



PIPADOR REVISION

MRCOG Part 1 Revision Notes

The Bony Pelvis

ANATOMY • LECTURE 1

VISUAL EXAMINATION REVISION NOTES

2026 Edition

MRCOG Part 1 Revision Notes

Lecture 1: The Bony Pelvis

Anatomy • Visual revision edition

COLOUR CODE USED THROUGHOUT THESE NOTES

ILIUM	ISCHIUM	PUBIS	SACRUM	COCCYX
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LEARNING OBJECTIVES — tick off as you go

- ☐ Identify the bones forming the pelvis and their key landmarks.
- ☐ Describe the hip bone components (ilium, ischium, pubis) and their fusion at the acetabulum.
- ☐ Describe the sacrum and coccyx.
- ☐ Recognise pelvic joints and ligaments.
- ☐ Compare male and female pelvis (gynaecoid, android, anthropoid, platypelloid).
- ☐ Identify surface landmarks for clinical examination.
- ☐ Apply knowledge of pelvic bones to obstetric pelvimetry.

1 Overview of the Bony Pelvis

IN ONE LINE: A ring of bone at the base of the spine: 2 hip bones + sacrum + coccyx.

2 × HIP BONES Innominate / os coxae — one each side (ilium + ischium + pubis)	SACRUM Posteriorly — wedged between the hip bones	COCCYX Inferior to the sacrum
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Five functions

SUPPORT	TRANSMIT	ANCHOR	PROTECT	BIRTH CANAL
Upper body weight when sitting and standing	Weight from axial skeleton to lower limbs	Muscles of locomotion and trunk	Bladder, rectum, internal reproductive organs	In females

2 The Hip Bone (Os Coxae / Innominate)

IN ONE LINE: Three bones — ilium, ischium, pubis — fuse at the acetabulum (triradiate cartilage fuses at puberty; ossification complete by ~25 years).

