

Let me Patella you Something about Lower Extremity Injuries and Conditions

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Educational Objectives

- As a result of this activity, learners will be able to describe common lower extremity conditions and injuries.
- As a result of this activity, learners will be able to identify important components of the patient's history that are key to arriving at accurate diagnoses for lower extremity conditions and injuries.
- As a result of this activity, learners will describe sensitive and specific physical examination techniques for patient's with lower extremity conditions and injuries

Relationships with commercial interest

- I have no conflicts of interest or relationships to disclose.

Knee



Osteoarthritis



Definition / Background

- Common
- 3 compartments
- Primary or secondary

Clinical Symptoms

- Obese
- Genetic predisposition
- Insidious onset pain
- Stair climbing difficulties
- Stiffness and intermittent swelling
- Crepitation

Tests

- Physical Examination
 - Crepitus
 - Diffuse joint line tenderness
- Diagnostic Tests
 - X-rays
 - Weight bearing
 - Narrowing of the joint space
 - Subchondral cysts and sclerosis

Treatment

- NSAIDS
- Weight loss
- Activity modifications
- PT
- Neoprene sleeves
- Heel wedges
- Corticosteroid injections
- Visco-supplementation

NSAIDS

- Recommended at anti-inflammatory dosage
- Without underlying comorbidities that exclude
- Ibuprofen 800 mg with food TID
- Naprosyn 500 mg with food BID

- With documented GI issues Celebrex 200 mg QD (may require prior authorization)

Corticosteroids

- Selecting corticosteroids
- Little systematic evidence
- Risk: reduction of synovial blood flow, alteration of collagen synthesis
- Triamcinolone
- Kenalog
- Depo-Medrol (most common)

Dosing

- Depo-medrol 40/ML
- Kenalog 40/ML
- Triamcinolone 20/ML

- Common equivalent dose is 40 mg

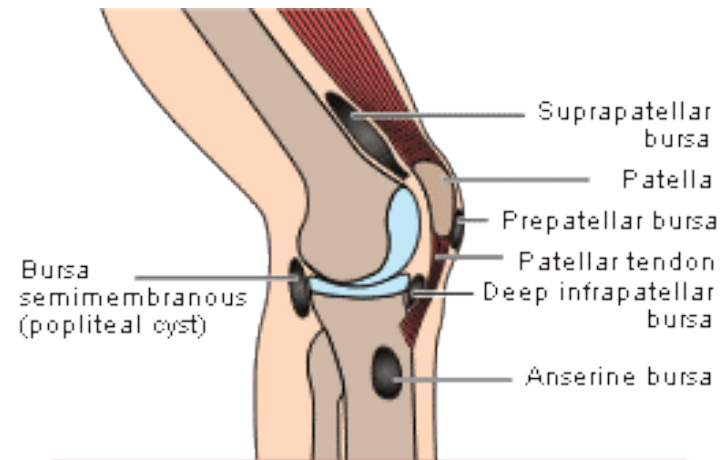
- Given with anesthetic (Marcaine typically) 4-6 ML.

Referral Red Flags

- Pain that is not responding to conservative measures
- Functional limitations



Bursitis



Definition / Background

- Pes Anserine
- Pre-patellar
- Sacs between bony prominences
- Lined with synovial fluid
- Chronic pressure or friction
- Trauma
- Rule out septic

Clinical Symptoms

- Pain over one of these areas
- Pain with activity or direct pressure first
- Traumatic – swelling over area after fall... NOT effusion!

Tests

- Physical Examination
 - Palpate structures for tenderness and swelling, know your anatomy! :)
- Diagnostic Tests
 - X-ray
 - Rarely needed, rule out bony pathology
 - MRI
 - Mass is differential?

Treatment

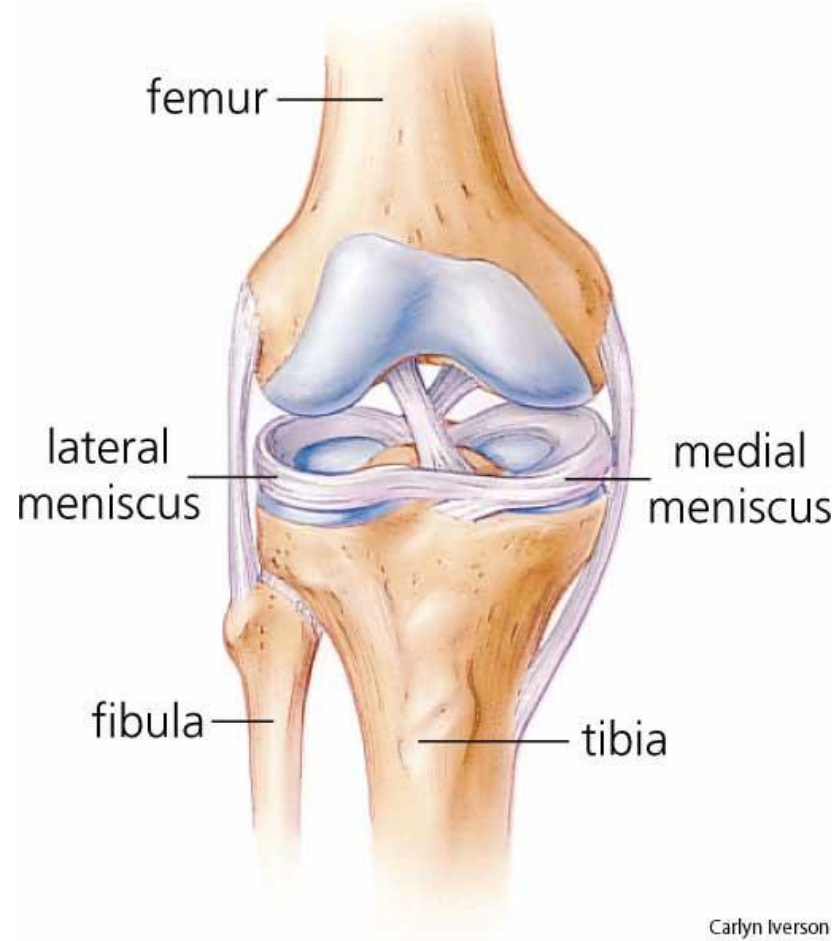
- Non infected respond to conservative tx
- NSAIDS, ice, activity modification
- Compression
- Do not drain
- Injections?

