History

- What, How, When did the injury happen?
- Where does it hurt?
- Did you hear/feel a “pop?”
- Swelling? If so, immediate or delayed?
- Locking, or inability to go through a FROM?
Knee Physical Exam-General

- Standing Alignment: varus, valgus?
- Range of Motion-symmetric?
- Squat ability, pain with squat (where)?
- Swelling/effusion?
- Quadriceps Function/ atrophy
- Patellofemoral Exam
- Ligament Exam
- Palpation for tenderness: Joint Line, other
- Flexion McMurray’s
- Examine Hips, Back – look for “zebras”
ACL Injury
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.

SENSITIVITY 41%
SPECIFICITY 95%

Katz and Fingeroth, 1986
ANTERIOR DRAWER TEST
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

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<tr>
<th>SENSITIVITY</th>
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<tr>
<td>82%</td>
<td>97%</td>
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Katz and Fingeroth, 1986
VARIATIONS OF THE LACHMAN TEST
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
PCL Injury
POSTERIOR SAG SIGN

• 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.
QUAD ACTIVE TEST

• Eyes at the level of the patient’s flexed knee
• Foot is stabilized by the examiner’s hand (or sit on foot)
• Patient is asked to gently slide the foot down the table.
• (+) = tibial displacement anteriorly (due to quadriceps contraction)
**PosteroLateral Corner Injury**

- **Mechanisms:**
- Isolated injury rare- usually injury occurs with PCL or multiligament injury
- Knee hyperextension with varus stress (posterolateral force directed vs. proximal tibia with knee at or near full extension)
- Hyperextension +/- external rotation
- Severe varus stress or ext. rotation of tibia
- Injury to LCL, popliteus, biceps insertion on fibula, IT band, varus smaller PL ligaments
PosteroLateral Corner Injury
PLC Injury
LCL Injury

- **Mechanisms:**
  - varus force applied to the interally rotated, flexed knee
  - Isolated injury rarer than MCL injuries
  - More common to see combined with PCL injury or as part of posterolateral corner injury
LCL Injury
LCL 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
VARUS STRESS TEST
PLRI- Dial test

• Patient may be tested supine or prone
• Side to side difference $> 15^\circ$ abnormal
• Test at 30 and 90 degrees of flexion
• $\uparrow$ External rotation at 30°: Isolated PLS inj
• $\uparrow$ External rotation at 30°, 90°: PLS+PCL inj
PLRI- Dial test
MCL Injury

- **Mechanisms:**
- Valgus force applied to the flexed knee
- Occasionally caused by forced ER of tibia
- Ruptures or sprains frequently involve attachment to the medial femoral condyle
- May be associated with tears of the PM capsule, the ACL, and the medial meniscus
- A contusion/fx due to impact of the lateral femoral condyle or lateral tibial plateau is common (bone bruise with lateral pain)
MCL Injury
MCL Injury
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
VALGUS STRESS TEST
MCL Instability
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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Fowler and Lubliner, 1989
McMurray TP: The Semilunar Cartilages.
Thessaly Test
APLEY’S TEST

• Patient prone, knee bent to 90 °. Push down on sole of the foot toward the examination table.

• Tibia is rotated both externally and internally

  (DISTRACTION)

• The tibia is then distracted while being rotated once more.

• (+) = Patient experiences decreased pain with the distraction maneuver as compared to the compression maneuver

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<td>80%</td>
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Fowler and Lubliner, 1989
APLEY’S TEST

Apley AG: The Diagnosis of Meniscus Injuries.
Patella Dislocation
Patellofemoral Instability

- **Mechanism:**
- Femoral internal rotation on a fixed, externally rotated tibia
  - Often a twisting injury
  - 38% during athletics (ER + valgus)
- Direct blow to knee
- Acute hemarthrosis
MRI - PF Instability
Evaluation - PF instability

- Generalized ligamentous laxity
- Anatomic alignment
- Foot Hyperpronation
- Quadriceps tone (esp. VMO)
Evaluation - PF instability

• Q-angle
• J-tracking
• Patellar tenderness
• Patellar mobility (tilt, glide)
• “Apprehension”
Patellar Apprehension Sign