



PIPADOR REVISION

MRCOG Part 1 Revision Notes

The Urethra

ANATOMY • LECTURE 15

VISUAL EXAMINATION REVISION NOTES

2026 Edition

MRCOG Part 1 Revision Notes

Lecture 15: The Urethra

Anatomy • Visual revision edition

COLOUR CODE USED THROUGHOUT THESE NOTES

URETHRA	PROSTATIC	MEMBRANOUS	SPONGY	SMOOTH SPHINCTER	STRIATED SPHINCTER
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LEARNING OBJECTIVES — tick off as you go

- ☐ Describe female urethral anatomy (length, course, sphincters).
- ☐ Describe male urethral anatomy (prostatic, membranous, spongy).
- ☐ Identify the internal and external urethral sphincters.
- ☐ Recognise Skene's (paraurethral) glands.
- ☐ Describe blood supply, lymphatics and innervation.
- ☐ Apply to SUI, diverticulum, catheterisation and urethral injury.

1 Overview — Female vs Male

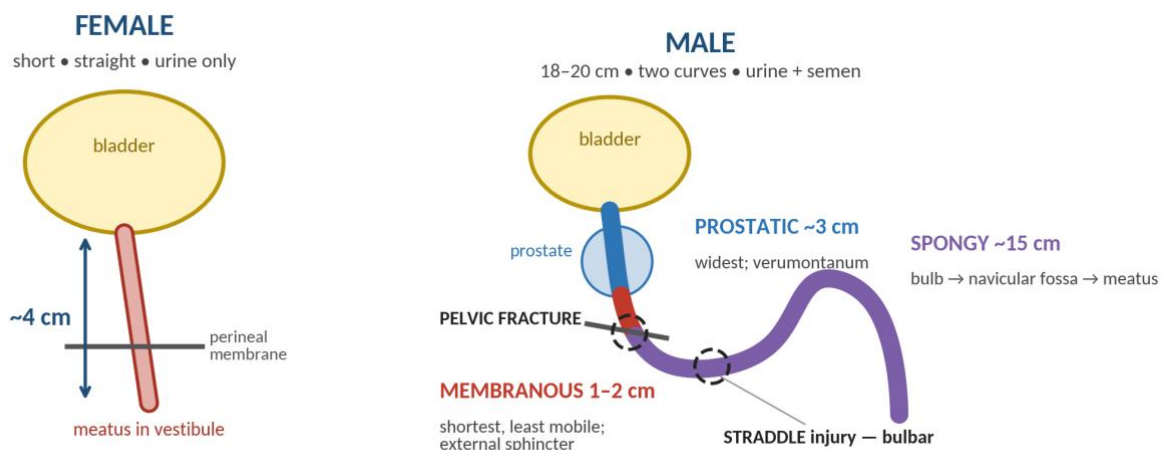


Figure 1. The short straight female urethra vs the long curved male urethra.

2 The Female Urethra

Feature	Key facts
Size	~4 cm long, ~6 mm wide
Course	Bladder neck → down and slightly forward through the pelvic floor → embedded in the anterior vaginal wall → meatus in the vestibule, between clitoris and vaginal opening
Relations	Front: pubic symphysis, Retzius • Back: anterior vaginal wall (fused) • Sides: pubovaginalis, deep transverse perineal, compressor urethrae, urethrovaginal sphincter; perineal membrane below

Feature	Key facts
Layers	1. Mucosa — squamous distally, transitional/pseudostratified proximally • 2. Spongy vascular submucosa ('mucosal seal') • 3. Smooth muscle (internal sphincter proximally) • 4. Striated muscle (external sphincter mid-urethra)