Referral Red Flags

- Not responding to conservative measures
- Suspect infection



Meniscus Tears



Background / Definition

- Fibrocartilaginous pads
- Shock absorbers
- Isolated or with ligament tears
- Disrupt the mechanics of the knee, leading to varying degrees of symptoms
- Predisposes to degenerative arthritis
- Are part of the arthritis continuum of cartilage loss *****

Flexion Pinch Test



Meniscal Symptoms

- History of significant twisting injury to knee
- Usually able to weight bear and may continue activity
- Onset swelling 1-3 days
- Locking, catching, popping
- True locking problematic



Tests

- Physical Examination
 - Posterior joint line tenderness
 - Flexion pinch
 - Effusion
- Diagnostic Tests
 - X-rays
 - MRI
 - Hx previous repair = MRI arthrogram

Treatment

- Evaluate and treat aggressively
- Restrict sports participation
- PT

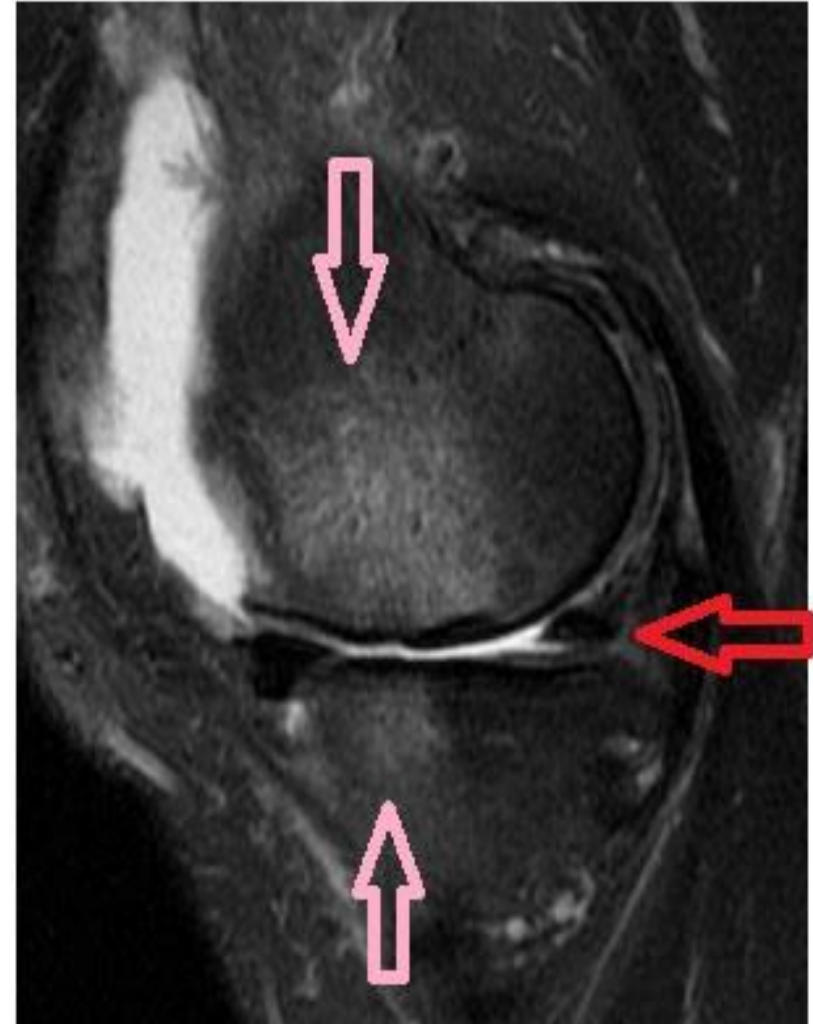
Treatment

- Active/young
 - Treat aggressively
 - Restrict participation in sports
 - PT
 - Surgery may be indicated
- Associated with Osteoarthritis
 - Rest
 - Conservative measures
 - Bracing, PT
 - Corticosteroid injections
 - Viscosupplementation
 - Surgery almost never indicated!

