



PIPADOR REVISION

MRCOG Part 1 Revision Notes

Blood Supply of the Abdominal Wall

ANATOMY • LECTURE 27

VISUAL EXAMINATION REVISION NOTES

2026 Edition

MRCOG Part 1 Revision Notes

Lecture 27: Blood Supply of the Abdominal Wall

Anatomy • Visual revision edition

COLOUR CODE USED THROUGHOUT THESE NOTES

DEEP ARTERIES	SUPERFICIAL ARTERIES	SYSTEMIC VEINS	PORTAL / PARA-UMBILICAL	LYMPHATICS
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LEARNING OBJECTIVES — tick off as you go

- ☐ Name the arteries supplying the abdominal wall from above, behind and below.
- ☐ Describe the course and branches of the superior and inferior epigastric arteries.
- ☐ Describe superficial and deep venous drainage and the umbilical watershed.
- ☐ Use vein flow direction to distinguish IVC, SVC and portal obstruction.
- ☐ Describe lymph drainage and apply all of this to incisions, ports and flaps.

1 Overview

IN ONE LINE: Supply comes from ABOVE (internal thoracic), BEHIND (aorta) and BELOW (external iliac + femoral) — and it all anastomoses, which is why flaps work and collaterals open.

MNEMONIC / MEMORY HOOK

'Above, Behind, Below' — internal thoracic • intercostals/subcostal/lumbar • external iliac + femoral.

2 Arterial Supply

Arteries of the anterior abdominal wall (schematic)

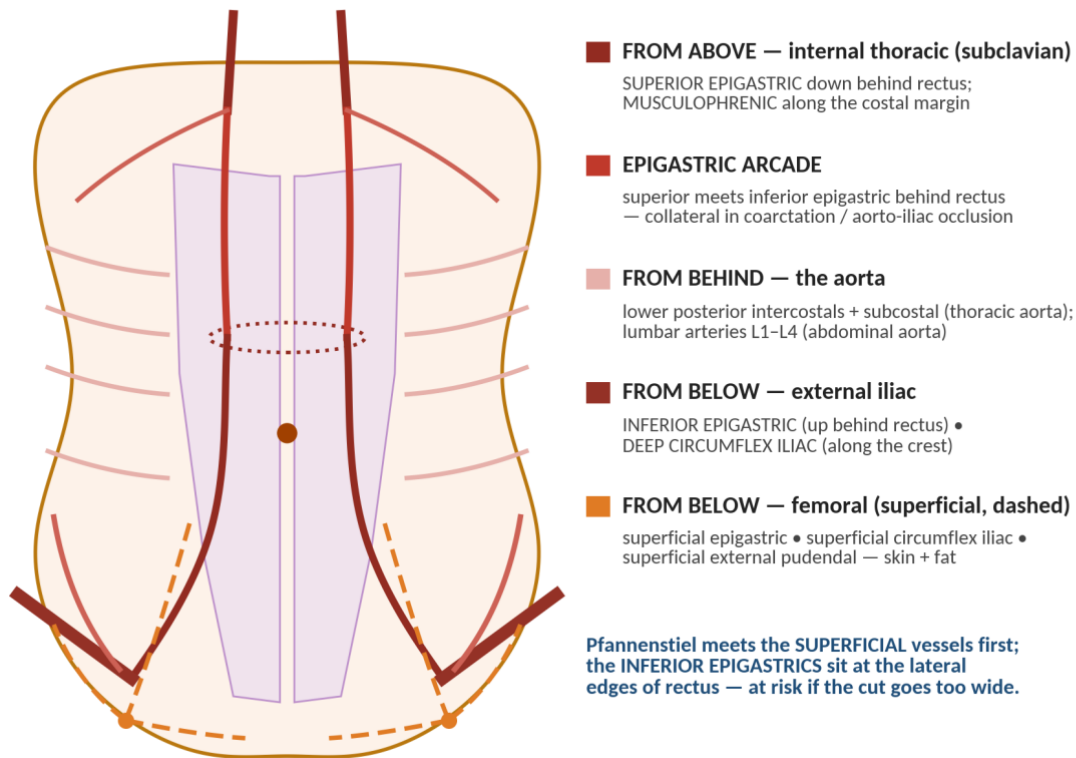


Figure 1. Arteries of the anterior abdominal wall.

