Approach to Knee Pain, May 2024

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Objectives
1. Review common causes of knee pain in young, middle aged and senior patients.
2. Diagnostic tests—exam, aspiration, imaging options (weight bearing plain films, "ortho" views, MRI, dual energy CT for gout, bone scans), blood work
3. General approach to treatment—activity modification (non wt bearing)/bracing/aids (walking poles), topicals, orals, physiotherapy, referrals

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Case 1. 15 yr old M basketball player presents with 3 months of increasing right knee pain.

Case 2. 50 yr old F gardener with sudden onset left knee pain since stumbling in the garden last week.

Case 3. 80 yr old F not sleeping at night and increasing difficulty with ADL's for several months due to bilateral knee pain.

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Approach—Diagnosis is 90% history, 10% exam

1. get a good history *the patient tells us the diagnosis*

Age of patient is key—
Younger? More ligamentous/growth/cartilage causes.
Middle aged? More likely to be overuse, or meniscal degeneration.
Senior? OA, referred from hip/spine/mets

Traumatic vs atraumatic
If traumatic/sudden onset—mechanism of injury helps to identify possible causes, eg foot planted + pivot=ACL, force to lateral knee—medial collateral, etc.
Mechanical features, such as locking or giving way/instability, are key for considering surgical referral early

Atraumatic—
location of pain is key—anterior? eg PFPS, prepatellar bursitis, patellar tendinitis
Unilateral? Any red flags (night pain, night sweats, weight loss, heat, redness, fever)
Bilateral? Think systemic causes
Medial vs Lateral—MM vs ITBS
Other joints or systems involved? Inflammatory, crystal arthropathy, etc

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Examination pearls:
#1. Walking -> Standing ->Seated -> Supine -> (Prone)
#2. Examine normal side first
#3. If acute injury and non weight bearing, do screening pulses/neuro, immobilize, XR, wait a week for

full exam

Functional assessment begins with observation of gait, eg walking into the exam room. Limp? Crutches/cane/walker?

Standing (ideally in shorts)—alignment, deformity, bruising, redness, full extension, wasting? Toe walk/heel walk for neuro screen
Squatting—can they do a partial or full squat (depends on age of patient!)
Duck walk? Rules out most intra-articular injuries
Single leg hop? Can rule out stress fractures
Single leg squat? Demonstrates quad and gluteal strength/weakness, can reproduce pain
Thessaly test at 5 degrees and 20 degrees of flexion (demo)

Seated—observe for heat, swelling, redness, palpate anatomy (joint lines, patellar tendon, tibial tubercle, pes ancerine bursa, popliteal fossa) Can tap reflexes at knee/ankle,
Can check strength with resisted knee extension and dorsiflexion.

Supine—hip ROM bilat, knee ROM bilat (start with normal side*), effusion*? Patellar mobility/apprehension? Crepitus? Check collaterals, cruciates, menisci.

Prone—grind (Apley's) test

Management—depends on the cause

See attached tables for management of common traumatic and non traumatic knee problems

Usually trial of conservative approach for 4-12 weeks
More likely to require surgery: ACL tear with giving way on usual activities, meniscal tear/loose body with locking

OA knees—physio+++, non wt bearing activity (cycling, water fit, rowing), Tylenol regularly, NSAID's if Tylenol not helping and safe for patient, injections, bracing (if wear is unilateral)

Injection options for patients "too young" for TKR (which only last 15-20y)
Local anaesthetic to confirm pain origin (ITBS, pes ancerine)
Steroid $50-100, with local, 70-80% success in reducing pain for 1-9 months, eg pre Europe holiday!
Visco $300-400 per injection, can do single vs series, better for mechanical (bone on bone, crepitus), 50-60% helpful
Visco+steroid ("Cingal")
PRP $600-800? Only 50% helpful, deep pockets?

Case 1—15M basketball player with 3m R knee pain
Worse with jumping
No night pain
Better with rest
No trauma at onset, getting worse as season goes on
On exam—Swollen tibial tubercle, tender over patellar tendon, no effusion, intact ligaments, can duck walk with pain on R, full ROM
DDx- patellofemoral pain syndrome? Patellar tendinitis?
Dx-Osgood Schlatter's (clinical diagnosis)
Tx-ice, modify activity, stretch/strengthen quads/glutes, warn re future deformity, time

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Case 2 50F gardener, 7d of L knee pain since stumbling
Some night pain in certain positions. Worst with weight bearing, stairs. Tylenol helping about 40%. Improving a bit.
On exam Limping. Unable to squat to 90 due to L knee pain. +Thessaly test at 5 degrees on L. Tender over medial joint line. +McMurray. Collaterals and cruciates intact. ROM 0-100 degrees
DDX-MM tear, pes ancerine bursitis, plica syndrome
Dx-MM tear
Tx-time (3-4 months), less wt bearing, physio, pain meds, non surgical unless locking

