



PIPADOR REVISION

MRCOG Part 1 Revision Notes

The Male Genital Tract

ANATOMY • LECTURE 21

VISUAL EXAMINATION REVISION NOTES

2026 Edition

MRCOG Part 1 Revision Notes

Lecture 21: The Male Genital Tract

Anatomy • Visual revision edition

COLOUR CODE USED THROUGHOUT THESE NOTES

TESTIS	EPIDIDYMIS	VAS DEFERENS	SEMINAL VESICLE	PROSTATE
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LEARNING OBJECTIVES — tick off as you go

- ☐ Describe testicular anatomy, descent and blood supply.
- ☐ Identify the epididymis and vas deferens.
- ☐ Describe the seminal vesicles and ejaculatory ducts.
- ☐ Identify the four zones of the prostate.
- ☐ Describe the scrotum and spermatic cord contents.
- ☐ Recognise penile anatomy.
- ☐ Apply to male infertility, prostate pathology and varicocele.

1 Overview — The Route of Sperm

Route of sperm — side view, anterior on the LEFT (schematic)

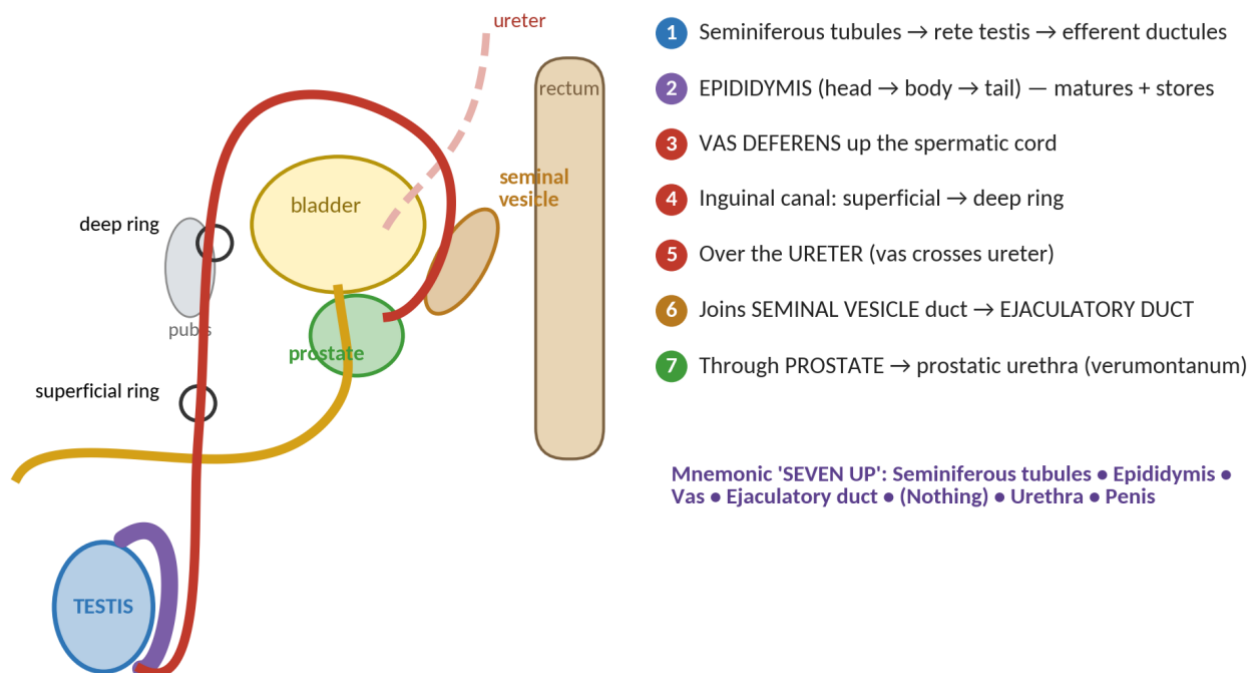


Figure 1. From seminiferous tubule to urethra.

MNEMONIC / MEMORY HOOK

'SEVEN UP' — Seminiferous tubules, Epididymis, Vas deferens, Ejaculatory duct, (Nothing), Urethra, Penis.

