

Lower Extremity Special Tests

Hip Special Tests

- **Trendelenburg Test:** a test for weakness of the gluteus medius muscle during unilateral weight bearing. Therapist is positioned behind patient to observe the pelvis. The patient assumes a unilateral stance on the test side extremity. A positive sign is indicated by the pelvis dropping toward the unsupported limb.
- **Faber's (Patrick) Test:** a test designed to alert the examiner to the possibility of hip pathology or SI joint dysfunction. The examiner places the test limb in flexion, abduction and external rotation so that the foot of the test limb rests on the patient's opposite knee. The examiner then passively presses the test limb toward the table while applying stabilizing counter pressure on the opposite ilium. The test is positive if there is noted pain in the back or the tested limb or if the tested limb remains in a plane above the opposite limb. This may indicate tightness of the hip flexors, adductors or joint capsule of the hip.
- **Sign of the Buttock:** a test for determining whether a patient's buttock pain has its origin in the buttock as a local lesion or is referred from the hip, sciatic, nerve or hamstring muscles. The examiner performs an SLR test on the subject to the point of buttock pain and notes the degree of hip flexion. After returning the limb to a neutral position, the limb is subsequently again flexed at the hip but this time the knee is also flexed. If the amount of hip flexion is greater with the knee flexed as compared to extended
- **Scouring (Qudarant) Test:** a test for non-specific joint pathology. The examiner takes the test extremity and passively brings it into flexion. While applying an axial load the examiner then moves the extremity in quadrants. A positive test is indicated by clicking, crepitus or pain.
- **Piriformis Test:** a test to determine if tightness of the piriformis muscle is responsible for buttock pain or referred pain from the sciatic nerve. The patient is positioned sidelying. The test limb is taken into flexion, adduction and internal rotation. A positive test is reproduction of gluteal pain or radicular symptoms in the distribution of the sciatic nerve.
- **Thomas Test:** a test to determine if a patient has tightness of the rectus femoris or iliopsoas muscles. The patient is positioned supine on the plinthe. The subject is then asked to bring both knees to their chest and to hold the untested limb with their hands. The examiner then passively lowers the test limb to the plinthe. If the limb remains up off the table, a hip flexor contracture is suspected. To differentiate muscles, the examiner then passively extends the knee placing the rectus femoris on slack. If the test limb lowers to the table the rectus femoris is shortened. If the test limb remains off the table with the knee flexed the iliopsoas is shortened.
- **Ely's Test:** a test to determine if a patient has shortening of the rectus femoris muscle. The patient is positioned prone. The examiner passively flexes the knee of the test extremity. If the ipsilateral buttock rises off the plinthe the test is positive.
- **Ober Test:** a test to determine if a patient has tightness of the tensor fasciae latae or iliotibial band. The subject is positioned sidelying with the test limb on top. The hip and knee of the limb closest to the plinthe should both be flexed to stabilize the patient. The uppermost limb is passively positioned into abduction and extension so the ITB passes over the greater trochanter. The knee may be either flexed or extended, but a greater stretch will be felt in extension. The examiner stabilizes the pelvis to prevent substitution and then allows the test limb to slowly adduct towards the table. A positive test is indicated by the test limb remaining off the table.

- **Craig's Test** – a test for femoral anteverision. Patient is position prone on plinthe with knee bent to 90°. The greater trochanter is palpated and then the test leg is internally and externally rotated until the greater trochanter is positioned parallel to the table or feels to be protruding the greatest. The greater trochanter is then allowed to return to its normal position and the angle created is measured. A positive test is an angle > 15°.

Sacroiliac Joint Tests

- Usually the side where a patient reports their symptoms is the side of the dysfunction!
- Provocative tests are most reliable!
- **Standing FWD flexion Test:** palpate PSISs while patient flexes FWD. Both PSIS should stay equal. If one side moves inferiorly with forward bending this may indicate hypomobility of that side.
- **Gilette (Sacral Fixation) Test:** With the patient standing, palpate S2 spinous process with one thumb and other on PSIS. With normal SI mobility the PSIS should rotate downward and the ischial tuberosity should move laterally as the hip flexes.
- **Long Sitting (Supine → Sit) Test:** tests for the presence of an anterior or posterior innominate (rotation) at the SI joint. Begin by having the patient positioned supine with both legs bent up so that feet are resting on the plinth. You may also ask them to perform a bridge to “set” their hips (**Wilson-Barstow Maneuver**). Once patient is comfortable straighten both legs while applying a slight distractive force on both malleoli. Note if one malleolus sits higher or lower than the opposite.

