

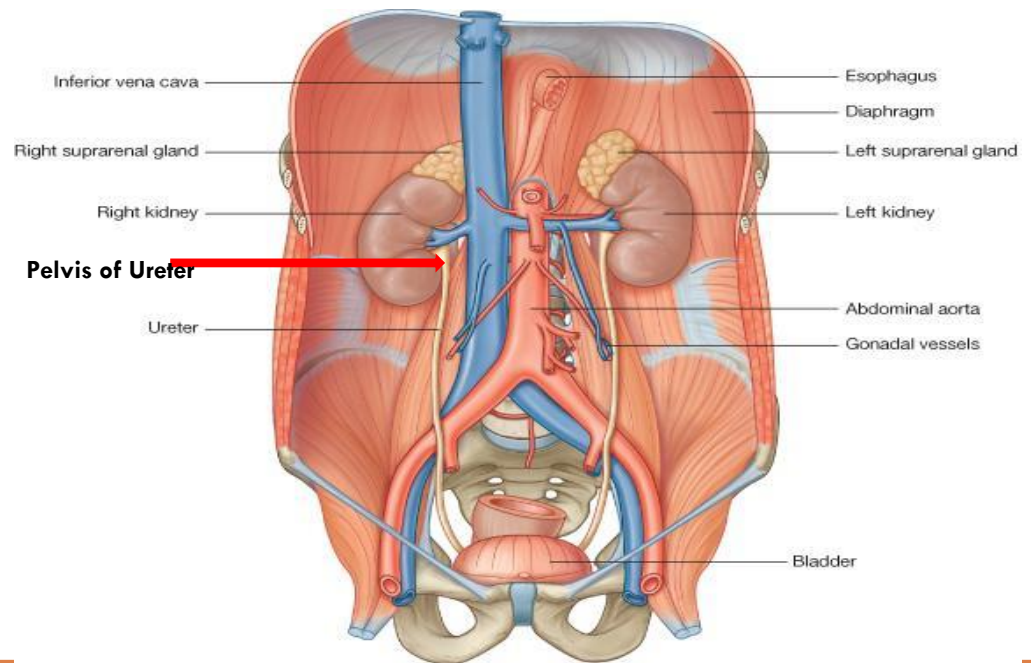
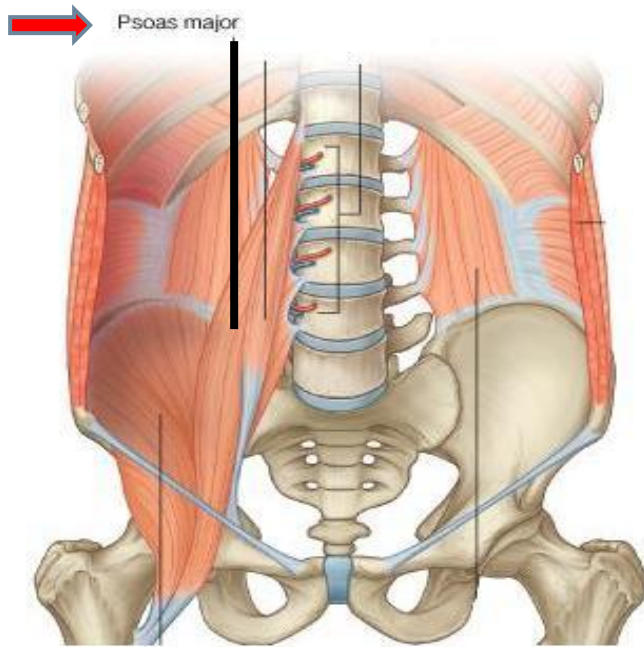
Prof. Ahmed Fathalla Ibrahim
Dr. Sanaa Al Shaarawi

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

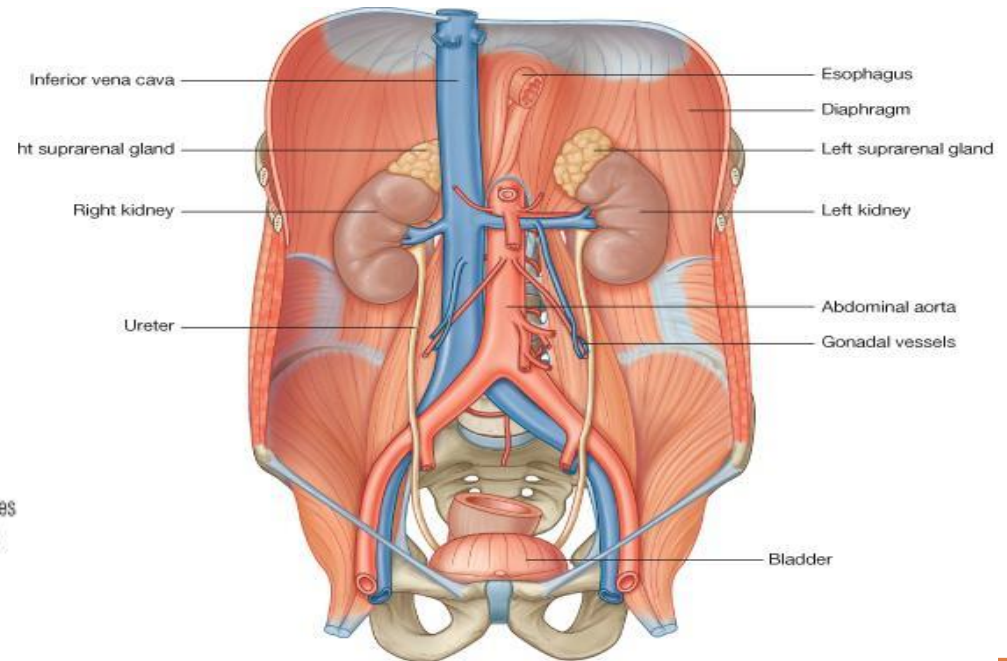
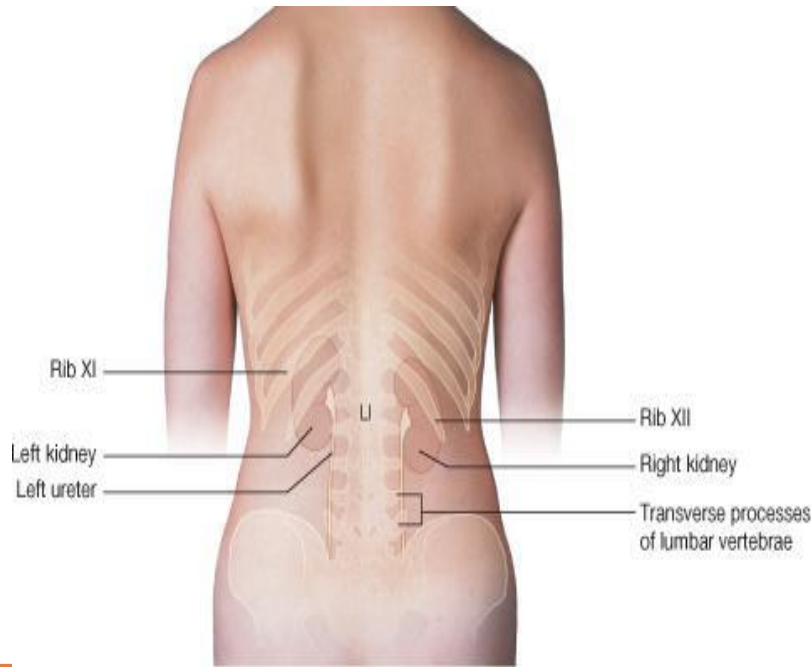


