



PIPADOR REVISION

MRCOG Part 1 Revision Notes

The Recti Abdominis

ANATOMY • LECTURE 26

VISUAL EXAMINATION REVISION NOTES

2026 Edition

MRCOG Part 1 Revision Notes

Lecture 26: The Recti Abdominis

Anatomy • Visual revision edition

COLOUR CODE USED THROUGHOUT THESE NOTES

RECTUS	PYRAMIDALIS	EXTERNAL OBLIQUE	INTERNAL OBLIQUE	TRANSVERSUS	TRANSVERSALIS FASCIA
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LEARNING OBJECTIVES — tick off as you go

- ☐ Describe the origin, insertion and features of rectus abdominis and pyramidalis.
- ☐ Describe the rectus sheath, arcuate line, linea alba and linea semilunaris.
- ☐ State the nerve supply, dermatomes and blood supply (epigastric anastomosis).
- ☐ Describe the common abdominal incisions and their relation to the recti.
- ☐ Apply to divarication, rectus sheath haematoma and laparoscopic port safety.

1 Rectus Abdominis and Pyramidalis

IN ONE LINE: Paired vertical strap muscles either side of the linea alba, each wrapped in the rectus sheath — the muscle every lower abdominal incision has to deal with.

The recti — front view (schematic)

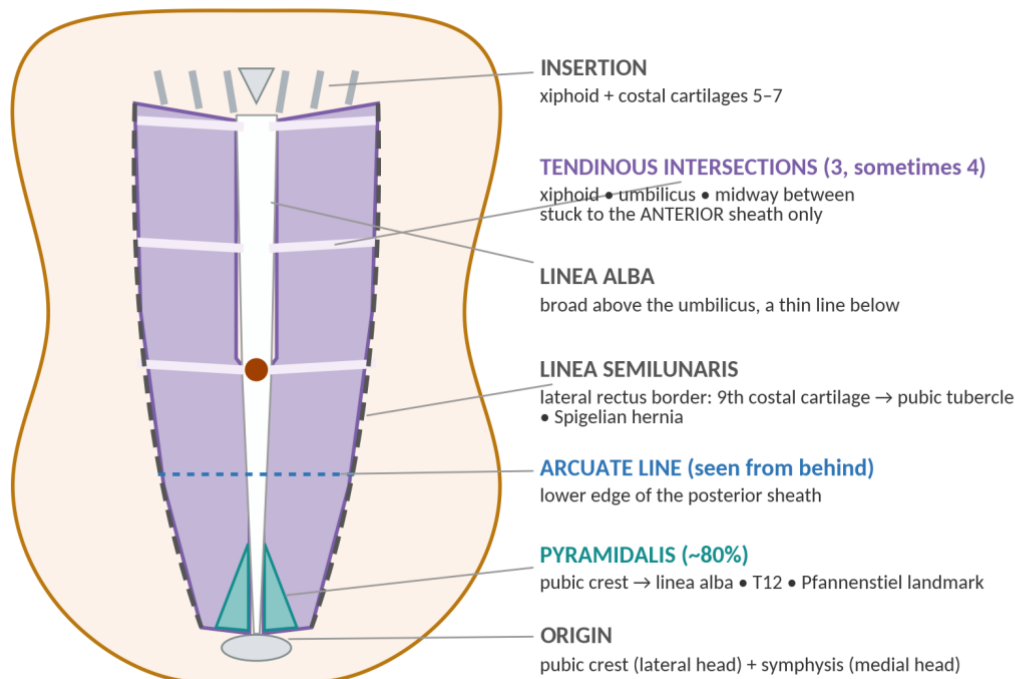


Figure 1. The recti from the front.

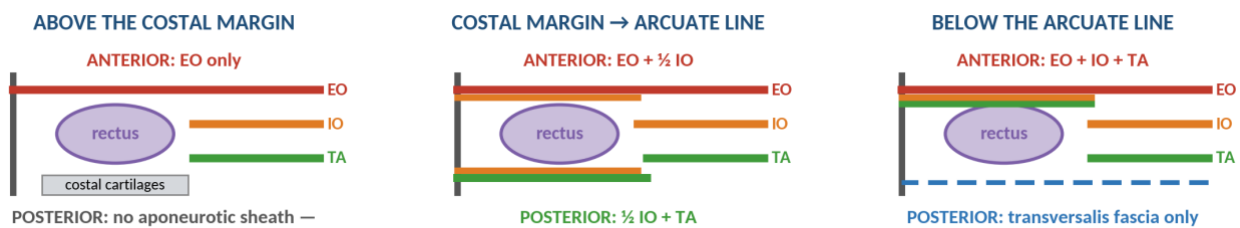
RECTUS ABDOMINIS

- **Origin:** pubic crest (lateral head) + pubic symphysis (medial head)
- **Insertion:** xiphoid + costal cartilages 5–7
- Broader above, narrower below
- **3 (sometimes 4) tendinous intersections** — at the xiphoid, umbilicus and midway; fused to the **anterior** sheath only

