Pain Management for Primary Care

Series: Eleven

Joint Pain Conditions

Module 11-3

Knee Pain

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Knee Pain

By the end of the module, you will be able to:

- Describe the overall scope of clinical knee pain
- Describe the basic anatomy and physiology of the knee joint
- Review the basic clinical examination for knee pain
- Discuss common clinical knee problems and their evidence-based management

We will review:

Topic One: Scope of Knee Pain

Topic Two: Anatomy and Physiology Review

Topic Three: Clinical Examination

Topic Four: Common Conditions and Evidence-based Management Pathways

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Topic One

Scope of Knee Pain

Knee pain is common and increases with age, especially in women over 60.

- Knee pain can refer to the thigh, lower back and leg
- Lower extremity cramping can manifest as vague symptoms at and around the knee
- Referred pain into this region is typically poorly localized and will often not increase with mechanical loading
- A careful investigation of the hip, lumbar spine, and leg is warranted if referred symptoms are suspected

Notes

Knee pain is a common condition in primary care and specialty clinics. Pain from the knee typically has clear mechanical aggravating and easing factors.

Accounts for over 1 million ER visits and more than 1.9 million US primary care outpatient visits annually

Symptomatic knee OA is a common condition with an increasing prevalence as patients age – prevalence per 100

Age>60 years: 12.1 (10.0 female; 13.6 male)

Age>45 years: 16.7 (18.7 female; 13.5 male)

Age>26 years: 4.9 (4.9 female; 4.6 male)

Knee joint pain is typically local to the joint and will have mechanical aggravating factors

While referred pain is less common in this area, a careful history and evaluation of area of symptoms need to be included. Always assess the joint/region proximal and distal. Ask about the presence or history of back pain and its relationship to the knee pain.

Knowledge Check

When a patient reports having "knee pain" this often represents _____.

a. mechanical aggravating factors

b. Vague or poorly localized distribution of symptoms

c. Pain reproduced with joint loading

d. Pain localized at the joint line

Knowledge Check – Answer

When a patient reports having "knee pain" this often represents _____.

a. mechanical aggravating factors

b. Vague or poorly localized distribution of symptoms

c. Pain reproduced with joint loading

d. Pain localized at the joint line

Notes

People who present with knee pain have knee pain. Yes, it's true that when knee pain is vague and poorly localized that it requires eval of the regions above and below to see if it is referred pain. Therefore, in addition to assessing the specific region of pain (knee), it is also important to assess/consider the areas of referred pain as part of the clinical evaluation.