2 The Testes

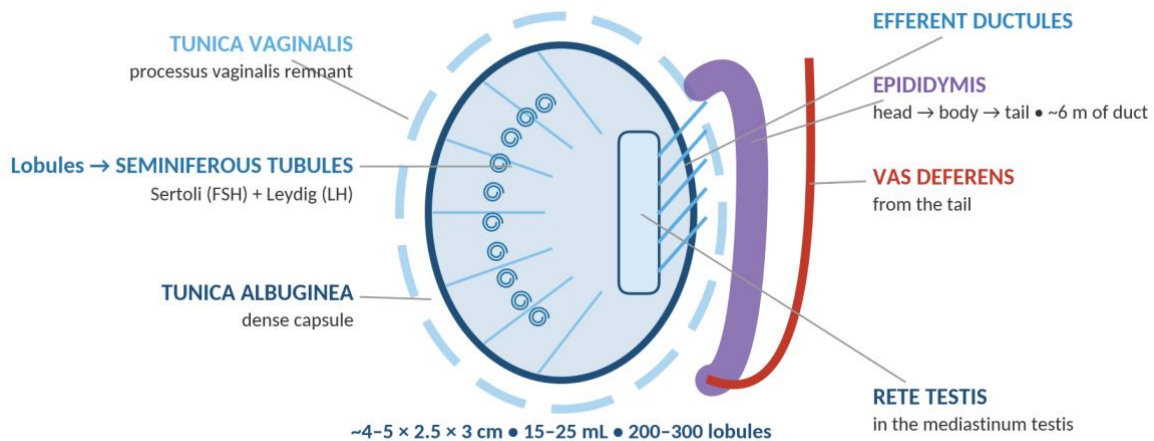


Figure 2. Inside the testis.

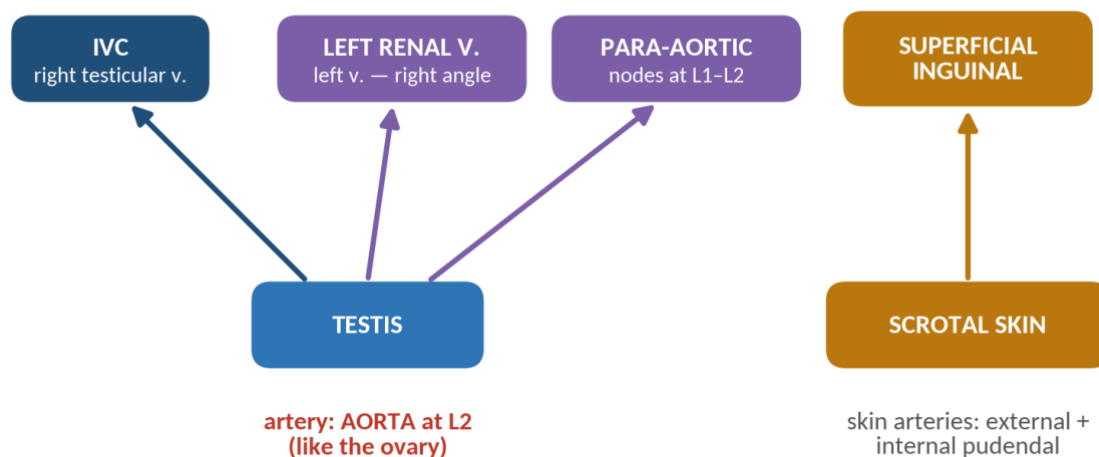
GROSS + CELLS

- ~4–5 × 2.5 × 3 cm; 15–25 mL; 10–15 g; left usually lower
- Tunica vaginalis (serous) around tunica albuginea (fibrous)
- **Sertoli**: support spermatogenesis (FSH), AMH (fetus), inhibin, ABP, blood–testis barrier
- **Leydig**: testosterone (LH)

DESCENT

- Develops on the posterior abdominal wall; guided by the **gubernaculum**
- Through the inguinal canal in the last trimester (~7–9 months)
- **Processus vaginalis** normally closes; patent → indirect hernia, hydrocele
- **Cryptorchidism** ~3% at term; most descend by 6 months • ↑ infertility and cancer • **orchidopexy at 6–12 months** (18 months latest)

Testis drains HIGH; scrotum drains to the GROIN



Varicocele: LEFT >> right. New RIGHT varicocele → look for a retroperitoneal mass.
 Testicular cancer → para-aortic nodes, so orchidectomy is INGUINAL, never trans-scrotal.

