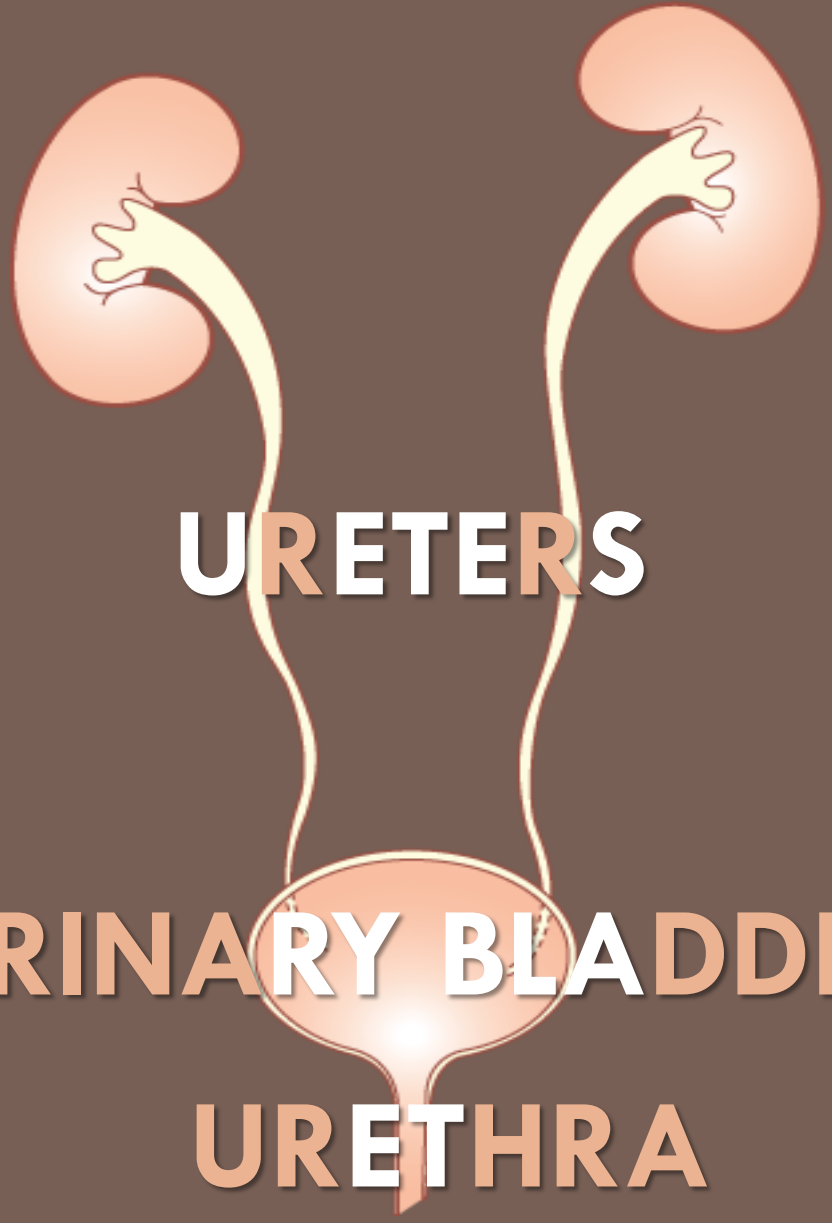


URETERS

URINARY BLADDER

URETHRA

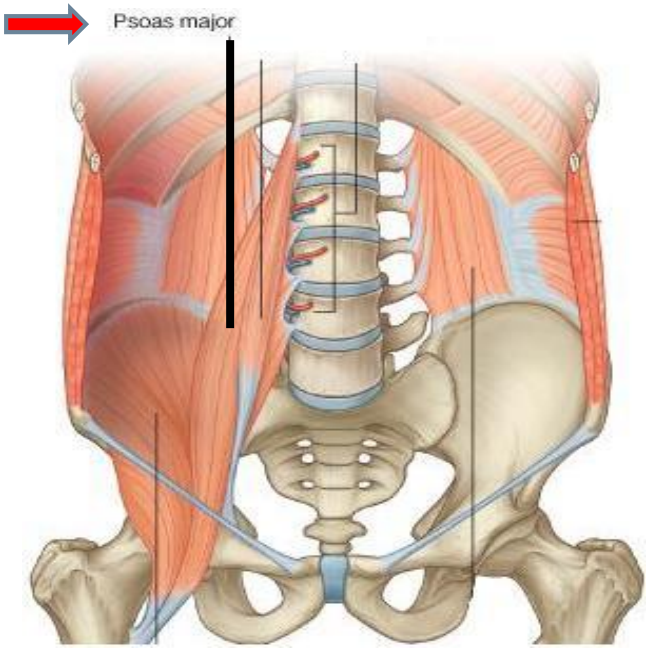
Prof. Ahmed Fathalla Ibrahim
Dr. Sanaa Al Shaarawi

