HIP, THIGH, GROIN, AND PELVIS
• Femur
  
  i. The femur is the longest bone in the body
  
  ii. At the hip joint the head of the femur makes up the ball of this ball and socket joint
BONES (CONT.)

• Pelvis (Hip)
  i. The pelvis is made up of 2 paired coxal bones
  ii. Each coxal bone is made up of 3 fused bones; Illium, Ischium, and Pubis
BONES (CONT.)

- Sacrum
  
  The sacrum is the base of the spine and is made up of 5 fused vertebrae.
BONES (CONT.)

• Coccyx
  i. The coccyx is also known as the tail bone. It is at the very tip of the spine and is made up of 4 fused vertebrae
LIGAMENTS

- Ligamentum teres
  - Also known as the ligament of the head. It lies inside of the hip joint and attaches to the head of the femur and to the acetabulum (hip socket).
• Transverse acetabular
  i. Lies on the inferior aspect of the hip joint. It helps to stabilize the hip joint.
Ligaments (cont.)

- Iliofemoral
  i. A very strong “Y” shaped ligament that lies at the anterior aspect of the hip joint.
LIGAMENTS (CONT.)

• Pubofemoral
  i. Lies at the anterio-inferior aspect of the hip joint. It arises from the acetabular rim and attaches to the femur.
LIGAMENTS (CONT.)

- Inguinal
  i. Arises from the Ilium and attaches to the pubis. It functions to separate the abdomen from the thigh.
Joints

- Hip Joint
  - A ball and socket joint. It has great stability provided by its bone structure as well as its strong ligament support.
• Sacroiliac Joint
  i. The articulation of the sacrum and the ilium on each side. It is a very strong joint that has very little movement.
JOINTS (CONT.)

• Pubic Symphysis
  i. The articulation of the pubic bones at the anterior aspect of the pelvis. It is barely movable except during child birth in women.
ANATOMICAL PLANES

• Median or Sagittal Plane
  i. Bisects the body into right and left halves
ANATOMICAL PLANES (CONT.)

- Coronal or Frontal Plane
  - Bisects the body into front and back planes
ANATOMICAL PLANES (CONT.)

• Horizontal or Transverse Plane
  i. Bisects the body into upper and lower planes
RANGE OF MOTION

- Adduction
  - Moving leg toward the midline in frontal plane
RANGE OF MOTION (CONT.)

• Abduction
  i. Moving leg away from the midline of the body in a frontal
RANGE OF MOTION (CONT.)

- Flexion
  - Decreasing angle between anterior thigh and abdomen through the Sagittal plane
RANGE OF MOTION (CONT.)

• Extension
  i. Increasing angle between anterior thigh and abdomen through the Sagittal plane
RANGE OF MOTION (CONT.)

• Internal Rotation
  i. Rotation of femur toward the midline
RANGE OF MOTION (CONT.)

• External Rotation
  i. Rotation of the femur away from the midline
RANGE OF MOTION (CONT.)

- Torso Flexion
  i. Moving the torso forward through the sagittal plane
• Torso Extension
  i. Moving the torso forward through the sagittal plane
RANGE OF MOTION (CONT.)

• Torso Lateral Flexion
  i. Moving the torso laterally (side to side) in the frontal planes
• Torso Rotation
  i. Rotating the torso in the transverse plane
# Let's Make Flash Cards!!

<table>
<thead>
<tr>
<th>1 Function</th>
<th>2 Functions</th>
<th>3 Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Rotation (ER) Green</td>
<td>Abduction Internal Rotation (ABD/IR) Yellow</td>
<td>Abduction External Rotation Extension (ABD/ER/Ext) Brown</td>
</tr>
<tr>
<td>Flexion (Flex) Blue</td>
<td>Flexion Internal Rotation (Flex/IR) Red</td>
<td>Flexion Abduction External Rotation (FABER) Purple</td>
</tr>
<tr>
<td>Extension (Ext) Pink</td>
<td>Adduction Internal Rotation (ADD/IR) Black</td>
<td>Flexion Adduction Internal Rotation (FADIR) Orange</td>
</tr>
</tbody>
</table>

Colors: Green, Yellow, Brown, Blue, Red, Pink, Black, Purple, Orange
## Color Coded Based on Muscle Action

