



PIPADOR REVISION

MRCOG Part 1 Revision Notes

Mechanics of Childbirth

ANATOMY • LECTURE 34

VISUAL EXAMINATION REVISION NOTES

2026 Edition

MRCOG Part 1 Revision Notes

Lecture 34: Mechanics of Childbirth

Anatomy • Visual revision edition

COLOUR CODE USED THROUGHOUT THESE NOTES

INLET	MID-CAVITY	OUTLET	MALPOSITION	BREECH / OTHER
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LEARNING OBJECTIVES — tick off as you go

- ☐ Describe the powers, passage and passenger.
- ☐ State the pelvic diameters at each level and the four pelvic shapes.
- ☐ Define lie, presentation, attitude, position, engagement and station.
- ☐ Describe the cardinal movements for an occipito-anterior labour.
- ☐ Explain the mechanisms of OP, face, brow and breech.
- ☐ Recognise the anatomy behind CPD, deep transverse arrest and shoulder dystocia.

1 The Three Ps

POWERS

Contractions (~3–5 in 10 min, 45–60 s) + maternal pushing in the second stage

PASSAGE

Bony pelvis + soft tissues (cervix, pelvic floor, vagina, perineum)

PASSENGER

Fetal head — size, presentation, position, attitude; moulding

2 The Maternal Pelvis

The obstetric pelvis — sagittal view, anterior on the RIGHT

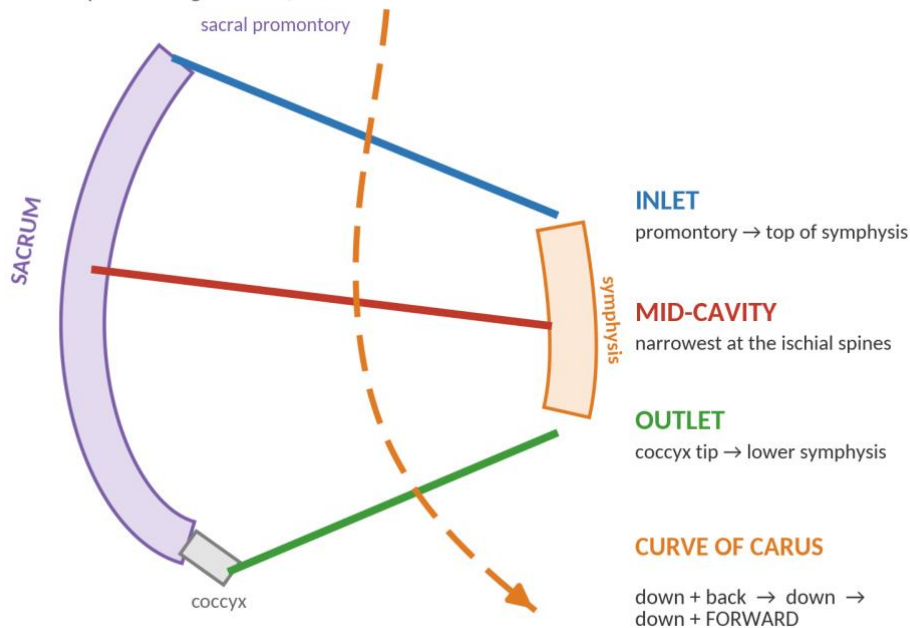
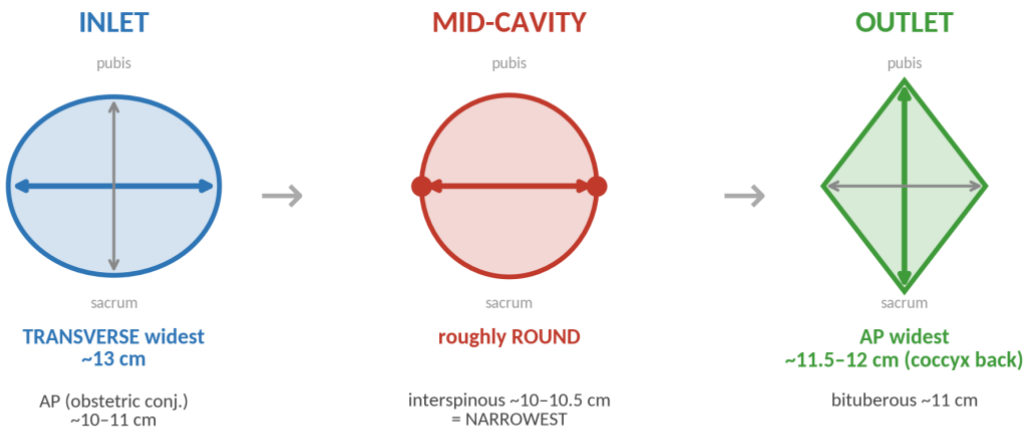