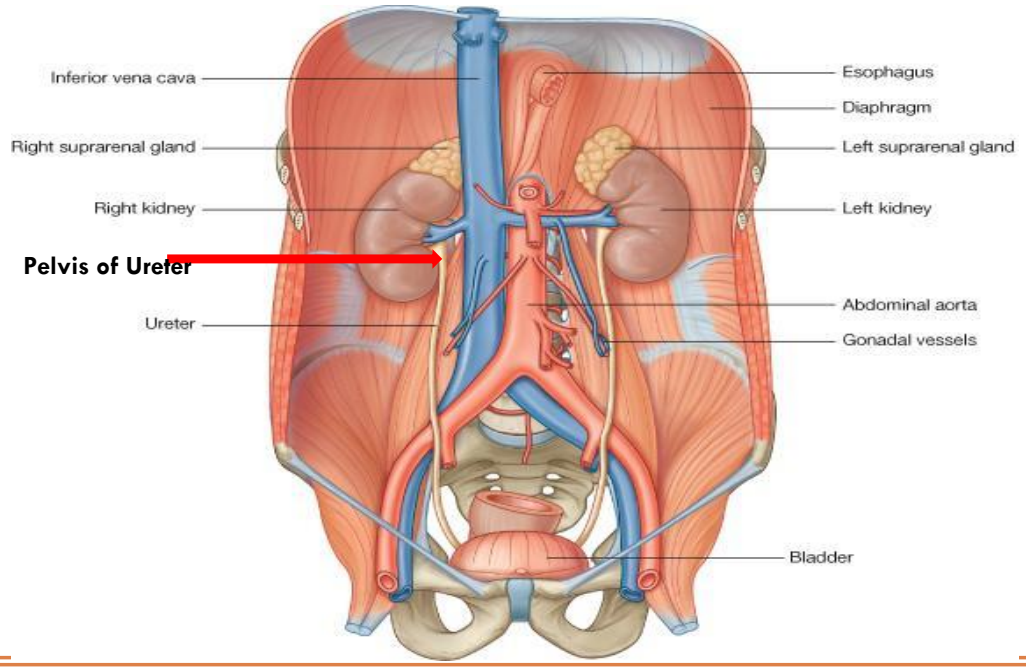
OBJECTIVES

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



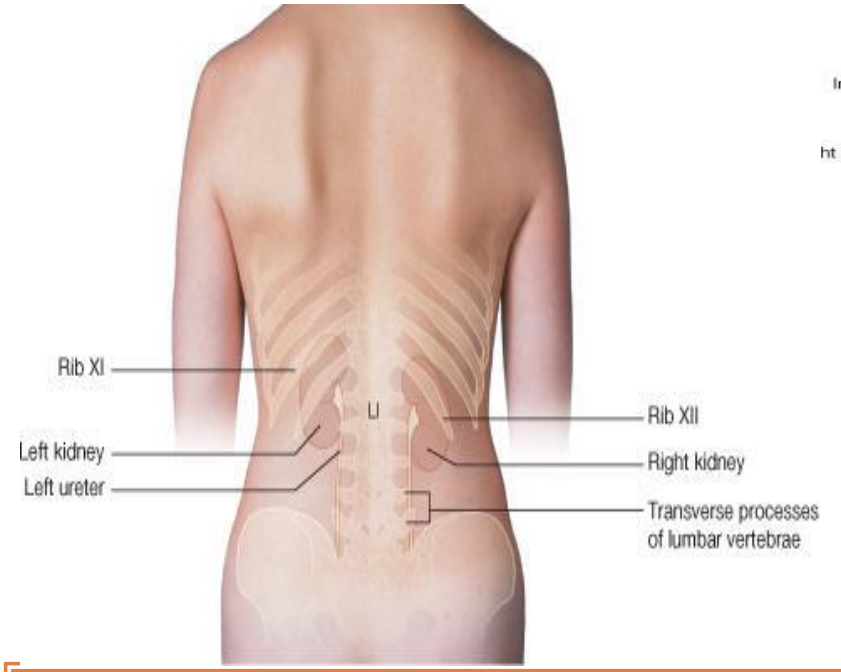


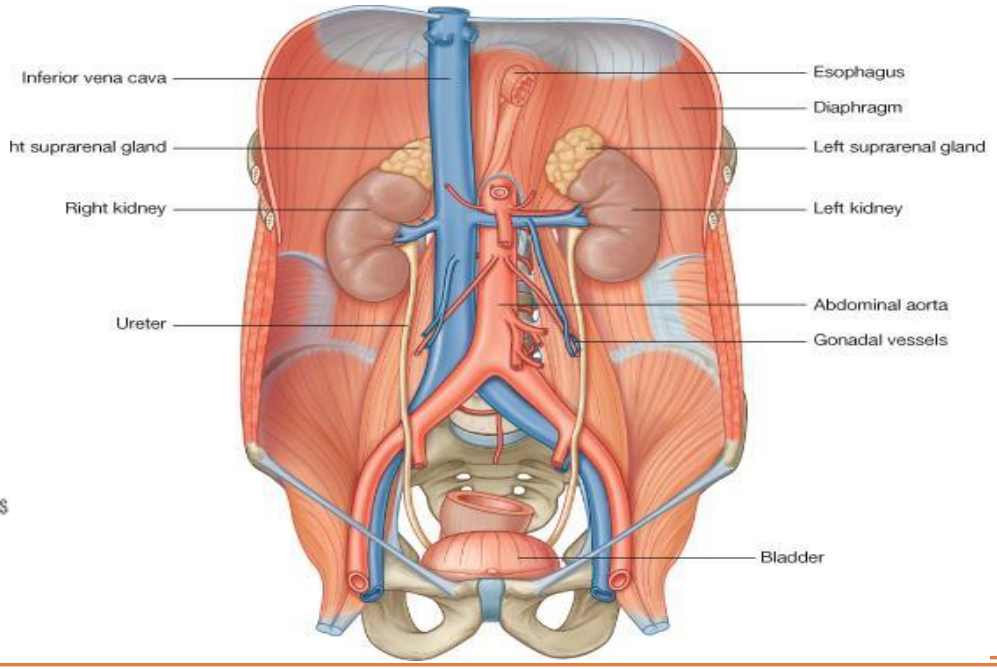
DEFINITION: It is a **muscular tube** transporting urine from kidney to urinary bladder.

