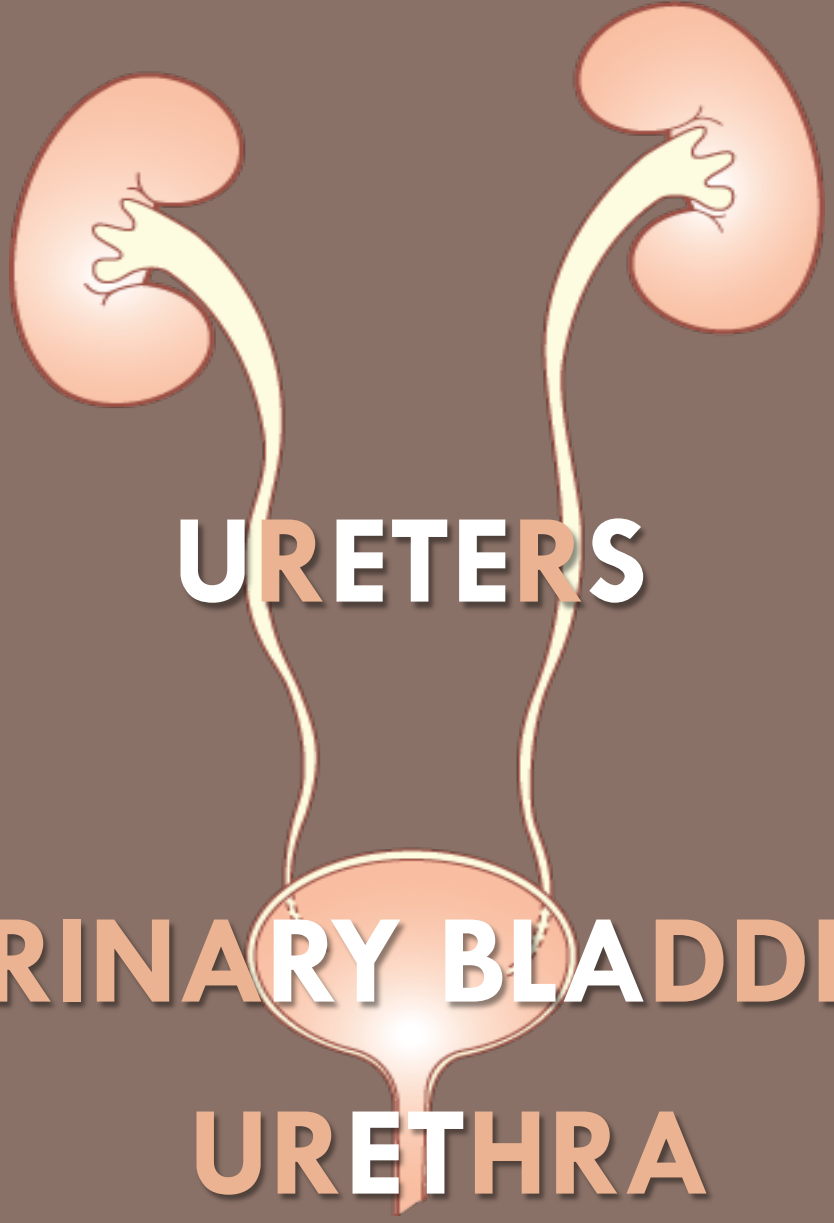


URETERS

URINARY BLADDER

URETHRA

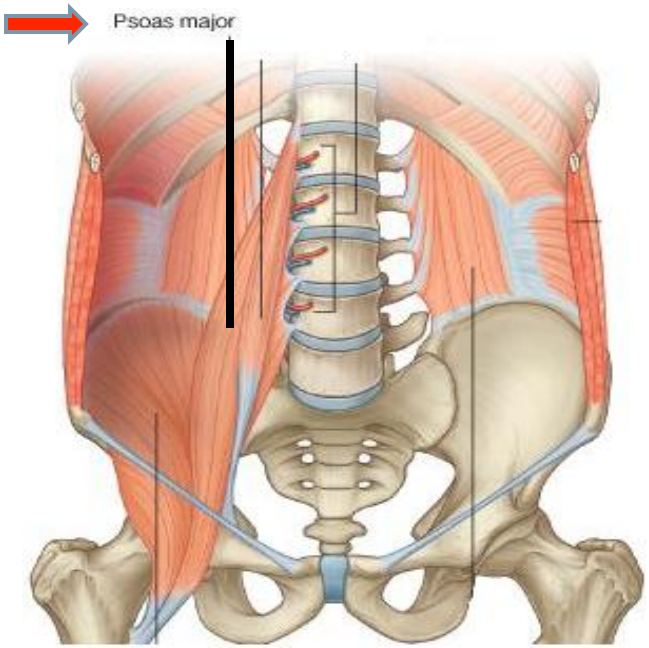
Prof. Ahmed Fathalla Ibrahim
Dr. Sanaa Al Shaarawi

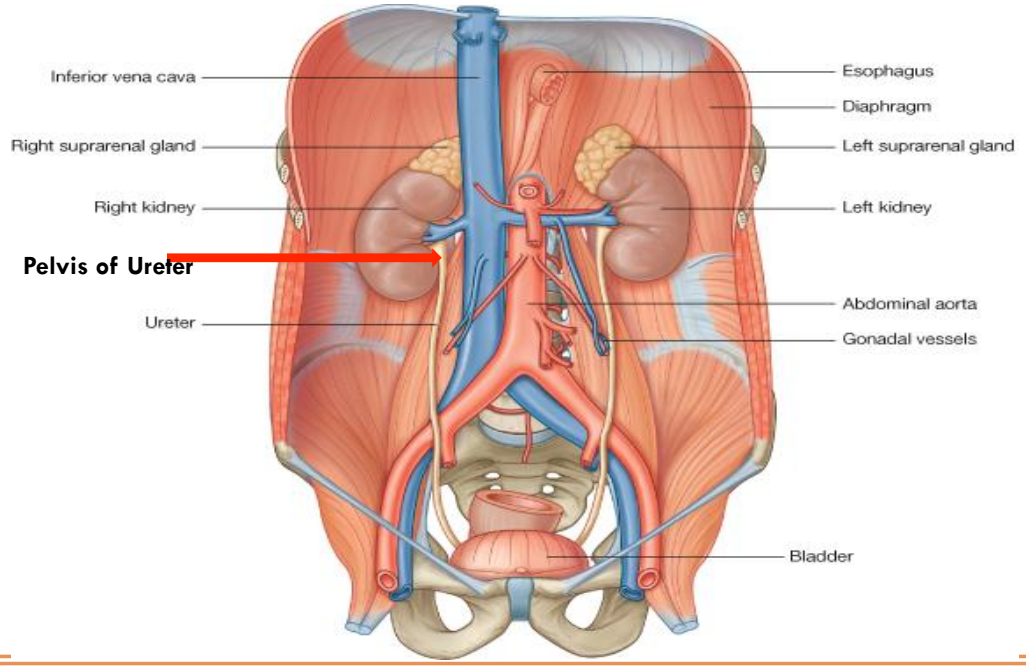
OBJECTIVES

At the end of the lecture, students should be able to:

- Describe the **course** of **ureter** & identify the **site of ureteric constrictions.**
- Describe the **important relations** & identify certain areas **(trigone, uvula vesicae)** in the base of **urinary bladder.**
- List the **blood supply, lymphatic drainage & nerve supply** of **urinary bladder**
- Differentiate between **male & female urethra** regarding **length, structure, course & function.**