DEFINITION: It is a muscular tube transporting urine from kidney to urinary bladder.

LENGTH: 25 – 30 cm

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

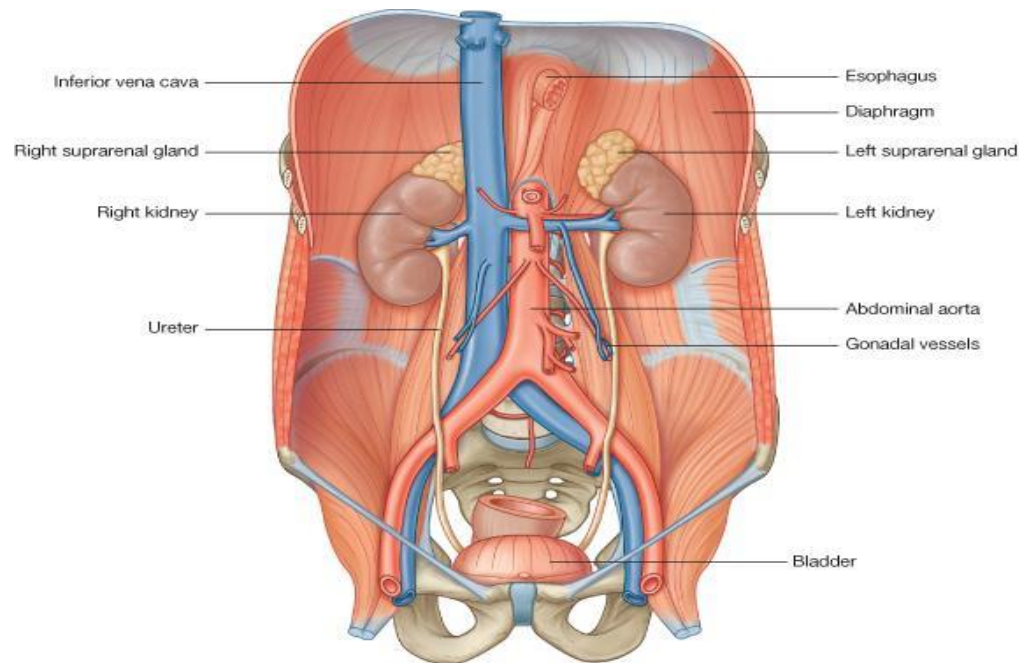
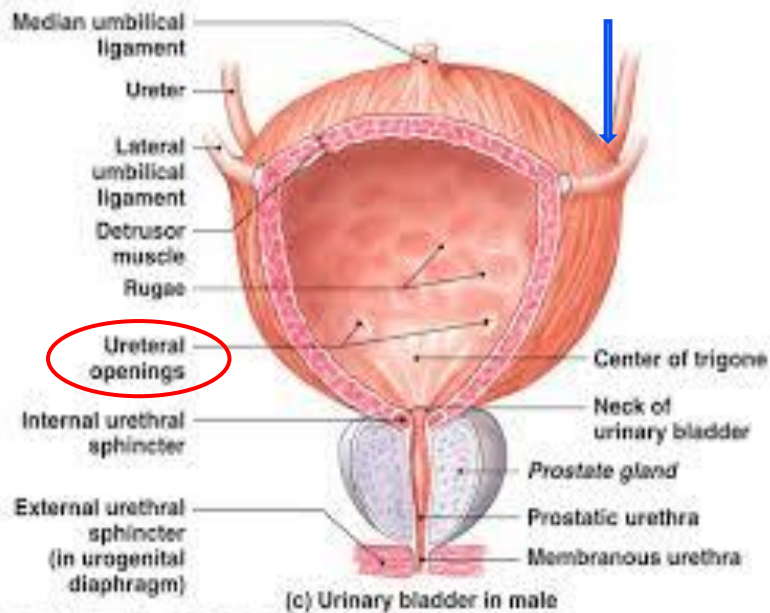
THE URETER



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 $\frac{3}{4}$ inch in wall of bladder before opening (valve-like part).