Sphincters

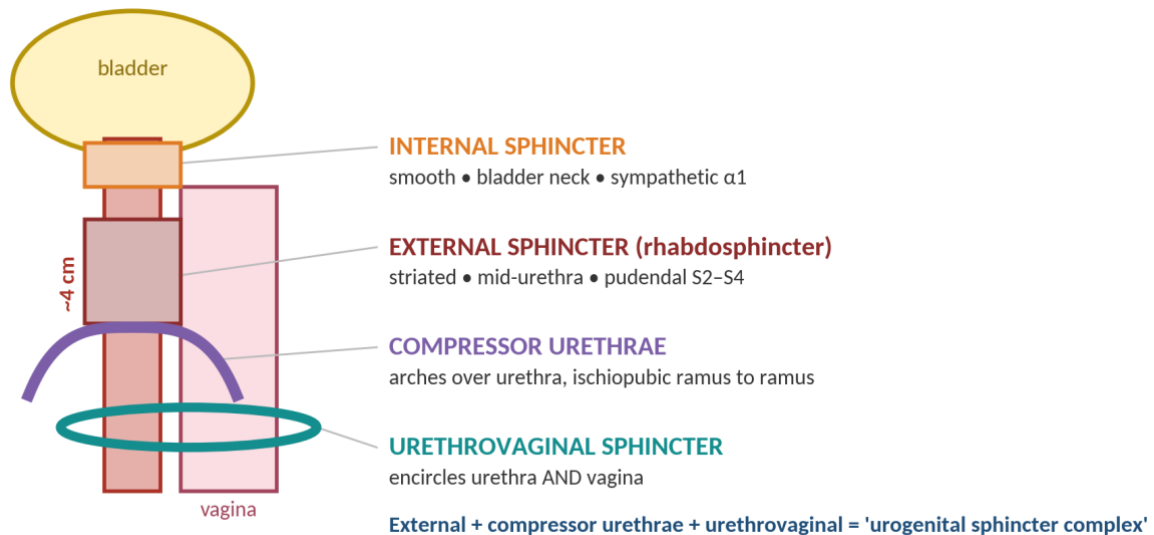


Figure 2. The female sphincter complex.

MNEMONIC / MEMORY HOOK

INTERNAL = Involuntary (smooth, sympathetic $\alpha 1$). EXTERNAL = Extra control (striated, pudendal).

The vestibule and Skene's glands

The vestibule, en face

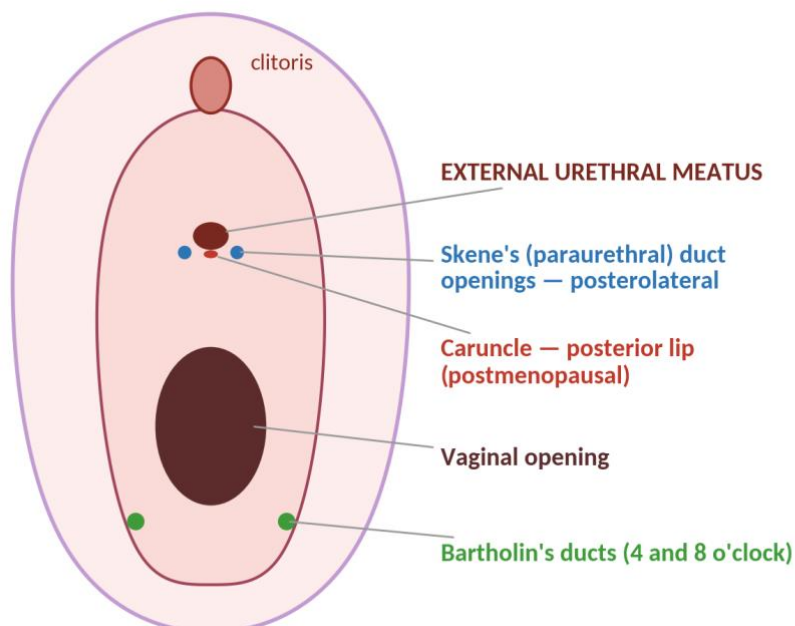
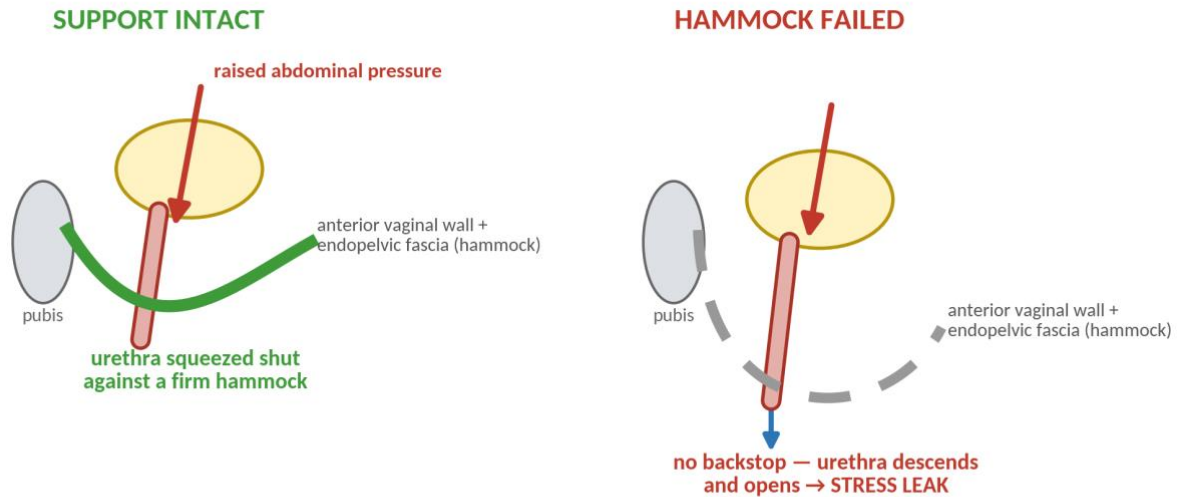


