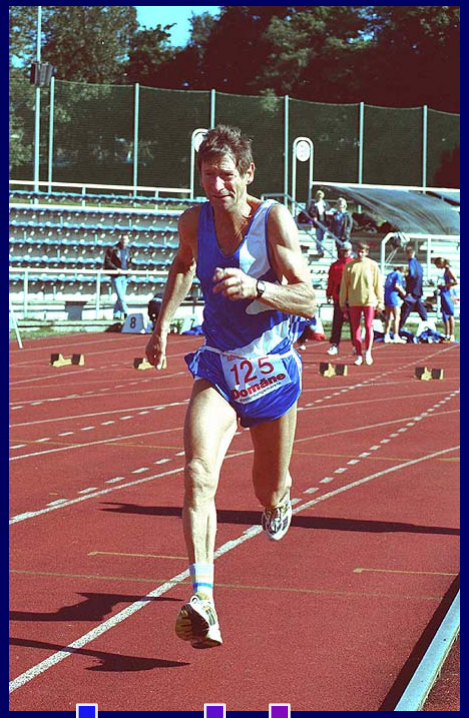
Clinical Knee Exam



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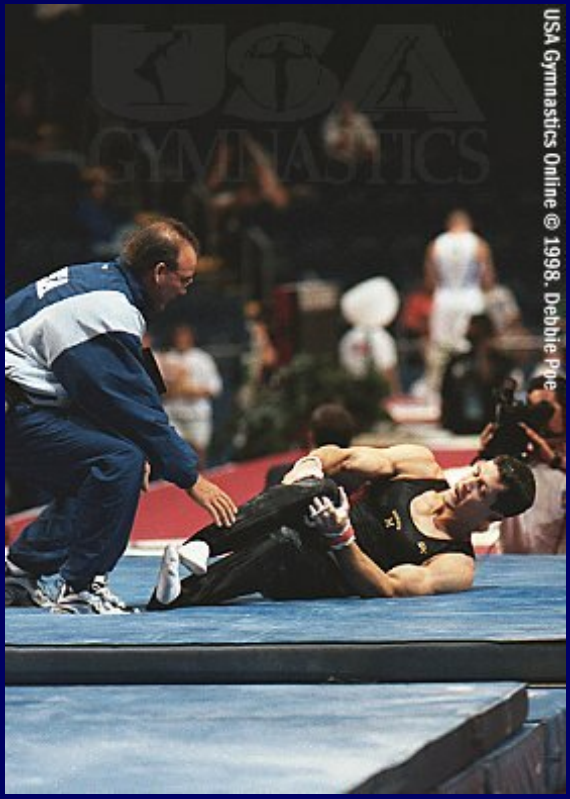
Goals &Objectives

- 1. Review the anatomy of the knee
- 2. Practice your hands-on skills
- 3. By the end of the workshop:
  - Be able to categorize knee injuries
  - Understand the significance of an effusion
  - Realize the importance of the history towards making a diagnosis in knee pain
  - Describe an interesting feature found while examining the knee of your partner (limited to the knee)

Systematic Approach to Joint Examinations

- Inspection
- Palpation
- Range of Motion
- Strength/Stability Testing
- Special Tests

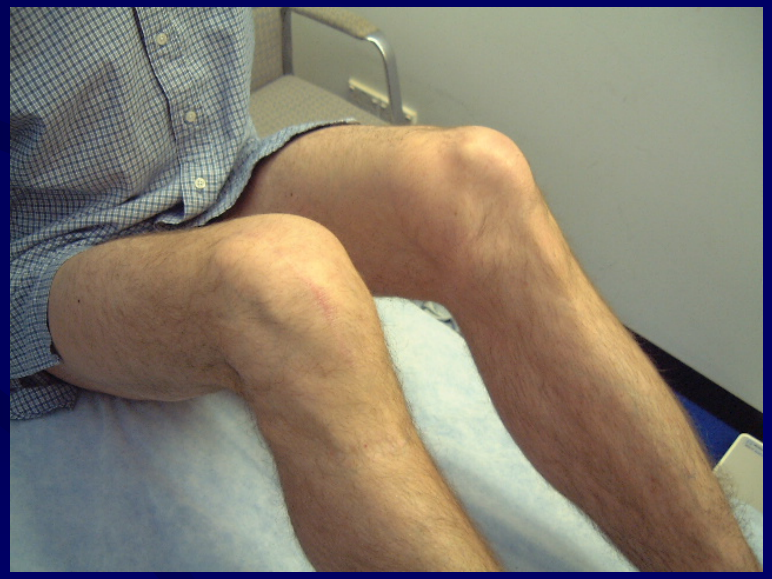


Inspection of the Knee

- Swelling or Effusion
- Redness, Ecchymosis, Scars, Abrasions
- Patellar position (alta or baja)
- Symmetry of Quad muscles
- Leg alignment (straight, bowed, knock-knee)
- Leg length

