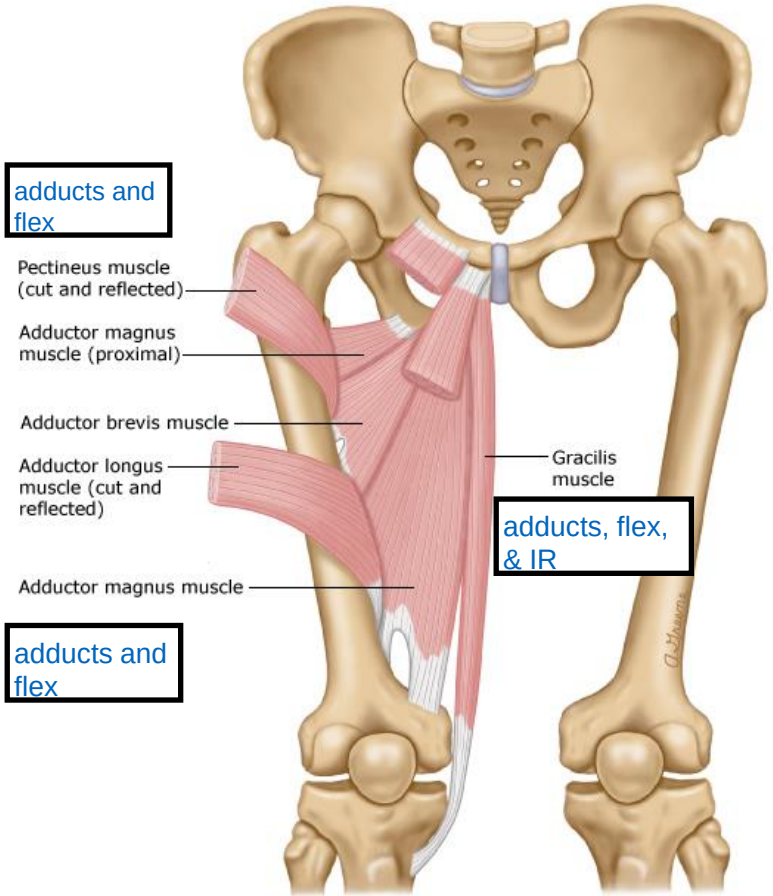
MEDIAL ANATOMY - HIP ADDUCTORS



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PHYSICAL EXAM - ACTIVE RANGE OF MOTION

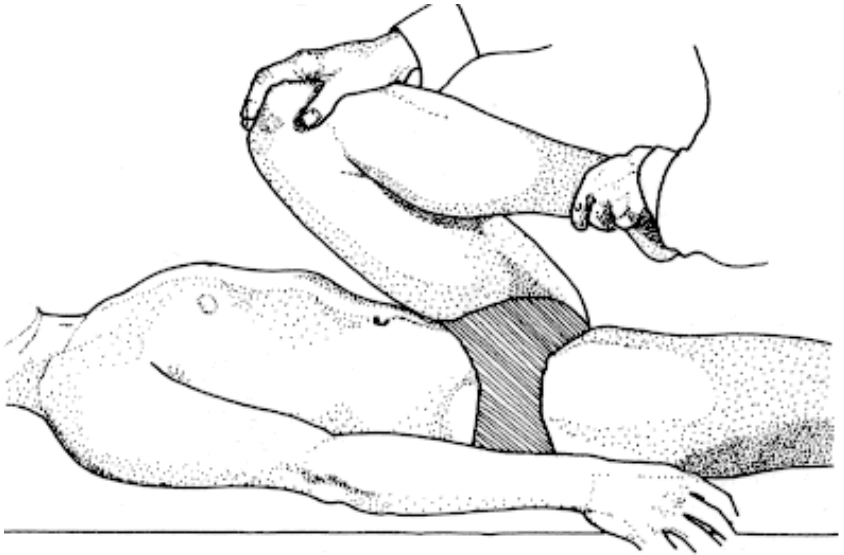
Determine if there is a gross restriction in range of motion

- **Flexion - draw each leg toward chest without bending back. Should be able to bring almost to chest (~130º flexion)**
- **Extension - fold arms across chest & keeping back straight, get up from a chair. Prone lifting leg off table**
- **Adduction - bring legs together from abduction, cross leg in front of the other (~20º adduction)**
- **Abduction - spread legs out as far as possible (each leg ~45º abduction)**

PHYSICAL EXAM - PASSIVE RANGE OF MOTION

FLEXION

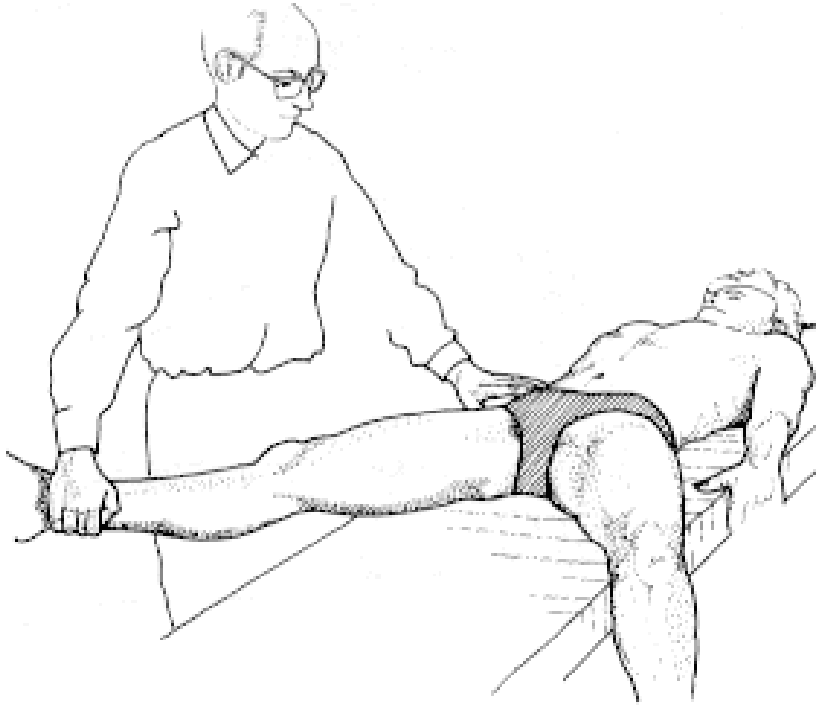
- Patient supine, flex hip
- When lumbar lordosis is flattened, pelvis is stabilized, additional motion only from hip joint
  - ✓ Normal flexion allows for the hip to rest on the abdomen (~135º)



PHYSICAL EXAM - PASSIVE RANGE OF MOTION

ABDUCTION

- Patient supine
- Stabilize pelvis and hold ankle gently abducting the leg as far as it will go
  - ✓ Normal abduction is ~45-50º
  - ✓ You can feel pelvis move at end of abduction



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PHYSICAL EXAM - PASSIVE RANGE OF MOTION

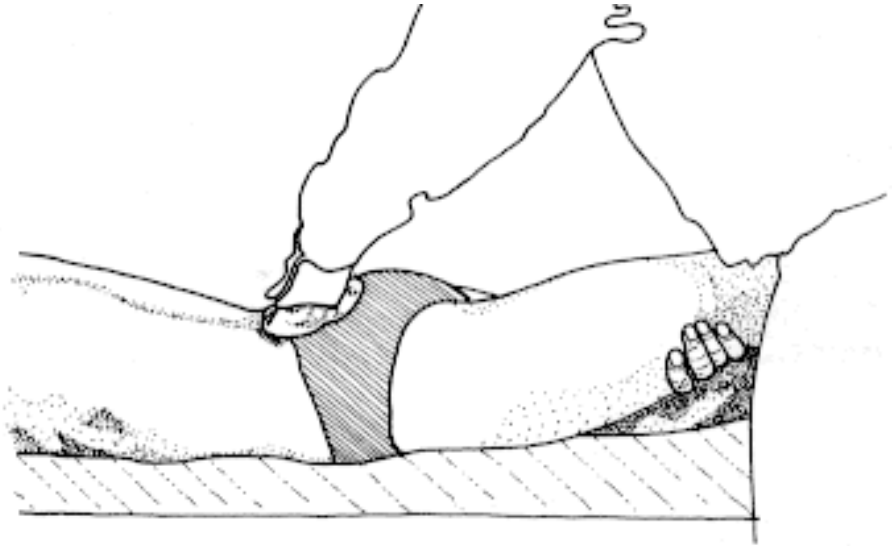
ADDUCTION

- Patient supine
- Stabilize pelvis and holding ankle, guide leg across the midline & over the opposite extremity
  - ✓ Normal adduction is ~20-30º
  - ✓ Can feel pelvis move at end of adduction
  - ✓ Thighs can offer soft tissue resistance

PHYSICAL EXAM - PASSIVE RANGE OF MOTION

EXTENSION

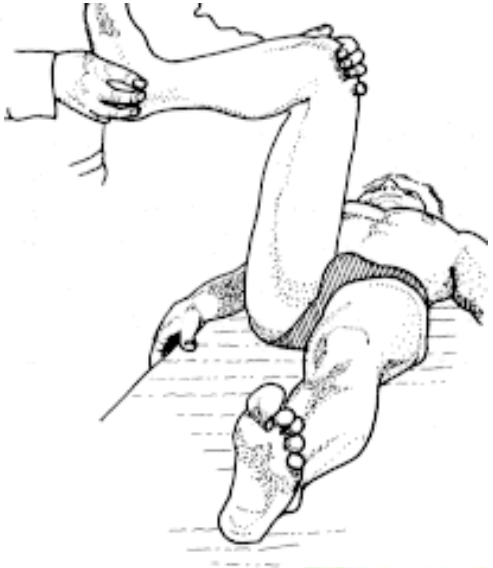
- Patient prone or lateral
- Stabilize pelvis and have patient bend knee, move leg & thigh posteriorly
  - ✓ Normal extension is ~30º
  - ✓ If no extension, flexion contracture is probable cause



PHYSICAL EXAM - PASSIVE RANGE OF MOTION

INTERNAL ROTATION

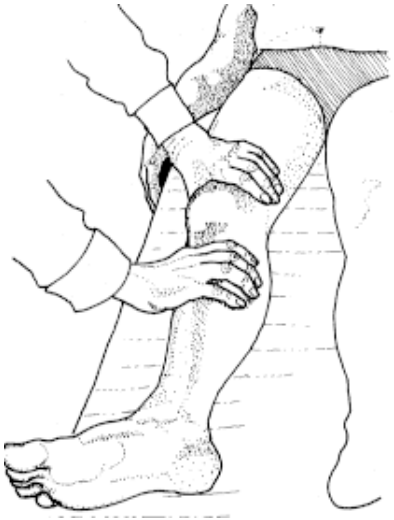
- Patient supine
- Tested both in neutral position and with hip & knee flexed
  - ✓ Normal internal rotation is ~40-50º
  - ✓ Excessive rotation suggests joint hyper-mobility

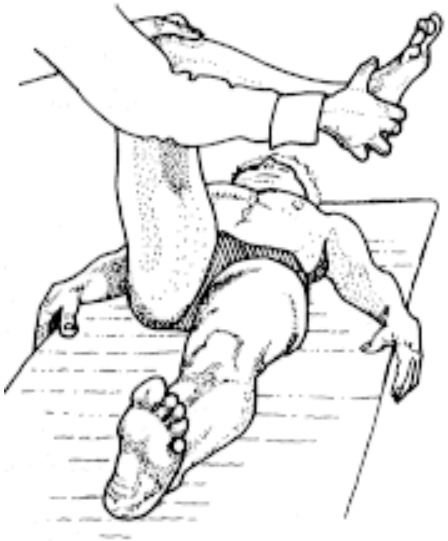


PHYSICAL EXAM - PASSIVE RANGE OF MOTION

EXTERNAL ROTATION

- Patient supine
- Tested both in neutral position and with hip & knee flexed
  - ✓ Normal external rotation is ~40-50º
  - ✓ Excessive rotation suggests joint hyper-mobility





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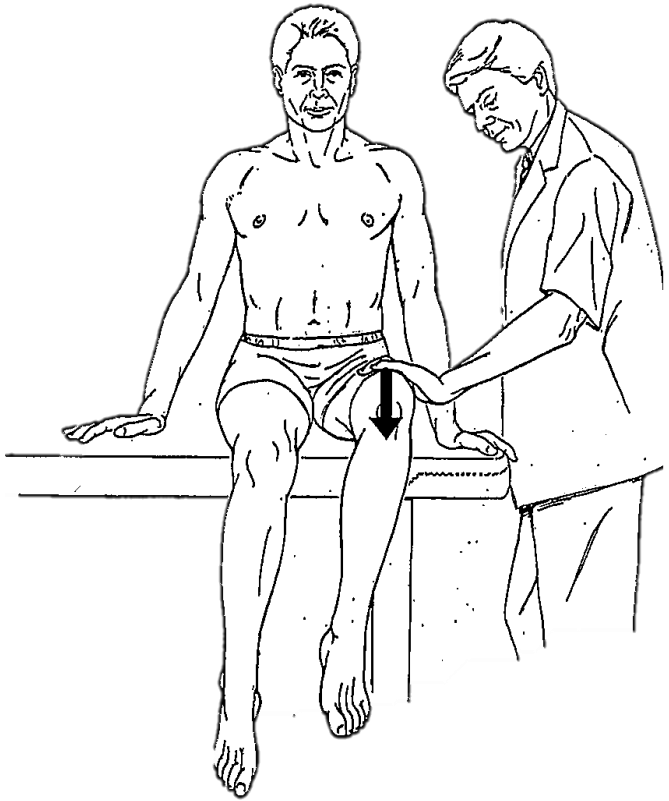
PHYSICAL EXAM- STRENGTH TESTING

GRADE	PERCENTAGE	DESCRIPTION
5 (Normal)	100	Complete range of motion against gravity with full resistance
4 (Good)	75	Complete range of motion against gravity with some resistance
3 (Fair)	50	Complete range of motion against gravity with no resistance
2 (Poor)	25	Complete range of motion with gravity eliminated
1 (Trace)	10	Evidence of slight contractility with no evidence of joint motion even with gravity eliminated
0 (Zero)	0	No evidence of muscle contractility

PHYSICAL EXAM - STRENGTH TESTING

FLEXORS

- Patient seated
- Tests psoas & rectus femoris



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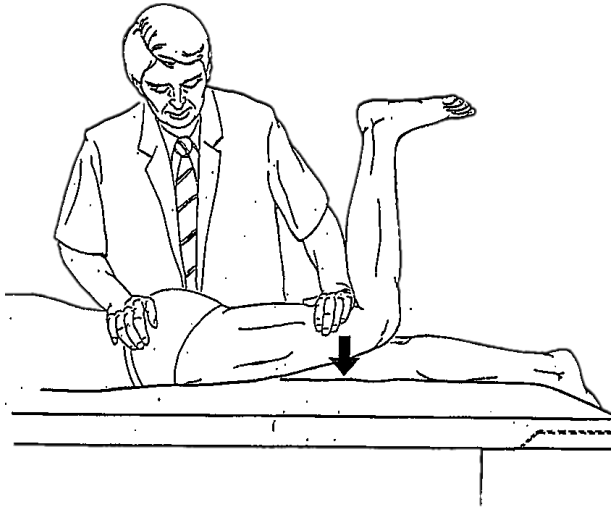
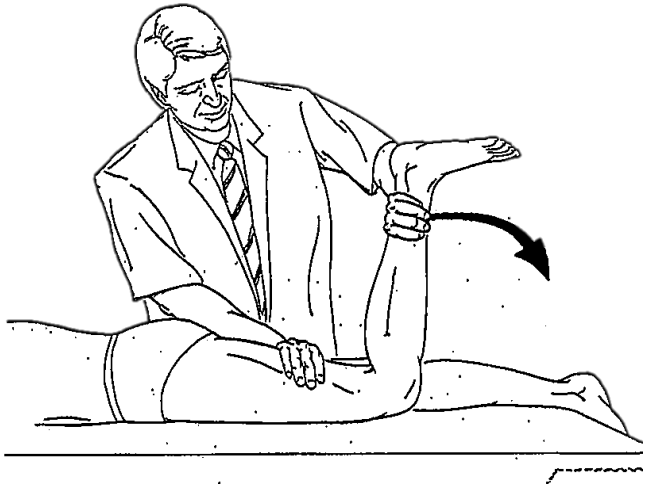
PHYSICAL EXAM - STRENGTH TESTING

EXTENSORS

- Patient prone
- Test gluteus maximus & hamstring

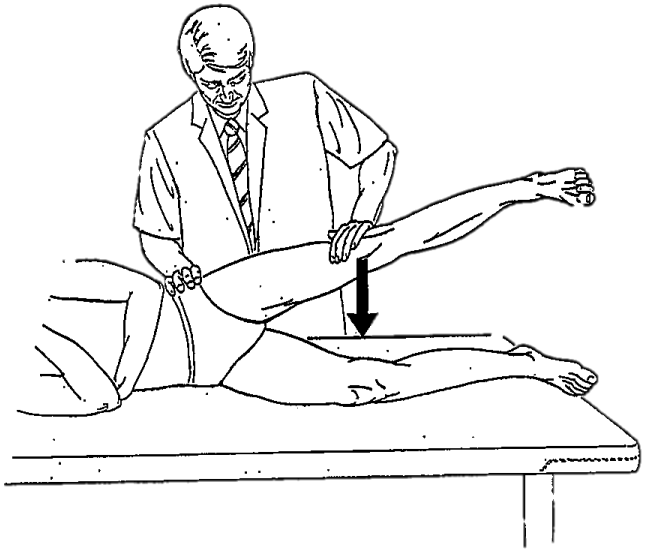


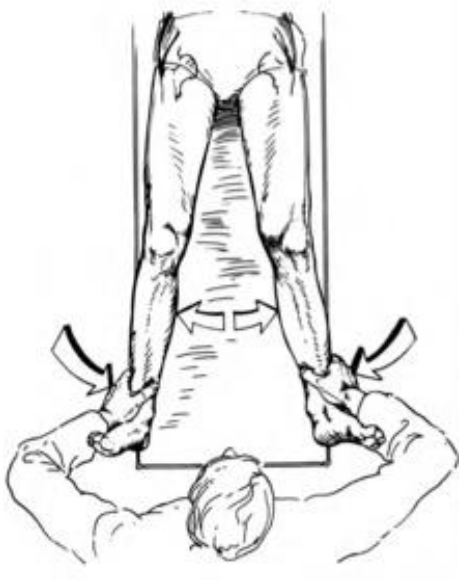


PHYSICAL EXAM - STRENGTH TESTING

ABDUCTORS

- Can test individually or simultaneously for comparison
- Tests gluteus medium & minimus





