

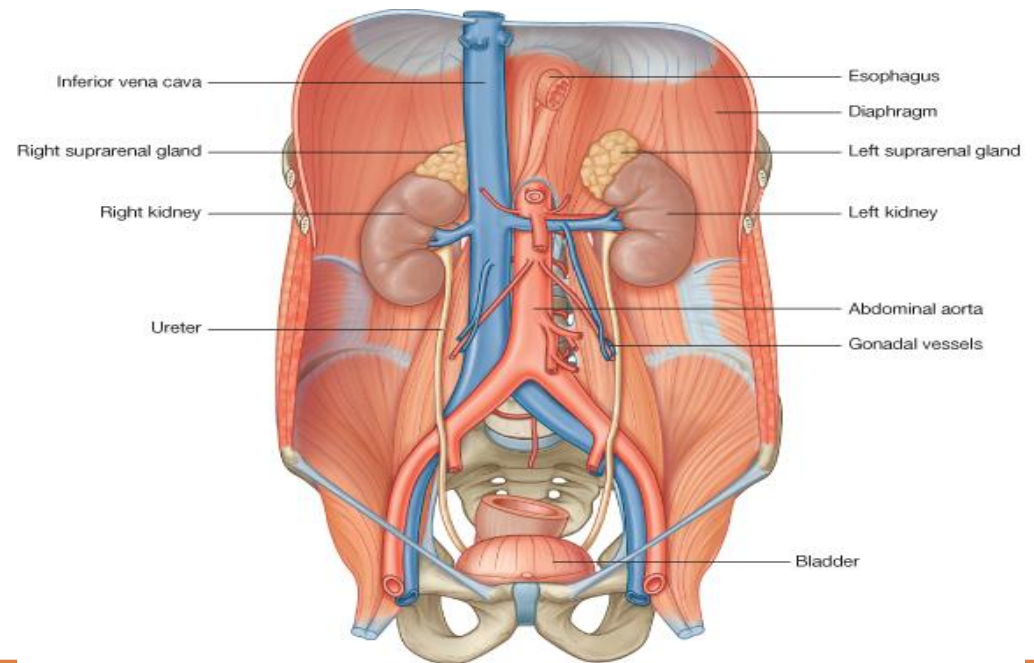
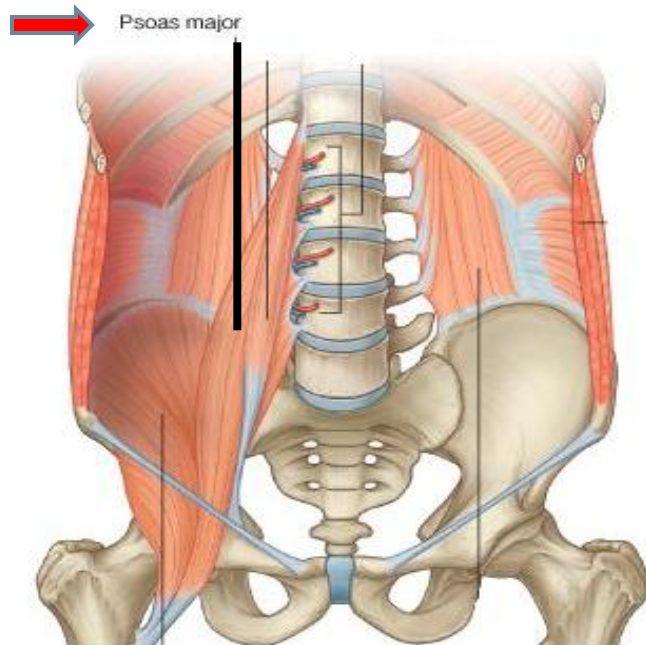
Prof. Ahmed Fathalla Ibrahim

OBJECTIVES

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

- Describe the course of ureter & identify the site of ureteric constriction
- 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-1

