



PIPADOR REVISION

MRCOG Part 1 Revision Notes

Transversus Abdominis

ANATOMY • LECTURE 25

VISUAL EXAMINATION REVISION NOTES

2026 Edition

MRCOG Part 1 Revision Notes

Lecture 25: Transversus Abdominis

Anatomy • Visual revision edition

COLOUR CODE USED THROUGHOUT THESE NOTES

EXTERNAL OBLIQUE	INTERNAL OBLIQUE	TRANSVERSUS	RECTUS	TRANSVERSALIS FASCIA
------------------	------------------	-------------	--------	----------------------

LEARNING OBJECTIVES — tick off as you go

- ☐ Describe the origin, insertion and fibre direction of transversus abdominis.
- ☐ Explain its contribution to the rectus sheath and conjoint tendon.
- ☐ Describe the transversalis fascia, deep ring and Hesselbach's triangle.
- ☐ Describe the neurovascular plane and TAP block.
- ☐ State its actions and apply to caesarean section, closure and hernias.

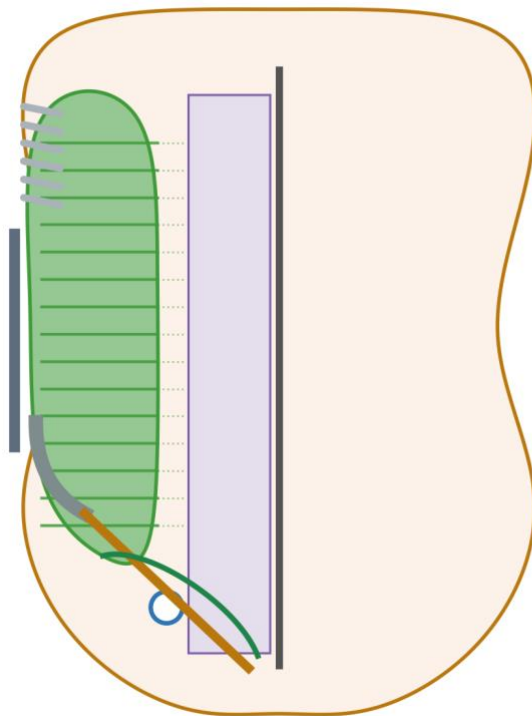
1 Overview

IN ONE LINE: *The deepest flat muscle. Horizontal fibres make it a corset — the main compressor and 'core' stabiliser of the abdomen.*

- From the hypaxial myotomes (like EO and IO) → segmental T7–L1 innervation.
- The **neurovascular plane lies on its superficial surface**, between IO and TA — the **TAP block** target.

2 Origin and Insertion

Patient's right transversus abdominis (EO + IO removed) — schematic



ORIGIN

inner surfaces of costal cartilages 7–12 (interdigitating with the DIAPHRAGM) • thoracolumbar fascia • inner lip of anterior $\frac{2}{3}$ of the iliac crest • lateral $\frac{1}{3}$ of the inguinal ligament

FIBRES

HORIZONTAL — a corset

INSERTION

linea alba (and xiphoid) via the aponeurosis • pubic crest + pectineal line with IO = CONJOINT TENDON

DEEP RING

in the transversalis fascia, BELOW the arching lower border of TA, lateral to the inferior epigastrics

Figure 1. Transversus abdominis — the corset.

ORIGIN

- Inner surfaces of costal cartilages 7–12 — interdigitating with the diaphragm
- Thoracolumbar fascia (iliac crest → 12th rib)
- Inner lip of the anterior $\frac{2}{3}$ of the iliac crest
- Lateral $\frac{1}{3}$ of the inguinal ligament

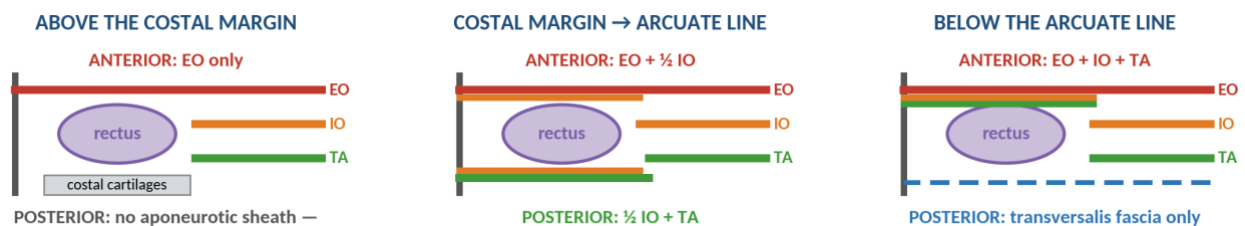
INSERTION

- Linea alba via its aponeurosis (upper fibres towards the xiphoid)
- Pubic crest + pectineal line — with IO as the conjoint tendon

MNEMONIC / MEMORY HOOK

Outside in: EO → IO → TA = 'down, up, ACROSS'. Inguinal ligament origins shrink as you go deeper: EO forms it, IO takes the lateral $\frac{2}{3}$, TA the lateral $\frac{1}{3}$.

