📚 HIP BONE (COXAL BONE)

🧠 Overview

The hip bone (coxal bone) forms the pelvic girdle along with:

- Sacrum
- Coccyx

👉 Each hip bone is formed by fusion of 3 bones:

🧠 Ilium + Ischium + Pubis → Fuse at acetabulum → Form hip bone

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🧩 Parts of Hip Bone

Bone	Position	Contribution
Ilium	Superior	Forms upper part
Ischium	Posteroinferior	Forms lower back part
Pubis	Anteroinferior	Forms anterior part

🕳️ Acetabulum

🧩 Formation: Formed by all three bones

📍 Features

Feature	Description

Lunate surface	Articular (horseshoe-shaped)
Acetabular fossa	Non-articular center
Acetabular notch	Inferior gap

⭐ Exam Pearl: Weight-bearing = lunate surface

🦴 ILIUM

🧩 Parts

- Body → forms acetabulum
- Ala (wing) → expanded upper part

📍 Important Landmarks

🔺 Iliac Crest

- Extends from ASIS → PSIS

🔹 Spines

Spine	Location
ASIS	Anterior superior
AIIS	Below ASIS
PSIS	Posterior superior
PIIS	Below PSIS

⭐ Exam Pearl: ASIS = landmark for inguinal ligament

🧩 Surfaces

🔹 Lateral Surface

- Gluteal lines (muscle attachments)

🔹 Medial Surface

Feature	Function
Iliac fossa	Iliacus origin
Arcuate line	Pelvic brim

Auricular surface	Articulates with sacrum

🦴 ISCHIUM

🧩 Parts

- Body
- Ramus

📍 Key Features

Feature	Description
Ischial tuberosity ⭐	Weight-bearing (sitting)

Ischial spine	Ligament attachment
Greater sciatic notch	Above spine
Lesser sciatic notch	Below spine

🧠 Flowchart: Notches → Foramina

Greater sciatic notch

- Ligaments → Greater sciatic foramen

Lesser sciatic notch

- Ligaments → Lesser sciatic foramen

⭐ Exam Pearl: Ischial tuberosity = "sitting bone"

🦴 PUBIS

🧩 Parts

Part	Contribution
Body	Pubic symphysis
Superior ramus	Acetabulum
Inferior ramus	Obturator foramen

📍 Important Features

Feature	Description

Pubic crest	Thickened ridge
Pubic tubercle ⭐	Attachment of inguinal ligament
Pecten pubis	Pectineal line

⭐ Exam Pearl: Pubic tubercle = key surgical landmark

🕳️ Obturator Foramen

🧩 Features

- Large opening between pubis & ischium
- Closed by obturator membrane

🔑 Function

- Reduces weight
- Transmits obturator nerve & vessels

🧠 Ossification of Hip Bone

🧩 Centers

🧠 Flowchart

Primary centers (3)

→ Ilium

→ Ischium

→ Pubis

Secondary centers (5)

→ Iliac crest

→ AIIS

→ Ischial tuberosity

→ Pubis

→ Acetabulum

⭐ Exam Pearl: Fusion occurs at Y-shaped triradiate cartilage

⚠️ Clinical Correlation: Pelvic Fractures

🧠 Mechanism

Trauma

- Direct (RTA 🚗)
- Indirect (fall on feet)
- Fracture at weak points

📍 Common Sites

- Pubic rami
- Acetabulum
- Sacroiliac joint

⚠️ Complications

Pelvic fracture → Soft tissue injury → Damage to →

Bladder 🚽 + Urethra

⭐ Exam Pearl: Always check urinary symptoms in pelvic trauma

🎯 Summary

🧠 Must-Know Points

- Hip bone = ilium + ischium + pubis
- Acetabulum = hip joint socket
- Ischial tuberosity = weight-bearing
- Pubic tubercle = inguinal landmark
- Obturator foramen = largest foramen
- Triradiate cartilage = fusion site

🦴 HIP BONE MUSCLE ATTACHMENTS

🧠 OVERVIEW

The hip bone (os coxae) provides attachment to:

- Trunk muscles
- Lower limb muscles
- Pelvic floor muscles

👉 Think of it as a "central anchor" connecting upper body + lower limb.