With osteoarthritis as a comorbidity

- Meniscus tears are part of the continuum of degenerative disease
- Avascular and have no ability to heal

MRI of Meniscus Tear With and Without Osteoarthritis

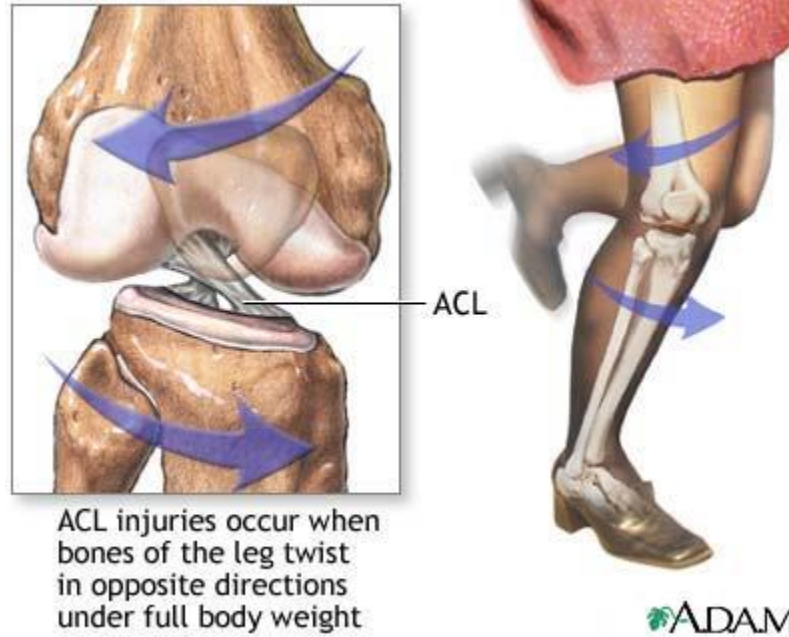


Referral Red Flags

- Locked knee
- Suspect posterior horn tear
- Inability to return to activity level



ACL Tear



Definition / Background

- Anterior Cruciate Ligament
- Primary stabilizer of the knee
- Mechanism of injury
 - Rotational or hyperextension force that overcomes the strength of the ligament³

• ³ Beynon, Vacek, Newell, Tourville, Smith, Shultz, and Johnson (2014)

Clinical Symptoms

- Usually report sudden pain and giving way
- 1/3 audible pop
- Unable to continue play due to pain or instability
- Immediate effusion

Tests

- Physical Examination
 - Effusion
 - Lachman's test



Tests (Cont.)

- Diagnostic Tests
 - X-rays
 - MRI



Adverse Outcomes

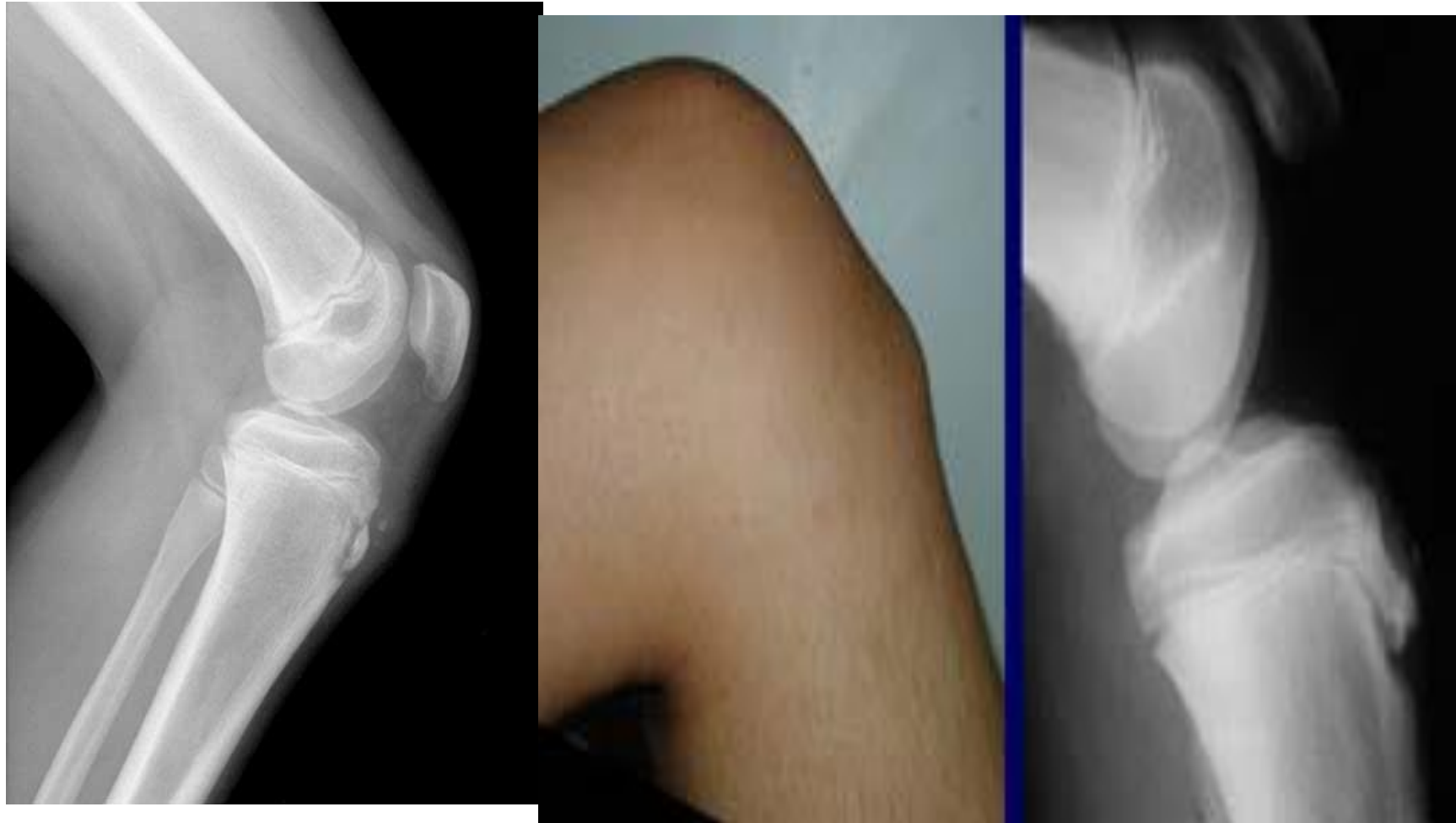
- Recurring instability
- Further internal damage
 - Meniscus tears
 - Osteochondral injuries