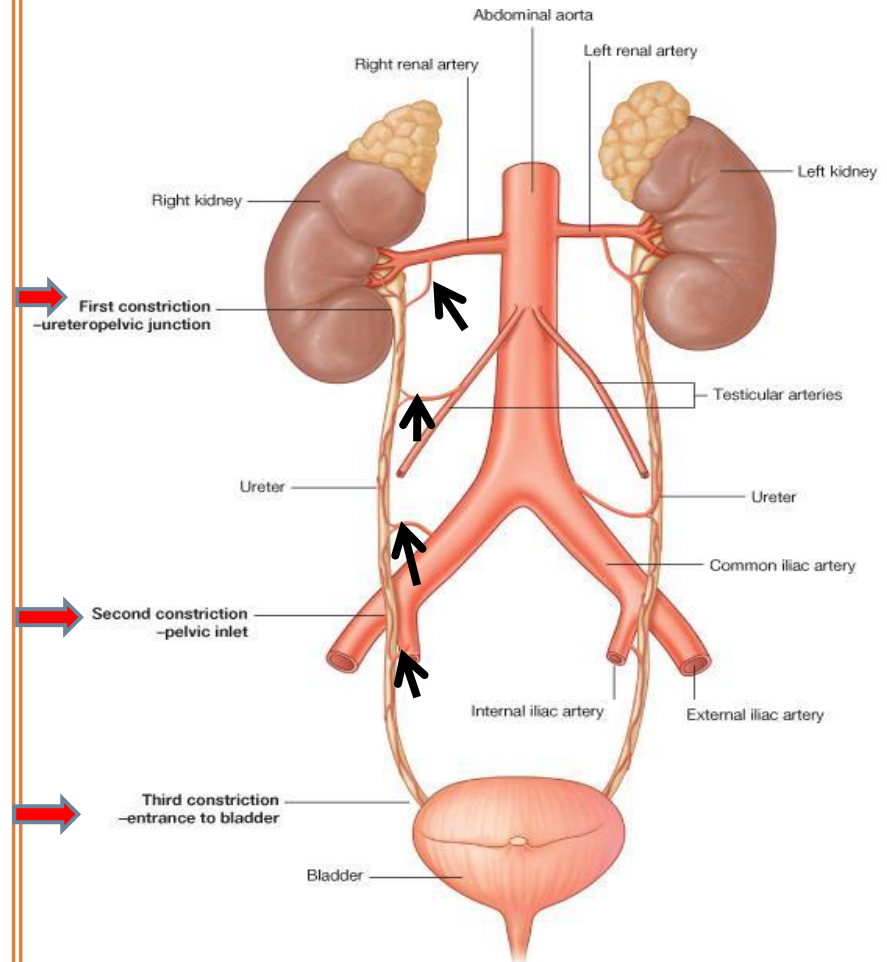
THE URETER

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

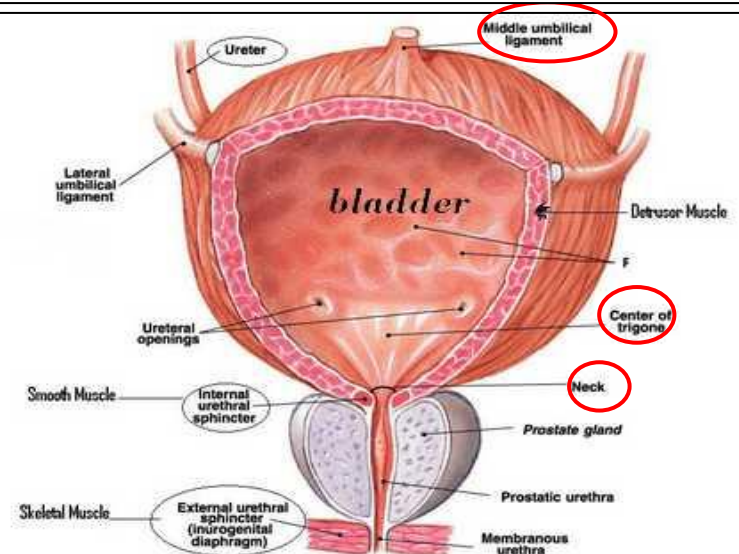
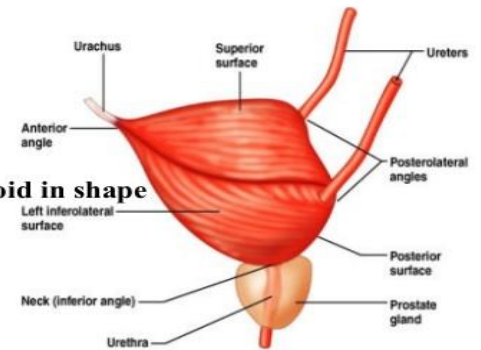


1-THE URINARY BLADDER (SHAPE)

- 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**

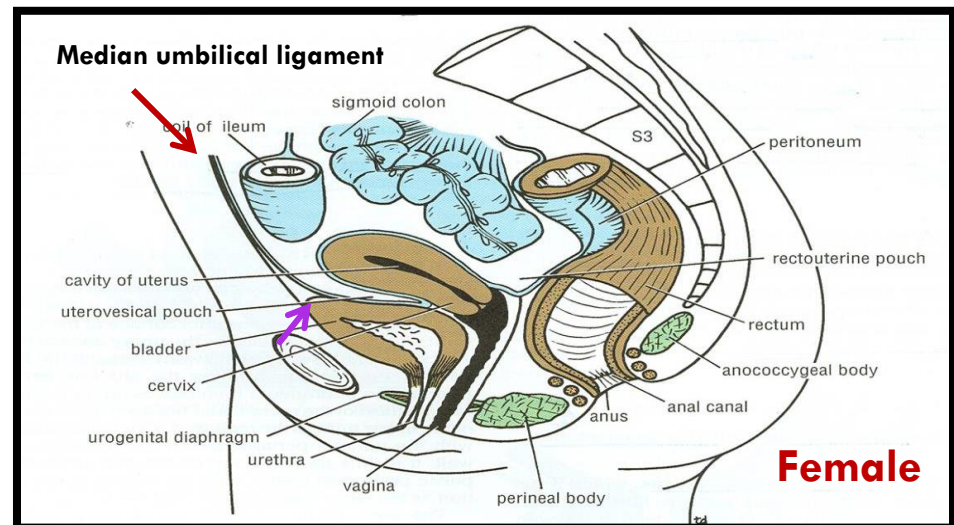
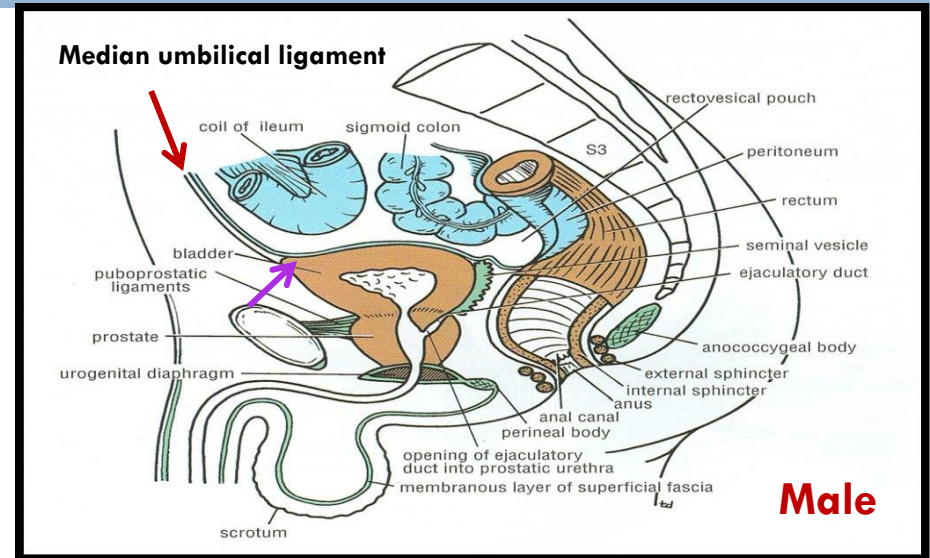
Shape