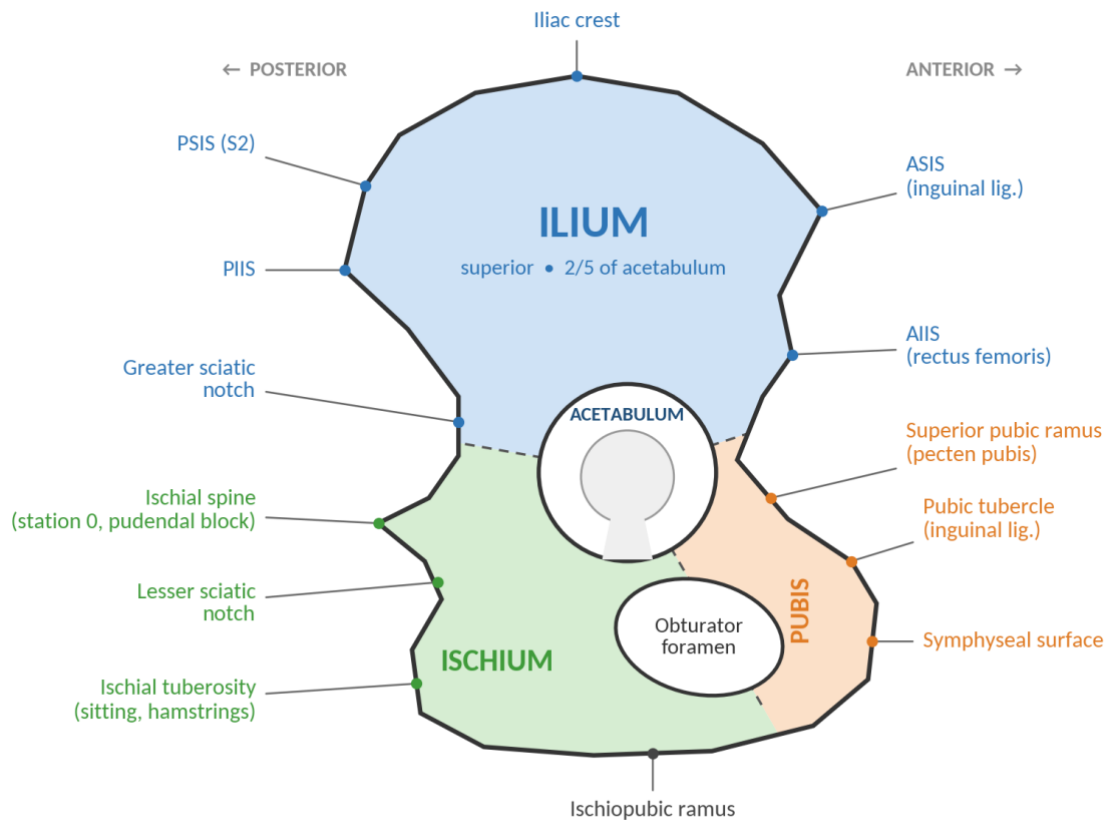


Figure 1. The three parts of the hip bone and their landmarks — learn the map first, then the details.

2.1 The Ilium — the largest part; forms the SUPERIOR part

Landmark	What it is	Why it matters
Iliac crest	Superior border, ASIS → PSIS	Highest point = L4 (lumbar puncture)
ASIS	Anterior superior iliac spine	Inguinal ligament attaches; palpable; McBurney's point
AIIS	Anterior inferior iliac spine	Rectus femoris (straight head)
PSIS	Posterior superior iliac spine	Overlies S2; SI joint landmark; 'dimples of Venus'
PIIS	Posterior inferior iliac spine	Lies below PSIS
Iliac fossa	Smooth internal surface	Iliacus attaches
Gluteal surface	External; posterior, anterior, inferior gluteal lines	Lines demarcate gluteal muscle origins
Auricular surface	Ear-shaped articular surface	Articulates with sacrum (SI joint)
Iliac tuberosity	Rough area behind auricular surface	Interosseous sacroiliac ligaments
Greater sciatic notch	Posterior notch	Becomes greater sciatic foramen (sacrospinous lig.)
Arcuate line	Ridge on inner surface	Part of the pelvic brim (linea terminalis)

2.2 The Ischium — forms the POSTEROINFERIOR part

Landmark	What it is	Why it matters
Body	Main mass of ischium	Forms posterior 2/5 of acetabulum
Ischial spine	Projects medially; separates the two sciatic notches	Sacrospinous lig.; station 0; pudendal nerve block
Ischial tuberosity	Prominent posteroinferior process	Weight-bearing in sitting; hamstrings; sacrotuberous lig.
Lesser sciatic notch	Between spine and tuberosity	Becomes lesser sciatic foramen
Ramus	Runs anteriorly	Joins inferior pubic ramus = ischiopubic ramus

MNEMONIC / MEMORY HOOK

Notch + ligament = foramen

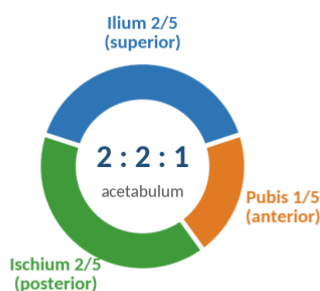
Greater sciatic notch + sacrospinous → GREATER sciatic foramen

Lesser sciatic notch + sacrospinous + sacrotuberous → LESSER sciatic foramen

2.3 The Pubis — forms the ANTEROINFERIOR part

Landmark	What it is	Why it matters
Body	Meets opposite side	Pubic symphysis
Pubic crest	Superior border of body	Rectus abdominis attaches; part of brim
Pubic tubercle	Lateral end of pubic crest	Inguinal ligament; groin/hernia examination
Superior pubic ramus	Body → acetabulum	Carries pecten pubis (pectineal line) — part of brim
Inferior pubic ramus	Runs inferolaterally	Joins ischial ramus
Obturator foramen	Bordered by pubis + ischium; covered by obturator membrane	Obturator nerve, artery, vein pass via obturator canal (superior part)
Pubic arch	Inferior pubic rami of both sides	Female >90°, male <70°

2.4 The Acetabulum — where all three meet



- Cup-shaped cavity on the lateral hip bone; articulates with the **head of femur** (hip joint).
- **Ilium 2/5** (superior) • **Ischium 2/5** (posterior) • **Pubis 1/5** (anterior).
- Triradiate cartilage fuses at **puberty (12–16 y)**; complete by 25.
- **Lunate surface** = articular; **acetabular notch** = inferior gap; **acetabular fossa** = central, non-articular.