LENGTH: 25 – 30 cm

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

THE URETER

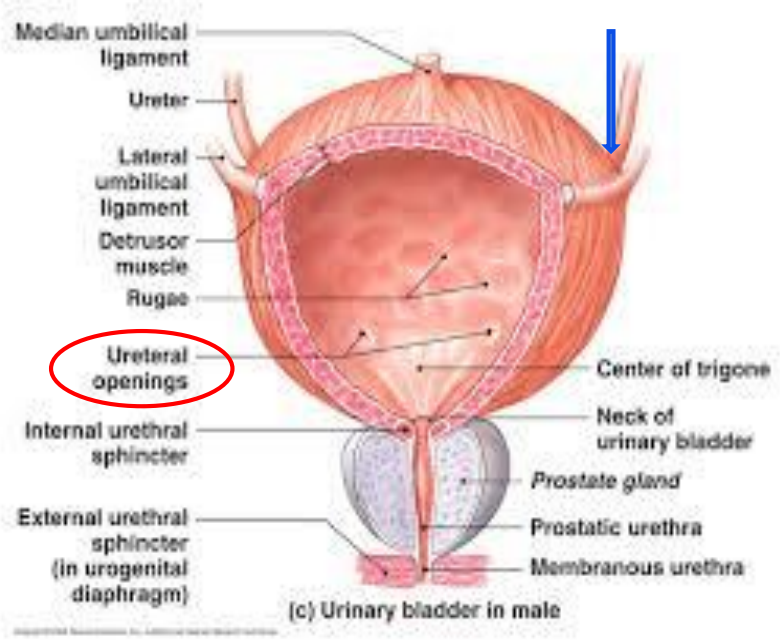


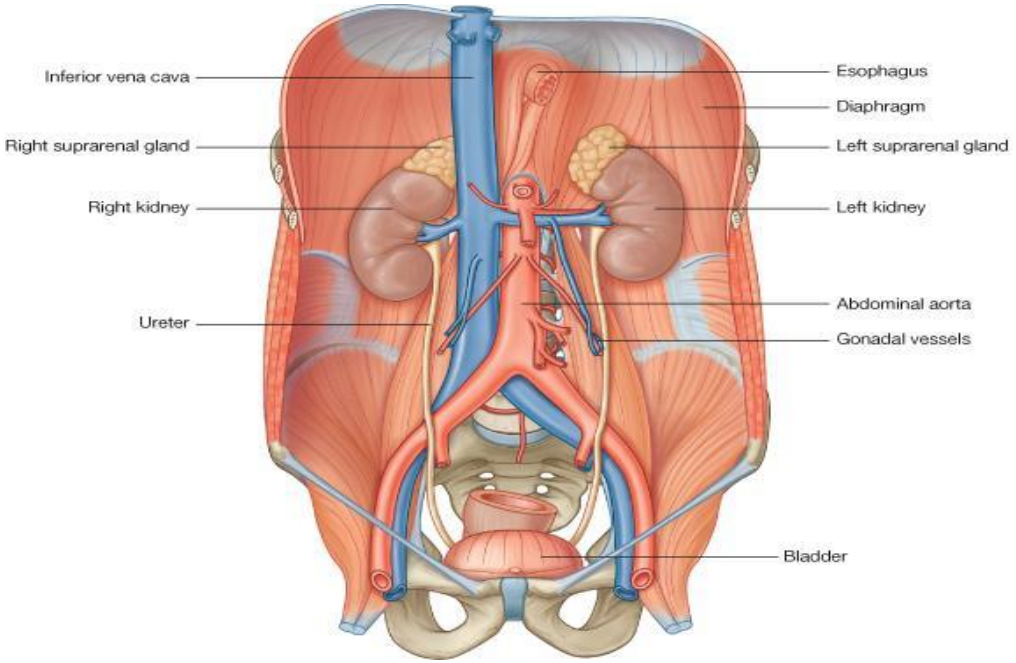


COURSE IN ABDOMEN:

- 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).

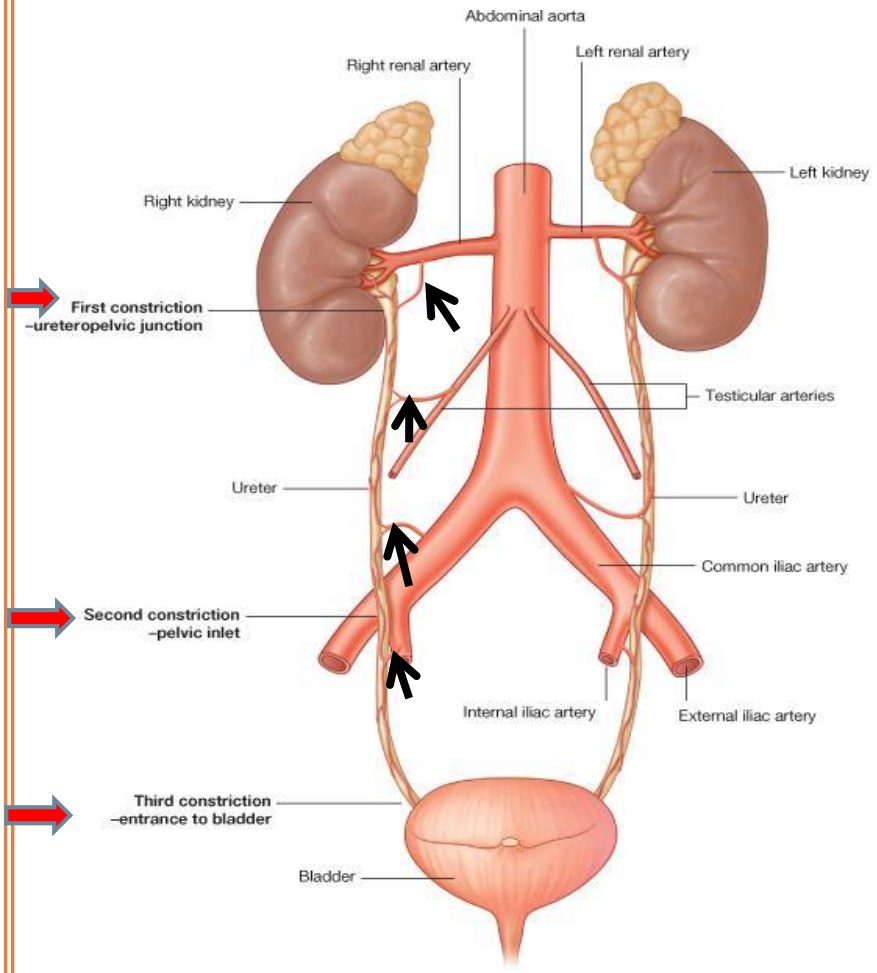
THE URETER

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)

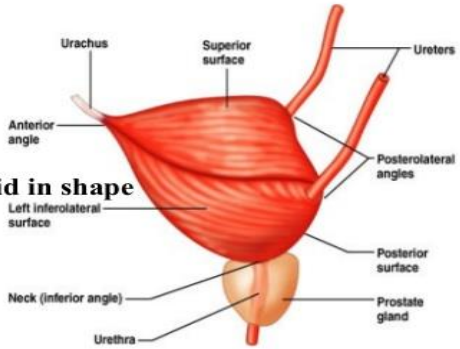
- It is pelvic organ.
- It has the shape of three-sided pyramid placed on one of its angle (NECK).
- It has:

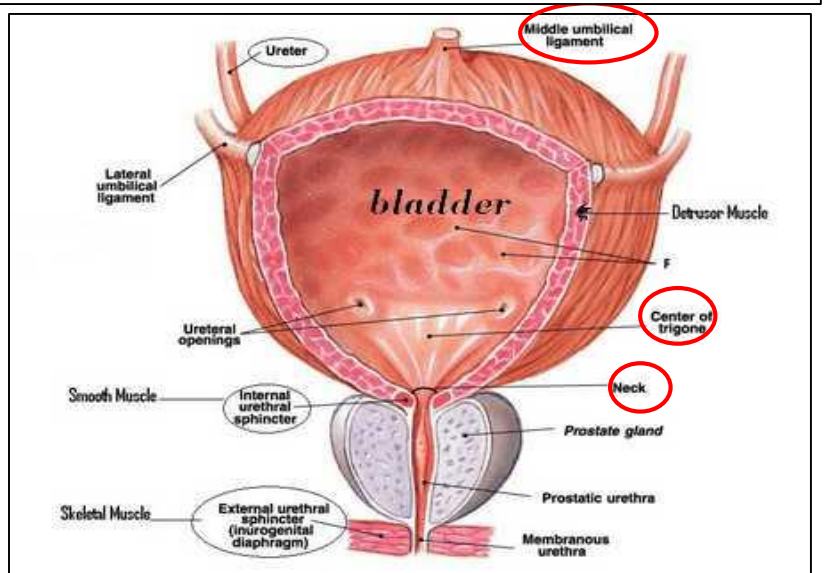
1) An APEX: directed anteriorly (Forward).
2) A BASE: directed posteriorly
3) A SUPERIOR SURFACE
4) Two INFERO-LATERAL SURFACE

Shape

- An empty bladder is 4 sided pyramid in shape and has
  - 4 angles -an apex, neck & 2 lateral angles
  - 4 surfaces
    - Base (posterior surface)
    - 2 inferiolateral surfaces
    - Superior surface

