

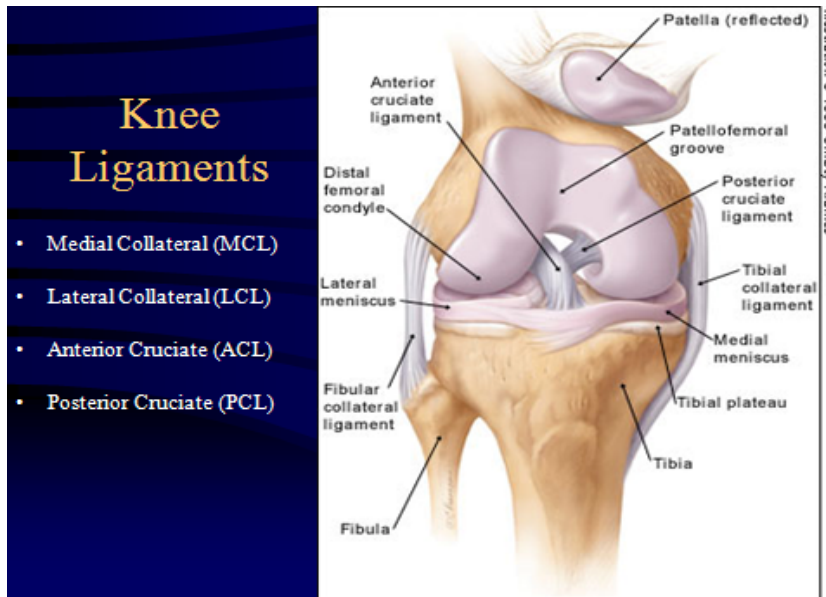
# NPAM Conference

## Knee Exam Workshop (Student Handout)

### Goals

- Learn how to perform a history and physical exam on a patient with knee pain
- Review cases to demonstrate common presentations of knee pain in primary care

### Anatomy review



### History

#### Attempt to diagnose the problem

**P**recipitates or **P**alliates pain: flexion, extension, sitting, walking

**Q**uality of pain

**R**egion and **R**adiation: back, buttock, leg?

**S**everity: how does it limit activity?

**T**emporal qualities: onset/duration sudden, gradual? What was patient doing at?  
time of onset/injury? History of intermittent pain in past?

## Categorizing Knee Conditions

1. Overuse Knee Pain (insidious onset)
  - Patellofemoral pain syndrome
  - Patellar or Quadriceps tendonitis
  - Plica syndrome
  - Pes Anserine bursitis
  - Ilio-Tibial Band syndrome
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2. Meniscal Injury
  - Acute traumatic (twisting injury)
  - Chronic degenerative (sudden worsening of DJD)
    - Reactive effusion usually present
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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
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4. Bony Injury
  - DJD (chronic insidious)
  - Fracture (high velocity trauma)
5. Osgood-Schlatter Disease : (usually diagnosed based on the history, children between the ages of 10 and 15 years who are active in sports present with a painful bump over their tibial tuberosity, with pain worse with activities.)

## 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

### 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

### Physical Exam

#### Systematic approach:

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

#### Inspection:

- Swelling or Effusion

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

#### Palpation:

- 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)

#### ROM

- 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

#### Special tests of the knee:

##### **Brush/Sweep/Wipe Test:**

##### Steps

Patient is supine with his/her legs extended & relaxed

Examiner uses one hand just below the joint line on the medial side & strokes proximally toward the patient's hip 2–3 times

Examiner uses the other hand to stroke down the lateral side of the patella

Examiner observes for a fluid wave bulge just below the medial distal portion or patellar border

##### Positive Test

Fluid wave bulge just below the medial distal portion or patellar border

##### Positive Test Implications

Intracapsular effusion/swelling

## **Ballotable Patella Test:**

### Steps

Patient lies supine while the examiner "milks" the knee capsule  
Examiner ends by placing proximal hand over the suprapatellar pouch and the distal hand (mainly the thumb and index finger of the distal hand) over the patella  
Examiner compresses the suprapatellar pouch with the proximal hand and then compresses the patella into the femur

### Positive Test

Patella moves downwardly and then rebounds once the pressure on the patella is removed; appearance of a floating or ballotable patella

### Positive Test Implications

Indicative of moderate to severe effusion (depending on the amount of movement compared bilaterally)

## **Valgus Stress Test (25–30 degrees of flexion):**

### Steps

Patient is supine with the involved leg close to the edge of the table and the knee in full extension  
Examiner supports the medial portion of the distal tibia with one hand while the other hand grasps the knee along the lateral joint line  
Examiner applies a medial (valgus) force to the knee & the distal tibia is moved laterally while the knee is in complete extension