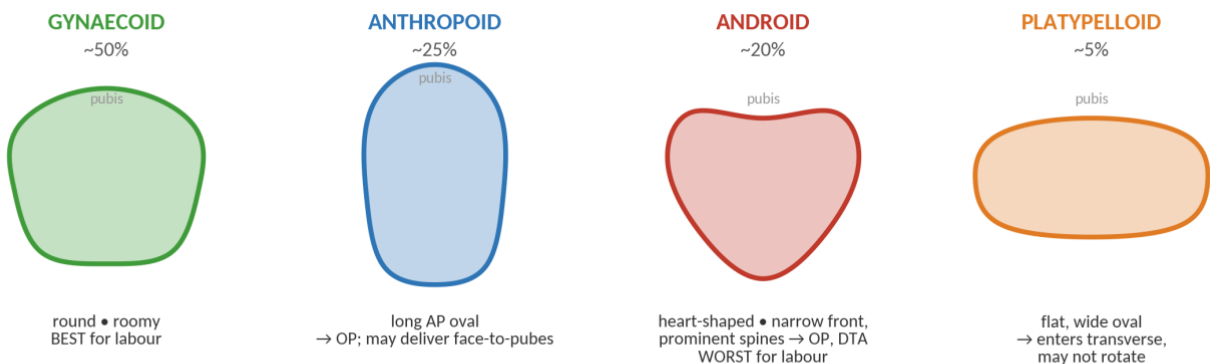
Figure 1a. The three pelvic planes and the curve of Carus (from Lecture 7).



The widest diameter turns through 90° — so the fetal head must rotate from transverse to AP.

Figure 1b. The widest diameter turns through 90° (from Lecture 7).

Level	AP	Transverse
Inlet	True conjugate ~11 cm; obstetric conjugate ~10–11 cm (shortest)	~13–13.5 cm — widest
Mid-cavity	~12 cm	Interspinous ~10 cm — narrowest of the pelvis
Outlet	~11.5–13 cm — widest (coccyx moves back)	Bituberous ~11 cm



Caldwell–Moloy inlet shapes (viewed from above, pubis at the top). Percentages vary between series.

Figure 2. Caldwell–Moloy pelvic shapes.

3 Describing the Fetus

Term	Meaning
Lie	Fetal long axis vs uterine long axis — longitudinal (~99%), transverse, oblique
Presentation	Part over the cervix — cephalic (~96%), breech (~3–4%), shoulder, brow, face, compound
Attitude	Relation of fetal parts — normally flexed
Position	Denominator vs the maternal pelvis: vertex = occiput, face = mentum, breech = sacrum, shoulder = acromion

Term	Meaning
Engagement	Widest transverse diameter (BPD) through the inlet — $\leq 2/5$ palpable abdominally
Station	Leading bony part vs the ischial spines (cm, -5 to +5); 0 usually means engaged, but caput and moulding can mislead

Vertex positions — where the OCCIPUT points (looking up from below)