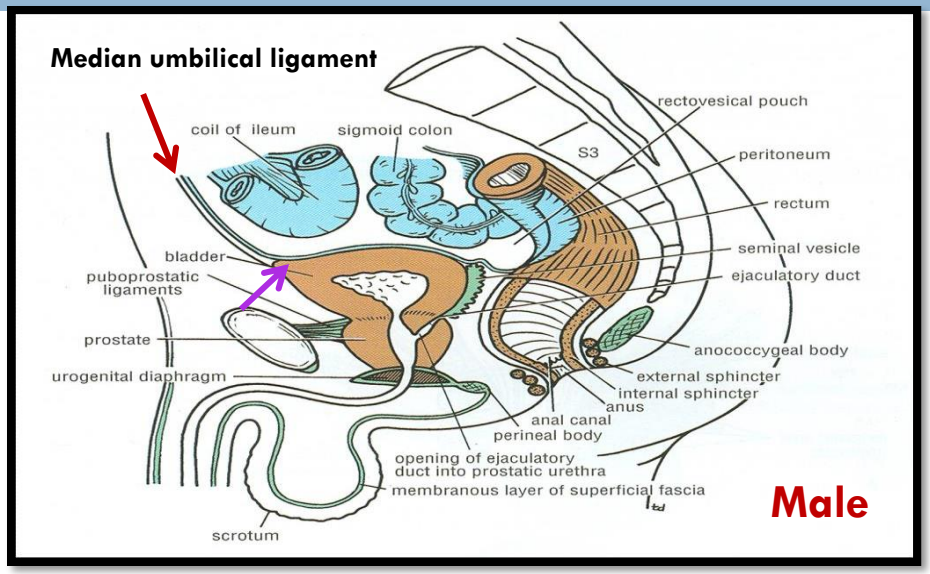
When distended it is ovoid in shape

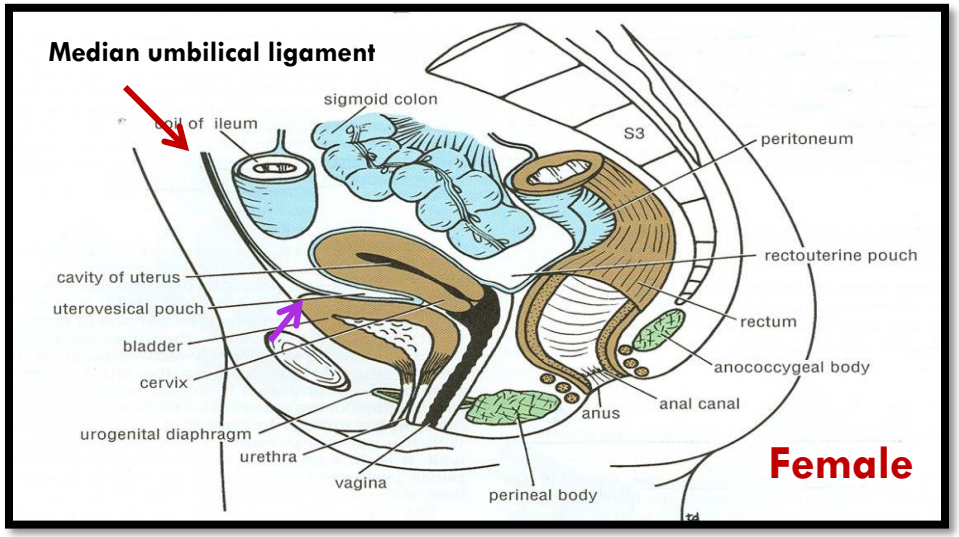




2-THE URINARY BLADDER (APEX)

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





3-THE URINARY BLADDER (BASE)

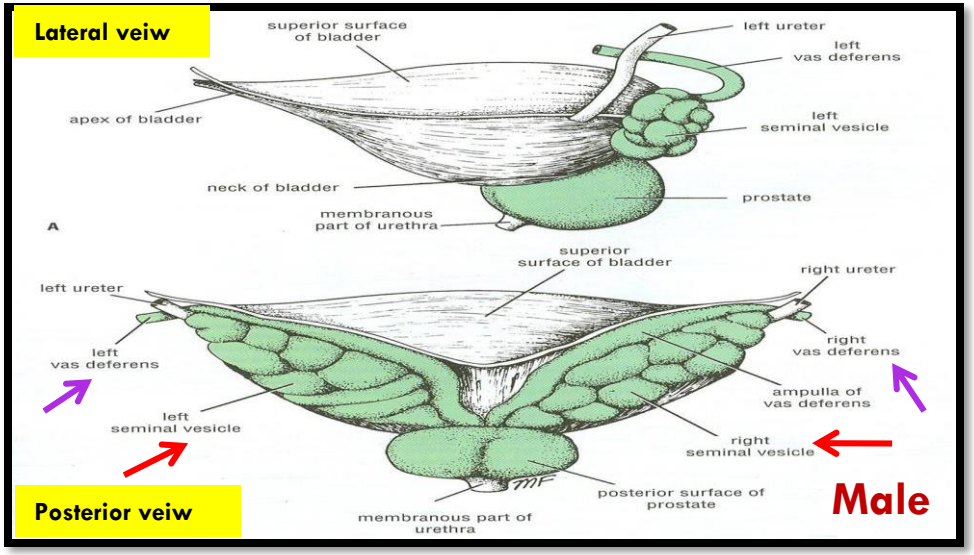
- Is directed backward

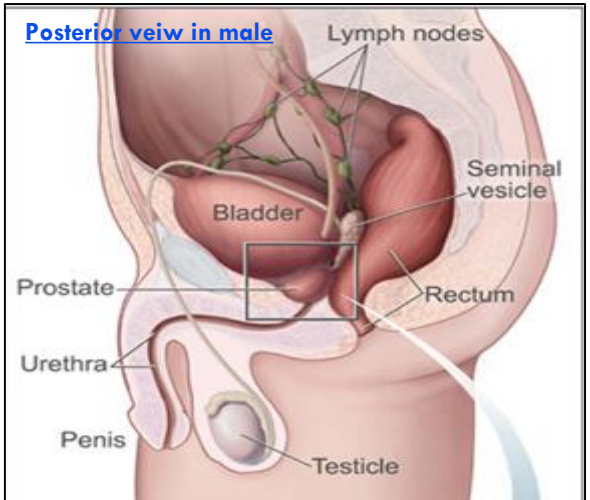
IN MALE:

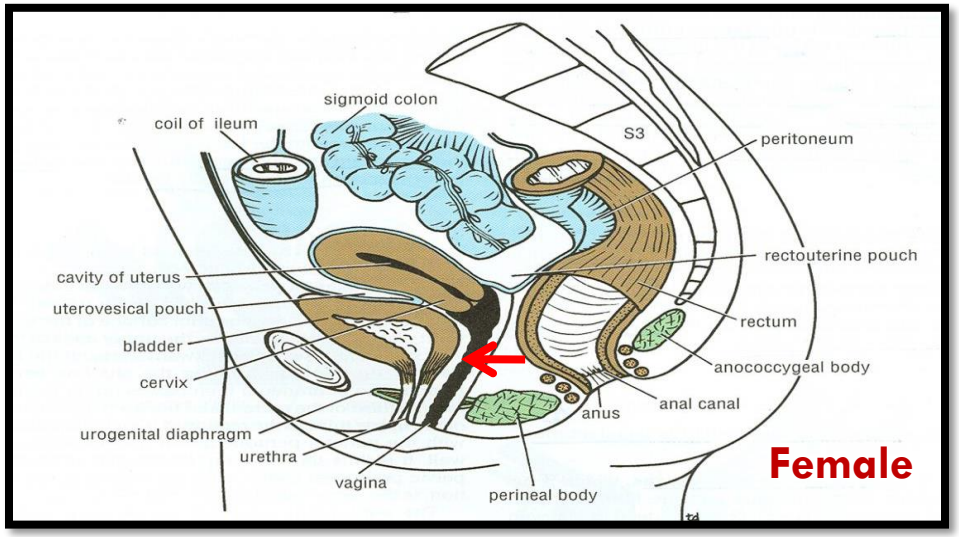
- Is related to vas deferens & seminal vesicle of both sides