Artery	Origin, course and points
Superior epigastric	Terminal branch of the internal thoracic (6th intercostal space) → through the sternocostal triangle (Larrey/Morgagni) → into the sheath behind rectus
Musculophrenic	Other terminal branch of the internal thoracic — along the costal margin; upper lateral wall
Inferior epigastric	External iliac just above the inguinal ligament → medial to the deep ring (lateral border of Hesselbach's triangle) → pierces transversalis fascia → enters the sheath at the arcuate line → behind rectus
Posterior intercostals (lower) + subcostal	Thoracic aorta — lateral wall, in the plane between IO and TA
Lumbar arteries (4 pairs)	Abdominal aorta, opposite L1–L4 — posterolateral wall
Deep circumflex iliac	External iliac, opposite the inferior epigastric → along the iliac crest between TA and IO (iliac crest grafts)
Superficial epigastric, superficial circumflex iliac, superficial external pudendal	Femoral artery — skin and fat of the lower wall; met at the start of a Pfannenstiel

EXAM HOOK

The **epigastric arcade** (superior ↔ inferior epigastric behind rectus) is a major collateral: in **coarctation** or aorto-iliac occlusion it carries subclavian blood to the legs.

Branches of the inferior epigastric

Right inferior epigastric artery and its branches — from inside (schematic)

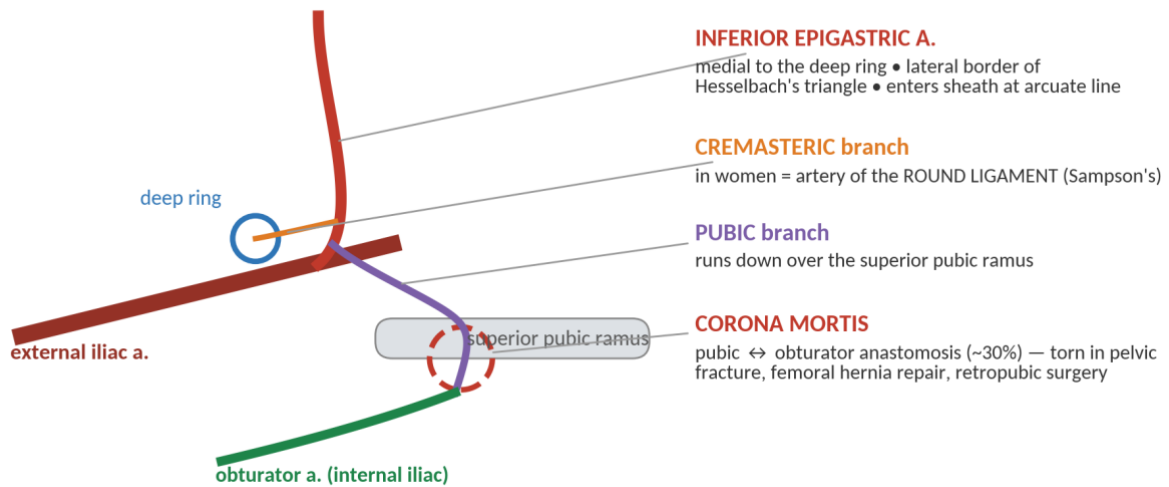
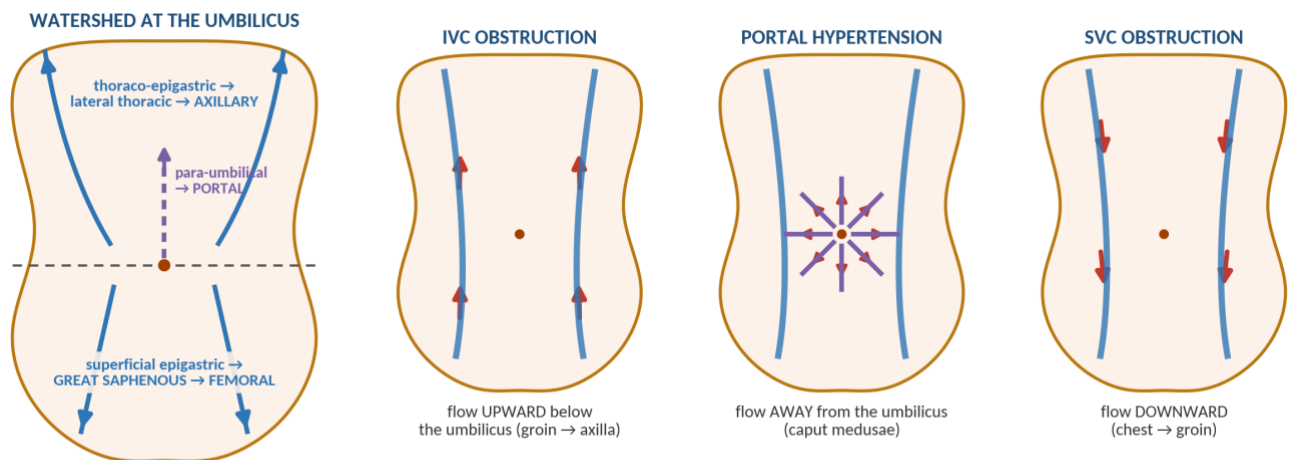