Referral Red Flags

- Any time
- Active patients
- For discussion of options



Osgood – Schlatter Disease



Background / Definition

- Overuse injury
- Growth spurt – age 11-13
- Tight Quads

Clinical Symptoms

- Pain exacerbated by running, jumping and kneeling

Tests

- Physical Examination
 - Tenderness and swelling at the insertion of the patellar tendon onto the tibial tubercle
- Diagnostic Tests
 - X-rays
 - Comparison views

Treatment

- RICE
- Activity modification
- Stretch
- Stretch
- Immobilization



Referral Red Flags

- Not improving with conservative measures



Patella-femoral Pain (AKA anterior knee pain)

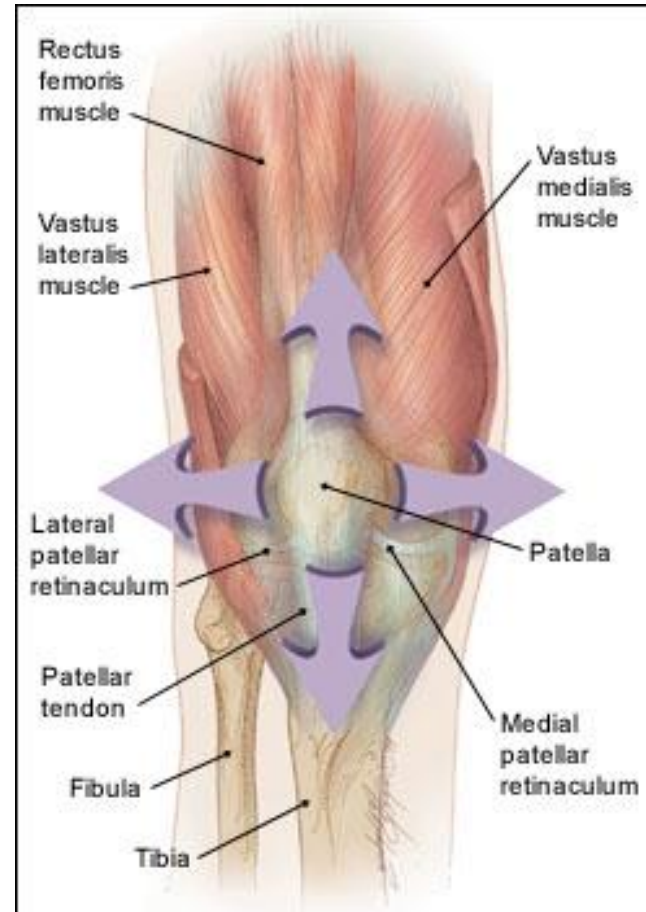


Illustration © 1999 Floyd E. Hosmer

Background/Definition

- Common problem
- Abnormal patellar tracking
- **ADOLESCENT FEMALES**

Tests

- Physical Exam
 - One finger
 - Look at the feet!
 - Inverted “J” Sign
 - X-Rays?
 - Sunrise view



Treatment

- PT
- Core
- Treat pes planus

Referral Red Flags

- Failure of conservative measures



Patellar Instability



Background / Definition

- Varying degrees
- Malignment to subluxations to dislocation
- Ligamentous laxity

Clinical Symptoms

- Feeling of subluxations or instability
- Frank dislocations

Tests

- Physical Examination
 - Patellar tilt
 - Apprehension sign
 - Tenderness over medial retinaculum
- Diagnostic Tests
 - X-rays
 - Rarely MRI
 - Complete dislocation = MPFL tear
 - Treatment change?

Apprehension Sign



Treatment

- PFM or instability
 - PT
 - VMO strengthening
 - ITB stretching
 - Bracing
- Dislocation
 - 4 weeks brace
 - Locked 0
 - AROM
 - PT

Referral Red Flags

- Loose body on plain films
- Failed conservative management
- Inability to return to play



Hip and ankle

Hip



Physical Examination Techniques

- Inspection / Palpation
 - Anterior view
 - Look for atrophy of anterior thigh
 - Alignment
 - Posterior View
 - Atrophy
 - Trendelenberg test
 - Gait
 - Antalgic (limp)
 - Trendelenberg / gluteus medius gait

Physical Examination (Cont.)

- Anterior view, supine
 - ASIS
 - Tenderness with avulsion of sartorius or rectus femoris
- Lateral view, side-lying
 - Tenderness over trochanter
- ROM
 - Flexion: Zero starting position
 - Supine
 - Normal 110-130

Physical Examination (Cont.)