- 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



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)

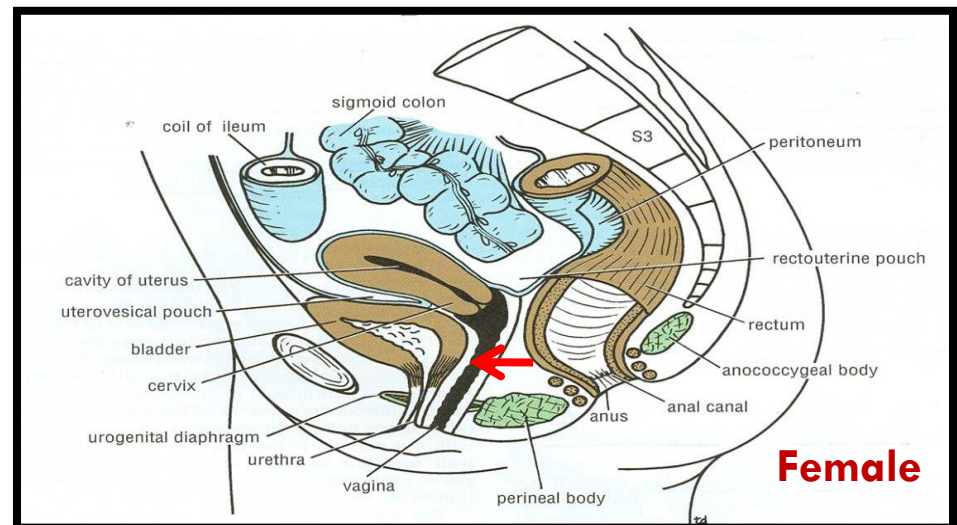
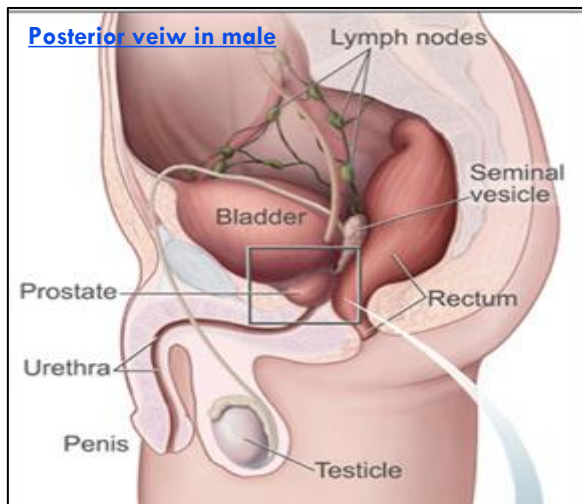
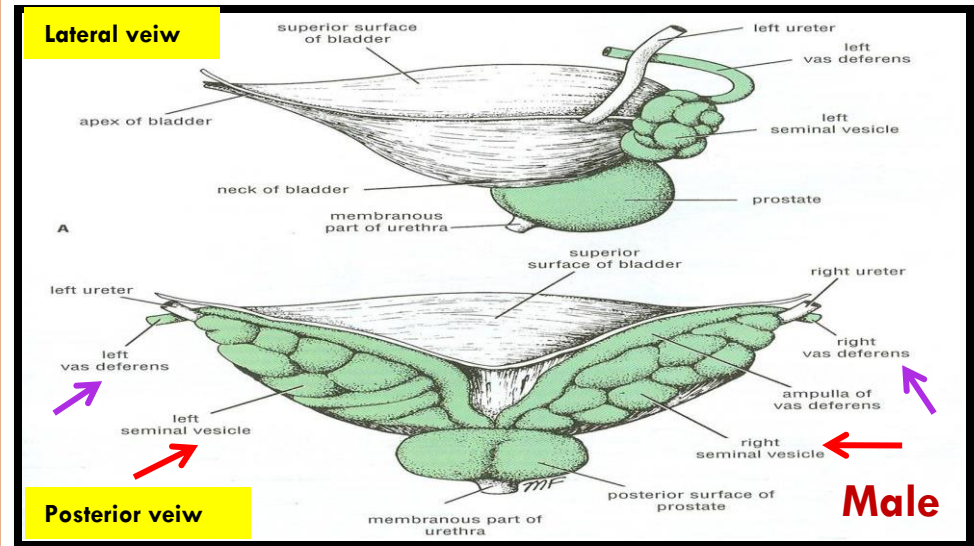
-Is directed backward

IN MALE:

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

IN FEMALE:

-Is related to **vagina**



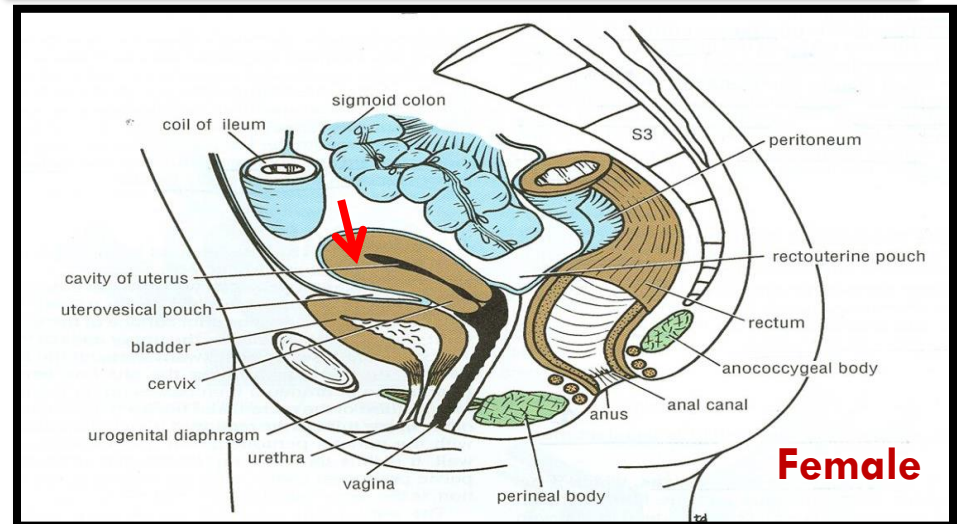
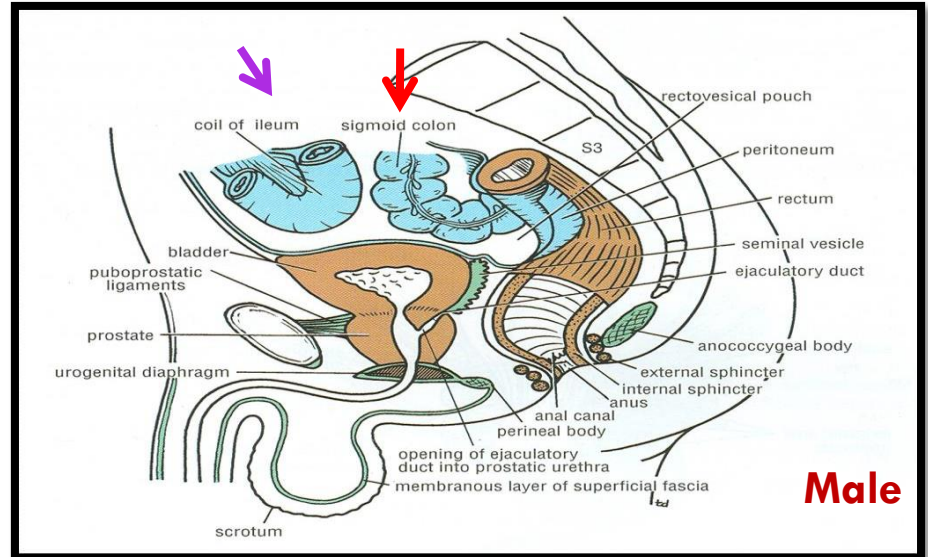
4-THE URINARY BLADDER (SUPERIOR SURFACE)

IN MALE:

-Is related to coils of ileum & sigmoid colon

IN FEMALE:

-Is related to the uterus



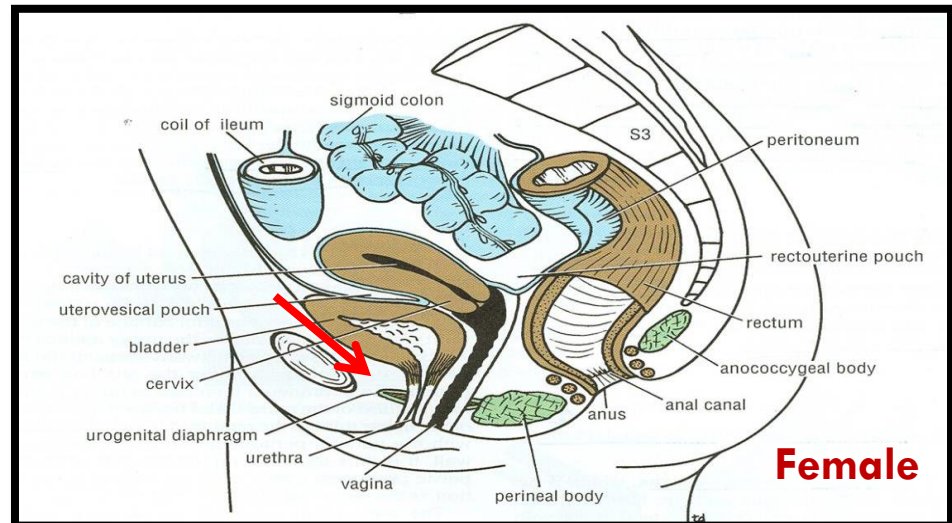
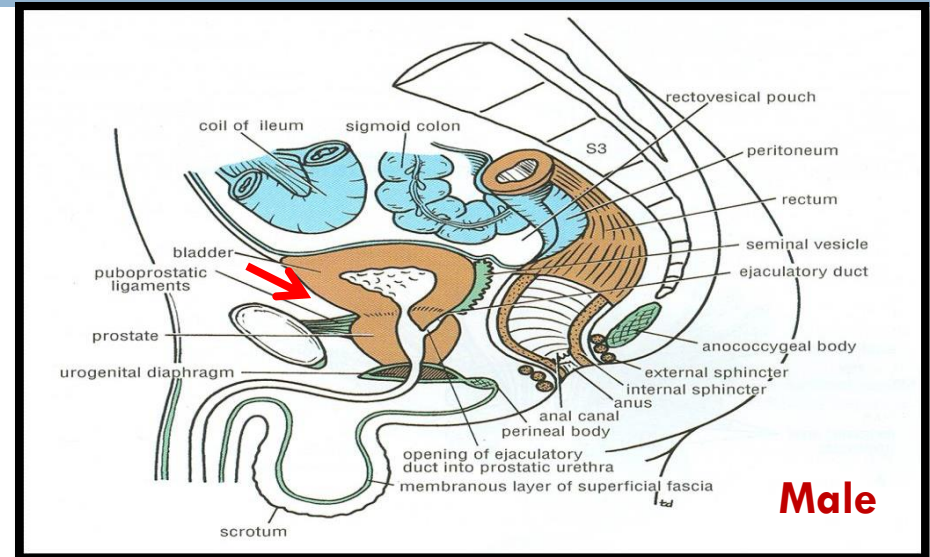
5-THE URINARY BLADDER (INFERO-LATERAL SURFACES)