THE URETER



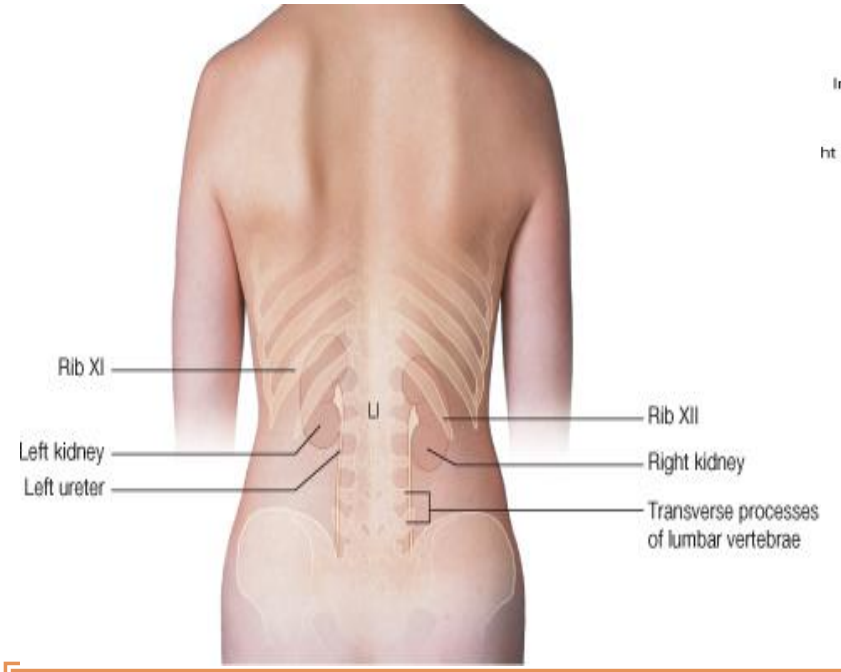


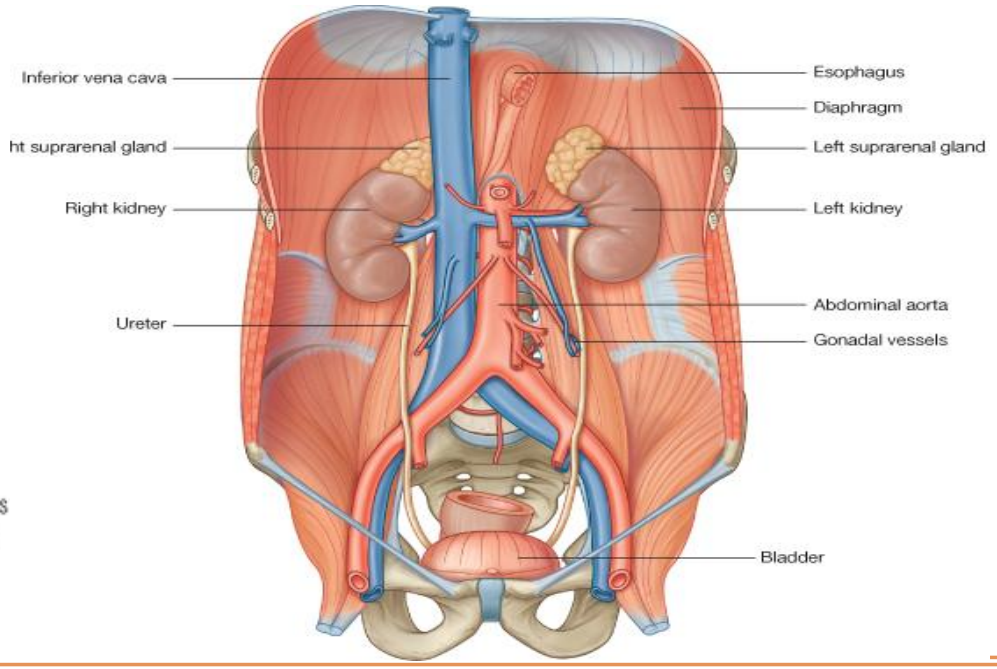
DEFINITION: It is a **muscular tube** transporting urine from kidney to urinary bladder.

LENGTH: 25 – 30 cm

BEGINNING: It **begins as a continuation of renal pelvis** (or pelvis of ureter).

THE URETER

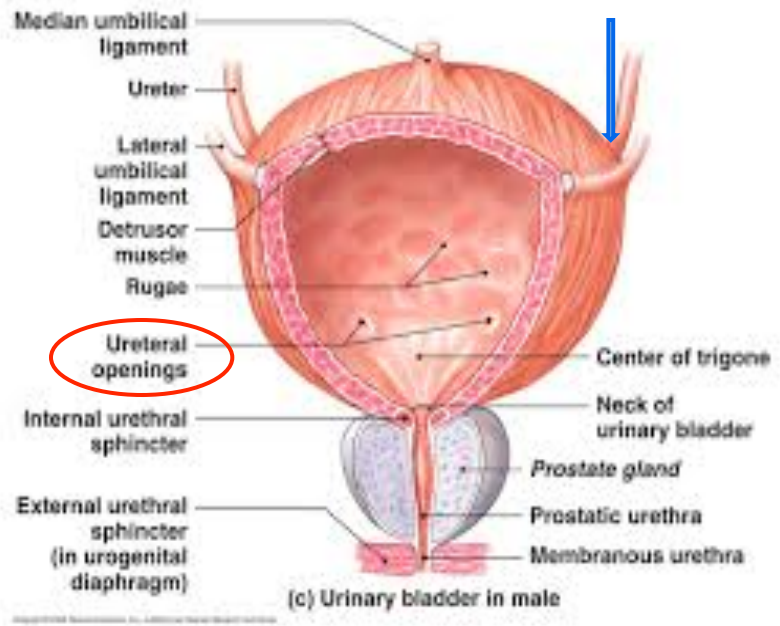


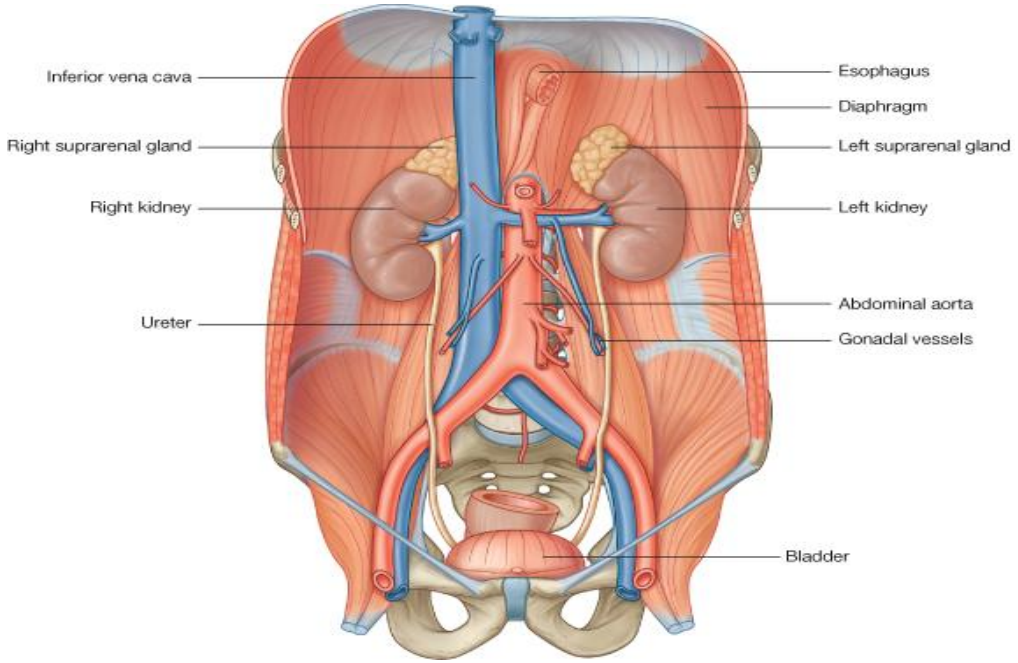


COURSE IN ABDOMEN:

- It descends **anterior to** psoas major muscle (opposite the tips of lumbar transverse processes).
- It crosses **anterior to the end (bifurcation) of common iliac artery** to **enter the pelvis.**

THE URETER





COURSE IN PELVIS & TERMINATION:

- It runs downward & backward to the level of ischial spine. It curves forward to open in upper lateral angles of the base of urinary bladder.

