PIPADOR REVISION

MRCOG Part 1 Revision Notes

Male Genital Ducts

EMBRYOLOGY • LECTURE 64

VISUAL EXAMINATION REVISION NOTES

2026 Edition

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Lecture 64: Male Genital Ducts

Embryology • Visual revision edition

COLOUR CODE USED THROUGHOUT THESE NOTES

WOLFFIAN DUCT	MESONEPHRIC TUBULES	UROGENITAL SINUS	MÜLLERIAN	CLINICAL

LEARNING OBJECTIVES — tick off as you go

- ☐ List the Wolffian derivatives and the hormone each needs.
- ☐ Explain why the prostate and external genitalia need DHT but the ducts don't.
- ☐ Describe the prostate zones, spermatic cord and duct remnants in both sexes.
- ☐ Compare AIS, 5α-reductase deficiency and PMDS.
- ☐ Apply to CBAVD/CFTR, vasectomy, obstructive azoospermia, BPH and prostate cancer.

1 What Comes From Where

IN ONE LINE: *Male ducts = the Wolffian duct kept alive by TESTOSTERONE. Prostate + Cowper's glands = urogenital-sinus buds grown by DHT.*

Male genital ducts — what comes from where (schematic)

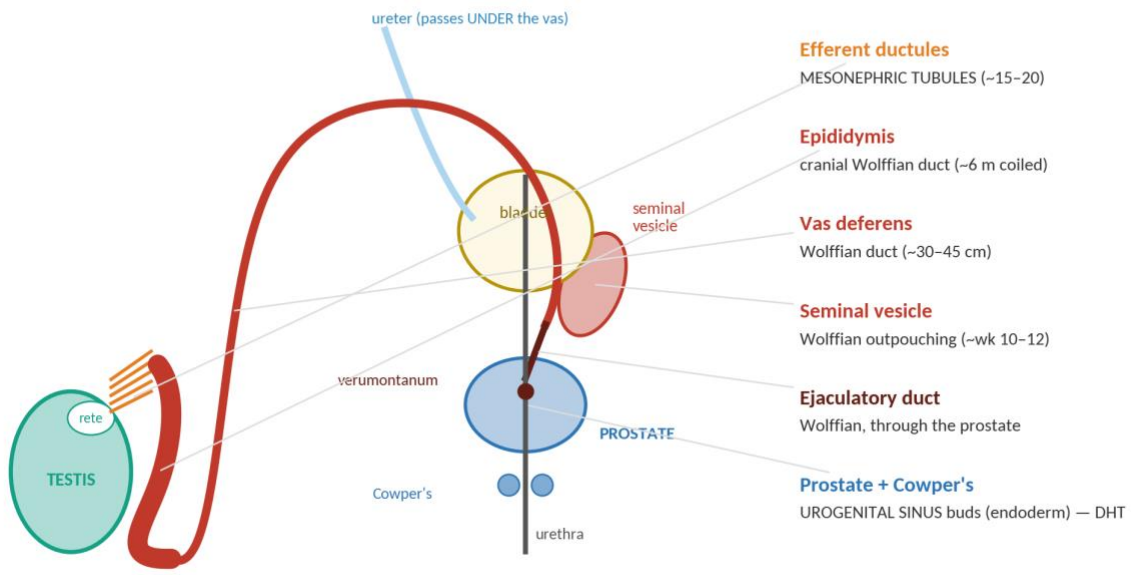


Figure 1. Male genital ducts and their origins.

Structure	Origin	Key facts
Efferent ductules	Mesonephric tubules	~15–20; rete testis → head of epididymis
Epididymis	Cranial Wolffian duct	~6 m coiled; sperm maturation + storage

Structure	Origin	Key facts
Vas deferens	Wolffian duct	~30–45 cm; through the inguinal canal; crosses over the ureter; vasectomy in the scrotal part
Seminal vesicle	Wolffian outpouching	~60–70% of semen volume — fructose, prostaglandins, semenogelin
Ejaculatory duct	Caudal Wolffian duct	Vas + seminal vesicle duct → through prostate → verumontanum
Prostate	Urogenital sinus buds (+ mesoderm stroma)	From ~week 10 under DHT
Bulbourethral (Cowper's)	Urogenital sinus	Alkaline pre-ejaculate; = Bartholin's

