Exercise walk-through

3.5 Abdomen

University Medicine

Territories: embryology as a pain map

1. **Grid** Nine regions (four quadrants for speed): epigastric, umbilical, hypogastric columns flanked by three pairs.
2. **Supply** Coeliac (foregut), superior mesenteric (midgut), inferior mesenteric (hindgut) - one artery per embryological gut.
3. **Referral** Foregut T5-9 epigastric, midgut T10-12 umbilical, hindgut L1-3 hypogastric - **referred pain** is embryology as symptoms.

Nine regions above, three territories and pain bands

nine regions

R hypochond.	epigastric	L hypochond.
R lumbar	umbilical	L lumbar
R inguinal	hypogastric	L inguinal

referred pain: embryology as symptoms

foregut — coeliac
T5–9 → epigastric

midgut — sup. mesenteric
T10–12 → umbilical

hindgut — inf. mesenteric
L1–3 → hypogastric

Nine regions above, three territories and pain bands below.

Exercises 2.1–2.3

2.1 Which artery supplies the transverse colon to its distal third? [3]

2.2 To which band does gallbladder pain refer? [3]

2.3 Above the pectinate line, is bleeding typically painful? [3]

Exercises 2.1·2.3

2.1 Which artery supplies the transverse colon to its distal third? [3]

2.1

- Superior mesenteric (midgut ends at the distal transverse colon).

2.2 To which band does gallbladder pain refer? [3]

2.2

- Foregut band (T5–9) – epigastric.

2.3 Above the pectinate line, is bleeding typically painful? [3]

2.3

- No: visceral supply above the line carries no sharp pain.

Exercise 3.1

3.1 A patient has sudden epigastric pain radiating to the right shoulder tip.

Place the organ by territory and band. Explain the shoulder referral (phrenic C4 shared segment). Predict what imaging would show and why the pain localises poorly at first. [7]

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3.1

- Gallbladder: foregut/coeliac territory → epigastric band.
- The shoulder tip is C4 via the phrenic nerve: the gallbladder's inflamed peritoneal surface shares the segment.
- Early visceral pain is midline and dull (shared segment); imaging (ultrasound) localises the organ the band only bands.

Exercise 3.2

3.2 A patient has painless fresh bleeding per rectum.

Use the pectinate line to argue the source is likely above it. State the artery of the hindgut and its major branch at risk. Explain why painlessness itself narrows the differential. [7]

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3.2

- Painless fresh bleeding implies visceral supply: above the pectinate line.
- Inferior mesenteric artery; its superior rectal branch.
- Below the line, somatic innervation would make bleeding painful – painlessness itself argues the source is visceral.