Figure 3. What you see at the meatus.

- **Skene's (paraurethral) glands:** two small mucus glands opening **posterolaterally** near the meatus — **female homologue of the prostate**. Abscess, cyst, very rarely adenocarcinoma.

How the female urethra stays shut



DeLancey's hammock hypothesis (sagittal schematic, anterior on the left)

Figure 4. DeLancey's hammock hypothesis.

POSITION	CLOSURE PRESSURE	SUPPORT
bladder neck and urethra above the pelvic floor	smooth + striated sphincters, mucosal seal, vascular plexus (oestrogen-dependent)	hammock of anterior vaginal wall + endopelvic fascia; pelvic floor muscles

Lose any of these → **stress incontinence**.

3 The Male Urethra

Part	Length	Key features
Prostatic	~3 cm	Through the prostate; widest, most distensible; internal sphincter at its start
Membranous	1–2 cm	Shortest, narrowest (bar the meatus), least mobile; through the perineal membrane and external sphincter; Cowper's glands alongside; torn in pelvic fracture
Spongy (penile)	~15 cm	In the corpus spongiosum; bulb (proximal) and navicular fossa (distal) dilatations; Cowper's ducts + glands of Littre; bulbar part hit in straddle injury

Two curves (prepubic and infrapubic) — lifting the penis straightens it to one curve for **catheterisation**.

Prostatic urethra opened from the front

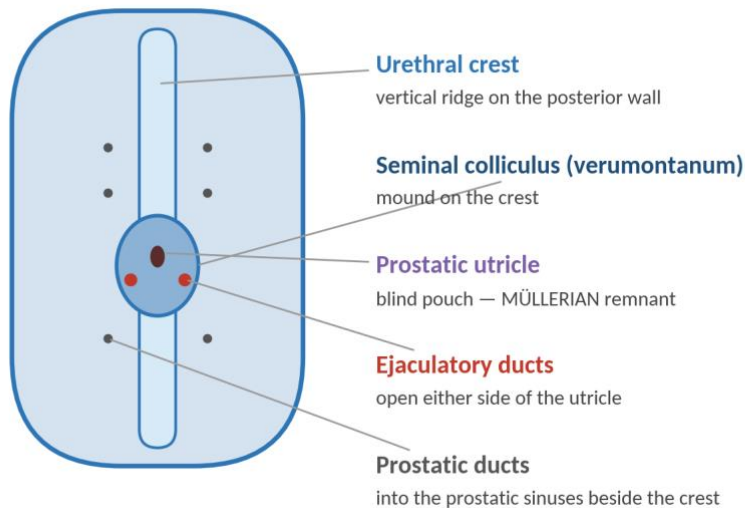


Figure 5. Landmarks on the posterior wall of the prostatic urethra.