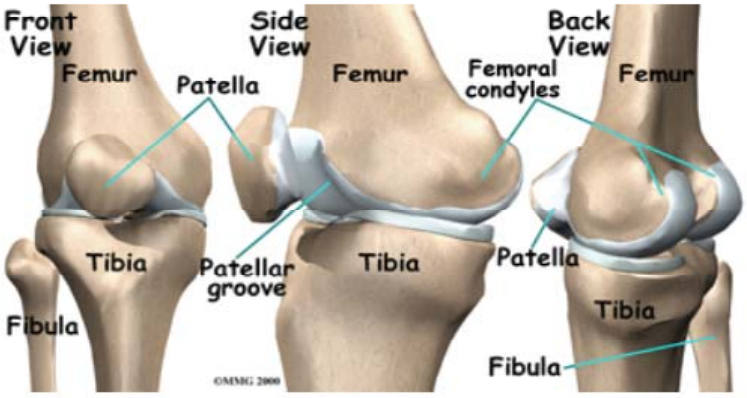
Topic Two

Anatomy and Physiology

Knee Anatomy: Bones and Joints

Three Compartments

- Tibiofemoral
- Patellofemoral
- Proximal tibiofibular

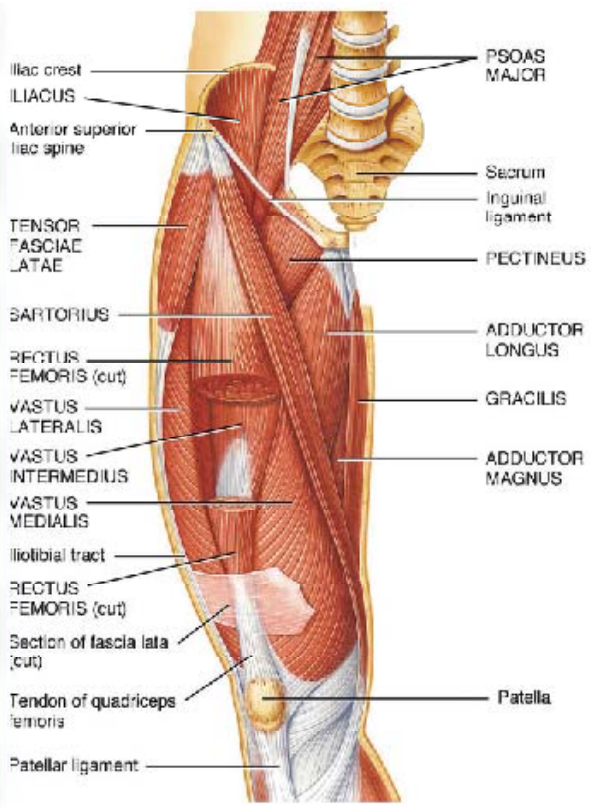


Notes

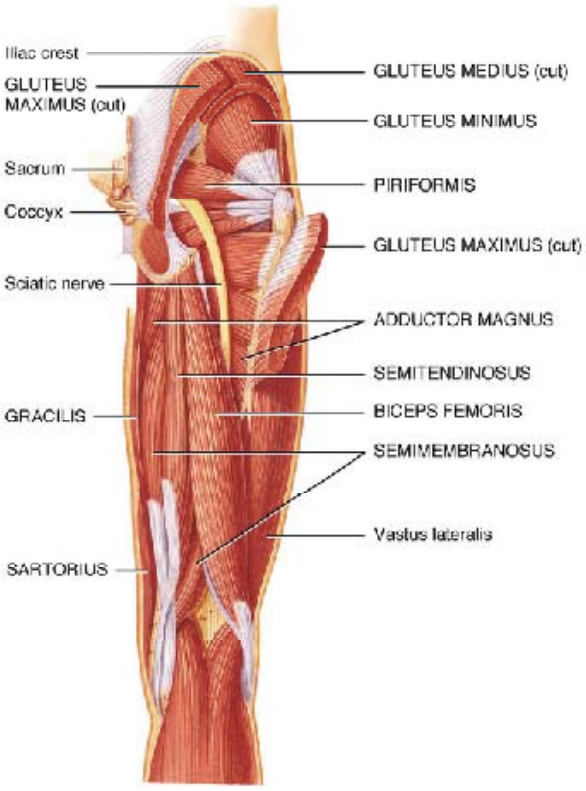
The main tibiofemoral joint has an almost flat socket of the tibial plateau on which sits the soft cartilage of the meniscus, which has several roles. The fibrocartilagenous meniscus deepens the socket for the femoral condyles to roll into, it provides some stability and some cushion. The outer third is vascularized and innervated, but the inner third is not.

The patella sits inside the quadriceps tendon coming down from the thigh and continues as the patella tendon as it attaches past the knee onto the tibial tuberosity. The proximal tibiofibular joint is less often a site of problems.

Knee Anatomy



(a) Anterior superficial view



(b) Posterior superficial view

Notes

The rectus femoris is the one quad which both crosses the knee and crosses the hip, thus acts to both extend the knee and flex the hip.

The hamstrings cross the hip as the proximal attachment is on the ischial tuberosity and distally cross the knees. They act to extend the hip and flex the knee.

The gastrocnemius crosses the knee proximally and crosses the ankle at the Achilles tendon, thus it is the main strong plantarflexor of the ankle, but also helps flex the knee

Knowledge Check

The _____ is NOT one of the three known knee compartments.

a. Tibiofemoral

b. Patellofemoral

c. Lateral tibiofibular

d. Proximal tibiofibular

Knowledge Check – Answer

The _____ is NOT one of the three known knee compartments.

a. Tibiofemoral

b. Patellofemoral

c. Lateral tibiofibular

d. Proximal tibiofibular

Notes

The main knee joints indicated in localized knee pain are either interarticular to the hinge joint of the tibiofemoral joint or extra-articular at the patellofemoral or across the proximal tibiofibular joint.

There is no lateral tibiofibular.

Knowledge Check

The _____ is NOT one of the four known quadriceps muscles.

a. Vastus Lateralis
b. Rectus Intermedius
c. Vastus Medialis
d. Rectus Femoris

Knowledge Check – Answer

The _____ is NOT one of the four known quadriceps muscles.

a. Vastus Lateralis
b. Rectus Intermedius
c. Vastus Medialis
d. Rectus Femoris

Notes

The 4 quads are vastus lateralis, vastus medialis, vastus intermedius, and rectus femoris.

Topic One

Clinical Examination

Physical Exam is key, and pay attention to pain behaviors.

