Special Tests of The Hip Joint

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Tests & Measurements

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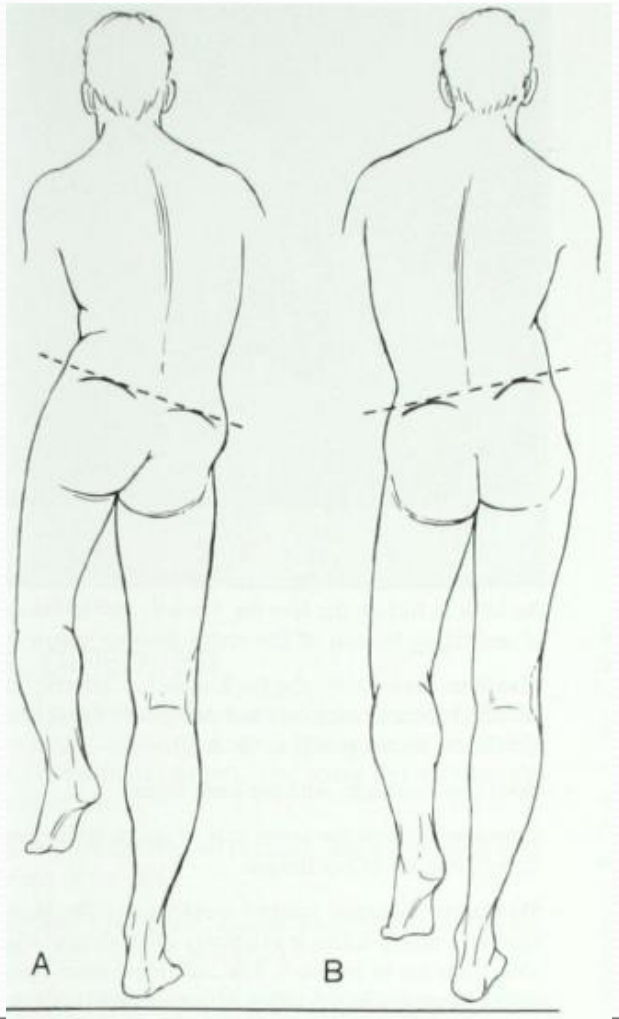
- Trendelenburg Test
- Thomas Test
- Iliotibial Band Shortening Test (Ober's Test)
- Leg Length Discrepancy Tests
  - True Leg Length Discrepancy Test
  - Apparent Leg Length Discrepancy Test
- Tests for Congenital Hip Dislocation
  - Ortolani's test
  - Barlow's test

TRENDELENBURG TEST

Trendelenburg Sign and Hip Abductor Weakness

- Along with the gluteus medius muscle, the gluteus minimus assists in abducting, or lifting, the thigh outwards.
- They play an important part in keeping the torso upright when the foot of the opposite side is off the ground during walking and running.
- strong hip abductors can stabilize the pelvis on the femur in hip joint abduction, ***as shown in Figure A.***



- ***Figure B shows*** a position of hip joint *adduction* that results when hip abductors are too weak to stabilize the pelvis on the femur. The pelvis drops downward on the opposite side.
- Figure B indicates a positive ***Trendelenburg Sign*** On the right side i.e. Weak right gluteus medius muscle.

- Figure A indicates a negative ***Trendelenburg Sign*** On the right side i.e. Strong right gluteus medius muscle.

