

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.

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.

Functional Anatomy

Synovial, modified hinge joint, 3 compartments. Particularly susceptible to traumatic injury, located at ends of two long levers.

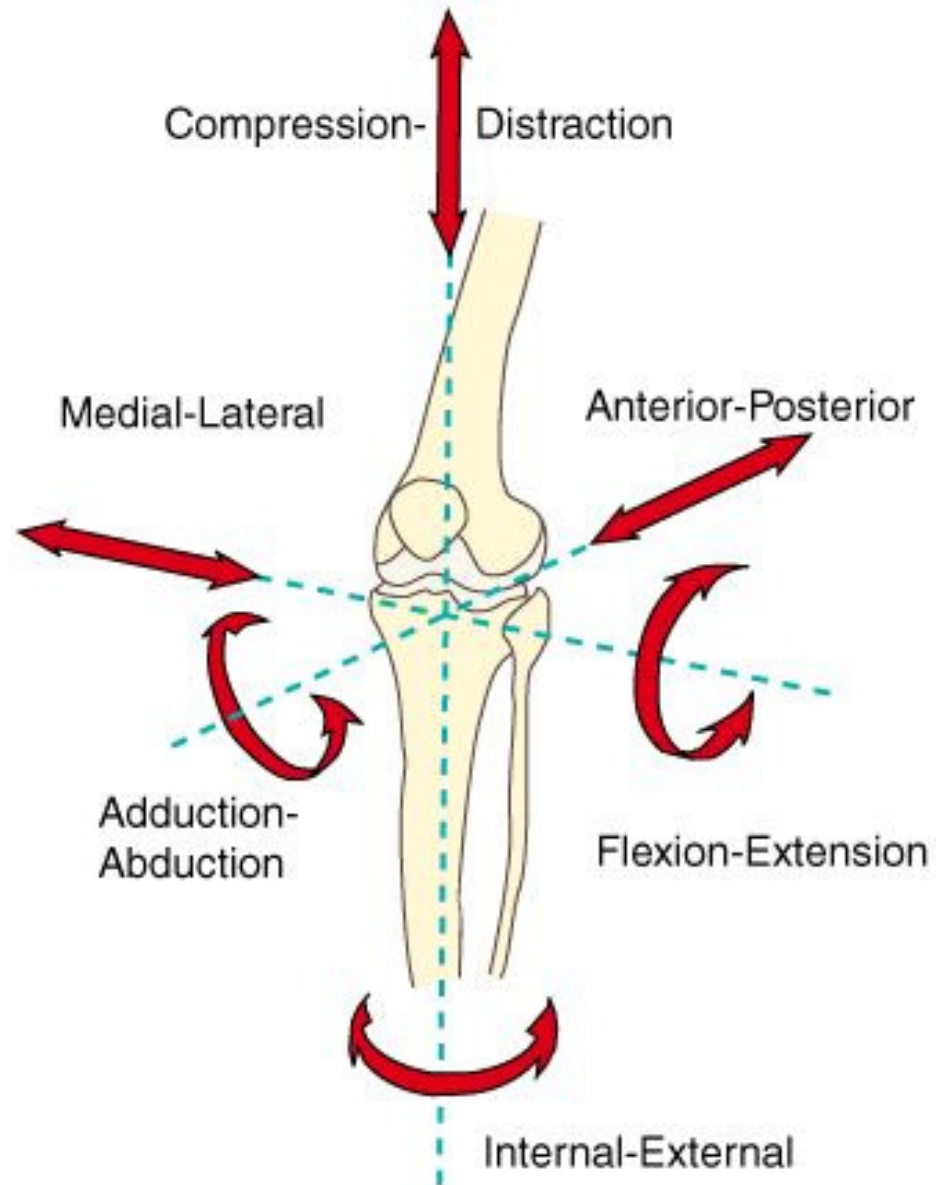
Bone, joint, menisci (congruency)

Active vs passive restraints

(muscles/ligaments and the ITB .)

Structure in relation to movement (stability and movement)

Directions Of Movement



Bones, joints & menisci

Congruency in full extension (close packed position)

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

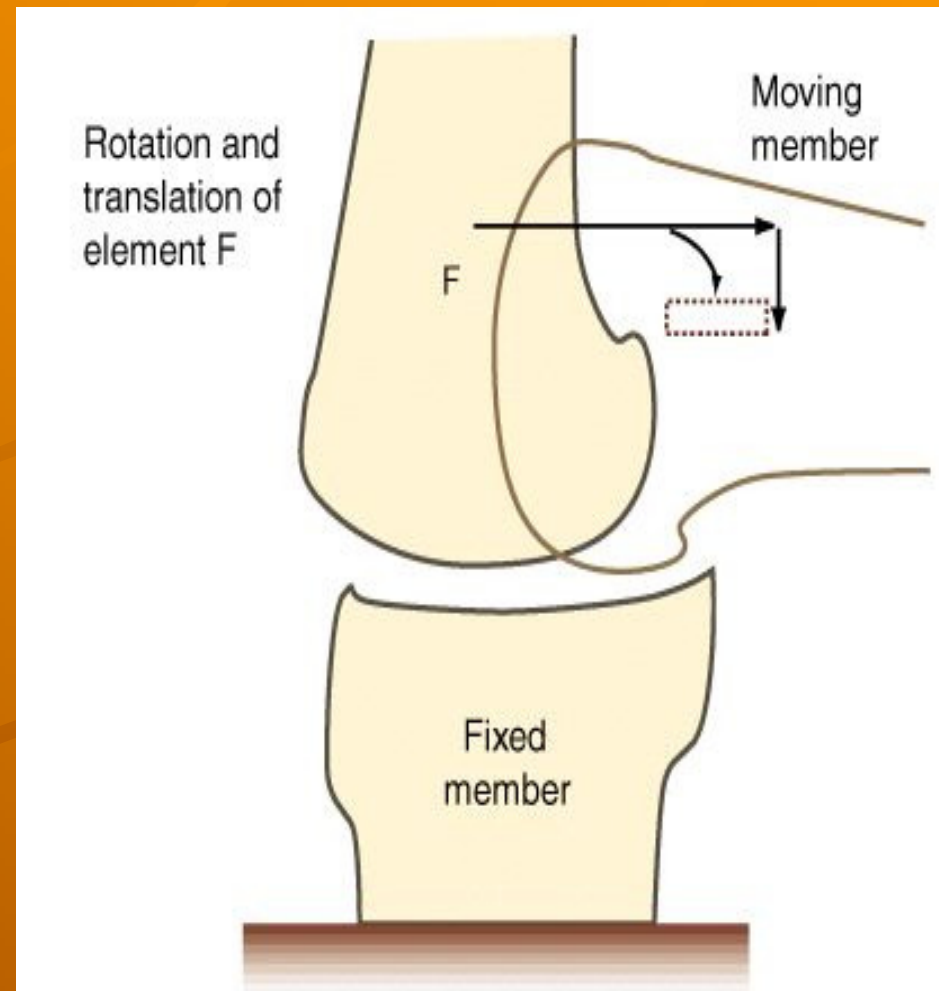
Resting position (unstable), 25° flx'n.
capsular pattern flx'n > Ext'n.