MNEMONIC / MEMORY HOOK

2 : 2 : 1 — ilium and ischium get two-fifths each; the little pubis gets the leftover one-fifth.

3 The Sacrum ■ SACRUM

IN ONE LINE: Five fused vertebrae (S1–S5) forming a triangular wedge — the posterior wall of the pelvis.

Part	Key facts
Base (superior)	Articulates with L5 (lumbosacral joint). Promontory on anterior edge — pelvimetry landmark
Apex (inferior)	Articulates with coccyx (sacrococcygeal joint)
Anterior (pelvic) surface	Concave; transverse ridges = fusion lines; 4 pairs anterior foramina (anterior rami)
Posterior surface	Convex; three crests (see mnemonic); 4 pairs posterior foramina (posterior rami)
Sacral canal	Continuation of vertebral canal: cauda equina, spinal nerves, filum terminale
Sacral hiatus + cornua	Inferior opening at S4–S5 (laminae unfused), flanked by sacral cornua — caudal anaesthesia
Auricular surface / tuberosity	Lateral; articulates with ilium; tuberosity anchors interosseous SI ligaments

MNEMONIC / MEMORY HOOK

Posterior sacral crests — say 'SAT' from the midline outwards:

Spinous processes → median crest • Articular processes → intermediate crests • Transverse processes → lateral crests

4 The Coccyx ■ COCCYX

IN ONE LINE: 3–5 (usually 4) fused coccygeal vertebrae — the vestigial tail.

- Base articulates with the apex of the sacrum; **cornua** at the base (homologous to articular processes).
- Attachments: **coccygeus**, **levator ani**, sacrotuberous and sacrospinous ligaments, part of the anal sphincter.
- Slight mobility at the sacrococcygeal joint lets it **displace backwards in childbirth**.

CLINICAL LINK

Fracture in childbirth or trauma → **coccydynia**.

5 Pelvic Joints

	Sacroiliac	Sacrococcygeal	Pubic symphysis
Type	Synovial (partly fibrous posteriorly)	Symphysis (fibrocartilaginous)	Secondary cartilaginous (symphysis) + interpubic disc

	Sacroiliac	Sacrococcygeal	Pubic symphysis
Between	Auricular surfaces of sacrum and ilium	Apex of sacrum and base of coccyx	Bodies of left and right pubic bones
Movement	Minimal gliding — strong ligaments	Slight flexion—extension	Minimal, except in pregnancy
Ligaments	Anterior, posterior, interosseous SI	—	Superior pubic; inferior (arcuate) pubic
Pregnancy / birth	Relaxin → laxity → pelvic girdle pain	Coccyx pushed back → larger outlet	Relaxin → up to 4 mm widening; SPD / PGP

Sacroiliac ligaments — weakest to strongest

Anterior SI weak	Posterior SI (long + short) strong	Interosseous SI strongest — fills gap between sacral and iliac tuberosities
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Accessory ligament	Runs from → to
Sacrotuberous	Sacrum → ischial tuberosity
Sacrospinous	Sacrum → ischial spine
Iliolumbar	L5 transverse process → iliac crest

6 The Pelvic Brim (Linea Terminalis)

IN ONE LINE: The brim divides the *FALSE (greater) pelvis* above from the *TRUE (lesser) pelvis* below.