- It runs obliquely for ¾ inch in wall of bladder before opening (valve-like part).

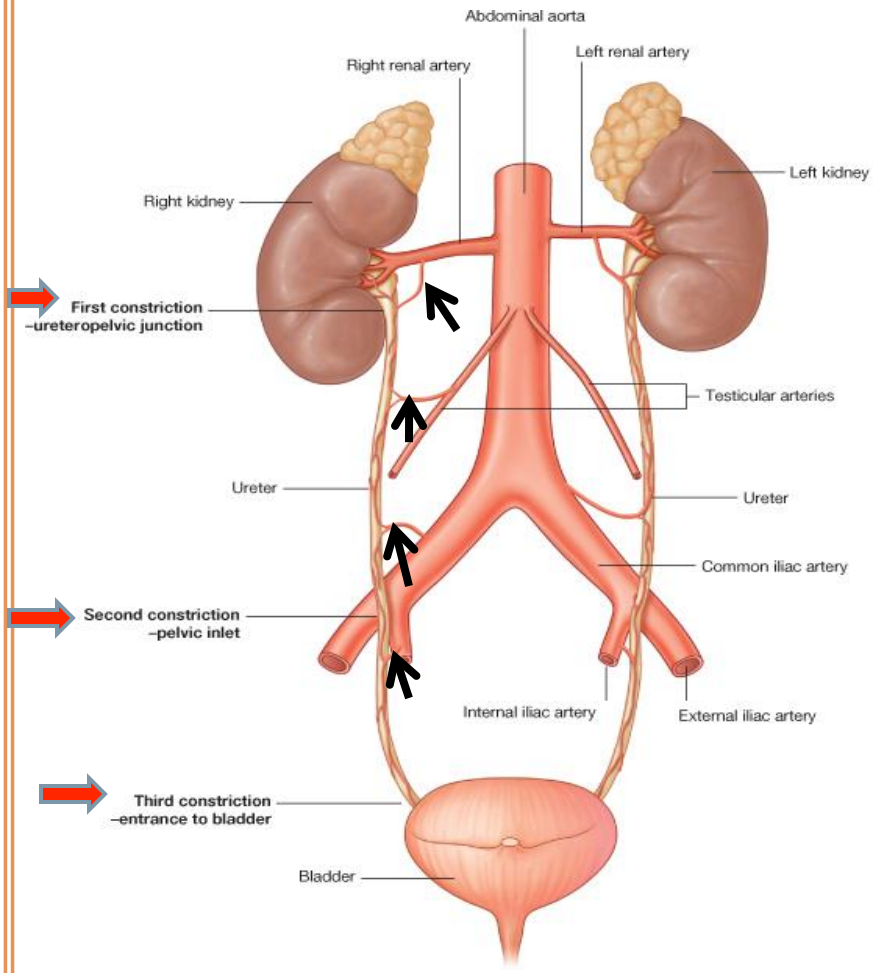
THE URETER

SITES OF CONSTRICTIONS (OBSTRUCTION-STONE IMPACTION)

- At ureteropelvic junction
- At pelvic inlet (site of crossing of common iliac artery)
- At site of entrance to bladder

ARTERIAL SUPPLY:

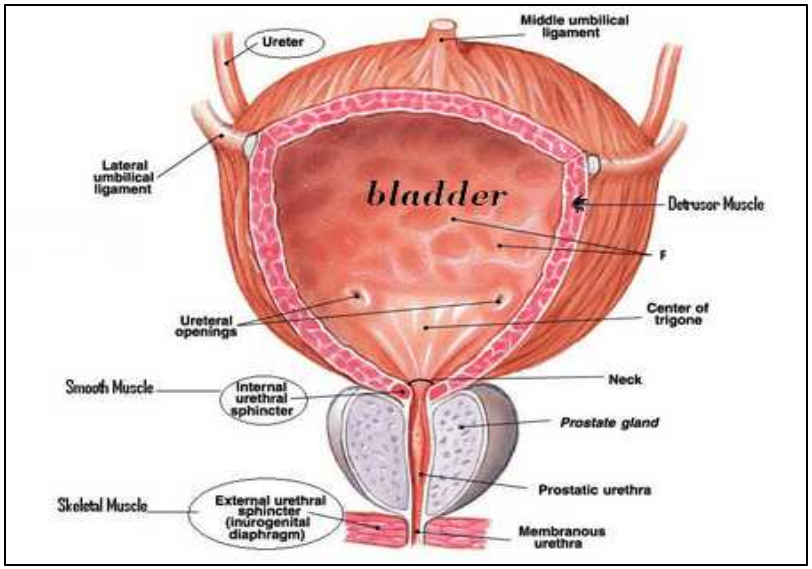
- Renal artery
- Gonadal artery
- Common iliac artery
- Internal iliac artery



1-THE URINARY BLADDER(SHAPE)

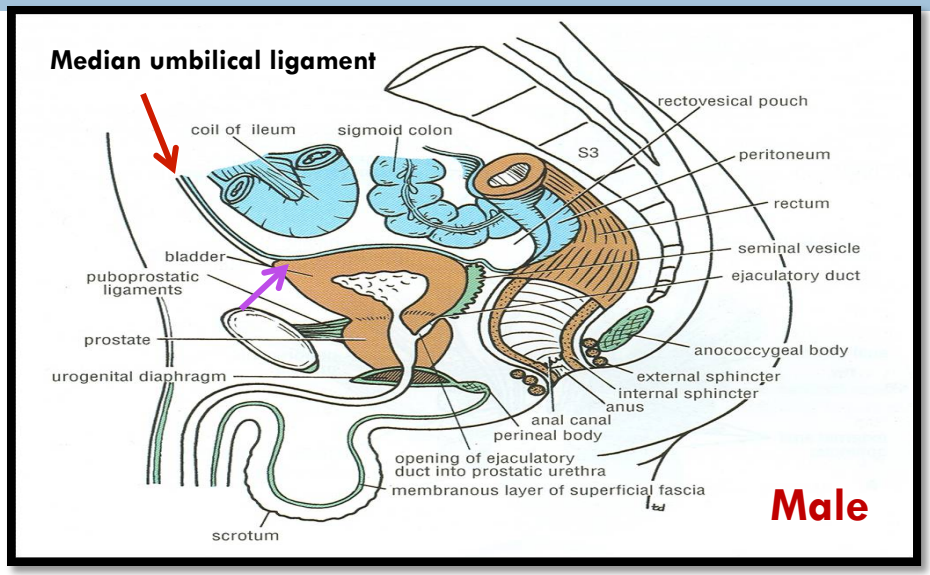
- It is pelvic organ.
- It has the shape of three-sided pyramid placed on one of its angle (NECK).
- It has:

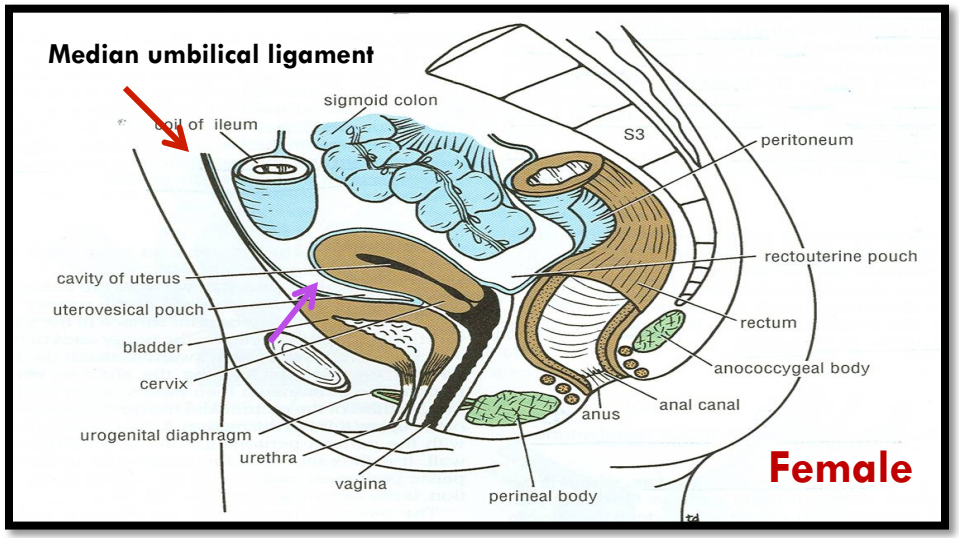
1) An APEX: directed anteriorly
2) A BASE: directed posteriorly
3) A SUPERIOR SURFACE
4) Two INFERO-LATERAL SURFACE



2-THE URINARY BLADDER (APEX)

- Is directed forward.
- Is related to (lies behind) upper border of symphysis pubis.
- Is connected to umbilicus by the median umbilical ligament (remnant of urachus).





3-THE URINARY BLADDER (BASE)

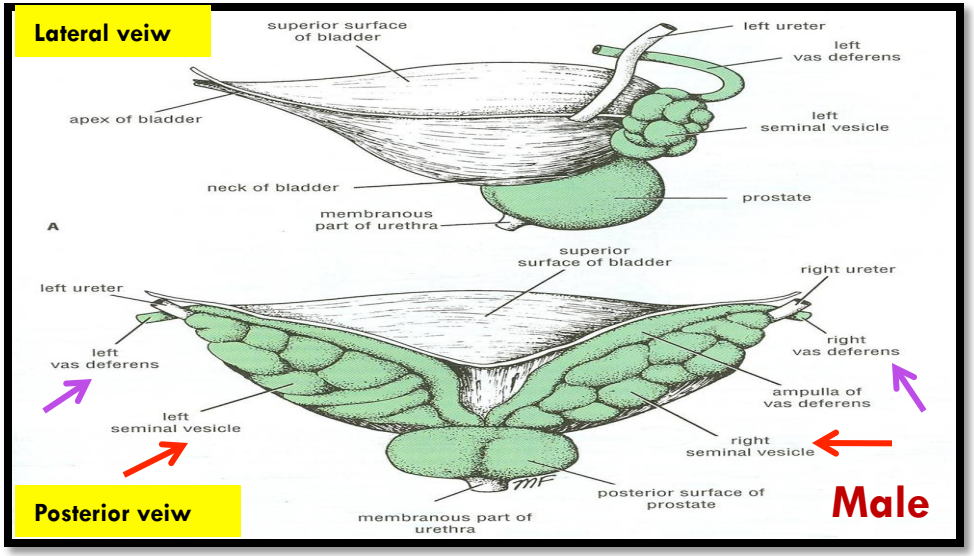
- Is directed backward

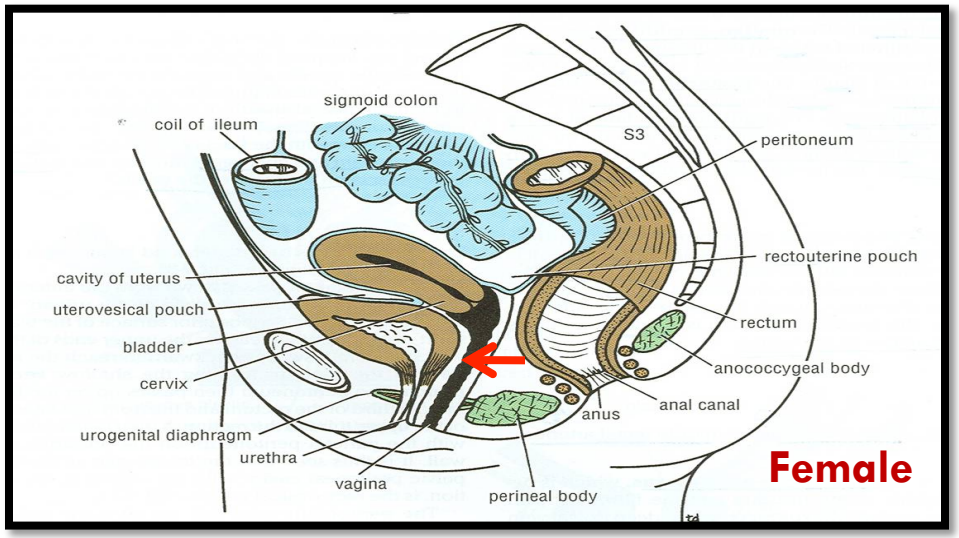
IN MALE:

- Is related to vas deferens & seminal vesicle of both sides

IN FEMALE:

- Is related to vagina





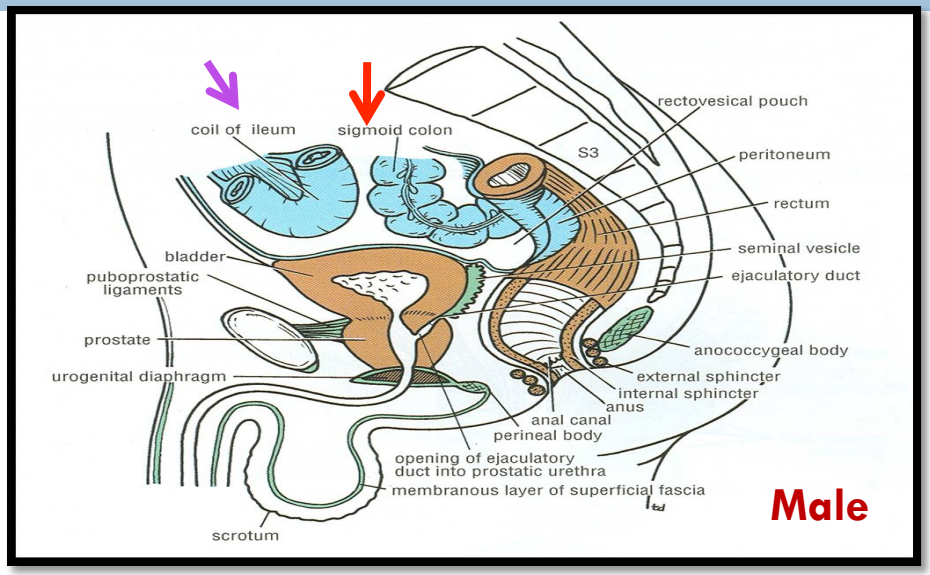
4-THE URINARY BLADDER
(SUPERIOR SURFACE)

