

Stiffness : ↓ active ROM
NL passive ROM

Contracture : ↓ both active

The Hand:

The hand is a class III lever system.

Look:

- Expose both hands. Inspect the skin (changes), soft tissues (swelling), muscles (wasting), nails, joints and bone (deformities). Examine dorsum and palm.

Feel:

- **Temperature**, compare both hands. Notice sweaty or dry hands.
- **Tenderness and swelling** in each joint. Wrist (press with both thumbs on dorsal aspect, fluctuate to assess sponginess (synovial inflammation) and notice tenderness). Assess MCPs using both thumbs for tenderness and sponginess (you can use the thumb and the index for the 2nd MCP). Press the PIPs and DIPs between your thumb and index for the 2nd MCP. Sponginess and tenderness. Squeeze all MCPs (except first MCP) at once with your grip to assess tenderness (MCP squeeze test). + wrist

Move:

- **Power**: ask the patient to grip on two of your fingers, assess power.
- **Range of motion** at wrist (extension and flexion at 90 degrees), at MCPs and phalangeal joints, ask the patient to count on his fingers (opponens).

Nerves:

- **Median**: motor: ask the patient to create an OK sign (this is composed of thumb opposition/rotation, by median proper, and flexion of first IP joint, by anterior interosseous nerve. Sensor: assess sensation in the pulp of index finger (median nerve supplies lateral three and a half fingers).
- **Ulnar**: motor: finger adduction and abduction. Sensory: assess sensation in the pulp of little finger (ulnar supplies medial one and a half fingers).

Power
Flaw
- FDS
- FDP
- FPL
- FPP



De Quervain's tenosynovitis: inflammation of the first extensor compartment (lateral to radial styloid, contains tendons of extensor polices brevis and abductor polices longus).

- **Frinkelstein's test:** ask the patient to place their thumb in their palm and close the fist on it, and medially deviate the wrist with your hand. Positive test: pain above the radial styloid. This can cause discomfort in people who write with a pen often.

- **Radial:** motor: extension of MCPs (this is specifically done by radial nerve only, unlike IP joint flexion which also uses the interossei).
Sensory: assess sensation on the dorsum of first interosseous muscle.

Tendons:

- **Flexor digitorum superficialis** FDS: acts on PIPs, is made of 4 separate muscles, hence you need to examine each finger separately. Hold all fingers with your hand except for the one to be tested, ask the patient to close their hand, notice PIP flexion of free finger.
- **Flexor digitorum profundus** FDP: acts on PIPs and DIPs, is one unit. Hold the finger to be assessed and fix its DIP, ask the patient to close their hand, notice flexion of DIP of the fixed finger.
- **Direction of finger flexion:** normally, towards the scaphoid tubercle. This is important for a functional grip, especially when doing a surgery for a fracture.

Masses: for example: Bouchard's (PIP) and Heberden's (DIP) seen in primary osteoarthritis.

Carpal Tunnel Syndrome:

- A very common condition, is a compressive neuropathy of the median nerve in the carpal tunnel (also contains tendons of FDS, FDP and Flexor pollicis longus). Treated by median nerve release. The median nerve passes exactly in the midline of the forearm deep to palmaris longus. The distal wrist crease is the proximal margin of the flexor retinaculum (roof of carpal tunnel).
- **Carpal Compression test:** most accurate test. Compress with your thumb on the point proximal to the distal wrist crease for 1 minute. Positive test: numbness, paresthesia or pain in the lateral 3 ½ fingers.
- **Tinel's test:** tap with your finger on the same point for 1 minute. Positive test: numbness or paresthesia on the lateral 3 ½.
- **Phalen's test:** flex the patients wrist for 1-2 minutes. Positive test: numbness, paresthesia or pain in the lateral 3 ½ fingers. You also can use the reverse prayer sign for this test.

The Knee Joint:

Look:

- **Gait:** for example: antalgic gait (short stance phase) due to a lower limb joint problem causing pain (non-specific).
- While the patient is supine, from the foot of the bed, notice:
 - Alignment: normally the knee joint is valgus (at 5-7 degrees)
 - Muscle bulk: notice vastus medialis atrophy, calf muscle and quadriceps
 - Posteriorly: notice Baker's cysts
 - Also: position of patella, redness, hotness, scars, sinuses, hair distribution, asymmetry, swelling, sutures.

Feel:

- Patella, examine temperature and compare both limbs
- Femoral condyles, should be smooth
- Joint lines, notice tenderness (indicating pathology)
- Head of fibula
- Hamstring muscles
- Posterior aspect of knee
- Patellar tendon
- Tibial tuberosity

Move:

- Range of motion: start with active motion, than passive.
- Flexion/extension: range is usually 0-140 degrees, the extent of flexion varies according to the mass of thigh muscles (can reach 160 degrees in the lean, and less than 140 in the obese or body builders).
- Abnormal range of flexion is when the movement stops before the calf touches the thigh.
- Extension: full extension is to 0 degrees. In men it is normal to reach up to 10 degrees (slight flexion), while in women it is normal to reach -10 degrees (slight hyperextension) due to laxity of joints.
- Listen for crepitus (usually in osteoarthritis).