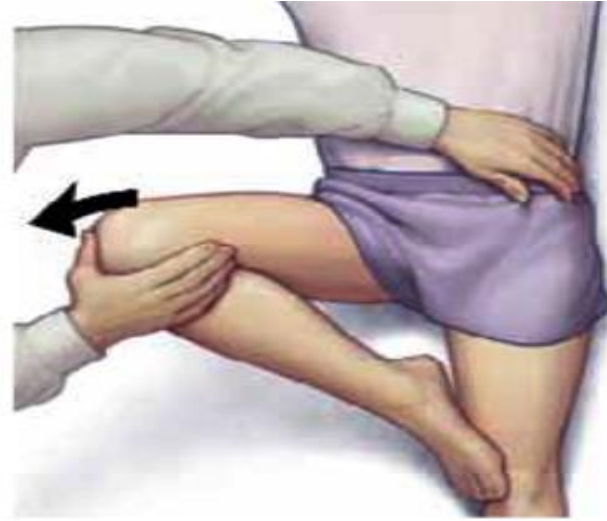
- Abduction and Adduction
 - Normal abduction 35 to 50
 - Normal adduction 25 to 35
- Internal-external rotation in flexion

Physical Examination (Cont.)

- Muscle testing
 - Hip flexors
 - Seated, flex hip as resist effort
 - Hip extensors
 - Prone, 90 flexion, extend as you resist
 - Abductors – adductors
 - Supine, abduct and adduct against resistance

Physical Examination (Cont.)

- FABER test
 - Flexion – abduction – external rotation test
 - Figure four test
 - Hip and sacroiliac pathology
- THIRD test
 - The hip – internal rotation- with distraction test
 - Labral pathology



Common Hip Orthopedic Conditions

Osteoarthritis



Definition / Background

- Loss of articular cartilage of the hip joint
- Primary or secondary

Clinical Symptoms

- Gradual onset of anterior thigh or groin pain
- Initially pain with activity, then at rest, then night pain
- Decreased ROM
- Ambulatory capacity decreases

Tests

- Physical Examination
 - Loss of IR
 - Antalgic gait
- Diagnostic Tests
 - X-rays
 - Loss of joint space
 - Subchondral cysts
 - Subchondral sclerosis

Treatment

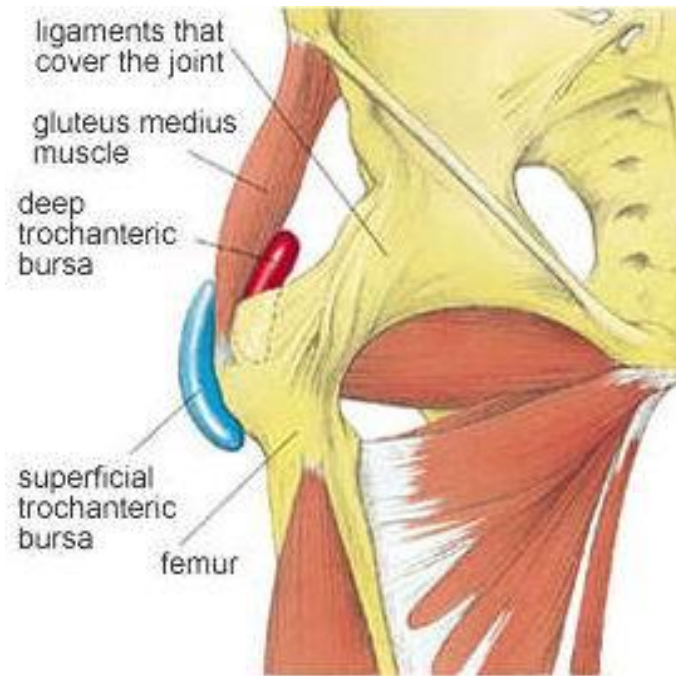
- Acetaminophen
- NSAIDS
- Activity modifications
- Rest
- PT
- Weight loss
- Intra-articular corticosteroids
- Hip replacement

Referral Red Flags

- Persistent pain despite conservative management
- Corticosteroid injection



Greater Trochanteric Bursitis



Background / Definition

- Inflammation and hypertrophy of the greater trochanteric bursa
- Primary or secondary

Clinical Symptoms

- Pain and tenderness over the greater trochanter
- May radiate.....
- Worse when rising from seated or recumbant position
- Pain lying on affected side

Tests

- Physical Examination
 - Pain with palpation in lateral decubitus position
 - Exacerbated with active hip abduction
- Diagnostic Tests
 - X-rays
 - Not necessary, but rule out bony abnormalities

Treatment

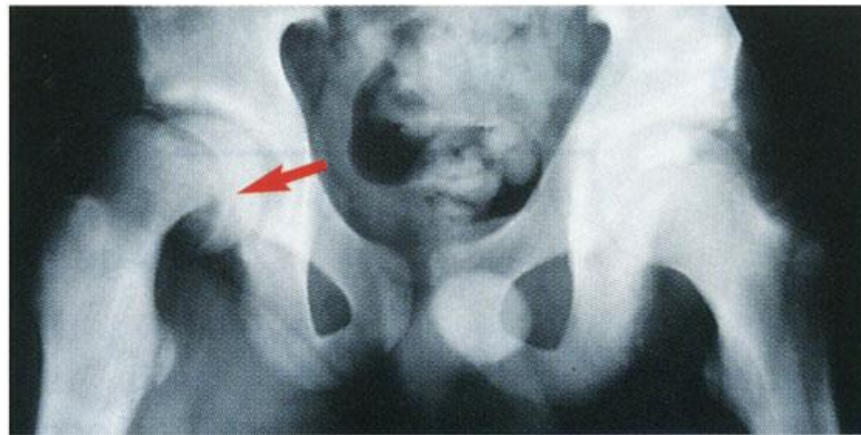
- Rest
- Activity modifications
- NSAIDs
- Ice
- Corticosteroid injection