Figure 2. The inferior epigastric and the corona mortis.

- **Cremasteric branch** — in women, the **artery of the round ligament (Sampson's artery)**, which bleeds at laparoscopic round ligament division.
- **Pubic branch** — anastomoses with the obturator artery over the superior pubic ramus: the **corona mortis** (present in about a third of people).

3 Venous Drainage



Test: strip a dilated vein with two fingers, lift one, watch which way it refills.

Figure 3. The umbilical watershed and how flow direction reveals the obstruction.

DEEP VEINS (follow the arteries)

- Superior epigastric → internal thoracic
- Inferior epigastric → external iliac
- Intercostal, subcostal, lumbar → azygos system / IVC
- **Ascending lumbar veins** → azygos/hemiazygos — posterior bypass in IVC obstruction

SUPERFICIAL VEINS

- **Above the umbilicus** → thoraco-epigastric → lateral thoracic → **axillary**
- **Below the umbilicus** → superficial epigastric → **great saphenous** → **femoral**
- **Para-umbilical veins** → along the ligamentum teres → **portal vein** (porto-systemic anastomosis)

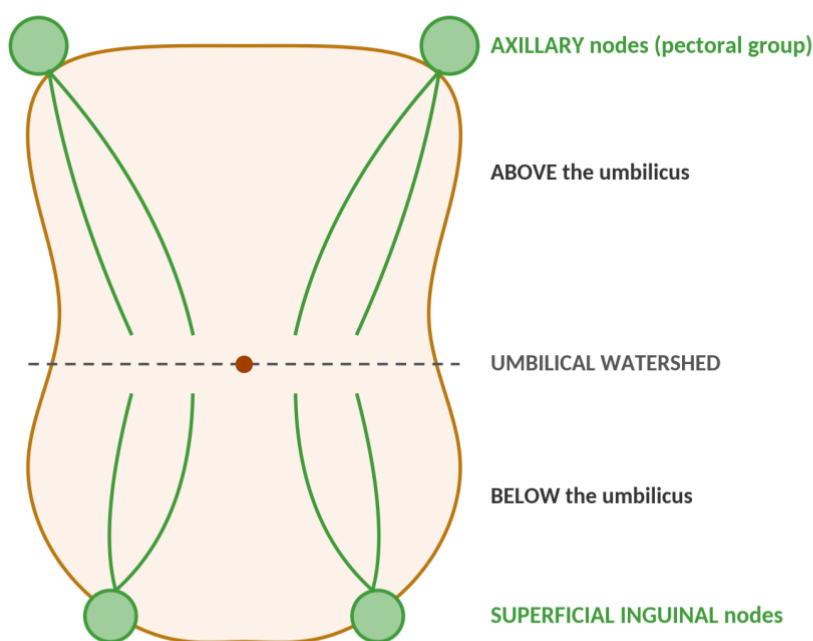
Obstruction	What you see
IVC	Dilated veins groin → axilla; flow UPWARD below the umbilicus
Portal hypertension	Para-umbilical veins dilate — flow AWAY from the umbilicus (caput medusae)
SVC	Flow DOWNWARD in the thoraco-epigastric veins towards the groin

MNEMONIC / MEMORY HOOK

Blood flows AWAY from the block: IVC blocked → blood goes UP; SVC blocked → DOWN; portal blocked → OUT from the umbilicus.