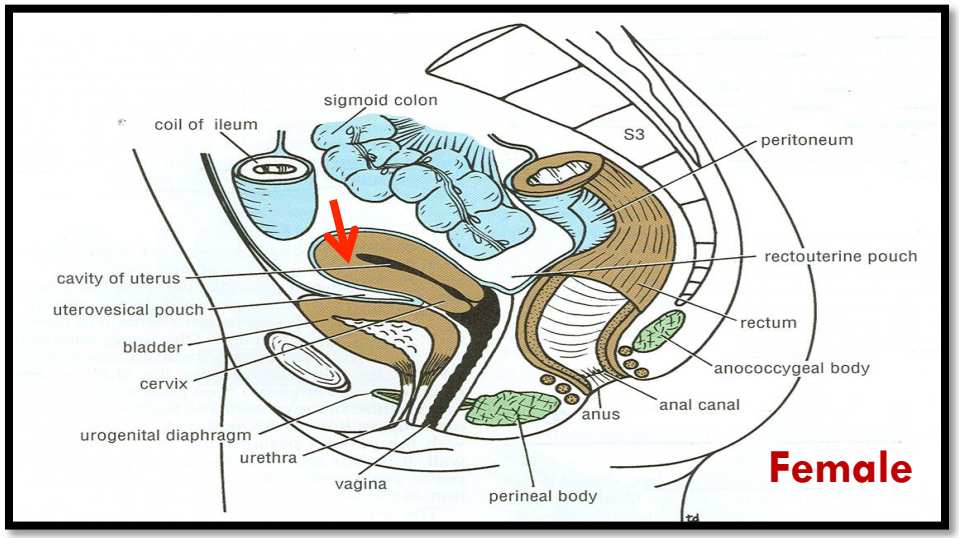
IN MALE:

- Is related to coils of ileum & sigmoid colon

IN FEMALE:

- Is related to the uterus



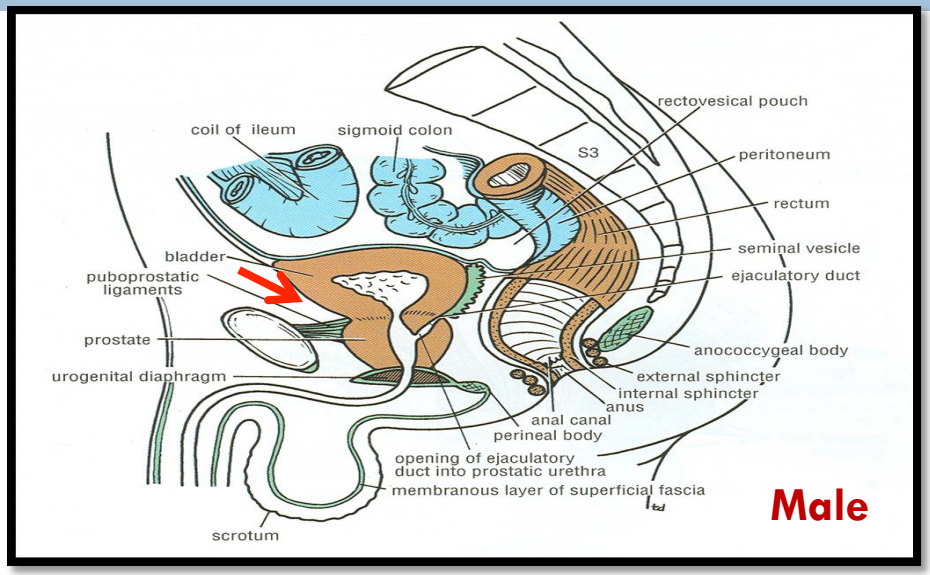


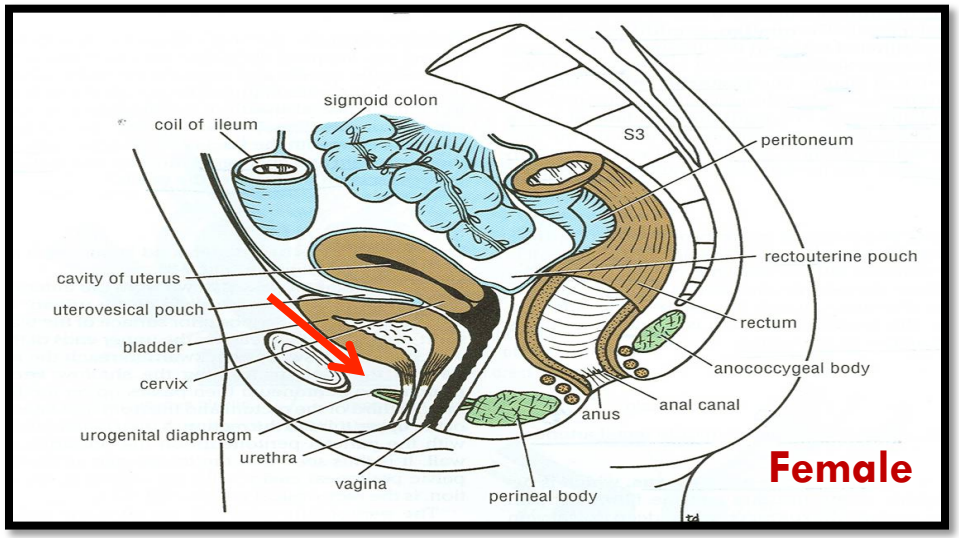
5-THE URINARY BLADDER
(INFERO-LATERAL SURFACES)

- Are related to **retropubic fat** separating them from pubic bones

Retropubic fat

- Accomodates distention of bladder
- Continuous with anterior abdominal wall. **Rupture of bladder** → escape of urine to anterior abdominal wall