### Positive Test

Increased laxity, pain, and guarding

### Positive Test Implications

Injury to the MCL, medial joint capsule; probable ACL/PCL involvement if there is no endpoint

## **Varus Stress Test (25–30 degrees of flexion):**

### Steps

Patient is supine with the involved leg close to the edge of the table and the knee is in full extension  
Examiner supports the lateral portion of the distal tibia with one hand while the other hand grasps the knee along the medial joint line  
Examiner applies a lateral (varus) force to the knee & the distal tibia is moved medially while the knee is in complete extension

### Positive Test

Increased laxity, pain, and guarding

### Positive Test Implications

Injury to the LCL, lateral joint capsule, & arcuate ligament; probable PCL (& maybe ACL) involvement if there is no endpoint

## **Lachman's Test:**

### Steps

Patient is supine with his/her knee passively flexed to approximately 20 degrees & hands crossed across his/her chest

Examiner's thumb of the same-side hand as the knee to be examined is placed at the anterior medial tibial plateau/joint line, while digits 2–5 are positioned posterior, slightly distal to the popliteal fossa

Examiner's contralateral hand is placed laterally around the distal femur, just proximal to the patella with the thumb anterior & the digits 2–5 are positioned posteriorly

Examiner sets the tibia by pushing posterior (to make sure the PCL is in tact)

Examiner provides an anterior force to the tibia while applying posterior pressure to the femur; repeats the process 2–3 times

### Positive Test

Increased anterior tibial translation, pain

### Positive Test Implications

ACL tear (primary posterolateral bundle but also the anteromedial bundle)

## **Anterior Drawer Test:**

### Steps

Patient is lying supine with his/her hip flexed 45 degrees & knee flexed 90 degrees

Examiner sits on the patient's foot & grasps the tibia just below the joint line

Examiner's thumbs are placed along the joint line on either side of the patellar tendon & the index fingers are used to palpate the hamstring tendons

Examiner ensures that the patient is relaxed, esp. the hamstring tendons

Examiner draws the tibia straight forward (no rotation)

### Positive Test

Increased anterior tibial translation, pain

### Positive Test Implications

ACL tear (mainly the anteromedial bundle because the posterolateral bundle is basically lax in this position)

## **Posterior Drawer Test:**

### Steps

Patient is lying supine with his/her hip flexed to 45 degrees & knee flexed to 90 degrees

Examiner sits on the patient's foot & grasps the tibia just below the joint line

Examiner's thumbs are placed along the joint line on either side of the patellar tendon

Examiner ensures that the patient is relaxed, esp. the quadriceps

Examiner pushes the tibia posteriorly

### Positive Test

Increased posterior tibial translation, pain

Positive Test Implications  
PCL tear

### **McMurry's Test:**

#### Steps

Patient is supine  
Examiner stands lateral & distal to the involved knee with one hand supporting the lower leg  
Examiner positions thumb & index finger of the opposite hand in the anteromedial & anterolateral joint lines on either side of the patellar tendon  
Examiner keeps the tibia in the neutral position, applies a valgus stress through knee flexion & varus stress through knee extension  
Examiner internally rotates the tibia & applies a valgus stress through knee flexion & a varus stress through knee extension  
Examiner externally rotates the tibia & applies a valgus stress through knee flexion & a varus stress through knee extension

#### Positive Test

Popping, clicking, or locking of the knee; pain from within the joint

#### Positive Test Implications

Possible meniscus tear

### **Apley's Compression Test:**

#### Steps

Patient is prone with his/her knee flexed to 90 degrees  
Examiner applies pressure to the plantar aspect of the heel, applying an axial load to the tibia while simultaneously internally & externally rotating the tibia

#### Positive Test

Pain; possible clicking

#### Positive Test Implications

Possible meniscus tear

### **Apley's Distraction Test:**

#### Steps

Patient is prone with his/her knee flexed to 90 degrees  
Examiner grasps the lower leg & stabilizes the knee proximal to the femoral condyles  
Examiner distracts the tibia away from the femur while internally & externally rotating the tibia

#### Positive Test

Pain from Apley's compression is reduced and/or eliminated during distraction  
Pain occurs with distraction & rotation

### Positive Test Implications

Possible meniscus tear with decreased pain // joint capsule or ligament sprain with increased pain

### **Treatment:**

RICE

NSAID (be careful – GI bleeds)

Physio Therapy

Ortho referral (surgical options)