PYRAMIDALIS

- Small triangle in front of lower rectus, inside the sheath — present in **~80%**
- Pubic crest → linea alba; tenses the linea alba
- Nerve: **subcostal (T12)**
- Its apex marks the midline at Pfannenstiel

2 The Rectus Sheath and Arcuate Line



The IO aponeurosis is the one that **SPLITS** — between the costal margin and the arcuate line.

Figure 2. The rectus sheath at three levels (from Lecture 24).

Level	Anterior layer	Posterior layer
Above the costal margin	EO aponeurosis	Absent — rectus lies on costal cartilages
Costal margin → arcuate line	EO + anterior leaf of IO	Posterior leaf of IO + TA
Below the arcuate line	EO + IO + TA	Absent — transversalis fascia only

MNEMONIC / MEMORY HOOK

EO always in **FRONT**, **TA** always **BEHIND** (until the arcuate line), **IO** splits in the middle — then below the arcuate line everyone moves to the front.

- **Arcuate line (of Douglas):** curved lower edge of the posterior sheath, about a third of the way from the umbilicus to the pubis (often quoted as midway; ~5 cm below the umbilicus in some texts).

3 Linea Alba, Linea Semilunaris and the Epigastric Vessels

LINEA ALBA

- Midline raphe of interlacing aponeuroses, xiphoid → symphysis
- **Broad above the umbilicus** (1–2 cm), a thin line below — so divarication shows more above
- Umbilicus = closed umbilical ring in the linea alba

LINEA SEMILUNARIS

- Lateral curved edge of rectus/sheath: **9th costal cartilage → pubic tubercle**
- Meets the costal margin at the **gallbladder fundus**
- Site of **Spigelian hernia**, usually near/below the arcuate line

Right rectus seen from BEHIND (posterior sheath above the arcuate line shaded green)

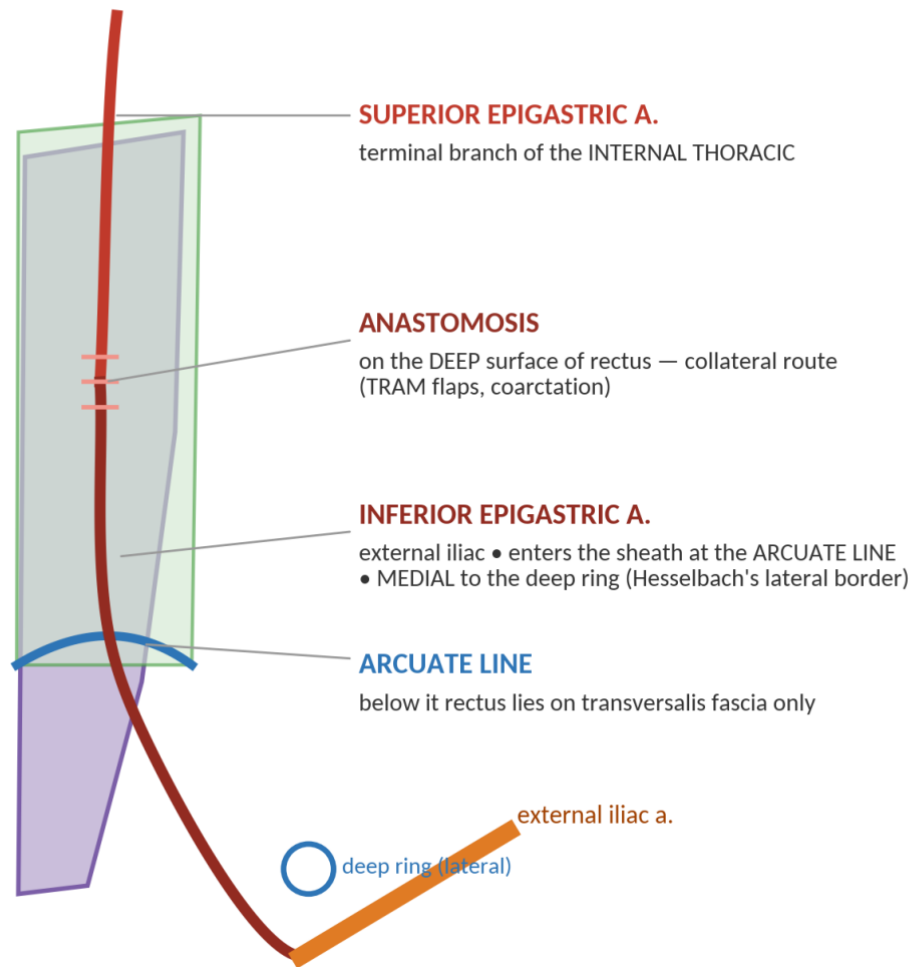


Figure 3. The epigastric anastomosis on the deep surface of rectus.