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

Retropubic fat

- Accommodates distention of bladder

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

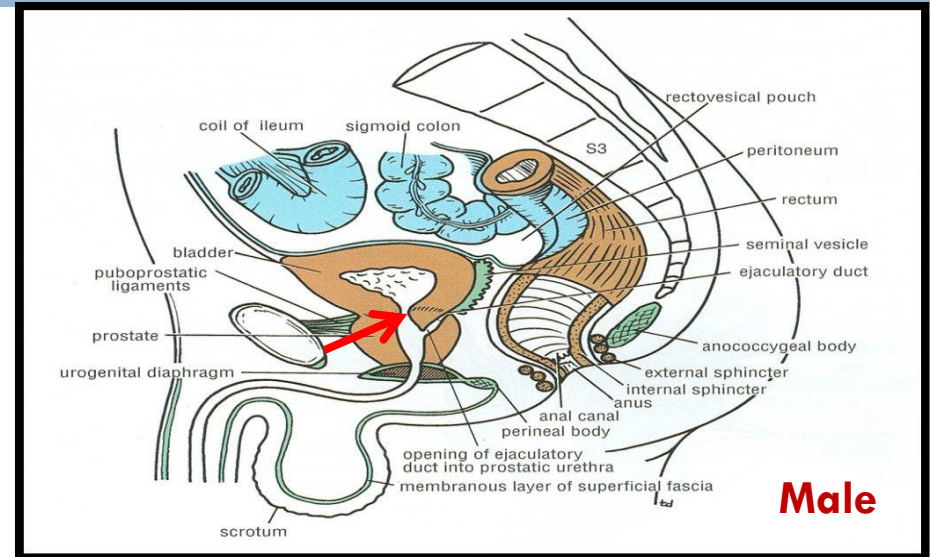


6-THE URINARY BLADDER (NECK)

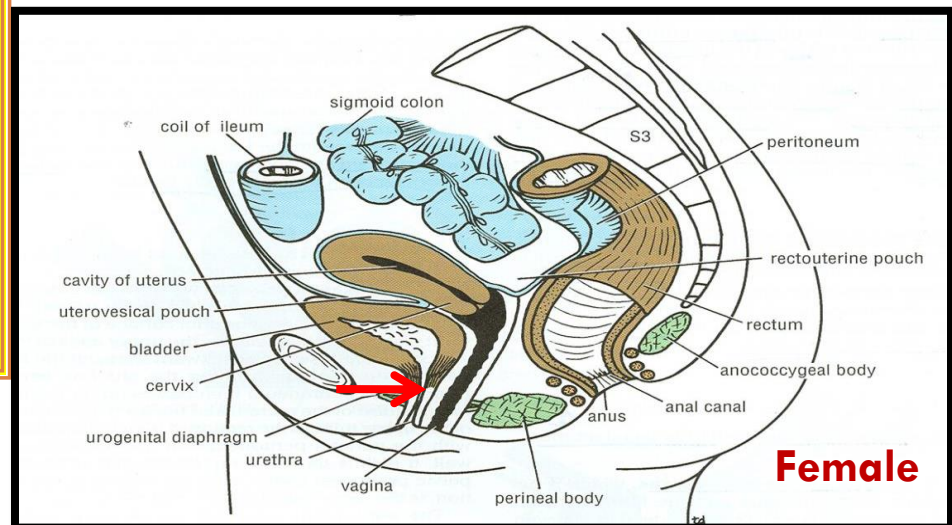
- Is the lowest & most fixed part of urinary bladder.
- Is continuous with urethra.
- Is related to (lies behind) lower border of symphysis pubis

IN MALE:

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



Male

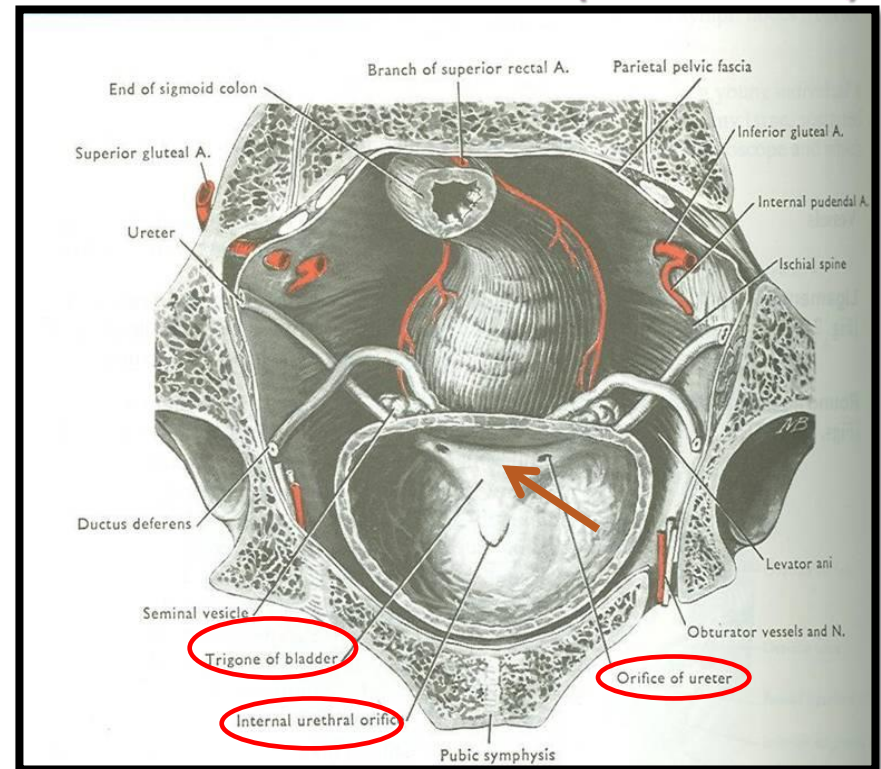
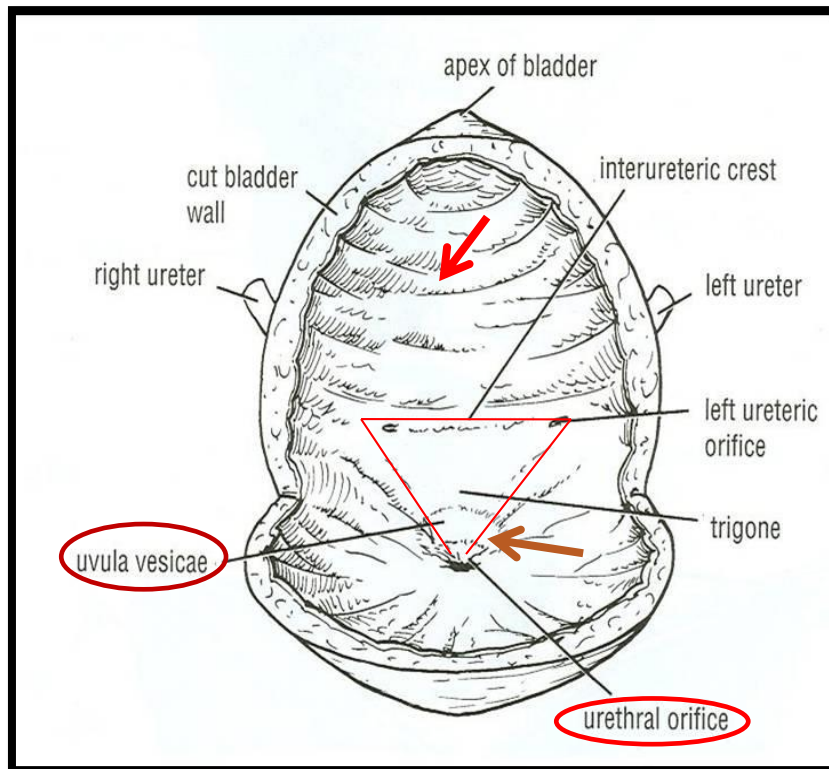