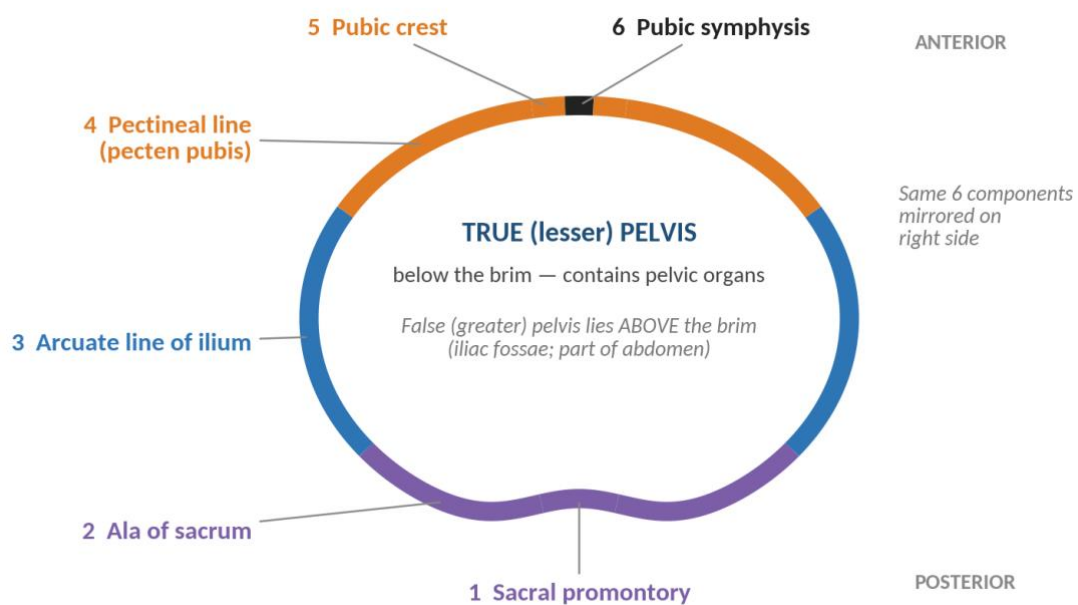
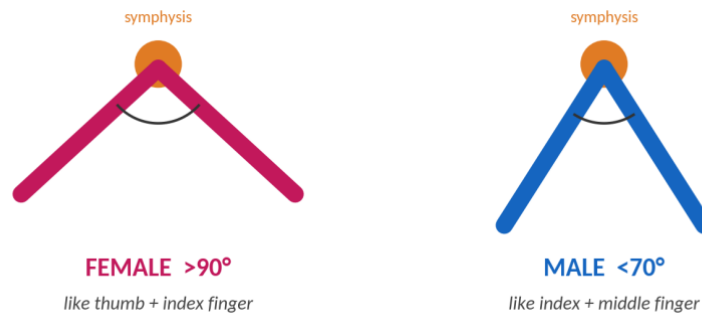


Figure 2. Six components of the brim, numbered posterior → anterior and coloured by bone.

MNEMONIC / MEMORY HOOK**P-A-A-P-P-S, back to front: "Pelvic Architecture Always Protects Precious Structures"**

Promontory • Ala of sacrum • Arcuate line • Pectineal line • Pubic crest • Symphysis

7 Male vs Female Pelvis

*Figure 3. The subpubic angle — the single most-asked difference.*

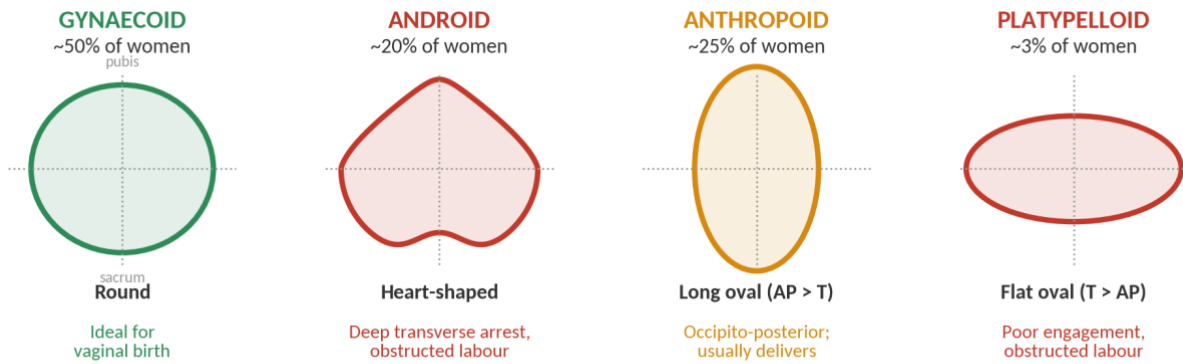
Feature	♀ Female	♂ Male
General structure	Light, thin, smooth	Heavy, thick, rough
Pelvic inlet	Oval, transversely wider	Heart-shaped
Pelvic outlet	Wider	Narrower
Pelvic cavity	Shorter, wider	Longer, narrower
Subpubic angle	>90° (wide)	<70° (narrow)
Sacrum	Short, wide, curved	Long, narrow, less curved
Sacral promontory	Less pronounced	More pronounced
Iliac crests	Less prominent, more curved	More prominent
Ischial spines	Everted (wider apart)	Inverted (closer)
Obturator foramen	Oval / triangular	Round
Acetabulum	Smaller, faces more anteriorly	Larger, faces more laterally
Greater sciatic notch	Wide (~90°)	Narrow (~70°)

EXAM HOOK

Theme to remember: the female pelvis is built **wider and shallower** for birth — almost every row follows from that.