Notes

Always look for:

Grimace

Groan

Guarding

Over reaction

Never forget the OPQRSTU mnemonic:

Onset of pain

Provocation/Palliation

Quality/ Character

Region/ Radiation

Severity/ Intensity

Timing (continuous, intermittent)

U You / Impact

Look at gait, range of motion, test reflexes, and pulse. Interpret provocative pain tests carefully.

- Carefully palpate the knee and surrounding structures.
  - May be best performed with knee in slight flexion
  - Palpate medial, lateral, and anterior joint lines; patella, fibular head
  - Assess for variations in skin temperature
- Assess for effusion – knee is enlarged or lacks full flexion
- Special provocative testing like McMurray's often lack specificity.
  - Use them judiciously and appropriately. Special tests are not a substitute for a good history and basic exam

Notes

As with all neuromusculoskeletal exams:

If neuro signs and sx, perform lower quarter/lumbar neuro screen first.

Observation—of region of complain, of posture, of gait, of functional motion (squat or step up or single leg stance or activity that aggravated)

Range of motion—facilitator demonstrate passive and active testing of full range—usually performed in seated for extension actively, in supine passively; flexion can be screened in sitting, but fully tested in prone.

Manual muscle testing—same as ROM

Palpation—systematic palpation of distal quad muscles, all about the patellar borders, the patella tendon, the joint line—particular joint line tenderness can be a sign of meniscal pathology—sensitive, not specific—for screening.

Range of motion

Manual muscle testing

Special tests—the old well-known McMurray's test for meniscal pathology has been completely debunked as not sensitive nor specific. An excellent test with both of those properties is the Thessalay test.

Facilitator demonstrate, everybody in class can quickly try it. If that doesn't reproduce patient's complain, likely not a meniscal problem.

Palpate lower extremity pulses

Sensation – dermatomes, peripheral nerves

Motor function and strength

Basic motor function should be assessed, but may be insufficient as the lower extremity musculature is stronger than typical examiner's hand assessment

Functional strength tests – squat, step up, step down

Reflexes may need to be assessed if there is a suspected proximal referral.

Knowledge Check – True or False

The knee physical examination should focus on a series of named orthopedic special tests (Lachman, McMurray, Thessalay and others) in order to make an accurate diagnosis.

Knowledge Check – Answer

The knee physical examination should focus on a series of named orthopedic special tests (Lachman, McMurray, Thessalay and others) in order to make an accurate diagnosis.

False: A thorough history and focused clinical exam including palpation, ROM, and function is far more important to making an accurate diagnosis. Named orthopedic tests often have poor psychometrics and have questionable utility in isolation.

Topic Four

Common Conditions and Evidence-based Management Pathways

Different diseases appear at different ages.

Patients under 45 years of age

- Patellofemoral pain appears twice as often in women and does not require referral to surgery.
- Pain is aggravated by squatting, climbing stairs, prolonged sitting, running, or lifting.

Patients over 45 years of age

- Osteoarthritis of the knee presents with morning stiffness, knee crepitus, bony tenderness, bony enlargement, and no palpable warmth of the knee.
- Treatment should focus on maintaining or improving function. Encourage activity and general exercise with Physical Therapy and short-term NSAIDs as first line treatment.

Notes

Patellofemoral pain

There are no specific special tests that are helpful in the diagnosis of PFPS. It is based on history and examination – rule out other likely conditions.

In the history, "+ moviegoer's sign" is when patient experiences their main complaint with sitting for a long time with their knees flexed at 90 deg. Oftentimes soldiers who have to ride in HMMWVs have this pain. They will report that they want to extend and straighten out their knees for comfort.

A physical therapist will find the contributing factors to the problem such as shortened muscles or poor motor control of muscles that cross the knee (quads, hamstring, gastroc), pelvic imbalance, foot issues—and will change those contributing factors to provide relief of this condition, also called runner's knee, retropatellar pain, and anterior knee pain.

There's no reason for an ortho consult as there is no surgery nor ortho tx for PFPS.

Osteoarthritis

Presence of knee pain plus at least 3/6 of the following:

Greater than 50 years of age, morning stiffness < 30 min, crepitus, bony tenderness, bony enlargement, no palpable warmth

Assessment of functional levels and impairments

Treatment should focus on maintaining or improving function. Encourage activity and general exercise

Physical Therapy and NSAIDs should be first line treatment > surgery or orthopedic consult

Trauma and infection appear in all ages.