PHYSICAL EXAM - STRENGTH TESTING

ADDUCTORS

- Patient supine
- Tests adductor longus, brevis, magnus,+

PHYSICAL EXAM - NEURO & VASCULAR

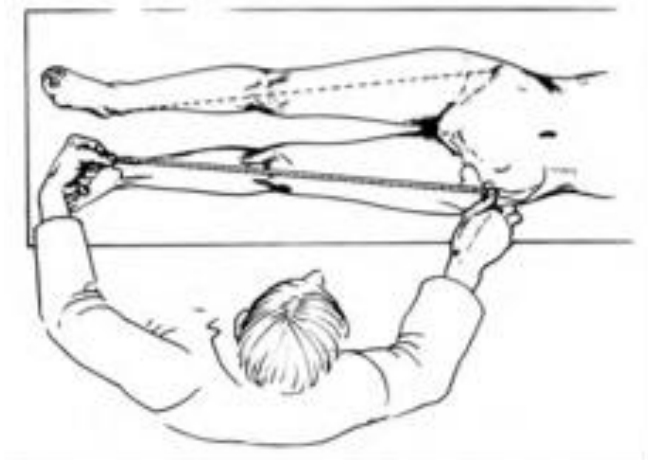
- With history of neurologic complaint or trauma, focused neuro & vascular exams should be performed
- Assessing femoral, popliteal, posterior tibial & dorsal pedis pulses to ensure appropriate blood flow, comparing sides
- In addition to strength (as above), sensation & deep tendon reflexes should be performed
  - ✓ Consider straight leg test & evaluate for saddle anesthesia

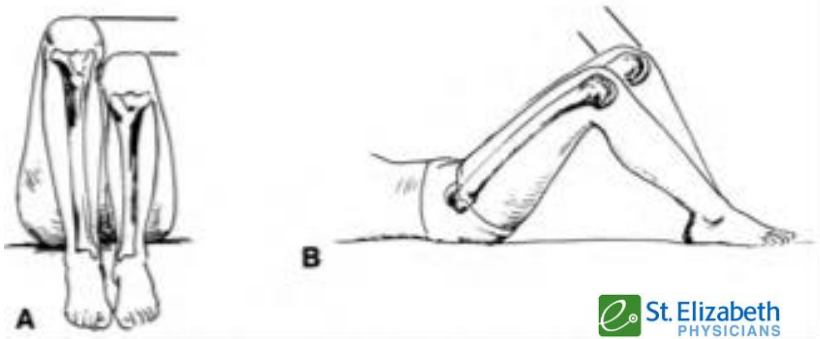
PHYSICAL EXAM SPECIAL TESTS

- History & physical exam can often help to narrow down the differential diagnosis
- Special tests can help refine the list & often help guide diagnostic testing
- The sensitivity & specificity of these tests are largely unstudied

PHYSICAL EXAM SPECIAL TESTS

- Leg length discrepancy test - measure from fixed bony points (ASIS to medial mal)
- A positive test is > 1 cm difference in leg length
- In true leg length discrepancy (vs. apparent), have patient lie supine & flex knees to 90º to determine where discrepancy lies
- Weber-Barstow maneuver

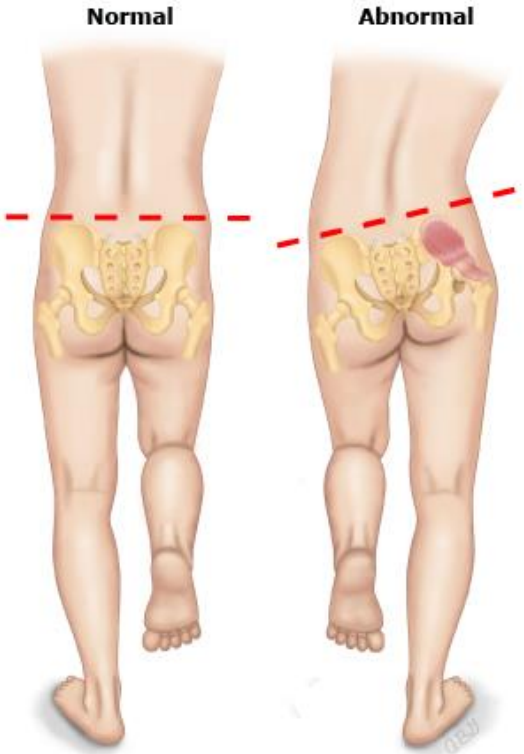




PHYSICAL EXAM SPECIAL TESTS

TRENDELENBURG TEST

- Stand behind patient
- Have stand on one leg, flexing knee & hip of untested side
  - ✓ Positive test is where the pelvis drops on the unsupported side
  - ✓ This indicates the gluteus medius muscle is either weak or nonfunctioning



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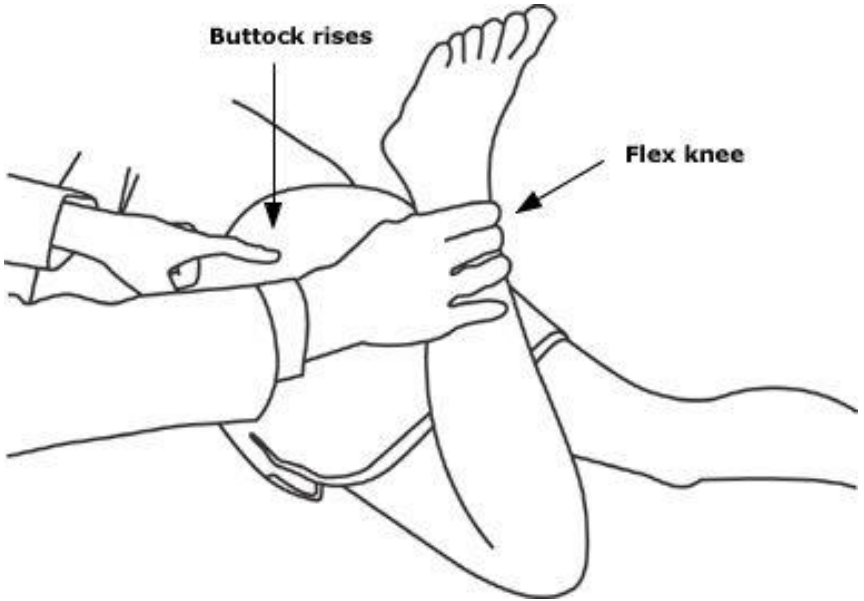
PHYSICAL EXAM SPECIAL TESTS

ELY TEST

- Patient prone
- Provider passively flexes knee to ~130º
  - ✓ Positive test if the pelvis comes up off the table
  - ✓ Indicates a tight rectus femurs muscle



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PHYSICAL EXAM SPECIAL TESTS

OBER'S TEST

- Patient in lateral decubitus on unaffected side
- Provider abducts leg & flexes knee to 90º
- Release knee but support lower leg
  - ✓ Positive test is decreased or inability of knee to be adducted by gravity only
  - ✓ Positive test suggests iliotibial band or tensor fascia late tightness
  - ✓ May also indicate tightness of gluteus medius

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PHYSICAL EXAM SPECIAL TESTS

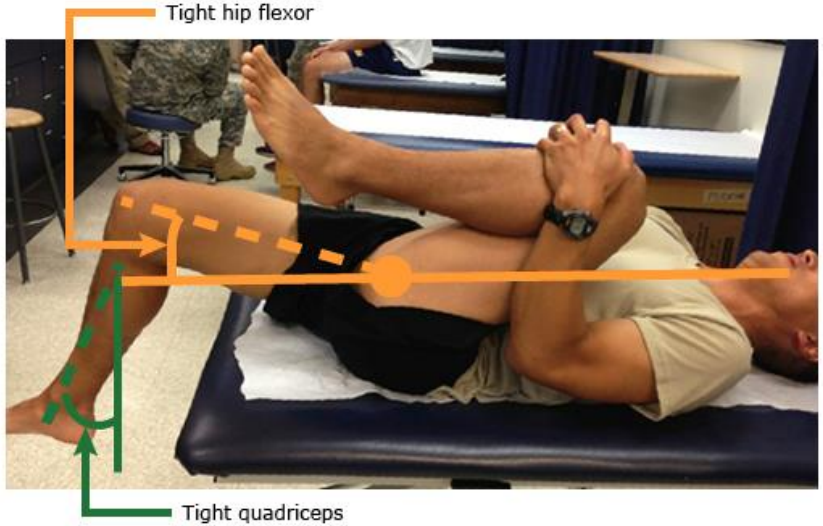
NOBLE'S TEST

- Patient in supine or sitting position
- Apply pressure at lateral epicondyle and patient extends
  - ✓ Reproduces pain, typically at 30° of flexion

PHYSICAL EXAM SPECIAL TESTS

THOMAS TEST

- **Patient supine - brings thigh to trunk**
  - ✓ **Positive test if contralateral leg does not rest on table or the thoracic spine comes off table**
  - ✓ **Positive test indicates tight psoas muscle or a fixed flexure contracture, a painful click may indicate a labral tear**



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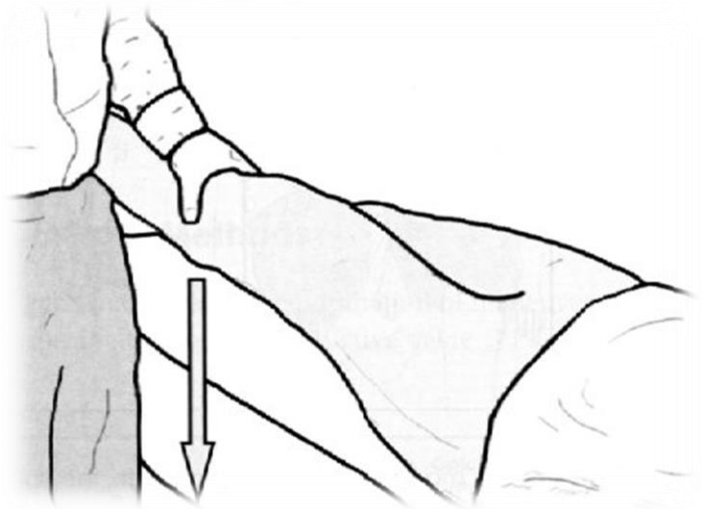
PHYSICAL EXAM SPECIAL TESTS

STINCHFIELD TEST

- Patient supine - raise leg with knee fully extended
- Provider presses down on patient's shin
  - ✓ Positive test is if pain or weakness is noted
  - ✓ Positive indicates iliopsoas pathology or an intra-articular hip pathology



PHYSICAL EXAM SPECIAL TESTS

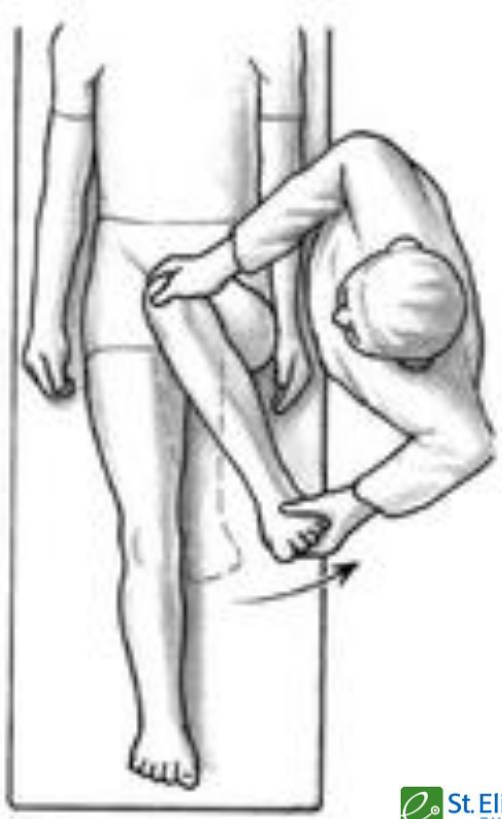
EXTERNAL ROTATION STINCHFIELD TEST

- Patient supine - raises leg with knee fully extended & leg externally rotated
- Provider presses down on patient's shin
  - ✓ Positive test if pain in the groin or weakness is noted
  - ✓ This indicates adductor pathology - concerning for sports hernia

PHYSICAL EXAM SPECIAL TESTS

FADDIR TEST

- Patient supine
- Provider passively maximally flexes patient's hip & flexes the knee to 90º then adducts & internally rotates the hip
  - ✓ Pain marks a positive test
  - ✓ Pain suggests a femoroacetabular impingement (FAI)
  - ✓ High sensitivity, low specificity



PHYSICAL EXAM SPECIAL TESTS

FABER TEST

- Patient supine - crosses foot of involved side over opposite thigh
- Provider applies pressure to increase external hip rotation
  - ✓ Pain marks a positive test
  - ✓ Different locations of pain suggest different pathologies:
    - Pain in groin suggests OA, iliopsoas pathology, or FAI
    - Pain in lateral hip suggests lumbar disc disease
    - Pain posteriorly suggests SI joint pathology

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PHYSICAL EXAM SPECIAL TESTS

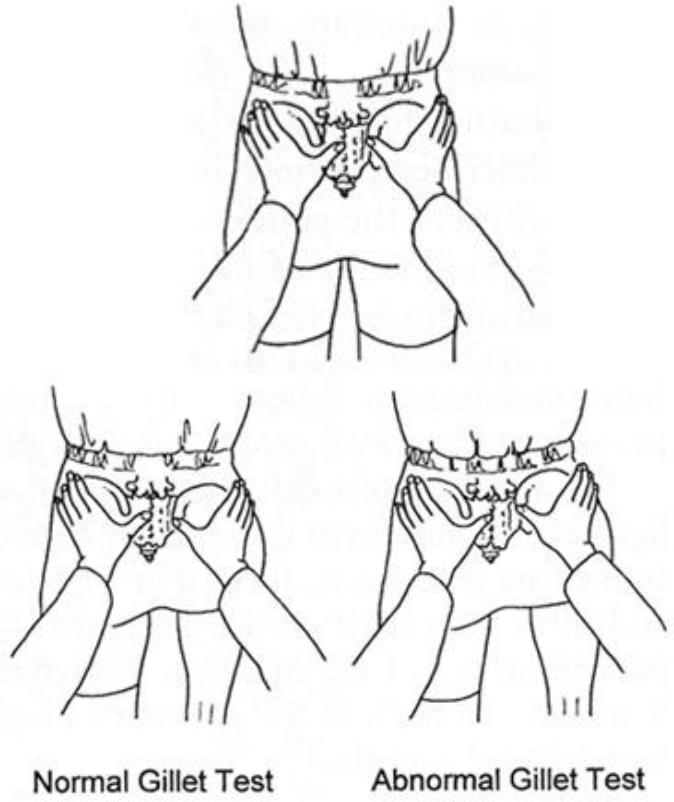
GAENSLEN TEST

- Patient supine
- Provider flexes one hip by pushing it to patient's chest & simultaneously extends opposite hip joint
  - ✓ Maneuver stresses both SI joints
  - ✓ Posterior pelvic pain marks a positive test - suggesting SI joint dysfunction
  - ✓ Low sensitivity (~50%) specificity (~70%)

PHYSICAL EXAM SPECIAL TESTS

GILLET'S TEST

- Patient standing
- Provider places one thumb on PSIS and other at the parallel level of the sacrum
- Patient asked to pull that side knee toward chest and hold it there
- Provider should feel the sacrum move posteriorly / PSIS inferiorly on flexed side
  - ✓ Positive test is minimal or anterior movement of the sacrum & reproduction of pain
  - ✓ Positive test can be seen with lumbar facet, SI joint or pars pathology



PHYSICAL EXAM SPECIAL TESTS

POSTERIOR SHEAR TEST

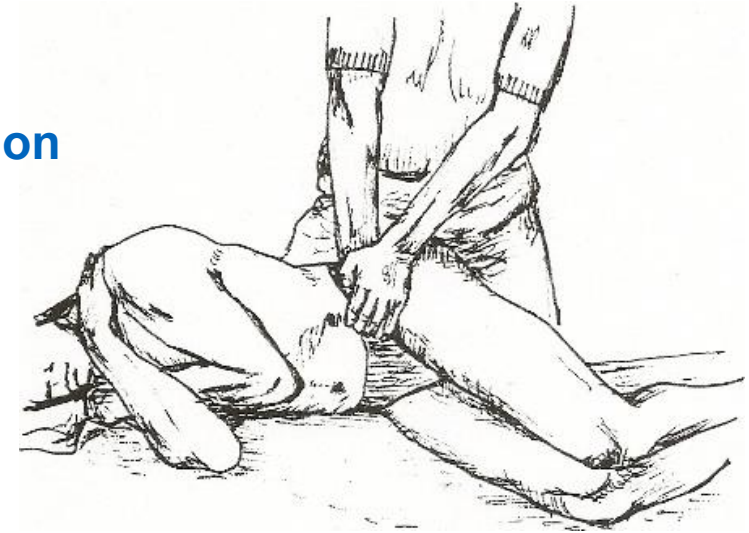
- Patient supine
- Provider places one hand under sacrum then flexes both the hip & knee to 90º
- Pressure applied downward along axis of femur
  - ✓ Pain at the ilium or SI joint is a positive test
  - ✓ A positive test suggests SI joint dysfunction

    Sensitivity (88%)
    Specificity (69%)

PHYSICAL EXAM SPECIAL TESTS

LATERAL COMPRESSION TEST

- **Patient in lateral decubitus**
- **Compress patient's pelvis by pushing down on the greater trochanter & iliac crest**
  - ✓ **Positive test is marked by pain**
  - ✓ **Positive test suggests osteitis pubis (if anterior midline) or minor pelvic fracture (stress fractures)**
  - ✓ **Posterior pain suggestive of SI joint pathology**



PHYSICAL EXAM SPECIAL TESTS

FULCRUM TEST

- Patient seated
- Provider places forearm underneath area of femoral pain & applies steady pressure at distal femur
  - ✓ This stresses the site of suspected injury
  - ✓ Positive test is marked by increased pain at site tested
  - ✓ Positive test suggests a stress fracture

    Sensitivity (88-93%)
    Specificity (15-75%)

PHYSICAL EXAMINATION

- There are a multitude of other tests & variations of the tests discussed
- If a picture is worth a thousand words, how much is a video worth?
  - ✓ Tons of videos online to assist with your learning!
- Develop a standardized approach and use this with every patient ("cheat sheets" can help)
- Despite individual special tests not being specific or sensitive, a combination of history & exams should allow for a focused differential diagnosis and direct specific imaging when indicated

REFERENCES

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Thompson, J. (2016). Netter's Concise Orthopedic Anatomy, 2nd edition. Philaelphia, PA: Saunders Elsevier.

