

Examination of the Knee

Wash your hands & Introduce the exam to the patient

Positioning & Draping

- With the patient supine, make sure both legs are exposed in order to compare each side
- be sure to use draping to cover the patient's groin

Inspection

- masses, scars, and lesions (trauma)
- atrophy/hypertrophy
- erythema (redness)/discolouration
- swelling –especially in the medial fossa & suprapatellar pouch
- muscle bulk/symmetry

Palpation

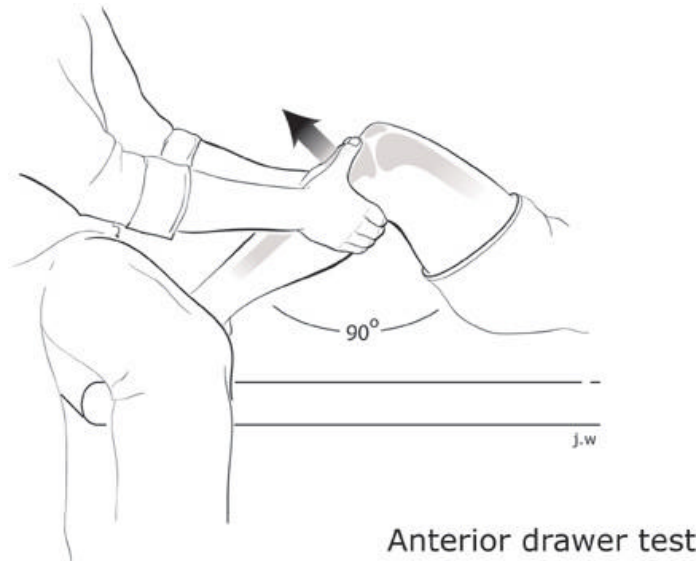
- Temperature
 - with the back of your fingers, feel above, below, and on the kneecap
 - the kneecap is normally the coldest part of the joint
 - compare each side
- Joint line tenderness
 - flex the patient's knee to ~90°
 - find the tibial tuberosity & patellar tendon
 - feel along the joint line with your thumbs
 - each side of the joint should be palpated separately for tenderness
- Joint effusion
 - Bulge sign
 - milk fluid from the medial fossa to the suprapatellar pouch to the lateral fossa, then look at medial aspect of the knee for a bulge (indicating excess fluid)
 - no bulge could indicate:

- no fluid
- a large excess of fluid
- Ballottement
 - with one hand, milk the fluid from the suprapatellar pouch
 - using the index finger and thumb of your other hand, attempt to push the fluid back-&-forth between the medial and lateral fossae
- Patellar tap
 - milk fluid from the suprapatellar pouch
 - push down on the patella and feel for a clunking noise

Special maneuvers

- Range of motion (ROM)
 - Active
 - with their heel off the bed, get the patient to:
 - touch their heel to their buttocks
 - straighten their leg
 - the patient should have full ROM (i.e.) ~120° flexion & full extension
 - Passive
 - fully flex & extend the limb while maneuvering your hand over the medial & lateral aspects of the joint as well as the kneecap in order to feel for crepitus
- Stability testing
 - Anterior Cruciate Ligament (ACL)
 - Anterior drawer test (ADT) (see Figure 1)
 - flex the knee to ~90° and ask the patient to relax their leg
 - stabilize the patient's foot (often done by lightly sitting on the patients foot)
 - grasp the tibia near the knee joint and pull forward
 - if the ACL is damaged, look for the tibia to slide forward (like a 'drawer' opening). This is a positive ADT.

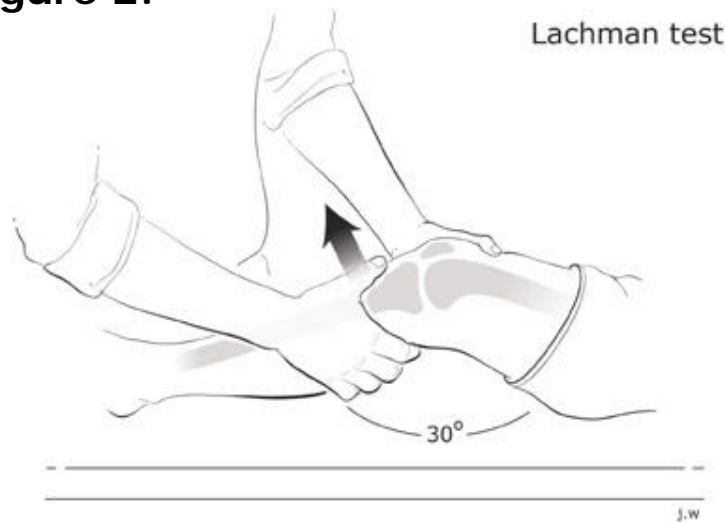
Figure 1:



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- Lachman test (optional) (see Figure 2)
 - flex the knee to $\sim 25^\circ$ and ask the patient to relax their leg
 - with one hand, grasp the thigh just above the knee joint in order to stabilize the femur
 - with your other hand, grasp behind the tibia just below the knee joint and pull forward briskly
 - if the ACL is damaged, look for the tibia to slide forward. This is a positive Lachman test.