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

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 flex'n: Initial 20° flex'n, "pure roll", support phase of gait, requires stability.

Maximal distortion of menisci and contact area in full ext'n.

Beyond 20° flex'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 (suprapatella bursae/parapatellar recess), patella held firmly against femur, fails to glide down to

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, **not an inevitable consequence of ageing!**

Numbers increasing as population ages and prevalence of risk factors such as obesity an

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

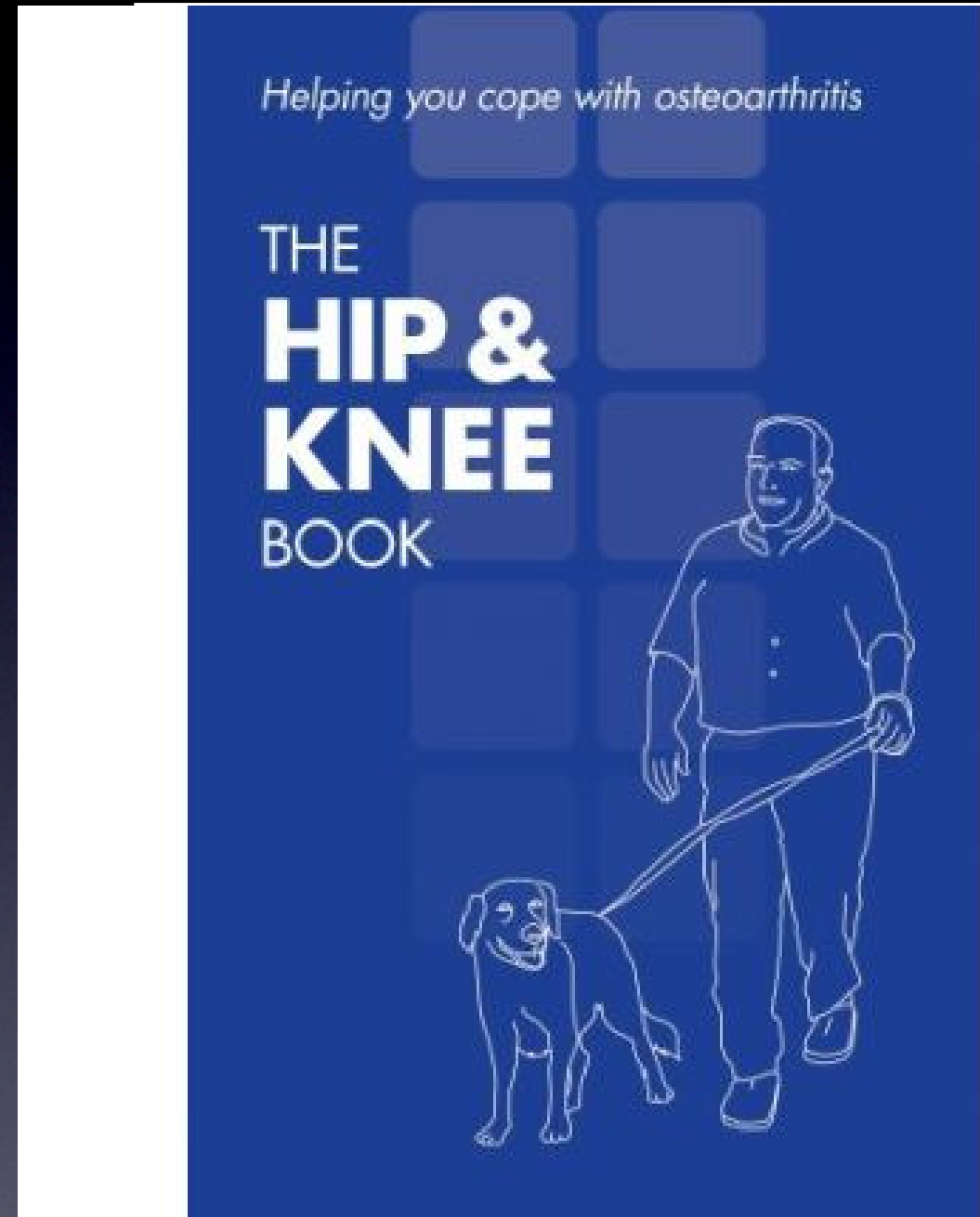
knee pain, morning Stiffness, eases with time
returns at end of day, reacts to vigorous
exercise, any gradients/steps, spontaneous or
reactive effusions, night pain, loss of function.

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

the definitive article: Nice
guidelines, 2008,
<http://www.guidance.nice.org/CG59/guidance/pdf/english>



Management
“damage”, “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

Exercises

Nice reviewed 13 RCT's in 2008, covering different types of exercise interventions. Half of 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.

Running, too fast, too far, 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,

training, 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,

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

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.

Probably the commonest presentation in OA.

Non-traumatic degenerate meniscus.

Traumatic meniscus.

Medial collateral ligament/coronary ligament.

Pes-anserine bursitis.

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 4-6w

If sudden deterioration with a twisting movement and localised tenderness trial of injection to

7. Acute Anterior/Medial/MCL Injuries

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 urgent if locked.

MRI of Knee

Accurate and helps decision making; diagnosis 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 the confidence.