Hip Bone & Joint Anatomy - http://unitedhipspecialists.com/images/hip-anatomy.jpg

Hip Muscles Deep - http://www.med.uio.no/imb/english/research/projects/functional-anatomy/dype-setemuskler-elsevier-500.jpg

Hip Muscles Flex Adduct - http://www.susanamatthews.com/images/Musculature_Deep_Hip.jpg

http://www.nle.nottingham.ac.uk/websites/rheumatology/chapter7.html

https://crcjs.med.utah.edu/sma_fitness/hip_testing.php#

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ADVANCED IMAGING OF THE HIP

Dr. Amit Rattan

RADIOLOGY ASSOCIATES
OF NORTHERN KENTUCKY

OVERVIEW & OBJECTIVES

Overview

How do we do it?

- Modalities overview
- What test to order? –ACR Clinical Imaging Support
- Arthrography utilization recommendations

Imaging basics/anatomy

- Modalities, emphasis on XR and MRI

Imaging of various injuries and pathologies

- Young/old, athletes, AVN, GTPS

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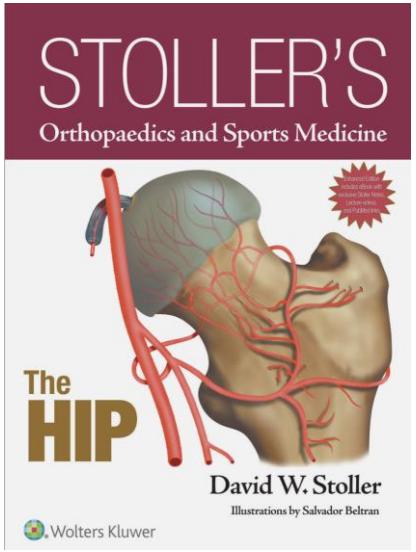
HOW WE DO IT

Helpful Resources



OrthoCincy Orthopaedics & Sports Medicine | St. Elizabeth PHYSICIANS

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Most presentation images come from Stoller's books. Essential resources for orthopedic radiology. Unless otherwise noted presentation images are from Stoller.

HOW WE DO IT

Modalities & ACR Appropriateness Criteria

Radiography
- Ionizing radiation
- Low cost
- First look
- Poor for soft tissues

CT
- Ionizing radiation
- Fracture characterization/high bone detail
- Contraindications to MRI
- CT arthrography

MRI
- No ionizing radiation
- NSF, contrast, pregnancy, hardware
- Superior soft tissue assessment
- Arthrography
- Can be challenging for patients, time

Ultrasound
- “Sports medicine doc’s stethoscope”
- Useful tool in skilled hands
- Intervention guidance
- Low risk

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HOW WE DO IT

Modalities & ACR Appropriateness Criteria

Evidence-based guidelines

Assist referring providers in making the most appropriate imaging or treatment decision for a specific clinical condition

Enhance quality of care and contribute to the most efficacious use of radiology

Developed & reviewed by expert panels

ACR Appropriateness Criteria

The ACR Appropriateness Criteria® (AC) are evidence-based guidelines to assist referring physicians and other providers in making the most appropriate imaging or treatment decision for a specific clinical condition. Employing these guidelines helps providers enhance quality of care and contribute to the most efficacious use of radiology. Learn more »

The newest ACR AC are listed below.

https://www.acr.org/Clinical-Resources/ACR-Appropriateness-Criteria

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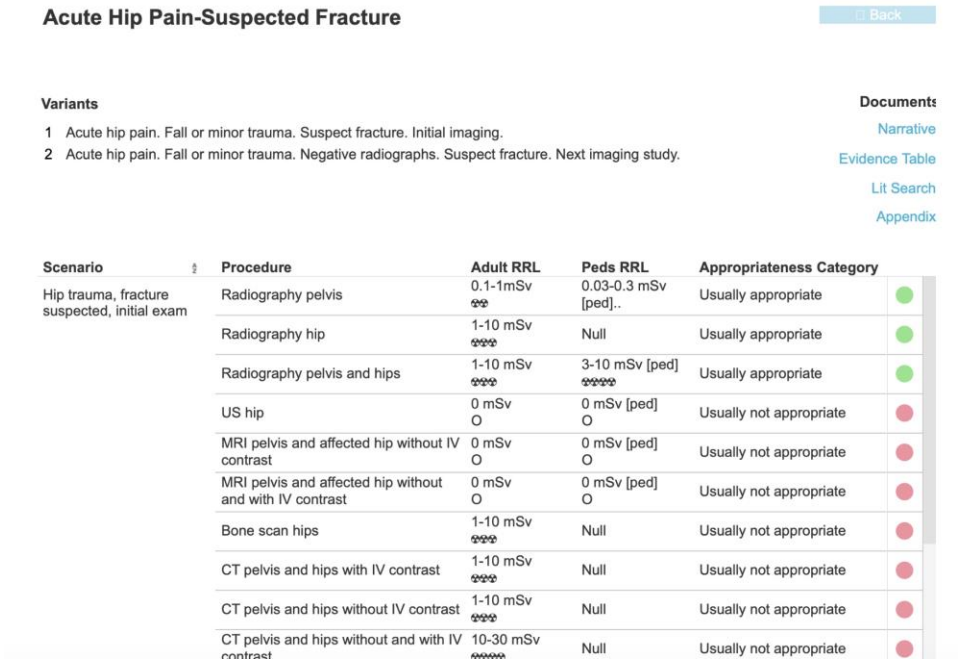
Modalities & ACR Appropriateness Criteria



Acute Hip Pain-Suspected Fracture

Back

Variants

1 Acute hip pain. Fall or minor trauma. Suspect fracture. Initial imaging.
2 Acute hip pain. Fall or minor trauma. Negative radiographs. Suspect fracture. Next imaging study.

Documents

Narrative
Evidence Table
Lit Search
Appendix

Scenario	Procedure	Adult RRL	Peds RRL	Appropriateness Category
Hip trauma, fracture suspected, initial exam	Radiography pelvis	0.1-1mSv	0.03-0.3 mSv [ped]..	Usually appropriate
	Radiography hip	1-10 mSv	Null	Usually appropriate
	Radiography pelvis and hips	1-10 mSv	3-10 mSv [ped]	Usually appropriate
	US hip	0 mSv O	0 mSv [ped] O	Usually not appropriate
	MRI pelvis and affected hip without IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
	MRI pelvis and affected hip without and with IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
	Bone scan hips	1-10 mSv	Null	Usually not appropriate
	CT pelvis and hips with IV contrast	1-10 mSv	Null	Usually not appropriate
	CT pelvis and hips without IV contrast	1-10 mSv	Null	Usually not appropriate
	CT pelvis and hips without and with IV contrast	10-30 mSv	Null	Usually not appropriate

https://www.acr.org/Clinical-Resources/ACR-Appropriateness-Criteria

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Modalities & ACR Appropriateness Criteria

hip trauma, fracture suspected, neg radiography	MRI pelvis and affected hip without IV contrast	0 mSv O	0 mSv [ped] O	Usually appropriate	
	CT pelvis and hips without IV contrast	1-10 mSv ☢☢☢	Null	Usually appropriate	
	US hip	0 mSv O	0 mSv [ped] O	Usually not appropriate	
	MRI pelvis and affected hip without and with IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate	
	Bone scan hips	1-10 mSv ☢☢☢	Null	Usually not appropriate	
	CT pelvis and hips with IV contrast	1-10 mSv ☢☢☢	Null	Usually not appropriate	
	CT pelvis and hips without and with IV contrast	10-30 mSv ☢☢☢☢	Null	Usually not appropriate	

https://www.acr.org/Clinical-Resources/ACR-Appropriateness-Criteria

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HOW WE DO IT

Modalities & ACR Appropriateness Criteria

Chronic Hip Pain

Back

Variants

1 Chronic hip pain. Initial Imaging.
2 Chronic hip pain. Suspect noninfectious extra-articular abnormality, such as tendonitis or bursitis. Radiographs n..
3 Chronic hip pain. Suspect impingement or dysplasia. Radiographs negative or nondiagnostic. Next imaging study.
4 Chronic hip pain. Suspect labral tear. Radiographs negative or nondiagnostic. Next imaging study.
5 Chronic hip pain. Radiographs equivocal or positive for mild osteoarthritis. Evaluate articular cartilage integrity. N..

Documents

Narrative
Evidence Table
Lit Search
Appendix

Scenario	Procedure	Adult RRL	Peds RRL	Appropriateness Category
Hip pain, chronic, bursitis suspected, radiography negative, next imaging study	US hip	0 mSv O	0 mSv [ped] O	Usually appropriate
	MRI hip without IV contrast	0 mSv O	0 mSv [ped] O	Usually appropriate
	Image-guided anesthetic +/- corticosteroid injection hip joint or sur..	Null	Null	May be appropriate
	MR arthrography hip	0 mSv O	0 mSv [ped] O	Usually not appropriate
	MRI hip without and with IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
	CT arthrography hip	1-10 mSv	Null	Usually not appropriate
	Bone scan hip	1-10 mSv	Null	Usually not appropriate
	CT hip with IV contrast	1-10 mSv	Null	Usually not appropriate
	CT hip without IV contrast	1-10 mSv	Null	Usually not appropriate

https://www.acr.org/Clinical-Resources/ACR-Appropriateness-Criteria

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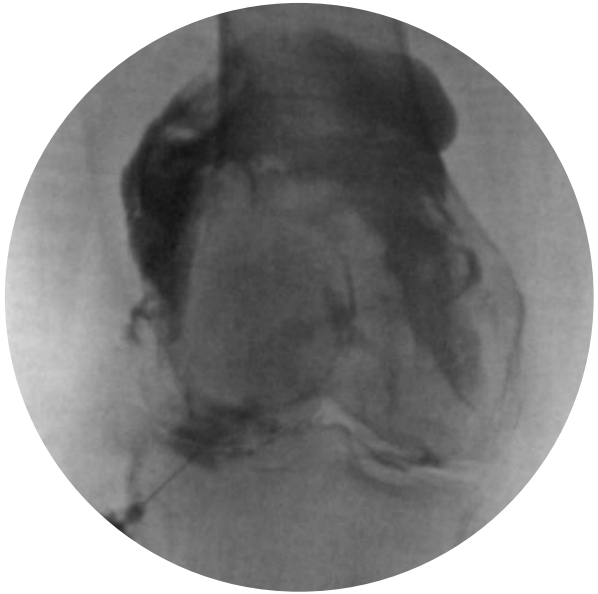
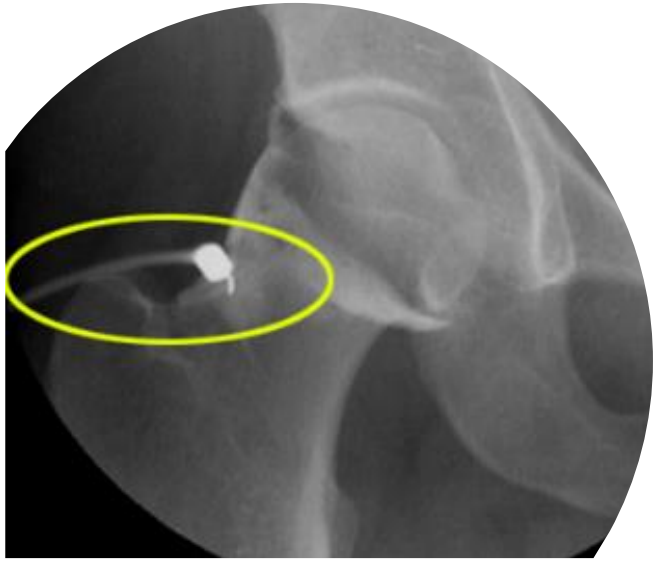
HOW WE DO IT

MRI/Arthrography etc





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HOW WE DO IT

MRI: Magnet strength, technique, etc.

Key MRI points

- Low motion
- Uniform fat suppression
- Appropriate contrast
- High resolution
- Proper/dedicated coils

European Radiology
Springer

Comparative reliability and diagnostic performance of conventional 3T magnetic resonance imaging and 1.5T magnetic resonance arthrography for the evaluation of internal derangement of the hip

A. Chopra, A. J. Grainger, [...], and Philip Robinson

3

Conclusion

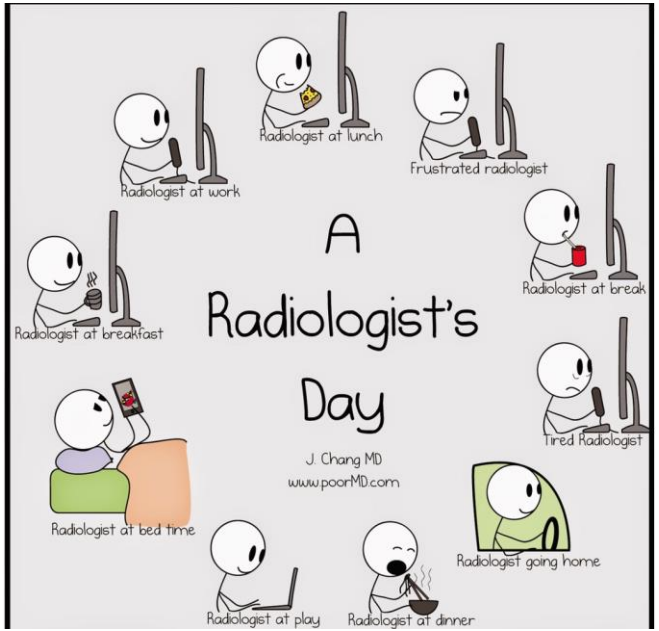
Conventional 3T MRI may be at least equivalent to 1.5T MRA in detecting acetabular labrum and possibly superior to 1.5T MRA in detecting cartilage defects in patients with suspected FAI.

Key Points

- *Conventional 3T MRI is equivalent to 1.5T MRA for diagnosing labral tears.*
- *Conventional 3T MRI is superior to 1.5T MRA for diagnosing acetabular cartilage defect.*
- *Conventional 3T MRI is equivalent to 1.5T MRA for diagnosing cartilage delamination.*
- *Symptom severity score was significantly higher ($p<0.05$) in group proceeding to surgery.*

HOW WE DO IT

Call me maybe?



