# 📚 Gluteal Region

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## 🧠 Overview

The gluteal region is a clinically crucial area containing:

- Powerful extensor & stabilizer muscles
- Major neurovascular structures (especially sciatic nerve)
- Important injection landmarks

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## 🧴 Skin & Superficial Fascia

### 📌 Blood Supply

- Perforating branches of:

- Superior gluteal artery
- Inferior gluteal artery

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### 💧 Lymphatic Drainage

Drains into → Superficial inguinal lymph nodes (lateral group)

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## 🧱 Deep Fascia (Gluteal Fascia)

### 🔍 Key Features

- Continuation of fascia lata (thigh)
- Covers gluteus medius above
- Splits to enclose gluteus maximus below

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## 🧠 Flowchart: Deep Fascia Arrangement

Fascia lata → Covers gluteus medius (above) → Splits around gluteus maximus → Rejoins → Continues laterally as iliotibial tract (IT band)

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⭐ Exam Pearl:

IT tract plays role in knee stability

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## 🦴 Bones of Gluteal Region

- Posterior surface of:
  - Hip bone
  - Femur
- Hip joint

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# 🔒 Ligaments of Gluteal Region

## 📌 Two Important Ligaments

| Ligament | Function |
| --- | --- |
| Sacrospinous | Stabilizes sacrum |
| Sacrotuberous | Prevents posterior rotation |

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## 🧠 Functional Importance

Sacrospinous + Sacrotuberous ligaments → Convert sciatic notches into foramina

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## 🧠 Flowchart: Formation of Foramina

Greater sciatic notch + ligaments → Greater sciatic foramen

Lesser sciatic notch + ligaments → Lesser sciatic foramen

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## 🚪 Greater Sciatic Foramen

🧠 Piriformis = Key Landmark

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### 🔼 Above Piriformis

- Superior gluteal nerve
- Superior gluteal vessels

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### 🔽 Below Piriformis

- Inferior gluteal nerve & vessels
- Sciatic nerve ⚠️
- Posterior cutaneous nerve of thigh
- Pudendal nerve
- Internal pudendal vessels
- Nerve to obturator internus
- Nerve to quadratus femoris

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⭐ Exam Pearl:

"Most structures pass BELOW piriformis"

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## 🚪 Lesser Sciatic Foramen

### 📥 Entering

- Pudendal nerve

- Internal pudendal vessels

### 📤 Exiting

- Tendon of obturator internus
- Nerve to obturator internus

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## 💪 Muscles of Gluteal Region

### 🔢 List of Muscles

- Gluteus maximus
- Gluteus medius
- Gluteus minimus
- Tensor fascia lata
- Piriformis
- Superior gemellus
- Inferior gemellus

- Obturator internus
- Quadratus femoris

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## 💪 Gluteus Maximus

### 🧩 Key Features

| Feature | Description |
|---|---|
| Size | Largest muscle in body 💪 |
| Origin | Ilium, sacrum, coccyx, sacrotuberous ligament |
| Insertion | IT tract (major), gluteal tuberosity |
| Nerve | Inferior gluteal nerve (L5, S1, S2) |

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### ⚙️ Actions

- Extension of hip
- Lateral rotation
- Stabilizes hip & knee via IT tract

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### 🧠 Functional Role

Gluteus maximus → Powerful contraction → Raises body from sitting + Climbing stairs / running

⭐ Exam Pearl: Called "chief antigravity muscle"

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## 💪 Gluteus Medius

| Feature | Description |
| --- | --- |

| | |
|---|---|
| Origin | Ilium (between gluteal lines) |
| Insertion | Greater trochanter |
| Nerve | Superior gluteal nerve (L4–S1) |

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## ⚙️ Actions

- Abduction of thigh
- Medial rotation
- Pelvic stabilization during walking 🚶

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## 💪 Gluteus Minimus

- Similar to medius (deeper)
- Same nerve supply (SGN)

- Same actions

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### 🧠 Flowchart: Pelvic Stability

Gluteus medius & minimus → Contract during walking →

Prevent pelvic drop → Maintain level pelvis

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## ⚠️ Clinical Correlation

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## 🚶 Trendelenburg Test

### 🧠 Procedure

Stand on one leg → Observe pelvis

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## 📊 Interpretation

| Result | Meaning |
| --- | --- |
| Normal | Pelvis rises on opposite side |
| Positive ❗ | Pelvis drops on opposite side |

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## 🧠 Flowchart: Positive Trendelenburg

Gluteus medius/minimus weakness → Loss of pelvic stabilization → Pelvis drops on opposite side → Positive Trendelenburg sign

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## 📌 Causes

- Superior gluteal nerve injury

- Fracture neck of femur
- Hip dislocation
- L4–L5 disc lesion

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## 💉 Safe Injection Site

### 📍 Ventrogluteal Site

- Upper lateral quadrant (gluteus medius)

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### 🧠 Why Safe?