8 Caldwell–Moloy Classification of Pelvic Shapes

IN ONE LINE: Based on the shape of the pelvic **INLET**. Most women are gynaecoid, but many have mixed types.



Pelvic inlet viewed from above (anterior at top). Dotted lines = AP and transverse diameters.

Figure 4. The four inlet shapes. Green = favourable, amber = usually manageable, red = risk of obstructed labour.

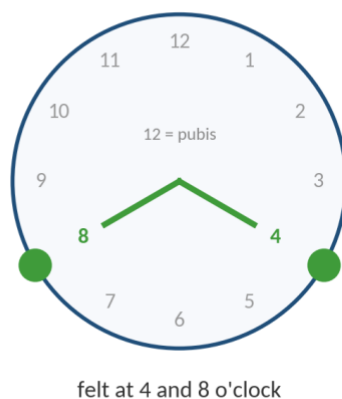
Type	Frequency	Features	Obstetric implications
Gynaecoid	~50%	Rounded inlet; wide subpubic angle; spines not prominent; well-curved sacrum	Ideal for vaginal delivery
Android	~20% (more common in white women)	Heart-shaped inlet; narrow subpubic angle; prominent spines; convergent side walls	Difficult labour; deep transverse arrest; obstructed labour
Anthropoid	~25%	Oval inlet, AP > transverse; narrow transverse diameter; deep pelvis	Tendency to occipito-posterior; delivery usually possible
Platypelloid	~3%	Flat inlet, transverse > AP; shortened AP, wide transverse	Poor head engagement; high risk of obstructed labour

EXAM HOOK

Most reliable assessment is **clinical and intrapartum**, not preconception classification.

9 Surface Landmarks

Ischial spines on PV



Station = leading part vs spines

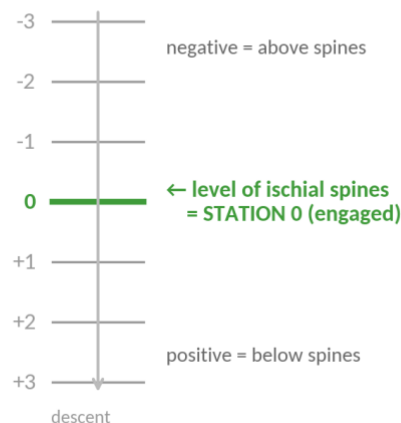


Figure 5. Ischial spines on vaginal examination, and how station is defined from them.

Landmark	Where / how felt	Level or clinical use
Iliac crest	Highest point palpable at the flank	L4 — lumbar puncture
ASIS	Palpable anteriorly	Reference for McBurney's point (appendix)
Pubic symphysis	Anterior midline	Pubic landmark
Pubic tubercle	Just lateral to symphysis	Inguinal hernia neck lies above and medial; femoral hernia below and lateral (inferolateral)
PSIS	Dimples of Venus	S2 — level of dural sac termination
Sacral promontory	Only felt on PV in thin patients	Pelvimetry
Ischial spines	PV at 4 and 8 o'clock	Station 0 (engagement)
Ischial tuberosities	Palpable inferiorly	Weight-bearing in sitting
Coccyx	Natal cleft	—

MNEMONIC / MEMORY HOOK

Two 'S2' facts go together: PSIS dimples overlie S2 — and the dural sac ends at S2.