Inspection

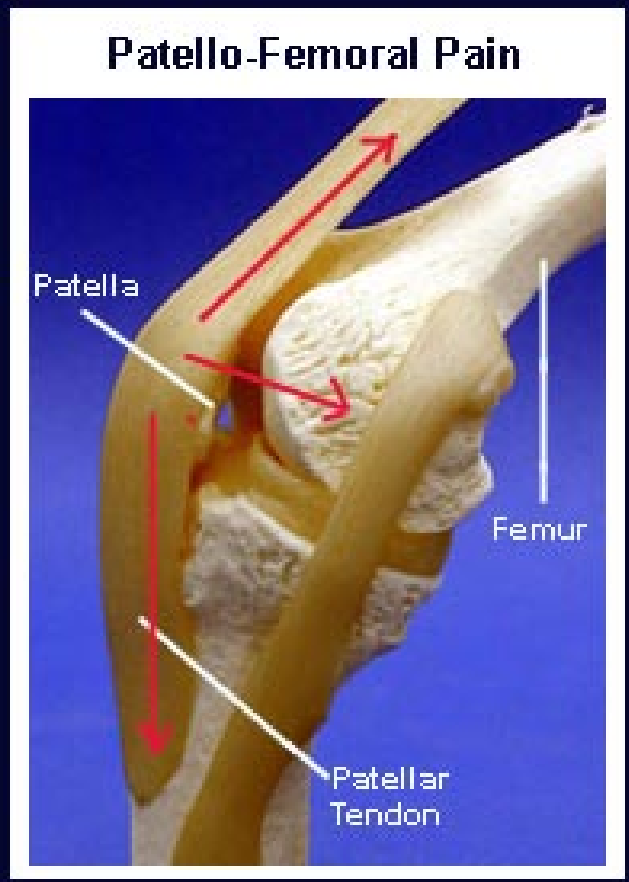
Inspection

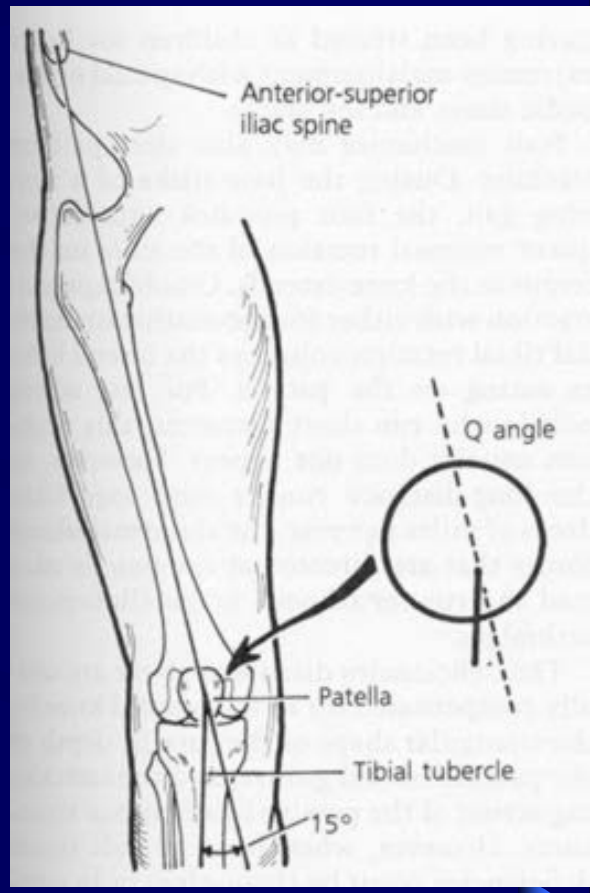


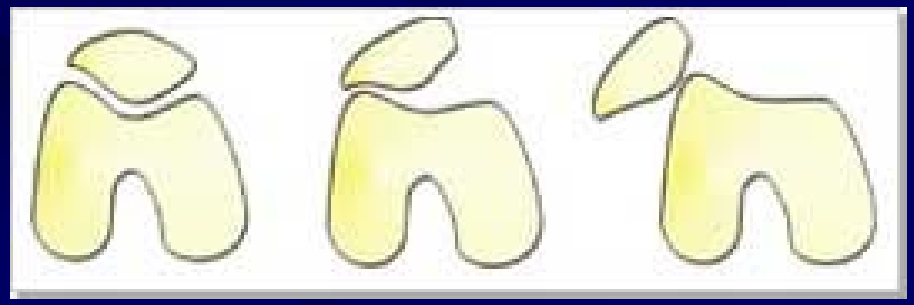
Patellofemoral Anatomy

- Functions as main extensor of the knee

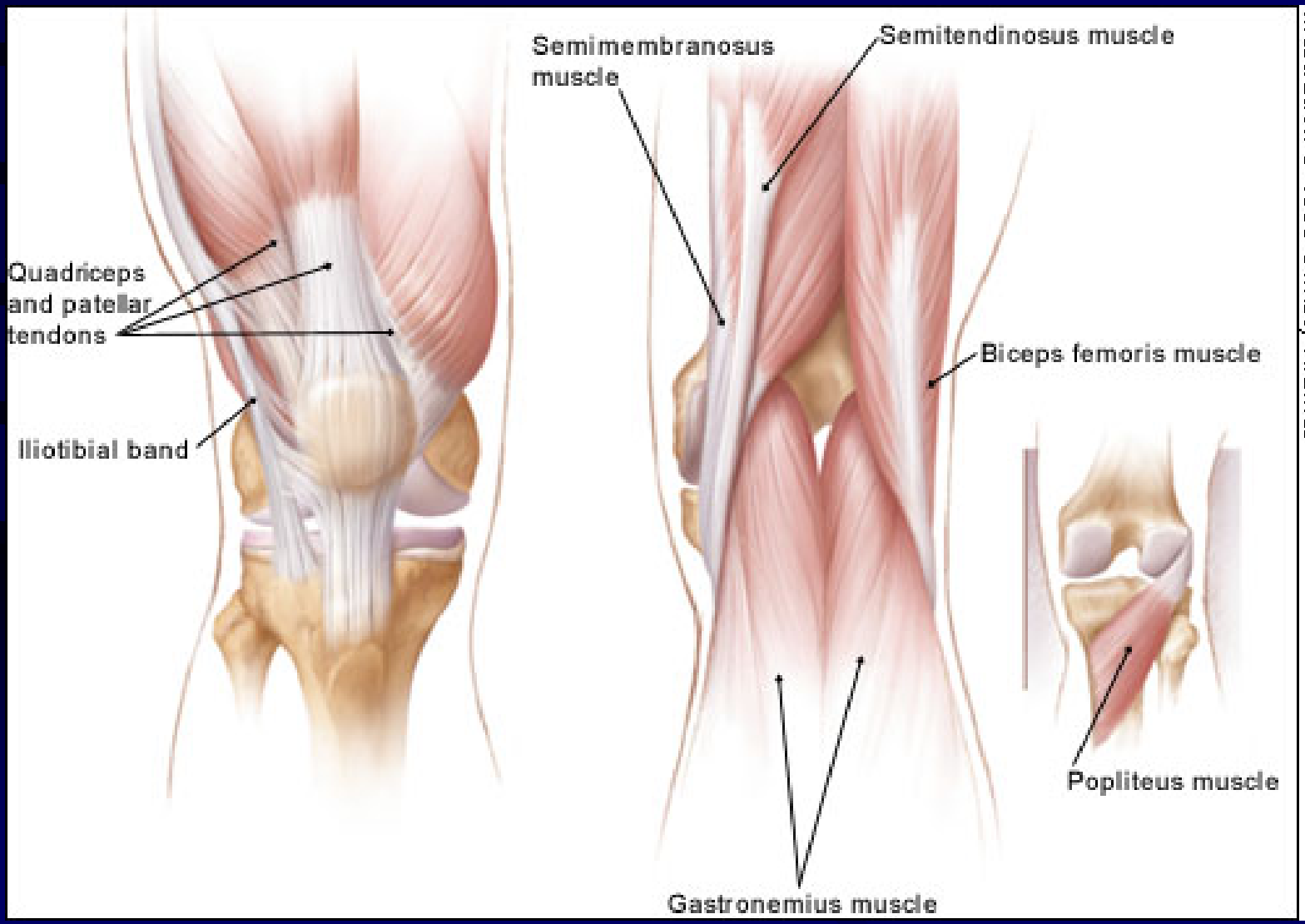
- Factors that affect it's ability to function:
  - 1. Alignment (Q-angle)
  - 2. Rotation:
    - » (femoral anteversion)
  - 3. Quad strength:
    - » stabilizes patella
  - 4. Hamstring flexibility:
    - » decreases forces across joint
  - 5. High Impact Activity
    - » Increases force across joint