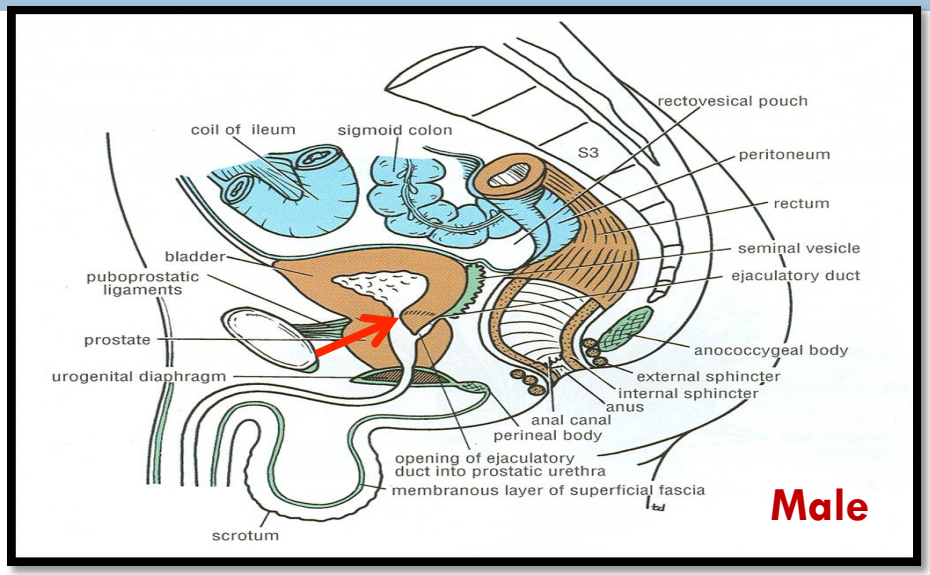


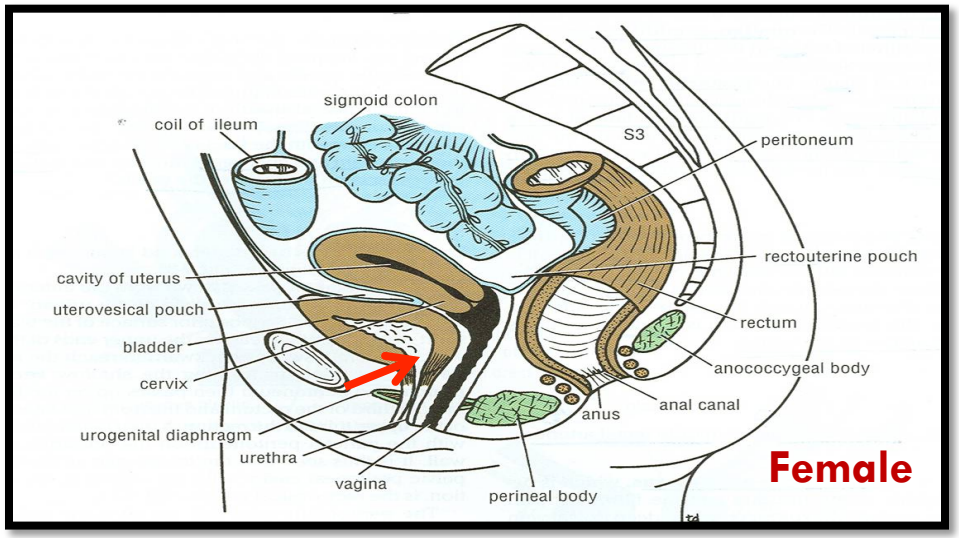
6-THE URINARY BLADDER (NECK)

- Is the lowest & most fixed part of urinary bladder.
- Is continuous with urethra.
- Is related to (lies behind) lower border of symphysis pubis

IN MALE:

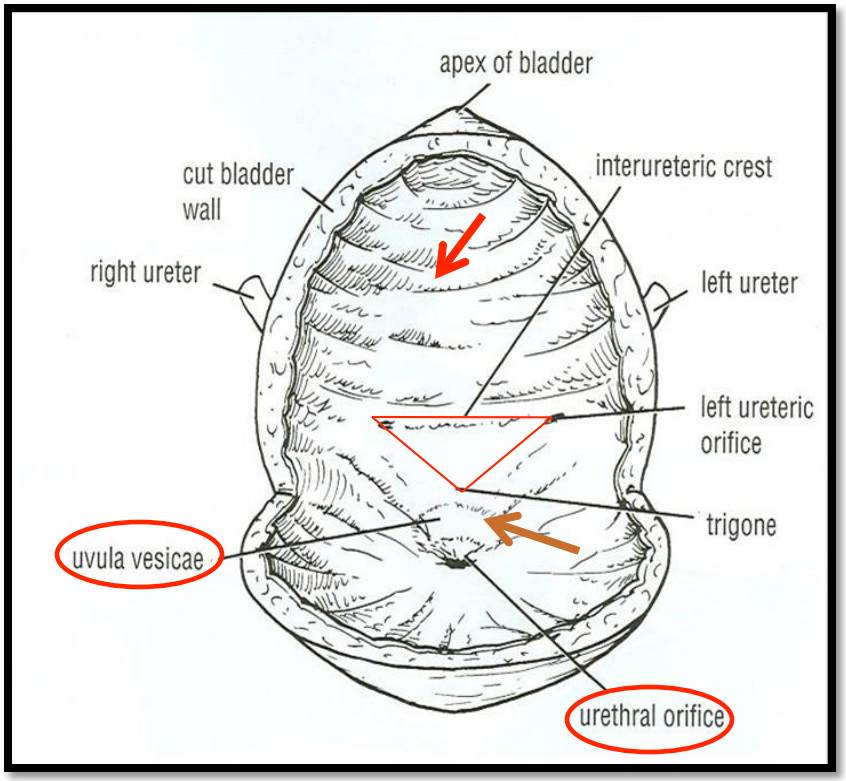
- Is related to upper surface of prostate gland (inferiorly, it rests on the base of prostate).

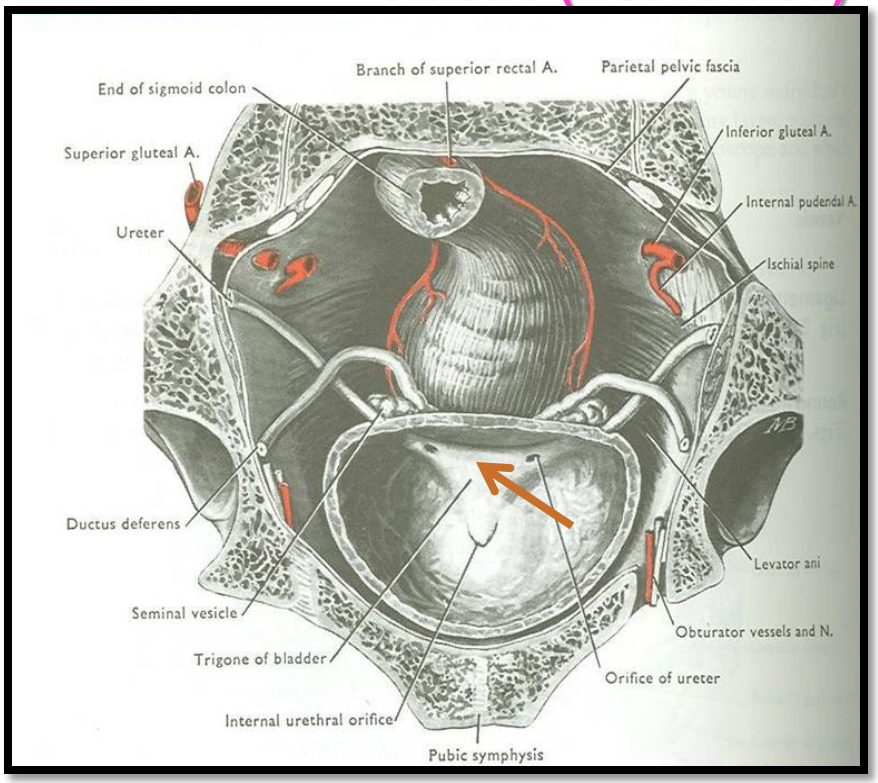




7-THE URINARY BLADDER (INTERIOR)

- Mucous membrane is **folded**.
- **Uvula vesicae:** elevation behind internal urethral orifice, produced by median lobe of prostate gland
- **Trigone:** a triangular area in base of bladder bounded by the 2 ureteric orifices & internal urethral orifice. Its mucous membrane is elastic (not folded)