- Ask the patient to extend his leg and try to hold it in the air to assess extensor weakness.

Special Tests:

1- McMurray's test: for medial and lateral menisci

- Flex the knee to 90 degrees, feel the joint lines with your left hand (between femoral condyles and tibial head), and hold the foot with your right hand (the foot not the leg).
- To examine the medial meniscus: extend the knee, then flex while externally rotating it and place it in a valgus position. A sensation of a clunk on the medial side of the joint line is a positive test.
- To examine the lateral meniscus: extend the knee, then flex while internally rotating it and place it in a varus position. A clunk laterally is a positive test.
- For both, repeat the extension-flexion cycles a number of times, each time reducing the degree of flexion. (Extend the knee then flex it to 90 degrees, then extend it back and flex it to 60 degrees for example and so on).

2- Medial and Lateral Collaterals test: the medial collateral ligaments prevents valgus deformity and the lateral collateral prevents varus deformity in the normal knee.

- Extend the knee fully, and hold the foot and place it between your elbow and waist. Place one hand on the lateral joint line and the other hand on the medial line.
- Move your body to force a valgus position, feel an opening of the medial joint line, this indicates failure of anterior cruciate ligament (ACL), posterior cruciate (PCL) and the medial collateral ligament (all of them).
- Repeat for a varus position, opening of the lateral crease indicates failure of ACL, PCL and the lateral collateral (all of them).
- If the test was negative on full extension of the knee, repeat while flexing it at 30 degrees. This, however, indicates failure of the lateral or medial collaterals, it does not indicate anything regarding the cruciate ligaments.
- It is normal to have lateral crease opening at 30 degrees flexion, up to 1-2mm is normal and not failure of lateral collateral.

- move the fluid back to the medial gutter, bulging of the medial gutter is a positive milking test. The test is negative in a massive effusion.
- **Transmitted thrill:** close the suprapatellar pouch with your left hand and the lower aspect of the knee with your right hand. Feel with your fingers the medial and lateral sides of the patella. Alternate between feeling fluid thrill in one side by pushing in the other side.
- **Patellar tap:** using the thumb or the index and middle fingers, push the patella down and release quickly, notice a rebound of the patella where it jumps back quickly on your finger, indicating a massive effusion. You can close the suprapatellar pouch to exaggerate the test.

Patellar Apprehension: place your thumb on the lateral side of the patella and push it laterally while gradually flexing the knee, apprehension (the patient is scared of moving the patella) usually at 30 degrees of flexion indicates recurrent patellar dislocation.

Patellofemoral joint: Grinding test:

- Ask the patient to tense quadriceps then relax it.
- Place your thumb on superior pole of the patella and ask the patient to tense the muscle, notice pain. Pain indicates a pathology, however discomfort is normal.

Examine the ankle, hip, lower limb vascular system and the lumbar spine.

Done by
Mohamed Al
sth yr Med

3- **Lachman's test:** for ACL, it normally prevents anterior translocation of tibia on femur.

- Ask the patient to relax his knee, hold the distal end of femur with the left hand, hold the proximal end of tibia with the right hand, try to translocate tibia on femur anteriorly (move your right hand toward you and the left towards the floor, repeatedly). Feel for a stiff end point (abrupt stiffness at maximal anterior translocation), this is normal (negative) test. Absent stiff end point (positive) indicates ACL rupture.
- To make it easier, you can place your knee under the patients flexed (30 degrees) knee (under the distal femur). Place left hand above the distal femur and move tibia with your right hand.

4- **Drawer's test:** for ACL and PCL.

- Flex the knee at 90 degrees, prevent the foot from rotating to relax the hamstring muscles by sitting on it, place both hands behind tibia (thumbs on tibial tuberosity and fingers along lower popliteal fossa).
- Posterior Drawer test: move tibia away from you, any translocation indicates PCL rupture. Always perform the posterior test before the anterior test, PCL rupture can mimic a positive anterior test.
- Anterior Drawer test: move the tibia towards you, normal translocation is less than 5mm. +1 translocation is 5mm. +2 is more than 5 to 10mm. 3+ is above 10mm.

See effusion:

ok:

- **Medial gutter hollow sign:** flex the knee to 15 degrees and notice fullness in the medial gutter posterior to the patella, any fullness is an early sign of effusion.

el:

- **Milking test:** extend the knee fully, milk the medial gutter with your hand and then close the suprapatellar pouch by swiping your other hand across the thigh to the top of the patella. Fluid will shift to the lateral side. Release and press on the lateral side with your thumb to

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