Injection here → Avoids sciatic nerve + Avoids major vessels → Safe intramuscular injection

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### ⭐ Summary

- Gluteal region = muscles + major nerves (sciatic)
- Piriformis divides greater sciatic foramen
- Gluteus maximus = powerful extensor
- Gluteus medius/minimus = pelvic stabilizers
- Trendelenburg test = SGN function
- Safe injection = upper lateral quadrant

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## 💪 Tensor Fasciae Latae (TFL)

### 🧩 Key Features

| Feature | Description |
|---|---|
| Origin | Outer iliac crest (between ASIS & iliac tubercle) |
| Insertion | Iliotibial tract (IT band) |

| Nerve | Superior gluteal nerve (L4–S1) |
| --- | --- |

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## ⚙️ Actions

- Maintains knee in extension 🦵
- Stabilizes pelvis during walking
- Assists in abduction & medial rotation

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## ⭐ Exam Pearl:

👉 Works with gluteus maximus via IT tract for knee stability

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# 💪 Piriformis

## 🧩 Features

| Feature | Description |
| --- | --- |
| Origin | Anterior surface of S2–S4 |
| Insertion | Upper border of greater trochanter |
| Nerve | Anterior rami of S1, S2 |

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## ⚙️ Actions

- Lateral rotation of thigh
- Stabilizes hip joint
- Assists abduction (when hip flexed)

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## ⭐ Clinical Importance:

Divides greater sciatic foramen into:

- Above piriformis
- Below piriformis

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## 💪 Obturator Internus

| Feature | Description |
| --- | --- |
| Origin | Inner surface of obturator membrane |
| Insertion | Greater trochanter (with gemelli) |
| Nerve | Nerve to obturator internus (L5–S1) |

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## ⚙️ Action

- Lateral rotation of thigh

# 💪 Superior & Inferior Gemelli

## 🧩 Origins

- Superior gemellus → Ischial spine
- Inferior gemellus → Ischial tuberosity

## 🧩 Insertion

- Greater trochanter (with obturator internus)

## 🔌 Nerve Supply

| Muscle | Nerve |
| --- | --- |

| | |
|---|---|
| Superior gemellus | Nerve to obturator internus |
| Inferior gemellus | Nerve to quadratus femoris |

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## ⚙️ Action

- Lateral rotation of thigh

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## 💪 Quadratus Femoris

| Feature | Description |
|---|---|
| Origin | Ischial tuberosity |
| Insertion | Quadrate tubercle of femur |

| Nerve | Nerve to quadratus femoris (L4–S1) |
| --- | --- |

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## ⚙️ Action

- Strong lateral rotator of thigh

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## 🧠 Functional Concept: Deep Gluteal Muscle Function

Deep gluteal muscles → Act together → Stabilize femoral head in acetabulum → Produce lateral rotation → Maintain hip joint integrity

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⭐ Exam Pearl: These are called "short lateral rotators of hip"

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# 🔌 Nerves of Gluteal Region

## 📊 List of Important Nerves

| Nerve | Function |
| --- | --- |
| Sciatic nerve | Major nerve of lower limb ⚠️ |
| Superior gluteal nerve | Gluteus medius, minimus, TFL |
| Inferior gluteal nerve | Gluteus maximus |
| Posterior cutaneous nerve of thigh | Sensory |
| Pudendal nerve | Perineum |
| Nerve to obturator internus | Deep muscles |
| Nerve to quadratus femoris | Deep muscles |

⭐ Exam Pearl: Sciatic nerve = largest nerve in body

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## 🩸 Arteries of Gluteal Region

### 🧩 Sources

From Internal Iliac Artery

- Superior gluteal artery
- Inferior gluteal artery

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From Profunda Femoris Artery

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

## 🔴 Superior & Inferior Gluteal Arteries

### 🛣️ Course

Internal iliac artery → Exit pelvis via greater sciatic foramen

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### 🧠 Flowchart: Arterial Pathway

Internal iliac artery → Greater sciatic foramen → Superior gluteal artery (above piriformis) + Inferior gluteal artery (below piriformis) → Supply gluteal muscles → Participate in hip joint anastomosis

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## 🔗 Anastomosis Around Hip

- Superior gluteal artery
- Inferior gluteal artery
- Circumflex femoral arteries

👉 Ensures collateral circulation 🩸

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## ⚠️ Clinical Correlation

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### 🧠 Piriformis Syndrome

Mechanism

Piriformis spasm → Compresses sciatic nerve → Pain radiating to lower limb

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### 🧠 Flowchart: Piriformis Syndrome