Figure 3. Testis and scrotum drain to different places.

EXAM HOOK

Testis = ovary: artery from the **aorta at L2**; right vein → IVC, left vein → **left renal vein**; lymph **directly to para-aortic nodes**; pain via **T10** (periumbilical). **Scrotal skin** drains to the **superficial inguinal nodes**.

3 Epididymis, Vas, Seminal Vesicles and Ejaculatory Ducts

Structure	Key facts
Epididymis	Posterior to the testis; head (efferent ductules) → body → tail; ~6 m of coiled duct; pseudostratified columnar epithelium with stereocilia; matures and stores sperm; epididymitis, cysts, spermatocele
Vas deferens	~30–45 cm thick-walled muscular tube from the epididymal tail → posterior spermatic cord → inguinal canal → lateral pelvic wall → crosses OVER the ureter → ampulla behind the bladder; palpable in the scrotum; vasectomy site
Seminal vesicles	~5 cm sacculated glands behind the bladder, lateral to the vas; 60–70% of semen — alkaline, fructose, prostaglandins, clotting factors
Ejaculatory ducts	Vas + seminal vesicle duct; ~2 cm; through the prostate → prostatic urethra at the verumontanum, either side of the utricle

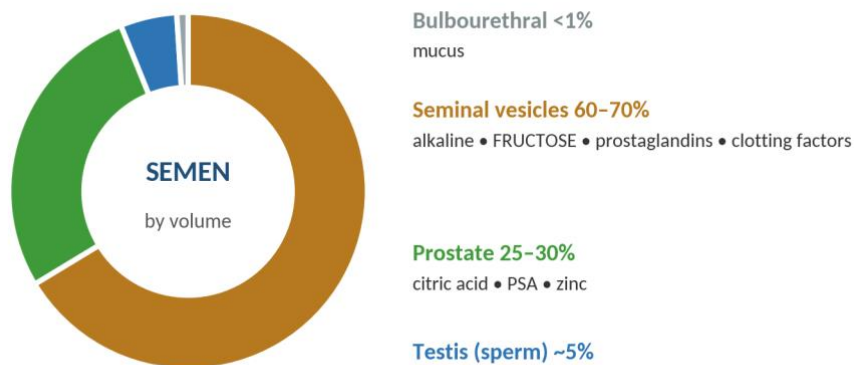


Figure 4. Who makes the semen.

4 The Prostate

ANATOMY + RELATIONS

- Walnut-sized (~3 × 4 × 2 cm, ~20 g); bladder neck above, urogenital diaphragm below
- Front: symphysis, Retzius, prostatic venous plexus
- Back: **rectum** across **Denonvilliers' fascia** — felt on DRE
- Sides: levator ani

VESSELS + NERVES

- Arteries: **inferior vesical** (± middle rectal, internal pudendal)
- Venous plexus → internal iliac; links to **Batson's plexus** → vertebral metastases
- Lymph: internal iliac (± external iliac, sacral)
- **Cavernous nerves** run posterolaterally → erection; spared in nerve-sparing prostatectomy