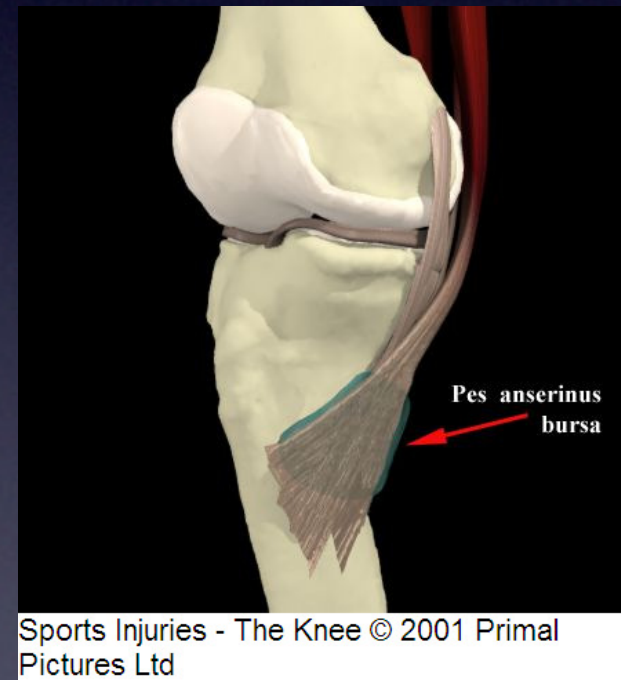
Yielded small, but significant benefits in patient's knee related quality of life, but non-significant improvements in physical function (DAMASK trial, 2007).

Results of similar study, retrospective analysis of 12yrs of GP open access, revealed large variation in requesting patterns between GP's

Site of 3 tendons;
swimmers, cyclists,
runners.

Localised tenderness
and swelling.

Identify cause, address
any extrinsic factors, ice,
nsaids, light stretch,
inject if not responding



POSTERIOR KNEE PAIN

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

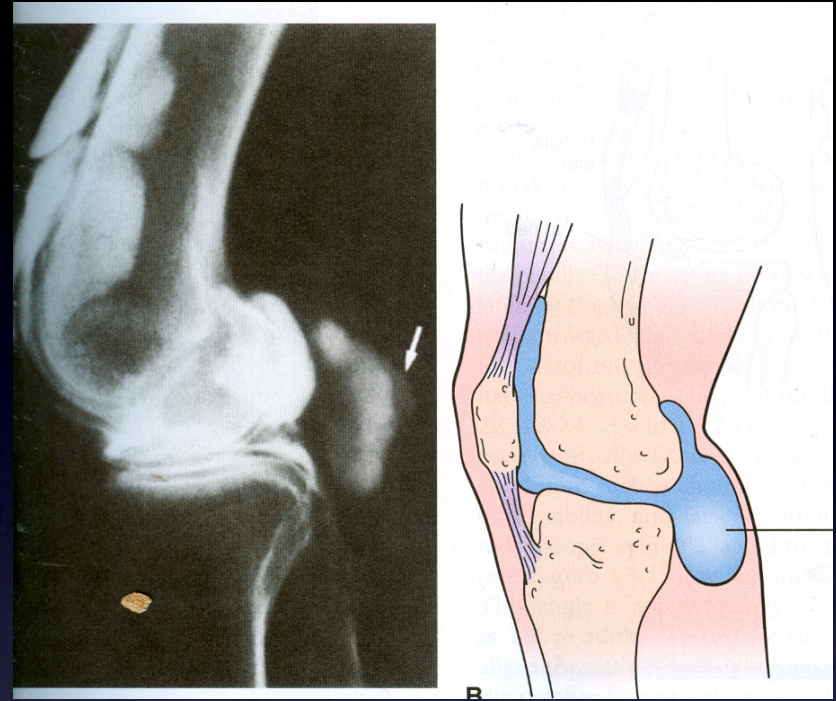
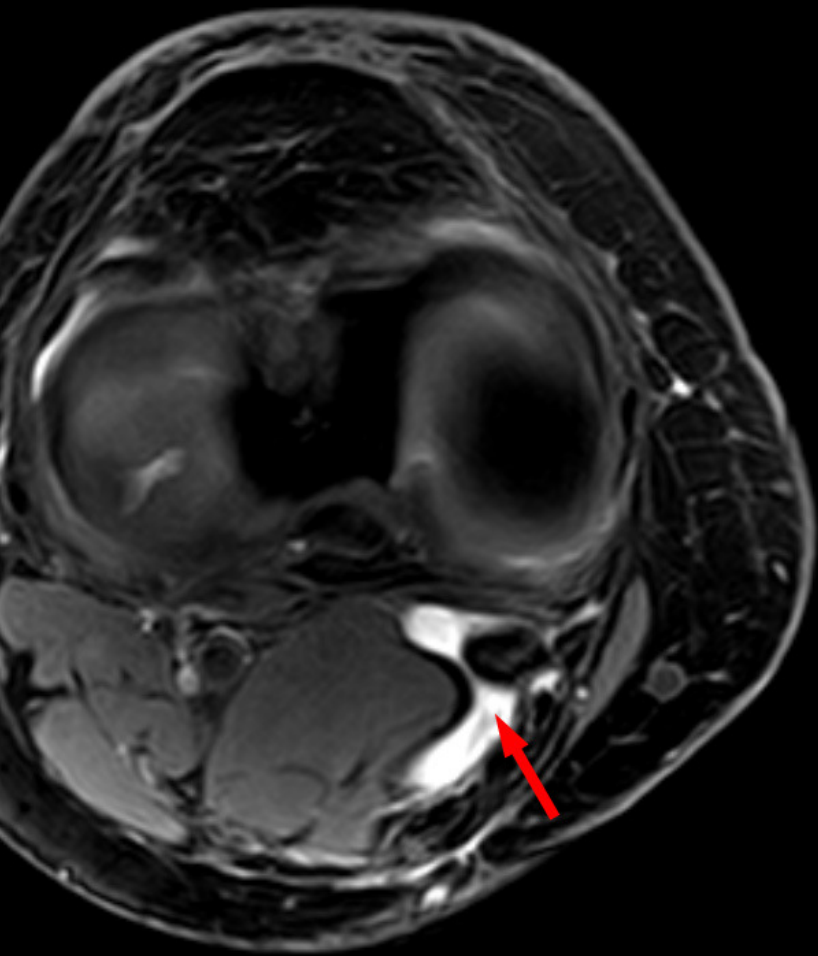
Baker's Cyst