Piriformis tightness → Sciatic nerve compression → Pain in buttock → Radiates down leg → Mimics sciatica

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## 💉 Injection Injury

Wrong injection site → Sciatic nerve injury → Paralysis of posterior thigh + leg

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## ⭐ Summary

- Deep muscles = lateral rotators + stabilizers
- Piriformis = key landmark
- SGN → medius, minimus, TFL
- IGN → gluteus maximus
- Sciatic nerve = major clinical structure
- Gluteal arteries pass via greater sciatic foramen

# 🧴 Bursae Related to Gluteus Maximus

Bursae reduce friction between muscle, bone, and tendons

## 📍 Types of Bursae

| Bursa | Location | Function |
|---|---|---|
| Gluteofemoral bursa | Between gluteus maximus tendon & vastus lateralis | Reduces friction during movement |
| Trochanteric bursa | Between gluteus maximus & greater trochanter | Most clinically important |
| Ischial bursa | Between gluteus maximus & ischial tuberosity | Cushions during sitting |

### ⚠️ Clinical Correlation: Trochanteric Bursitis

Repeated friction / pressure → Inflammation of trochanteric bursa → Pain over lateral hip → Difficulty walking / lying on side

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### ⭐ Exam Pearl:

Trochanteric bursitis = most common

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## 🔌 Sacral Plexus

### 🧩 Formation

L4 (part) + L5 → Lumbosacral trunk

- S1, S2, S3, S4 → Sacral plexus formed

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## 📍 Location

- Lies anterior to piriformis muscle

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## 🧠 Flowchart: Formation of Sacral Plexus

L4 + L5 → Lumbosacral trunk → Joins S1–S4 → Sacral plexus

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## ⭐ Exam Pearl: Sacral plexus lies in front of piriformis (important landmark)

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# ⚡ Sciatic Nerve

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## 🧩 Basic Features

| Feature | Description |
| --- | --- |
| Roots | L4–S3 |
| Type | Largest nerve in body |
| Origin | Sacral plexus |

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## 🛣️ Course of Sciatic Nerve

### 🧠 Flowchart: Course

Sacral plexus → Exits pelvis via greater sciatic foramen → Passes below piriformis → Enters gluteal region → Crosses: Superior gemellus + Obturator internus + Inferior gemellus + Quadratus femoris → Enters posterior thigh (deep to biceps femoris) → Descends →

Reaches apex of popliteal fossa → Divides into:

- Tibial nerve
- Common fibular (peroneal) nerve

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## 💪 Motor Supply

Direct

- Hamstrings:
  - Biceps femoris
  - Semitendinosus
  - Semimembranosus
- Hamstring part of adductor magnus

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Indirect (via branches)

- All muscles of leg & foot

## 🧠 Sensory Supply

- No direct sensory supply ❗
- Indirect via branches:
  - Lateral leg
  - Foot (dorsal + plantar)
  - Heel

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⭐ Exam Pearl: Sciatic nerve = motor in thigh, sensory via branches

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## ⚠️ Clinical Correlations

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# 🧠 Piriformis Syndrome (Revisited)

## 📌 Mechanism

Piriformis compresses sciatic nerve

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## 🧠 Flowchart: Symptoms

Sciatic nerve compression → Buttock pain → Radiates down leg → Numbness + weakness → Worse with hip movement

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## 🤰 Obstetric & Pathological Causes

## 📊 Important Causes

| Cause | Effect |
| --- | --- |

| | |
|---|---|
| Fetal head pressure | Compresses sacral plexus |
| Tumor invasion | Nerve compression |
| Obturator nerve pain | Referred pain |
| Disc herniation | Nerve root irritation |

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## 💉 Caudal Anesthesia

- Injection into sacral canal
- Blocks sacral plexus
- Used in:
    - Obstetrics
    - Perineal surgeries

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# ⚠️ Sciatic Nerve Injury

Causes

- Wrong gluteal injection
- Trauma
- Hip surgery

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## 🧠 Flowchart: Sciatic Nerve Injury

Sciatic nerve damage → Loss of hamstring function →

Weak knee flexion → Loss of leg/foot movements →

Sensory loss in lower limb

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## ⭐ Summary

- Bursae reduce friction (trochanteric = most important)

- Sacral plexus = L4–S4
- Sciatic nerve:
    - Largest nerve
    - Exits below piriformis
    - Divides in popliteal fossa
- Piriformis syndrome = nerve compression
- Important procedures:
    - Caudal anesthesia
    - Safe gluteal injections

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-> The End <-