

Examination of the Hip

Joints

Femoral-Acetabular Joint – The head of the femur articulates with the acetabulum which is deepened by the acetabular labrum (a circular fibrocartilaginous rim that forms a tight collar around the head of the femur).

★The hip joint is beneath a point 3 cm below the midpoint of the inguinal ligament and 3 cm lateral to the palpable femoral artery ★

Bony Landmarks

1. Pubic Symphysis – Found anteriorly in the midline above the crotch.
2. Anterior Superior Iliac Spine
3. Iliac Crest
4. Greater Trochanter of the Femur
5. Ischial Spine
6. Ischial Tuberosity

Soft Tissue Landmarks

1. Inguinal Region (femoral triangle)
 - a. Inguinal ligament – Can become strained and bulges along it can signify hernia
 - b. Iliopsoas bursa – Lies over the anterior surface of the articular capsule, lateral to the femoral artery and beneath the deep surface of the iliopsoas muscle. It is the largest and most constant bursa and communicates with the hip joint in 15% of cases.
 - c. Femora Artery – Passes under the inguinal ligament at its midpoint halfway between the ASIS and the pubic tubercle.
 - d. Femoral Nerve – Lies lateral to the artery
 - e. Femoral Vein – Lies medial to the artery
 - f. Lymphadenopathy
 - g. Adductor longus muscle – forms the medial border of the femoral triangle
 - h. Sartorius – forms the lateral border of the triangle
2. Greater Trochanter
 - a. Trochanteric Bursa – Comprises three bursa (gluteus maximus is the principal one).
 - b. Gluteus Medius – Inserts into the lateral portion of the greater trochanter
3. Sciatic Nerve
 - a. Sciatic Nerve is located midway between the greater trochanter and the ischial tuberosity.
 - b. Ischial bursa

Movement

Flexion – 135° Iliopsoas (L2,3)

Extension – 30° Gluteus Maximus and Hamstrings (L4,5 S1,2)

Abduction – 45° Gluteus Medius (L4,5 S1)

Adduction – 20° Adductor Magnus, Longus, Brevis, Pectineus, & Gracilis (L3,4,5,S1)

External Rotation – 45° Gluteus Maximus, Quadrator femoris, Piriformis (L4,5,S1)

Internal Rotation – 35° Gluteus Minimus (L4,5,S1)

Symptoms – Pain with the following activities

1. Walking or other activities which increase the load through the joint
2. Putting on socks and shoes – flexing the hip
3. Stairs
4. Sexual intercourse

Pain

1. Groin and inner thigh – Most typical site
2. Anterior thigh and around the knee and can be confused with knee pathology – don't get fooled.
3. Trochanteric region and buttock – Less often

The Examination

For every joint of the lower extremity always begin with the patient in standing

IN STANDING

Inspection & Palpation

Hip

1. Flexion Contracture
 - a. Hip held in flexion
 - b. Knee in flexion
 - c. Hyperlordosis at the lumbar spine
 - d. Pelvic Obliquity (tilting of the pelvis)
 - e. Functional Scoliosis
2. External Rotation – Often seen in osteoarthritis to help relieve pain by increasing the joint space.
3. Muscles – Look for wasting of gluteal muscles

Lumbar Spine & Pelvis

1. Scoliosis – Look at the skin creases in the back
2. Hyperlordosis – Often a secondary phenomenon to hip flexion contracture
3. Pelvic Obliquity – Look at the gluteal crease and lower folds and put your hands on the iliac crests to see if the pelvis is level.
4. Pelvic Tilt

Knee, Ankle, & Foot

Make sure these are well aligned – can worsen the problem

Special Tests

Trendelenburg Test

Patient stands with feet about 12 inches apart

Patient then stands on the affected limb

Normally the adductor 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.

Gait

Tredelenburg Gait

With hip disease the abductor muscle group (gluteus medius) 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 pelvis drops

To counteract this, the patient actually leans over the affected limb to alter the center of gravity (fascinating!!)

Waddling Gait

Often a sign of bilateral hip disease and is really a bilateral trendelenburg gait (even more cool!)

Externally Rotated Foot on the Affected Side

A very interesting observation. Why does this occur? Well, patients with hip disease lose their ability to internally rotate early in the course of the disease (one of the first things lost). As we walk in order to turn our pelvis to plant the swinging foot we need to internally rotate the hip that we are standing on. But, as I mentioned, in patients with hip disease they cannot do this. So they cheat! Instead they will constantly hold the hip in an externally rotated position. When they walk they can now internally rotate, from this externally rotated position, but they rotate back to neutral. It is a pseudo-internal rotation. How cool is that!