IN FEMALE:

- Is related to vagina







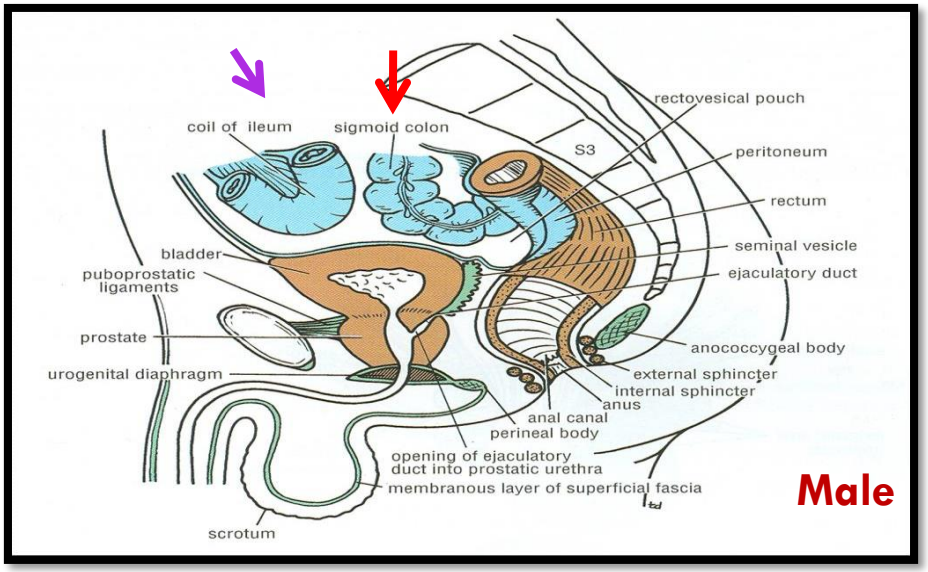
4-THE URINARY BLADDER
(SUPERIOR SURFACE)

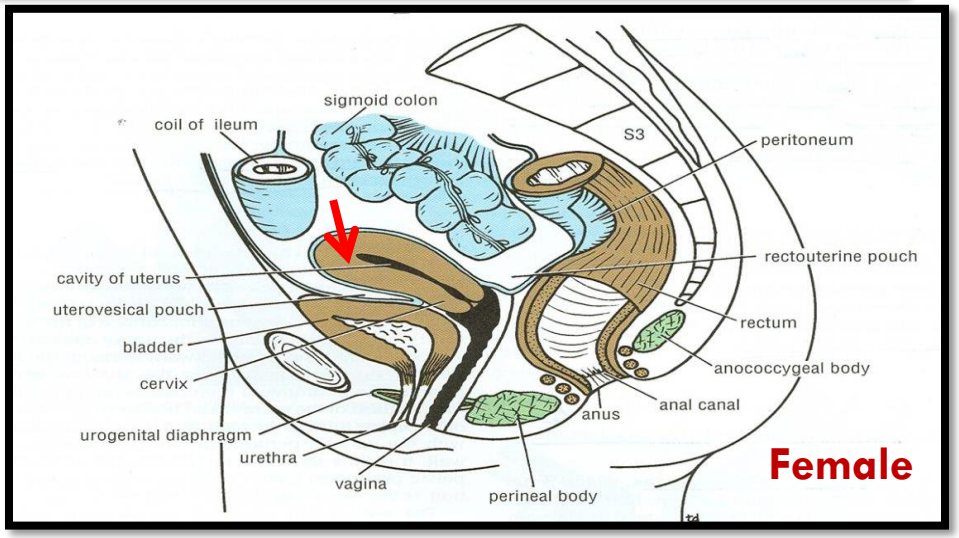
IN MALE:

- Is related to coils of ileum & sigmoid colon

IN FEMALE:

- Is related to the uterus



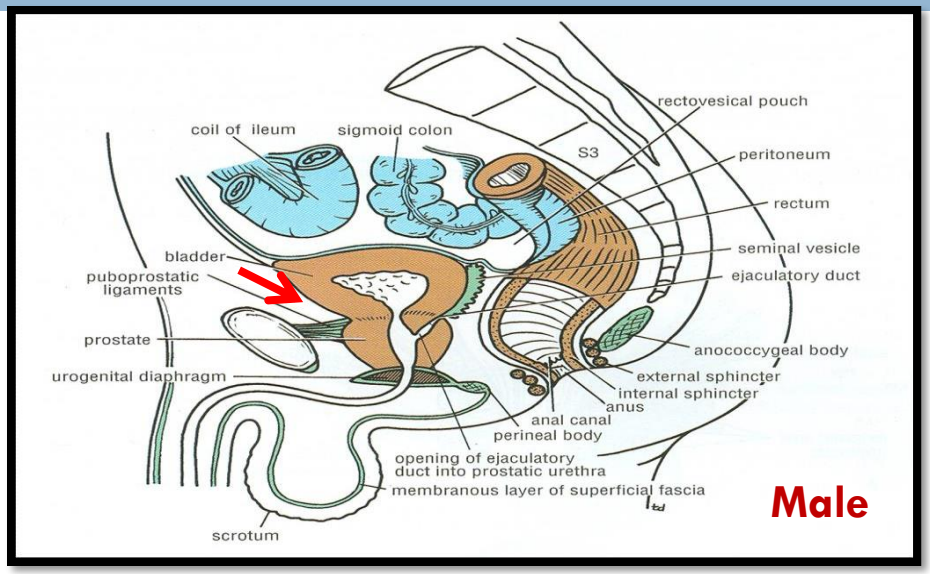


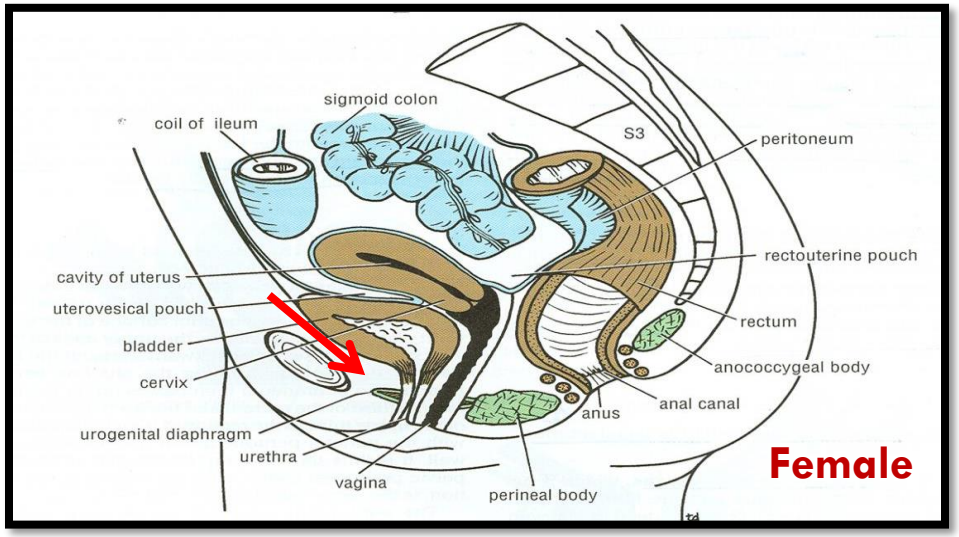
5-THE URINARY BLADDER
(INFERO-LATERAL SURFACES)

- 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





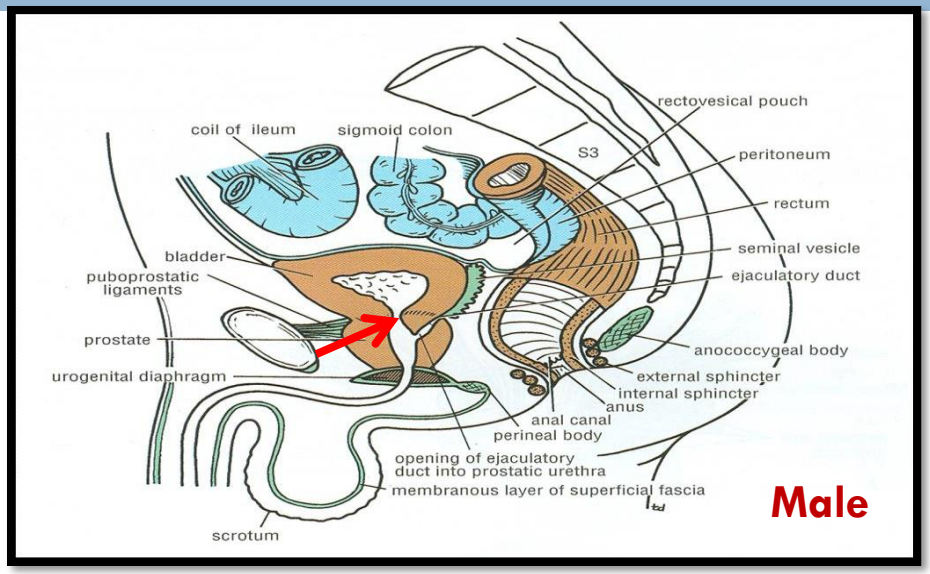
6-THE URINARY BLADDER (NECK)

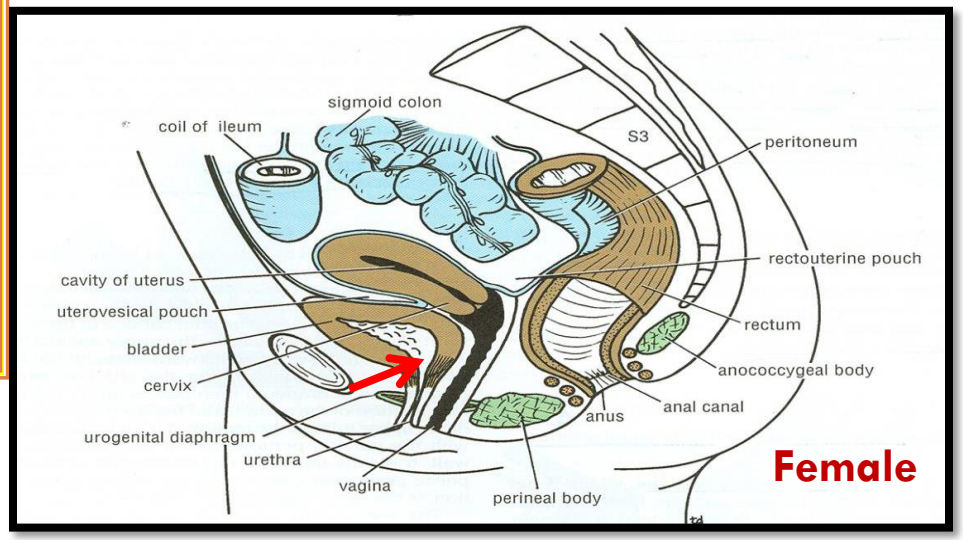
- Is the lowest & most fixed part of urinary bladder.
- Is continuous with urethra.
- Is related to (lies behind) lower border of symphysis pubis

IN MALE:

- Is related to upper surface of prostate gland

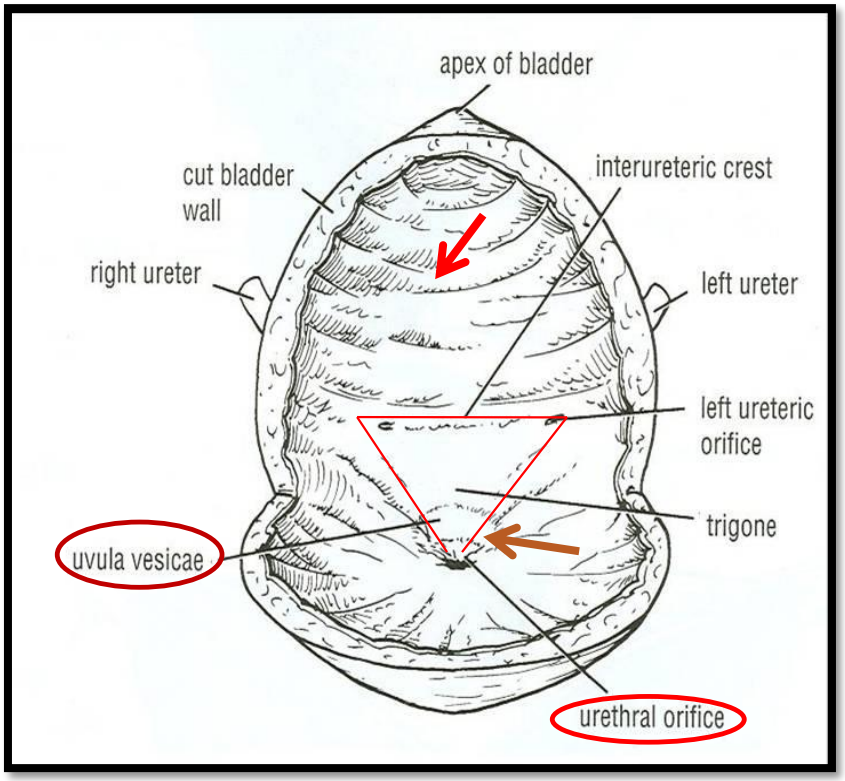
(inferiorly, it rests on the base of prostate)