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

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

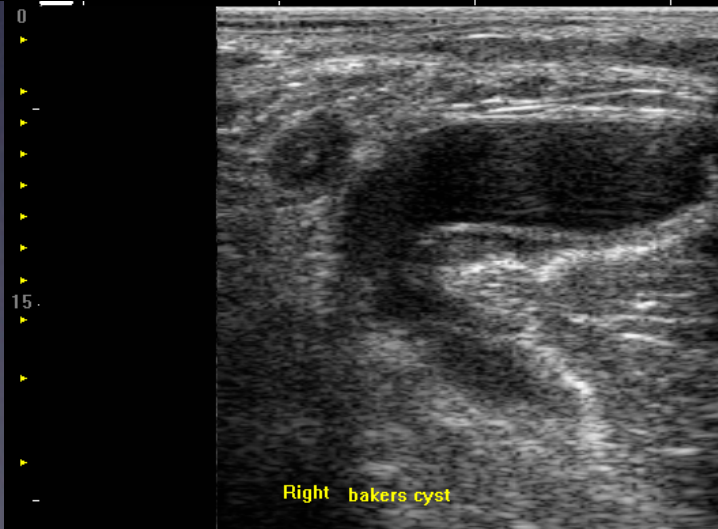
Prevalence varies in RA (5-58%), OA (42%), internal derangement (5-18%).

Management: observe, aspirate & inject effusions, treat internal derangements,



Clinician : Martyn Speight
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21 Jan 2008



- Mus-Skel**
- Right
 - RT
 - Left
 - LT
 - Compression
 - No compression
 - Fluid
 - Tendon
 - Cyst
 - Bursa
 - Muscle
 - Joint
 - Tear
 - Calcification
 - Shoulder
 - Knee
 - Elbow
 - Ankle
 - Wrist
 - Hip
 - Carpal Tunnel

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
knee from hip region, ? serious
pathology.



night pain in child with limp and bone swelling
malignancy.

delayed onset of pain and loss of function
following an awkward twist/impact/compressio

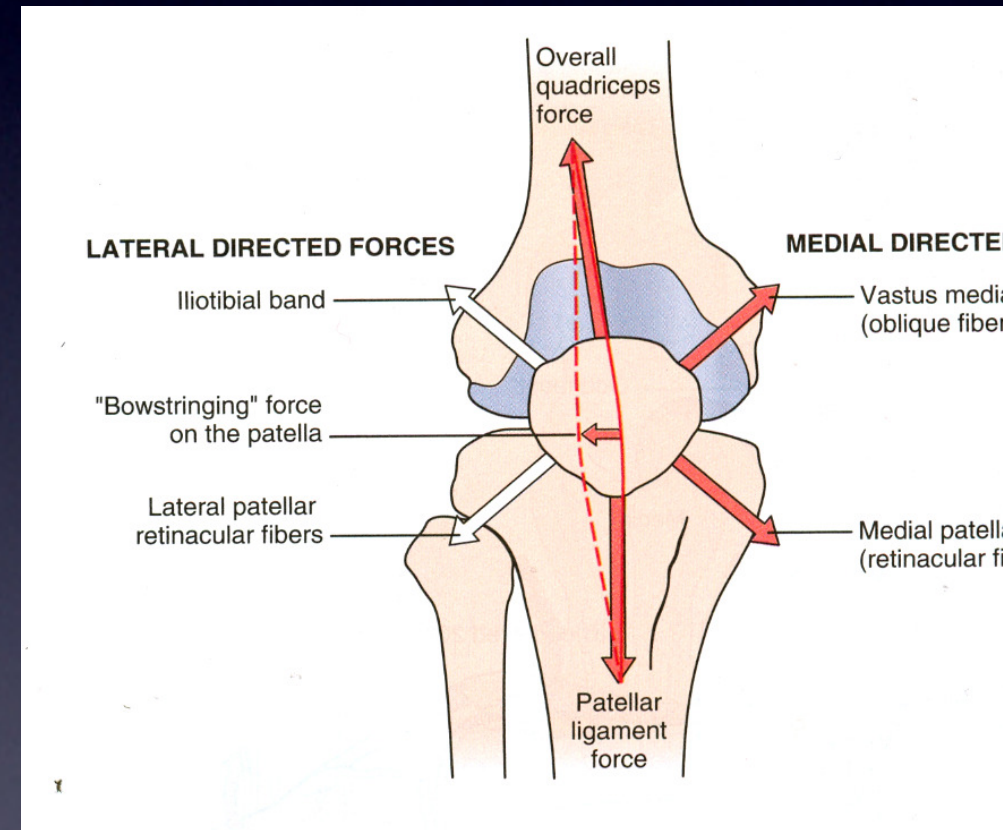
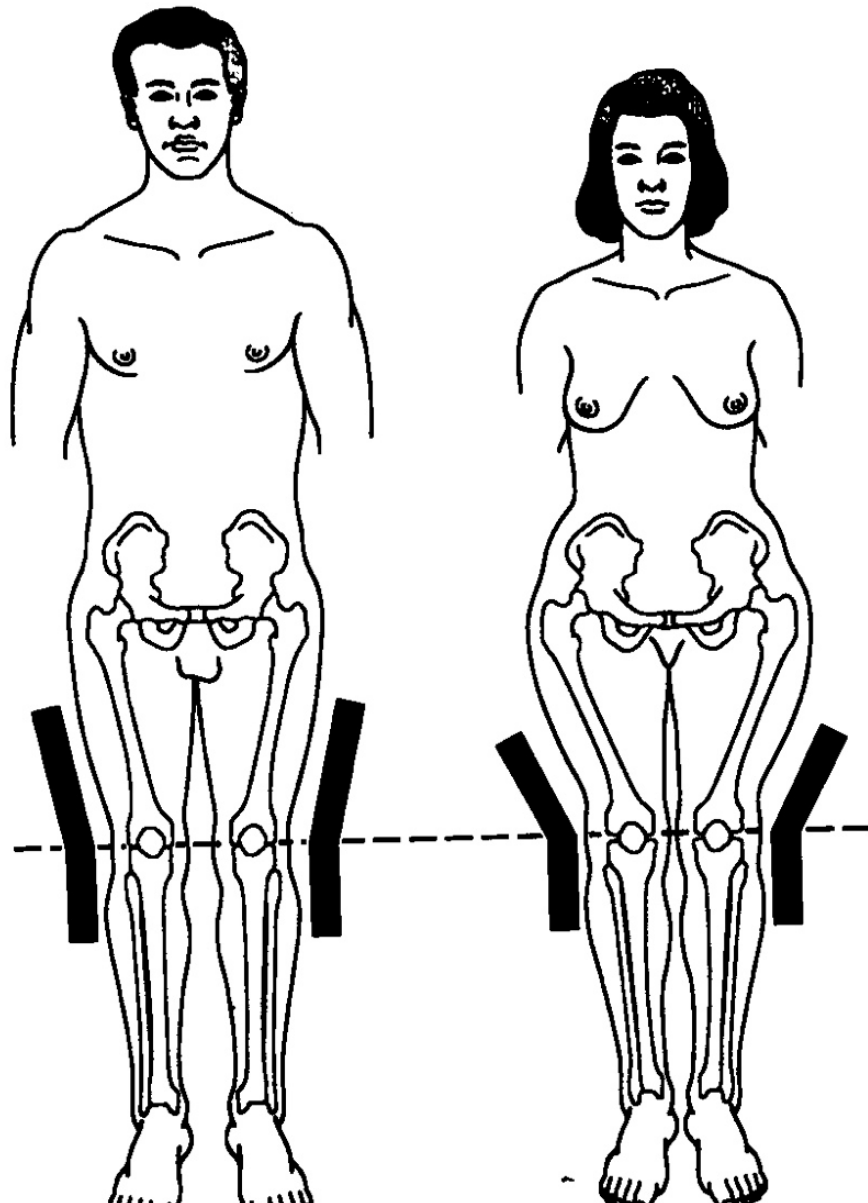
Maltracking/Malalignment