3 Rectus Sheath, Conjoint Tendon and Transversalis Fascia



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	Where the TA aponeurosis goes
Above the costal margin	No posterior sheath — rectus lies on the costal cartilages (TA arises from their deep surfaces)
Costal margin → arcuate line	Behind rectus — posterior sheath with the posterior leaf of IO
Below the arcuate line	In front of rectus with EO and IO — rectus then lies on transversalis fascia only

Lower anterior abdominal wall from INSIDE (laparoscopic view)

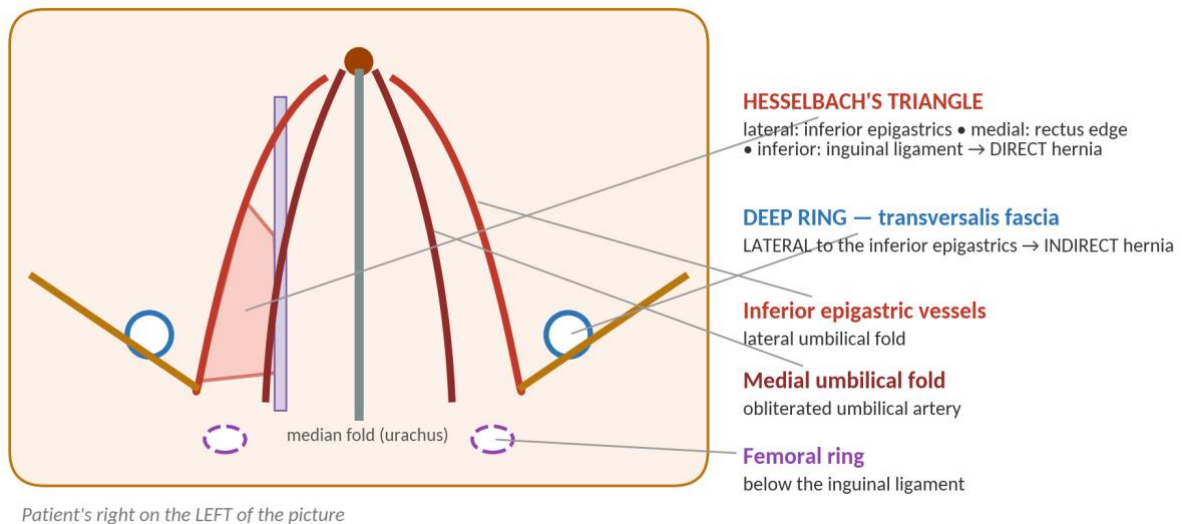


Figure 3. The lower wall from inside — the view at laparoscopy.

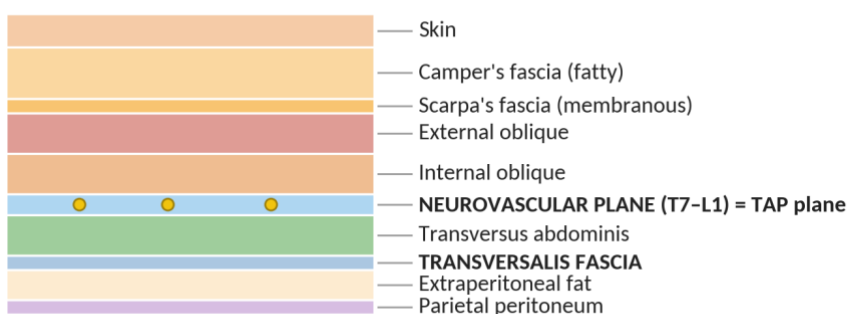
CONJOINT TENDON + HESSELBACH

- Lower TA + IO aponeuroses → pubic crest and pectineal line
- Reinforces the **posterior wall medially**
- **Hesselbach's triangle**: inferior epigastrics (lateral), rectus edge (medial), inguinal ligament (inferior) → **direct hernia**

TRANSVERSALIS FASCIA

- Deep to TA — lines the whole abdomen (continuous with diaphragmatic, iliac, pelvic and internal spermatic fasciae)
- **Deep ring** = opening in this fascia, ~1.25 cm above the midpoint of the inguinal ligament, **lateral to the inferior epigastrics**, below the arching lower border of TA → **indirect hernia**

4 The Neurovascular Plane and TAP Block

Layers of the anterolateral abdominal wall — outside in**LATERAL wall (above)**

vs

PFANNENSTIEL level

(below the arcuate line):

EO + IO + TA are all aponeurotic → one anterior rectus sheath; then rectus, transversalis fascia, peritoneum

Figure 4. Layers of the abdominal wall, outside in.

