ANATOMY

Subject: Introduction to Anatomy
Lecturer: Dr. Mahir Al-Hadidi
Done by: Sama'a Al Rai

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The Gluteal Region

In the gluteal region the skin is tough with many layers underneath. Directly under it is the superficial fascia followed by the deep fascia then the muscles and the bones of the thigh. Intramuscular injections are regularly given in this region so it is important to know exactly where it should be administered. Since the region is divided into four Quarters we must follow the rule of thumb to find the safest area for administration. We first put the tip of the thumb on the anterior superior iliac spine then move the index finger posterior; the tip of the index finger pin points the upper lateral border which is the safest site for injecting medication.

The outer surface of the ilium is convex due to muscles tension and shows three lines: anterior gluteal line, middle gluteal line, posterior gluteal line.
## Muscles of Gluteal Region

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Origin</th>
<th>Insertion</th>
<th>Nerve Supply</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gluteus Maximus (largest muscle of body)</td>
<td>Sacrum, Ilium, Coccyx</td>
<td>Upper 2/3 iliotibial tract Lower 1/3 linea aspra of femur</td>
<td>Inferior gluteal Nerve from sacral plexus</td>
<td>Lateral rotation of hip. Extend the hip</td>
</tr>
<tr>
<td>Gluteus Medius</td>
<td>Outer surface of Ilium</td>
<td>Greater trochanter of femur</td>
<td>Superior gluteal nerve</td>
<td>Abduct hip joint and steadies pelvis during walking and running</td>
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<tr>
<td>Piriformis (Spindle shape muscle)</td>
<td>Anterior surface of sacrum inside the pelvis then leaves through the greater sciatic</td>
<td>Greater trochanter of femur</td>
<td>Sacral Plexus</td>
<td>Lateral rotation of hip</td>
</tr>
<tr>
<td>Muscles/Tissues</td>
<td>foramen</td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obturator Internus</td>
<td>Inner aspect of obturator membrane / foramen then leaves through the lesser sciatic foramen</td>
<td>Greater trochanter of femur, Sacral Plexus, Lateral rotation of hip joint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gemellus Superior</td>
<td>Spine of Ischium</td>
<td>Greater trochanter of femur, Sacral Plexus, Lateral rotation of hip joint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gemellus inferior</td>
<td>Ischial tuberosity</td>
<td>Greater trochanter of femur, Sacral Plexus, Lateral rotation of hip joint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quadratus femoris (quadrangular in shape)</td>
<td>Ischial tuberosity</td>
<td>Greater trochanter of femur, Sacral Plexus, Lateral rotation of hip joint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tensor Fascia lata</td>
<td>Iliac crest</td>
<td>Iliotibial tract, Superior gluteal nerve, Confirm extension of the knee joint (along with gluteus maximus)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
To summarize some main points on the muscles of the gluteal region:

- Most of the muscles in this region are lateral rotators of the hip joint.
- Lateral rotators are stronger than the medial rotators leading to forced lateral rotation of the thigh in the case of neck of femur fracture.
- All the muscles are supplied by the sacral plexus.
Only one muscle is supplied by the inferior gluteal nerve, gluteus maximus.
Piriformis acts as a key for the gluteal region, naming anything above as superior and anything below as inferior. (nerve, vein, artery)
Two muscles abduct the hip during walking: Gluteus medius and minimus.
Six muscles act as rotators to the hip joint: Gluteus maximus, Piriformis, Obturator internus, Gemellus Superior and Inferior, Quadratus femoris.

Nerves of the Gluteal Region

- Lumbar Plexus L1-L4
- Sacral Plexus L4, L5, S1, S2, S3
  - Superior Gluteal Nerve: Supplying 3 muscles, can you name them? (gluteus medius, minimus, tensor fascia lata)
  - Inferior Gluteal Nerve: Supplying the gluteus Maximus.
  - Posterior Cutaneous nerve of thigh: supplies skin of posterior aspect of thigh (anterior by femoral nerve and medial by obturator nerve and lateral by lateral cutaneous nerve)
  - Sciatic Nerve: Largest nerve in the body
    Originating from L4, L5, S1, S2, S3
    Emerging thorough the greater sciatic foramen

Below: Piriformis
Above: Gemellus Superior, Gemellus Inferior, Quadratus Femoris, Obturatos Internus
Between: Ischial Tuberosity and Greater Trochanter of femur
Descending down to thigh and divides into 2 branches the tibial and fibular nerve (common peroneal nerve)

**NOTE:** If neck of femur is fractured sciatic nerve is directly affected therefore, patients legs are held together to prevent damage to the sciatic nerve (trap of sciatic nerve).

**Arteries of the Gluteal Region**

- Common Iliac Artery divides into:
  - Internal iliac artery
  - External iliac artery >> continues as femoral artery
    - Femoral artery then provides the largest branch:
      - Profunda Femoris Artery: forms **cruciate anastomosis** (connection between 4 arteries at the level of the lesser trochanter of femur). Very important in forming a healthy connection between the internal iliac artery and
the femoral artery. Four arteries are involved in the cruciate anastomosis:

- Inferior gluteal artery
- Medial femoral circumflex
- Lateral femoral circumflex
- First perforating artery

Trochanteric anastomosis (connection between vessels)
Main blood supply to head and neck of femur, as well as connects internal iliac artery with femoral artery. Formed with four arteries:

- Superior gluteal artery
- Inferior gluteal artery
- Medial femoral circumflex
- Lateral femoral circumflex
# Posterior compartment of thigh

## Hamstring muscles (3 ½)

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<tr>
<td>Semitendinosus</td>
<td>Ischial Tuberosity</td>
<td>SGS Area</td>
<td>Sciatic Nerve</td>
<td>Extends hip and flexes knee (due to crossing two joints)</td>
</tr>
<tr>
<td>Semimembranosus</td>
<td>Ischial Tuberosity</td>
<td>Medial condyle of tibia</td>
<td>Sciatic Nerve</td>
<td>Extend hip and flexes knee</td>
</tr>
<tr>
<td>Biceps Femoris</td>
<td>Long Head: Ischial Tuberosity Short Head: Linea aspera of femur</td>
<td>Both at head of fibula</td>
<td>Sciatic Nerve (Long head :tibial nerve Short head : fibular nerve )</td>
<td>Flex the knee joint ⊚</td>
</tr>
<tr>
<td>Adductor Magnus</td>
<td>Ischial Tuberosity</td>
<td>Adductor Tubercle of femur</td>
<td>Sciatic Nerve</td>
<td>Extend hip joint</td>
</tr>
</tbody>
</table>
لا تخش من التنازل عما هو جيد للحصول على ما هو أفضل 😊