Knee Problems In Primary Care.

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Overview

• How do knee problems present?
• Quick revision of functional anatomy.
• Regional problems of the knee; diagnosis and management.
• Questions.
How do knee problems present?

Knee pain is one of the commonest MSK symptoms in primary care.

Knees Regional pain; Anterior, medial, lateral, posterior, generalised.

The knee that gives way, locking, clicking, swelling.

Acute vs chronic, sudden vs gradual onset.

Exercised related pain, rest/night pain.
Synovial, modified hinge joint, 3 compartments. Particularly susceptible traumatic injury, located at ends of two long levers.

Bone, joint, menisci (congruency) Active vs passive restraints muscles/ligaments and the ITB. Structure in relation to movement stability and movement.)
Directions Of Movement

- Compression-Distraction
- Medial-Lateral
- Anterior-Posterior
- Adduction-Abduction
- Flexion-Extension
- Internal-External

Sports Injuries - The Knee © 2001 Primal Pictures Ltd
Bones, joints & menisci

Congruency in full extension (close packed position)

Lateral femoral condyle, longer and more anterior, prevents excess lateral patella movements.

Resting position (unstable), 25° flx’n. capsular pattern flx’n>Ext’n.
Bones, Joints & Muscles

Tibiofemoral/ Patellofemoral (3 compartments) and Proximal tibiofibular (ankle movements).

Transmits loads, participates in motion, aids in conservation of momentum, provides force couple in leg activity.

Flexion (0-135°) extension, rotation, add’n/abd’n.

Non-congruent joint surfaces, enables two bones to move different amounts guided by

Three degrees of freedom planar joint. The tibia or femur is free to rotate and translate. In this case the fixed member is the tibia, the moving member is the femur.

Sports Injuries - The Knee © 2001 Primal Pictures Ltd
Stability And Movement.

Line of gravity: Posterior to centre of movement hip joint, anterior to knee joint, ligamentous tension.

Single vs two leg WB.

Modified Hinge: rotation, axes of movement, articular contact areas changes with movement.

Radius of curvature: femoral condyles, changes with movement (“cam-like vs circular”)
Stability And Movement

Range of knee flexion (active vs passive) varies with hip extension (hamstring efficiency.
Quads’ retraction, shortened capsular ligaments.
Rolling/gliding of femoral condyles:
Reflection of the interdependence of mobility & stability.
Stability And Movement

Ratio of rolling to gliding changes throughout flx’n: Initial 20° flx’n, “pure roll”, support phase of gait, requires stability. Maximal distortion of menisci and contact area in full ext’n.

Beyond 20° flx’n, knee becomes “looser” as more gliding occurs, radius of femoral condyles reduces, tibia nearer to axis of femur, ligaments relax, prepares joint for more axial rotation.
Patellofemoral joint: Patella moves 2x its length throughout flexion, as far as intercondylar groove.

Lateral displacement of patella: Reduced by lateral lip of lateral condyle, (more anterior) and “horizontal fibres” of VMO.

Compressive forces over small area, tight patellofemoral retinaculum and ITB.

Post traumatic “stiff knee”, inflammatory adhesions in capsular recesses (suprapatellar bursae/parapatellar recess), patella held firmly against femur, fails to glide down to intercondylar notch.
Osteoarthritis
By far the commonest knee presentation in primary care.

Adults > 45yrs, most common site of pain limiting > 1/52 in past 1/12 is knee (19%)

Adults aged > 50yrs, 23% report severe pain and disability. (Jinks et al 2004).

Prevalence rises in frequency with ageing, but not an inevitable consequence of ageing!

Numbers increasing as population ages and prevalence of risk factors such as obesity and...
Risk factors for OA knee

- **Genetic:** Responsible genes not identified, but heritability estimates are between 40-60%

- **Constitutional:** ageing, female, obesity and high bone density.

- **Biomechanical:** more local, joint injury, occupational or recreational usage, reduced muscle strength, joint laxity and joint malalignment.

- Many environmental/lifestyle factors reversible (obesity, muscle weakness, ...
Osteoarthritis

generalised knee pain (periarticular), medial knee pain, morning stiffness, eases with time, returns at end of day, reacts to vigorous exercise, any gradients/steps, spontaneous or reactive effusions, night pain, loss of function.

