The examination of the painful knee

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Objectives of the talk

By the end of this talk you will know

• The important anatomy of the knee
• The most common etiologies of acute and chronic knee pain
• The important parts of the history to evaluate knee pain
• The approach to the knee exam
• The diagnostic maneuvers to narrow down your diagnosis
Anatomy of the knee

- Four bones: femur, tibia, fibula, patella
- Four ligaments: medial collateral ligament, lateral collateral ligament, anterior cruciate ligament and posterior cruciate ligament
- Two shock absorbers: Medial and lateral meniscus
- Two main muscle groups: quadriceps muscles, hamstring muscles
Anatomy of the knee

- Anterior Cruciate Ligament (ACL)
- Lateral Meniscus
- Lateral Collateral Ligament (LCL)
- Patella (kneecap)
- Tibia
- Fibula
- Posterior Cruciate Ligament (PCL)
- Medial Meniscus
- Medial Collateral Ligament (MCL)

Right Knee
The most common causes of knee pain

Acute
• Ligamental tears (MCL, ACL, LCL, PCL)
• Meniscus tear
• Knee fracture

Chronic
• Osteoarthritis
• Patello-Femoral Pain syndrome
• Pes anserine bursitis
• IT band syndrome
• Plica syndrome
History of Knee pain

• Onset of pain: Acute or Chronic
• Location of pain: Medial, Lateral, Anterior, Posterior
• Also....
• Patient age
• History of trauma or change in activities
• Mechanism of injury
• Effusion
• Ability to bear weight
Examination of the knee

- Inspection
- Palpation
- Active and Passive Range of Motion
- Provocative Maneuvers
Examination of the knee

Inspection

- Gait
- Swelling
- Bruising
- Atrophy
- Scars
- Effusion
Examination of the knee

**Palpation**

Best performed with the knee flexed

- Skin temperature
- Effusion (Fluid wave, Ballottement)
- Anterior: Tibia, Tuberositas tibiae, patellar tendon, Patella, quadriceps tendon
- Medial: pes anserine bursa, Medial joint line,
- Lateral: fibular head, Lateral joint line, femoral condyle, IT band
- Posterior: Masses: Baker ‘s cyst, Aneurysm
Examination of the knee

Active and Passive Range of Motion

More than 140° is normal
Less than 10° is normal
Examination of the knee

Provocative Maneuvers

• MCL: Valgus test
• LCL: Varus Test
• ACL: Anterior Drawer, Lachman
• PCL: Posterior Drawer
• Meniscus: Mc Murray
• Patella subluxation: Apprehension.
Examination of the knee

Anterior Cruciate Ligament

Anterior Drawer Test  Lachman Test
Examination of the knee

Posterior Cruciate Ligament

Posterior Drawer Test
Examination of the knee

Menisci

McMurray test
Examination of the knee

Medial Collateral Ligament: Valgus Stress Test

Lateral Collateral Ligament: Varus Stress Test
Examination of the knee

Patellar subluxation

Patellar apprehension test
Your patient presents with knee pain. What is the diagnosis?

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<td>Acute</td>
<td>diffuse</td>
<td>Sudden twisting motion with a planted foot. Immediate swelling</td>
<td>Joint effusion + Lachman test (LR if present: 17) + Anterior drawer sign (LR if finding is present 11.5)</td>
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<td>or repeated squatting</td>
<td>+ McMurray test</td>
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<td>Delayed swelling</td>
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<td>- Activity related pain</td>
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<td>onset</td>
<td>anterior</td>
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Let’s move on to....
The shoulder exam
Anatomy of the shoulder

Bones of the shoulder

- Clavicle
- Scapula → Acromion
- Humerus
Anatomy of the shoulder

Shoulder muscles

- Deltoid
- Clavicle
- Lateral head of Triceps brachii
- Pectoralis major
- Biceps brachii
- Brachioradialis
Anatomy of the shoulder

Muscle of the rotator cuff

- Supraspinatus
- Infraspinatus
- Teres minor
- Subscapularis
Anatomy of the shoulder

Function of the shoulder muscles

- **Abduction**: Supraspinatus and Deltoid muscles
- **Adduction**: Subscapularis (and Teres minor muscle)
- **Internal rotation**: Subscapularis muscle
- **External rotation**: Infraspinatus and Teres minor muscle
Evaluation of shoulder pain

Common Diagnoses

• Impingement/Rotator cuff tendonitis
• Bursitis
• AC joint disease
• Biceps tendonitis
• Neck problems
• Rotator cuff tear
• Adhesive capsulitis (Frozen shoulder)
• Rare: Glenohumeral arthritis
• Referred pain
Evaluation of shoulder pain

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Evaluation of Shoulder pain

Common diagnosis

• Extrinsic (referred) pain
  Normal shoulder exam, constitutional symptoms

• Cervical spine disease
  Paresthesias, pain that radiates down the arm past the elbow
Evaluation of Shoulder pain

- Inspection – LOOKS WEIRD?
- Palpation
- ROM – PASSIVE VS ACTIVE
- Provocative Tests
Evaluation of Shoulder pain

Inspection

Always look at the shoulder
Always compare both sides
Evaluation of Shoulder pain

Range of motion

Unable to do active ROM but no problems with passive ROM → Rotator cuff problem

Unable to do either active or passive ROM → adhesive capsulitis (frozen shoulder)
Evaluation of Shoulder pain

Provocative tests

Impingement
Evaluation of Shoulder pain

Impingement

Hawkins impingement sign
Evaluation of Shoulder pain

Impingement

Neer impingement sign
Evaluation of Shoulder pain

Impingement

Painful arc
Evaluation of Shoulder pain

Biceps tendonitis

Yergason sign
Evaluation of shoulder pain
AC joint disease
Cross body adduction
Evaluation of shoulder pain

Rotator cuff

Dropped arm test
Evaluation of shoulder pain

Rotator cuff tears

Supraspinatus test
(Empty can test)
Evaluation of shoulder pain

Rotator cuff tears

Infraspinatus test
Evaluation of shoulder pain

Rotator cuff tears

Subscapularis muscle (Gerber Lift off test)
Thank you