2 Hormonal Control

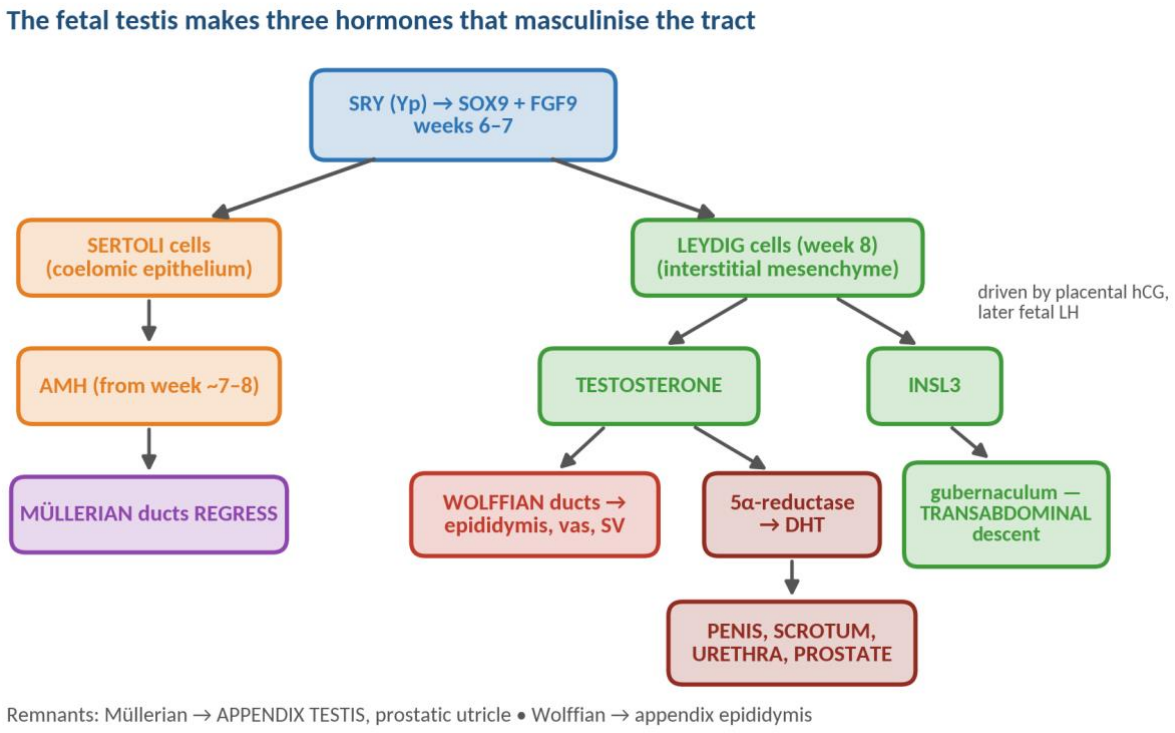


Figure 2. AMH, testosterone, DHT, INSL3 (from Lecture 60).

MNEMONIC / MEMORY HOOK

'T for Tubes, D for Down-below' — Testosterone keeps the Wolffian tubes; DHT builds the prostate and external genitalia. AMH removes the Müllerian ducts.

3 Prostate and Spermatic Cord

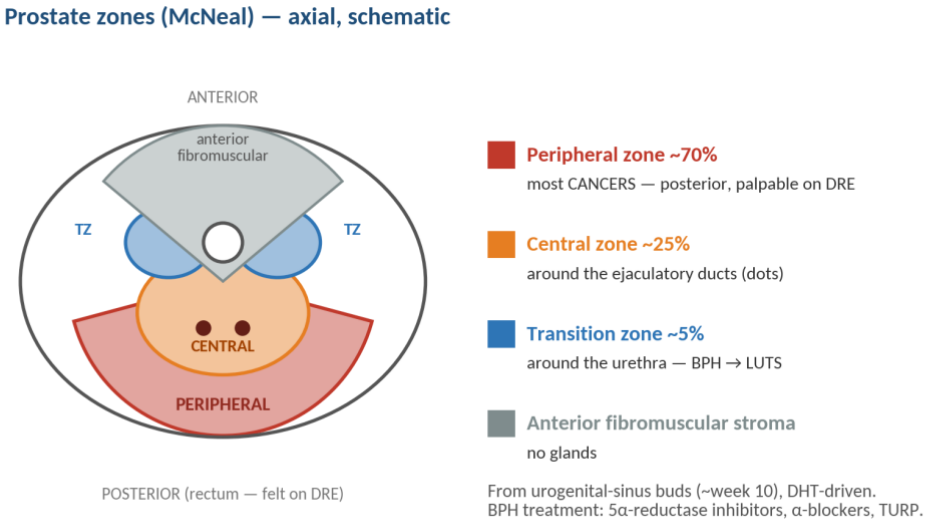


Figure 3. Prostate zones.