- **Superior epigastric** (internal thoracic) and **inferior epigastric** (external iliac) meet on the deep surface of rectus — collateral flow after ligation of either, in coarctation, and the basis of **TRAM flaps**. Posterior intercostal and subcostal arteries add laterally. Veins follow the arteries; the superficial thoraco-epigastric veins drain the skin.

4 Nerve Supply and Dermatomes

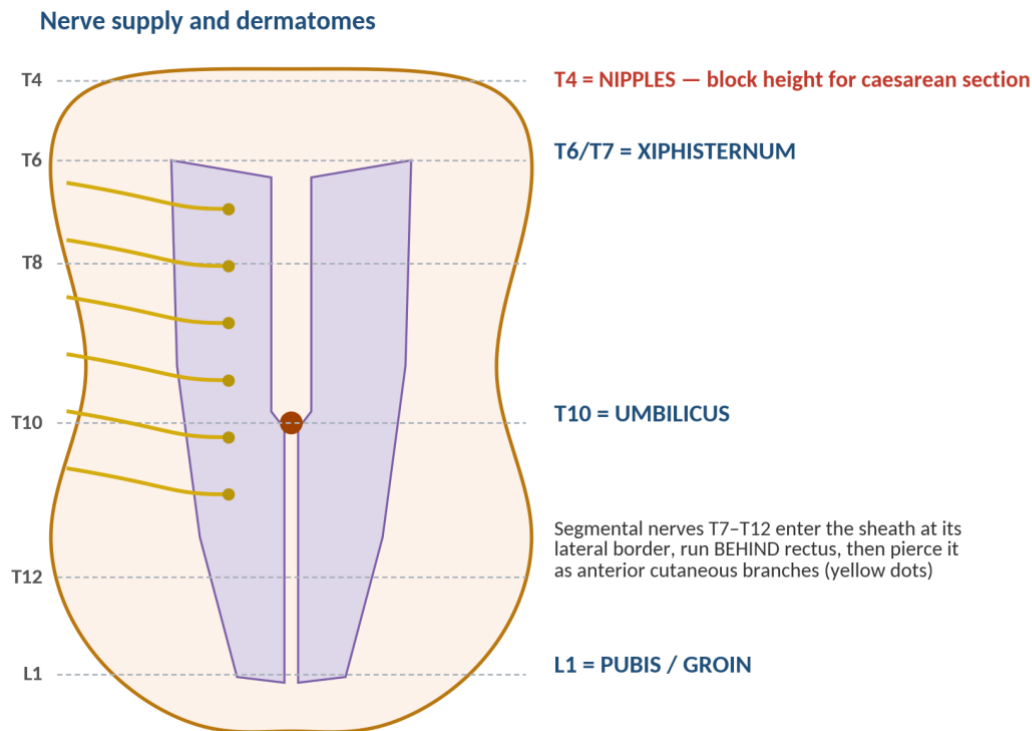


Figure 4. Segmental nerves and the dermatomes you test before surgery.

Level	Landmark / use
T4	Nipples — target block height for caesarean section (cold/light touch)
T6/T7	Xiphisternum
T10	Umbilicus
L1	Pubis / groin

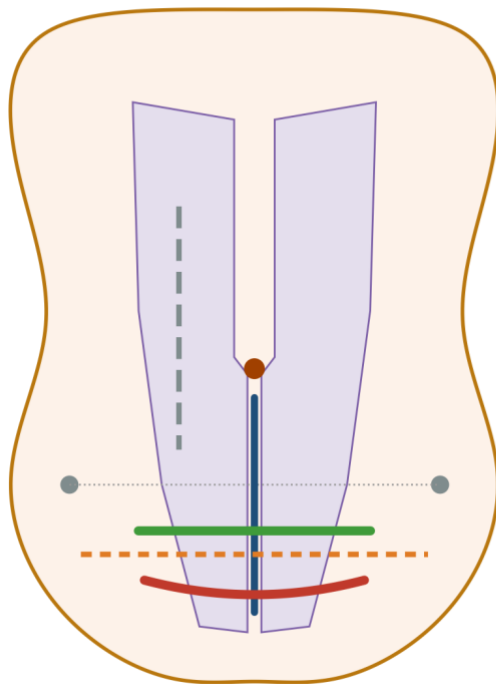
Rectus is supplied by **T7–T12** ($\pm$ T6): the nerves enter the sheath at its lateral border, run **behind** the muscle, then pierce it as anterior cutaneous branches. Pyramidalis: T12 only.