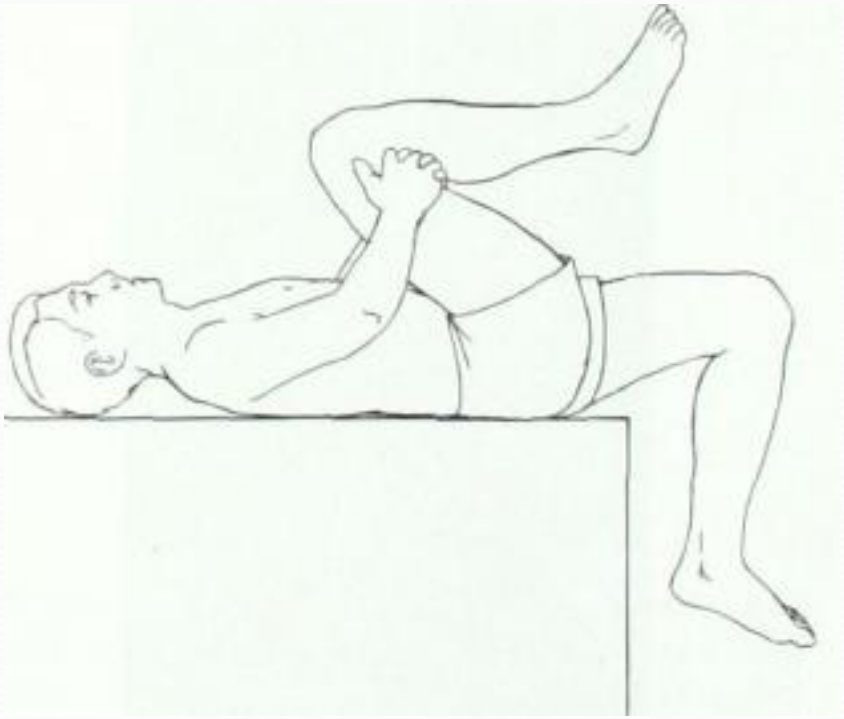
- With paralysis or marked weakness of the gluteus medius, a gluteus medius limp (waddling gait) will occur in walking.

Testing Procedures

- Patient stands with feet about 12 inches apart.
- Patient then stands on the affected limb.
- Normally the abductor muscle of the affected limb (gluteus medius) will contract to hold the pelvis stable.
- If the abductor muscles (gluteus medius) are not functioning (become weak and atrophy, or have a nerve lesion (L5)) then
- The pelvis will fall away on the opposite side.

TRENDELENBURG GAIT

- With hip disease the abductor muscle group (gluteus medi becomes weak.
- With walking, when standing on the affected limb the abductors cannot hold the pelvis level.
- This would result in the patient falling over because the pe drops.
- To counteract this, the patient actually leans over the affected limb to alter the center of gravity (fascinating!!).
- Waddling Gait (Trendelenburg Gait).
- Often a sign of bilateral hip disease and is really a bilateral Trendelenburg gait .



Thomas Test

Thomas Test

- This is a test for a hip flexion contracture. It is done as follows:

-Examining from the patients right hand side.

-Ask the patient to bring both knees up into their chest.

-Put your left hand underneath their lumbar spine to make sure it is flat on the bed.

-Ask the patient to let their right leg drop down flat on the bed while holding the left knee into the chest.

-The right leg should be able to drop flat down onto the bed and the lumbar spine should stay flat on the bed.

-Alternate legs and do the same thing with the other legs.

Normal Thomas Test

Abnormal Thomas Test

- **Abnormal Test:** *With the lumbar spine flat on the bed the patients leg does not extend downwards to lie flat on the table.*

Substitutions

- Patients will sometimes hyperextend the lumbar spine which will allow the leg to fall flat on the table.
- This will "trick" you into thinking that the hip has full extension.
- So make sure that the lumbar spine stays flat on the table through this test.
- A concomitant knee flexion contracture will impair the patient's ability to place the leg flat on the table.
- Again, this may "trick" you into thinking that a contractur exists in the hip.

- To overcome this, move the patient down the table to let their knees and lower legs hang over the edge of the bed.
- This will take the knee flexion contractures out of the picture.

True& Apparent or Functional leg length discrepanci

-It is important to distinguish true leg length discrepancy from apparent leg length discrepancy.

- Apparent discrepancy is due to an instability of the hip, due to pelvic obliquity or from adduction or flexion deformity in the hip joint. During inspection, pelvic obliquity manifests itself as uneven anterior or posterior superior iliac spines while the patient is standing.

- A true shortening may be the result of poliomyelitis, or of a fracture that crossed the epiphyseal plate during childhood.

- **True leg length discrepancy**

- To determine true leg length, first place the patient legs in precisely comfortable positions and measure the distance from the anterior superior iliac spines (ASIS) to the medial malleoli of the ankles from fixed bony point to another).

True LLD
Pelvis level

- Unequal distances between these fixed points verify that one lower extremity is shorter than the other.

- To determine in short order where the discrepancy lies (whether in the tibia or in the femur), ask the patient to lie supine, with his knees flexed to 90 degrees and his feet flat on the table.

- If one knee appears higher than the other, the tibia of that extremity is longer. While, if one knee projects further anteriorly than the other, the femur of that extremity is longer.

