Knee Exam:
Putting it all Together
Live on Screen Exam Demonstration
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History
- Traumatic vs. atraumatic (overuse)
- Sudden onset vs. insidious
- Length of symptoms
- Aggravators/Relievers
- Pain vs. instability complaint?
- Instability: due to quad weakness or inhibition, an unstable knee (ligament), or patellar subluxation?

History- 95% of the Diagnosis
- What, How, When did the injury happen?
- Mechanism
- Where does it hurt?
- Did you hear/feel a “pop?”
- Swelling? If so, immediate or delayed?
- Locking, or inability to go through a FROM?

RED FLAGS- Don’t Miss these…
- Night pain
- Fever
- Weight Loss
- Limp
  - THINK ABOUT INFECTION OR TUMOR!!!
- Always check the hip and back
Knee Physical Exam-General

- Standing Evaluation
- Supine
- Sitting

- Modify Exam for Acute Injury
- **Always examine both knees - Normal vs Abnormal**

Physical Examination - Standing

- **Always examine both knees**
- Standing position:
  - Gait
  - alignment (Varus, Valgus),
  - obesity, LLD, atrophy
  - torsional deformities (tibial)
  - feet (pronation)
- Squat ability, pain with squat (where)? - Patellofemoral or Meniscus based on location
- Thessaly’s Test - Meniscus

Physical Examination - Supine

Supine position:
- **Always examine both knees**
- Effusion (15 cc - quad inhibition)
- Quadriceps Atrophy
- Range of Motion
- Palpate soft tissues
- Joint Line Tenderness
- McMurray’s test (Meniscus)
- Ligament Exam
  - ACL, PCL, MCL, Posterolateral Corner
JOINT LINE TENDERNESS

- Palpation of the anterior, middle, and posterior parts of both the medial and lateral joint spaces.

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Fowler and Lubliner, 1989

MCMURRAY’S TEST

- Knee is flexed and placed in external rotation
- Examiner applies a valgus or varus force
- Knee is then extended.
- (+) = Pain and/or a popping/snapping sensation.

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<td>96%</td>
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Fowler and Lubliner, 1989

McMurray TP: The Semilunar Cartilages.
**ANTERIOR DRAWER TEST**

- Hip flexed at 45°, knee flexed at 90°
- With both thumbs placed on the joint line, the tibia is gently drawn forward.
- Excursion of the tibia is compared with the unaffected side.

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Katz and Fingeroth, 1986
Tibia is internally rotated and axially loaded while applying a gentle valgus stress to the knee. Start at full extension.

(+): “Shift” felt with subluxation/reduction of the lateral tibial plateau anteriorly as the knee is brought into further flexion at ~30°.

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Katz and Fingeroth, 1986

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Lachman's Test:

- 15° - 30° of knee flexion
- The femur is stabilized with one hand and the tibia is gently drawn forward with the opposite hand.
- (+): Anterior translation of the tibia with a “soft” or “mushy” endpoint

Best Test for ACL Injury:

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Katz and Fingeroth, 1986

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Pivot Shift Test:

- Tibia is internally rotated and axially loaded while applying a gentle valgus stress to the knee. Start at full extension.
- Knee is then slowly brought into flexion.
- (+): “Shift” felt with subluxation/reduction of the lateral tibial plateau anteriorly as the knee is brought into further flexion at ~30°.

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Katz and Fingeroth, 1986
Galway RD, Beaupre A, MacIntosh DL:
Pivot Shift: A Clinical Sign of Symptomatic Anterior Cruciate Insufficiency

PCL Injury

- Knee is placed in a resting position at 90° of flexion.
- (+) = “Sag” posteriorly.
- Compare with the opposite side.
**POSTERIOR DRAWER TEST**

- Hip flexed at 45°, knee flexed at 90°
- With both thumbs placed on the joint line, the tibia is gently pushed posteriorly.
- Excursion of the tibia is compared with the unaffected side.

**PCL INJURY**
VARUS STRESS TESTS

- A Varus stress is applied both in full extension and in 20-30° of flexion
- Test in extension checks for injury of posterolateral corner structures (may see some laxity with isolated LCL injury)
- Test in flexion evaluates LCL
- Grading of Injury based on Jt. Space opening:
  - Grade I: 0 to 5 mm
  - Grade II: 6 to 10 mm
  - Grade III: 11 to 15 mm
PLRI- Dial test

- Patient may be tested supine or prone
- Side to side difference > 15° abnormal
- Test at 30 and 90 degrees of flexion
- ↑ External rotation at 30°: Isolated PLS inj
- ↑ External rotation at 30°, 90°: PLS+PCL inj

MCL Injury

VALGUS STRESS TESTS

- A Valgus stress is applied both in full extension and in 20-30° of flexion
- Test in extension checks for injury of posteromedial corner structures (capsule, connections of semimembranosus)
- Test in flexion evaluates MCL
- Grading of Injury based on Jt. Space opening:
  - Grade I: 0 to 5 mm
  - Grade II: 6 to 10 mm
  - Grade III: 11 to 15 mm
Physical Examination-Supine

- Patella Mobility/glide (quadrant system)
- Patella Tilt (retinaculum tightness)
- Apprehension Test (instability)
- Clarke’s sign (PF pain)
- Patella Facet and condyle tenderness

- Symmetric strength/flexibility of quads, hamstrings, gastroc/soleus, ITB, hip flexors, hip Ext Rotators
- Hip ROM
- Q- angle
- Lateral Position
  - Ober’s test- IT band pathology
Physical Examination-Sitting

- PF instability Tests
  - 90°/seated “Q” angle
    - avg. nl = 4.3°
  - “J” tracking with extension
  - ligamentous laxity
    - elbows, knees, thumb-forearm
    - 2nd MCP joint, shoulders

- Ligament Exams
  - ACL- Modified Lachman Test