In the plane (IO ↔ TA)	Detail
Nerves	Anterior rami T7–T11 (continuing from the intercostal spaces), T12 subcostal, L1 iliohypogastric + ilioinguinal
Vessels	Lower posterior intercostal, subcostal, lumbar arteries and veins; deep circumflex iliac along the crest

TAP block coverage (approximate)

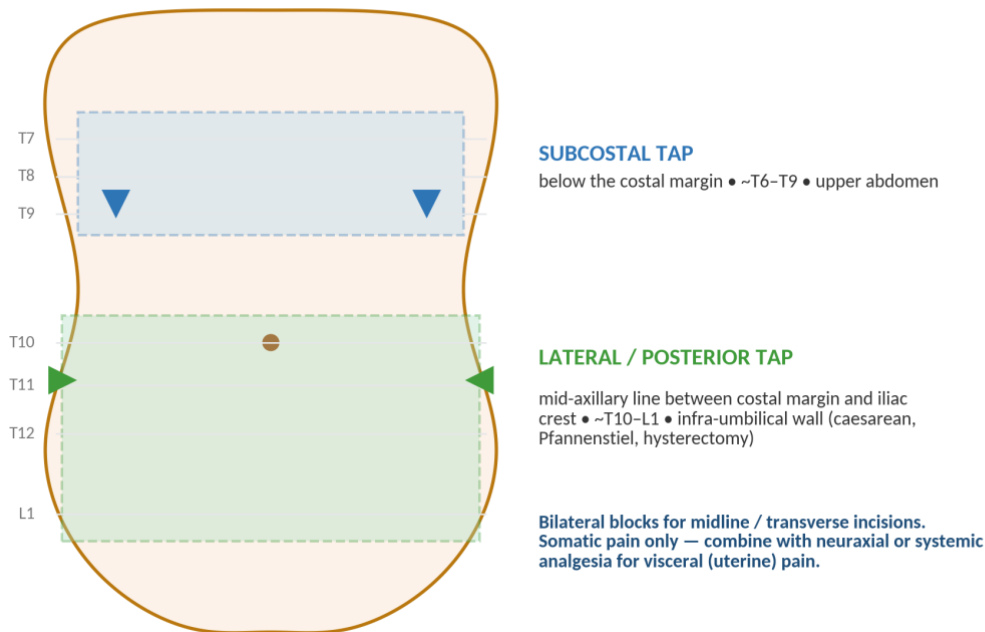


Figure 5. Approximate TAP block coverage.

EXAM HOOK

A TAP block numbs **skin, muscle and parietal peritoneum** (somatic) but **not visceral pain** — after caesarean section it **supplements, never replaces**, neuraxial or systemic analgesia.

5 Nerve Supply, Blood Supply and Actions

NERVES + ARTERIES

- **T7–T11, T12, L1** (iliohypogastric/ilioinguinal — lowest fibres + conjoint tendon)
- Posterior intercostal + subcostal arteries
- Superior + inferior epigastric (the inferior enters the sheath at the arcuate line)
- **Deep circumflex iliac** along the crest; lumbar arteries

ACTIONS

- **Compresses the abdomen** — its main job: defecation, micturition, **bearing down**, vomiting, coughing
- **Core stability** with the diaphragm and pelvic floor
- Forced expiration — pulls the lower ribs in
- Little flexion or rotation — horizontal fibres