4 Lymphatic Drainage

Lymph drainage of the abdominal wall skin



Deep lymphatics follow the deep arteries: parasternal (above), external iliac (below), lumbar/para-aortic (behind).

Figure 4. The umbilicus divides the skin lymph too.

- Skin **above the umbilicus** → **axillary** (pectoral) nodes; **below** → **superficial inguinal** nodes. Deep lymphatics follow the deep arteries: parasternal, external iliac, lumbar/para-aortic.
- A lower abdominal wall melanoma or infection → **inguinal** nodes; above the umbilicus → **axillary** nodes.

5 Surgical Implications

INCISIONS

- **Midline:** through the relatively avascular linea alba — quick, little bleeding; more incisional hernias
- **Pfannenstiel:** superficial epigastric/circumflex iliac vessels in the fat; inferior epigastrics lie at the **lateral edges of rectus** — at risk if the fascial cut goes too far laterally
- **Maylard:** recti cut transversely — **ligate both inferior epigastrics** deliberately

FLAPS

- **TRAM (pedicled):** rectus + skin on the **superior** epigastric → breast
- **DIEP:** skin + fat on **inferior epigastric perforators**, rectus spared → less donor morbidity
- **VRAM:** rectus on the **inferior** epigastric → vulval, perineal, pelvic reconstruction

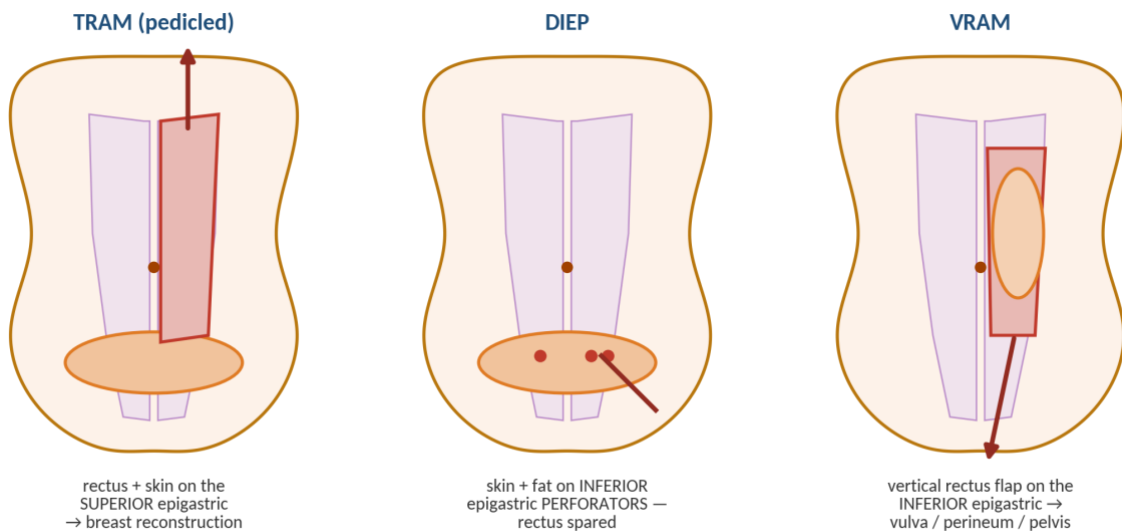


Figure 5. Flaps based on the epigastric vessels.

