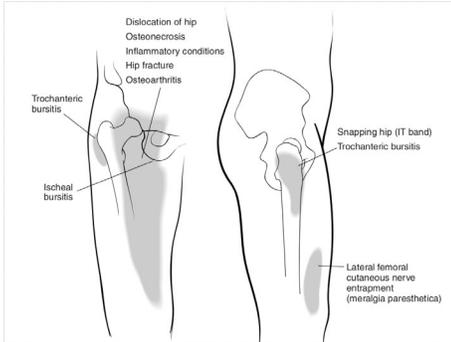
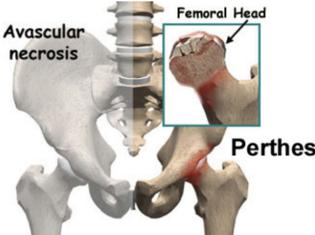
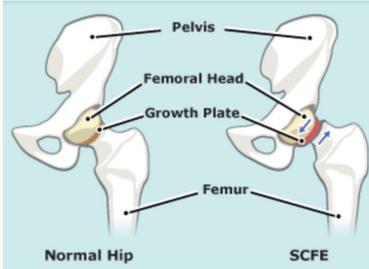
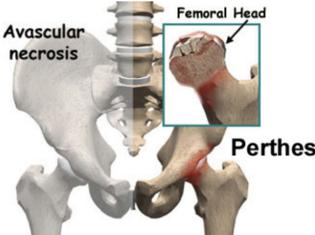
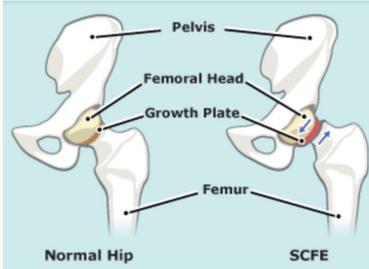
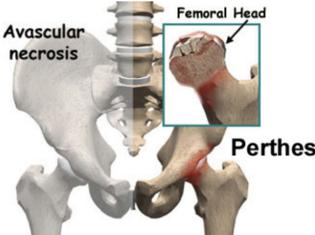
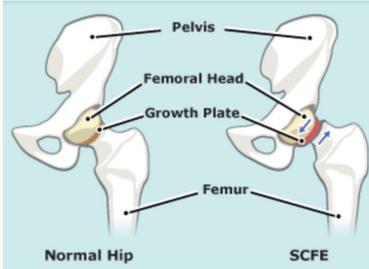
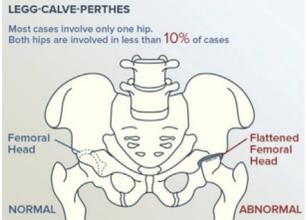
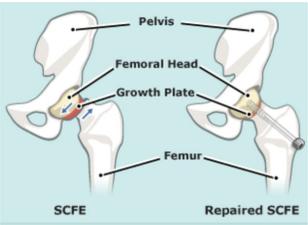


## HIP EVALUATION - HISTORY

Evaluation of a patient with hip pain should begin with a thorough history. Important questions include:

| <b>Mechanism of injury</b>  | <ul style="list-style-type: none"> <li>Ask if there was acute trauma or if this chronic pain is due to overuse.</li> </ul>   |                       |  |   |   |  |   |                               |   |                   |                                   |                   |               |               |                               |
|---|--|-----------------------|--|---|---|--|---|-------------------------------|---|-------------------|-----------------------------------|-------------------|---------------|---------------|-------------------------------|
| <b>Duration and location of the pain</b>  | <ul style="list-style-type: none"> <li>Ask how long the pain has been present.</li> <li>Also ask the general location of the pain – is it in the front, back or side.</li> <li>Suspect the following based on location of the pain:</li> </ul> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="background-color: #fff9c4;"><b>Front</b></td> <td>Suspect hip joint: OA, fracture, osteochondritis dissecans (OCD)</td> </tr> <tr> <td style="background-color: #fff9c4;"><b>Side</b></td> <td>Suspect trochanteric bursa, iliotibial (IT) band, meralgia paresthetica</td> </tr> <tr> <td style="background-color: #fff9c4;"><b>Back</b></td> <td>Suspect hip joint, sciatica, SI joint, hamstring pull, ischeal bursitis</td> </tr> </table><br>   | <b>Front</b>          | Suspect hip joint: OA, fracture, osteochondritis dissecans (OCD) | <b>Side</b>   | Suspect trochanteric bursa, iliotibial (IT) band, meralgia paresthetica               | <b>Back</b>                            | Suspect hip joint, sciatica, SI joint, hamstring pull, ischeal bursitis |                               |   |                   |                                   |                   |               |               |                               |
| <b>Front</b>  | Suspect hip joint: OA, fracture, osteochondritis dissecans (OCD)   |                       |  |   |   |  |   |                               |   |                   |                                   |                   |               |               |                               |
| <b>Side</b>   | Suspect trochanteric bursa, iliotibial (IT) band, meralgia paresthetica  |                       |  |   |   |  |   |                               |   |                   |                                   |                   |               |               |                               |
| <b>Back</b>   | Suspect hip joint, sciatica, SI joint, hamstring pull, ischeal bursitis  |                       |  |   |   |  |   |                               |   |                   |                                   |                   |               |               |                               |
| <b>Pain in the back or down the leg</b>   | <ul style="list-style-type: none"> <li>Pain from sciatica may start at the posterior hip (sciatic notch) and then radiate down the back or side of the leg.</li> <li>Also keep in mind that hip pathology may refer pain to the inner thigh or knee (via obturator nerve irritation).</li> </ul>   |                       |  |   |   |  |   |                               |   |                   |                                   |                   |               |               |                               |
| <b>Snapping or clicking with movement</b>   | <ul style="list-style-type: none"> <li>When this occurs at the lateral hip it is usually due to the IT band or gluteus maximus snapping over the greater trochanter.</li> <li>If it occurs on the medial side it is usually due to the iliopsoas tendon popping over the lesser trochanter or hip subluxation.</li> </ul>  |                       |  |   |   |  |   |                               |   |                   |                                   |                   |               |               |                               |
| <b>Problem affect gait or activity</b>  | <ul style="list-style-type: none"> <li>The presence of a limp, limitation of activity or the inability to sit and remove footwear can indicate the significance of a hip problem.</li> </ul>   |                       |  |   |   |  |   |                               |   |                   |                                   |                   |               |               |                               |
| <b>History of prior hip problems</b>  | <ul style="list-style-type: none"> <li>Childhood problems (Legg-Perthe's disease, SCFE, hip dislocation) frequently lead to significant problems later in life.</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #fff9c4;"> <th style="width: 50%;">Legg-Perthe's disease</th> <th style="width: 50%;">SCFE</th> </tr> </thead> <tbody> <tr> <td>  </td> <td>  </td> </tr> <tr> <td>avascular necrosis of the femoral head</td> <td>slipped capital femoral epiphysis</td> </tr> <tr> <td>males between the age of 4-10</td> <td>obese adolescents between 9-16 years of age</td> </tr> </tbody> </table>  | Legg-Perthe's disease | SCFE   |  |  | avascular necrosis of the femoral head | slipped capital femoral epiphysis                                       | males between the age of 4-10 | obese adolescents between 9-16 years of age |                   |                                   |                   |               |               |                               |