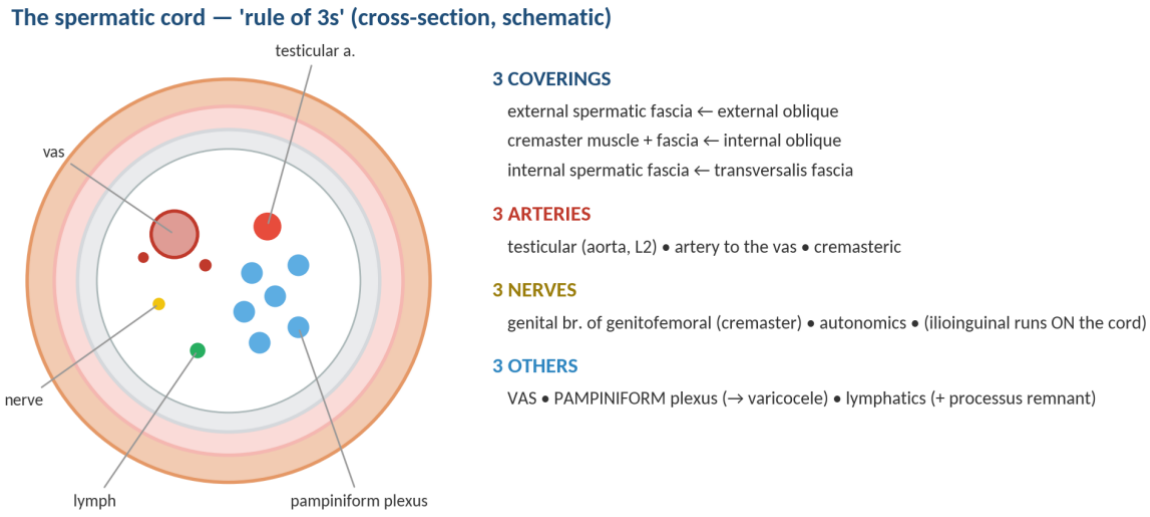


Figure 4. Spermatic cord.

4 Remnants and Anomalies

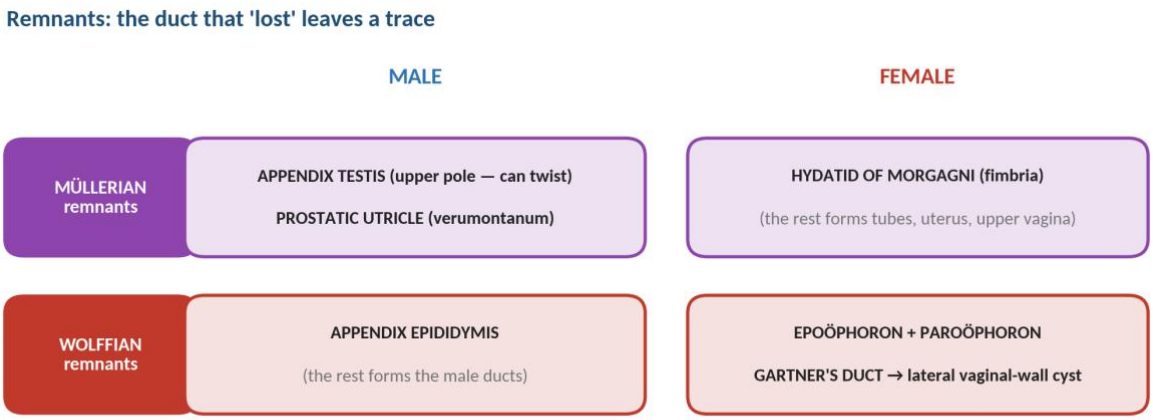


Figure 5. Duct remnants in both sexes.

46,XY differences of sex development — side by side

	Karyotype	Gonads	Müllerian (uterus/tubes)	Wolffian (vas, epididymis)	External genitalia	Key point
Complete AIS	46,XY	testes	ABSENT	absent	FEMALE	AR (X-linked); breasts, scant hair; gonadectomy often after puberty
5α-reductase deficiency	46,XY	testes	absent	PRESENT	AMBIGUOUS	SRD5A2; virilises at puberty; variable gender identity
PMDS	46,XY	testes (often undescended)	PRESENT	present	MALE	AMH / AMHR2; uterus found at hernia repair or orchidopexy
Swyer (46,XY CGD)	46,XY	STREAKS	PRESENT	absent	FEMALE	no AMH, no testosterone; gonadoblastoma → gonadectomy

Logic: Müllerian ducts vanish only with AMH (Sertoli); Wolffian ducts survive only with testosterone; external male genitalia need DHT.