Safe laparoscopic entry — surface map

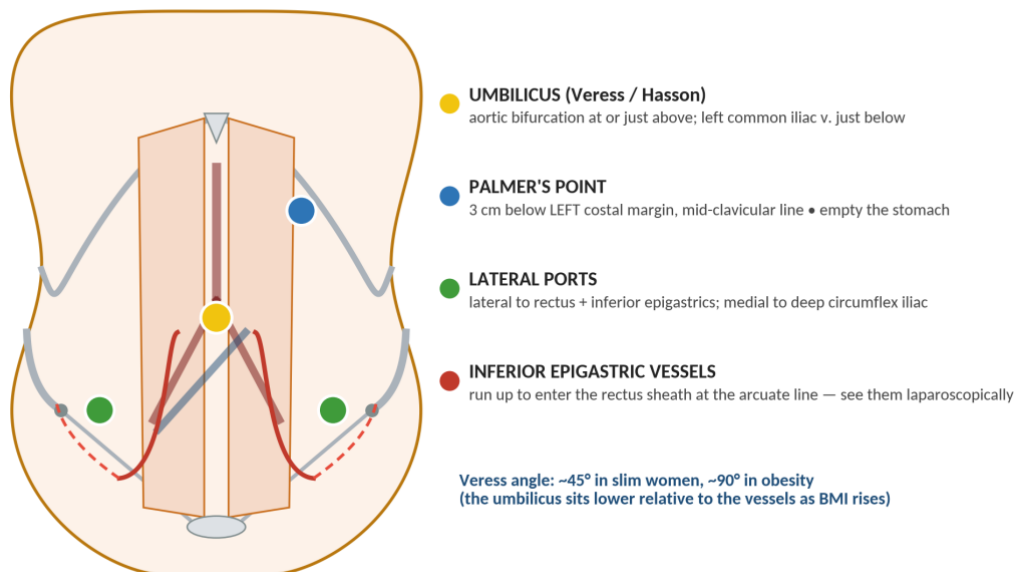


Figure 6. Safe laparoscopic entry (from Lecture 22).

EXAM HOOK

Lateral ports: lateral to rectus (linea semilunaris) at any level; **transillumination shows superficial vessels only** — find the inferior epigastrics **laparoscopically**, lateral to the medial umbilical fold. **Palmer's point** (3 cm below the left costal margin, mid-clavicular line) is a relatively avascular alternative entry.

★ **PEARL — corona mortis**

An **obturator–inferior epigastric (or external iliac) anastomosis over the superior pubic ramus**, present in roughly a third of people.

Torn in pelvic fracture, ramus fixation, femoral hernia repair and retropubic surgery (e.g. colposuspension, paravaginal repair) — brisk, concealed bleeding.

6 MRCOG Exam Pearls — Last-Minute Page

Numbers to know

3 Directions of supply	4 Pairs of lumbar arteries	3 Superficial femoral branches	~1/3 Have a corona mortis
1 Watershed — the umbilicus	3 cm Palmer's point below costal margin	2 Epigastric arteries meeting	3 Obstruction patterns

HIGH-YIELD CHECKLIST

- ☐ Above: superior epigastric + musculophrenic (internal thoracic). Behind: intercostals, subcostal (thoracic aorta), lumbar (abdominal aorta). Below: inferior epigastric, DCIA (external iliac); superficial branches (femoral).
- ☐ Inferior epigastric: medial to the deep ring; enters the sheath at the arcuate line.
- ☐ Epigastric arcade = collateral in coarctation / aorto-iliac occlusion.
- ☐ Cremasteric branch = artery of the round ligament in women; pubic branch → corona mortis.
- ☐ Superficial veins: above umbilicus → axillary; below → great saphenous/femoral; para-umbilical → portal.
- ☐ IVC block: flow up; SVC block: flow down; portal: away from the umbilicus.
- ☐ Lymph: above umbilicus → axillary; below → superficial inguinal.
- ☐ Maylard: ligate the inferior epigastrics. Pfannenstiel: superficial vessels first.
- ☐ TRAM on superior epigastric; DIEP and VRAM on inferior epigastric.
- ☐ Lateral ports lateral to rectus; transillumination misses the deep vessels.

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

Question	Answer
Parent artery of the superior epigastric?	Internal thoracic
Parent artery of the inferior epigastric?	External iliac
Where does the inferior epigastric enter the rectus sheath?	At the arcuate line
Which vessels are met first in a Pfannenstiel?	Superficial epigastric / circumflex iliac
What is the corona mortis?	Obturator–inferior epigastric anastomosis over the pubic ramus

Question	Answer
Artery of the round ligament arises from...?	Inferior epigastric (cremasteric branch)
Superficial veins below the umbilicus drain to...?	Great saphenous → femoral
Flow in abdominal wall veins in IVC obstruction?	Upward (cephalad)
Caput medusae is a sign of...?	Portal hypertension
Lymph from skin below the umbilicus?	Superficial inguinal nodes
Which flap spares the rectus muscle?	DIEP

7 References

- Standring S, editor. Gray's Anatomy. 42nd ed. 2020.
- Moore KL et al. Clinically Oriented Anatomy. 8th ed. 2017.
- RCOG Green-top Guideline No. 49. Preventing Entry-Related Gynaecological Laparoscopic Injuries. 2008.