Metabolically active and dynamic, progressive loss of cartilage, osteophyte formation with reduced movement and bone sclerosis of subchondral bone.

Limp, use of stick, knee brace, muscle wasting (VM’s), reduced active/passive ROM (capsular pattern, flexion loss > extension loss).
Primary Care Management

Management of "wear and tear", "exercise is detrimental" "running/jogging will damage my knees" etc, etc...

Explain the disease. Encourage/promote light CVS exercise which patients prefer to tablets, injections and surgery.

Encourage weight loss, aerobic exercise and home based quadriceps muscle strengthening exercises.

Although some patients experience temporary exacerbations, the vast majority, irrespective of symptom severity, will not... (Hurley et al 2007)
Aerobic & Strengthening Exercises

Nice reviewed 13 RCT’s in 2008, covering different types of exercise interventions. Half of the studies had an outcome favouring exercise.

Two further studies since (Doherty M et al 2009 & Segal N A, et al 2009), have both demonstrated a positive outcome from exercise. Doherty study 2009, did not show any benefit of dietary intervention on OA, but depression improved.
“Too fast, Too Fat, Too tough”

Classic scenario; 40yr + male, former footballer, previous PMM, mild/moderate varus deformity, no exercise for many yrs, weight gain, starts running.

Initially ok, then pain with running. Being a tough guy, continues until he gets rest pain. Stops all exercise. Constant overload causes microdamage to articular cartilage,
Running, maintaining a healthy body weight, proper injury rehab', will, most likely, not overload joints.

Muscle mass and CVS health will be maintained, and bone mass index will remain normal health. Certainly supported by biomechanical and radiological research (Hohmann E et al 2005.)

Too fast, too fat, too tough, too soon will almost certainly cause OA, with or without risk factors.

Steady slow build up, regular exercise,
The Effused Knee

- non-traumatic vs traumatic (meniscus, cruciates, patellar dislocation) and inflammatory/infective.

- Flare of RA, seronegative arthropathy, reactive arthropathy, crystal arthropathy, Gout.

- PMH, recent foreign travel.

- Aspiration useful if diagnosis needs confirming; send for microscopy etc if appropriate, to exclude infection or crystals. ?Turbid or Clear synovial fluid.
The Effused Knee.

Where indicated, do serology (inflammatory markers, uric acid, auto antibodies.) Consider suitability for IAI Corticosteroid, rest, early quads” rehab, gradual mobilisation. Consider referral to Rheumatologist for further investigations.
Medial Knee Pain

Probably the commonest presentation in OA.

Non-traumatic degenerate meniscus.

Traumatic meniscus.

Medial collateral ligament/coronary ligament.

Pes-anserine bursitis.
Degenerate Meniscus/Coronary Ligament.

Patient usually over 40 yrs, gradual onset of knee pain, clicking, pain with twisting (getting out of car, turning in bed etc).

Reduced ROM and medial joint line tenderness, McMurray’s positive, reactive effusions, ? some mechanical symptoms.

Trial of conservative treatment. Refer at 4-6wks.

If sudden deterioration with a twisting movement and localised tenderness, trial of injection to
Int’n rot’n, with flx’n, body thrust outwards producing valgus torque: isolated ACL (+/- MCL or MM), click or pop.

Valgus, ext’n rot’n, combination of ligament injury in association with MM. Click or pop.
Younger age gp, twist, unable to continue game/sport, pop or click, pain, delayed effusion, ? locking, joint line tenderness, McMurray’s +ve with minimal flexion. Thessaly test.

Refer to surgeons early ie 1-2 wks or urgently if locked.
MRI Scan

Accurate and helps decision making; diagnostic accuracy of order of 94% for medial meniscus/ACL and slightly less for lateral meniscus and PCL (McNally E, ed, BMJ 2002 332 pts, diagnoses pre and post MRI; in meniscal tears 57/113 pre imaging diagnoses were changed, with changed management in 62% of cases, and only 38% proceeding to arthroscopy.
Did not significantly alter GP diagnoses or treatment, compared with direct referral to Orthopaedics, but significantly **increased** their confidence.

Yielded small, but significant benefits in patient’s knee related quality of life, but non-significant improvements in physical function (DAMASK trial, 2007).