🧩 DIVISION-WISE MUSCLE ATTACHMENTS

🟦 I. ILIUM — Muscle Attachments

🔹 External Surface (Gluteal Surface)

Gluteal Line	Muscle Attached	Function
Posterior gluteal line	Gluteus maximus	Powerful hip extension
Between posterior & anterior lines	Gluteus medius	Abduction + pelvic stability
Between anterior & inferior lines	Gluteus minimus	Abduction + medial rotation

💡 Exam Tip: These 3 muscles are arranged in layers (Maximus on top → Medius → Minimus).

🔹 Internal Surface (Iliac Fossa)

Muscle	Function

Iliacus	Hip flexion (part of iliopsoas)

🔹 Iliac Crest Attachments

Region	Muscles
Outer lip	External oblique
Intermediate	Internal oblique
Inner lip	Transversus abdominis

💡 Mnemonic:

"T-I-E" ➡️ Inside → Outside ➡️ Transversus → Internal → External

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- Key Landmarks

Landmark	Attachment
ASIS	Sartorius, Inguinal ligament
AIIS	Rectus femoris (straight head)
Iliac tubercle	Tensor fascia lata

🟫 2. ISCHIUM — Muscle Attachments

- Ischial Tuberosity

👉 Known as "Sitting bone"

Muscle Group	Muscles

Hamstrings	Semitendinosus, Semimembranosus, Long head of biceps femoris
Others	Adductor magnus (hamstring part), Quadratus femoris

Ischial Spine

- Muscle/Ligament -
Superior gemellus
Sacrospinous ligament

Around Lesser Sciatic Notch

Structure	Function

Obturator internus tendon	Lateral rotation of thigh
Inferior gemellus	Assists obturator internus

🟥 3. PUBIS — Muscle Attachments

- 🔹 Body of Pubis

Muscle	Function
Rectus abdominis	Flexes trunk
Pyramidalis	Tenses linea alba

- 🔹 Superior Pubic Ramus

Muscle	Function
Pectineus	Hip adduction + flexion

🔹 Inferior Pubic Ramus

Muscle Group	Muscles
Adductors	Adductor longus, brevis
Medial thigh	Gracilis

🔗 IMPORTANT LIGAMENTOUS ATTACHMENTS

Ligament	Attachment

Sacrotuberous	Sacrum → Ischial tuberosity
Sacrospinous	Sacrum → Ischial spine
Inguinal ligament	ASIS → Pubic tubercle

🔄 FUNCTIONAL FLOWCHART (Integration)

Hip bone acts as a functional hub:

Trunk muscles attach → Stabilize pelvis

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Pelvic muscles attach → Support pelvic organs

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Lower limb muscles attach → Produce movement

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Combined action → Walking, standing, posture 🚶

🧠 CLINICAL CORRELATIONS

🩺 1. ASIS — Important Landmark

- Used to palpate femoral artery
- Used to measure true limb length

True limb length: ASIS → Medial malleolus

🩺 2. Ischial Tuberosity Injuries

- Seen in hamstring avulsion injuries
- Common in athletes 🏃

🩺 3. Gluteal Muscle Weakness

Gluteus medius/minimus weakness

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Pelvic instability

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Positive Trendelenburg sign 🚶

🩺 4. Sciatic Foramina Formation

Greater sciatic notch + sacrospinous ligament + sacrotuberous ligament

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Greater sciatic foramen

Lesser sciatic notch + same ligaments

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Lesser sciatic foramen

🎯 SUMMARY

- Ilium → Gluteal + abdominal muscles
- Ischium → Hamstrings + rotators
- Pubis → Adductors + abdominal muscles
- ASIS & ischial tuberosity = clinical hotspots ⚠️

-> The End <-