Referral Red Flags

- Failure of treatment
- Diagnostic uncertainty



SCFE



Definition / Background

- Slipped capital femoral epiphysis
 - Displacement of the femoral head through the physis
- Common during growth spurt
- Obese, male, active
- Bilateral involvement
 - 40- 50%



Clinical Symptoms

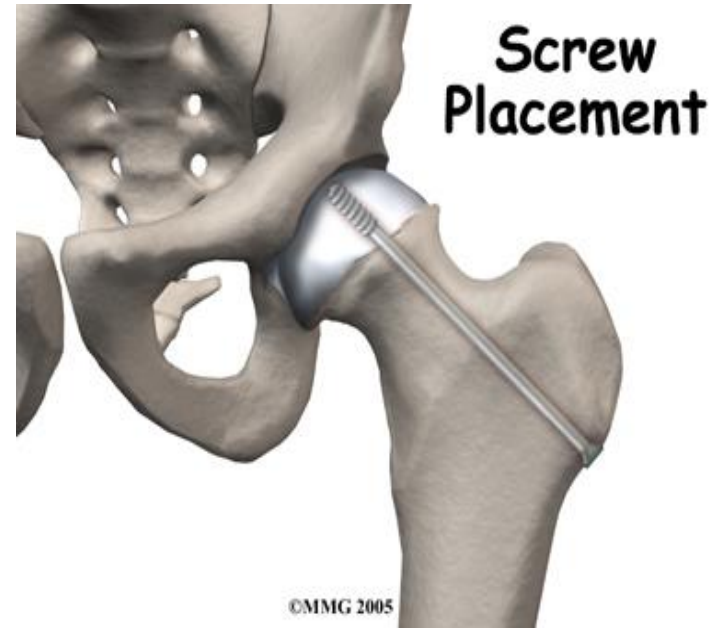
- Pain exacerbated by activity
- Usually proximal thigh
- Limp

Tests

- Physical Examination
 - Loss of hip IR
 - Decreased abduction and external rotation
- Diagnostic Tests
 - X-rays
 - AP and Frog-lateral

Treatment

- Surgery
- Heavily debated treatment of contralateral side

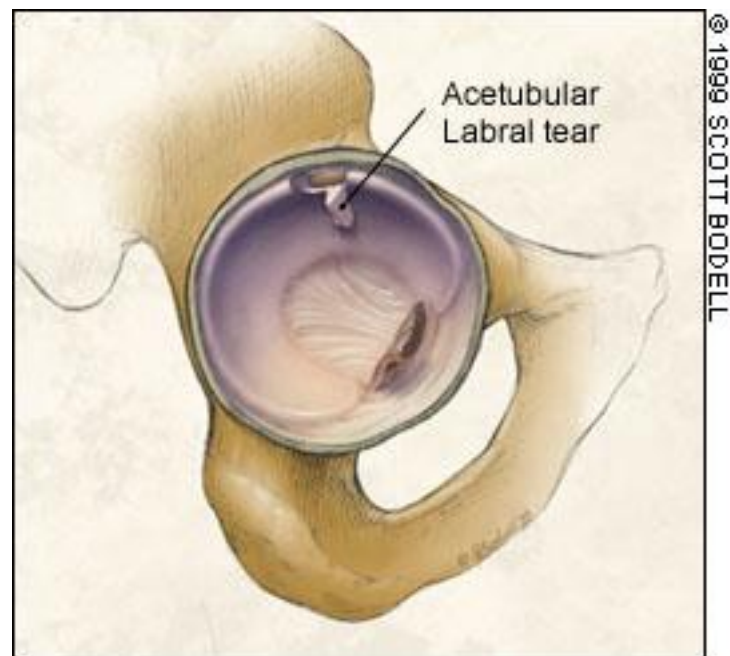


Referral Red flags

- If you suspect a SCFE – refer.



Labral Tears



Background / Definition

- Acetabular labrum
 - Fibrocartilage rim at the periphery of the acetabulum
- Snapping in the hip that causes giving way and residual pain

Clinical Symptoms

- A snapping hip that doesn't get better
- Deep pain
- Catching or giving way
- Inability of an athlete to perform

Tests

- Physical Examination
 - THIRD Test
 - ROM
- Diagnostic Tests
 - X-rays
 - MRI arthrogram

Treatment

- If truly mechanical = surgery

Referral Red Flags

- Snapping hip?
- Athletes



Treatment

- RICE
- Activity modification
- Stretch
- Stretch
- Immobilization



Referral Red Flags

- Not improving with conservative measures



Osteoarthritis

- Stiffness, especially after inactivity or prolonged sitting⁷
- X-rays
- Groin pain

• ⁷ Dubin, A (2016).