| Legg-Perthe's disease   | SCFE   |                       |  |   |   |  |   |                               |   |                   |                                   |                   |               |               |                               |
|  |   |                       |  |   |   |  |   |                               |   |                   |                                   |                   |               |               |                               |
| avascular necrosis of the femoral head  | slipped capital femoral epiphysis  |                       |  |   |   |  |   |                               |   |                   |                                   |                   |               |               |                               |
| males between the age of 4-10   | obese adolescents between 9-16 years of age  |                       |  |   |   |  |   |                               |   |                   |                                   |                   |               |               |                               |
| <b>Age of the patient</b>   | <ul style="list-style-type: none"> <li>The most common conditions affecting the hip vary, depending on the patient's age:</li> </ul> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="background-color: #fff9c4;"><b>Newborn</b></td> <td>Congenital hip dislocation, Synovitis</td> </tr> <tr> <td style="background-color: #fff9c4;"><b>2 – 8 yo</b></td> <td>Legg-Perthe's disease, synovitis</td> </tr> <tr> <td style="background-color: #fff9c4;"><b>10 – 14 yo</b></td> <td>Slipped capital femoral epiphysis (SCFE)</td> </tr> <tr> <td style="background-color: #fff9c4;"><b>14 – 25 yo</b></td> <td>Stress fracture, Synovitis</td> </tr> <tr> <td style="background-color: #fff9c4;"><b>20 – 60 yo</b></td> <td>Avascular necrosis, Synovitis, RA</td> </tr> <tr> <td style="background-color: #fff9c4;"><b>45 – 60 yo</b></td> <td>OA, Synovitis</td> </tr> <tr> <td style="background-color: #fff9c4;"><b>65+ yo</b></td> <td>OA, Fracture, Stress fracture</td> </tr> </table> | <b>Newborn</b>        | Congenital hip dislocation, Synovitis                            | <b>2 – 8 yo</b>   | Legg-Perthe's disease, synovitis  | <b>10 – 14 yo</b>                      | Slipped capital femoral epiphysis (SCFE)                                | <b>14 – 25 yo</b>             | Stress fracture, Synovitis                  | <b>20 – 60 yo</b> | Avascular necrosis, Synovitis, RA | <b>45 – 60 yo</b> | OA, Synovitis | <b>65+ yo</b> | OA, Fracture, Stress fracture |
| <b>Newborn</b>  | Congenital hip dislocation, Synovitis  |                       |  |   |   |  |   |                               |   |                   |                                   |                   |               |               |                               |
| <b>2 – 8 yo</b>   | Legg-Perthe's disease, synovitis   |                       |  |   |   |  |   |                               |   |                   |                                   |                   |               |               |                               |
| <b>10 – 14 yo</b>   | Slipped capital femoral epiphysis (SCFE)   |                       |  |   |   |  |   |                               |   |                   |                                   |                   |               |               |                               |
| <b>14 – 25 yo</b>   | Stress fracture, Synovitis   |                       |  |   |   |  |   |                               |   |                   |                                   |                   |               |               |                               |
| <b>20 – 60 yo</b>   | Avascular necrosis, Synovitis, RA  |                       |  |   |   |  |   |                               |   |                   |                                   |                   |               |               |                               |
| <b>45 – 60 yo</b>   | OA, Synovitis  |                       |  |   |   |  |   |                               |   |                   |                                   |                   |               |               |                               |
| <b>65+ yo</b>   | OA, Fracture, Stress fracture  |                       |  |   |   |  |   |                               |   |                   |                                   |                   |               |               |                               |