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

Maltracking/Malalignment.



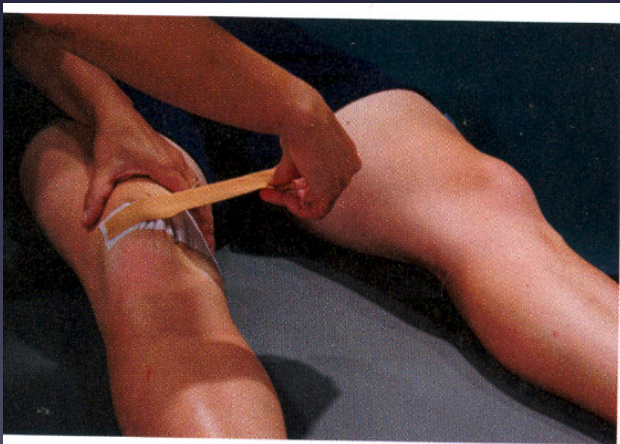
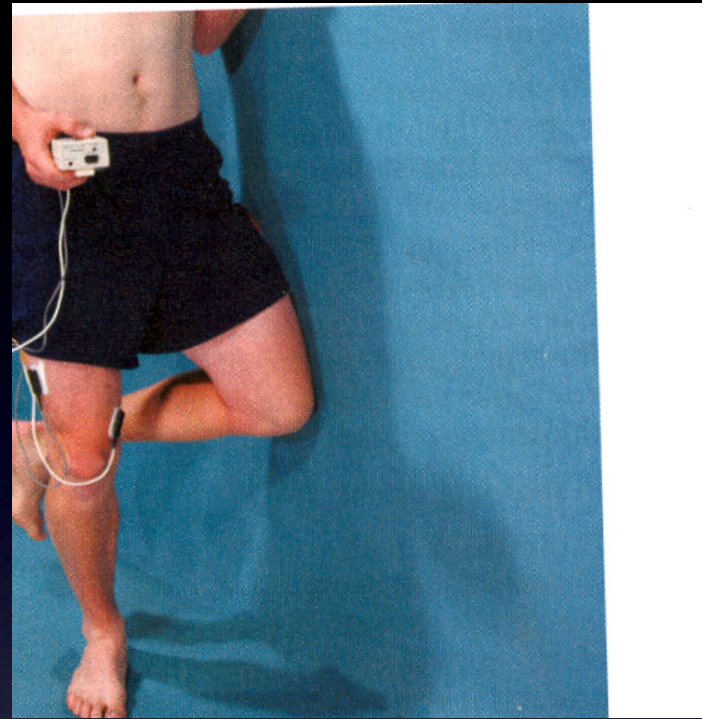
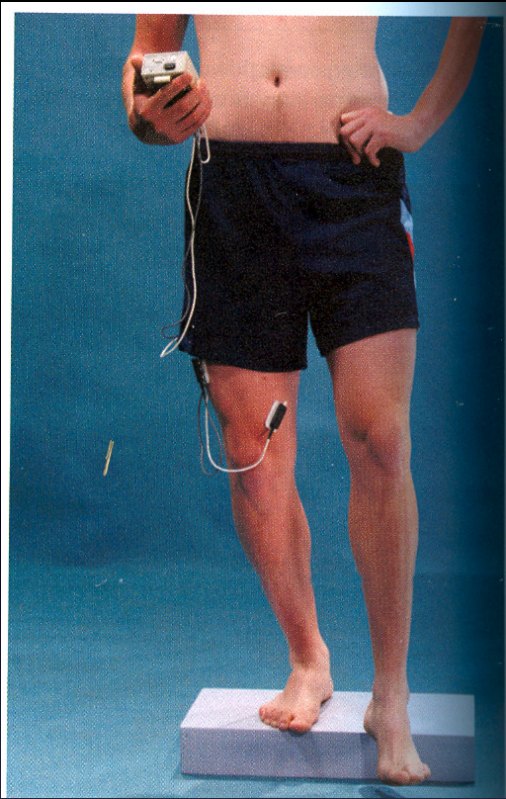
comprehensive assessment by physiotherapist
Need to establish not just what but why?