Supine		Long Sitting	
Anterior Rotation	→ leg appears long	Anterior Rotation	→ leg appears short
Posterior Rotation	→ leg appears short	Posterior Rotation	→ leg appears long

For example, if a patient came in with a ® anterior innominate, in lying their ® ASIS would appear depressed while their ® PSIS would appear elevated. Essentially this moves their acetabulum inferiorly making it appear that their ® leg is longer. When the person moved into long-sitting the ® ASIS would appear elevated and the ® PSIS would appear depressed. This would move the acetabulum superiorly making it appear that the ® leg is now shorter. If this were the outcome of the test the result would be a positive test for a ® anterior innominate.

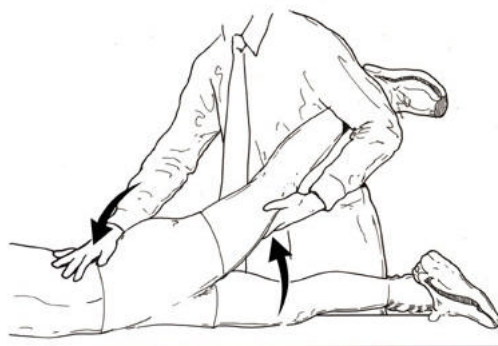
Treatment to Reverse Innominate

Using a muscle energy technique we would begin to correct the ® anterior innominate by having the patient contract their right gluteal muscles to pull the pelvis posteriorly and reduce the rotation. If a ® posterior rotation occurred we would attempt to have the patient contract their iliacus, essentially their hip flexors to reverse the innominate.

- **Anterior Gapping Test:** patient is supine. Examiner's hands are both criss-crossed over the ASISs. (right hand on patient's right ASIS and left hand on left ASIS) Therapist applies an inferior lateral force through both ASISs. This gaps the anterior SI and compresses the posterior SI. Pain implicates pathology of the anterior SI ligament.
- **Posterior Gapping / Squish Test:** patient is supine. Examiners hands are both placed over patient's ASISs. Therapist places a bilateral medially and anterior directed force to the ASISs as if you were trying to approximate the ASISs. This compresses the anterior SI and gaps or distracts the posterior SI. Pain implicates pathology of the posterior SI Test can also be performed in sidelying. Force directed inferiorly towards plinthe.
- **Sacral Compression Test:** the patient is positioned prone. The examiner places both hands, one on top of the other, directly over the sacrum. The examiner then applies a downward pressure, creating a shear of the sacrum on the ilium. The test is positive if the patient experiences pain in the SI joint.
- **FABER (Patrick) Test:** test limb taken into flexion, abduction and ER. Test is positive if patient's sx are reproduced. May also perform a "FABIR" to stress the SI in internal rotation



- **Sacroiliac Rocking Test:** used to identify irritation or rupture of the sacrotuberous ligament. Patient is positioned supine. Examiner passively and maximally flexes hip and knee, while adducting test extremity to opposite shoulder. Positive if there is a reproduction of pain at the SI.
- **Yeoman's Test:** patient positioned prone; the test limb is passively taken into hyper-extension. A positive test implicates anterior sacro-iliac ligaments.



- **Flamingo Test:** Patient stands on the test extremity lifting the unaffected leg off the ground. Test is positive if patient's symptoms are reproduced on that side or at the pubic symphysis. An additional provocation may be to add gentle to moderate hopping.
- **Gaenslen's Test:** The patient lie supine on a treatment table. With one leg hanging over the side of the table in hyperextension the other knee is drawn to the chest by the patient. The clinician may aid the patient in moving the hip into hyperextension with gentle pressure. A positive test is indicated by pain in the ipsilateral sacroiliac joint. Which may be due to an Ipsilateral joint lesion, hip pathology, or an L4 nerve.