Results of similar study, retrospective analysis of 12yrs of GP open access, revealed large variation in requesting patterns between GPs’.
Pes Anserine Bursitis

Site of 3 tendons; swimmers, cyclists, runners.

Localised tenderness and swelling.

Identify cause, address any extrinsic factors, ice, nsaid, light stretch, inject if not responding.
Posterior Knee Pain

- Effusion.
- Referred from posterior horn tear MM.
- Baker’s Cyst.
- PCL.
- Aneurysm.
Baker's Cyst

Synovial lined cystic swelling between the heads of medial gastrocnemius and semimembranosus.

Many are asymptomatic, but do present with swelling/mass, aching, or effusion.

Prevalence varies in RA (5-58%), OA (42%), internal derangement (5-18%).

Management: observe, aspirate & inject effusions, treat internal derangements,
Anterior Knee Pain

Probably the second commonest presentation in primary care. Several differential diagnoses

PTFJ pain;
Maltracking/Malalignment/Chondromalacia Patellae, OA.

Bursitis: Pre-patellar/Supra-patellar.

Patellar Tendinopathy.

Fat Pad impingement.

Osgood Schlatter’s disease.
Limping child with referred pain to knee from hip region, ? serious hip pathology.

Night pain in child with limp and bone swelling ? malignancy.

Delayed onset of pain and loss of function following an awkward twist/impact/compression.
Maltracking/Malalignment

Technically, two different things, but present as the same; “Miserable malalignment syndrome”

Mainly non-traumatic, gradual onset, more commonly females, pain around patellar (superomedial) gradients, squatting, kneeling rising from chair, feels unstable/weak often bilateral, unable to exercise.

Hypermobile patellae, Poor biomechanics, patellar alta, muscle imbalances secondary to training techniques...
Maltracking/Malalignment.
problems.

Need to establish not just what but why?


Supervised exercise therapy is more effective than “usual care”, with respect to pain at rest, pain on activity and knee function (RCT Van Linschoten R et al, BMJ 2009)

Foot Orthoses: produce earlier and larger
PTFJ Physiotherapy
Patellar Tendinopathy


Any sport involving running or jumping.
Pain, during sport,
pain during exercise, after, night time, early morning stiffness. Pain on descending, lunging, kneeling. Most are at the proximal pole (upper third)
Tendinopathy

Generic term describes clinical conditions in and around tendons resulting in Pain, Swelling and Impaired Function
Histopathology

Tendinopathy is characterised by an absence of inflammation

- No inflammatory cells
- Vascular in growth
- Hypocellular / hypercellular
- Increased in inter-fibrillar GAGs
- Collagen disarray
- Mucoid and Lipoid degeneration
Tendinopathy
Mainstay is Protracted (3-6 mths) progressive programme of eccentric loading programme on decline board, through physiotherapy, stretching, ice, activity modification.

Nitrate patches (some evidence). 1.25 microgrammes in 24 hrs

Growth factors (autologous blood and platelet rich plasma, under ultrasound guidance.)
Eccentric loading with decline board.
Osgood-Schlatter Disease

Osteochondritis of growth plate of patellar tendon on tibial tuberosity. Adolescent growth spurt. Pain after exercise (am) and some night pain. Problems kneeling. Tenderness at tibial tuberosity.

- Advice rest from 1 or 2 sports involving running or jumping, ice after exercise. Refer physiotherapy for stretching and strengthening exercises. No evidence that complete rest cures it. May last 2 yrs.
Osgood Sclatter’s Disease
Lateral Knee Pain.

Iliotibial Band Friction Syndrome

Condensation of gluteus maximus and TFL. Aching or stabbing/knife-like pain to lateral knee with exercise. Running (12%) particularly downhill (reduce knee flexion) or on cambered course. Immediately relieved on stopping running.

Mainly tenderness over lateral femoral condyle 2-3cm above joint line. Some acute cases are Gerdy’s tubercle of tibia with oedema.
Activity modification, Ice, nsaid's, stretching, muscle imbalances (glutei), biomechanics (Podiatry), inject bursae in resistant cases.
Lateral Meniscal Cyst

Intermittent swelling to lateral knee, varies in size. Consider surgical referral.
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