PIPADOR REVISION

MRCOG Part 1 Revision Notes

Body Cavities

EMBRYOLOGY • LECTURE 73

VISUAL EXAMINATION REVISION NOTES

2026 Edition

MRCOG Part 1 Revision Notes

Lecture 73: Body Cavities

Embryology • Visual revision edition

COLOUR CODE USED THROUGHOUT THESE NOTES

PERICARDIAL	PLEURAL	PERITONEAL	SOMATIC / DORSAL	SPLANCHNIC / VENTRAL

LEARNING OBJECTIVES — tick off as you go

- ☐ Describe how the intraembryonic coelom forms and becomes one body cavity.
- ☐ Explain partitioning into pericardial, pleural and peritoneal cavities.
- ☐ Describe the four sources of the diaphragm and its innervation.
- ☐ Describe the mesenteries, lesser sac and secondarily retroperitoneal organs.
- ☐ Apply to CDH, Cantrell, referred pain and pregnancy.

1 The Intraembryonic Coelom

IN ONE LINE: *One space in the lateral plate (week 3) → sealed by folding (week 4) → split by two pairs of membranes into pericardial, pleural and peritoneal cavities.*

The intraembryonic coelom (cross-sections, schematic)

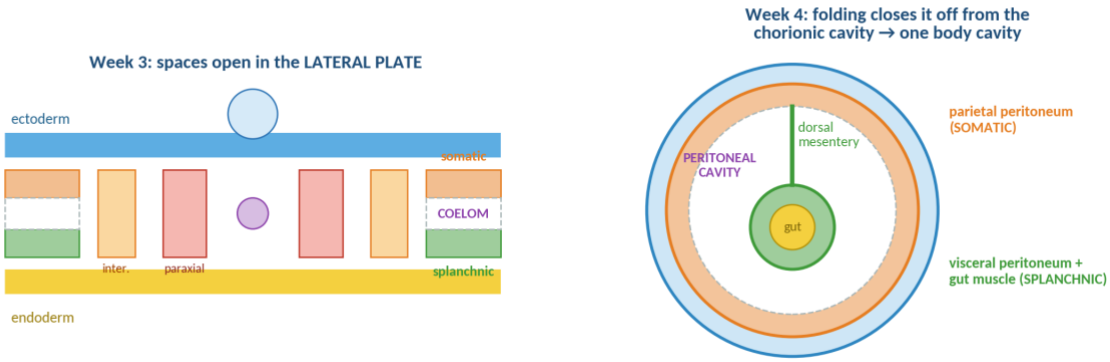


Figure 1. Somatic vs splanchnic layers.

Layer	Gives
Somatic (parietal) — next to ectoderm	Parietal serosa (pleura, pericardium, peritoneum) + body-wall connective tissue — pain-sensitive (somatic nerves)
Splanchnic (visceral) — next to endoderm	Visceral serosa + gut smooth muscle and connective tissue — stretch/ischaemia pain only (visceral)