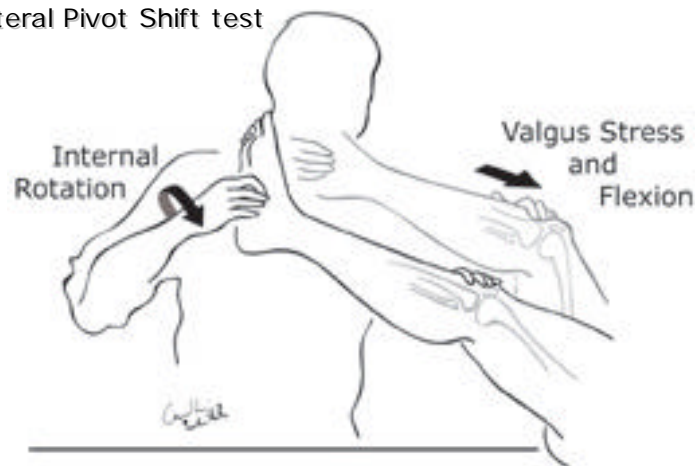
Figure 2:



- The Lateral Pivot Shift test (optional)(see Figure 3)
 - with the knee at $\sim 45^\circ$ flexion, place one hand over the patient's knee
 - with your other hand, internally rotate the foot
 - while applying a valgus stress, extend the patient's leg
 - if a 'thud' or 'jerk' sensation occurs at $\sim 15^\circ$ flexion, the test is positive

Figure 3:

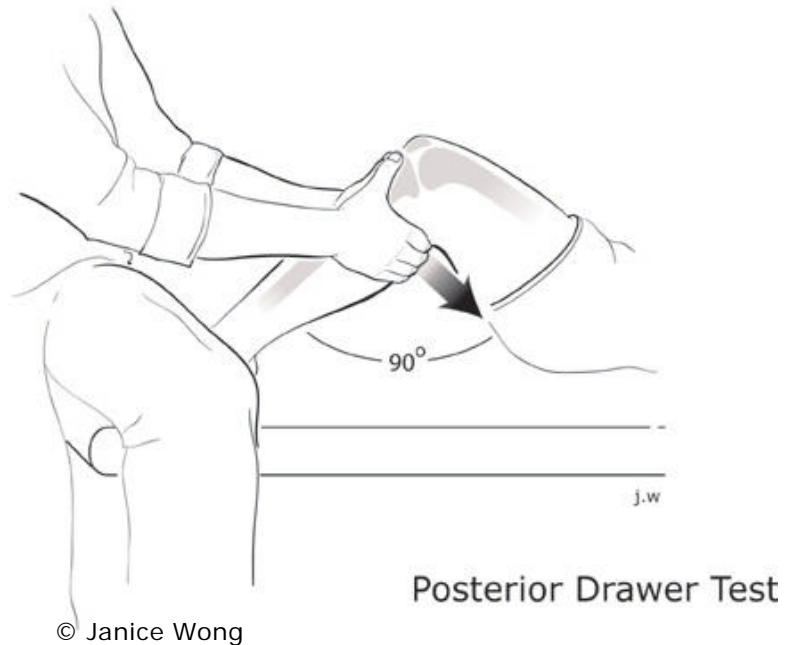
The Lateral Pivot Shift test



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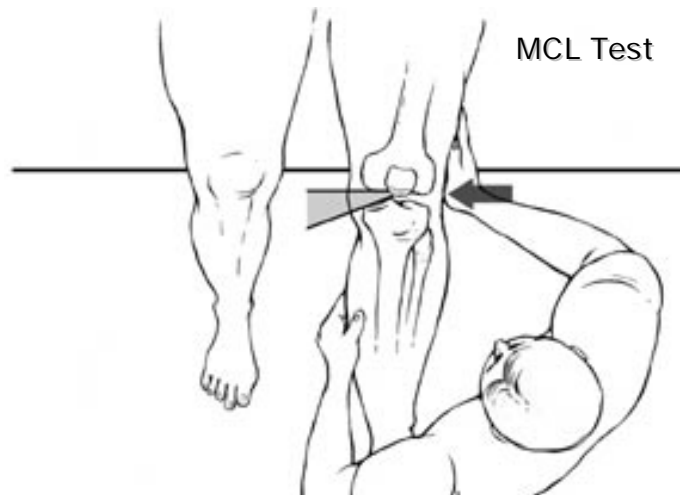
- Posterior Cruciate Ligament (PCL)
 - Posterior drawer test (PDT) (see Figure 4)
 - flex the knee $\sim 90^\circ$ and ask the patient to relax their leg
 - stabilize the patient's foot
 - grasp the lower leg near the knee joint and push backward
 - if the PCL is damaged, look for the shin to slide backward. This is a positive PDT.