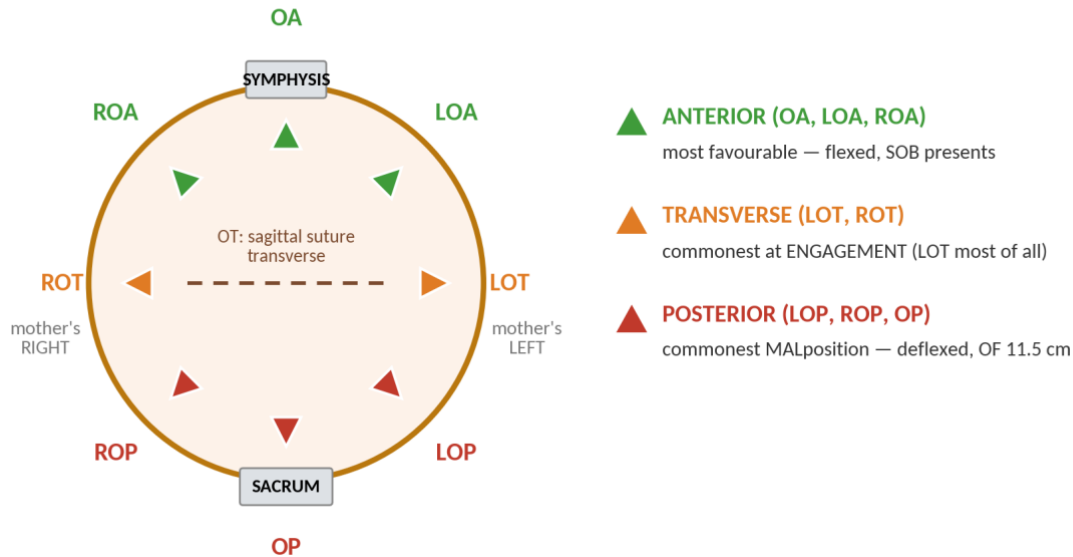
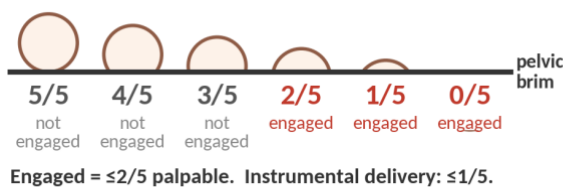


Figure 3. The eight vertex positions.

FIFTHS PALPABLE ABDOMINALLY



STATION ON PV

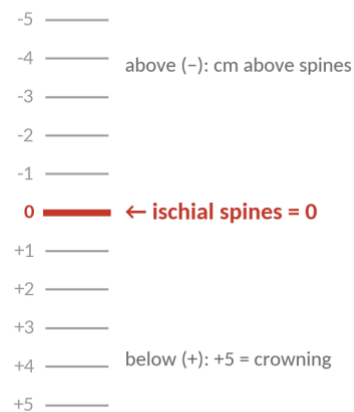


Figure 4. Fifths and station (from Lecture 7).

4 The Cardinal Movements (OA Labour)

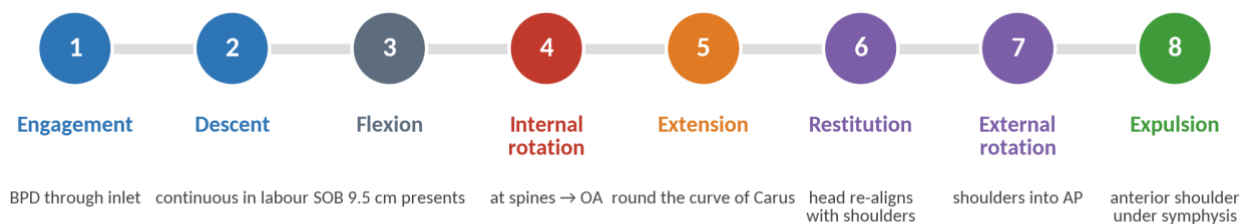


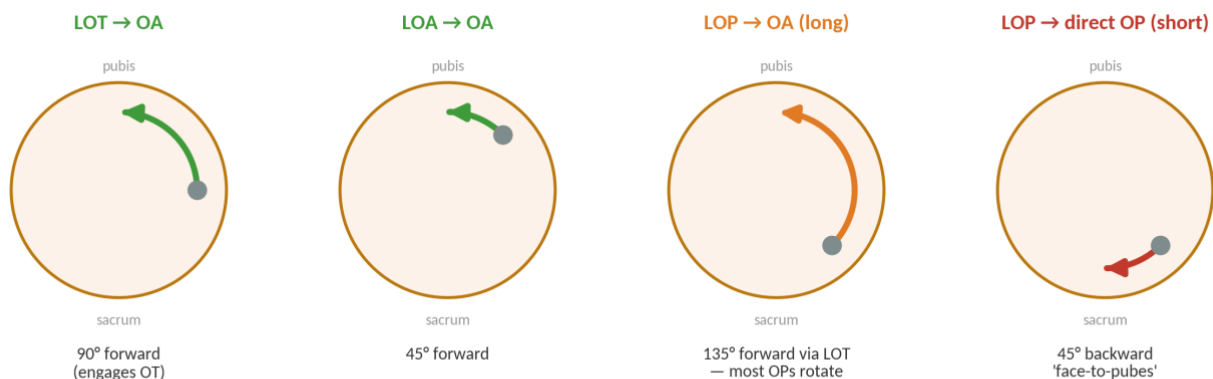
Figure 5. Cardinal movements (from Lecture 7).