Greater trochanteric bursitis

- Pain with prolonged sitting
- Overweight
- Pain directly over the greater trochanteric bursa
- PT
- Injection with cortisone

Ankle Sprains

Definition / Background

- More than 25,000 a day!
- Lateral ligaments (ATFL and CFL)
- “High ankle sprain”
 - Syndesmosis

Clinical Symptoms

- Pain over injured ligaments
- “Pop”
 - Not always ominous
- Acute on chronic

Tests

■ Physical examination

- Ecchymosis
- Edema
- Base of 5th
- Squeeze test
- External rotation test

Tests (Cont)

- Diagnostic tests
 - X-rays
 - Ottawa ankle rules
 - MRI
 - Stress views

Treatment

- RICE
- Brace or air stirrup
- WBAT
- Cast?
- Rehab
 - Proprioception
 - Peroneal strengthening

Referral Red Flags

- Failure to respond to conservative measures after 6 wks
- Peroneal subluxation



Medial Tibial Stress Syndrome (Shin Splints)

- Proper shoe wear
- Avoid sudden increase in activity
- Limit forceful, extensive use of foot flexors

Definition / Background

- Lateral malleolus (distal fibula)
- Medial malleolus (distal tibia)
- Posterior malleolus (posterior lip of tibia)
- Unstable fractures involve both sides of the joint
 - Bimalleolar and trimalleolar

Clinical Symptoms

- Acute pain following trauma

Tests

- Physical examination
 - Pain and swelling
 - Circulatory status
 - Neurovascular status
 - Joint above and below
 - Skeletally immature point tender over growth plate = salter harris 1
- Diagnostic tests
 - X-rays
 - 3 views
 - Repeat if 7-10 days and still painful

Treatment

- Stable fx's distal fibula
 - Weight-bearing cast 4-6 weeks
- Unstable non displaced
 - Non-weight bearing cast
- Unstable displaced
 - Closed or open reduction

Referral Red Flags

- Unstable fractures
- Growth plate involvement
- Widened mortise



Sever Disease (Calcaneal Apophysitis)



Definition / Background

- Active, prepubertal children
- Pain posterior aspect heel
- Pain after play and sports activities
- Repetitive stress and microtrauma on apophysis

Clinical Symptoms

- Posterior heel pain
- Limp
- Activity related

Tests

- Physical examination
 - Tenderness at posterior aspect calcaneus
- Diagnostic Tests
 - X-rays
 - Not necessary, but helpful

Treatment

- Short-term modification or activity restriction of the precipitating activity
- Shoe modifications
 - $\frac{1}{4}$ heel lift
- Stretching
- Cast

Referral Red Flags

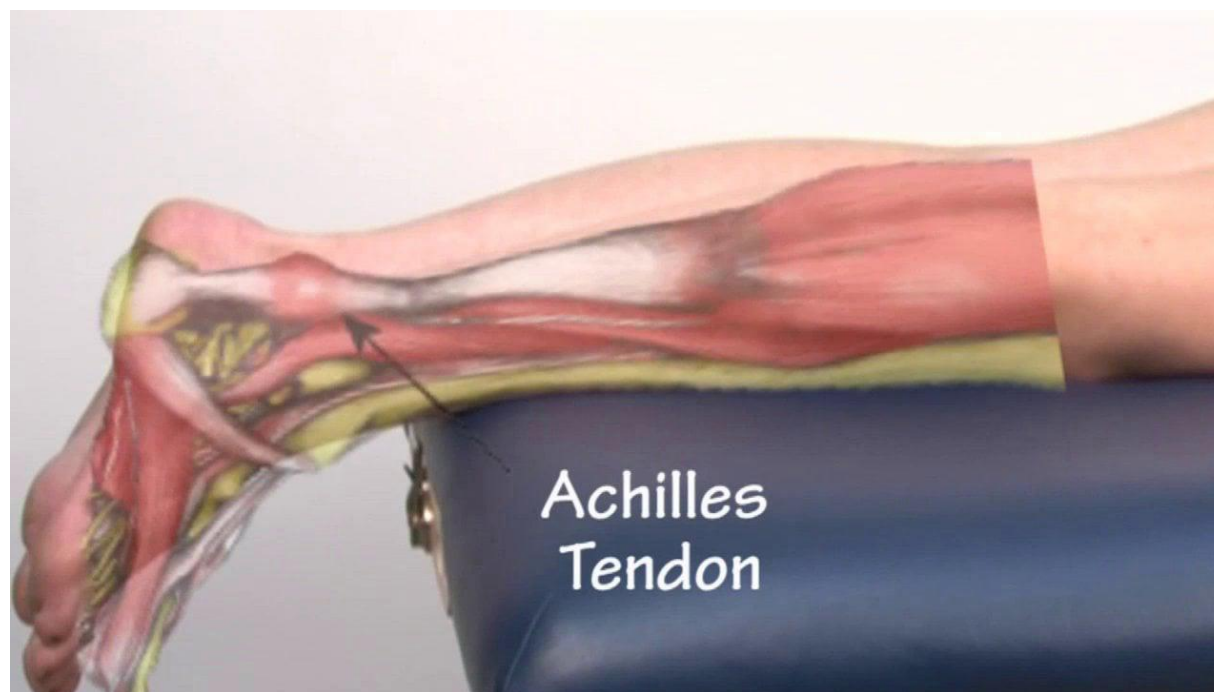
- Suspicion of tumor or osteomyelitis
- Refractory to conservative measures