MNEMONIC / MEMORY HOOK

Male order: 'P-M-S' — Prostatic (3), Membranous (1–2, shortest), Spongy (15, longest).

- **Internal sphincter** closes during ejaculation — prevents **retrograde ejaculation**.

4 Blood Supply, Lymph and Nerves

FEMALE

- Arteries: **vaginal** (upper), **internal pudendal** (lower), some inferior vesical
- Lymph: upper → internal iliac, obturator • **lower → superficial inguinal**

MALE

- Prostatic: inferior vesical, middle rectal • Membranous: bulbourethral a. • Spongy: internal pudendal branches
- Lymph: prostatic/membranous → internal iliac • spongy → deep + superficial inguinal

Structure	Nerve supply
Internal sphincter	Sympathetic T11–L2 (hypogastric nerves → pelvic plexus): contracts • parasympathetic S2–S4: relaxes for voiding
External sphincter	Pudendal S2–S4 (perineal branch) from Onuf's nucleus — voluntary
Sensation	Female + proximal male: visceral afferents to S2–S4 • Distal male: pudendal (dorsal nerve of penis)

5 Embryology

- From the **urogenital sinus** (front of the cloaca after the urorectal septum divides it).
- **Female**: whole urethra from the urogenital sinus; Skene's glands from sinus epithelium (prostate homologue).
- **Male**: prostatic and membranous urethra from the pelvic part of the sinus (with a mesonephric contribution to the upper posterior prostatic wall); spongy urethra from the phallic part plus an ectodermal ingrowth at the glans; urethral folds fuse under androgens.
- Fusion failure → **hypospadias** (ventral opening; commonest male urethral anomaly). **Epispadias** (dorsal) is rare and linked to bladder exstrophy.

6 Clinical Correlations

6.1 Stress urinary incontinence

- Leak with coughing, sneezing, exertion — **failed hammock + intrinsic sphincter deficiency**. Risks: vaginal birth, age, menopause, obesity, hysterectomy.

Mid-urethral mesh slings (TVT/TVT-O): paused in the UK since 2018; Cumberlege Review reported 2020

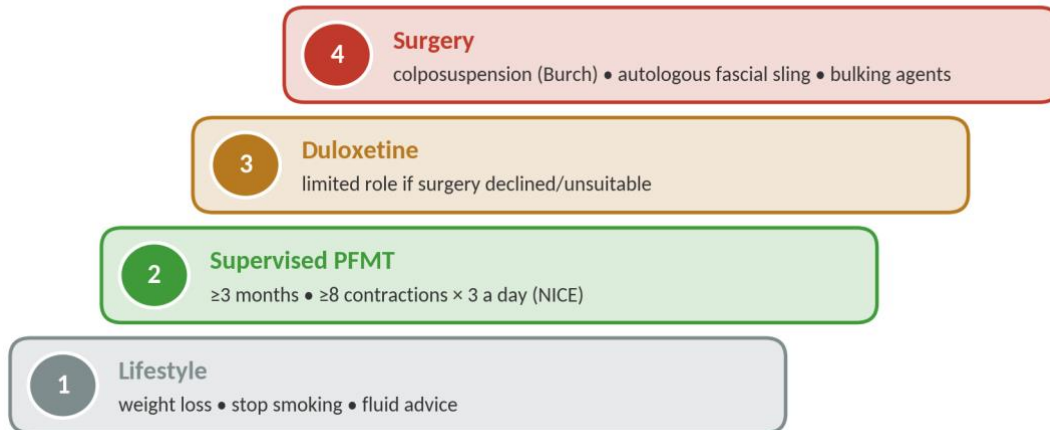


Figure 6. SUI management ladder (NICE NG123).