2 Partitioning

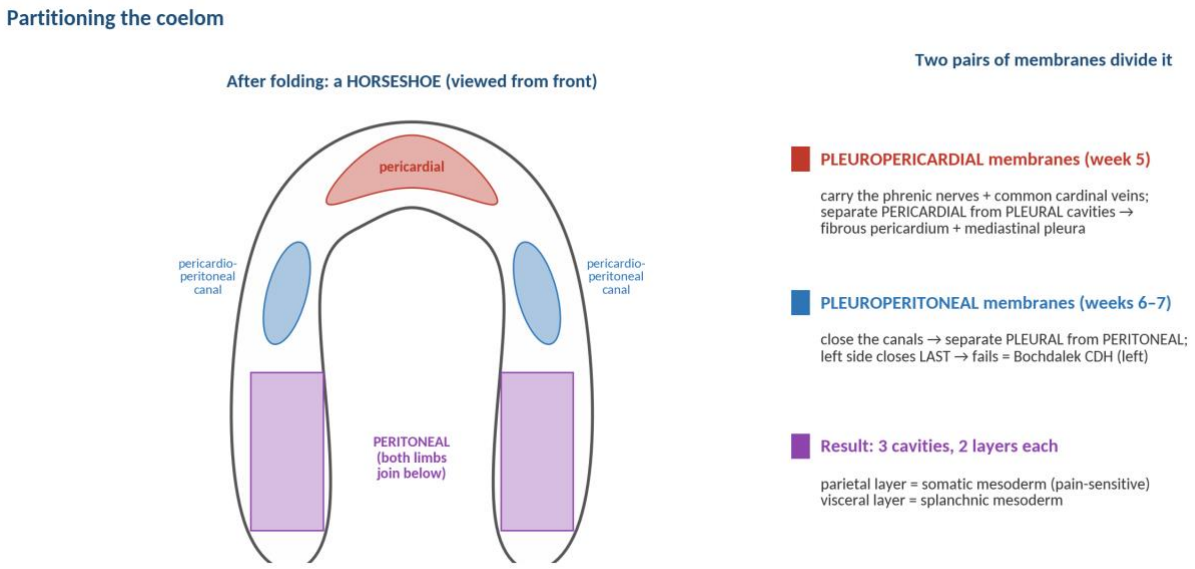


Figure 2. Horseshoe coelom and the two membranes.

- **Peritoneal cavity**: greater sac + **lesser sac** (behind the stomach), linked by the **epiploic foramen (Winslow)**.

3 The Diaphragm

Source	Contribution
Septum transversum	Central tendon
Pleuroperitoneal membranes/folds	Large posterolateral parts — and the route by which neck-derived muscle precursors spread through the diaphragm
Dorsal mesentery of the oesophagus	Median part → crura
Body wall	Peripheral rim

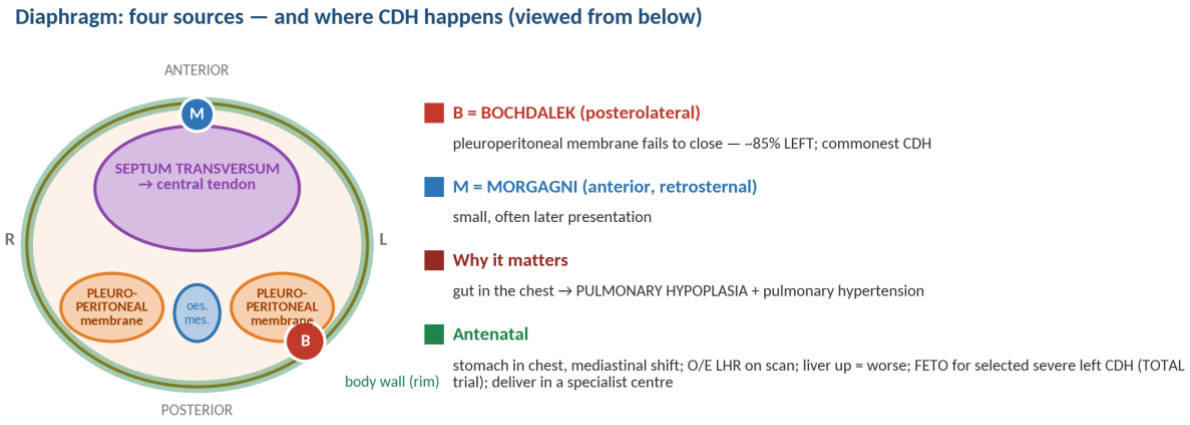


Figure 3. Diaphragm sources and CDH sites (from Lecture 66).

MNEMONIC / MEMORY HOOK

'C3, 4, 5 keeps the diaphragm alive' — muscle starts in the neck; the septum transversum descends and drags the phrenic nerve down. Central diaphragm irritation → **shoulder-tip** (C4) pain.