- **Straight Leg Raise (Lasegue) Test:** (sciatic nerve) patient lies down supine while therapist passively flexes hip keeping the knee extended to end range.

Perform hold relax muscle stretch-

A) If this increases the ROM most likely tight hamstrings

B) If this has no effect on pain – may be nerve root impingement or irritation

ROM Interpretations:

- 0 – 30° → indicates hip pathology or severely inflamed nerve root.
- 30 – 50° → indicates sciatic nerve involvement.
- 50 – 70° → indicates probable hamstring involvement.
- 70 – 90° → sacroiliac joint is stressed.

- **Isometric Hip ABD/ADD:** patient is positioned prone with knees bent, feet resting flat on plinthe. Examiner places either their forearm or a closed fist between the patients legs for ADD or hugs the outer condyles of the knee to resist ABD. Test is positive if patient reports symptoms in the SI joint.

Knee Tests

- **Anterior/posterior draw (sign) test:** a test designed to detect anterior and posterior instability of the knee (anterior cruciate ligament / posterior cruciate ligament). The patient lies supine with the test knee flexed 90°. The examiner sits across the forefoot of the patient's flexed lower limb. With the patient's foot in neutral rotation, the examiner palpates the patient's joint line with both thumbs and pulls forward in the proximal part of the calf. The examiner should also palpate the hamstring tendons with their index fingers to ensure they are relaxed. Both lower limbs are tested for comparison. The test is positive if the examiner feels excessive anterior movement of the tibia under their thumbs with respect to the femur indicating an ACL lesion. Excessive posterior movement would indicate a PCL lesion. There is a greater potential for a false negative here secondary to the increased potential for hamstring "guarding".
- **Lachman's test:** similar to the anterior drawer test except the knee is flexed to 15 – 30° and the drawer maneuver is attempted while the thigh is stabilized on the table. Excessive forward translation would indicate a torn ACL. This test is thought to be more sensitive than the anterior drawer because it is tested in the functional position of the knee (~30° of flexion)

Alternate position: patient lies prone with test knee flexed to 30°.

- **Posterior Sag Sign:** a test used to assess integrity of the PCL or determine a neutral tibial position before assessing ACL integrity. The patient lies supine and flexes both lower extremities so both feet rest flat on the plinthe. The examiner then visually compares the position of the tibia in relation to the femur on the test extremity. A positive sign is indicated by notable posterior displacement of the tibia upon the femur of the test extremity.
- **Anterior Draw with Medial/Lateral Rotation:** a subset test of the anterior drawer test used to detect anterior- lateral or anterior-medial instability of the ACL. With medial rotation the anterior – lateral portion of the ACL is tested. With lateral rotation the anterior – medial portion of the ACL is being tested. The examiner must avoid maximally rotating the tibia, as this will tighten most of the surrounding structures and create a high potential for false negatives.
- **Posterior Draw with Lateral/Medial Rotation:** a subset test of the posterior drawer test used to detect posterior – medial or posterior – lateral instability of the PCL. With lateral rotation the posterior lateral portion of the ACL is tested. With medial rotation the posterior – medial portion of the PCL is being tested. The examiner must avoid maximally rotating the tibia, as this will tighten most of the surrounding structures and create a high potential for false negatives.
- **Lateral Pivot Shift (Jerk Test):** a test used to test for laxity and integrity of the ACL. The test mimics the sensation of collapsing which a patient with a ruptured or lax ACL may describe. The examiner internally rotates the lower extremity while pushing the tibia anteriorly and applying a valgus force. While in this position the knee should be extended and flexed, which will alternately sublux and reduce the lateral tibial plateau on the femoral condyle. Tibial reduction may occur with a sharp, visible, or palpable jerk at about 30° of flexion.