4

RADIOLOGY ASSOCIATES OF NORTHERN KENTUCKY

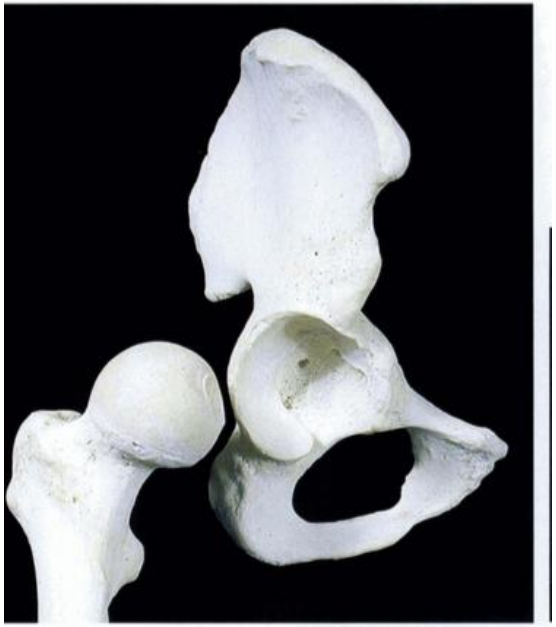
ANATOMICAL CONSIDERATIONS

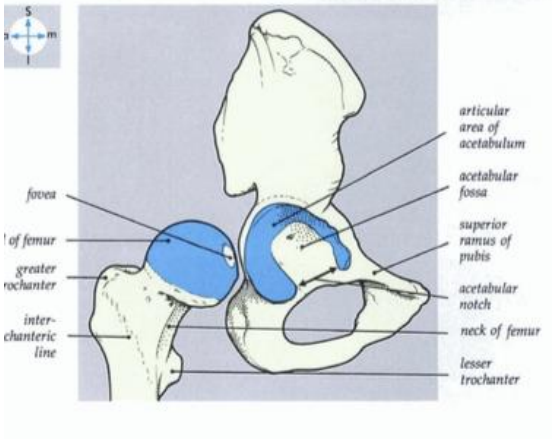
The Hip

- Complex joint
  - Acetabulum
  - Femur
  - Soft tissues

Complex pathology

- Athletes
- Trauma
- AVN
- Arthritis
- Infection
- Neoplasia





Anatomy

- Bone and joint
  - Dysplasia
  - Cartilage
  - Fibrocartilage
  - Articular cartilage
- Soft tissues
  - Joint capsule
  - Bursae

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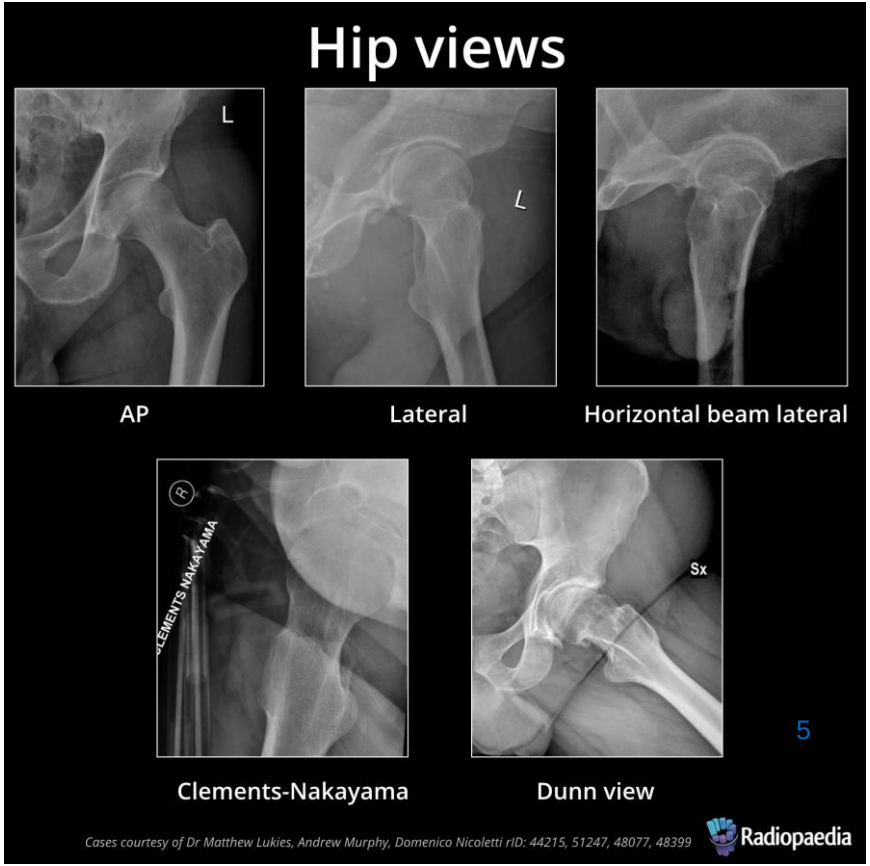
ANATOMICAL CONSIDERATIONS

RADIOGRAPHY



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ANATOMICAL CONSIDERATIONS

RADIOGRAPHY

Tonnis Criteria[6]

Grade 0- No signs of OA

Grade 1- Sclerosis, slight joint space narrowing

Grade 2- Small cysts, moderate joint space narrowing

Grade 3- Large cysts, severe joint space narrowing, remodeling

Kellgren and Lawrence[6]

Grade 0- None

Grade 1- Doubtful; no JSN, lipping

Grade 2- Minimal; min JSN, osteophytes

Grade 3- Moderate; def JSN, ostephytes and sclerosis

Grade 4- Severe; marked JSN, remodeling both sides of joint

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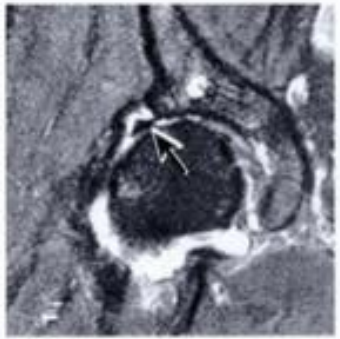
ANATOMY

MRI

Anterior Labrum

Mid Labrum

Mid to Posterior Labrum



Labral Tear with Anterior Cartilage Degeneration

Partial Labral Detachment

Paralabral Cyst

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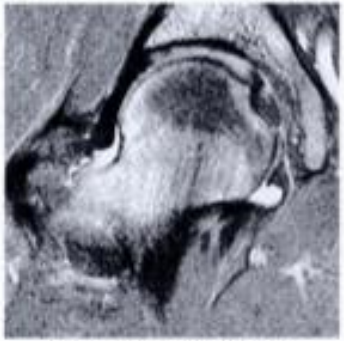
ANATOMY

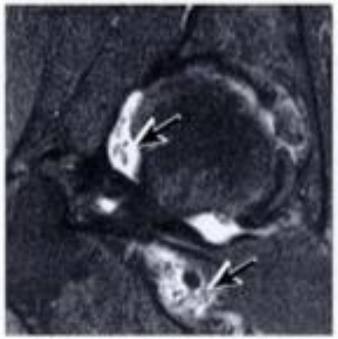
MRI



Anterior Hip Cartilage

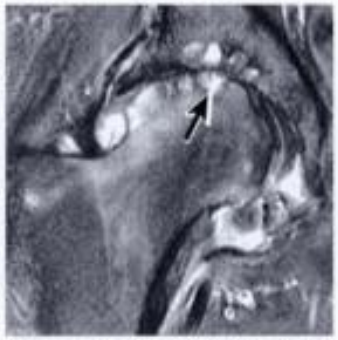
Anterior Superior Hip Cartilage

Superior Hip Cartilage



Chondral Loose Bodies

Labral Tear with Anterior Superior Chondral Degeneration



Severe Chondral Degeneration with Subchondral Cysts

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ANATOMY

MRI

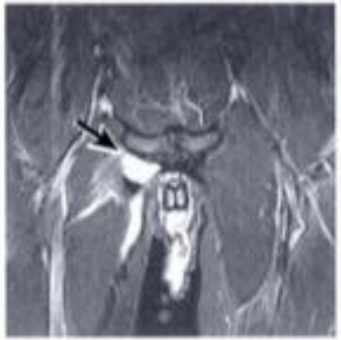
Normal Hamstring Origins

Normal Adductor Origins

Normal Gluteus Medius Insertion

Normal Rectus Femoris Origin

Hamstring Origin Tear



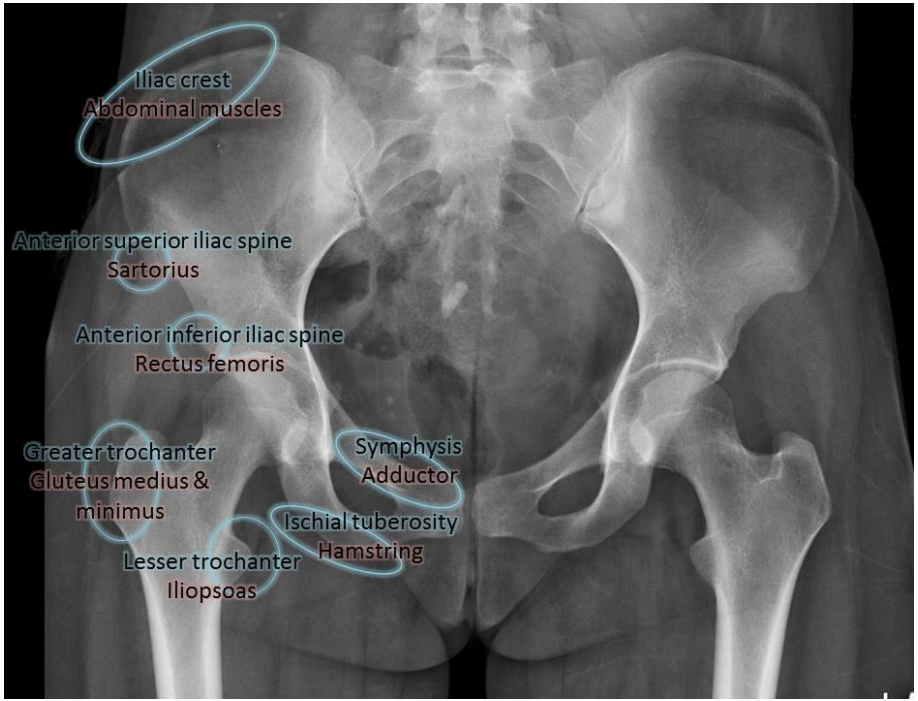
Adductor Origin Tear

Gluteus Medius Tear

Rectus Femoris Origin Tear

IMMATURE/MATURING HIP

AVULSION



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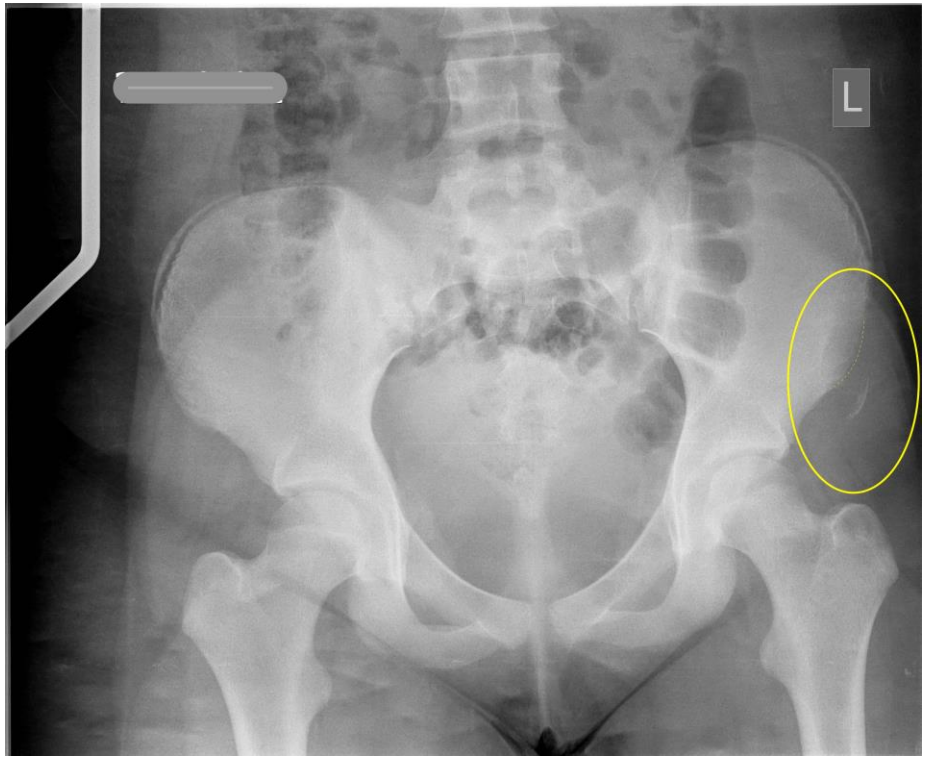
IMMATURE/MATURING HIP

AVULSION



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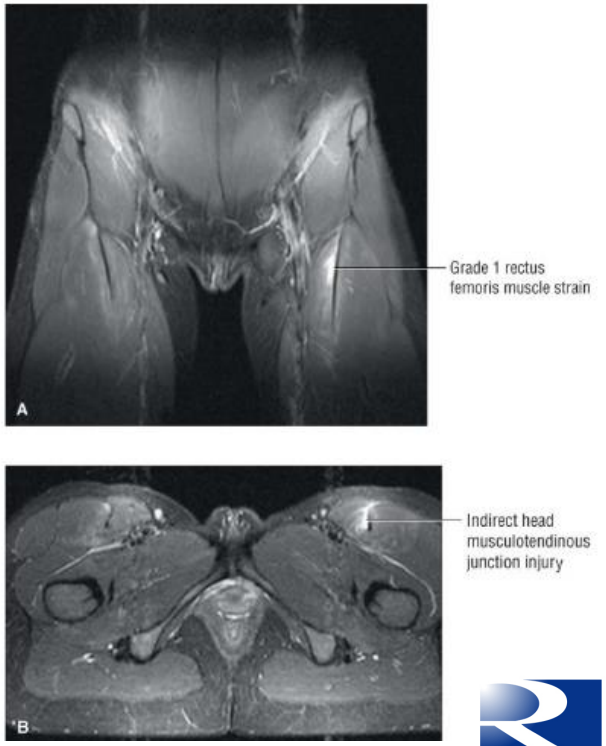
ATHLETIC HIP

Overview of Pathology

Strains/contusions

FIGURE 6.5 (**A**) Axial STIR MRI image demonstrates tear of the external oblique mu (*red arrow*), with edema tracking along the fa plane between the external and internal oblic There is also a tear of the internal oblique (*gr arrow*). (**B**) Sagittal STIR MRI image demonstr edema within the external oblique muscle be



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ATHLETIC HIP

Overview of Pathology

“Sports hernia” (athletic pubalgia, Gilmore’s groin etc)

Clinical syndrome chronic lower pelvic and groin pain

Insertion of abdominal muscles on pubis and upper aponeurotic attachment of adductors
- Shared aponeurotic plate

Acute and/or repetitive microtrauma

Soccer, hockey, football, rugby

Multimodality imaging- MRI workhorse
- osteitis pubis (stress response)
- adductor tendon injury- tendinosis, partial/complete tears (“secondary cleft”)
- exclude other etiologies (hernias, hip etiologies, stress fxs, piriformis etc)

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ATHLETIC HIP

Overview of Pathology

“Sports hernia” (athletic pubalgia)

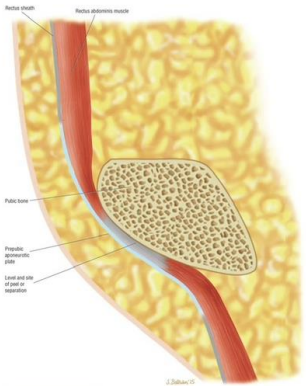

FIGURE 6.143 Sagittal perspective of intact prepubic aponeurotic plate.

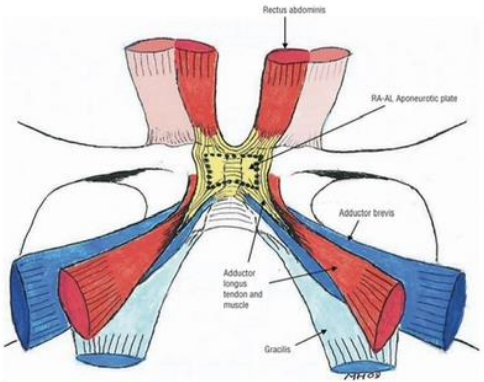

FIGURE 6.138 Muscle origins and aponeurotic plate at the pubic symphysis.

(Reprinted from Guanche CA. *Hip and Pelvis Injuries in Sports Medicine.* Philadelphia, PA: Wolters

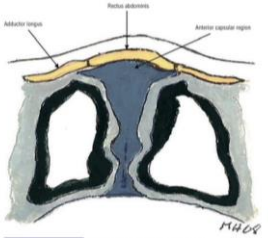

FIGURE 6.139 Cross-section distal to pubic tubercles displaying the proximity of the rectus abdominis adductor longus and the anterior capsule.

(Reprinted from Guanche CA. *Hip and Pelvis Injuries in Sports Medicine.* Philadelphia, PA: Wolters Kluwer; 2010, with permission.)

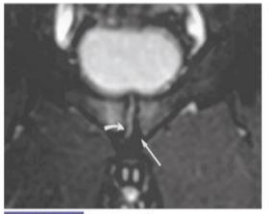

FIGURE 6.140 Secondary cleft.

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ATHLETIC HIP

Overview of Pathology

“Sports hernia”/athletic pubalgia

Adductor Longus Avulsion

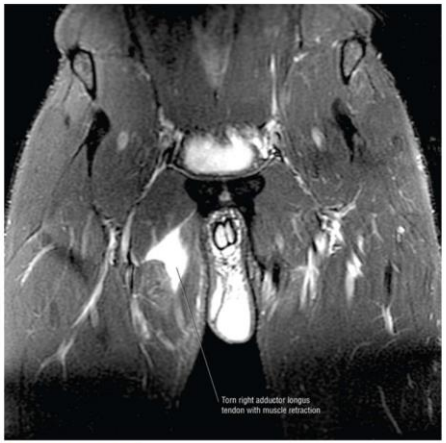

FIGURE 6.149 Coronal image demonstrates avulsion of the adductor longus at its origin at the anterior pubic bone. There is distal retraction of the muscle belly.