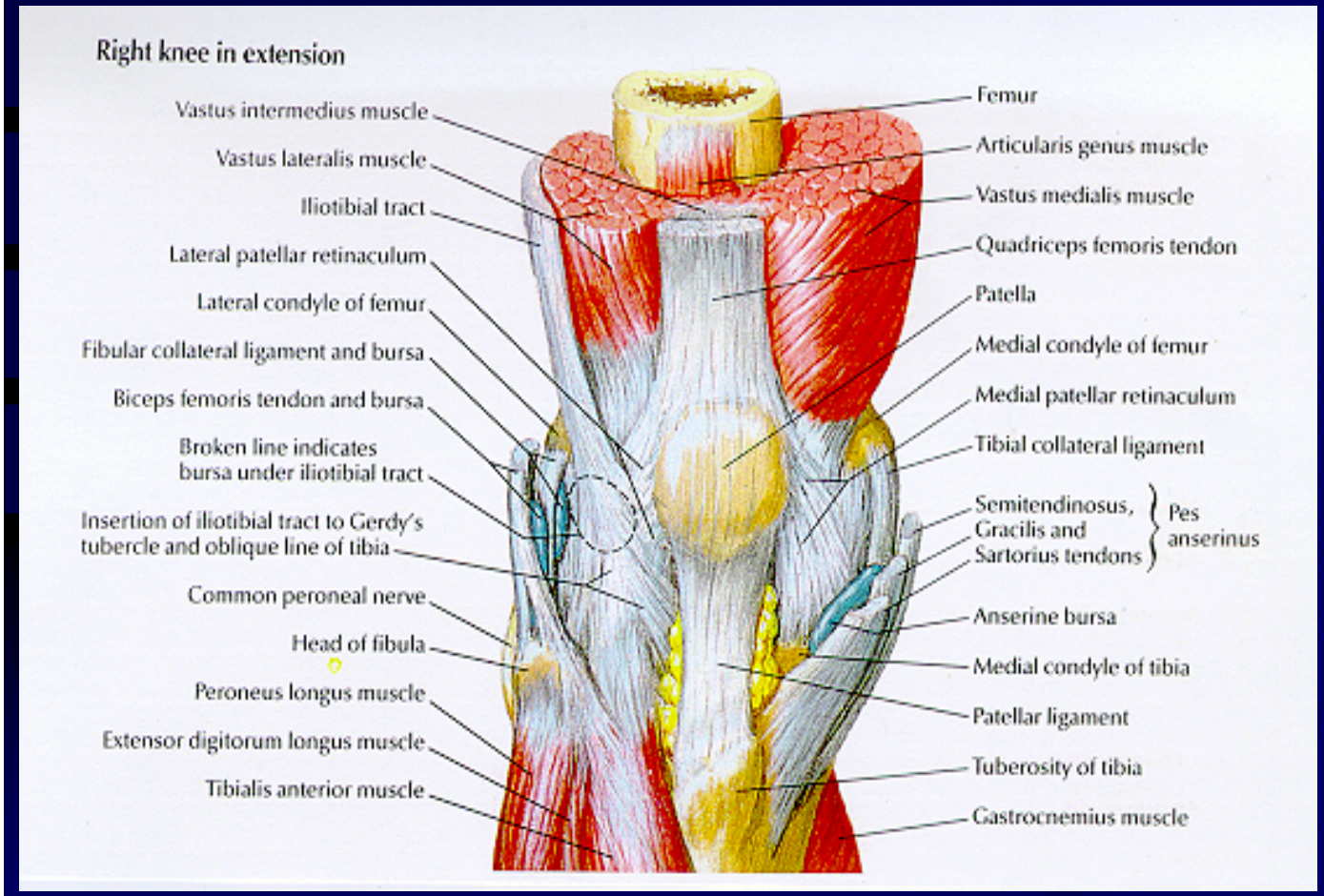
Knee Extensors and Flexors

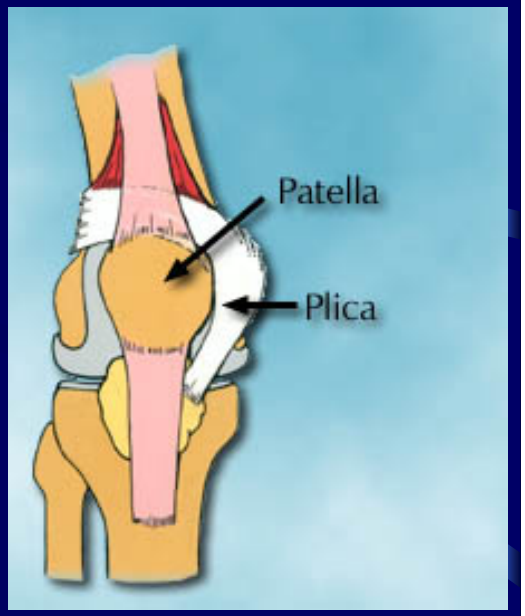


Palpation of the Knee

- Warmth
- Effusion
- Tenderness (systematic palpation)
  - Tendons: patellar & quadriceps
  - Bursa: prepatellar & pes anserine
  - Joint lines: meniscus
  - Bones: tubercles & patella