IN SITTING

If the patient can sit normally then you know the hip will flex to 90 degrees

There really is no inspection or palpation in sitting but active ROM can be accomplished.

Active ROM

- Flexion** – Ask the patient to bring each knee upwards, alternatively.
- Internal Rotation** – Ask the patient to internally rotate the hips to create a “knock kneed” appearance
- External Rotation** – Ask the patient to externally rotate the hips to create a “frog legged” appearance

IN SUPINE POSITION

Inspection

1. Skin
 - a. Effusions in the hip joint cannot be seen
 - b. Scars
 - c. Inguinal abnormalities (hernia, nodes)
 - d. Swelling over the greater trochanter
2. Bones
 - a. Are all of the bony landmarks in their proper places

Palpation

It is very important to palpate bony and soft tissues – sometimes a perceived hip problem can be due to a bone problem and not something in the joint.

1. Start at the symphysis pubis (bony palpation)
2. Work laterally along the inguinal ligament, feeling for
 - a. the normal femoral pulse
 - b. Inguinal adenopathy (superficial nodes along ligament, deep nodes in the femoral sheath)
 - c. Tenderness over the iliopsoas suggesting a bursitis
3. Palpate over the Iliac crests feeling for bony tenderness or enthesal tenderness
4. Stop halfway and drop your hands down to the lateral aspect of the femur and feel the greater trochanter and the trochanteric bursal region
5. STOP here and the rest of palpation is done with the patient on their side or prone

Active & Passive ROM

Abnormalities of abduction and internal rotation are the two movements most sensitive for early hip pathology.

- Begin range of motion with a passive log rolling of the entire lower extremity – if this reproduces pain it is likely that the patient will have pathology in or around the hip joint.

With ROM of the hip ALWAYS COMPARE BOTH SIDES FOR DISCREPANCY

- Flexion** – Passively bring the patients leg into flexion (135 degrees). The end point of flexion should be soft feeling and NOT bone on bone.
- Internal Rotation** – At 90 degrees of flexion turn the foot outward to assess internal rotation of the hip – it should be about 35 degrees
- External Rotation** – At 90 degrees of flexion turn the foot inward to assess external rotation of the hip – it should be about 45 degrees.
- Abduction** – Stabilize the opposite side of the pelvis and abduct the leg – should go to at least 45 degrees.
If you feel there is a minor abnormality in abduction ask the patient to flex their hips and knees and put their feet on the examination table together. Then ask them to drop their knees apart (frog leg position). This can be useful for picking up small differences in abduction.
- Adduction** – Stabilize the opposite side of the pelvis again and adduct the leg – should go to at least 20 degrees.

Special Tests

Thomas Test – This is a test for a hip flexion contracture. It is done as follows:

1. Examining from the patients right hand side
2. Ask the patient to bring both knees up into their chest
3. Put your left hand underneath their lumbar spine to make sure it is flat on the bed
4. Ask the patient to let their right leg drop down flat on the bed while holding the left knee into the chest
5. The right leg should be able to drop flat down onto the bed and the lumbar spine should stay flat on the bed.
6. Alternate legs and do the same thing with the other legs

Abnormal Test

With the lumbar spine flat on the bed the patients leg does not extend downwards to lie flat on the table.

Key Points

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 contracture 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.

Leg Length Discrepancy

First set the pelvis

Measure from the ASIS to the medial malleolus (true)

Measure from the umbilicus to the medial malleolus (apparent)

ON THEIR SIDE

Palpation

Better palpation of the trochanteric bursa

Can palpate the ischial tuberosity and ischial bursa

Special Tests

Test the strength of the gluteus medius. This is the same as the trendelenburg and you’ll find that most people are weak in hip abduction. The weakest are those with hip disease secondary to disuse atrophy.

PRONE POSITION

Inspection

Look for gluteal muscle wasting

Palpation

May want to palpate the ischium/ischial bursa in this position

Range of Motion

Passive extension of the hip – put one hand on the pelvis and cradle the quadriceps and passively extend the hip which should move through 30 degrees.

Neurovascular Examination

Joint Above (Spine) and Below (Knee and Ankle)

The above examination is not the medical school Inspection, palpation, range of motion exam. Instead it incorporates all of these maneuvers into 4 positions (Standing, Walking, Sitting, and Lying) to make things flow and ease the patient. Royal college exams are all OSCE format so they just check boxes. They aren’t worried what order you do things in and there is NO RIGHT WAY. If you do the exam like this it usually impresses the examiner and shows your consultancy skills.

I have done all of my royal college exams this way with no problems at all and besides it helps to learn it this way for the clinic as that is where it really counts.