MNEMONIC / MEMORY HOOK

'Every Doctor Feels Increasingly Excited Reaching Excellent Exams' — Engagement, Descent, Flexion, Internal rotation, Extension, Restitution, External rotation, Expulsion.

Movement	What happens
Engagement	Usually occipito-transverse: the head's long axis lies in the widest (transverse) diameter of the inlet, so the BPD sits in the AP
Descent	Throughout labour — contractions, then pushing
Flexion	Resistance from cervix and pelvic floor tucks the chin: OF 11.5 → SOB 9.5 cm
Internal rotation	At the pelvic floor/spines the occiput rotates forward — 90° from OT, 45° from OA-oblique — so the long axis meets the widest (AP) outlet diameter; levator ani / puborectalis gutter guides it
Extension	Suboccipital region pivots under the symphysis; bregma, face and chin sweep over the perineum
Restitution	Head untwists ~45° to realign with the shoulders
External rotation	Shoulders rotate into the AP of the outlet; the head turns with them
Expulsion	Anterior shoulder under the symphysis, then the posterior shoulder, then the body

5 OP, Face, Brow and Breech



Grey dot = starting position of the occiput; arrow = internal rotation (viewed from below, mother's left on the right). Stuck at OT at the spines = deep transverse arrest.

Figure 6. Rotation paths.

OCCIPITO-POSTERIOR

- Deflexed — **OF 11.5 cm** presents; longer labour, backache
- Most rotate **long (135°)** to OA
- Some rotate **short (45°)** to direct OP → **face-to-pubes** birth, more perineal trauma
- Deep transverse arrest:** stuck OT at the spines → **second-stage** rotation (manual, rotational ventouse, Kielland's) or caesarean

FACE (hyperextended)

- Denominator **mentum**; presenting **submento-bregmatic 9.5 cm**
- Mento-anterior:** can deliver — chin under the symphysis, head born by **flexion**
- Mento-posterior:** already fully extended — **cannot deliver** unless it rotates → caesarean

BROW (partly extended)

- The **brow** (between anterior fontanelle and orbital ridges) presents
- **Mento-vertical 13.5 cm** — too big at term
- May flex to vertex or extend to face; if it persists → **caesarean**

BREECH (~3–4% at term)

- Denominator **sacrum**; **bitrochanteric 10 cm** engages transverse/oblique
- Buttocks, then shoulders, then the aftercoming head — each engages transverse and rotates to AP
- Head delivers by **flexion** (Mauriceau–Smellie–Veit or forceps); **Løvset** for extended arms

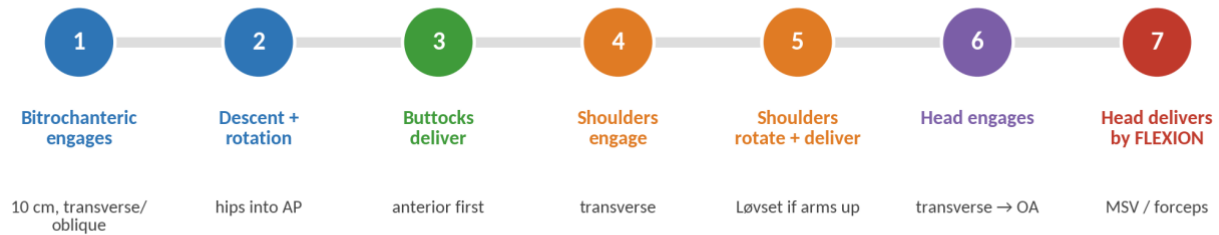
Breech mechanism (assisted vaginal breech)

Figure 7. Breech mechanism.