  - Soft tissues: plica & patellar retinaculum
- Crepitus (with ROM)

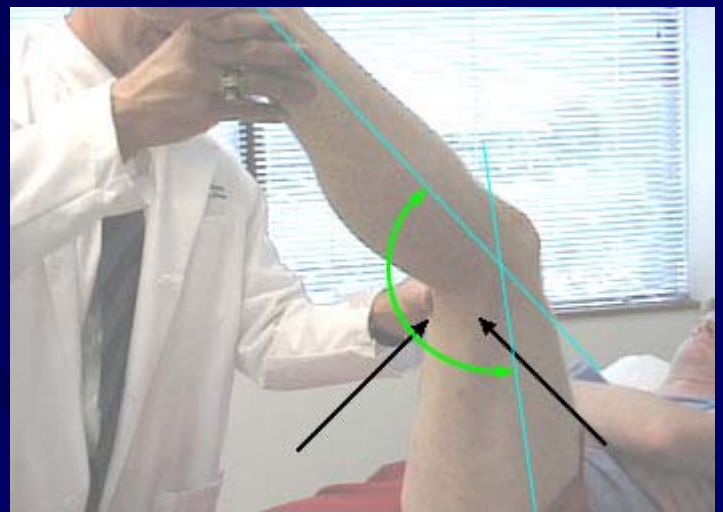
Knee Bursa and the Plica





Range of Motion of Knee

- Normal ROM: 0 to 135 degrees
  - check for decreased ROM or hyperextension
- Assess patellar tracking
  - feel for crepitus
  - pain with ROM?
- Assess Quad tone for symmetry