10 Ossification

3 PRIMARY centres per hip bone → meet at the TRIRADIATE cartilage (acetabulum)

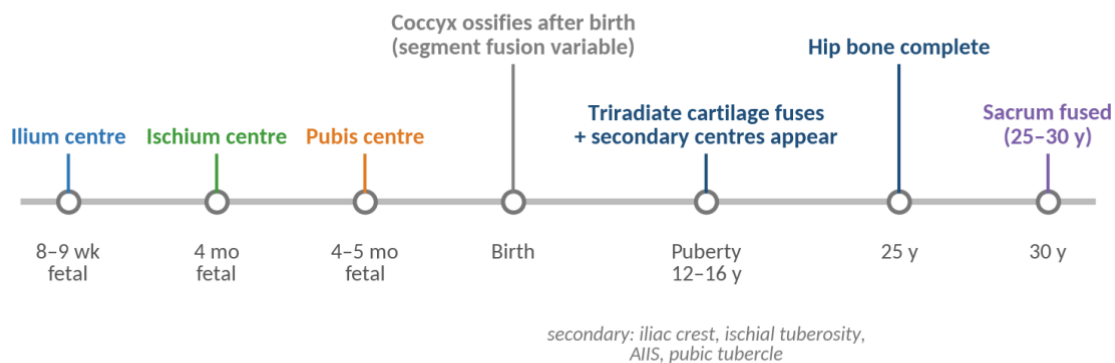


Figure 6. Ossification timeline.

- Each hip bone has **3 primary centres**: ilium (8th–9th fetal week), ischium (4th fetal month), pubis (4th–5th fetal month).
- They meet at the **triradiate cartilage** in the acetabulum; fusion between puberty and 25 years.
- Secondary centres** at puberty: iliac crest, ischial tuberosity, AIIS, pubic tubercle.
- Sacrum**: 5 primary centres for each vertebra; fusion by 25–30 years. **Coccyx**: ossifies postnatally; segment fusion variable.

MNEMONIC / MEMORY HOOK

Primary centres appear in **alphabetical order**: Ilium → Ischium → Pubis.

11 Clinical Correlations

11.1 Obstetric pelvimetry

Clinical pelvimetry assesses whether the pelvis is adequate for vaginal delivery.

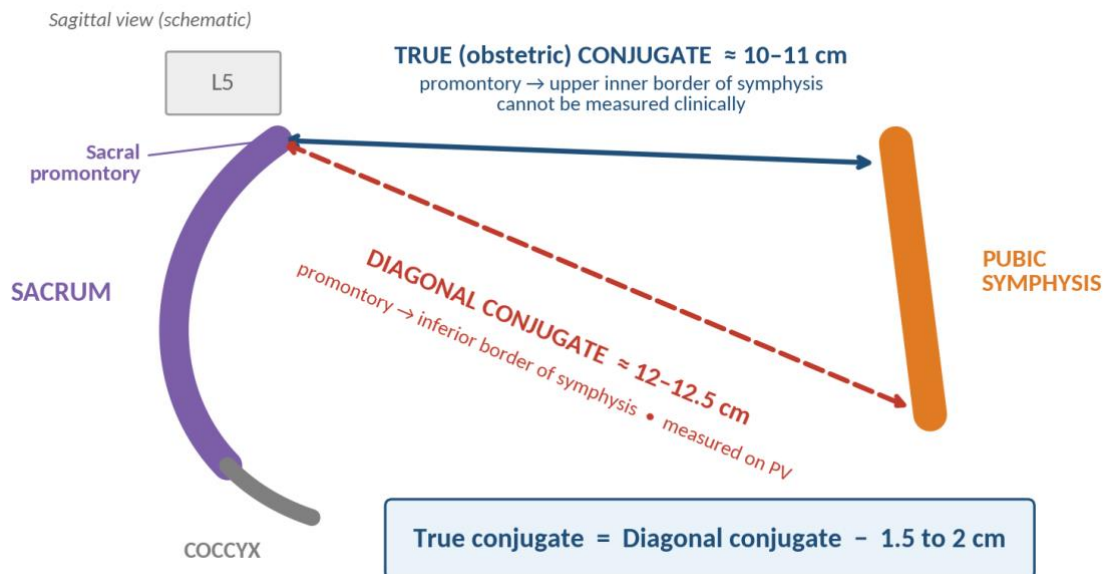


Figure 7. The two AP conjugates — one you can feel, one you have to calculate.