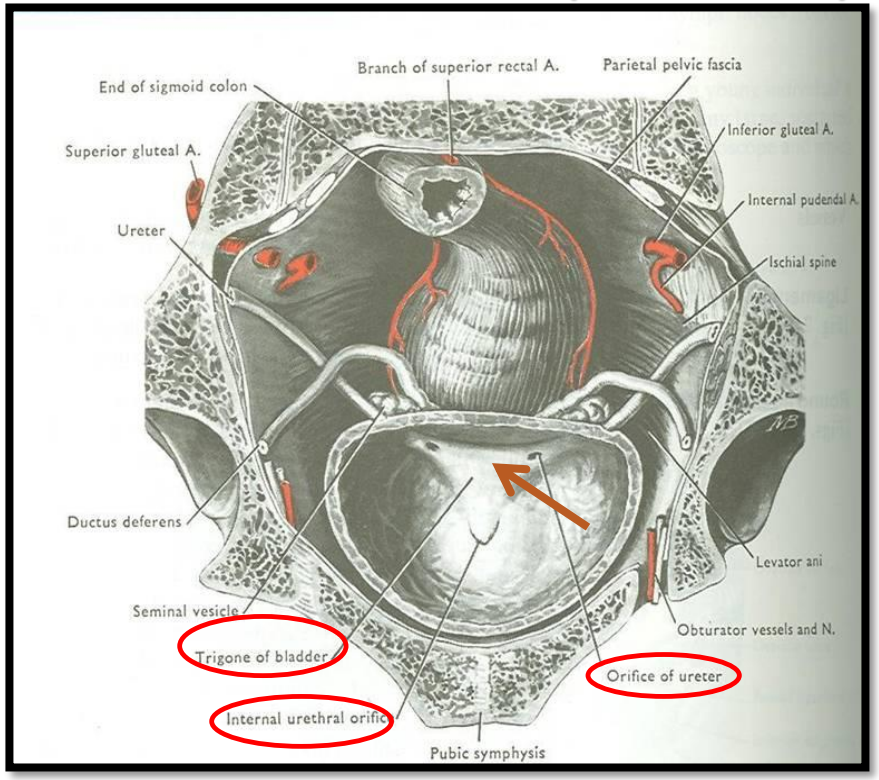


7-THE URINARY BLADDER (INTERIOR)

- 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)



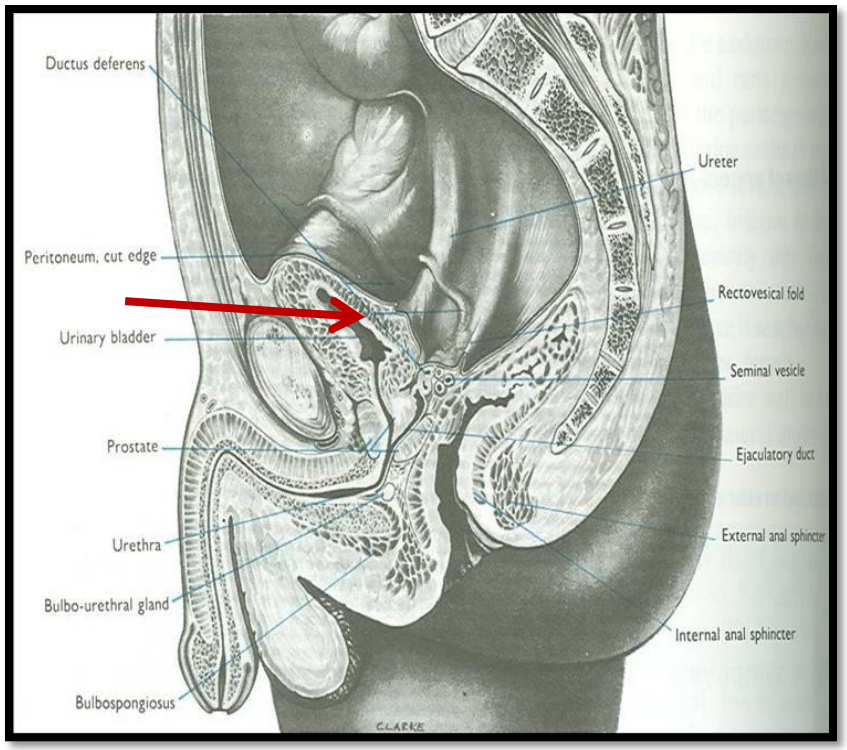
8-THE URINARY BLADDER (CAPACITY)

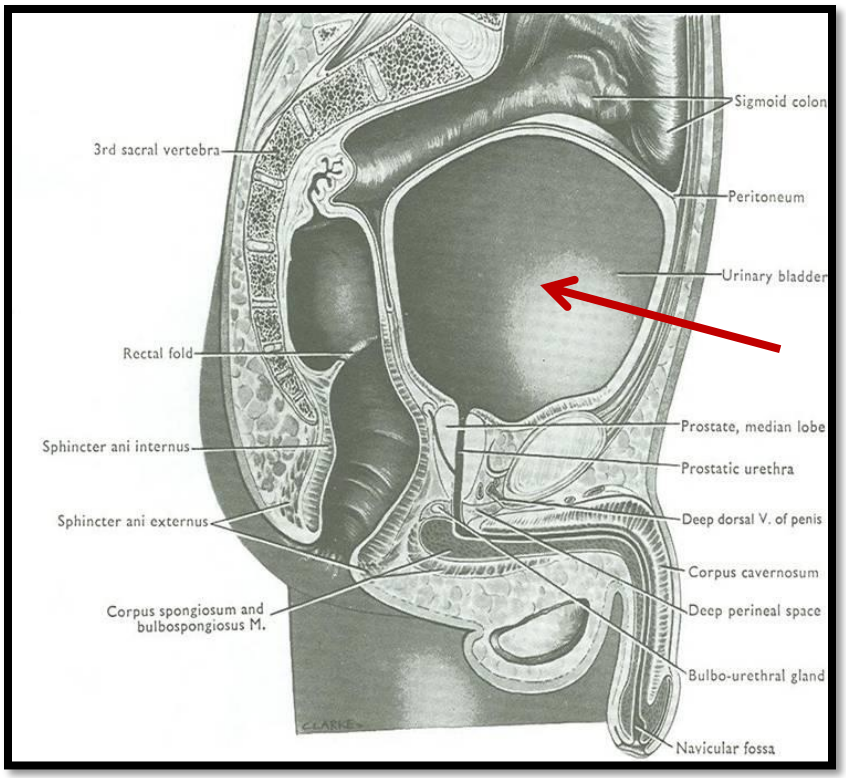
EMPTY

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

DISTENDED

- Is circular in shape
- Bulges into abdominal cavity

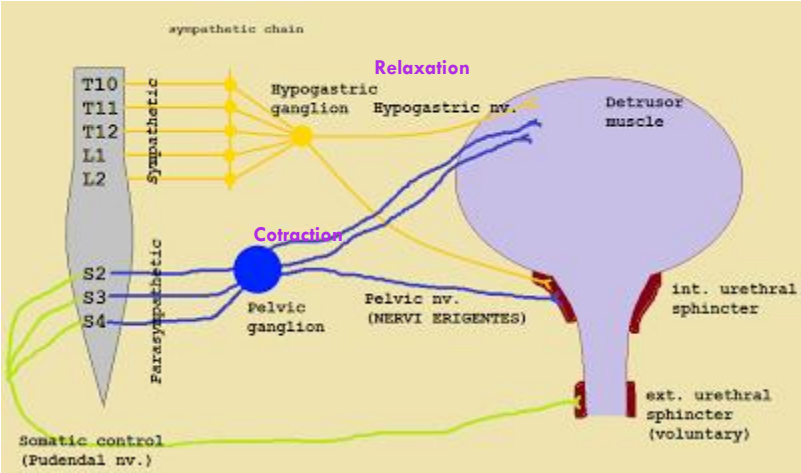




9-THE URINARY BLADDER (SUPPLY)