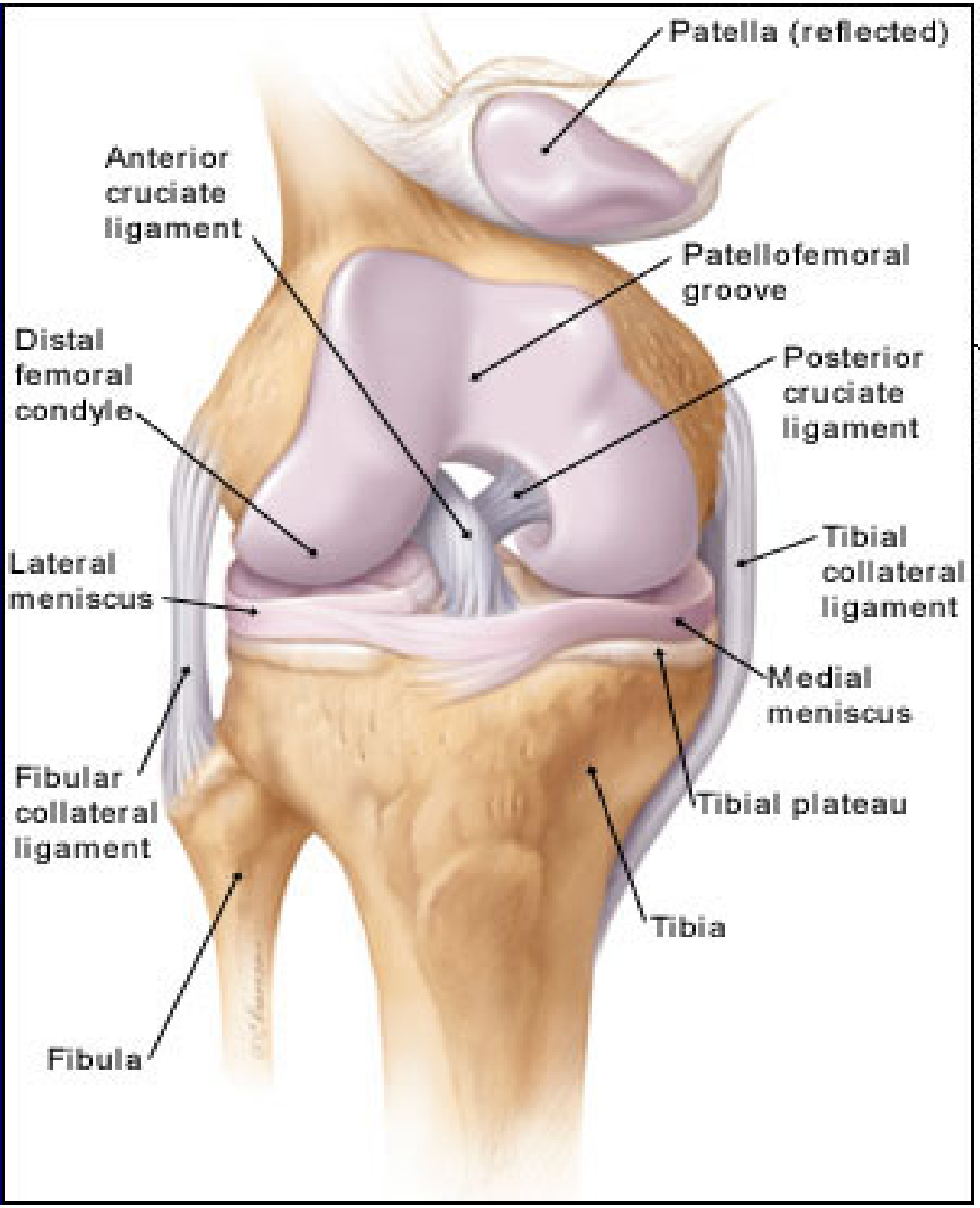


Ligament Injuries

- You have to have mechanism of injury!

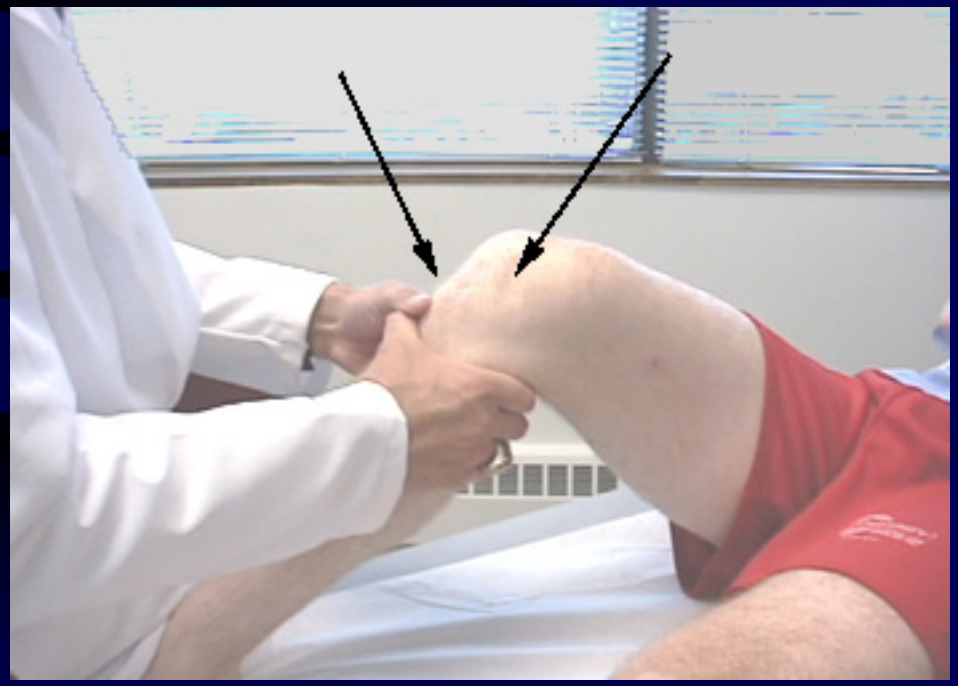
Knee Ligaments

- Medial Collateral (MCL)
- Lateral Collateral (LCL)
- Anterior Cruciate (ACL)
- Posterior Cruciate (PCL)