|   |  |   |  |
|---|--|---|--|
| <p><b>Legg-Calve-Perthes disease</b></p>        | <ul style="list-style-type: none"> <li>• Legg-Calve-Perthes disease is <u>avascular necrosis of the femoral head</u> that almost always affects <u>males</u> between the <u>age of 4-10</u>.</li> <li>• It is associated with delayed bone age. It manifests as an insidious onset of hip, groin, knee (referred pain), or thigh pain and <u>painful limp</u>.</li> <li>• X-rays usually demonstrate a flattened, and later fragmented, femoral head</li> <li>• Treatment consists of splinting and decreased weight bearing.</li> </ul> |   |   |
| <p><b>Slipped capital femoral epiphysis</b></p> | <ul style="list-style-type: none"> <li>• Slipped capital femoral epiphysis occurs more commonly in <u>obese adolescents</u> between <u>9-16 years of age</u>.</li> <li>• Patients will complain of a <u>limp, aching pain in the hip, knee, thigh, or groin</u> that is increased with activity.</li> <li>• X-ray of the hips will reveal a "<u>ice cream falling off a cone</u>" appearance because of slippage of the femoral epiphysis.</li> <li>• Treatment consists of surgical pinning.</li> </ul>                                 |  |  |

A 7-year-old male complains of a limp and pain in the right knee that has been worsening over the past 2 weeks. Physical examination reveals an afebrile male with short stature and no signs of inflammation or tenderness at the knee. The pain is worsened while assessing hip range of motion. The most likely diagnosis is

- Septic arthritis of the hip
- Osteomyelitis
- Osgood-Schlatter disease
- Legg-Calve-Perthes disease
- Slipped capital femoral epiphysis

A 14-year-old obese female is being evaluated for a limp. She tells you that she also has hip pain while running. Physical examination reveals an afebrile, overweight adolescent in no apparent distress. She complains of pain while you assess the hip range of motion. The most likely diagnosis is

- Septic arthritis of the hip
- Osteomyelitis
- Osgood-Schlatter disease
- Legg-Calve-Perthes disease
- Slipped capital femoral epiphysis

## HIP EVALUATION - EXAMINATION

Clothing should be removed to expose and compare both hips. Essential aspects of the hip exam include:

|          |                         |          |                  |          |                              |
|----------|-------------------------|----------|------------------|----------|------------------------------|
| <b>1</b> | <b>Inspection</b>       | <b>2</b> | <b>Palpation</b> | <b>3</b> | <b>Range of Motion (ROM)</b> |
| <b>4</b> | <b>Strength Testing</b> | <b>5</b> | <b>Sensory</b>   | <b>6</b> | <b>Special Tests</b>         |

### 1. Inspection

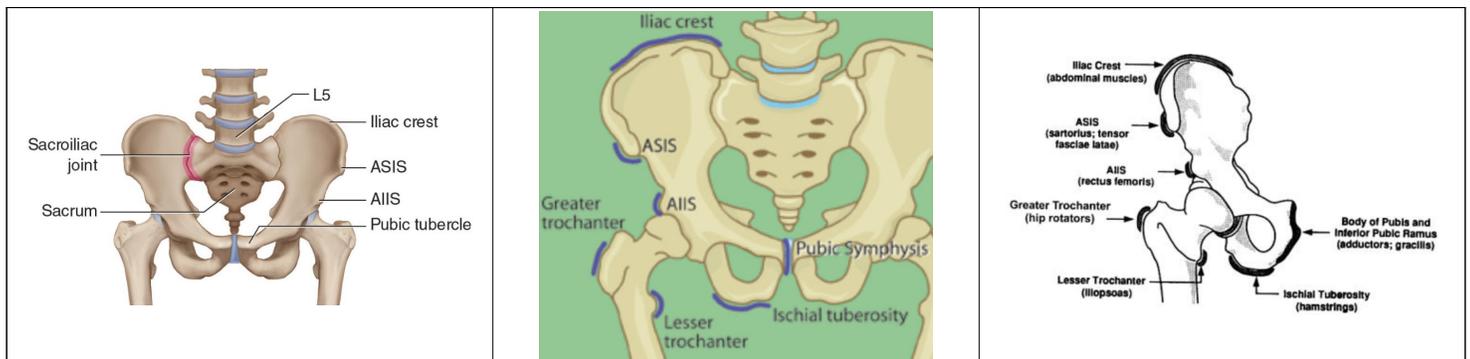
Inspect both hips from the front, back and sides. Note asymmetry due to muscle wasting or swelling. Observe gait up and down the hall checking for limp.