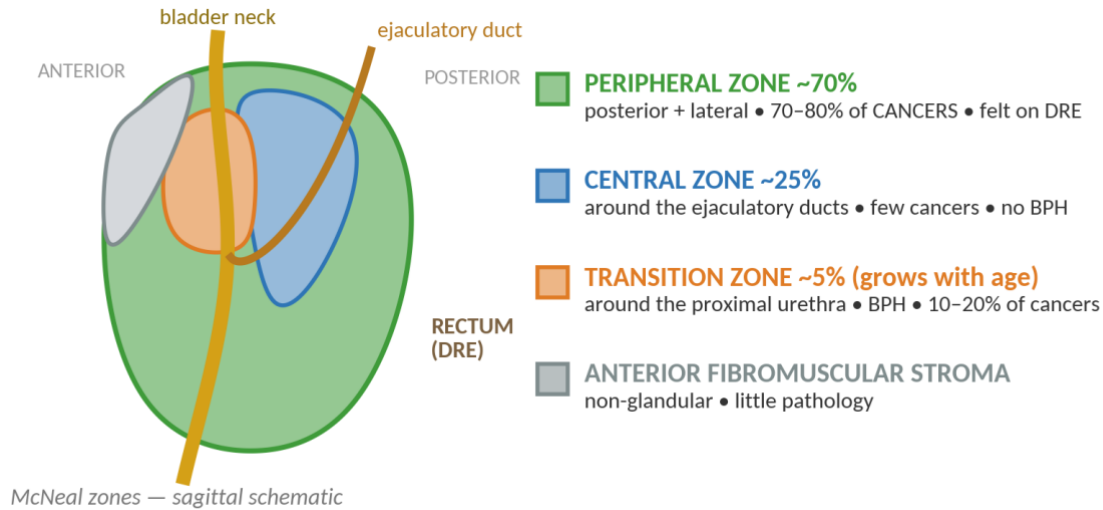


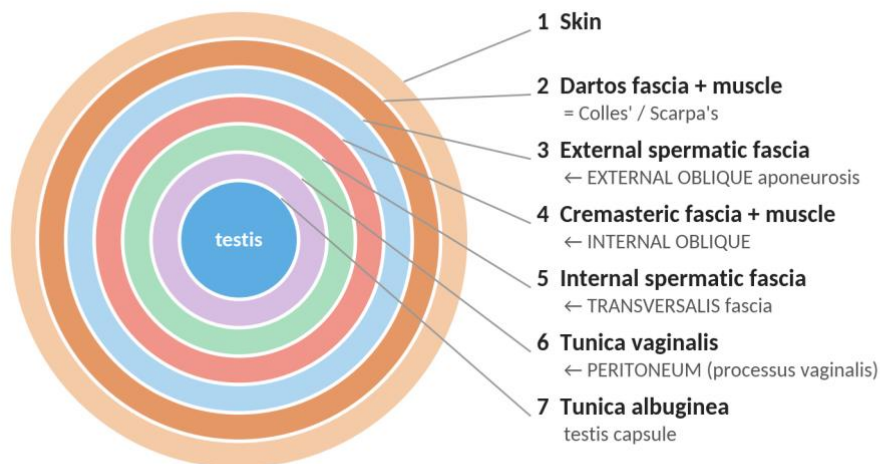
Figure 5. McNeal's zones.

MNEMONIC / MEMORY HOOK

Peripheral = Prostate cancer (and it's Palpable). Transition = The enlarging one (BPH).

5 Scrotum and Spermatic Cord

Scrotal layers — outside in



The spermatic cord's three coverings = layers 3, 4 and 5 (one from each abdominal wall layer).

Figure 6. Seven layers, each with an abdominal-wall origin.

- Scrotal supply: external pudendal (femoral) + posterior scrotal (internal pudendal) arteries • lymph → **superficial inguinal** • nerves: ilioinguinal + genital branch of genitofemoral (front), posterior scrotal (pudendal) and S2–S3 perineal branches (back).

Spermatic cord	Contents ('rule of threes')
3 coverings	External spermatic (external oblique) • cremasteric (internal oblique) • internal spermatic (transversalis)
3 arteries	Testicular (aorta) • cremasteric (inferior epigastric) • artery to the vas (inferior/superior vesical)
3 veins	Pampiniform plexus • cremasteric veins • veins of the vas

Spermatic cord	Contents ('rule of threes')
3 nerves	Genital branch of genitofemoral (cremaster) • autonomic testicular plexus • ilioinguinal (lies on the cord, outside its coverings)
3 others	Vas deferens • lymphatics • processus vaginalis remnant