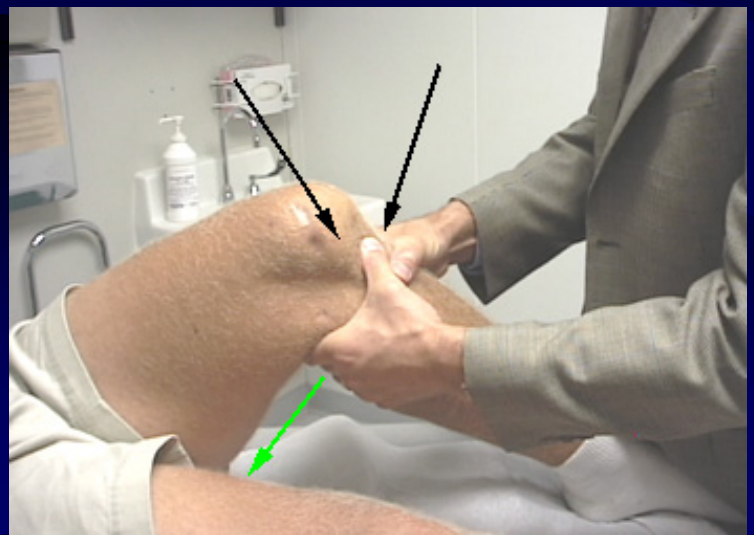


Medial/Lateral Ligament Testing

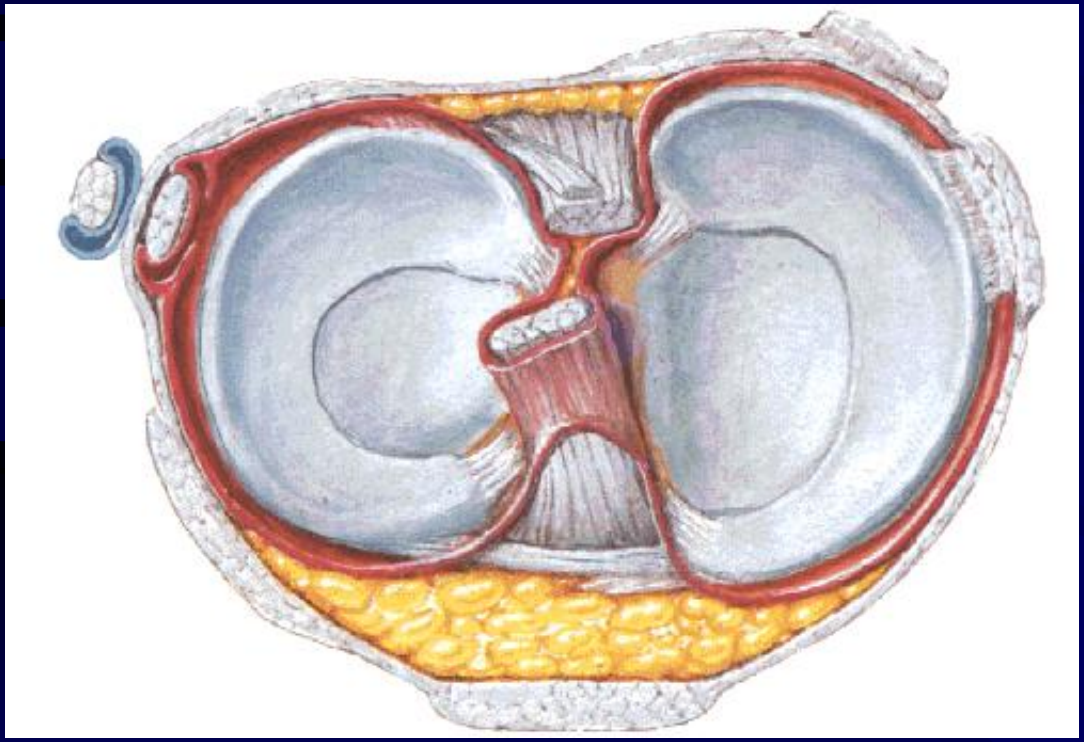
ACL Testing
(Anterior drawer & Lachmans)