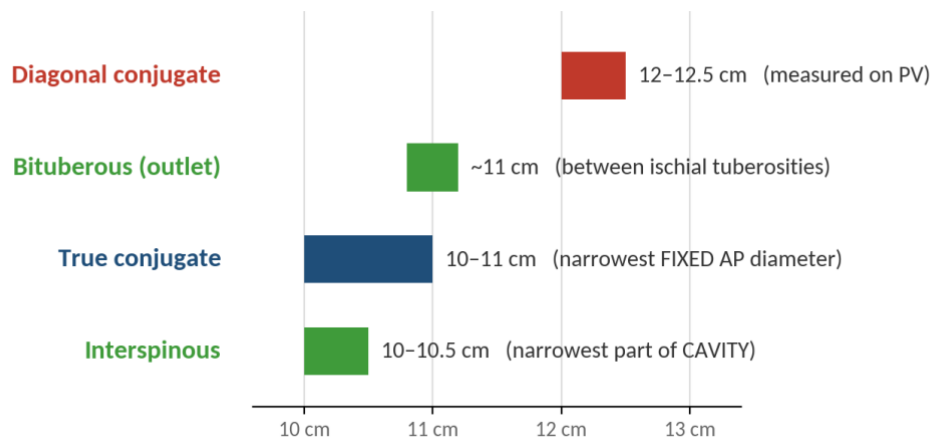


Figure 8. Key diameters at a glance — note the two 'narrowest' traps.

EXAM HOOK

True conjugate = narrowest **fixed** AP diameter. **Interspinous** = narrowest part of the **cavity**.
MRI/CT pelvimetry is now rarely used — radiation and limited predictive value.

11.2 – 11.4 Other clinical links

FRACTURES

- Pelvic: high-energy trauma (RTA, falls); '**open book**' = symphysis disruption
- Symphyseal separation in childbirth: pain, instability
- Coccyx: childbirth, falls $\rightarrow$ coccydynia
- Pubic ramus: osteoporotic postmenopausal women after falls

PELVIC GIRDLE PAIN / SPD

- **~20%** of pregnancies
- Relaxin-mediated joint laxity
- Pain over symphysis, SI joints, lower back
- Physiotherapy, support belts, analgesia, modified activity

SACROCOCCYGEAL TERATOMA

- Most common neonatal tumour
- Arises from totipotent cells near the coccyx
- Detected antenatally on USS; usually needs fetal/neonatal surgery

CAUDAL ANAESTHESIA

- Via the **sacral hiatus (S4–S5)**
- Locate using the **sacral cornua** either side

12 MRCOG Exam Pearls — Last-Minute Page**Numbers to know**

~12 cm Diagonal conjugate	10–11 cm True conjugate	~11 cm Bituberous	10–10.5 cm Interspinous
>90° / <70° Subpubic ♀ / ♂	~90° / ~70° Greater sciatic notch ♀ / ♂	2 : 2 : 1 Acetabulum Il : Is : Pu	~20% PGP in pregnancy

HIGH-YIELD CHECKLIST

- ☐ Hip bone: ilium + ischium + pubis, fuse at acetabulum (ossification complete by ~25).
- ☐ Pelvic brim: promontory, ala, arcuate line, pectineal line, pubic crest, symphysis.
- ☐ Gynaecoid ~50% ideal • android heart-shaped, obstructed • anthropoid oval AP, OP • platypelloid flat, rare.
- ☐ Ischial spines: 4 and 8 o'clock on PV; station 0 and pudendal nerve block.
- ☐ Sacral promontory: posterior midline of brim; pelvimetric landmark.
- ☐ Sacral hiatus at S4–S5: caudal anaesthesia.
- ☐ Triradiate cartilage fuses at puberty.
- ☐ Pelvic girdle pain: relaxin-mediated, ~20% of pregnancies.

Quick-fire self-test — cover the right-hand column

Question	Answer
Which bone contributes least to the acetabulum?	Pubis (1/5)
Which ligament converts the greater sciatic notch into a foramen?	Sacrospinous
Which diameter is the narrowest part of the pelvic cavity?	Interspinous (~10–10.5 cm)
Diagonal conjugate 12.5 cm — estimated true conjugate?	~10.5–11 cm
Which pelvic type predisposes to occipito-posterior position?	Anthropoid
Which pelvic type is linked with deep transverse arrest?	Android
What vertebral level does the PSIS overlie?	S2
What vertebral level is the highest point of the iliac crest?	L4
Strongest sacroiliac ligament?	Interosseous SI ligament
Which crest of the sacrum is formed by fused transverse processes?	Lateral sacral crest

Question	Answer
Most common neonatal tumour arising near the coccyx?	Sacroccocygeal teratoma

13 References

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