Knee Examination

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Introduction

- **W**ash hands, **I**ntroduce self, ask **P**atients name & DOB & what they like to be called, **E**xplain examination and get consent
- Undress to underwear. Ask about pain.
- **General inspection**: patient e.g. age, mobility, trauma, risks factors; around bed e.g. mobility aids.

Look

- **Gait:** phases of gait looking at knee, limp, movement restriction
- **Standing inspection:** alignment (patella/legs), varus/valgus deformities, fixed flexion deformity, recurvatum (hyperextension), Baker's cyst
- **Lying inspection:** skin (scars/arthroscopic portals, bruising, swelling), joints (effusions, RA nodules, psoriasis), alignment (patella, tibia), position (fixed flexion deformity); knobbly knees (OA)
- **Measure quadriceps muscle bulk:** measure quadriceps diameter 20 cm above tibial tuberosity

Feel

Check pain first and start normal side with patient supine.

- **Skin**: temperature
- **Joint**: flex patient's knee to 90˚ (and look for tibial lag) then feel along joint line (quadriceps tendon → patella → patella tendon → tibial plateau → tibial tuberosity → femoral epicondyles and over course of MCL and LCL → popliteal fossa). Note synovial thickening and tenderness.
- **Effusions** – test with knee extended
  - **Cross fluctuation test:** one hand empties suprapatellar puch, other just below patella. Alternate compressions. Positive test = impulses transmitted side to side (LARGE EFFUSION).
  - **Patella tap test:** empty suprapatellar pouch with one hand, then sharply tap patella with index finger. Positive test = patella sinks, striking femur then comes back up (MODERATE EFFUSION).
  - **Bulge test:** empty suprapatellar pouch, then systematically stroke around the knee starting fromthe medial-inferior position, up medial side (drains medial compartment) then down the lateral side to end in the lateral-inferior position. Positive test = ripples on medial surface (SMALL EFFUSION).

Move

Do movements actively then passively with one hand on knee (feeling for crepitus)

- **Flexion (140˚)**
- **Extension (0˚)**
- Lift foot when patient relaxed and look for hyperextension (up to 10˚ normal) (collagen disorder)
- **SPECIAL TESTS**
  - **Collateral ligaments:** hold ankle in one hand and knee in other and apply varus (stresses LCL) and valgus (stresses MCL) knee forces with thumb. Do at 0˚ and 30˚ of knee flexion (you can hold their foot in your armpit). Look/feel for excessive movement (collateral ligament tear).
  - **Cruciate ligaments**
    - **Drawer test:** ask if any foot pain. Flex knee to 90˚, sit on the side of their foot and hold knee with tumbs on tibial tuberosity and fingers in popliteal fossa. Pull forward (anterior lag = ACL tear) and push back (posterior lag = PCL tear).
    - **Lachman's test:** knee flexed to 30˚, hold one hand on top of thigh and other below calf. Pull calf anteriorly (more sensitive for ACL laxity).
  - **Meniscus tears**
    - **McMurray's test:** warn patient test may cause pain. Flex knee as much as possible. Use one hand to externally rotate their foot & put it over to the contralateral side of the patient; apply lateral force to knee with the other hand and extend the knee joint (stresses med meniscus). Then do the opposite (stresses lat meniscus). Positive test = painful click felt or heard (meniscal tear).
    - **Apley's grind test:** with patient prone, apply axial load to knee while flexed to 90˚ and rotate foot
  - **Patellofemoral apprehension test:** flex knee while pressing patella laterally. If patella is unstable, patient will anticipate dislocation and stop test.

Function

- **Squat test**
- (**Gait**: seen already)

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To complete exam

- "To complete my examination I would examine the joint above and joint below, and also do a full neurovascular exam distal to the joint – would you like me to do this now?"
- Summarise and suggest further investigations you would do after a full history

Common pathology

- **Anterior cruciate ligament tear**
  - Usually torn in twisting injury
  - May feel pop and effusion usually develops within 1 hour ± haemarthrosis
  - Initial pain makes full examination difficult before 2 weeks
  - Signs: increased laxity on anterior draw test
  - Treated with rest and physio and arthroscopic graft reconstruction may be required
- **Posterior cruciate ligament tear**
  - Usually due to high energy trauma
  - Signs: increased posterior laxity on posterior draw test
- **Meniscal tears**
  - Usually torn in twisting injury
  - Swelling develops a few hours later
  - Sharp localised medial or lateral pain exacerbated by hyperflexion/twisting
  - Knee may lock or give way
  - Signs: tender over medial/lateral joint line, good ROM unless knee is locked, positive McMurrays/Apleys test
  - MRI or arthroscopy can confirm and meniscal tear is usually excised arthroscopically
- **Collateral ligament tears**
  - Signs: varus laxity (LCL) and valgus laxity (MCL), effusion, tenderness over affected ligaments
  - Treated with rest and support
- **Osteoarthritis**
  - Pain and stiffness
  - Signs: reduced ROM, crepitus
- **Prepatellar bursitis (Housemaid's knee)**
  - Localised swelling over patella
  - Precipitated by period of kneeling
  - Signs: tenderness over patella, normal ROM
  - Treated with rest and NSAIDs

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