- Leg length discrepancy
- **Deformity & Asymmetry**
- **Muscle wasting (atrophy)**
- **Swelling**
- Skin changes (erythema) etc.

### 2. Palpation

Palpate the hip in the following areas for tenderness:

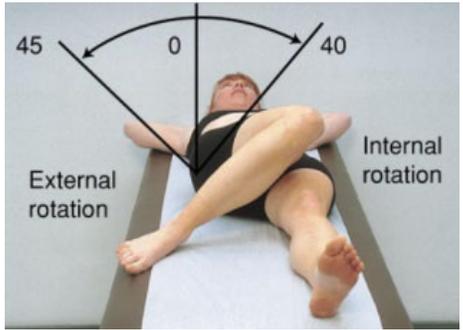
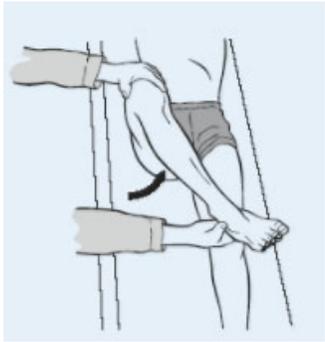
|    |                                       |  |
|----|---------------------------------------|--|
| 1  | Anterior hip joint                    | pain from OA, fracture or avascular necrosis (AVN)         |
| 2  | Anterior superior iliac spine         | sartorius attachment                                       |
| 3  | Anterior inferior iliac spine         | rectus femoris attachment                                  |
| 4  | Greater trochanter                    | bursa overlies   |
| 5  | Iliotibial band                       | can rub over greater trochanter with hip flexion           |
| 6  | Posterior superior iliac spine (PSIS) | posterior tip of iliac bone                                |
| 7  | Sacroiliac (SI) joint                 | lies just under the PSIS, common source of pain            |
| 8  | Sciatic notch                         | located slightly below the SI joint — tender with sciatica |
| 9  | Gluteus muscle                        | main extensor of the hip                                   |
| 10 | Ischial tuberosity                    | hamstrings attach here                                     |



### 3. Range of Motion (ROM)

Hip ROM should be tested looking for pain or limitation. Check the following motions:

|                             |   |
|-----------------------------|---|
| Hip Flexion (120°)          | with patient supine, grasp bent knee and pull to chest (stop when back flattens)  |
| Hip Extension (15°)         | while prone, lift leg off table   |
| Hip Abduction (45°)         | with patient supine, hold ankle and pull leg away from midline                    |
| Hip Adduction (30°)         | with patient supine, pull leg toward midline (until pelvis tilts)                 |
| Hip Internal rotation (30°) | stabilize knee at 90° flexion with patient seated and move foot away from midline |
| Hip External rotation (60°) | in the same position, move foot toward midline (lost early with hip OA)           |

| Hip Flexion: 120° (100-130°)  | Hip Abduction: 45° (40-50°)  | Hip Internal Rotation: 30° seated (40-45° supine)                                     |
|---|--|---|
| Flex knee and bring thigh close to abdomen  | Swing thigh away from midline  | Flex knee and swing lower leg away from midline                                       |
|    |    |    |
| Hip Extension: 15° (15-30°)   | Hip Adduction: 30° (20-30°)  | Hip External Rotation: 60° seated (40-45° supine)                                     |
| Move thigh backward without moving the pelvis                                       | Bring thigh toward and across midline  | Flex knee and swing lower leg toward midline  |
|  |  |  |

What is the normal value for range of motion of the hip extension?

- A. 100-130°
- B. 80-90°
- C. 15-30°
- D. 0°

What is the normal value for range of motion of the hip flexion?