FETAL HEAD

Suboccipitobregmatic — flexed vertex	9.5 cm
Biparietal	9.5 cm
Submentobregmatic — face (MA)	9.5 cm
Suboccipitofrontal — slightly deflexed	10 cm
Occipitofrontal — deflexed / OP	11.5 cm
Mentovertical — BROW	13.5 cm

MATERNAL PELVIS

Interspinous (mid-cavity)	10–10.5 cm
Obstetric conjugate (inlet AP)	10–11 cm
Bituberous (outlet)	11 cm
Outlet AP (coccyx back)	11.5–12 cm
Inlet transverse	13 cm

Figure 8. Head vs pelvis (from Lecture 7).

6 Soft Tissues and When Mechanics Fail

- **Pelvic floor:** the levator ani/puborectalis gutter directs the leading part forwards — the basis of internal rotation. The **levator hiatus** stretches enormously at crowning → avulsion and later prolapse.
- **Perineum:** thins and stretches at crowning; **mediolateral** episiotomy when indicated (Lecture 20).

CEPHALOPELVIC DISPROPORTION

- Head too big for the pelvis
- No descent despite good contractions; head still palpable abdominally; **severe moulding + caput**
- Caesarean

SHOULDER DYSTOCIA (RCOG GTG 42)

- Anterior shoulder impacted behind the **symphysis** after the head delivers ('turtle sign')
- **McRoberts + suprapubic pressure** first
- Then internal manoeuvres (posterior arm, rotation — Rubin, Woods' screw) or **all-fours**

OBSTRUCTED LABOUR

- Descent stops despite strong contractions
- Rising **Bandl's ring** (pathological retraction ring)
- Risk of **uterine rupture**, fistula

DEEP TRANSVERSE ARREST

- OT at the spines, no rotation
- Android and platypelloid pelvis predispose
- Rotational delivery (skilled operator) or caesarean

★ PEARL

The head enters with its **long axis transverse** (the inlet's widest diameter) and must turn so that its long axis lies **AP at the outlet** (the outlet's widest). The **pelvic floor** drives that rotation.

The **android pelvis** is worst: narrow forepelvis (pushes the head back → OP), prominent spines (block rotation → deep transverse arrest) and a narrow subpubic arch (perineal trauma).

7 MRCOG Exam Pearls — Last-Minute Page

Numbers to know

~13 cm Inlet transverse	~10 cm Interspinous (narrowest)	9.5 cm SOB — flexed vertex	13.5 cm MV — brow
10 cm Bitrochanteric (breech)	≤ 2/5 Engaged	90° / 45° Rotation from OT / OA-oblique	135° Long rotation from OP

HIGH-YIELD CHECKLIST

- ☐ Inlet widest transverse; mid-cavity narrowest at the spines; outlet widest AP.
- ☐ Gynaecoid best; android worst (OP, DTA, perineal trauma); anthropoid → OP; platypelloid → no rotation.
- ☐ Denominators: occiput, mentum, sacrum, acromion.
- ☐ Engaged ≤ 2/5 palpable; station measured from the ischial spines.
- ☐ Eight movements: engagement → expulsion (EDFIERE+E).
- ☐ Engages OT; rotates 90° to OA at the pelvic floor; delivers by extension.
- ☐ OP: deflexed, long rotation usually; short rotation = face-to-pubes; DTA → second-stage rotation or CS.
- ☐ Face MA deliverable (by flexion); MP not. Brow MV 13.5 — CS if persistent.
- ☐ Breech: bitrochanteric 10 cm; aftercoming head by flexion (MSV/forceps).
- ☐ Shoulder dystocia: McRoberts + suprapubic pressure first.

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

Question	Answer
Narrowest diameter of the pelvis?	Interspinous (~10 cm)

Question	Answer
Widest diameter of the outlet?	Antero-posterior
Worst pelvic shape for labour?	Android
Denominator in face presentation?	Mentum
Commonest position at engagement?	Occipito-transverse (LOT)
What drives internal rotation?	The pelvic floor (levator ani)
How many degrees from LOT to OA?	90°
Which face presentation cannot deliver vaginally?	Mento-posterior
How does the aftercoming head of a breech deliver?	By flexion
First manoeuvres for shoulder dystocia?	McRoberts + suprapubic pressure
Deep transverse arrest is managed in which stage?	Second stage

8 References

- Cunningham FG et al. Williams Obstetrics. 26th ed. 2022.
- RCOG Green-top Guideline No. 42. Shoulder Dystocia. 2012.
- RCOG Green-top Guideline No. 20b. Management of Breech Presentation. 2017.