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Case 3 80M with several months of increasing bilateral knee pain.
Worse with walking/weight bearing. Gets better quickly after sitting for a few minutes. No night pain, wt loss, night sweats. OTC Pain meds not helping. Chronic low back pain/DDD with previous facet injections for relief. No numbness/tingling/weakness/bladder/bowel dysfunction.
On exam—no limp, unable to squat to 90 degrees, normal knee exam. Hips ROM 50% of normal but non painful. Reflexes/sensation/pulses normal. Toe walk and heel walk sl weak/poor balance.
DDX—OA? Referred from hips? Referred from back?
Dx-spinal stenosis (seen on MRI), consider surgical referral

Traumatic Knee injuries:

Structure	Mechanism of Injury	Signs & Symptoms	Characteristics	Diagnostic test	Management
Anterior Cruciate Ligament	Often sports-related 70% Non contact Jump / landing, rapid turning or deceleration	Haemarthrosis Rapid onset 0- 2 hours	Report pop/ tear Pain poorly defined Restricted ROM or hyper extension	Lachmann Anterior Drawer Pivot Shift	Surgical or Conservative[3] If giving way on activities of daily living – surgery required Evidence based post-surgery rehabilitation protocols available
Posterior Cruciate Ligament	Less common Dashboard injury i.e hyperflexion or sudden violent hyperextension	Often minimal as PCL is extra-synovial	Diffuse pain Often associated with Posterolateral Complex(PLC) injury	Reverse Lachmann, Posterior Sag	Conservative if in isolation Rehabilitation favours Quads + Calf muscle strengthening Good outcomes despite laxity
Meniscus	Contact sports; Twisting on fixed foot Minimal trauma (i.e. twisting or falls) in older persons produces degenerative tear	Haemarthrosis = severe tear Slow onset =minor tear	Clicking Locking Reduced ROM due to swelling or blocked screw home mechanism at end range	Mc Murrays, Apleys Compression Joint line tenderness No single test accurately diagnostic2	Try conservative for 3 weeks Surgery to repair and preserve meniscus where possible Accelerated return to activity can damage underlying articular cartilage Surgical repairs as a result of degenerative tears have a poorer outcome than younger patients
Medial Collateral Ligament (MCL)	Common Contact injury Blow to flexed knee from lateral side MCL and ACL frequently inured together	Grade I - no swelling Grade II: Moderate swelling Grade III: large swelling associated with ACL/ Meniscus injury	Local pain Tenderness on palpation ROM often full in Grade I +II tears	Valgus stress in 30° flexion Grade I = pain, no laxity Grade II = pain, laxity but end feel Grade III = laxity no end feel +/- pain	Conservative management if isolated Grade I: 3 weeks rest from sport Grade II: 3-8 weeks rest from sport Grade III: 12 weeks rehabilitation; first 4-6 weeks in a brace Surgery may be required for sport or occupational reasons
Lateral Collateral Ligament (LCL)	Uncommon Direct varus blow may also involve PCL	Delayed onset	Local pain Inability to weight bear	Varus Stress in 30° flexion	Usually conservative

from Physiopedia

Non traumatic knee pain:

TABLE
Nontraumatic Knee Pain: What to Look for, How Best to Treat

Diagnosis	History	Physical exam	Treatment
PFPS*	Anterior pain + Theater sign Descending stairs exacerbates	No effusion + Patellar tilt test Pain with squatting	Quad and hip strengthening Hip flexor, hamstring, iliotibial band, and quad stretching Taping/bracing may help
Chronic dislocation	Anterior pain Snapping/feeling of dislocation History of dislocation	+ J sign Hypermobile patella + Patellar tilt test + Patellar apprehension	VMO strengthening Bracing Surgery may be needed
Patellar tendinopathy†	Anterior pain that worsens with activity, especially jumping	Focal suprapatellar pain (assess for tendon integrity)	Eccentric training Physical therapy PRP injections may be considered
ITBS	Lateral pain that worsens with repetitive knee flexion	+ Noble's test + Ober's test	Refrain from activity that causes pain/activity modification NSAIDs Physical therapy Corticosteroid injections
Plica syndrome	Medial pain Catching/locking	+ Mediopatellar plica test Palpation of plica	Physical therapy Quad strengthening NSAIDs Corticosteroids
Anserine bursitis	Medial pain Obesity, particularly in females Diabetes	Pain with palpation at insertion of anserine complex Edema not always present	Rest Cryotherapy NSAIDs Corticosteroids Weight loss, diabetes treatment, as indicated
Popliteal cyst	Posterior pain/fullness History of other knee pathology	Palpable mass in popliteal fossa + Foucher's sign	Treat underlying condition Knee flexion Ice NSAIDs Aspiration/corticosteroids
Knee effusion	Chronic knee swelling, possibly intermittent, worse with activity	Red, hot, swollen knee indicates possible infection	Joint aspiration is a must if joint infection is a consideration Orthopedic referral if infection is found

Abbreviations: ITBS, iliotibial band syndrome; PFPS, patellofemoral pain syndrome; PRP, platelet-rich plasma; VMO, vastus medialis obliquus.
*Diagnosis of exclusion.
†The Victorian Institute of Sport Assessment (VISA) questionnaire can be used to follow the progress and severity of patellar tendinosis.[31]
+ A positive result is indicative of the diagnosis.

Clinician Reviews. 2015 May;25(5):25-26,28-30,32-34