- A. 120°
- B. 90°
- C. 45°
- D. 15°

#### 4. Strength Testing

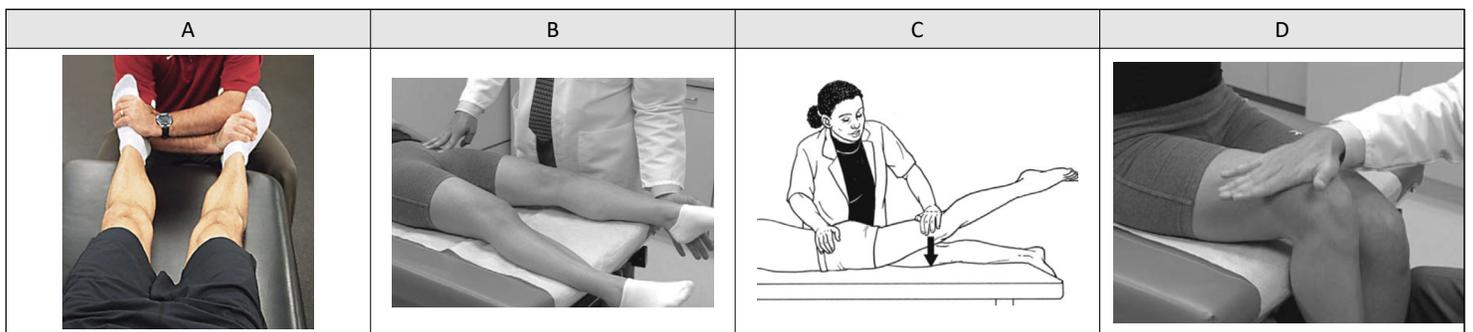
Strength should be evaluated by resisting range of motion:

|                      |   |   |
|----------------------|---|---|
| <b>Hip Extension</b> | While prone, raise entire leg from table            | gluteus maximus and hamstrings              |
| <b>Hip Flexion</b>   | While seated, flex hip upward against resistance    | iliopsoas, rectus femoris and sartorius     |
| <b>Hip Adduction</b> | While supine, resist attempts to push feet together | gluteus medius and minimus                  |
| <b>Hip Abduction</b> | While supine, resist attempts to pull feet apart    | adductors longus/brevis/magnus and gracilis |

#### Grading of Muscle Strength

| Grade    | Muscle Stage                               |  |
|----------|--|--|
| <b>0</b> | No muscle movement                         | No contraction                                 |
| <b>1</b> | Muscle movement without joint motion       | Flicker or trace of contraction                |
| <b>2</b> | Moves with gravity eliminated              | Active movement with gravity eliminated        |
| <b>3</b> | Moves against gravity but not resistance   | Active movement against gravity                |
| <b>4</b> | Moves against gravity and light resistance | Active movement against gravity and resistance |
| <b>5</b> | Normal strength                            | Normal power                                   |

#### POP QUIZ



Which of the above images shows the **Hip Flexion** strength test? \_\_\_\_\_

Which of the above images shows the **Hip Abduction** strength test? \_\_\_\_\_

Which of the above images shows the physical exam that accesses the **gluteus maximus** and **hamstring**? \_\_\_\_\_

Which of the above images shows the physical exam that accesses the **gluteus medius** and **minimus**? \_\_\_\_\_

### 5. Sensory

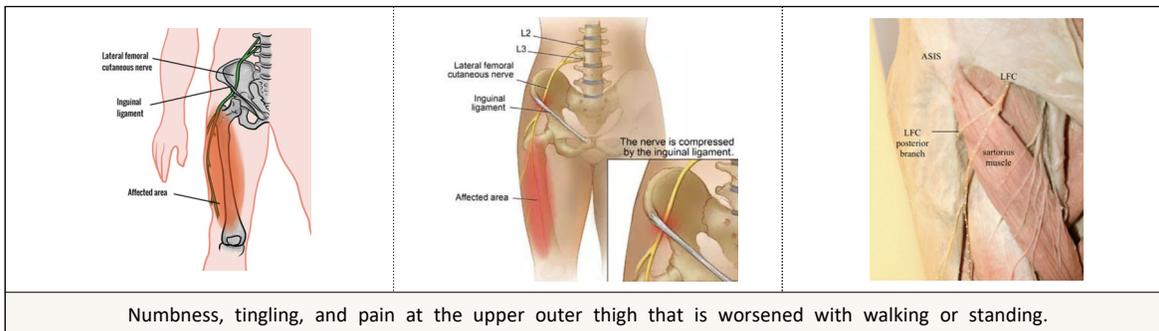
Evaluate sensation about the hip in the following areas:

|                      |  |
|----------------------|--|
| Distal lateral thigh | Hypesthesia here may indicate meralgia paresthetica (caused by compression of the lateral femoral cutaneous nerve) |
| Obturator nerve      | Innervates hip as well as medial thigh and knee (may cause pain from hip pathology to be felt in knee)             |

A 45-year-old carpenter develops numbness of the left upper lateral thigh. The numbness is especially prominent with walking and relieved with sitting. On physical examination, there is decreased sensation at the left upper lateral thigh and the pain is reproduced with tapping over the inguinal ligament. The most likely diagnosis is

- A. Meralgia paresthetica
- B. Patella-femoral syndrome
- C. Spinal stenosis
- D. Disc herniation at L4/L5
- E. Disc herniation at L5/S1

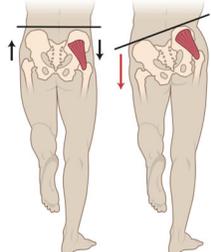
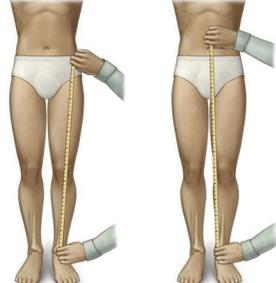
- \_\_\_\_\_ is entrapment of the lateral femoral cutaneous nerve. It most commonly occurs as the nerve passes through the inguinal ligament.
- Risk factors include tight belts, obesity, and pregnancy.
- History and physical examination are sufficient to make the diagnosis, but an EMG may be performed to rule out other causes.
- Complaints include numbness and tingling of the upper outer thigh area. The entrapment may also cause severe pain in this area. Symptoms are typically unilateral and made worse with standing or walking and relieved with sitting.
- Physical examination will confirm numbness at the anterolateral thigh. Tapping over the inguinal ligament or extending the thigh (stretches the nerve) will reproduce symptoms.
- Treatment is supportive. Injection with lidocaine and corticosteroid may be used if symptoms are severe.



|  |  |
|--|--|
|  | <ul style="list-style-type: none"> <li>• presents with knee pain with knee flexion and contraction of the quadriceps</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>• is associated with low back and leg pain with standing and walking.</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>• causes an L5 nerve impingement. It would result in weakness in extending the big toe.</li> <li>• Numbness and pain can be felt on top of the foot, and the pain may also radiate into, or from, the buttock.</li> </ul> |
|  | <ul style="list-style-type: none"> <li>• causes impingement of the S1 nerve. It may cause loss of the ankle reflex.</li> <li>• Numbness and pain can radiate down to the sole of the foot.</li> </ul>  |

### 6. Special Tests

Evaluate the hip using the following special tests:

| <p>1 Trendelenburg sign</p>          | <ul style="list-style-type: none"> <li>Found in people with weak or paralyzed abductor muscles of the hip, namely gluteus medius and gluteus minimus.</li> <li>While standing on one foot, look for pelvic tilt toward raised foot.</li> <li>The Trendelenburg sign is said to be positive if, when standing on one leg (the 'stance leg'), the pelvis drops on the <b>opposite</b> leg. The muscle weakness is present on the side of the <b>stance</b> leg.</li> </ul>   |    |                     |                          |                               |            |            |  |
|--------------------------------------|--|---|---------------------|--------------------------|-------------------------------|------------|------------|--|
| <p>2 Single Hop test</p>             | <ul style="list-style-type: none"> <li>Stand or hop unsupported on one leg. Look for reproduced pain at groin area.</li> <li>This test is usually positive with a femoral neck stress fracture.</li> <li>Types of Hop tests: Single hop test, Triple hop test, Crossover hop test, 6 meter timed hop test → They are both functional and quantitative, allowing a measurement of power and strength of the affected to unaffected leg.</li> </ul>  |    |                     |                          |                               |            |            |  |
| <p>3 Leg length</p>                  | <ul style="list-style-type: none"> <li>Should be measured from the anterior superior iliac spine (ASIS) to the medial malleolus and compared to opposite side.</li> <li>X-ray to confirm a suspected discrepancy.</li> </ul> <table border="1" data-bbox="370 919 1055 1029"> <thead> <tr> <th>True leg length</th> <th>Apparent leg length</th> </tr> </thead> <tbody> <tr> <td>ASIS to medial malleolus</td> <td>umbilicus to medial malleolus</td> </tr> <tr> <td>Anatomical</td> <td>Functional</td> </tr> </tbody> </table> | True leg length   | Apparent leg length | ASIS to medial malleolus | umbilicus to medial malleolus | Anatomical | Functional |  |
| True leg length                      | Apparent leg length  |   |                     |                          |                               |            |            |  |
| ASIS to medial malleolus             | umbilicus to medial malleolus  |   |                     |                          |                               |            |            |  |
| Anatomical                           | Functional   |   |                     |                          |                               |            |            |  |
| <p>4 Log roll test</p>               | <ul style="list-style-type: none"> <li>The examiner passively moves the patient's lower extremity through the maximal available range of hip external and internal rotation</li> <li>Eliciting a clicking or popping sensation may indicate an acetabular labral tear, while increased total ROM (range of motion) when compared to the opposite side may indicate ligament or capsular laxity</li> </ul>  |  |                     |                          |                               |            |            |  |
| <p>5 FABER test (Patrick's test)</p> | <ul style="list-style-type: none"> <li><b>FABER</b> = Flexion + <b>AB</b>duction + External <b>R</b>otation</li> <li>Performed while supine, with ankle placed on top of the opposite knee in the figure-4 position.</li> <li>Discomfort is often seen with hip pathology or SI joint pathology</li> </ul>   |  |                     |                          |                               |            |            |  |
| <p>6 Ober's test</p>                 | <ul style="list-style-type: none"> <li>Patient in side-lying with test side up. The knee may be extended or flexed to 90°. The hip is maintained in slight extension. The test leg is abducted, then allowed to lower toward the table with pelvis stabilized.</li> <li>Inability to bring knee down to table suggests iliotibial (IT) band tightness, which can predispose to the IT band friction syndrome.</li> </ul>   |  |                     |                          |                               |            |            |  |

Which of the following physical exams is used to determine the presence of a contracted IT (iliotibial) band or TFL (tensor fasciae latae)?

- A. FABER test
- B. Ober test
- C. Log roll test
- D. Trendelenburg test

The Faber test is testing for

- A. Hip pathology
- B. SI joint pathology
- C. Iliopsoas muscle tightness
- D. All of the above

The Log Roll test done by:

- A. active movement
- B. passive movement

The true leg length is measured by:

- A. ASIS to medial malleolus
- B. Umbilicus to medial malleolus

A positive Trendelenburg sign occurs when there is dysfunction of \_\_\_\_\_ muscle and the body is unable to maintain the center of gravity on the side of the stance leg.

- A. Extensor
- B. Flexor
- C. Abductor
- D. adductor

A 42-year-old patient complains of unbalanced hip movement during walking, running, and jumping. Physical exam reveals Trendelenburg sign positive as picture shown below. Which of the following is the correct interpretation?

- A. Right gluteus maxiums weakens
- B. Right gluteus medius weakness
- C. Left gluteus maximus weakness
- D. Left gluteus medius weakness