Muscle imbalances (quads, hip flexors, glute calf), biomechanical assessment by podiatrist factors in the foot. Exercise modification. McConnell taping.

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

Community Outreach



Patellar Tendinopathy

“Patellar Tendinitis” “Jumpers Knee. Certainly not a discrete inflammatory problem.

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

Tendinopathy

=

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

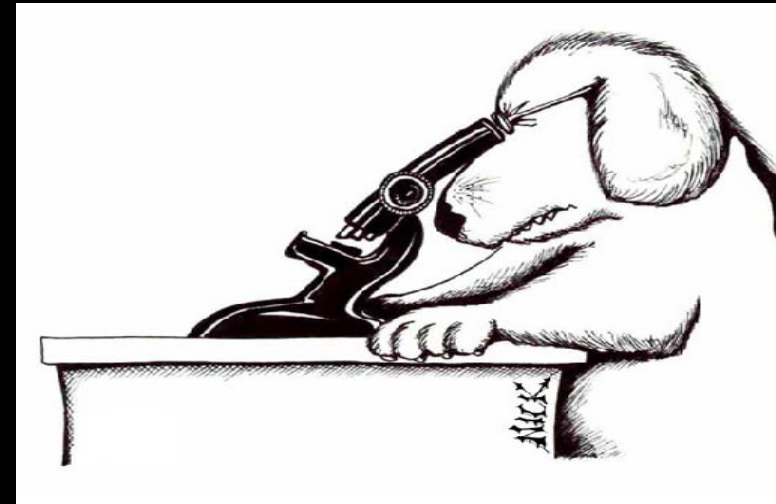