- **Apparent or Functional leg length discrepancy**

- Establish that there is no true leg length discrepancy before testing for an apparent discrepancy, in which there is no true bony inequality.

Apparent LLD
Pelvis tilted

- Have the patient lie supine with his legs in as neutral position as possible.

- take a measurement from umbilicus to medial malleoli of the ankle from a non fixed point to a fixed bony point).

-Unequal distances signify an apparent leg length discrepancy, particularly if the true leg length measurements are equal.

- **Iliotibial Band Shortening Test (Ober's Test)**

-Have the patient lie on his side with his involved leg uppermost.

-Be sure the patient does not move the pelvis forward or backward.

-Abduct the leg as far as possible, flex the knee to 90°, then extend the hip. Slowly release the patient's leg.

-If the iliotibial band is normal, the patient's thigh should
to the adducted position.

-If there is a shortening of the fascia lata or iliotibial band, the thigh remains abducted when the leg is released (positive test).

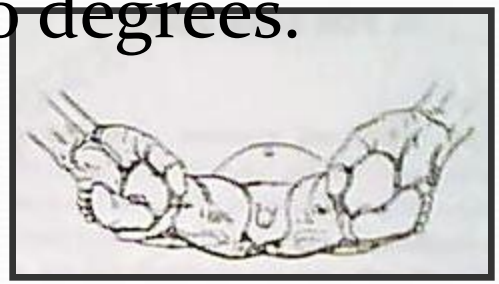
Tests for Congenital Hip Dislocation

- **Ortolani's test**

-The patient is positioned in supine with the hips flexed to °and the knees flexed.

-The therapist grasps the legs so that their thumbs are placed along the patient's medial thighs and the fingers are placed on the lateral thighs toward the buttocks.

-The therapist abducts the infant's hips and gentle pressure is applied to the greater trochanters until resistance is felt at approximately 30 degrees.



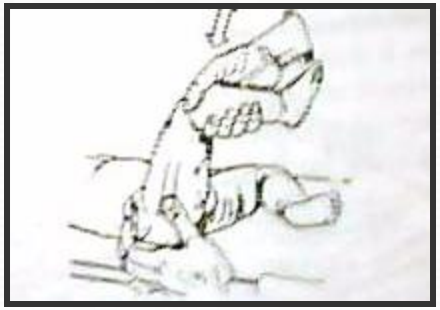
-A positive test is indicated by a click or clunk and may be indicative of a dislocation being reduced.

- **Barlow's test**

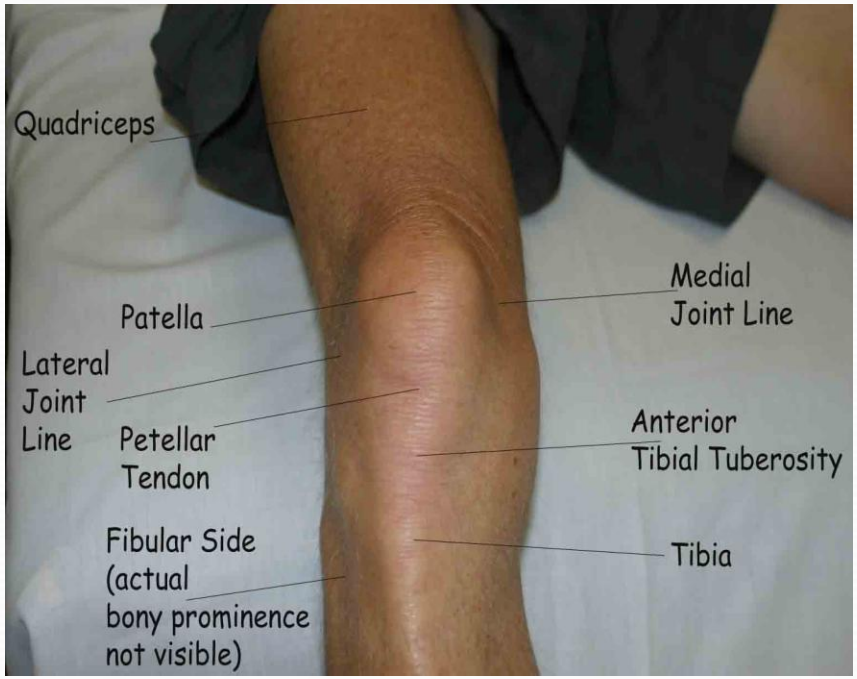
-The patient is positioned in supine with the hips flexed to 90 ° and the knees flexed.