- **Abduction (valgus stress) test:** a test designed to identify medial instability of the knee. The examiner applies a valgus stress to the patient's knee while the patient's ankle is stabilized in a slight lateral rotation. The test is first conducted with the knee fully extended and then repeated with the knee at 20-30° of flexion. Excessive movement of the tibia away from the femur indicates a positive test. Positive findings with the knee fully extended indicate a major disruption of the knee ligaments. A positive test with the knee flexed is indicative of damage to the MCL (Medial collateral ligament)
- **Adduction (varus stress) test:** a test designed to identify lateral instability of the knee. The examiner applies a varus stress to the patient's knee while the ankle is stabilized. the test is done with the patient's knee in full extension and then with the knee in 20 to 30° of flexion. A positive test with the knee extended suggests a major disruption of the knee ligaments, whereas a positive test with the knee flexed is indicative of damage to the LCL (Lateral collateral ligament).
- **Stiman's test:** with the foot hanging off the edge of the table and the thigh stabilized on the table, the knee is forcefully internally and externally rotated. Pain would be a positive sign for meniscal tear.
- **McMurray's test:** another useful test for meniscus lesions. To perform this test the patient lies supine while the examiner fully extends and flexes the knee while placing one hand over the joint line to feel for "clicks or pops". The test is then repeated with the foot internally rotated and again with the foot externally rotated. A "pop or click" that is reproducible is a positive test.
- **Apley Grind/Distraction test:** a test designed to detect meniscus lesions. The patient lies prone with the knee flexed to 90°. The examiner applies a compressive force on the heel and rotates the tibia back and forth while palpating the joint line with the other hand feeling for crepitation. The test is positive if the patient reports pain or the examiner feels crepitation. This test is then repeated by applying a distractive force to the leg, and if pain is elicited it is indicative of a ligamentous injury rather than a meniscus injury.
- **Bounce Home or Spring test:** test designed to indicate irritation or tear of the meniscus. To perform this test the examiner flexes the knee to 30° the knee is then allowed to passively drop into full extension. Inability of the knee to fully extend would indicate a bucket-handle type tear of the meniscus. Pain on full extension would indicate a smaller meniscus tear.
- **Patellar Apprehension test:** a test designed to identify dislocation of the patella. The patient lies supine with the knee resting in full extension. The examiner carefully and slowly displaces the patella laterally. If the patient looks apprehensive and tries to contract the quadriceps muscle to bring the patella back to neutral, the test is positive.
- **Brush or Stroke (wipe) test:** this test is designed to identify a mild effusion in the knee. Starting below the joint line on the medial side of the patella, the examiner strokes proximally with the palm and fingers as far as the suprapatellar pouch. With the opposite hand, the examiner strokes down the lateral side of the patella. The test is positive if a wave of fluid appears as a slight bulge at the medial distal border of the patella.
- **Zohler test:** a test used to identify the presence of chondromalacia of the patella. The examiner pulls the patient's patella distally with both hands and holds it in position. The patient is then instructed to contract their quadriceps.
- **Clarke's Sign:** a test designed to identify the presence of chondromalacia of the patella. The patient lies relaxed with knees extended as the examiner presses down slightly proximal to the superior pole of the patella with the web of the hand. The patient is then asked to contract the quadricep muscle as the examiner applies more force. The test is positive if the patient cannot complete the contraction without pain.