Female

7-THE URINARY BLADDER (INTERIOR)

- Mucous membrane is **folded**.
- **Uvula vesicae**: elevation behind **internal urethral orifice**, produced by **median lobe of prostate gland**

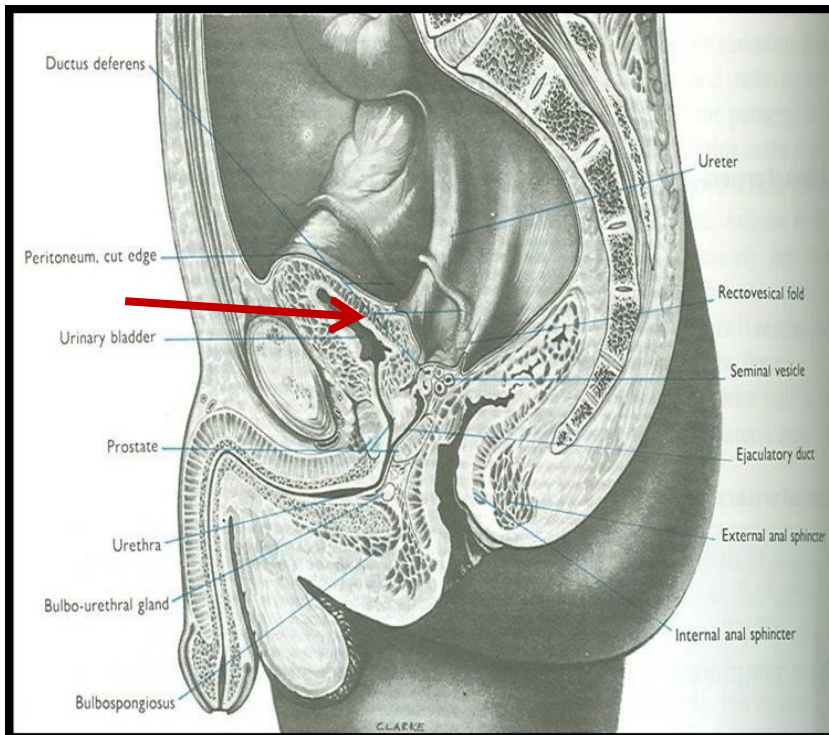
- **Trigone**: a triangular area in base of bladder **bounded by the 2 ureteric orifices & internal urethral orifice**. Its mucous membrane is **elastic (not folded)**



8-THE URINARY BLADDER (CAPACITY)

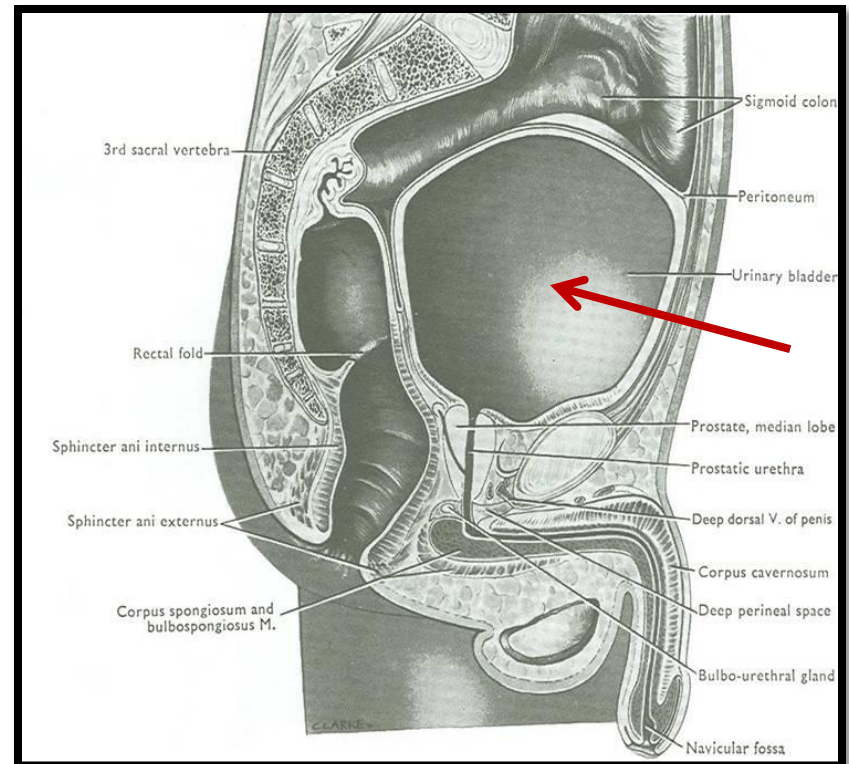
EMPTY

- Empty bladder is a **pelvic organ**.
- Accommodates from 300 – 500 ml of urine



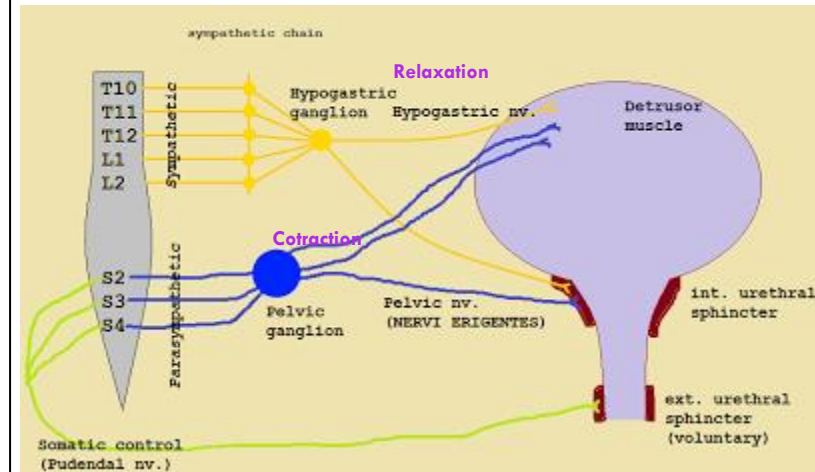
DISTENDED

- 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 **bladder** to **CNS**).