-The therapist tests each hip individually by stabilizing the femur and pelvis with one hand while the other hand moves the test leg into abduction while applying forward pressure to the greater trochanter.

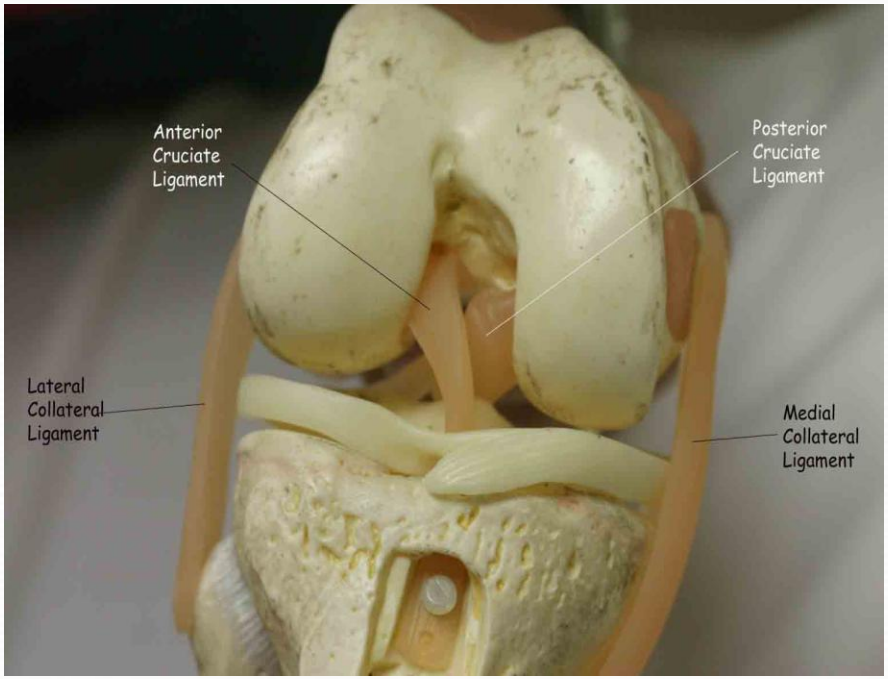
A positive test is indicated by a click or a clunk and may be indicative of a hip dislocation being reduced.



SPECIAL TESTS OF THE KNEE JOINT



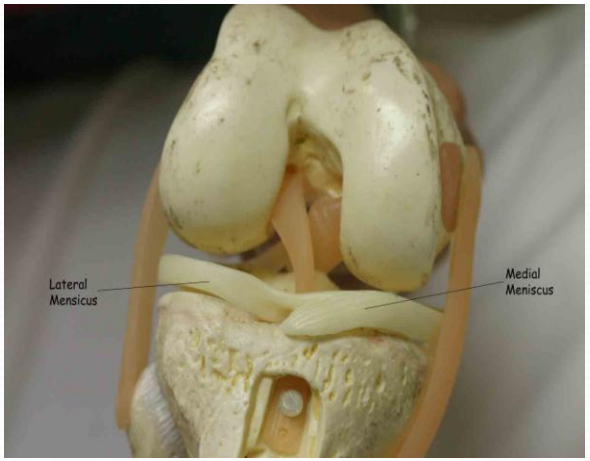
Surface anatomy of Right Knee



Anatomy of Ligaments& Menisci, Right Knee

Tests for Meniscal Injury

- The menisci sit on top of the tibia and provide a cushioned articulating surface between the femur and tibia .
- Symptoms occur when a torn piece interrupts normal smooth movement of the joint .



Anatomy of Menisci, Right Kne

- This can cause a sensation of pain, instability ("giving out" or locking in position .
- Injury may also cause swelling .
- Damage can occur to the underlying bone, leading to degenerative arthritis .