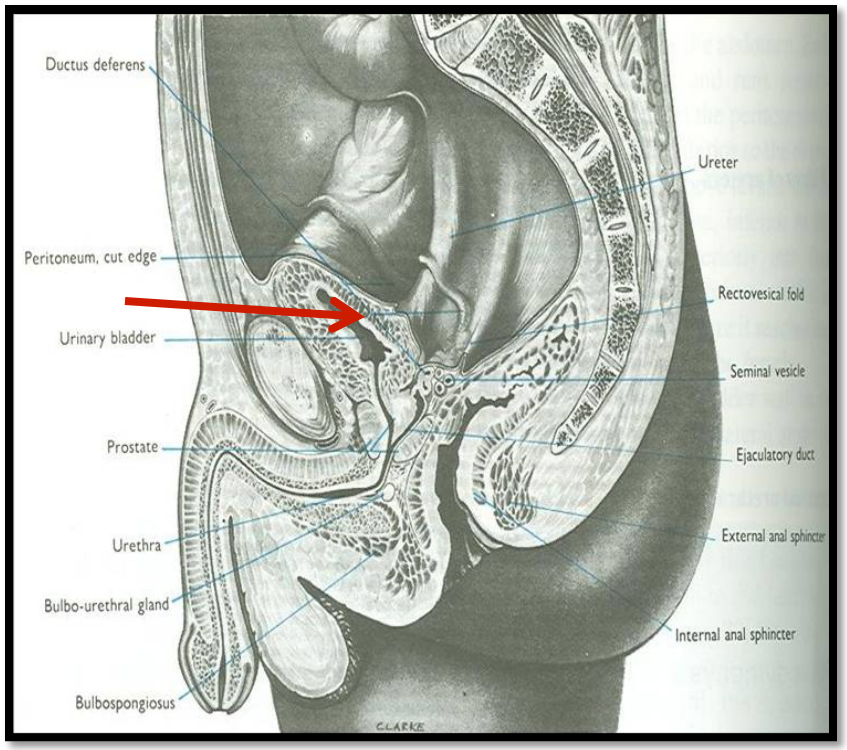
8-THE URINARY BLADDER (CAPACITY)

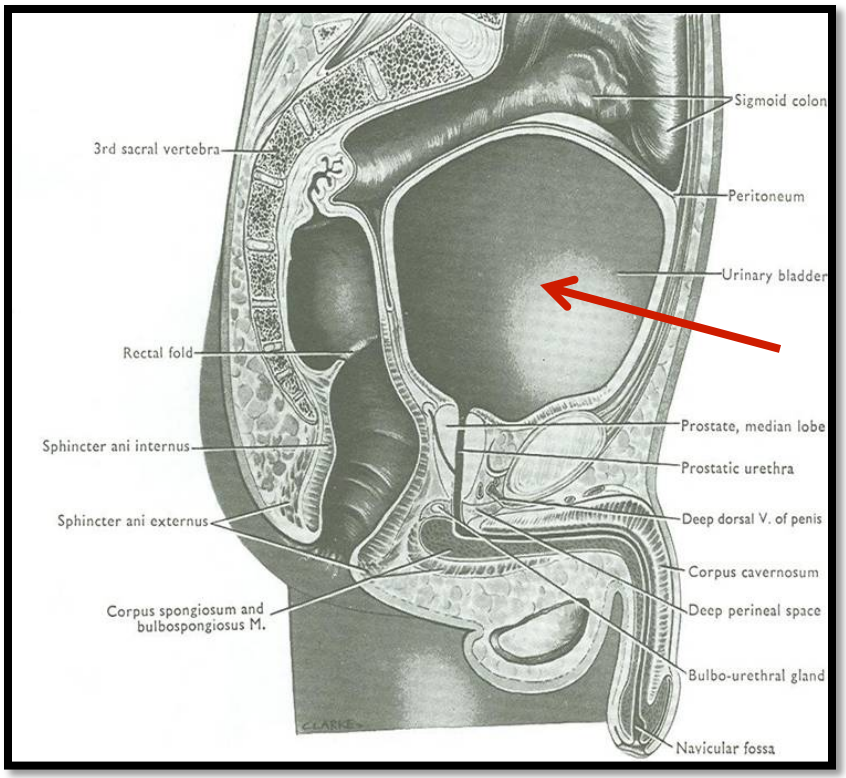
EMPTY

- Empty bldder is a pelvic organ.
- Accomodates from 300 – 500 ml of urine

DISTENDED

- Is circular in shape
- Bulges into abdominal cavity

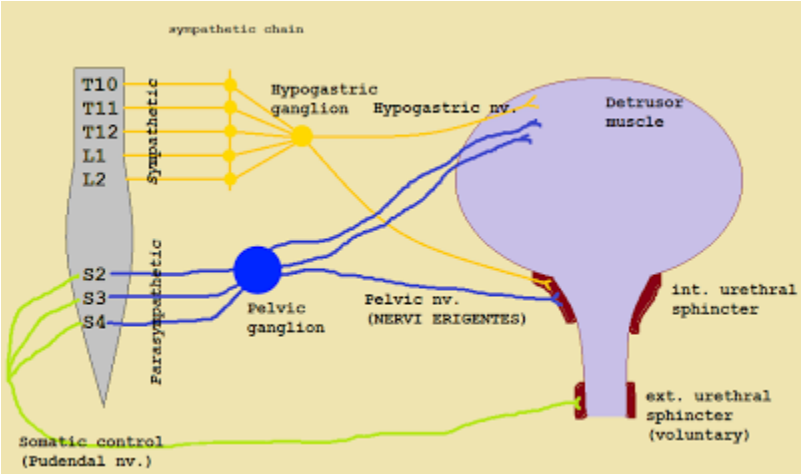




9-THE URINARY BLADDER (SUPPLY)

- **ARTERIES**: from **internal iliac artery**
- **VEINS**: into **internal iliac vein**
- **LYMPH**: into **internal iliac lymph nodes**
- **NERVES**:

1) ***Parasympathetic:*** ***through*** pelvic splanchnic nerves from **S2, 3, 4**
2) ***Sympathetic:*** from **L1,2** through hypogastric nerves.
3) ***Sensory:*** transmitting pain due to overdistention of bladder (via general visceral afferent fibres from bldder to CNS).



Autonomic Regulation of the Bladder

urination involves coordination between the central, autonomic, and somatic nervous systems.

MALE URETHRA
(LENGTH: 20 CM)

PROSTATIC URETHRA (Length=3 cm):