Figure 4:



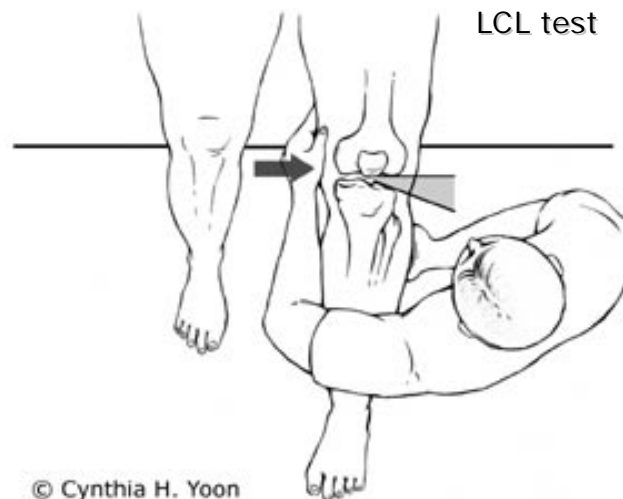
- Medial Collateral Ligament (MCL) (see Figure 5)
 - with the leg slightly flexed, place your hand over the medial aspect of the knee joint and apply a valgus strain
 - if the medial aspect of the knee 'opens up' too much, it is an indication of MCL damage

Figure 5:



- Lateral Collateral Ligament (LCL) (see Figure 6)
 - with the leg slightly flexed, place your hand over the lateral aspect of the knee joint and apply a varus strain
 - if the lateral aspect of the knee ‘opens up’ too much, it is an indication of LCL damage

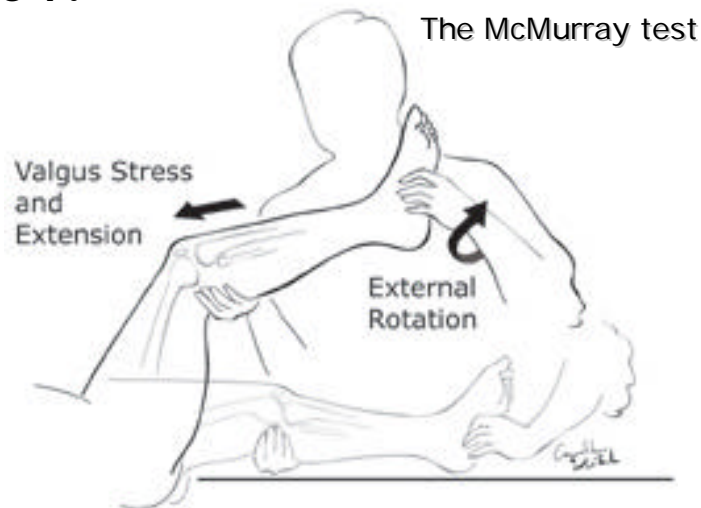
Figure 6:



- Tests for meniscal damage
 - Joint line tenderness
 - bend the knee 90°
 - find the tibial tuberosity & patellar tendon
 - feel along the joint line with your thumbs
 - each side of the joint should be palpated separately for tenderness
 - The McMurray test (see Figure 7)
 - with the knee at ~90°, place one hand under the patient’s knee

- with your other hand, externally rotate the foot
- while applying a valgus stress, extend the patient's leg
- repeat with the foot internally rotated
- if a grinding sensation is palpated, the test is positive

Figure 7:



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- The medial-lateral grind test
 - place one hand under the patient's knee
 - while working the leg through its ROM, apply valgus and varus stresses during flexion and extension
 - if a grinding sensation is palpated, the test is positive
- Observe Bony alignment
 - with the patient standing, look for:
 - valgus deformity ("knock-kneed")
 - varus deformity ("bow-legged")
 - genu recurvatum ("back knees")
- Gait analysis
 - Antalgic gait

- with knee injuries, in order to avoid pain during weight bearing, the patient will try to minimize the time the injured limb spends in the stance phase
- patients with knee pain do not extend or flex their leg fully while walking