O *McMurray's Test*

- When examining the right knee, place your left hand so that your middle, index, and ring fingers are aligned along the medial joint line .
- Grasp the foot with your right hand and fully flex the knee .
- Gently turn the ankle so that the foot is pointed outward.
- While holding the foot in this everted position, gently exte the knee while applying valgus stress.
- If there is medial meniscal injury, you will feel a "click "

Appley's Grind Test

- Helpful in the diagnosis of a torn meniscus.
- Have the patient lie on their stomach .
- Grasp one ankle and foot with both of your hands and gen flex the knee to ninety degrees .
- Hold the patients leg down by gently placing your leg over the back of their thigh .

Push down gently while rotating the knee medially and laterally .

- This maneuver places direct pressure on the menisci. If injured, it will cause pain .
- Test the opposite leg in the same fashion .

Distraction Test

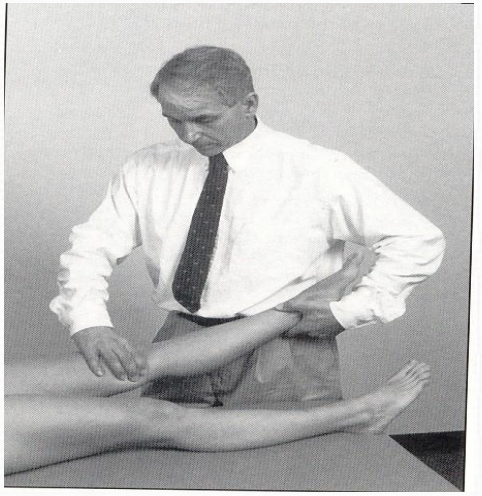
- The distraction test helps to distinguish between meniscal and ligamentous problems of the knee joint.
- The same progression as compression test but apply traction to the leg while rotating the knee medially or laterally.
- This maneuver reduces pressure on the meniscus and puts strain upon the lateral and medial ligamentous structures.

If the ligaments are damaged, the patient will complain of pain, if the meniscus alone is torn, the test should not be painful for him.

- ***Reduction Click***
  - The patient lies supine on the table and the examiner holds his heel and foot with one hand and the knee with the other, so that thumb and fingers touch each side of the joint line.
  - The aim of the reduction click procedures is to reduce the displaced and torn portion of the meniscus by clicking it back into place.
  - To do this, flex the knee while it is rotated both internally externally.

- Then rotate and extend the leg until the meniscus slips back to its proper position and you hear a characteristic click.
- This test will unlock a locked knee and permit full extensi

- ***Bounce Home Test***



- This test is designed to evaluate a lack of full knee extension, most often secondary to a torn meniscus, a loose body within the knee joint, or an intracapsular joint swelling.

- With the patient supine on the table, cup his heel in your palm and bend his knee into full flexion.

- Then, passively allow the knee to extend completely.
- The knee should extend completely or bounce home into extension with a sharp end point.
- If the knee falls short, offering a rubbery resistance to further extension, there is probably a torn meniscus or some other blockage, and bounce home motion cannot take place.

Tests for Injury to the Ligaments

- ***Medial Collateral Ligament***

- Slightly flex the right knee (~30 degrees).

- Place your left hand along the lateral aspect of the knee .
  - Place your right hand on the ankle.
  - Push steadily inward with your left hand while supplying a opposite force with the right .
  - If the MCL is completely torn, the joint will "open up" alon the medial aspect .
  - Additionally, palpation along the course of the ligament m also elicit pain if it has been injured .

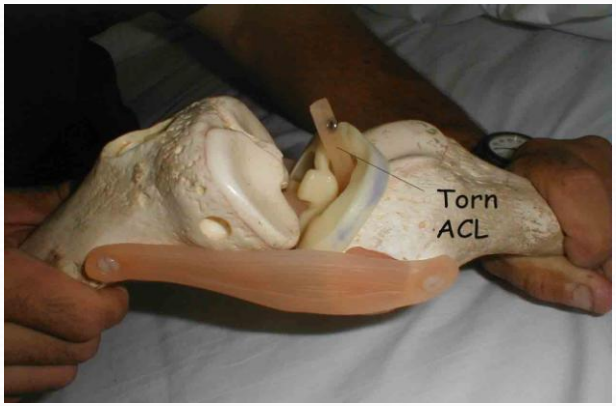
Lateral Collateral Ligament

- Slightly flex the right knee (~30 degrees) .
- Place your right hand along the medial aspect of the knee .
- Place your left hand on the ankle .