- Meniscal tear is common in osteoarthritis after twisting the knee with a fixed foot. It can lead to knee 'locking', effusion, and pain with loading activity.
- Bursitis is most commonly at the pre-patellar once it becomes infected and may require aspiration.
- Ligamentous injuries are common with trauma.
  - Early bracing may be warranted to prevent subsequent injury, crutches to limit weight bearing, control pain with rest / ice / compression / elevation.
  - Early rehabilitation should be utilized to maintain range of motion and improve function.

Notes

Ligamentous injuries

A meniscal injury can also be insidious if a mechanism of injury is not present and is common with people of all ages. The term "meniscal tear" contains a wide continuum of normal degeneration and fraying of the meniscus which accounts for 95% of "tearing." Only about 5% are frank tears that need surgical repair. The others will be surgically debrided, but many patients with meniscal pathology will respond to PT.

Bracing is often used in lateral or medial collateral ligament tears.

Decreasing inflammation with rest/ice/nsaids and physical therapy is always indicated. Even a patient with an acute anterior cruciate ligament tear can be rehabbed back to no pain, no swelling, normal range and strength, and the ability to run with no problem in a straight line. Some people with this injury do not require repair depending on their expected functions. Soldiers will need repair, but going to surgery after some months of rehab works well. A physical therapist can make the referral to ortho when needed.

Remember, most acute knee injuries are soft tissue injuries.

For imaging, follow the Ottawa Rules:

- Age ≥ 55
- Tenderness at the head of the fibula
- Isolated tenderness of the patella
- Inability to flex knee to 90 degrees
- Inability to walk 4 weight bearing steps
- Plain radiography is an appropriate first line
- If unrevealing MRI is useful for the detection of ongoing knee instability

Multiple treatments are available.

- Exercise therapy and weight loss are the foundational treatments in knee pain.
- Active physical therapy is better than passive, especially in knee Osteoarthritis (OA).
- Image guided intra-articular aspiration or steroid injection may offer transient relief for pre-patellar bursitis.
- While knee surgery is indicated in trauma, it must be discussed for OA.
- Other therapies like visco-supplementation, Prolotherapy and acupuncture have not been shown to be particularly effective.

Notes

Trauma should automatically be referred to ortho.

Other disease processes should obviously be referred to specialists such as rheumatology and neurology.

Otherwise, physical therapy should be consulted for all versions of neuromusculoskeletal complaints.

Knowledge Check

In Ottawa Rules in acute knee injury adult patients, initial knee plain films are necessary when factors such as isolated patella tenderness, inability to flex knee to 90 degrees, inability to walk 4 weight bearing steps, _____, and _____.

a. Age ≥ 55; tibia head tenderness

b. Age ≥ 65; fibula head tenderness

c. Age ≥ 75; fibula head tenderness

d. Age ≥ 55; patella inflammation

Knowledge Check – Answer

In Ottawa Rules in acute knee injury adult patients, initial knee plain films are necessary when factors such as isolated patella tenderness, inability to flex knee to 90 degrees, inability to walk 4 weight bearing steps, _____, and _____.

a. Age > 55; tibia head tenderness

b. Age > 65; fibula head tenderness

c. Age > 75; fibula head tenderness

d. Age > 55; patella inflammation

Notes

You can keep the Ottawa rules handy for radiology decisions for the knee, ankle, and foot.

Knowledge Check

Factors such as Greater than 50 years of age, No palpable warmth, morning stiffness < 30 min, _____, _____, and _____are used to diagnose Knee OA.

a. Crepitus; Bony tenderness; Bony reduction

b. Crepitus; Bony tenderness; Bony enlargement

c. Crepitus; Bony inflammation; Bony enlargement

Knowledge Check – Answer

Factors such as Greater than 50 years of age, No palpable warmth, morning stiffness < 30 min, _____, _____, and _____are used to diagnose Knee OA.

a. Crepitus; Bony tenderness; Bony reduction

b. Crepitus; Bony tenderness; Bony enlargement

c. Crepitus; Bony inflammation; Bony enlargement

Notes

Many people have loss of joint space on x ray; the true diagnosis of osteoarthritis is both loss of joint space and the complaint of pain that matches DJD, especially morning stiffness of the joint.

Summary

Be confident in performing physical exams while determining the differential diagnosis for knee pain.

Recall that different ages have different knee problems, and many knee pains are referred from the back and lower extremity.

Use imaging to exclude surgical conditions and refer to a surgeon if necessary. If not, reassure your patient that exercise, active physical therapy and life style changes work best.

Knee Clinical Examination

http://vimeo.com/115659959

Notes

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Notes

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