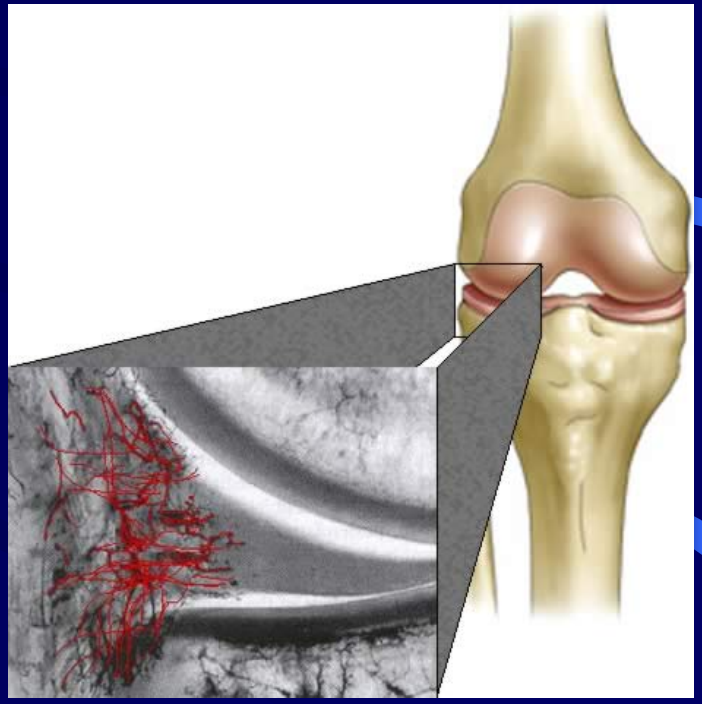


PCL Testing
(Posterior Drawer and Sag Sign)



Knee Meniscus





McMurray's & Apley's Grind

Effusion associated with Injury

- Acute: 1-2 hrs
  - Bleeding occurring within the joint (hemarthrosis)
- DDx of Acute Hemarthrosis:
  - 1. Bone (fracture)
  - 2. Meniscus (peripheral tear)
  - 3. ACL injury
  - 4. Patellar dislocation

- Subacute: 24hrs
  - Reactive effusion or slow bleeding
    - Small meniscal tear
    - PCL injury
- Redness/Warmth
  - Without trauma
    - Infectious
    - Inflammatory
      - Gout
      - Systemic Inflammatory disease

Categorizing Knee Conditions

- 1. **<u>Overuse Knee Pain</u>** (insidious onset)
  - Patellofemoral pain syndrome
  - Patellar or Quadriceps tendonitis
  - Plica syndrome
  - Pes Anserine bursitis
  - Ilio-Tibial Band syndrome

- 2. **<u>Meniscal Injury</u>**
  - Acute traumatic (twisting injury)
  - Chronic degenerative (sudden worsening of DJD)
    - Reactive effusion usually present

Categorizing Knee Conditions

- 3. **Ligamentous Injuries** (traumatic)
  - MCL: blow to outside of knee
  - ACL: deceleration and rotation or hyperextension
  - LCL: blow to inside of knee
  - PCL: dash board injury or landing on hyperflexed knee

- 4. **Bony Injury**
  - DJD (chronic insidious)
  - Osteochondritis dessicans (adolescents)
  - Fracture (high velocity trauma)

Symptoms associated with knee injury

- Catching or Locking
  - Symptoms associated with meniscal tear
  - Can happen with loose bodies in the knee due to OCD
- Giving way
  - Go to ground
    - Associated with pivoting
  - Unstable knee due to:
    - ACL tear (primarily)
    - Patellar subluxation

Pseudo-giving way

- Reflex inhibition of the quad muscle
  - Spinal reflex
  - Secondary to acute pain
  - Shuts off quadriceps muscle momentarily
  - You don't go to ground
- Can occur with
  - Patellofemoral pain
  - Meniscal tears

Case #1

- 42 yo PE teacher c/o posterior medial knee pain.
  - Racing a student in the shuttle run 3 days ago
  - Noticed some swelling the following day
  - It's painful to walk and he is unable to squat down due to pain
  - Feels stiff
  - Denies catching or locking or giving way

Case #2

- 28 yo female c/o knee pain
  - Recently started running again
  - Pain is worse after running and walking up steps
  - Pain is generally around her knee cap
  - Denies swelling, locking or catching
  - Feel popping underneath her knee cap

Case #3

- 26 yo female playing softball
  - Ran to catch a pop fly
  - As she changed directions she felt a pop and pain in her knee then fell
  - Had to be helped from the field
  - Noted significant swelling within an hour
  - Presented one week later due to it “not feeling right”

Case #4

- 34 yo female involved in front impact MVA
  - C/o severe knee pain immediately after the impact
  - Can’t recall what happen
  - Had swelling almost immediately
  - Unable to bear weight
  - Xrays were negative for fracture

  – At follow up
    - C/o severe pain with wt. bearing
    - Still with large effusion
    - Unable to examine due to pain and effusion
    - Very limited ROM

Case #5

- 58 yo male was walking up steps
  - Felt a pop in his knee and immediate pain
  - Had to limp back to his office
  - Continued to have pain the following day on medial side
  - Also noted some swelling
  - He thinks he tore his ACL
  - He wants an MRI