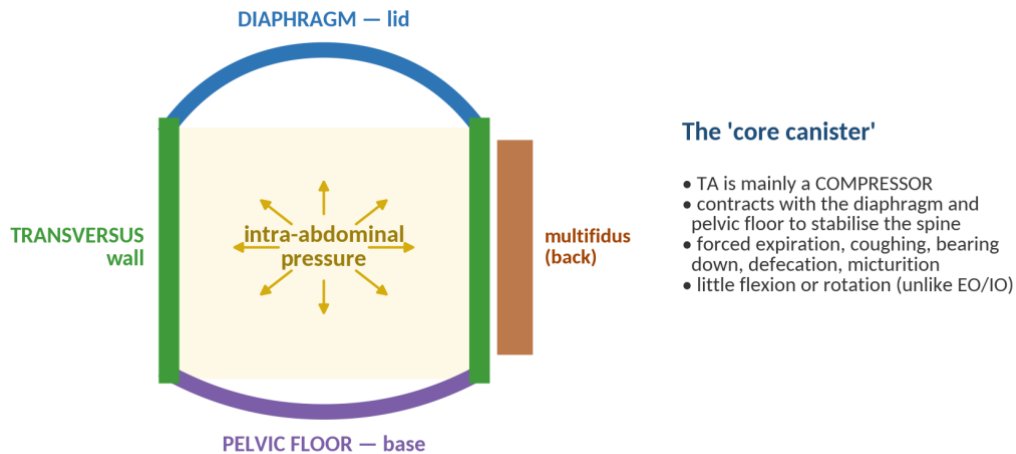


Figure 6. Transversus as the wall of the 'core canister'.

6 Surgical and Clinical Relevance

CAESAREAN SECTION

- Pfannenstiel / Joel-Cohen are **below the arcuate line**: EO, IO and TA are all aponeurotic here and form one **anterior rectus sheath**, opened transversely (lateral extension may split IO/TA muscle fibres)
- Recti separated in the midline; **transversalis fascia and peritoneum** opened

CLOSURE

- Above the arcuate line: posterior sheath (IO + TA) and anterior sheath both exist
- Below it (transverse lower incisions): close the **anterior sheath** — there is no posterior sheath
- Midline laparotomy: mass closure, slowly absorbable monofilament, small bites

HERNIAS

- **Direct**: posterior wall / conjoint tendon, Hesselbach's triangle
- **Indirect**: deep ring in transversalis fascia
- **Spigelian**: through the IO/TA aponeurosis at the linea semilunaris, usually near the arcuate line, under intact EO

TAP BLOCK

- After caesarean section, hysterectomy, lower abdominal incisions
- Ultrasound: EO → IO → **inject** → TA
- Bilateral for midline/transverse wounds

★ PEARL

TA is the most important flat muscle for **raising intra-abdominal pressure and core stability**.

It inserts on the pectineal line **together with IO** — the conjoint tendon is theirs jointly.

The **transversalis fascia** deep to it forms the **deep inguinal ring** and continues as the internal spermatic fascia.

7 MRCOG Exam Pearls — Last-Minute Page

Numbers to know

7–12 Costal cartilages of origin	$\frac{1}{3}$ Lateral inguinal ligament	$\frac{2}{3}$ Anterior iliac crest	T7–L1 Nerve supply
1.25 cm Deep ring above mid-ligament	3 Borders of Hesselbach's	T10–L1 Lateral TAP coverage	0 Visceral analgesia from TAP

HIGH-YIELD CHECKLIST

- ☐ TA: deepest flat muscle; horizontal fibres; main compressor and core stabiliser.
- ☐ Origin: cartilages 7–12 (with diaphragm), thoracolumbar fascia, anterior $\frac{2}{3}$ iliac crest, lateral $\frac{1}{3}$ inguinal ligament.
- ☐ Insertion: linea alba; pubic crest + pectineal line (conjoint tendon with IO).
- ☐ Sheath: behind rectus above the arcuate line, in front below it.
- ☐ Transversalis fascia deep to TA; deep ring is in this fascia, lateral to the inferior epigastrics.
- ☐ Hesselbach's triangle: inferior epigastrics, rectus edge, inguinal ligament → direct hernia.
- ☐ Neurovascular plane (T7–L1) between IO and TA = TAP plane.
- ☐ TAP block: somatic analgesia only; supplements neuraxial analgesia at caesarean section.
- ☐ Pfannenstiel: all three aponeuroses form one anterior sheath; no posterior sheath below the arcuate line.
- ☐ Little flexion or rotation — TA is a compressor.

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

Question	Answer
Direction of TA fibres?	Horizontal (transverse)
Which muscle does TA interdigitate with at its costal origin?	The diaphragm
Where is the TA aponeurosis below the arcuate line?	In front of rectus
What lies behind rectus below the arcuate line?	Transversalis fascia
The deep inguinal ring is an opening in...?	Transversalis fascia
Lateral border of Hesselbach's triangle?	Inferior epigastric vessels
Where is local anaesthetic placed in a TAP block?	Between internal oblique and transversus
Does a TAP block relieve visceral pain?	No — somatic only
TA's most important action?	Compressing the abdomen / raising intra-abdominal pressure
What forms the conjoint tendon?	IO + TA aponeuroses
Which layer continues as the internal spermatic fascia?	Transversalis fascia

8 References

- Standring S, editor. Gray's Anatomy. 42nd ed. 2020.
- Moore KL et al. Clinically Oriented Anatomy. 8th ed. 2017.
- Drake RL et al. Gray's Anatomy for Students. 4th ed. 2019.