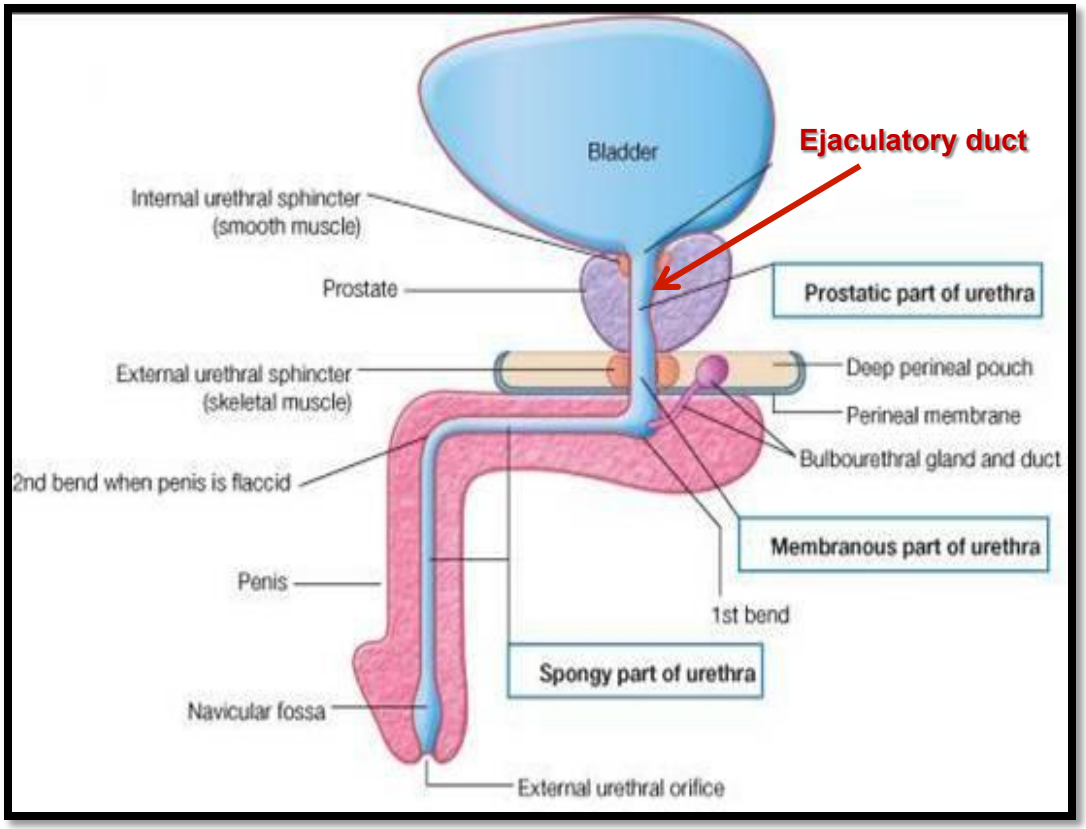
- Widest & most dilatable
- **Extends** from **neck** of bladder inside **prostate gland**

MEMBRANOUS URETHRA (Length=1 cm):

- Surrounded by **external urethral sphincter**

PENILE (SPONGY) URETHRA (Length=16 cm):

- Extends **inside penis** & opens externally through **external urethral orifice (narrowest part of whole urethra)**

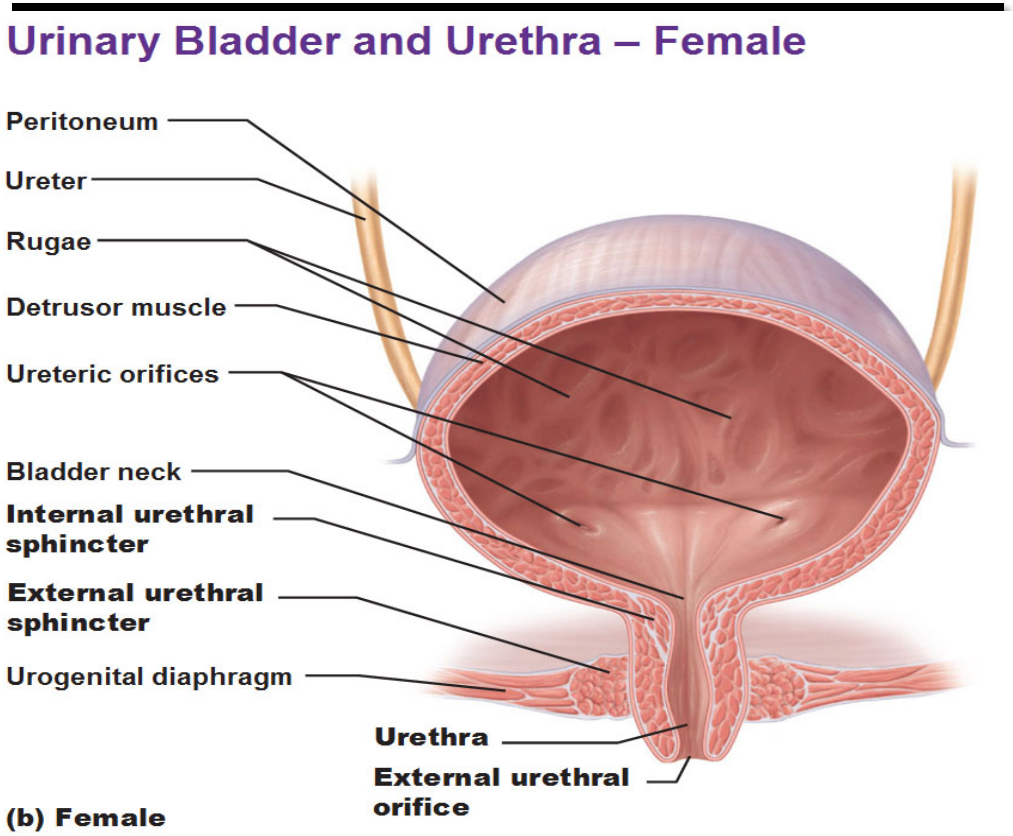


Structures openings into prostatic urethra:

- **Ejaculatory ducts:** containing sperms & secretion of seminal vesicles
- **Ducts of prostate gland**

FEMALE URETHRA
(LENGTH: 4 CM)

- Has only urinary function.
- Extends from neck of urinary bladder to open externally through the external urethral orifice (anterior to the vaginal opening)



THANK YOU

INTRAVENOUS UROGRAM (IVU,IVP)

- A urogram (Post micturation): demonstrates a bladder stone. Or any obstruction in the urinary system.

SUMMARY-1

URETER:

- ***Beginning:*** as continuation of renal pelvis
- ***Course:*** descends anterior to: psoas major & ends at (bifurcation) of common iliac artery.
- ***Termination:*** opens at upper lateral angle of base of urinary bladder
- ***Sites of constriction:*** at uteropelvic junction, at pelvic inlet, at site of entrance of bladder
- **Arterial supply:** renal, gonadal, common & internal iliac arteries

SUMMARY-2

URINARY BLADDER:

- ***Apex:*** related to symphysis pubis, continuous with median umbilical ligament
- ***Base:*** related to vas deferens & seminal vesicle (in male) & to vagina (in female)
- ***Superior surface:*** related to coils of ileum & sigmoid colon (in male) & to uterus (in female)
- ***Inferolateral surfaces:*** related to retropubic fat
- ***Neck:*** continuous with urethra, related to upper surface of prostate gland (in male)
- ***Trigone:*** lies in the base of bladder, bounded by ureteric orifices & internal urethral orifice, its mucous membrane is elastic
- ***Uvula vesicae:*** dilatation behind internal urethral orifice, produced by the median lobe of the prostate gland
- ***Supply:*** internal iliac (artery, vein, lymph nodes)
- ***Nerves:*** parasympathetic (S2,3,4), sympathetic (L1,2)
- A slight projection into the cavity of the bladder just behind the urethral opening, marking the location of the middle lobe of the prostate gland.

SUMMARY-3

MALE URETHRA:

- ***Function:*** **both urinary & genital**
- ***Length:*** **20 cm, divided into prostatic (3 cm), membranous (1 cm) & penile (16 cm)**
- ***Course:*** **Extends from neck of bladder to open externally through external urethral orifice (narrowest part of whole urethra)**

FEMALE URETHRA:

- ***Function:*** **urinary only**
- ***Length:*** **4 cm**
- ***Course:*** **Extends from neck of bladder to external urethral orifice (anterior to vaginal opening)**