- **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

MALE URETHRA
(LENGTH: 20 CM)

PROSTATIC URETHRA (Length=3 cm):

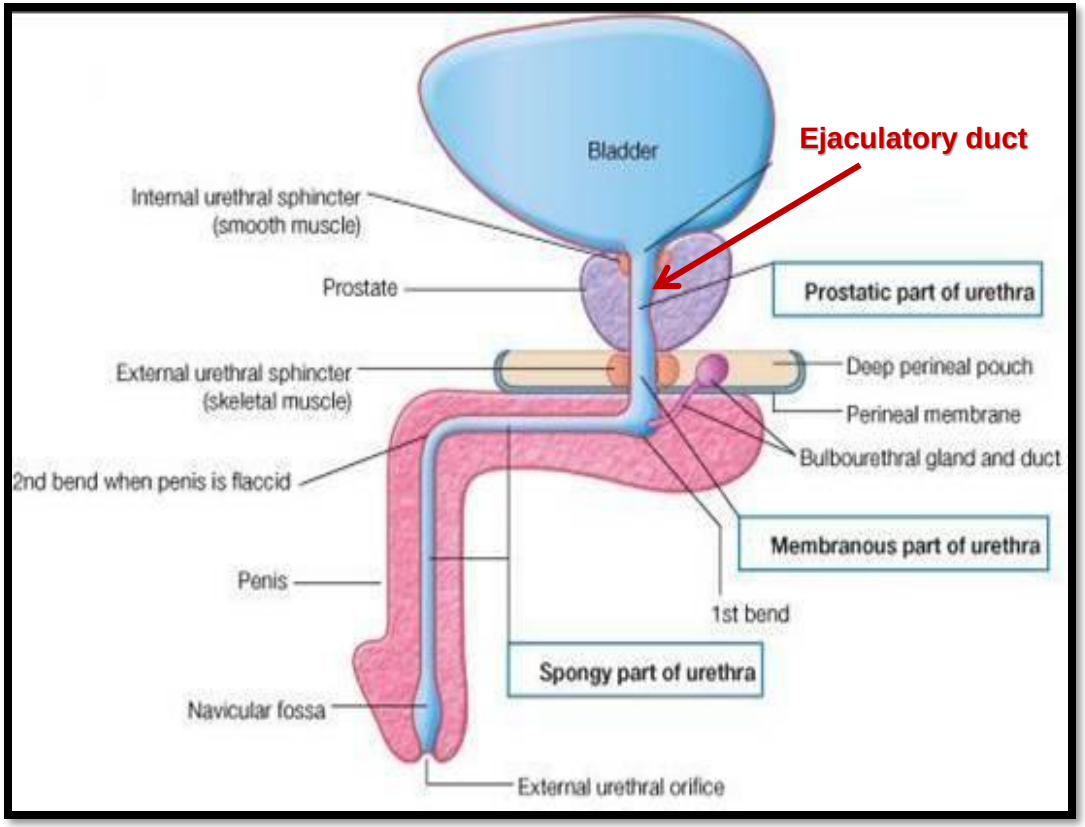
- Widest & most dilatable
- **Extends** from **neck** of bladder inside **prostate gland**

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)**

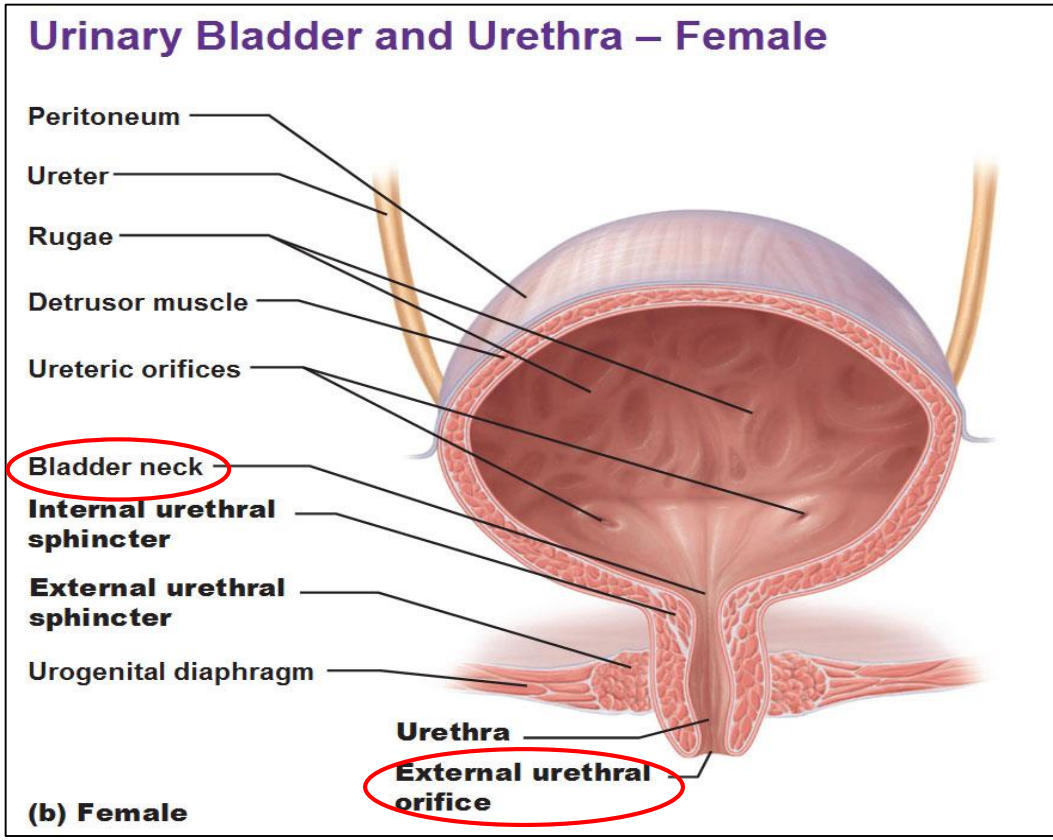


Structures openings into prostatic urethra:

- **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)**