4 Mesenteries

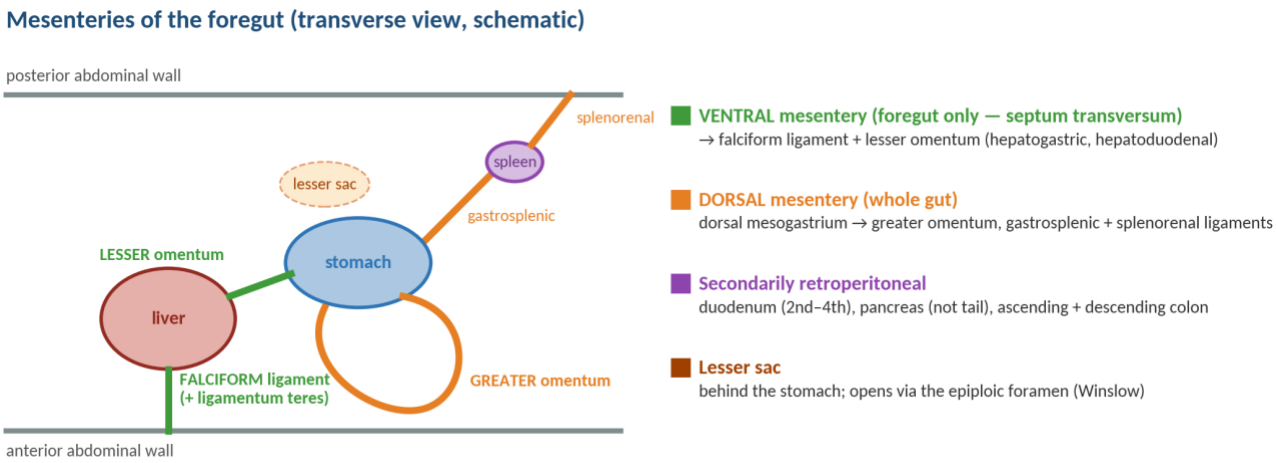


Figure 4. Ventral vs dorsal mesentery.

- **Secondarily retroperitoneal** (lost their mesentery by fusing to the back wall): duodenum (2nd–4th parts), pancreas (except the tail), ascending and descending colon — mobilised along these old planes (Kocher, Cattell–Braasch).

5 Anomalies

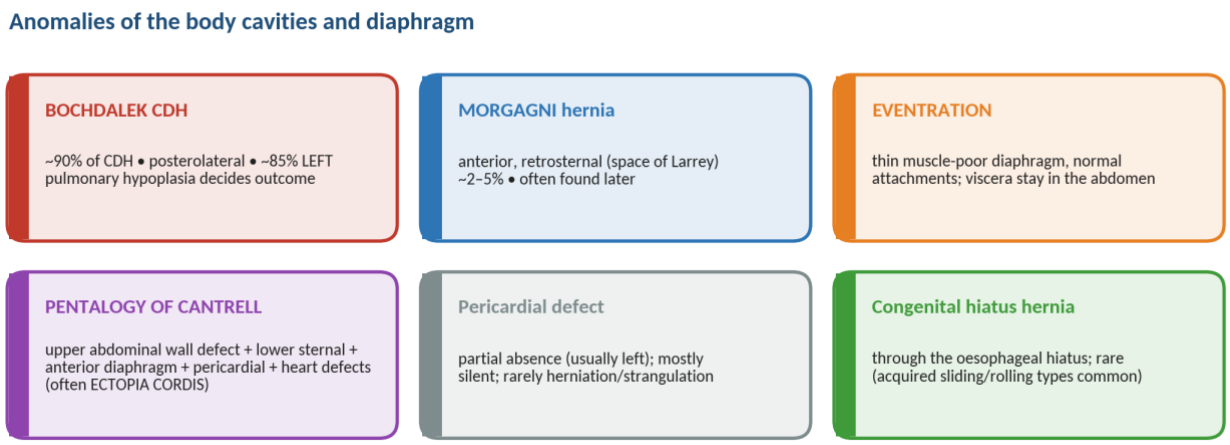


Figure 5. Body-cavity anomalies.

CDH — ANTENATAL

- Stomach/bowel in chest, mediastinal shift, polyhydramnios
- Prognosis: **observed/expected lung-to-head ratio (O/E LHR)** + **liver position**; MRI lung volume
- Karyotype/microarray + echo (associated anomalies)
- **FETO** (TOTAL trial): severe left CDH (O/E LHR < 25%) — balloon at ~27–30 weeks, removed ~34 weeks; ↑ survival, ↑ preterm birth

CDH — AFTER BIRTH

- Deliver in a specialist centre
- **Intubate at birth — no bag-and-mask**; NG tube
- Gentle ventilation, treat pulmonary hypertension (iNO), ECMO
- Repair when stable; survival ~70–80% overall, far lower in severe cases