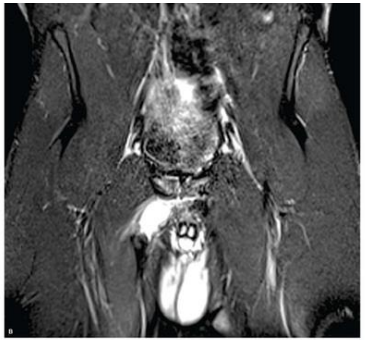

FIGURE 6.151 Coronal (**A, B**) and axial (**C**) images demonstrate tear of the anterior adductor aponeurosis in a rodeo player. (**B**) (**C**)

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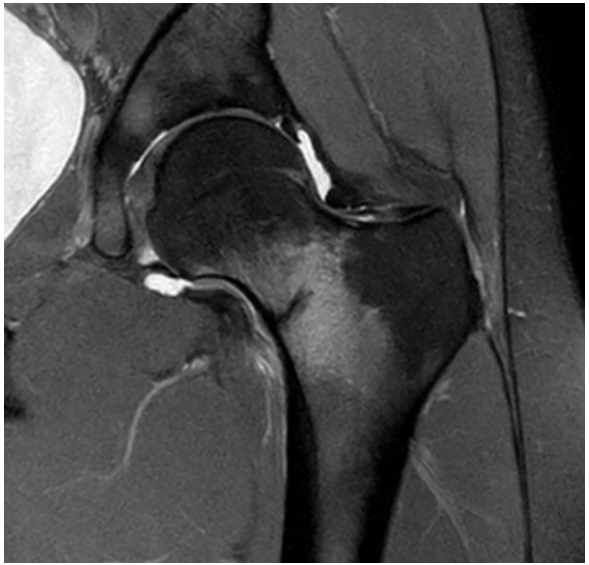
ATHLETIC HIP

Overview of Pathology

Fatigue/insufficiency fx



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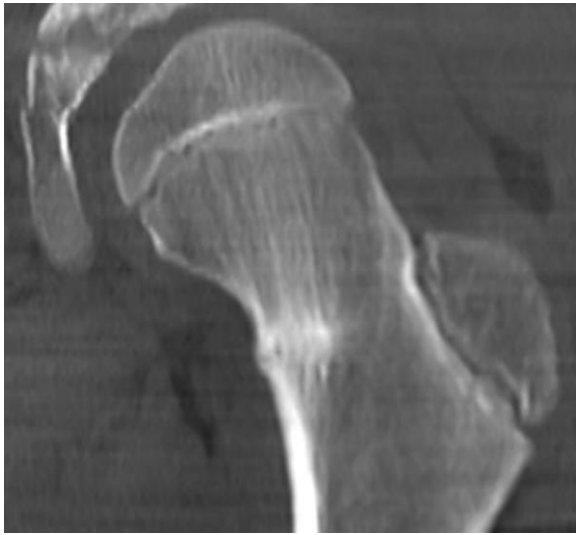

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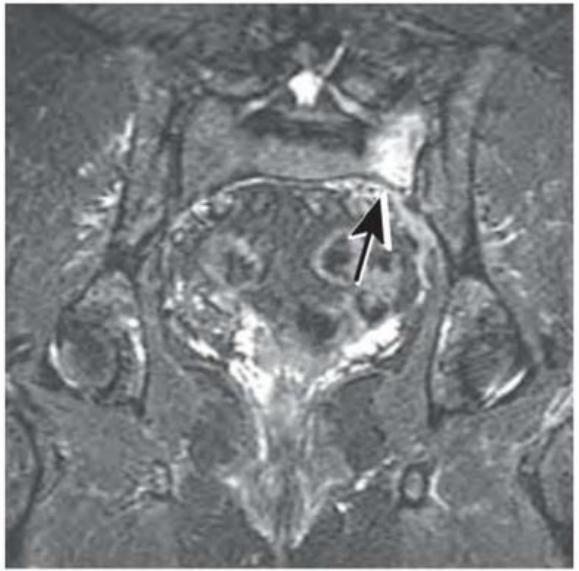
ATHLETIC HIP

Overview of Pathology

Fatigue/insufficiency fx



Left Sacral Insufficiency Fracture

Basicervical Fracture

Subchondral Insufficiency Fracture

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ATHLETIC HIP

Overview of Pathology

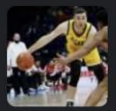
Femoroacetabular Impingement (FAI)

University of Iowa Health Care

UI Sports Medicine gets Hawkeye players back on court fast ...

FAI is a common cause of hip pain where the shape of the bones of the ... For athletes like Bohannon and McCaffery, FAI can be debilitating.

Mar 10, 2022



Orthopedics This Week

85% Return to Skiing After Hip Arthroscopy

"Hip arthroscopy has been shown to be an effective treatment for femoroacetabular impingement [FAI] in high-level athletes; however,...

Apr 18, 2022

British Journal of Sports Medicine

Risk of total hip arthroplasty after elite sport: linking 3304 ...

Conclusion Having been an elite athlete was associated with a doubling of THA risk compared with the general population for both sexes. High joint impact sport...

1 month ago

Ortho Spine News

Which Athletes Have Highest Rate of Return to Sport After FAI ...

The researchers looked at 29 articles and 1,426 hip arthroscopy cases (185 cutting, 265 impingement, 304 contact, 207 endurance, 116 flexibility...

Sep 17, 2020

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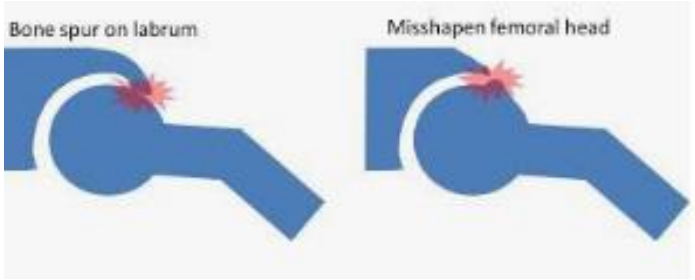
ATHLETIC HIP

Overview of Pathology

Femoroacetabular Impingement (FAI)

- Young, active patients
- Structural incongruity
- Abutment between femur and acetabulum
  - Flexion and internal rotation
- Early OA



Regenexx.com

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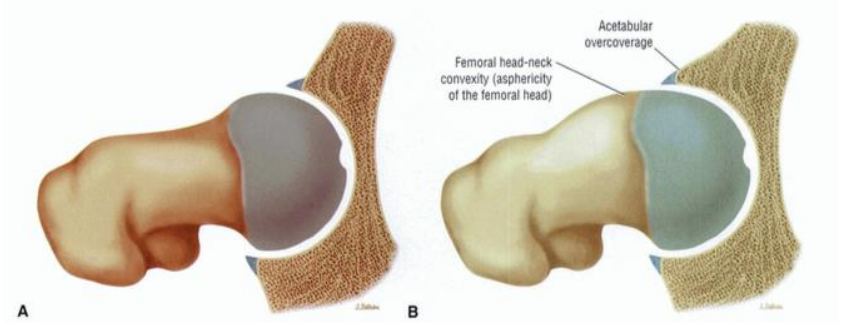
ATHLETIC HIP

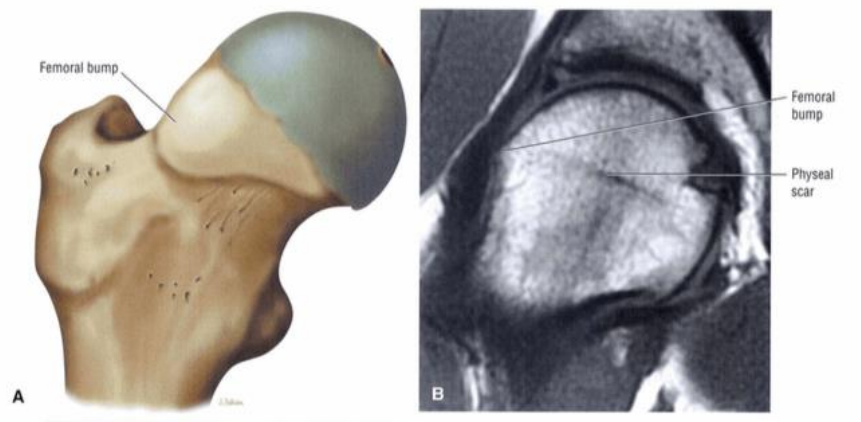
Overview of Pathology

Femoroacetabular Impingement (FAI)

- 2 subtypes
  - Cam
    - Bony protrusion ant sup fem head/neck
    - Just lateral to physeal scar
  - Pincer
    - Acetabular overcoverage

- Imaging findings
  - Dysplastic bump
  - Labral tears
  - Cartilage injury

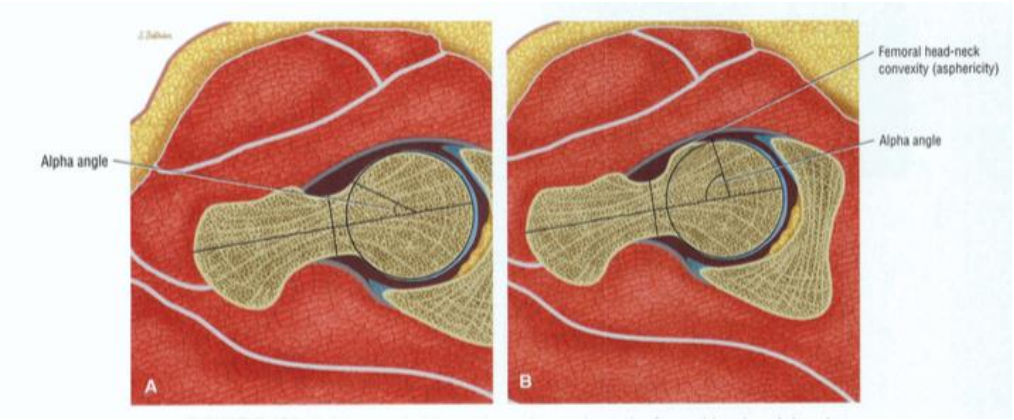


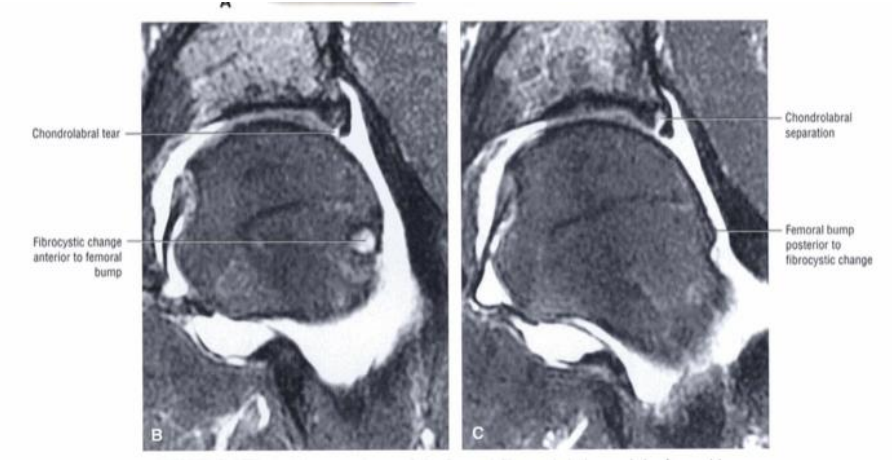


ATHLETIC HIP

Overview of Pathology

Femoroacetabular Impingement (FAI)





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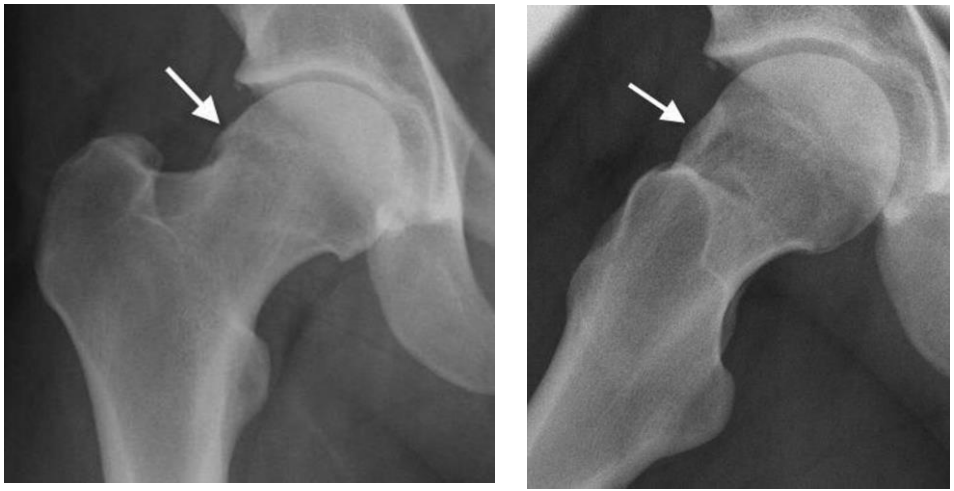
ATHLETIC HIP

Overview of Pathology

Femoroacetabular Impingement (FAI)



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ATHLETIC HIP

Overview of Pathology

Femoroacetabular Impingement (FAI)

Labrum

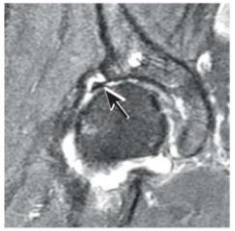
Normal Labrum

Normal Labrum, Lateral

Normal Labrum, Mid

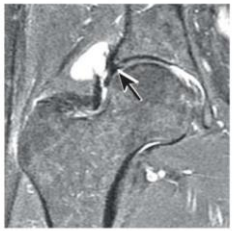
Labral Pseudotear (Sulcus), Medial to Anterior Labrum

Cartilage Pathology



Labral Tear with Anterior Cartilage Degeneration

Partial Labral Detachment



Paralabral Cyst

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AVN

Overview of Pathology

AVASCULAR NECROSIS (AVN)

Aseptic necrosis, osteonecrosis, ischemic necrosis
- AVN- Subchondral bone
- Osteonecrosis- Medullary bone

Traumatic vs non-traumatic
- Non-traumatic- younger, bilateral
  - sickle cell, blood dyscrasias, corticosteroid use, idiopathic

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AVN

Overview of Pathology

AVN (Femoral head)

Staging: Ficat and Arlet most popular

stage 0- incidental; imaging of contralateral hip
stage 1- mild osteopenia; early MRI features (edema, double line sign)
stage 2- visible xray and MRI; maintained head shape
stage 3- head collapse; joint space maintained/or even increased
stage 4- head collapse; advanced OA

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AVN

Overview of Pathology

AVN (Femoral head)

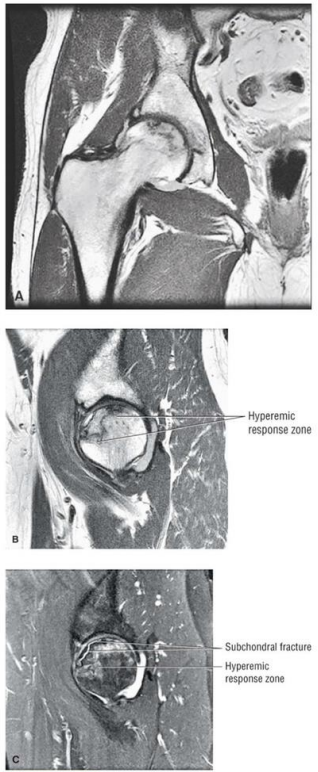

FIGURE 5.14 AVN with subchondral fracture. The focus of osteonecrosis involves a portion of the weight-bearing surface. (**A**) Coronal T1-weighted image. (**B**) Sagittal T1-weighted image. (**C**) Sagittal FS PD FSE image.

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GREATER TROCHANTER PAIN

Overview of Pathology

GTPS

Bursitis not always present

Most commonly middle-age females

Gluteal cuff tears

Trochanteric bursitis

IT band

13

Greater Trochanter Pathology

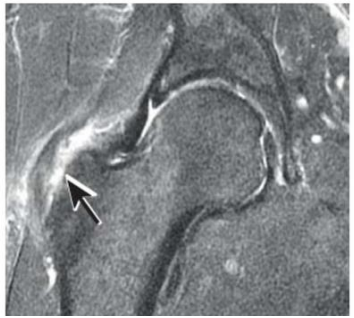
- Tendinosis gluteus medius insertion
  Confirm in axial plane

Tendinosis Gluteus Medius Insertion

- Trochanteric bursitis
  Lateral to medius and minimus pathology

Trochanteric Bursitis

- Partial tear and retraction gluteus minimus tendon anterior to mid-coronal



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SUMMARY

Overview

How do we do it?

- Modalities overview
- What test to order? –ACR Clinical Imaging Support
- Arthrography utilization recommendations

Normal Anatomy

- Modalities, emphasis on XR and MRI

Imaging of various injuries and pathologies

- Young to old, athletes/FAI, AVN, GTPS

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HIP ARTHROSCOPY

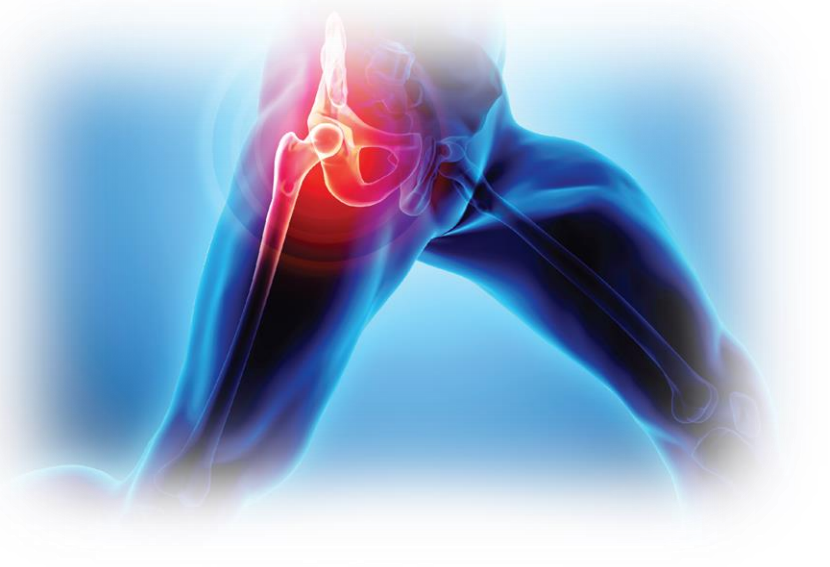
Dr. Matthew S. Grunkemeyer

OrthoCincy™
Orthopaedics & Sports Medicine

What is Hip Arthroscopy?