Plantar Fasciitis

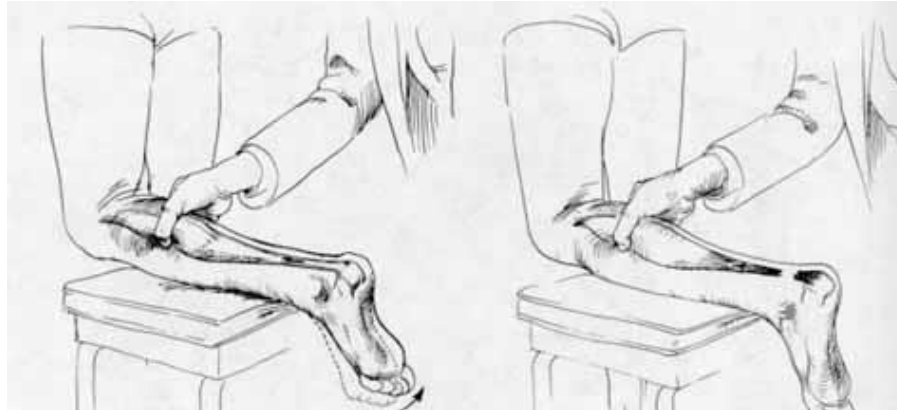
- Stretch calves and achilles
- Limit hills and speed work
- Good shoe wear

Achilles tendon tear

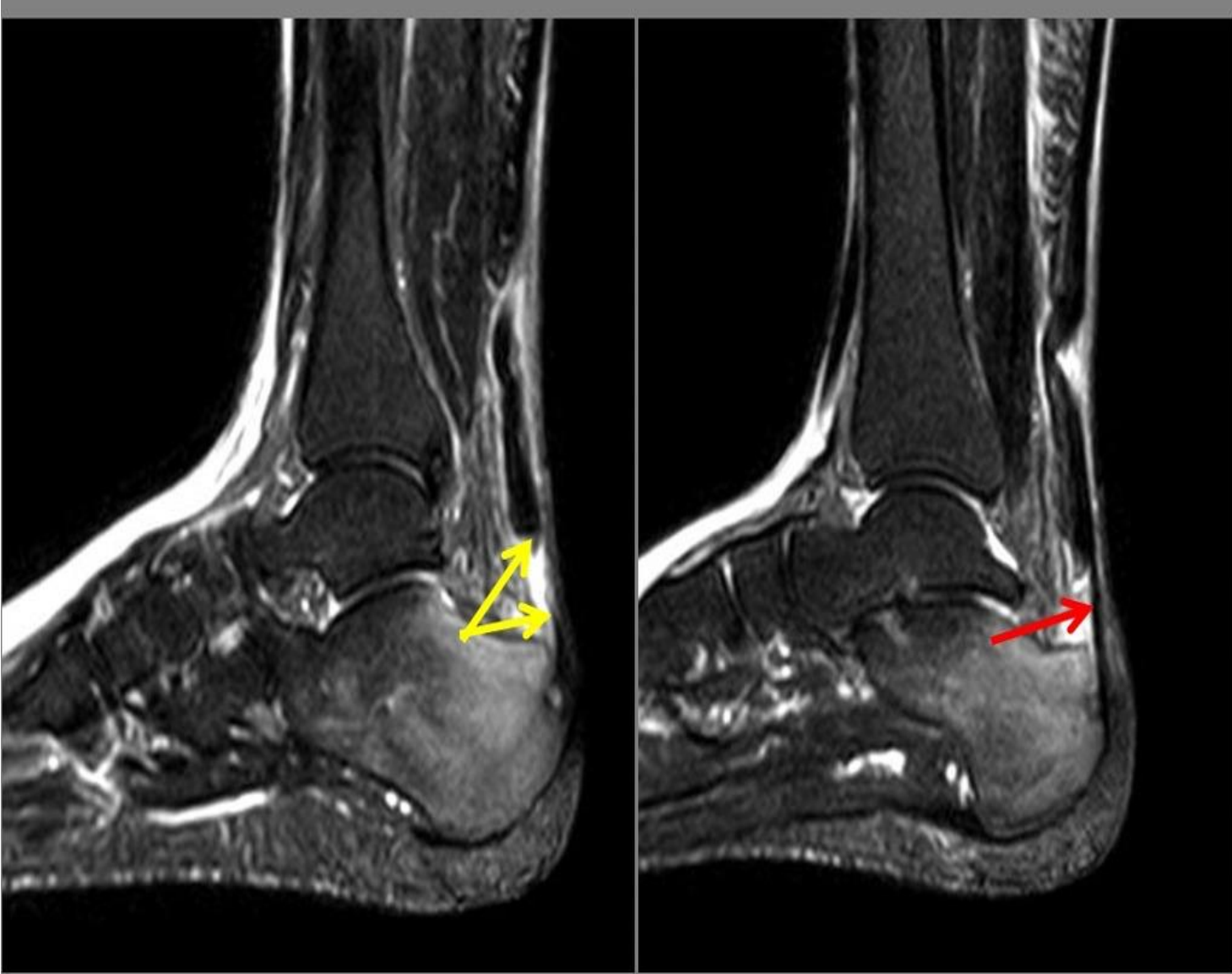


Thompson's Test

- Patient lie prone with knee flexed at 90 degree
- Squeeze the middle third of the calf to produce planar flexion of the foot
- * No plantar flexion indicates a complete tear of the Achilles tendon



Achilles Tendon Tear on MRI



Questions?



References

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