- Push steadily outward with your right hand while supplying an opposite force with the left .
- If the LCL is completely torn, the joint will "open up" alon the lateral aspect .
- Additionally, palpation along the course of the ligament m also elicit pain if it has been injured .

Anterior Cruciate Ligament (Anterior Drawer Test)

- Have the patient lie down, with the right knee flexed such that their foot is flat on the table .
- Gently sit on the foot. Grasp below the knee with both hands, with your thumbs meeting along the front of the tibia .
- Gently pull forward, gauging how much the tibia moves forward in relation to the femur .



- If the ACL is completely torn, the tibia will feel unrestrained in the degree to which it can move forward .

Posterior Cruciate Ligament (Posterior Drawer Test)

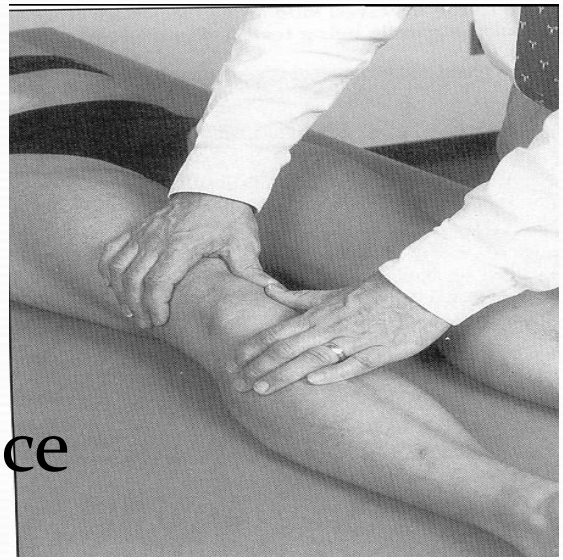
- Have the patient lie down, the right knee flexed to 90 degrees, foot flat on the table .

- Gently sit on the foot. Grasp below the knee with both hands, with your thumbs meeting along the front of the tibia .

- Gently push backward, gauging how much the tibia moves in that direction in relation to the femur .
- If the PCL is completely torn, the tibia will feel unrestrained in the degree to which it moves backwards .

Apprehension test for patellar dislocation and sublu

- Ask the patient to lie supine on the examining table, with his legs flat and the quadriceps relaxed.



- If you suspect that the patella may dislocate laterally, press against the medial border of the patella with your thumb.
- If everything is in order, this will produce little reaction.
- However, if the patella begins to dislocate, the expression on the patient's face will become one of apprehension and distress

Ballotable Patella Test

- Tests for knee effusion
- An effusion is the accumulation of fluid within the joint space .
- Slightly flex the knee which is to be examined .
- Place one hand on the supra-patellar pouch, which is above the patella and communicates with the joint space .
- Gently push down and towards the patella, forcing any fluid to accumulate in the central part of the joint .

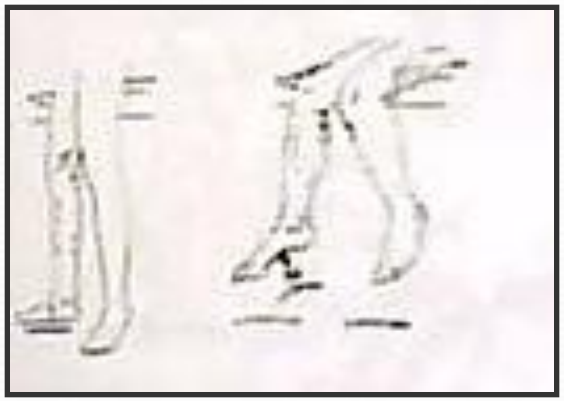
- Gently push down on the patella with your thumb .
- If there is a sizable effusion, the patella will feel as if it's floating and "bounce" back up when pushed down .

- Effusions resulting from inflammatory arthritis (e.g. infection, gout, rheumatoid arthritis) are associated with other signs of inflammation, including: warmth, redness, pain with any movement .