Figure 6. 46,XY DSDs (from Lecture 60).

Condition	Key points
CBAVD	Nearly all men with cystic fibrosis; most other men with CBAVD carry CFTR variants. Normal spermatogenesis → obstructive azoospermia → surgical sperm retrieval + ICSI; test the partner for CFTR first. Unilateral absence → check for renal agenesis
PMDS	AMH or AMHR2 defect — 46,XY male with uterus and tubes; found at hernia repair or orchidopexy (hernia uteri inguinalis)
Complete AIS	No AR: Wolffian ducts also fail; no uterus (AMH works); female external genitalia, blind vagina, testes inside
5α-reductase deficiency	Wolffian ducts normal (testosterone works); prostate small, genitalia ambiguous; virilises at puberty
Wolffian cysts	Seminal vesicle or ejaculatory-duct cysts — pain, dysuria, obstructive infertility

5 Clinical Correlates

VASECTOMY

- Scrotal division/occlusion of the vas
- **Not effective until clearance**: semen analysis **≥ 12 weeks and ≥ 20 ejaculations** after
- Antisperm antibodies common afterwards; reversal success falls with time

OBSTRUCTIVE AZOOSPERMIA

- CBAVD, vasectomy, infection, ejaculatory-duct obstruction
- **Normal FSH and testicular volume**, sperm retrievable — unlike non-obstructive (↑ FSH, small testes)
- Low-volume, acidic, fructose-negative semen → ejaculatory-duct / vesicle problem

PROSTATE

- **Cancer**: peripheral zone, androgen-dependent → ADT
- **BPH**: transition zone → LUTS; α-blockers, 5α-reductase inhibitors (finasteride), TURP

FEMALE PATIENTS

- **Gartner's duct cyst** (Wolffian) — lateral vaginal wall
- Paraovarian cysts in the mesosalpinx
- Partner CFTR screening when the man has CBAVD

★ PEARL

Azoospermic man with absent vasa on examination = CBAVD → think cystic fibrosis → test both partners for CFTR before ICSI.

Vas crosses OVER the ureter in men; the uterine artery crosses OVER it in women — the ureter is always 'water under the bridge'.

6 MRCOG Exam Pearls — Last-Minute Page

Numbers to know

Week 8 Leydig testosterone	**Week 10** Prostate buds (DHT)	**15–20** Efferent ductules	**~6 m** Epididymis uncoiled
30–45 cm Vas deferens	**60–70%** Semen from seminal vesicles	**~70%** Prostate = peripheral zone	**12 wk / 20** Vasectomy clearance

HIGH-YIELD CHECKLIST

- ☐ Wolffian → epididymis, vas, seminal vesicle, ejaculatory duct (testosterone).
- ☐ Mesonephric tubules → efferent ductules.
- ☐ Prostate + Cowper's → urogenital sinus (DHT).
- ☐ AMH → Müllerian regression; remnants = appendix testis, prostatic utricle.
- ☐ Female Wolffian remnants: epoöphoron, paroöphoron, Gartner's duct.
- ☐ Prostate zones: peripheral (cancer), transition (BPH).
- ☐ Cord: 3 coverings, 3 arteries, 3 nerves, 3 others.
- ☐ CBAVD ↔ CFTR — test the partner.
- ☐ AIS vs 5ARD vs PMDS — duct logic.
- ☐ Vasectomy clearance ≥ 12 weeks and ≥ 20 ejaculations.

Self-assessment — cover the right-hand column

Question	Answer
Hormone that keeps the Wolffian ducts?	Testosterone
Origin of the efferent ductules?	Mesonephric tubules
Origin of the prostate?	Urogenital sinus (endoderm), DHT-driven
Zone of most prostate cancers?	Peripheral
Female Wolffian remnant causing a vaginal cyst?	Gartner's duct
Male Müllerian remnants?	Appendix testis, prostatic utricle
Gene linked to CBAVD?	CFTR
Wolffian ducts in complete AIS?	Absent (no androgen receptor)
Wolffian ducts in 5α-reductase deficiency?	Normal
Three coverings of the spermatic cord?	External spermatic, cremasteric, internal spermatic fascia

7 References

- Sadler TW. Langman's Medical Embryology. 14th ed. 2019.
- NICE CG156. Fertility problems: assessment and treatment. 2013 (updated 2017).
- FSRH. Male and female sterilisation guideline (post-vasectomy semen analysis). 2014.