5 Actions

Action	Detail
Trunk flexion	Main flexor — sit-ups; brings thorax and pelvis together (whichever end is free)
Pelvic stability	Controls pelvic tilt, especially in walking
Compression	Helps the flat muscles raise intra-abdominal pressure — expiration, defecation, micturition, bearing down
Pyramidalis	Tenses the linea alba

6 Surgical and Clinical Relevance

Abdominal incisions and the recti



MIDLINE

through the linea alba • quick, bloodless, extendable • more incisional hernias

PARAMEDIAN

vertical through the sheath 2–5 cm from the midline • mostly historical

PFANNENSTIEL

curved, 2–3 cm above the symphysis • anterior sheath cut transversely, recti separated • cosmetic, few hernias • nerves at risk laterally

JOEL-COHEN

straight, ~3 cm below the line between the ASISs • largely blunt • quicker, less analgesia — basis of the Misgav-Ladach caesarean

MAYLARD / CHERNEY

Maylard cuts the recti transversely (ligate inferior epigastrics); Cherney detaches the recti from the pubis — wider pelvic access

Figure 5. Incisions and how they deal with the recti.

DIVARICATION OF THE RECTI

- Physiological in late pregnancy — nearly universal by the third trimester
- Gap > ~2 cm; about **1 in 3** still have it a year after birth
- Midline bulge on sit-up, back pain
- **Physiotherapy first** (deep core/TA activation); plication if symptomatic

RECTUS SHEATH HAEMATOMA

- Tear of an inferior epigastric branch — usually **below the arcuate line** (no posterior sheath to contain it)
- Coughing on **anticoagulation**, pregnancy, strain
- Tender mass; **Carnett's sign** (pain persists/worsens when the wall is tensed); **Fothergill's sign** (mass stays palpable, doesn't cross the midline)
- US/CT; mostly conservative; embolise if expanding



Almost universal late in pregnancy; still present in about 1 in 3 women a year after birth. Physiotherapy first; plication if symptomatic.

Figure 6. Divarication of the recti.

EXAM HOOK

Laparoscopic lateral ports: lateral to the rectus edge (linea semilunaris), and — as a rule of thumb — **~8 cm from the midline and ≥5 cm above the symphysis**. Transillumination shows superficial vessels only; **look for the inferior epigastrics laparoscopically**.

7 MRCOG Exam Pearls — Last-Minute Page

Numbers to know

5–7 Costal cartilages of insertion	3 Tendinous intersections	~80% Have pyramidalis	T7–T12 Nerve supply
T10 Umbilicus dermatome	T4 Caesarean block height	> 2 cm Divarication	2–3 cm Pfannenstiel above symphysis

HIGH-YIELD CHECKLIST

- ☐ Origin pubic crest + symphysis; insertion xiphoid + cartilages 5–7.
- ☐ 3 (–4) tendinous intersections, fused to the anterior sheath only.
- ☐ Pyramidalis (~80%): T12; marks the midline at Pfannenstiel.
- ☐ Sheath: EO front, TA back, IO splits — until the arcuate line; below it all in front.
- ☐ Linea alba broad above the umbilicus; linea semilunaris → Spigelian hernia.
- ☐ Superior (internal thoracic) + inferior (external iliac) epigastric anastomosis behind rectus.
- ☐ Inferior epigastric enters the sheath at the arcuate line; medial to the deep ring.
- ☐ Nerves T7–T12 enter laterally and run behind rectus. Dermatomes: T10 umbilicus, L1 pubis; T4 for CS.
- ☐ Pfannenstiel low transverse; Joel-Cohen straight and higher; Maylard cuts rectus; Cherney detaches it.
- ☐ Divarication > 2 cm: physio first. Sheath haematoma: below the arcuate line, anticoagulation.

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

Question	Answer
Insertion of rectus abdominis?	Xiphoid + costal cartilages 5–7
Tendinous intersections are fused to which layer?	Anterior rectus sheath
Nerve to pyramidalis?	Subcostal (T12)
What forms the posterior sheath above the arcuate line?	Posterior leaf of IO + TA
What lies behind rectus below the arcuate line?	Transversalis fascia
Parent artery of the superior epigastric?	Internal thoracic
Where does the inferior epigastric enter the sheath?	At the arcuate line
Dermatome at the umbilicus?	T10
Block height needed for caesarean section?	T4
Which incision cuts the recti transversely?	Maylard
Why do rectus sheath haematomas spread below the arcuate line?	No posterior sheath to contain them

8 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.