- **Wilson test:** a test designed to identify osteochondritis dissecans. The patient is seated with the lower leg in a dependent position. The patient extends the knee with the tibia medially rotated until the pain increases. The test is repeated with the tibia laterally rotated during extension. The test is positive if the pain does not occur when the tibia is laterally rotated (pain should be felt near 30°).
- **Tinel's Sign:** (medial tibia): the examiner taps the medial side of the tibial tubercle where the infrapatellar branch of the saphenous nerve courses. Pain or tingling indicates a neuroma in the peripheral nerve 2° knee surgery.
- **Patello-Femoral grind test:** this test indicates roughening or pitting of the articular surfaces of the patella and femoral condyles (chondromalacia). To perform this test the patient sits with the knee fully extended and supported on a table. The examiner moves the patella laterally and medially while applying slight downward pressure. The patella is then moved superiorly and inferiorly while applying slight downward pressure. Crepitus under the patella would indicate a positive test.
- **McConnell Test:** a test to determine the presence of an abnormally tracking patella. The patient is standing. The examiner takes the web space between their thumb and index finger and places it along the lateral border of the knee. The patient then attempts to squat down while the examiner pushes the patella medially. A decrease in symptoms indicates a positive test for patello-femoral syndrome.
- **Noble Compression Test:** a test to assess ITB tendonitis. The subject lies supine with the knee flexed to 90°. The examiner applies pressure immediately proximal (1 – 2 cm) above to the lateral femoral condyle and maintains that pressure while the knee is slowly extended. A positive test is indicated by pain over the area of the lateral femoral condyle at approximately 30° of knee flexion. Pain presents at this range because at 30° of flexion the ITB is directly over the lateral femoral condyle. As the knee moves through flexion and extension, the ITB moves posterior to the femoral condyle during flexion and anterior to the epicondyle during extension.
- **Homan's Sign:** a test used to detect the presence of a deep vein thrombosis. To perform the test the patient lies supine with the test LE relaxed and extended. The examiner passively dorsiflexes the test foot and then palpates the belly of the calf muscle and working up towards the popliteal crease, and down towards the beginning of the Achilles tendon. Failure to palpate the entire belly of the calf muscle may result in missing a potential DVT. A positive test is confirmed by calf pain.

Ankle Tests

- **Anterior Drawer:** examines the integrity of the anterior talofibular ligament. The patient lies supine. The examiner grasps the test heel with one hand and applies a posterior force to the tibia with the other hand, while drawing the heel forward. Laxity is compared with the opposite (uninjured) ankle. A positive test is indicated by a difference of 2 mm subluxation compared with the opposite side or a visible dimpling of the anterior skin of the affected ankle (suction sign)
- **Squeeze Test:** tests the integrity of the syndesmotic ligaments. The examiner places his hand 6 to 8 inches below the knee and squeezes the tibia and fibula together. A positive test results in pain in the ankle, which indicates injury of the syndesmotic ligament and a possible high ankle sprain.
- **Talar tilt (Kleiger) Test:** a test designed to identify lesions of the calcaneofibular ligament. The patient is sitting on a table with the leg in a dependent position and the knee flexed to 90 degrees. With the foot in a neutral position, the talus is tilted medially. The test is positive if the amount of inversion on the involved side is excessive.
- **Thompson Test:** special test used to test the integrity of the Achilles tendon. The patient lies prone with the test extremity hanging off the plinthe or table allowing the foot to relax into dorsiflexion. The examiner then squeezes the gastrocnemius/soleus complex. A normal response is a slight plantar flexion of the foot indicating an intact Achilles.
- **Feiss Line:** Used to examine the position of the navicular; the keystone of the medial longitudinal arch. While the patient is NWB, mark inner apex of the medial malleolus and plantar aspect of 1st metatarsalphalangeal joint. Have the patient stand 8 – 15 cm apart, palpate the navicular tuberosity noting where it is in line to the other 2 landmarks.
 - If navicula falls 1/3 distance to floor = 1st degree pes planus
 - If navicula falls 2/3 distance to floor = 2nd degree pes planus
 - If navicula falls and rests on floor = 3rd degree pes planus

Paraspinals Muscle Spasm Test

- **Paraspinal Weight shift test:** With patient standing, place thumbs on patient's lumbar paraspinals. The patient is then asked to shift his or her weight from one foot to the other. Normally, the paraspinals on the side of the stance foot will relax but if muscle guarding and/or spasm are present, the muscles will not relax.

Flexibility

- **Tripod Test:** a test used to assess the length of the hamstrings. The patient is seated with both knees flexed to 90 degrees over the edge of the table. The examiner passively extends one of the subject's knees while simultaneously observing the subject's trunk for any change in position. A positive sign noted by increased trunk extension may be reflective of decreased hamstring extensibility.

Lower Limb Tension Tests

- Work proximal to distal
- With each movement ask does this change your symptoms?

Sciatic Nerve

1. Flex, ADD, + IR Hip
2. Extend knee
3. Dorsiflex foot

Works best if knee is already extended when you flex hip!

Femoral Nerve

1. Extend hip
2. Flex knee