A surgical procedure to view the hip joint without making a large incision through the skin & other soft tissues

- ✓ **Used to diagnose & treat a wide range of hip problems**
- ✓ **A small camera (arthroscope) is inserted into the hip joint**
- ✓ **Displays pictures on a video monitor used to guide miniature surgical instruments**



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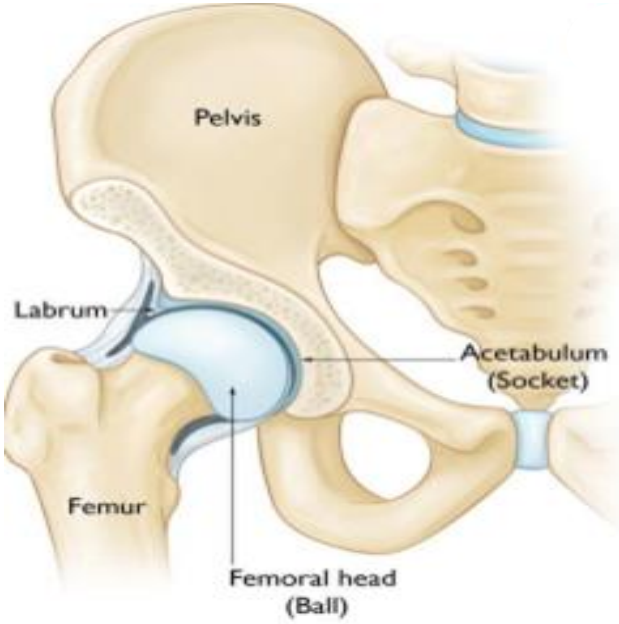
When Is Hip Arthroscopy Recommended?

CLINICAL CONDITIONS:

- Femoroacetabular Impingement (FAI)
- Hip Labrum Tears
- Bursectomy
- IT Band Division
- Gluteal muscle repair
- Dysplasia
- Snapping Hip Syndrome
- Loose Bodies
- Synovitis



OVERVIEW OF HIP ANATOMY

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Planning for Surgery

PREOPERATIVE CHECKLIST

PCP Visit

- Assess patient's general health
- Identify issues that may interfere w/ procedure
- For some health risks, more extensive evaluation may be necessary

MRI / CT

- Necessary to confirm underlying problem
- For presurgical planning with surgeon

DME

- Obtain DME if necessary

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Surgical Procedure

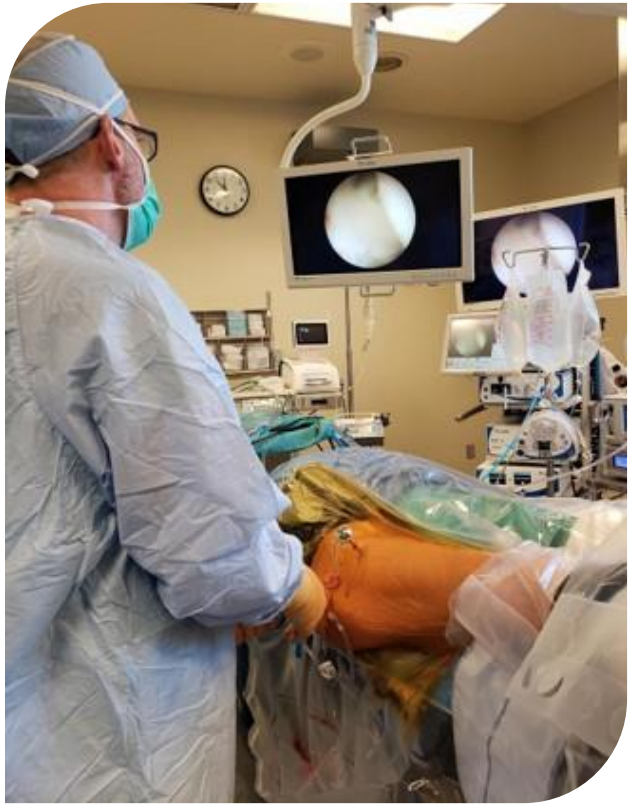
POSITIONING

- General anesthesia given
- Leg will be put in traction
  - ✓ Hip pulled away from the socket enough to insert instruments
  - ✓ See entire joint & perform treatments needed
- Surgeons typically draw lines on the hip
  - ✓ Indicates specific anatomy structures (such as bone, nerves & blood vessels)
  - ✓ Indicates incision placements & portals for the arthroscope

SUPINE POSITIONING

OrthoCincy Orthopaedics & Sports Medicine

Surgical Procedure



PROCEDURE

- After traction make a small puncture in hip (about the size of a buttonhole)
- Through arthroscope, the surgeon can view the inside of the hip & identify damage
  - ✓ Fluid flows through arthroscope to keep the view clear & control any bleeding
  - ✓ Images are projected onto a video screen
  - ✓ Surgeon will evaluate the joint before beginning treatments

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Surgical Procedure

PROCEDURE CONTINUED

Once problem is clearly identified, the surgeon will insert other small instruments through separate incisions. A range of procedures can be done, depending on patient needs. Examples include:

- Smooth off torn cartilage
- Repair or reconstruct the labrum
- Trim bone spurs caused by FAI
- Remove inflamed synovial tissue

Procedure length will depend on what is found & amount of work to be done. Upon completion, arthroscopy incisions are usually stitched or covered with skin tapes. An absorbent dressing is applied.

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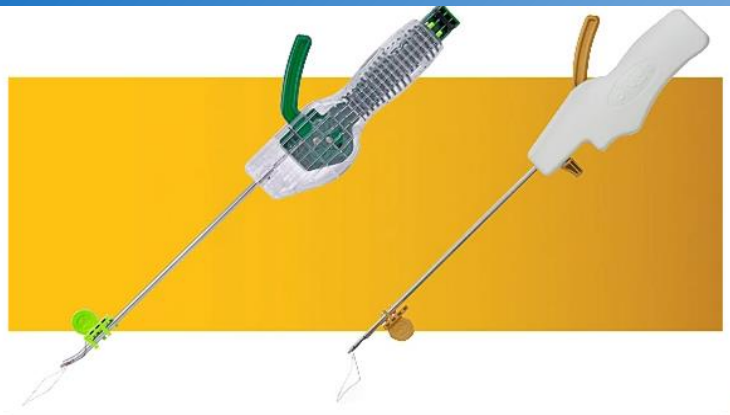
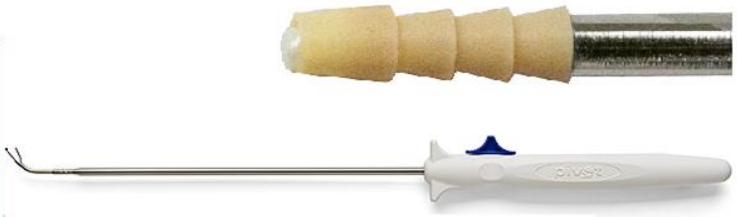
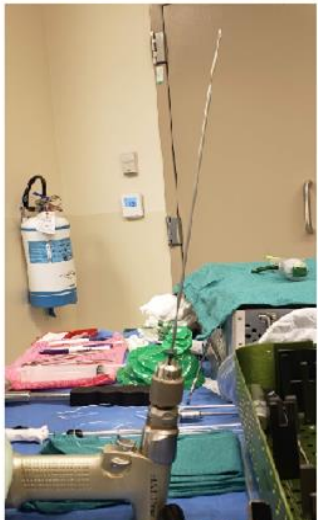
Specific Tools used







Post-Op

COMPLICATIONS

- Any surgery carries a small risk of injury to the surrounding nerves, blood vessels, or joint itself
- Heterotopic Ossification
- Traction needed for procedure can stretch nerves & cause numbness in the groin area
  (typically due to post used between legs to serve as counter-force)
- There are small risks of infection & blood clots forming in the legs (Deep Vein Thrombosis)

Recent Developments

- ✓ Cutting Edge Technology
- ✓ Guardian Table for Postless Traction
- ✓ NSAIDs to reduce chance of Heterotopic Ossification

OrthoCincy Orthopaedics & Sports Medicine

Post-Op

RECOVERY

- Recovery for 1 to 2 hours before discharge
- Patient will require someone to drive them home & stay at least the first night
- If DME was dispensed, it should be put on for safety
- Patient should expect to be on crutches (or walker) for a period of time

OrthoCincy Orthopaedics & Sports Medicine

Post-Op

ON THE ROAD TO RECOVERY

- Predetermined weight bearing status with crutches or walker
- Bracing for predetermined length (if necessary)
- Pain management for immediate post-op window
- Physical Therapy (if indicated) will start within 3 to 5 days
- Surgeon follow-up within ~ 10 days for wound check & suture removal

PAIN MANAGEMENT

Short course of narcotics may be prescribed to treat immediate pain

- Oxycodone, Norco, Tramadol

Strong NSAIDs may be prescribed to help prevent HO

Tylenol and/or Ibuprofen for breakthrough pain

OrthoCincy Orthopaedics & Sports Medicine

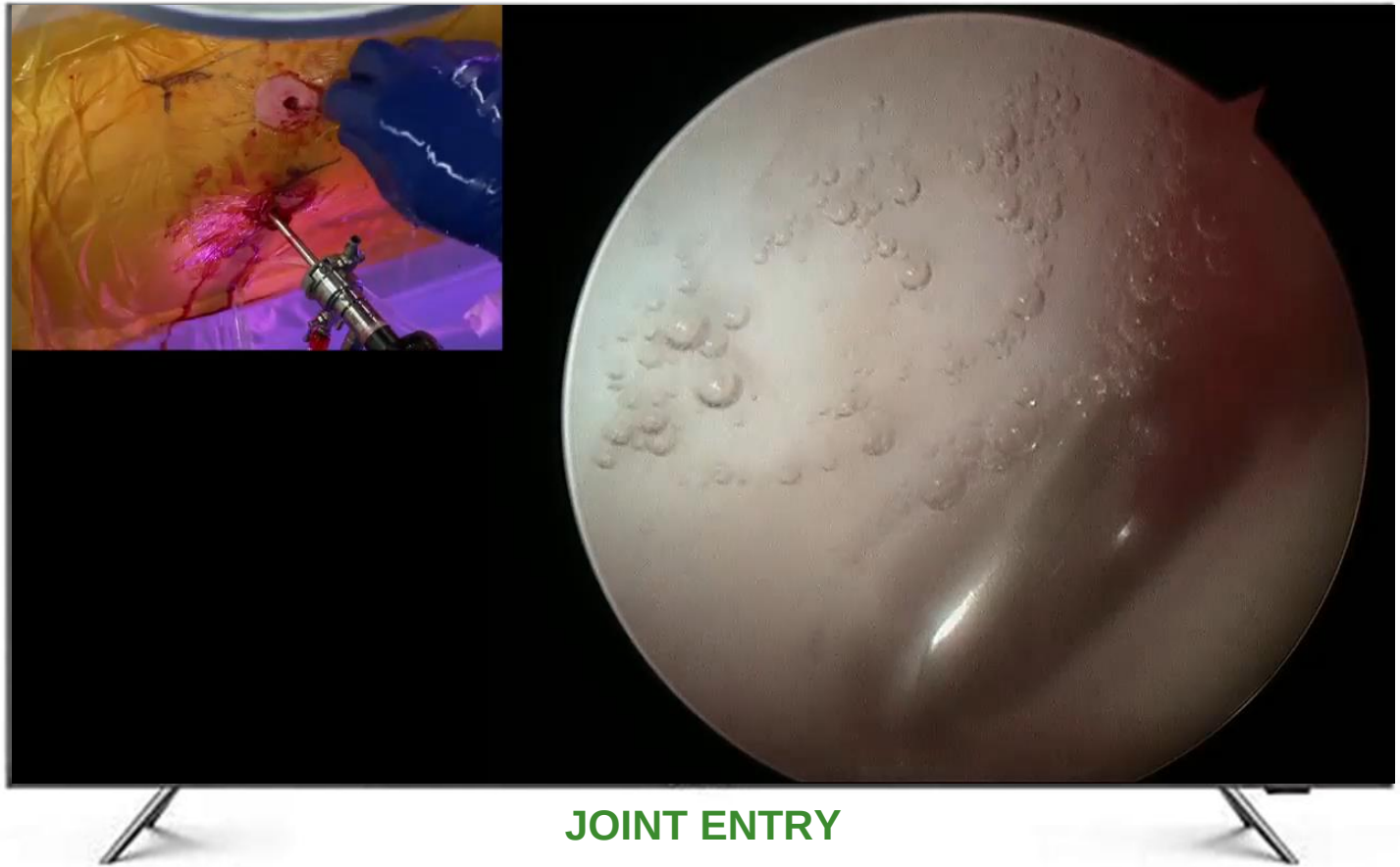
Long Term Outcomes

- Many people return to full, unrestricted activities after arthroscopy
- Recovery will depend on the type of damage that was present in the hip
- For some patients, lifestyle changes are necessary to protect the joint
  - ✓ Ex: Changing from high impact exercise (such as running) to lower impact activities (swimming or cycling)
  - ✓ These are decisions are made with guidance from the surgeon
- Occasionally, damage can be severe enough that it cannot be completely reversed and the procedure may not be successful