Histopathology

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



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Tendinopathy

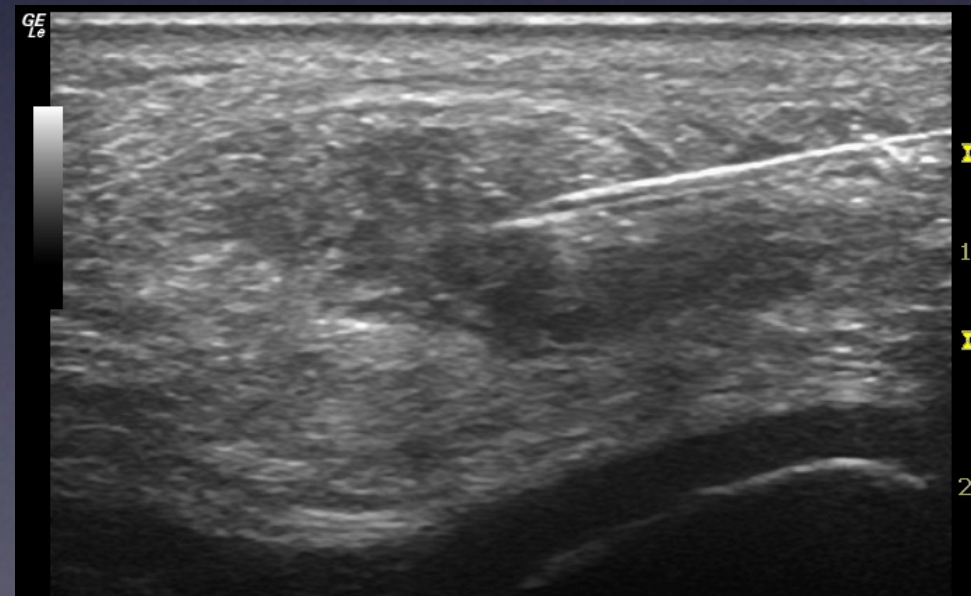
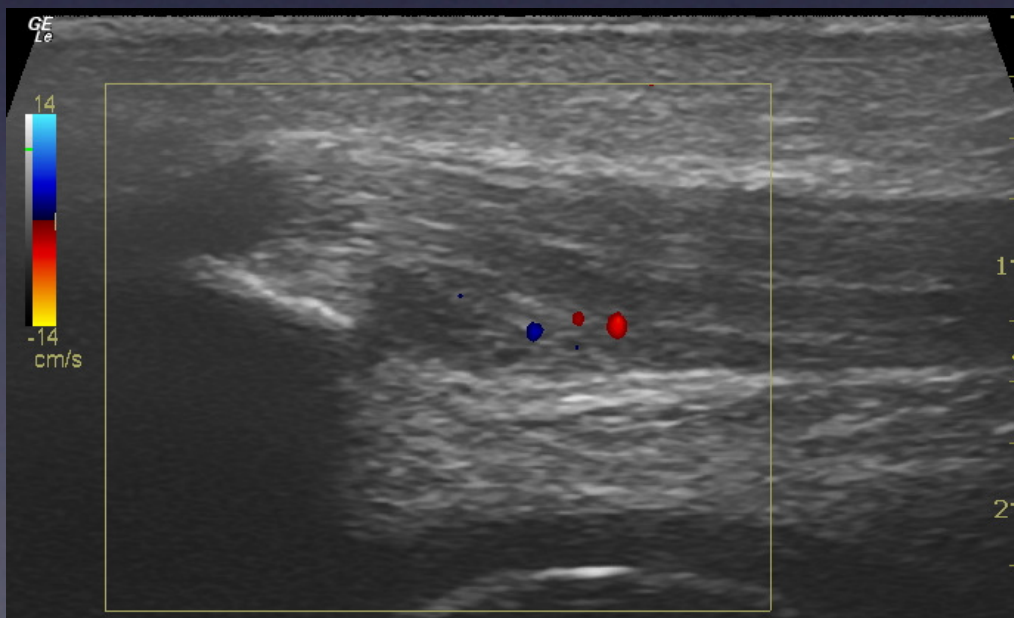
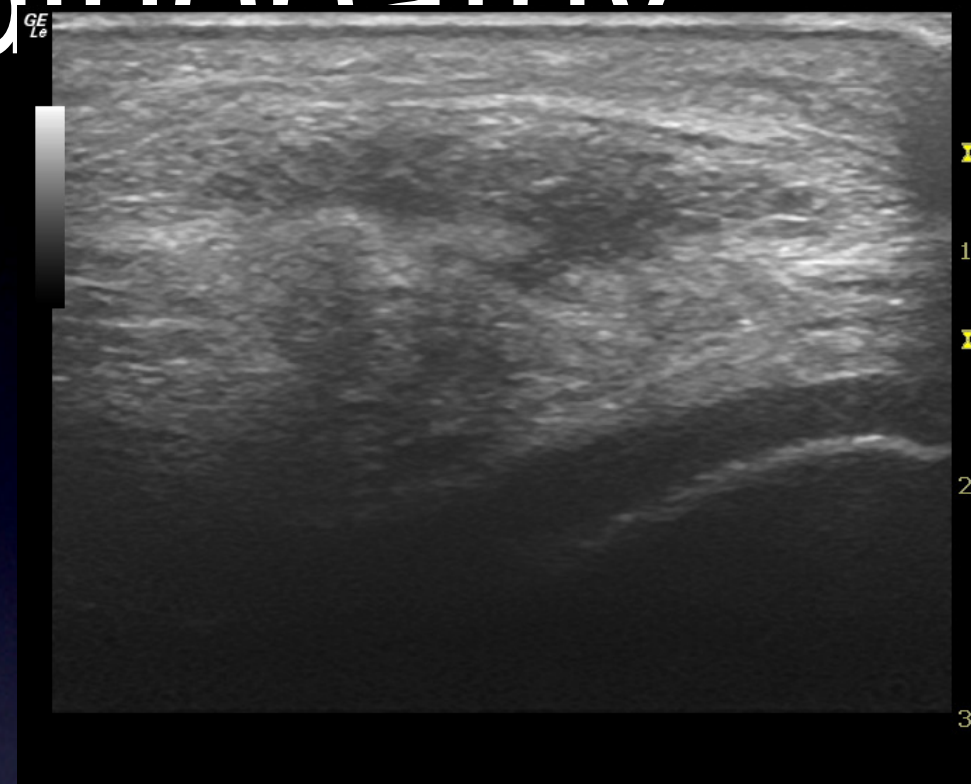
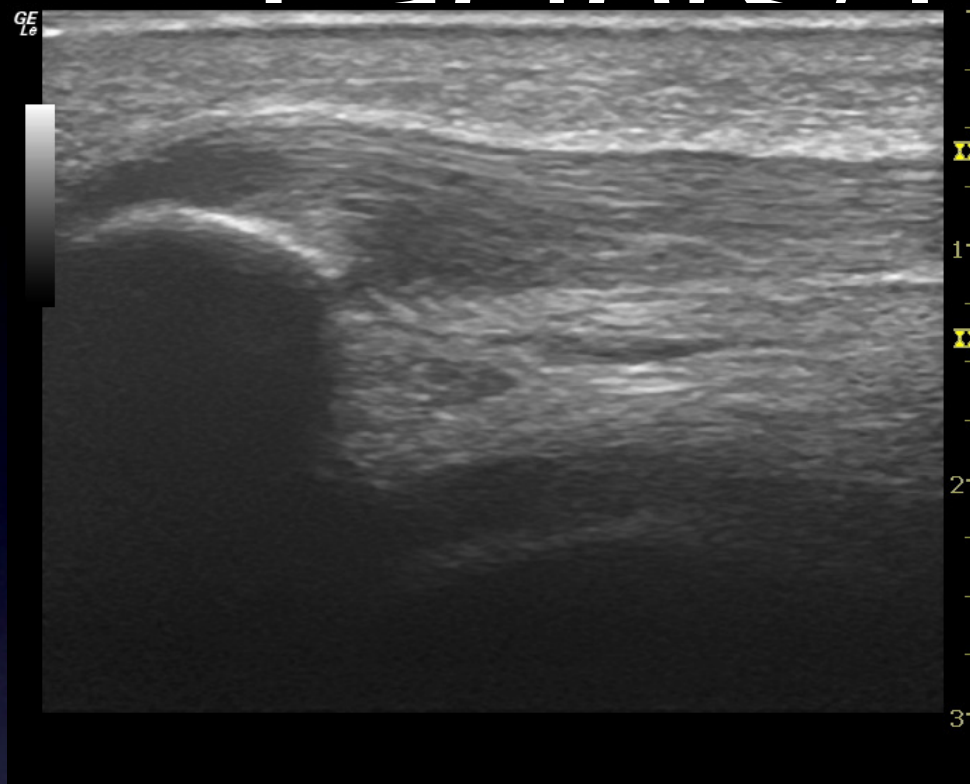
Mainstay is Protracted (3-6 mths)

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.)

Factors / Endoneurial Pathology



Eccentric loading with decline board.