Operation	Anatomy
Burch colposuspension	Sutures from paravaginal tissue beside the bladder neck to Cooper's (pectineal) ligament; open or laparoscopic; good long-term results
Autologous fascial sling	Rectus fascia or fascia lata under the bladder neck/urethra, tied to the abdominal fascia
Urethral bulking	Submucosal injection (e.g. Bulkamid); less invasive; lower cure rates
Mid-urethral sling (TVT / TVT-O)	Mesh at the mid-urethra — paused in the UK since July 2018; Cumberlege Review published 2020

6.2 – 6.10 More clinical links

URETHRAL DIVERTICULUM

- Often from an infected Skene's gland
- 3 Ds: Dysuria, post-void Dribbling, Dyspareunia**
- Tender suburethral mass; pus on milking
- MRI** best; excision

URETHRAL INJURY

- Female: rare (birth, surgery)
- Male: **pelvic fracture → membranous; straddle → bulbar**
- Blood at the meatus, perineal haematoma, retention
- No blind catheter** — suprapubic + retrograde urethrogram

CATHETERISATION + STRICTURE

- Aseptic; in men straighten the penis upwards
- Complications: trauma, false passage, infection, **stricture**
- Stricture (mostly male): infection, trauma, surgery → poor stream, retention

AT THE MEATUS

- Prolapse**: red ring of everted mucosa — girls and postmenopausal women
- Caruncle**: fleshy posterior-lip lesion, postmenopausal
- Both: **topical oestrogen** first
- Cancer: rare; mostly squamous

7 MRCOG Exam Pearls — Last-Minute Page

Numbers to know

~4 cm Female urethra	18–20 cm Male urethra	3 / 1–2 / 15 cm: P / M / S	S2–S4 Pudendal — external
T11–L2 Sympathetic — internal	≥3 mo Supervised PFMT	8 × 3 Contractions a day	2018 UK mesh sling pause

HIGH-YIELD CHECKLIST

- ☐ Female urethra 4 cm, embedded in the anterior vaginal wall; meatus in the vestibule.
- ☐ Male 18–20 cm: prostatic 3, membranous 1–2 (shortest), spongy 15.
- ☐ Prostatic urethra: verumontanum, utricle (Müllerian remnant), ejaculatory ducts.
- ☐ Internal sphincter: smooth, $\alpha 1$; stops retrograde ejaculation.
- ☐ External sphincter: striated, pudendal S2–S4, voluntary.
- ☐ Female complex: external sphincter + compressor urethrae + urethrovaginal sphincter.
- ☐ Skene's glands: posterolateral to the meatus; prostate homologue.
- ☐ Hammock hypothesis (DeLancey).
- ☐ SUI first line: supervised PFMT for 3 months; mesh slings paused in the UK since 2018.
- ☐ Diverticulum: 3 Ds; MRI.
- ☐ Pelvic fracture → membranous; straddle → bulbar. Don't catheterise blindly.
- ☐ Lower female urethra → superficial inguinal nodes.

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

Question	Answer
Length of the female urethra?	~4 cm
Shortest part of the male urethra?	Membranous
Widest part of the male urethra?	Prostatic
Which structure is a Müllerian remnant?	Prostatic utricle
Nerve to the external urethral sphincter?	Pudendal (S2–S4)
Female homologue of the prostate?	Skene's (paraurethral) glands
Where do Skene's ducts open?	Posterolateral to the meatus
Three Ds of urethral diverticulum?	Dysuria, post-void dribbling, dyspareunia
First-line treatment for SUI?	Supervised PFMT ≥3 months
Burch colposuspension sutures go to...?	Cooper's (pectineal) ligament
Urethral injury with pelvic fracture in a man?	Membranous urethra

8 References

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