OrthoCincy Orthopaedics & Sports Medicine

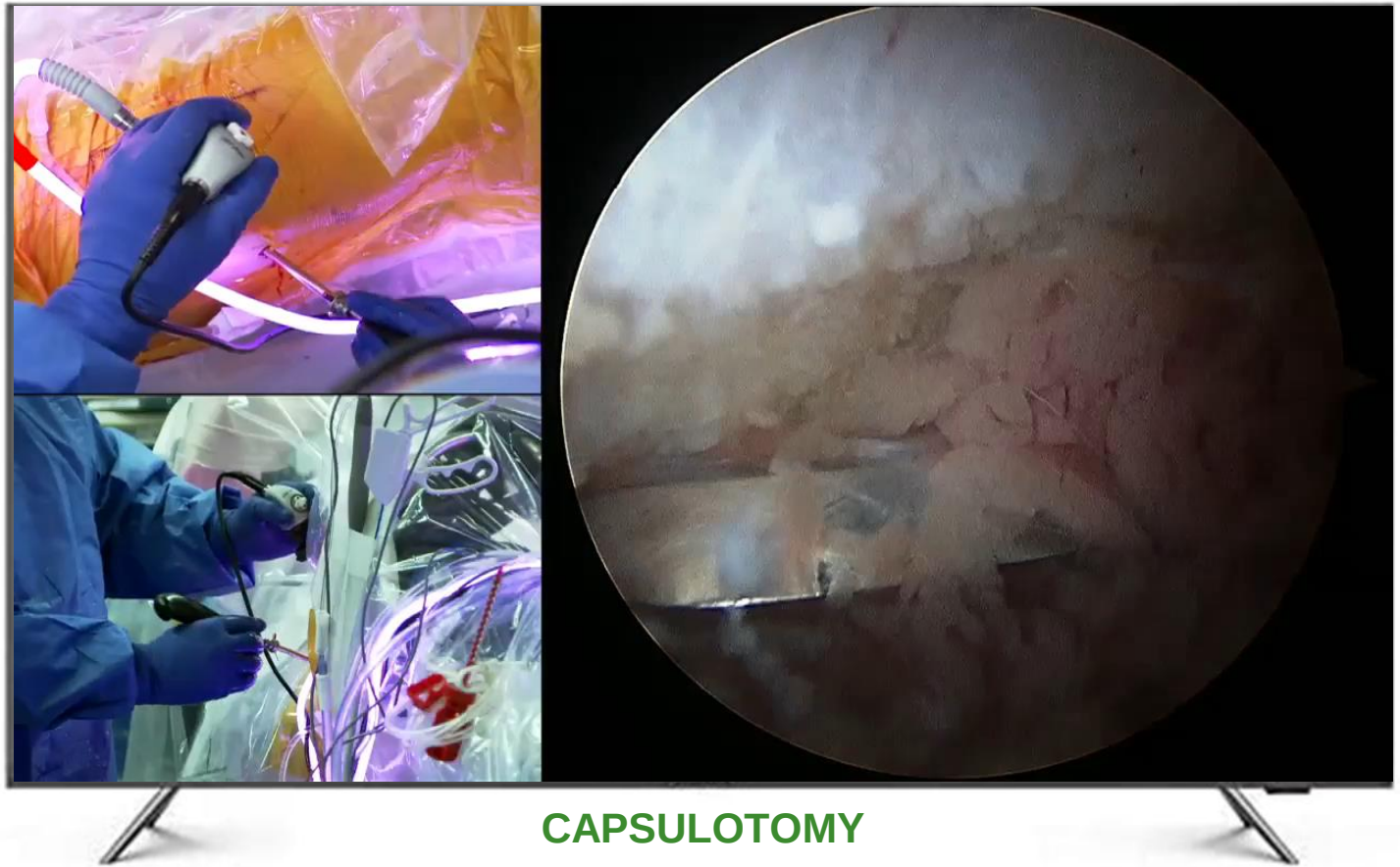

PostFree
PostFree
OEC Elite

Steps Involved for Hip Arthroscopy



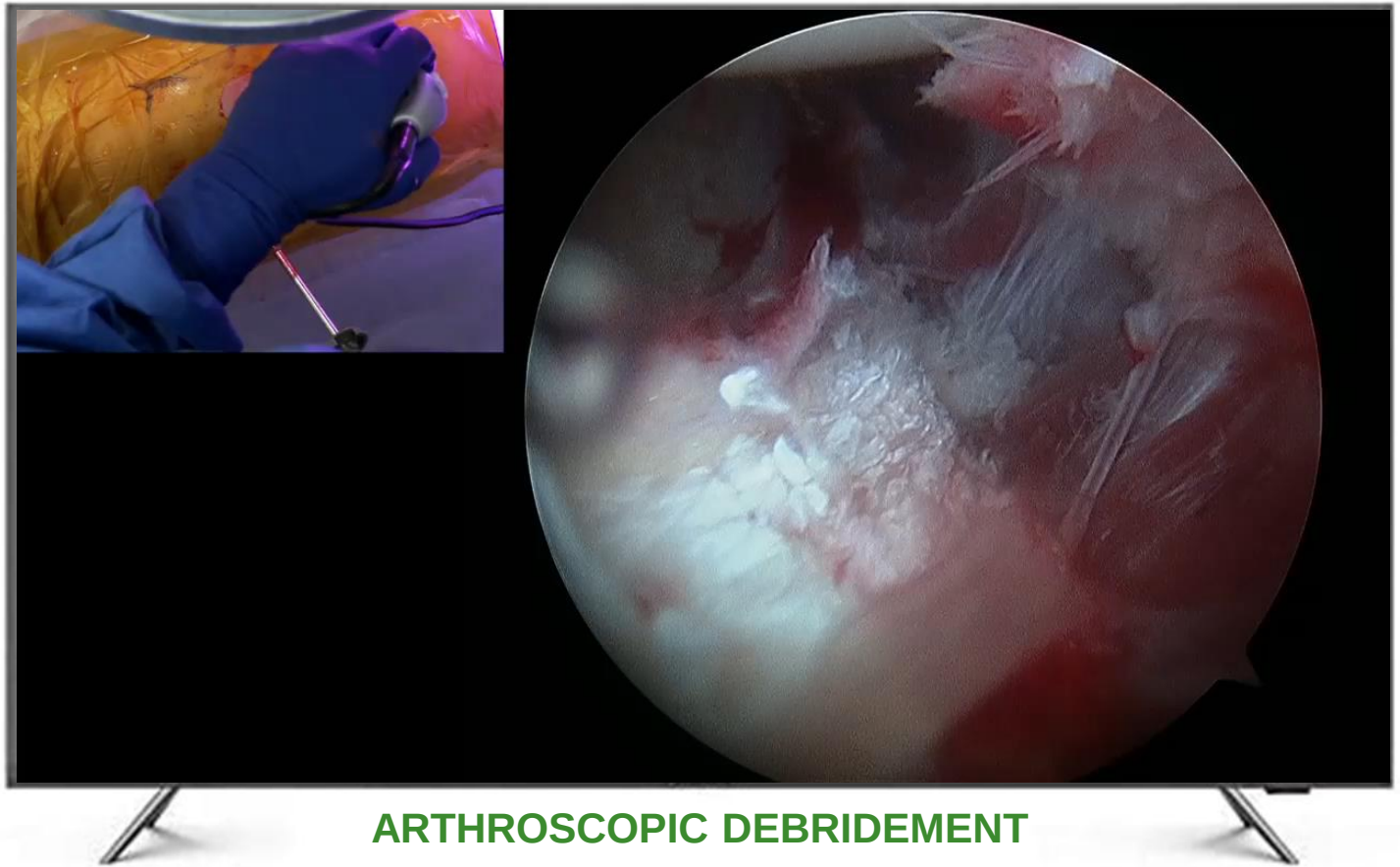
JOINT ENTRY

Steps Involved for Hip Arthroscopy



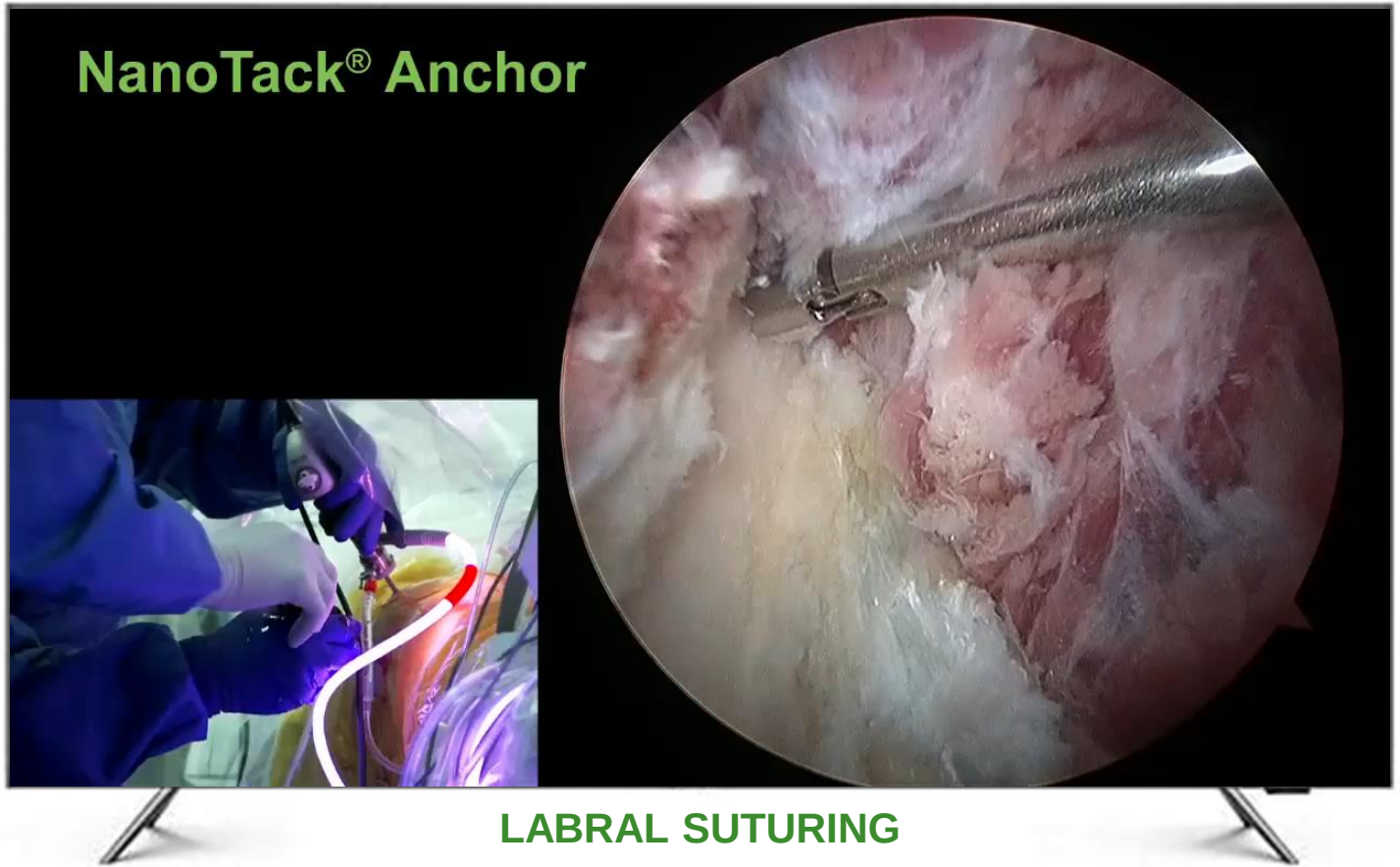
CAPSULOTOMY

Steps Involved for Hip Arthroscopy



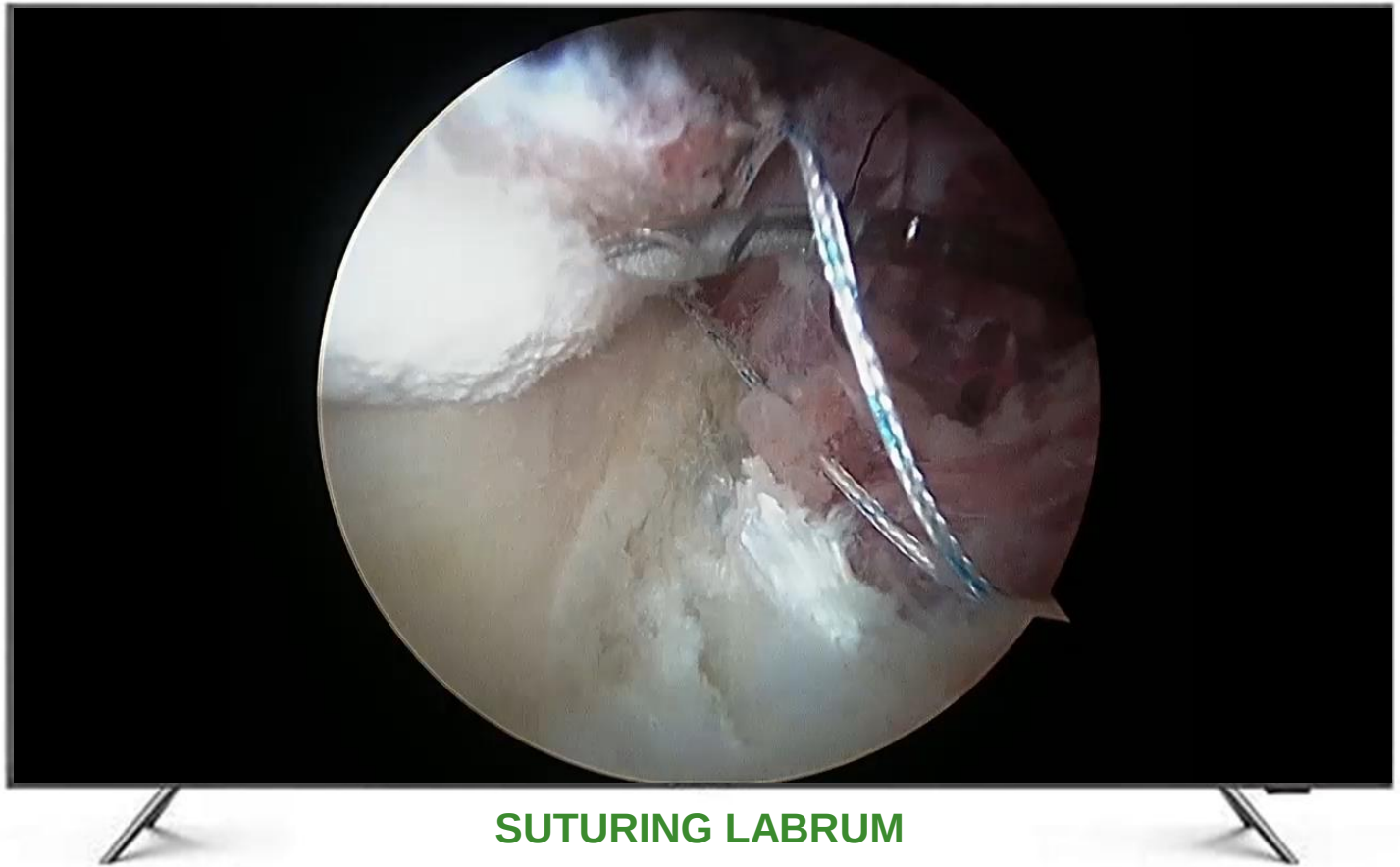
ARTHROSCOPIC DEBRIDEMENT

Steps Involved for Hip Arthroscopy



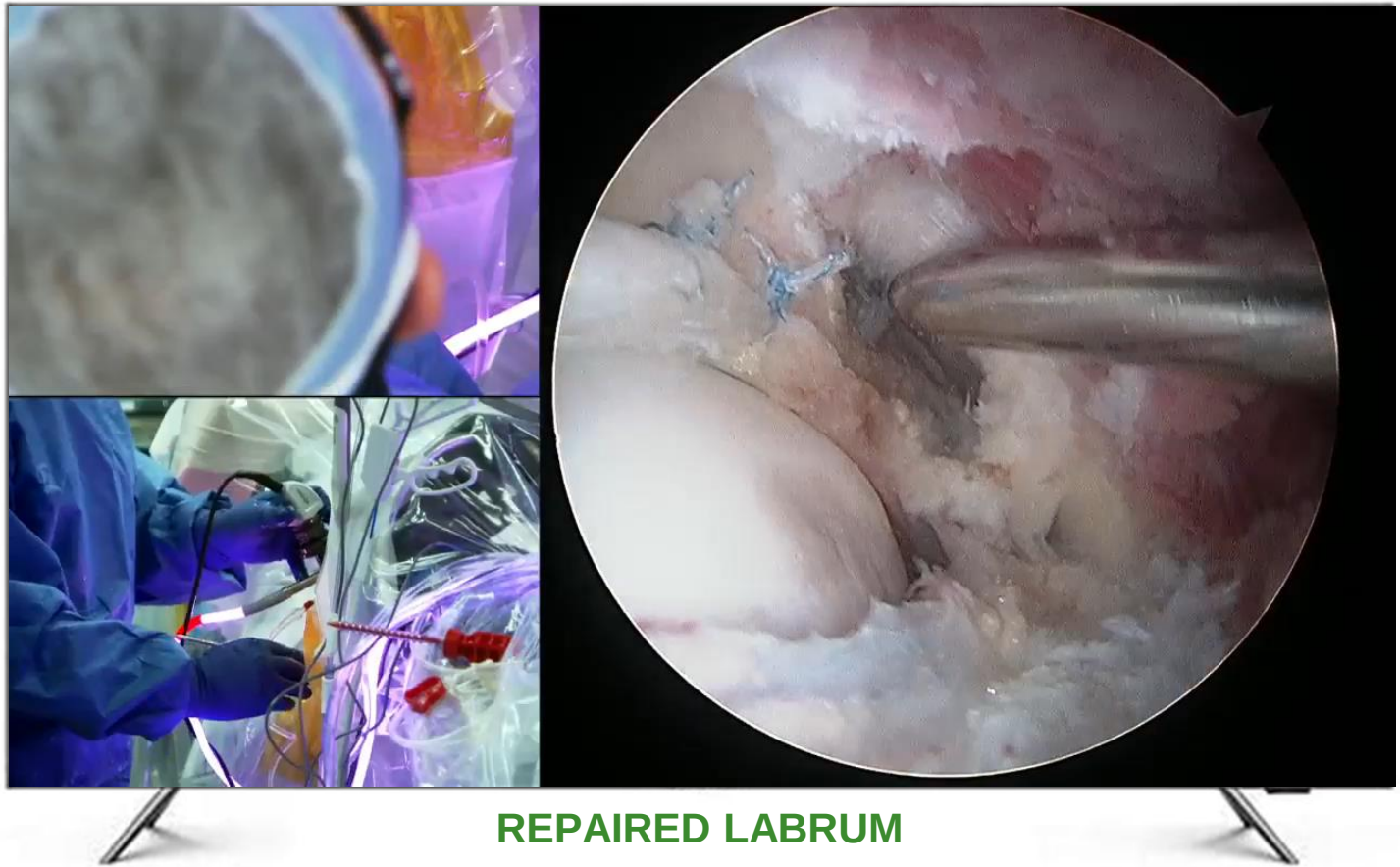
LABRAL SUTURING

Steps Involved for Hip Arthroscopy



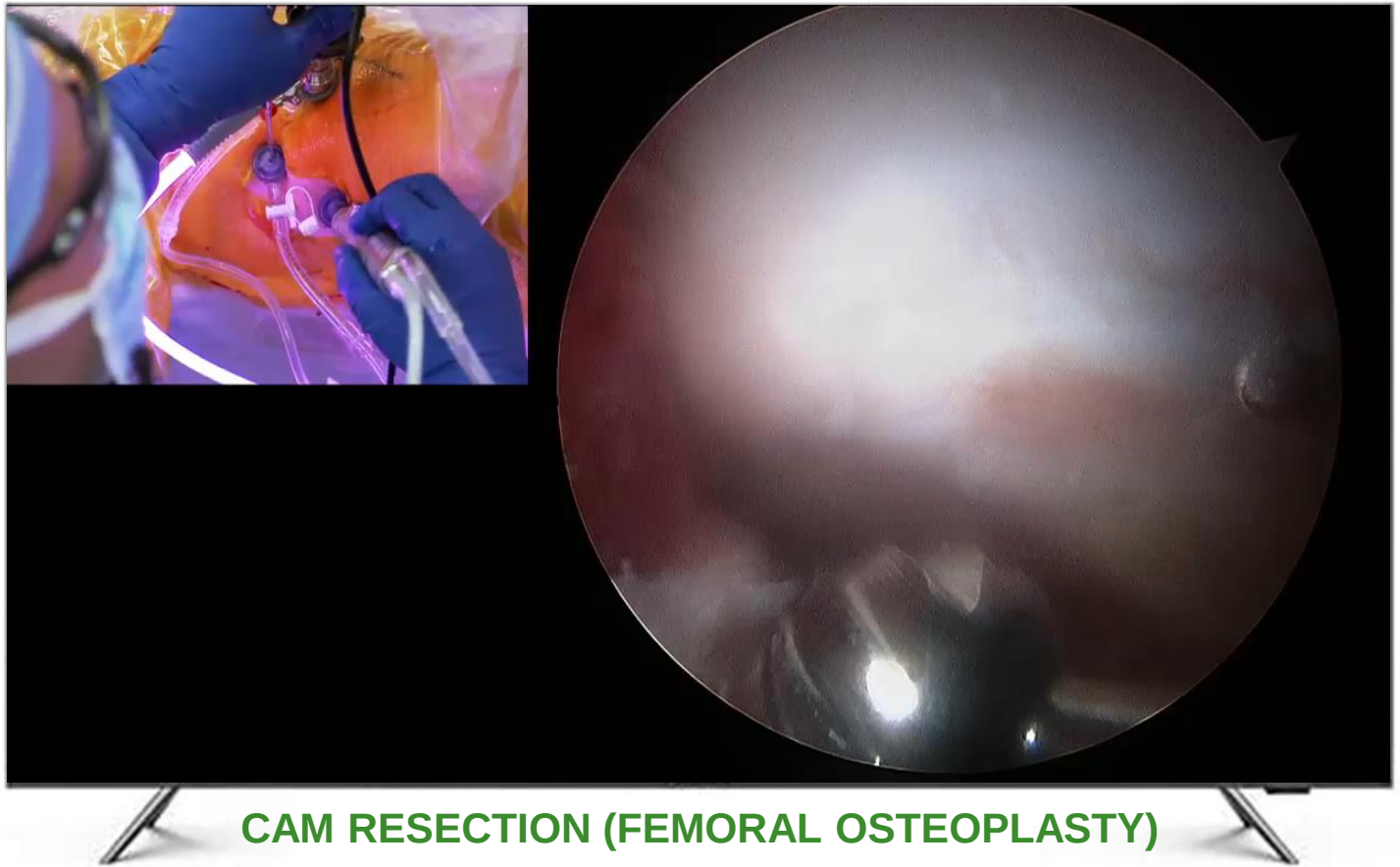
SUTURING LABRUM

Steps Involved for Hip Arthroscopy



REPAIRED LABRUM

Steps Involved for Hip Arthroscopy



CAM RESECTION (FEMORAL OSTEOPLASTY)