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<tr>
<th>1 Function</th>
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</tr>
</thead>
<tbody>
<tr>
<td><em>Piriformis</em>&lt;br&gt;<em>Gemellus Superior</em>&lt;br&gt;<em>Obturator Internus</em>&lt;br&gt;<em>Gemellus Inferior</em>&lt;br&gt;<em>Obturator Externus</em>&lt;br&gt;<em>Quadratus Femoris (GREEN)</em></td>
<td><em>Gluteus Medius</em>&lt;br&gt;<em>Gluteus Minimus (YELLOW)</em></td>
<td><em>Gluteus Maximus (BROWN)</em></td>
</tr>
<tr>
<td><em>Rectus Femoris</em>&lt;br&gt;<em>Iliacus</em>&lt;br&gt;<em>Psoas Major/Minor (BLUE)</em></td>
<td><em>Pectineus</em>&lt;br&gt;<em>Tensor Fasciae Latae (TFL) (RED)</em></td>
<td><em>Sartorius (PURPLE)</em></td>
</tr>
<tr>
<td><strong>Biceps Femoris (Pink)</strong></td>
<td><em>Adductor Longus</em>&lt;br&gt;<em>Adductor Brevis</em>&lt;br&gt;<em>Adductor Magnus (BLACK)</em></td>
<td><em>Gracilis (ORANGE)</em></td>
</tr>
</tbody>
</table>
MUSCLES AND FUNCTIONS

Piriformis
Sciatic Nerve
Gemellus Superior
Obturator Internus
Gemellus Inferior
Obturator Externus
Quadratus Femoris

Muscles of the Hip

Hip—posterior view

1. Gluteus maximus (cut)
2. Gluteus medius
3. Piriformis
4. Gemellus superior
5. Obturator internus
6. Gemellus inferior
7. Obturator externus
8. Quadratus femoris
9. Sciatic nerve

Note: Gemellus inferior and quadratus femoris have been shown separated to expose the deeply placed obturator externus.
PIRIFORMIS = EXTERNAL ROTATION

- Piriformis
- Action: External Rotation
- Piriformis
  + Sciatic Nerve
- G
- O
- G
- O
- Q
- Gemellus Superior
- Action: External Rotation
- P
  + Sciatic Nerve
- Gemellus Superior
- O
- G
- O
- Q
OBTURATOR INTERNUS = EXTERNAL ROTATION

- Obturator Internus
- Action: External Rotation
- P
  + Sciatic Nerve
- G
- Obturator Internus
- G
- O
- Q
Gemellus Inferior = External Rotation

- Gemellus Inferior
- Action: External Rotation
- P
  - Sciatic Nerve
- G
- O
- Gemellus Inferior
- O
- Q
OBTURATOR EXTERNUS = EXTERNAL ROTATION

- Obturator Externus
- Action: External Rotation

- P
- + Sciatic Nerve
- G
- O
- G
- Obturator Externus
- Q
QUADRATUS FEMORIS = EXTERNAL ROTATION

- Quadratus Femoris
- Action: External Rotation

- \( P \) + Sciatic Nerve
- \( G \)
- \( O \)
- Quadratus Femoris
RECTUS FEMORIS = FLEXION

- Rectus Femoris
  - Originates at AIIS
  - Inserts at Tibial Tuberosity

- Action: Flexion of the Hip
- Action: Extension of the Knee
ILIACUS = FLEXION

- Iliacus
- Action: Flexion
- Located on the Iliac Crest
- Psoas Major/Minor
- Action: Flexion
- Run from the Spine to the Hip
HAMSTRING MUSCLES

Hip and thigh—posterior view

- 1. Sciatic nerve
- 2. Quadratus femoris
- 3. Biceps femoris
- 4. Semimembranosus
- 5. Semitendinosus
- 6. Tibial nerve
- 7. Common peroneal nerve

Note: The common peroneal nerve is exposed to compression and damage as it passes over the head of the fibula. The quadratus femoris, a lateral rotator, is included for reference.
BICEPS FEMORIS = EXTENSION

- Biceps Femoris
  - Originates at the Ischial Tuberosity
  - Inserts on the Fibula

- Action: Extension of the Hip
- Action: Flexion of the Knee
MUSCLES AND FUNCTIONS

MUSCLES OF THE HIP

1. Gluteus maximus (cut)
2. Gluteus medius
3. Piriformis
4. Gemellus superior
5. Obturator internus
6. Gemellus inferior
7. Obturator externus
8. Quadratus femoris
9. Sciatic nerve