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

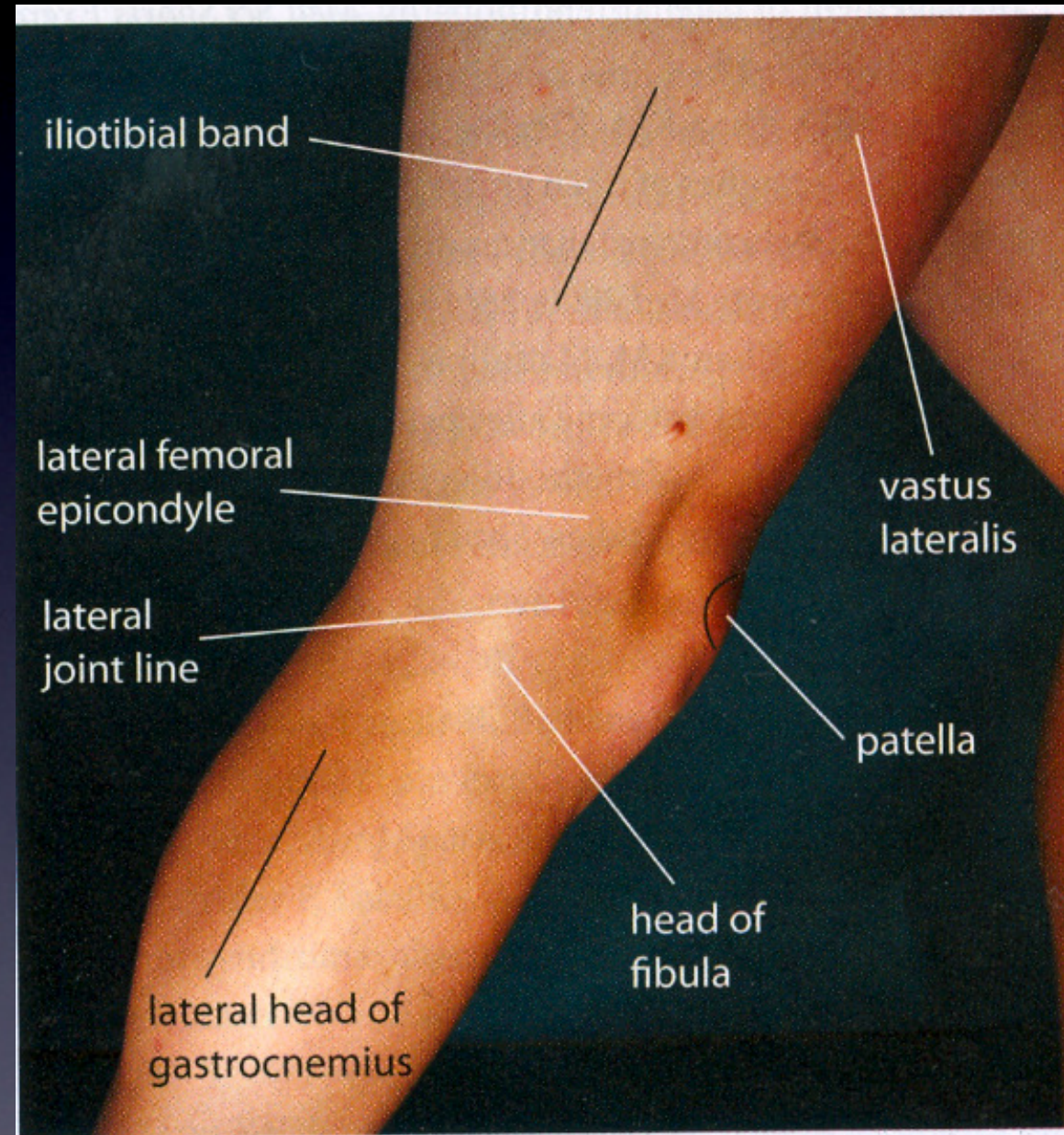
2 yrs

Osgood Sclatter's Disease



Lateral Knee Pain.

- Differential diagnoses:
Iliotibial band,
Lateral
meniscus,
Lateral
collateral
ligament.



Iliotibial Band Friction Syndrome

Condensation of gluteus maximus and TFL.

Aching or stabbing/knife-like pain to lateral knee with exercise.

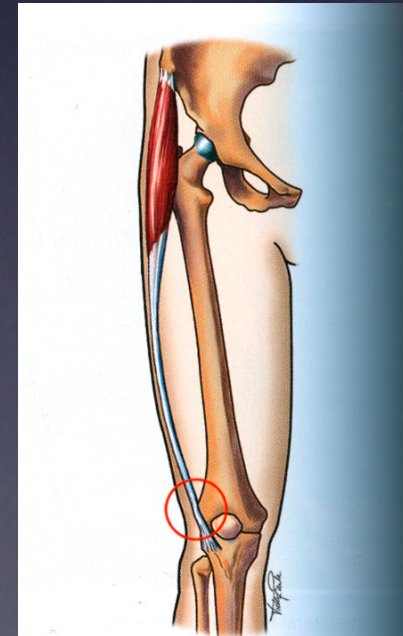
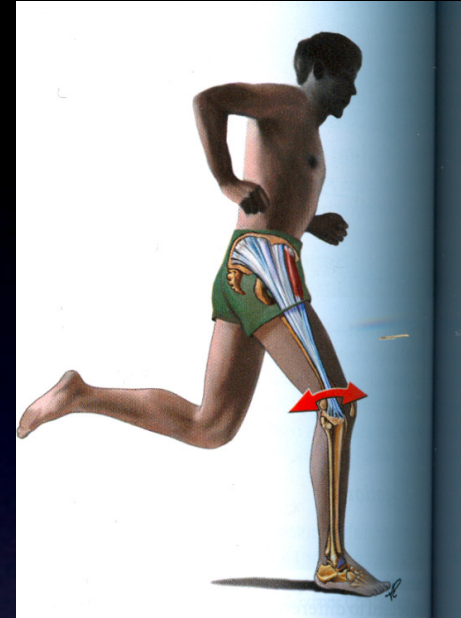
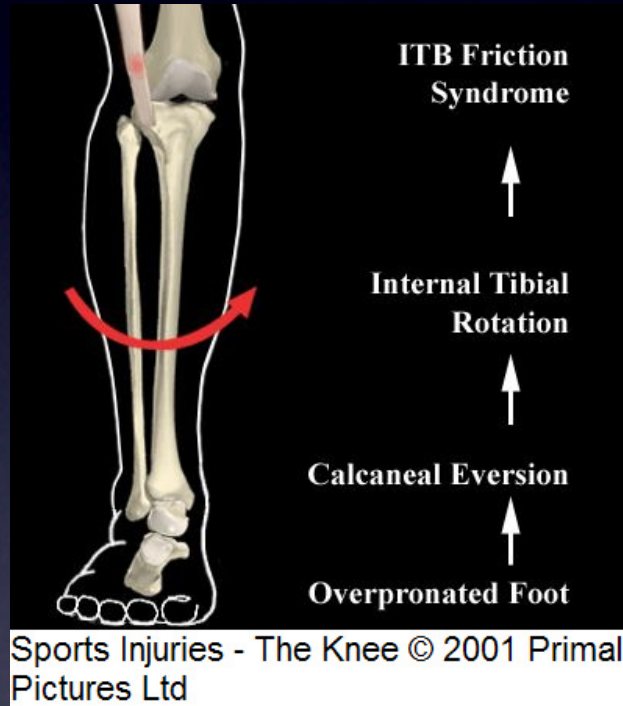
Running (12%) particularly downhill (reduce knee flexion) or on cambered course.

Immediately relieved on stopping running.

Mainly tenderness over lateral femoral condyle 2-3cm above joint line. Some acute cases are

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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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