Steps Involved for Hip Arthroscopy

FINISHED FEMORAL OSTEOPLASTY

PHYSICAL THERAPY CONSIDERATIONS FOR THE HIP

Kathy Boehmer, PT, MHS, SCS, ATC

St. Elizabeth HEALTHCARE

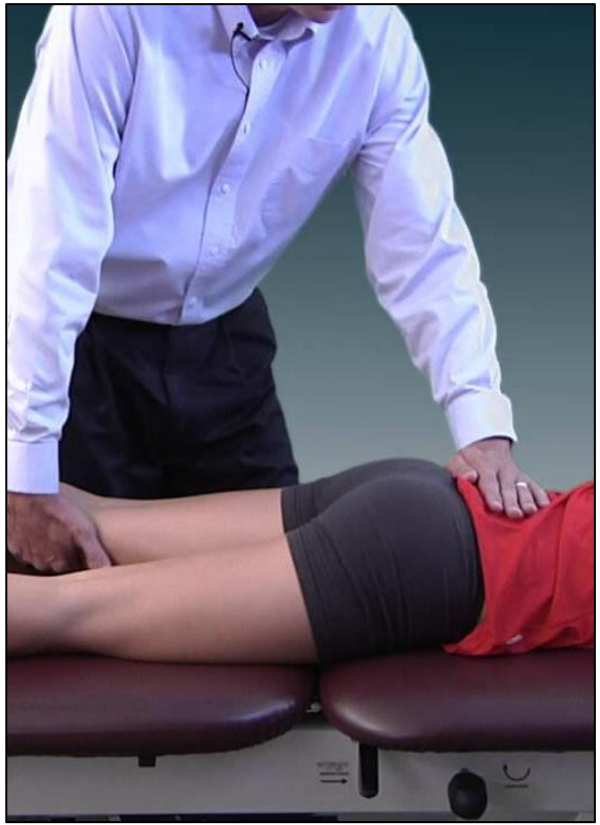
INTRODUCTION

Physical Therapy Evaluation

- Thorough history and a physical examination to determine the main pain generators and the patient's functional limitations

- Is hip pain acute or chronic?
  - Simple muscle strain
  - Complex overlapping pathologies[10]

- Approximately 21 different muscles that cross the hip and pelvic region, all working to maintain pelvic stability and functional hip activities[6]



INTRODUCTION

Acute Hip Injury

Rehabilitation for an acute hip injury can be broken down into 3 phases[6]

- Phase I - Acute management
- Phase II - Strengthening
- Phase III - Return-to-sport or return-to-competition phase

ACUTE MANAGEMENT

POLICE

Early approach to treatment like the classic recommendation of RICE, except that early optimal loading is encouraged instead of more extended rest[1]

- **P**rotection
- **O**ptimal loading
- **I**ce
- **C**ompression
- **E**levation

ACUTE MANAGEMENT

Goals of Phase I

To maintain and restore ROM, strength, core and hip stability and cardiovascular fitness[6]

- Therapeutic Exercises
- Therapeutic Modalities
- Manual therapy

ACUTE MANAGEMENT

Therapeutic Exercises

- ROM activities performed several times a day
- Isometric contractions
- Core stability exercises -**"Abdominal Drawing-in Maneuver"** in neutral spine position
- This maneuver should form the basis of all subsequent exercises throughout the progression[7]

ABDOMINAL DRAWING IN MANEUVER

ACUTE MANAGEMENT

Blood Flow Restriction Exercises

- “If the appropriate equipment is available BFR exercises have been shown to enhance muscle protein synthesis, along with achieving similar muscle strength and muscle mass improvements, when comparing the response of low-load BFR exercises to high-load exercises without using BFR.”[5]

ACUTE MANAGEMENT

Modalities and Manual Therapy

- Electrical stimulation and massage can help to alleviate muscle spasm[13]
- Other techniques may be used for pain management and swelling reduction away from the site of injury: [6,9]
  - Dry needling
  - Joint mobilizations/manipulations
  - Soft tissue manipulation
  - Instrument-assisted soft tissue mobilization

DRY NEEDLING

ACUTE MANAGEMENT

Criteria to Advance to Phase II

- Normal activities of daily living without pain
- No pain with range of motion and isometric exercises

STRENGTHENING

Goals of Phase II

- Strengthen and recondition the injured tissue to the level required for full participation in sporting activities while addressing the athlete's specific deficits[6]

STRENGTHENING

Therapeutic Exercise

- Progressive strengthening[6]
  - Eccentric and concentric exercises -gradually increase the load while varying repetitions
- Stabilization and reactive strategies to improve neuromuscular control
- Cardiovascular fitness

BOSU EXERCISES

STRENGTHENING

Modalities and Manual Therapy

- Continued utilization of both therapeutic modalities and manual therapy

- Hammond et al state that “Manual therapy can be applied directly to the injured tissue as healing in well into the remodeling phase.”[6]

STRENGTHENING

Criteria to Advance to Phase III

- Straight-line running
- Athlete can perform strengthening exercises without pain

RETURN-TO-SPORT OR RETURN-TO-COMPETITION PHASE

Goals of Phase III

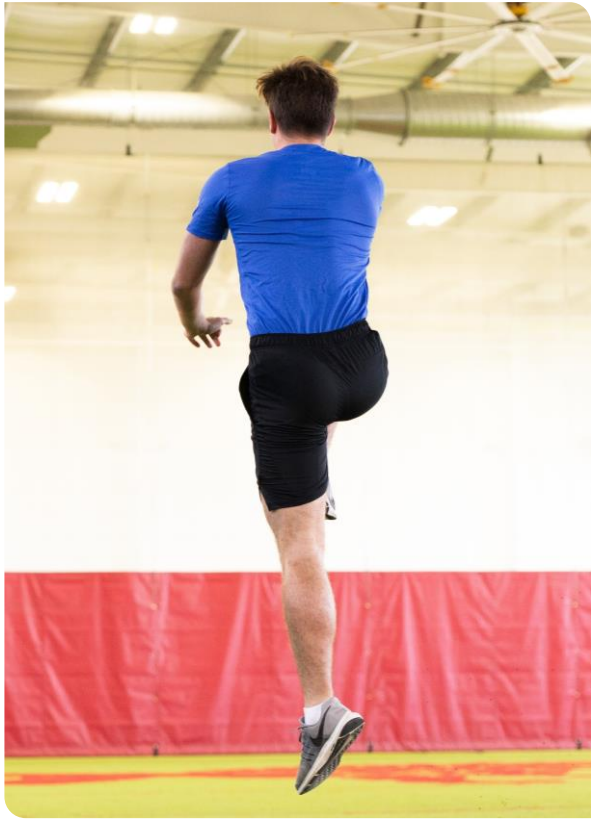
Return to full participation in practice and athletic competition

- Pain-free
- Full ROM
- Near-normal strength
- Dynamic movement ability is sufficient for a safe return

RETURN-TO-SPORT OR RETURN-TO-COMPETITION PHASE

Sports Specific Activities

- What does the athlete need to do to compete?
- Linear running exercises, controlled change of direction movements, plyometrics, and sport-specific drills may be initiated[6]
- Perform activity without pain, without compensation and without apprehension[3]

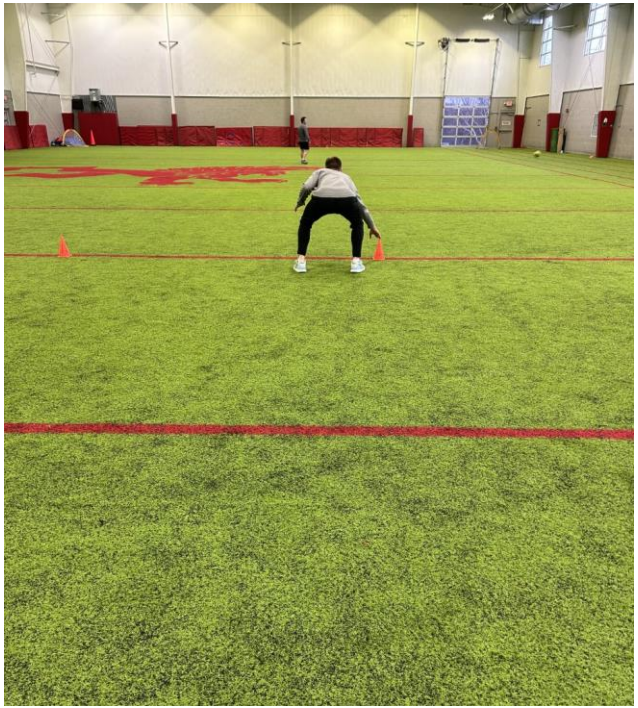


RETURN-TO-SPORT OR RETURN-TO-COMPETITION PHASE

Functional Performance Testing

- Tests designed to evaluate skills that are necessary to participate in higher level functions required by athletic activity
  - T-Test
  - Y Balance Test
  - Single Leg Hop
  - Timed Side to Side Hop

T TEST



RETURN-TO-SPORT OR RETURN-TO-COMPETITION PHASE

Return to Play

- Graded return to games and competitions

- The dosage of an appropriate workload for each athlete is key for a successful return to their sport and the completion of the rehabilitation process[6]

PHYSICAL THERAPY FOR CHRONIC HIP PAIN

APTA Clinical Practice Guidelines Hip OA - 2017[2]

- **Strong Evidence**
  - Manual Therapy
  - Flexibility, Strengthening, and Endurance Exercises

- **Moderate Evidence**
  - Patient Education Combined With Exercise
  - Modalities - Ultrasound (1 MHz;1 W/cm2 for 5 minutes each to the anterior, lateral, and posterior hip for a total of 10 treatments over a 2-week period) in addition to exercise

- **Weak Evidence**
  - Functional, Gait, and Balance Training
  - Weight Loss

Hip pain and mobility deficits—hip osteoarthritis examination/intervention guidelines decision-making model.

PHYSICAL THERAPY FOR CHRONIC HIP PAIN

Manual Therapy

- Cibulka et al conducted a systematic review of patients with hip mobility deficits and found a significant improvement in patient's receiving manual therapy[2]

- A "high force Long-Axis Distraction Mobilization in open packed position significantly increased hip ROM in all planes of motion compared to a medium or low force mobilization in patients with hip OA. A specific intensity of force mobilization appears to be necessary for increasing ROM in hip OA.“[4]

PHYSICAL THERAPY FOR CHRONIC HIP PAIN

Manual Therapy

- Yerys et al state that there is a significant increase in gluteus maximus strength in response to Grade IV P-A mobilizations performed on the anterior hip capsule[10]
- Clinicians can utilize these findings in everyday practice
  - Improve muscle strength by integrating manual therapy with therapeutic exercise
- As hip motion improves, clinicians should add exercises
  - Stretching and strengthening to improve the patient's range of motion, flexibility, and strength

P-A HIP JOINT MOB

PHYSICAL THERAPY FOR CHRONIC HIP PAIN

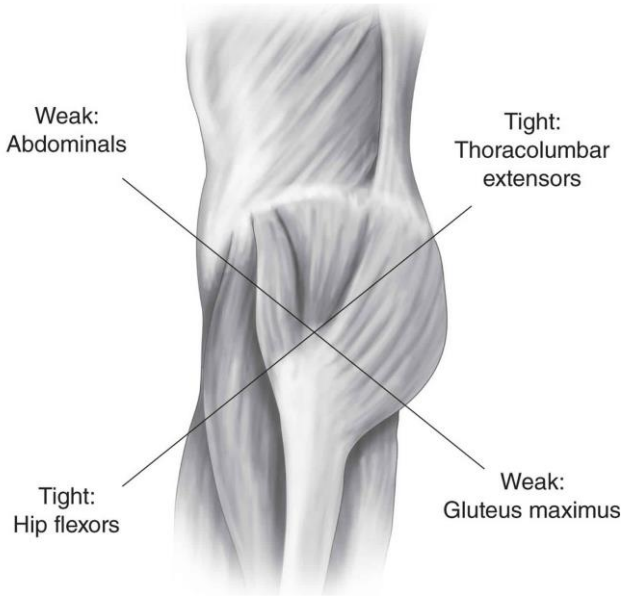
Flexibility, Strengthening and Endurance Exercises

- APTA recommends that "Clinicians should use individualized flexibility, strengthening and endurance exercises to address impairments in ROM, specific muscle weaknesses, and limited muscle flexibility."[2]

- Hip capsule, fascia, and muscle stretching, including extension, flexion, IR, ER, abduction, with attention to hip flexors and ERs

- Strengthening of hip abductors, ERs, extensors

LOWER CROSS SYNDROME



CONCLUSION

Goal of Rehabilitation

- Decrease pain
- Improve ROM/flexibility
- Establish dynamic stabilization of the surrounding hip musculature and concurrent core and pelvic control to prevent accessory motion of the hip joint during complex activities[8]
- Return to athlete or patient to their normal activity level

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ON THE FIELD ASSESSMENT OF HIP INJURIES

Stephanie James, MA, ATC

St. Elizabeth HEALTHCARE

EMERGENT VS NON-EMERGENT

Emergent- Hip Dislocations (with or without fracture)

- **Uncommon but are medical emergencies.**
- **Schupp et al found approx. 3% of all football-related injuries involve a hip fracture or dislocation.[8]**
- **70% of all hip dislocations are posterior and 90% of those occur during sport.[8]**

Non-Emergent: Soft-tissue injuries

- **Muscle strains, sprains, and contusions**
- **Can athlete RTP?**
- **Referral to MD and PT**
- **NCAA surveillance system for collegiate FB reported soft-tissue injuries to the hip and pelvis have an infrequent but significant incidence.[2]**
  - Strains and pelvis hip contusions being most common (1.9% and 1.8% respectively)

HIP STATS

LE injuries comprise 60% of all injuries reported.[1]

From 2015-2018, an average of 2006 LE injuries resulted in missed playing time.[1]

- **148 (7.4%) affected the hip.**

From 1997-2006, intra-articular injuries (labral tears, subluxations, dislocations) rep only 5% of all hip injuries.[1]

- **Resulted in the most time loss (avg of 94.2 days).**

From 2000-2017, a total of 16 posterior hip instability injuries in 14 players were reported.[1]

- **Most often offensive players (tight ends).**

HIP DISLOCATIONS

Video

ON-THE-FIELD EVALUATION

OBSERVATION

- Did AT witness MOI?
  - MOI: Forced adduction and internal rotation, with hip in flexed position.[8]
- Is the athlete moving injured leg?
- Note position of the leg
  - A fixed, immobile, awkwardly positioned, or noticeable shortened leg.[8]

HISTORY

- Location of pain
- Peripheral symptoms
- MOI
- Associated sounds and symptoms
- History of Injury

PALPATION

- Boney alignment
- Crepitus
- Joint alignment

SPECIAL TESTS

- Neurovascular pathology?
  - i.e. femoral and pedal pulses
- Capillary refill
- Sensory and motor function

PLAN

WHAT DO WE DO?

- Call EMS!
- Stabilize
- Spine board, if possible, allowing for the hip to be aligned in the most comfortable position[6]
    - Hip flexed and adducted
- Refer to ED ASAP
- GOALS:
    - Avoid neurovascular compromise[6]
    - Reduce joint as atraumatically as possible[6]
- Don’t forget about shock

ON THE FIELD REDUCTION?

Should it be attempted?

- **According to the NATA position statement on appendicular joint dislocations, an ATC can attempt to reduce a hip, under the direction of a physician .[7]**

- **May not be warranted or appropriate.[5]**
  - **Often requires intravenous pain medications, relaxants, and conscious sedation because of the significant amount of pain and muscle spasm.[7]**

- ***If patient is young enough that growth plates could still be open (as late as 22 years), onsite reduction should not be attempted because fracture is highly likely.[5]***

EVERYTHING ELSE…

Sprains, Strains, and Contusions

- Get athlete off the field ASAP
- Can they RTP? Should they RTP?
  - RTP decisions lack standardization.[4]
  - Pain alone may prohibit RTP[10]
  - Any weakness on exam would indicate potential for further injury.[10]
  - Functional testing.[4]
  - Psychological factors[4]
  - Other factors (timing and season, sport, position, ability to protect, limb dominance, level of competition)[4]
- Athlete's role in RTP decisions
- Ultimately, up to the Team Physician, if present[6]
- Refer to MD and PT

CASE REPORT

18-year-old elite college running back and special teams' player

- No previous hip complaints.
- Reports hip pain while blocking.
- During the play, the ball was kicked away from him, and he positioned himself as a blocker and engaged an opposing player approaching from the left.
- He reported being twisted to the left before falling to the ground.
- He had immediate pain in the posterior left hip and buttock as he fell backward to the ground but denied direct contact from the opposing player at the site of injury.
- He limped off the field and tried to “loosen up” the injury on the sideline.

CASE REPORT

EVALUATION BY TEAM PHYSICIAN

- No swelling, ecchymosis, or deformity
- Point tenderness along bony iliac crest and gluteus muscles, deep tenderness in posterior buttock
- Passive external rotation at 90° of hip flex limited and painful as well as hip abduction
- Prone passive extension of hip limited and painful posteriorly
- Passive log roll test (-)
- FABER test (+) for limited ER and inc pain deep in post leg
- FAI (flexion, adduction, IR) (+) pain deep in anterior hip
- Loading joint posteriorly with hip at 90° flex while supine significantly painful, no laxity.
- Locker Room X-Ray: Question of a CAM type anatomy and irregularity of the superior acetabular rim

CASE REPORT

Results and Treatment

MRI Results:

- Edema in the femoral head with possible overlying chondral flap tear
- Posterior capsule tear
- Non-displaced anterior-superior labral tear
  - Age of the labral tear was uncertain due to his anatomy being consistent with FAI.

Treatment Plan:

- Non-operative
- 4mo MRI f/u
  - Resolution of bony injury and small chondral flap
  - Extension of anterior labral tear with associated fraying
- Pros and cons of Surgical intervention??
- Cleared for full participation 5 months post injury.

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