6 The Penis

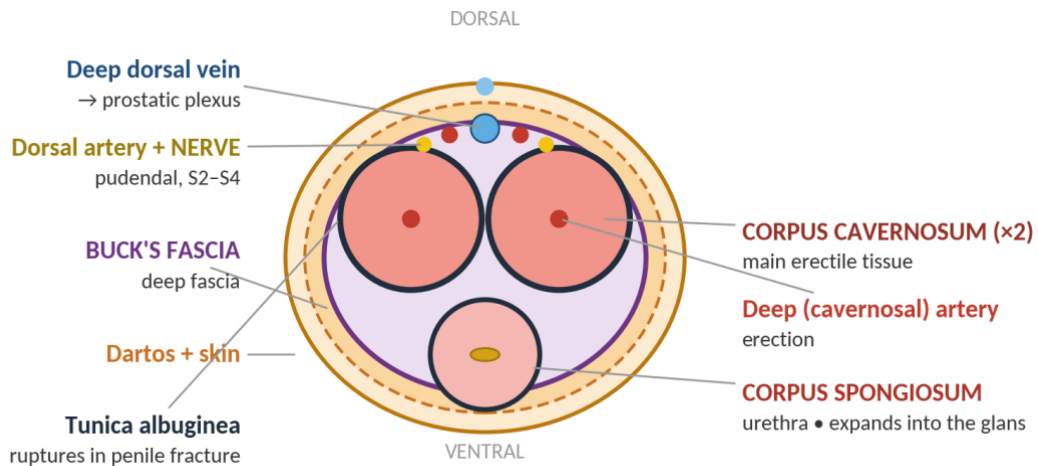


Figure 7. Cross-section of the penile shaft.

- **Root** in the superficial pouch: bulb (on the perineal membrane, under bulbospongiosus) and two crura (on the ischiopubic rami, under ischiocavernosus). **Body** and **glans** (expanded corpus spongiosum).
- Arteries from the internal pudendal: **deep (cavernosal)** — erection; **dorsal**; **bulbourethral**. Veins: deep dorsal → prostatic plexus; superficial dorsal → external pudendal.
- Sensory: **dorsal nerve of the penis** (pudendal, S2–S4). Erection: parasympathetic S2–S4 via cavernous nerves. Emission: sympathetic.

7 Embryology, Spermatogenesis and Ejaculation

EMBRYOLOGY

- **SRY** → testis → Sertoli (**AMH**: Müllerian ducts regress) + Leydig (**testosterone**: Wolffian ducts persist)
- Wolffian → epididymis, vas, seminal vesicles, ejaculatory duct
- Urogenital sinus → prostate, prostatic urethra, Cowper's glands
- **DHT** (5 α -reductase) masculinises external genitalia
- Failures: hypospadias, epispadias, 5 α -reductase deficiency, androgen insensitivity

SPERMATOGENESIS

- Continuous from puberty; **~74 days**
- Spermatogonia (2n) → primary spermatocytes (meiosis I) → secondary spermatocytes (n, meiosis II) → spermatids → spermatozoa
- **FSH** → **Sertoli**; **LH** → **Leydig** (high local testosterone)
- Inhibin (Sertoli) feeds back on FSH
- Matures in the epididymis; stored in the tail + vas

Phase	Nerve	What happens
EMISSION	Sympathetic (T10–L2)	Vas, seminal vesicles and prostate contract; bladder neck closes — prevents retrograde ejaculation

Phase	Nerve	What happens
EXPULSION	Somatic — pudendal (S2–S4)	Rhythmic bulbospongiosus contraction

'Point and Shoot': Parasympathetic → erection (Point); Sympathetic → emission (Shoot).