Autonomic Regulation of the Bladder

MALE URETHRA

(LENGTH: 20 CM)

Function: both urinary & genital

PROSTATIC URETHRA (Length=3 cm):

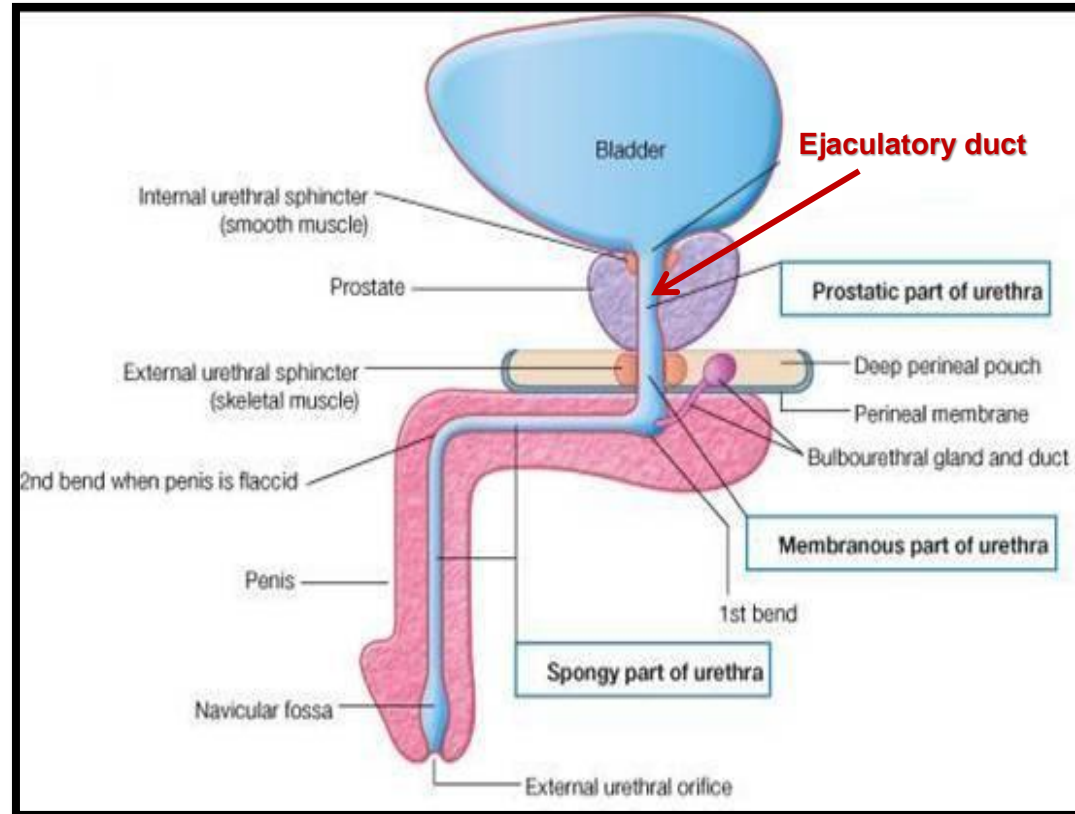
- Widest & most dilatable
- Extends from neck of bladder inside prostate gland

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:

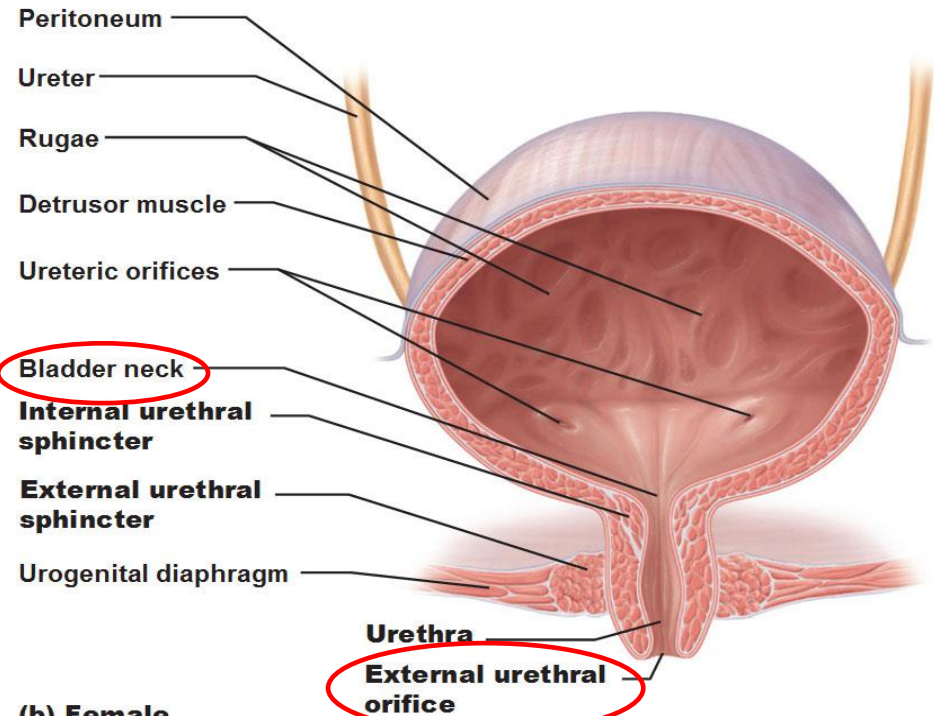
- Ejaculatory ducts: containing sperms & secretion of seminal vesicles
- Ducts of prostate gland

FEMALE URETHRA

(LENGTH: 4 CM)

- **Function** : Has only urinary function.
- Extends from neck of urinary bladder to open externally through the external urethral orifice which lies anterior to the vaginal opening.

Urinary Bladder and Urethra – Female



INTRAVENOUS UROGRAM (IVU,IVP)



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



THANK YOU

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)