SPECIAL TESTS OF THE ANKLE JOINT

Test for Rigid or Supple Flat Feet

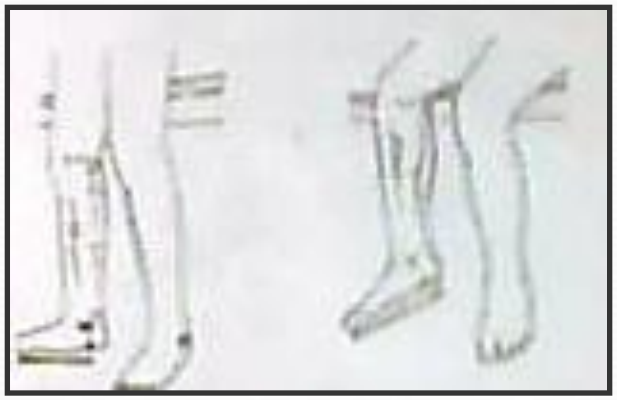
- Observe the patient's feet as he stands on his toes and whi
he is seated.



Supple flat feet present a visible longitudinal arch in positions other than standing

- If the medial arch is absent in all positions, the patient has
rigid flat feet.

- If the arch is present while he is on his toes or sitting and absent only when he stands, his flat feet are supple and are correctable with longitudinal arch supports.



Rigid flat feet remain flat in any position

Ankle Dorsiflexion Test

- When the ankle cannot be dorsiflexed or brought to the plantar grade position with the knee extended, limitation of motion to be caused by either the gastrocnemius or the soleus muscles.
- First, flex the knee joint, if you are able to achieve ankle dorsiflexion when the knee is flexed, the gastrocnemius muscle is the cause of limitation, since the soleus is a one-joint muscle i.e. it is not affected by flexion of the knee.
- If the soleus is responsible for the limited motion, the limitation will be the same whether the knee is flexed or not .

Homan's Test

- Test for deep vein thrombophlebitis.
- With knee extended and foot off table, ankle is moved into dorsiflexion.
- Pain in calf is a positive sign and should be referred.

Anterior Drawer Test

-Patient is sitting over the edge of the table with the knee bent.

-Therapist stabilizes the lower leg with one hand & cups the calcaneus with the forearm Supporting the foot in slight plantar flexion (20°) and slight inversion (few degrees).

-Therapist draws the calcaneus & talus anteriorly and slightly medially.

-Pain, anterior translation, dimple/sulcus, and/or "clunk“, indicate ATF ligament sprain/capsular sprain

Varus/Valgus Stress Testing of the MTP

-Patient is supine or sitting with his/her knees extended.

-Therapist stands lateral to the involved foot.

-Therapist stabilizes the proximal bone close to the joint to be tested.

-Therapist grasps the bone distal to the joint to be tested near the middle of its shaft.

-Therapist moves the distal bone medially/laterally, attempting to open up the joint.

-Increased laxity or pain indicate Collateral ligament sprain

Thompson's Test

-Patient is prone with his/her knee extended.

-Therapist squeezes the calf musculature while observing for ankle plantar flexion.

-If the Foot does not plantar flex when calf is squeezed, Achilles tendon may be rupture.

Supple Pes Planus Test

- Patient is sitting on the edge of the table

-Therapist is positioned on a stool facing the Patient.

-Therapist notes the presence of a medial longitudinal arch.

-Therapist has the patient stand with his/her body weight evenly distributed.

-Medial longitudinal arch disappears when weight bearing Supple Pes Planus.

Kleiger's (External Rotation) Test

-Patient is sitting with his/her legs over the edge of the table

-Stabilizes the lower leg with one hand

-Therapist grasps the medial aspect of the foot while supporting the ankle in neutral

-Therapist rotates the foot laterally

-Medial/lateral joint pain; indicate Deltoid ligament sprain

-syndesmosis (anterior Tib–fib) pain, indicate syndesmosis involvement

Inversion Talar Tilt Test

- Patient is sitting with his/her legs over the edge of the table
- Therapist grasps the calcaneus with one hand & stabilizes the lower leg with the other hand
- Therapist provides inversion stress rolling the calcaneus inward while the ankle is in neutral
- Therapist provides an inversion stress by rolling the calcaneus inward while the ankle is in the plantar flexed position.
- Talus tilts or gaps excessively; pain, indicates involvement of ATF (PF position)/CF (neutral position)

Eversion Talar Tilt Test

-Patient is sitting with his/her legs over the edge of the table

-Therapist grasps the calcaneus with one hand & stabilizes the lower leg with the other hand

-Therapist provides an eversion stress rolling the calcaneus outward while the ankle is neutral

-Talus tilts or gaps excessively; pain, indicate Deltoid ligam sprain.