6 Clinical Correlates

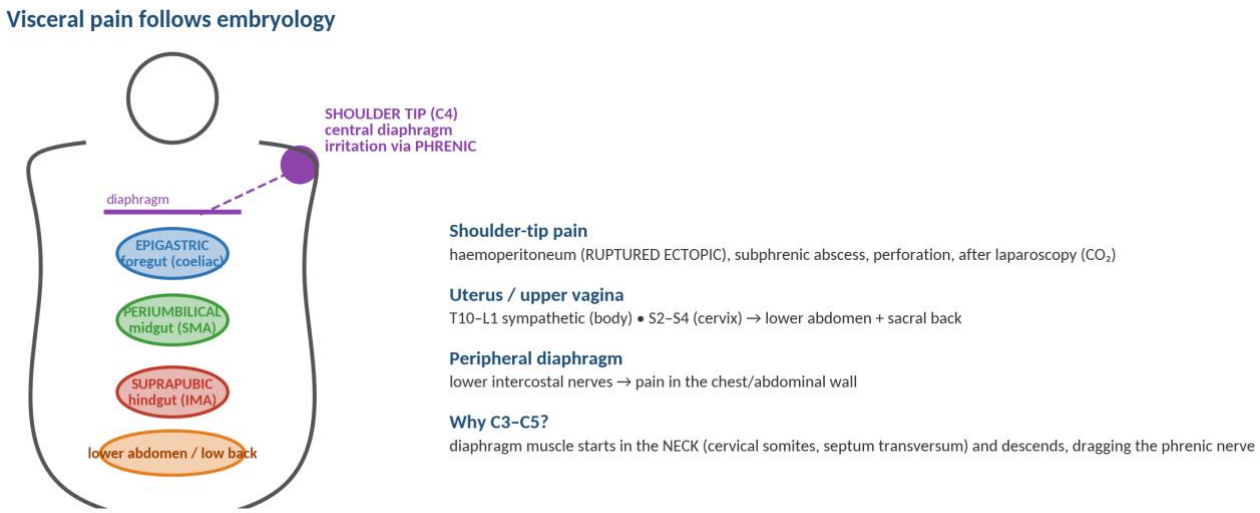


Figure 6. Referred visceral pain.

PREGNANCY

- Uterus pushes the diaphragm up ~4 cm by term → **FRC ↓ ~20%**
- Tidal volume and minute ventilation ↑ (progesterone) — diaphragm movement is preserved
- Hiatus hernia/reflux worse (pressure + progesterone on LOS)

SURGERY

- **Right subphrenic space** — common site for post-op abscess
- Shoulder-tip pain after laparoscopy = retained CO_2
- Ruptured ectopic: shoulder-tip pain = blood under the diaphragm

★ **PEARL**

Pleuroperitoneal membrane fails (left) → Bochdalek CDH → pulmonary hypoplasia — the lungs, not the hernia, decide survival.

Ventral mesentery exists only in the foregut (falciform + lesser omentum); everything else hangs from the dorsal mesentery.

7 MRCOG Exam Pearls — Last-Minute Page

Numbers to know

Week 3 Coelom forms	**Week 4** Folding seals it	**Week 5** Pleuropericardial membranes	**Wk 6–7** Pleuroperitoneal close
C3–C5 Phrenic nerve	**~90%** CDH = Bochdalek	**~85%** CDH on the left	**< 25%** O/E LHR = severe CDH

HIGH-YIELD CHECKLIST

- ☐ Coelom splits lateral plate: somatic (parietal) vs splanchnic (visceral).
- ☐ Horseshoe: pericardial, pericardioperitoneal canals, peritoneal.
- ☐ Pleuropericardial membranes (phrenic + cardinal veins) → fibrous pericardium.
- ☐ Pleuroperitoneal membranes → left closes last → Bochdalek.
- ☐ Diaphragm: septum transversum (tendon), pleuroperitoneal, oesophageal mesentery (crura), body wall.
- ☐ Phrenic C3–C5 → shoulder-tip pain.
- ☐ Ventral mesentery: falciform + lesser omentum; dorsal: greater omentum, splenic ligaments.
- ☐ Secondarily retroperitoneal: duodenum 2–4, pancreas (not tail), ascending/descending colon.
- ☐ CDH: O/E LHR, liver up, FETO; no bag-mask.
- ☐ Cantrell = abdominal wall + sternum + diaphragm + pericardium + heart (± ectopia cordis).

Self-assessment — cover the right-hand column

Question	Answer
Where does the intraembryonic coelom form?	Lateral plate mesoderm (week 3)
What separates pericardial from pleural cavities?	Pleuropericardial membranes
Embryological source of the central tendon?	Septum transversum
Why is the phrenic nerve C3–C5?	Diaphragm muscle originates in the neck and descends
Commonest CDH and side?	Bochdalek, left
Main determinant of CDH survival?	Degree of pulmonary hypoplasia
Two derivatives of the ventral mesentery?	Falciform ligament, lesser omentum
Name three secondarily retroperitoneal organs.	Duodenum (2–4), pancreas, ascending/descending colon
Components of pentalogy of Cantrell?	Abdominal wall, lower sternum, anterior diaphragm, pericardium, heart
Why shoulder-tip pain in a ruptured ectopic?	Blood irritates the central diaphragm (phrenic, C4)

8 References

- Sadler TW. Langman's Medical Embryology. 14th ed. 2019.
- Deprest JA et al. Fetal surgery for severe / moderate left CDH (TOTAL trials). N Engl J Med 2021.
- Moore KL, Persaud TVN, Torchia MG. The Developing Human. 11th ed. 2020.