8 Clinical Correlations

MALE INFERTILITY • Pre-testicular: hypogonadotrophic hypogonadism (Kallmann's, pituitary) • Testicular: cryptorchidism, varicocele, infection, torsion, chemo/radiotherapy, Klinefelter's (47,XXY) • Post-testicular: CBAVD (cystic fibrosis), ejaculatory duct obstruction, vasectomy • Semen analysis (WHO), FSH/LH/testosterone, karyotype, CFTR, scrotal USS	VARICOCELE • Dilated pampiniform plexus — 'bag of worms' • Left >> right (left vein → left renal vein at a right angle) • Pain, subfertility, atrophy • Ligation or embolisation • New right-sided → look for a retroperitoneal mass
TORSION + TESTICULAR CANCER • Torsion: emergency — explore within ~6 hours; fix both sides • Cancer: commonest solid tumour of young men; cryptorchidism ↑ risk • Seminoma ~40–50%; NSGCT (embryonal, yolk sac, choriocarcinoma, teratoma) • Markers: hCG, AFP, LDH • spreads to para-aortic nodes • Radical INGUINAL orchidectomy — never trans-scrotal	PROSTATE • BPH: transition zone; LUTS; α-blockers, 5α-reductase inhibitors, TURP • Cancer: peripheral zone; commonest male cancer in the UK; PSA + DRE, MRI, biopsy; Gleason; bone spread via Batson's • Prostatitis: ciprofloxacin penetrates well
VASECTOMY • Divide the vas in the scrotum • Failure ~1 in 2000 after clearance (vs ~1 in 200 female sterilisation) • Ejaculate volume barely changes • Not effective until azoospermia confirmed ≥12 weeks later	HYDROCELE • Fluid in the tunica vaginalis • Communicating (patent processus vaginalis) vs non-communicating • Transilluminates

9 Male–Female Homologues

MALE	FEMALE
Testis	Ovary
Gubernaculum testis	Ovarian ligament + round ligament
Scrotum	Labia majora
Corpora cavernosa (penis)	Corpora cavernosa (clitoris)
Bulb / corpus spongiosum	Vestibular bulbs

MALE	FEMALE
Glans penis	Glans clitoris
Prostate	Skene's glands
Cowper's glands	Bartholin's glands
Wolffian duct → vas, SV, ejaculatory duct	Wolffian remnants: epoophoron, paroophoron, Gartner's duct
Müllerian remnants: prostatic utricle, appendix testis	Müllerian → tubes, uterus, upper vagina

10 MRCOG Exam Pearls — Last-Minute Page

Numbers to know

L2 Testicular artery (aorta)	T10 Testicular pain	~74 d Spermatogenesis	60–70% Semen from seminal vesicles
~70% Peripheral zone	~3% Cryptorchidism at term	6–12 mo Orchidopexy	1 in 2000 Vasectomy failure

HIGH-YIELD CHECKLIST

- ☐ Testicular artery from the aorta at L2; left vein → left renal vein; lymph → para-aortic.
- ☐ Scrotal skin → superficial inguinal nodes.
- ☐ Vas crosses over the ureter; joins the seminal vesicle duct → ejaculatory duct → verumontanum.
- ☐ Seminal vesicles 60–70% of semen (fructose); prostate 25–30% (PSA, zinc, citrate).
- ☐ Prostate zones: peripheral (cancer), central, transition (BPH), anterior stroma.
- ☐ Prostate cancer → vertebrae via Batson's plexus.
- ☐ Spermatic cord: 3 coverings, 3 arteries, 3 veins, 3 nerves, 3 others.
- ☐ Penis: 2 corpora cavernosa + 1 corpus spongiosum (urethra, glans).
- ☐ Emission sympathetic (bladder neck closes); expulsion pudendal (bulbospongiosus).
- ☐ Spermatogenesis ~74 days; FSH → Sertoli, LH → Leydig.
- ☐ Cryptorchidism ~3%; orchidopexy at 6–12 months.
- ☐ Testicular cancer: inguinal orchidectomy, never trans-scrotal.

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

Question	Answer
Where does the left testicular vein drain?	Left renal vein
First lymph nodes for the testis?	Para-aortic
First lymph nodes for scrotal skin?	Superficial inguinal
Which gland makes most of the semen?	Seminal vesicles
Which prostatic zone gives rise to most cancers?	Peripheral zone
Which zone gives rise to BPH?	Transition zone

Question	Answer
Artery to the cremaster comes from...?	Inferior epigastric artery
What prevents retrograde ejaculation?	Sympathetic closure of the bladder neck
Male infertility with absent vasa — which gene?	CFTR (CBAVD)
Why is testicular cancer removed through the groin?	Avoid seeding scrotal (inguinal) lymphatics
Female homologue of the prostate?	Skene's glands

11 References

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