Note: Gemellus inferior and quadratus femoris have been shown separated to expose the deeply placed obturator externus.
GLUTEUS MINIMUS = ABDUCTION AND INTERNAL ROTATION

- Gluteus Minimus
- Action: Abduction and Internal Rotation
- Part of the Buttocks
- Deepest of the 3 Gluteal Muscles.
GLUTEUS MEDIUS =
ABDUCTION AND INTERNAL ROTATION

- Gluteus Medius
- Action: Abduction and Internal Rotation
- Part of the Buttocks.
- Sits between the Gluteus Minimus and Gluteus Maximus.
MUSCLES AND FUNCTIONS

MUSCLES OF THE ANTERIOR THIGH

1. Tensor fasciae latae
2. Iliotibial tract
3. Vastus lateralis (quadriceps femoris)
4. Vastus intermedius (quadriceps femoris)
5. Rectus femoris (cut) (quadriceps femoris)
6. Sartorius
7. Vastus medialis (quadriceps femoris)

HIP FLEXORS AND ADDUCTORS

1. Psoas major
2. Iliacus
3. Inguinal ligament
4. Femoral nerve, vein, artery
5. Pectineus
6. Adductor brevis
7. Adductor longus (cut)
8. Adductor magnus
9. Gracilis
Tensor Fasciae Latae = Flexion and Internal Rotation

- Tensor Fasciae Latae (TFL)
- Action: Flexion and Internal Rotation
- Sits in the Iliotibial Band (ITB) at the iliac crest.
PECTINEUS = FLEXION AND INTERNAL ROTATION

- Pectineus
- Action: Flexion and Internal Rotation
MUSCLES AND FUNCTIONS

HIP FLEXORS AND ADDUCTORS

1. Psoas major
2. Iliacus
3. Inguinal ligament
4. Femoral nerve, vein, artery
5. Pectineus
6. Adductor brevis
7. Adductor longus (cut)
8. Adductor magnus
9. Gracilis
ADDUCTOR MAGNUS =
ADDUCTION AND INTERNAL ROTATION

- Adductor Magnus
- Action: Adduction and Internal Rotation
- Largest of the 3 Adductor Muscles.
Adductor Longus

Action: Adduction and Internal Rotation

Longest of the 3 Adductor Muscles.
ADDUCTOR BREVIS = ADDUCTION AND INTERNAL ROTATION

- Adductor Brevis
- Action: Adduction and Internal Rotation
- Shortest of the 3 Adductor Muscles.
MUSCLES AND FUNCTIONS

MUSCLES OF THE HIP

Hip—posterior view

1. Gluteus maximus (cut)
2. Gluteus medius
3. Piriformis
4. Gemellus superior
5. Obturator internus
6. Gemellus inferior
7. Obturator externus
8. Quadratus femoris
9. Sciatic nerve

Note: Gemellus inferior and quadratus femoris have been shown separated to expose the deeply placed obturator externus.
GLUTEUS MAXIMUS = ABDUCTION, EXTENSION, AND EXTERNAL ROTATION

- Gluteus Maximus
- Action: Abduction, Extension, and External Rotation
- Part of the Buttocks.
- Largest and most Superficial of the Gluteal Muscles.
MUSCLES AND FUNCTIONS

MUSCLES OF THE ANTERIOR THIGH

1. Tensor fasciae latae
2. Iliotibial tract
3. Vastus lateralis (quadriceps femoris)
4. Vastus intermedius (quadriceps femoris)
5. Rectus femoris (cut) (quadriceps femoris)
6. Sartorius
7. Vastus medialis (quadriceps femoris)
Sartorius

- Originates at the ASIS
- Inserts at the pes anserine on the tibia

- Action: FABER
  - Flexion
  - Abduction
  - External Rotation
MUSCLES AND FUNCTIONS

HIP FLEXORS AND ADDUCTORS

1. Psoas major
2. Iliacus
3. Inguinal ligament
4. Femoral nerve, vein, artery
5. Pectineus
6. Adductor brevis
7. Adductor longus (cut)
8. Adductor magnus
9. Gracilis

Hip and thigh—anterior view
Gracilis

- Originates on the Pubis
- Inserts at the pes anserine on the tibia

Action: FADIR

- Flexion
- ADduction
- Internal Rotation