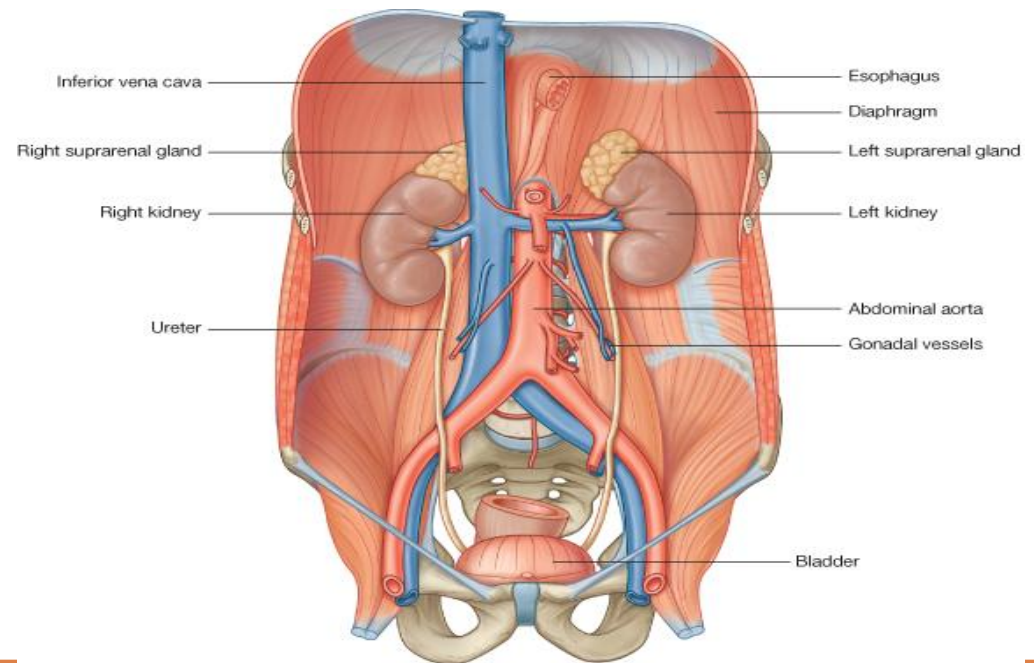
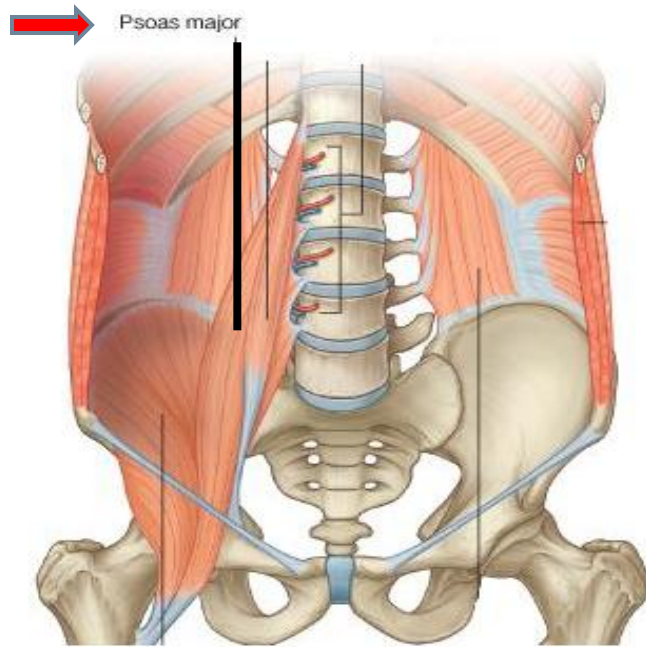


DEFINITION: It is a muscular tube transporting urine from kidney to urinary bladder.

LENGTH: 25 – 30 cm

BEGINNING: It begins as a continuation of renal pelvis.

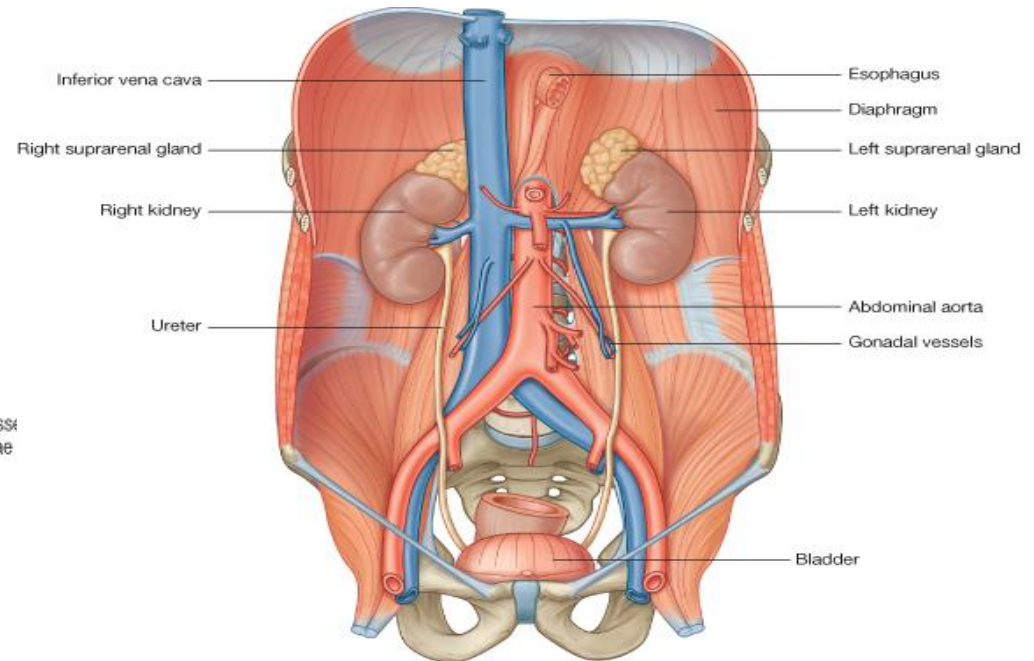
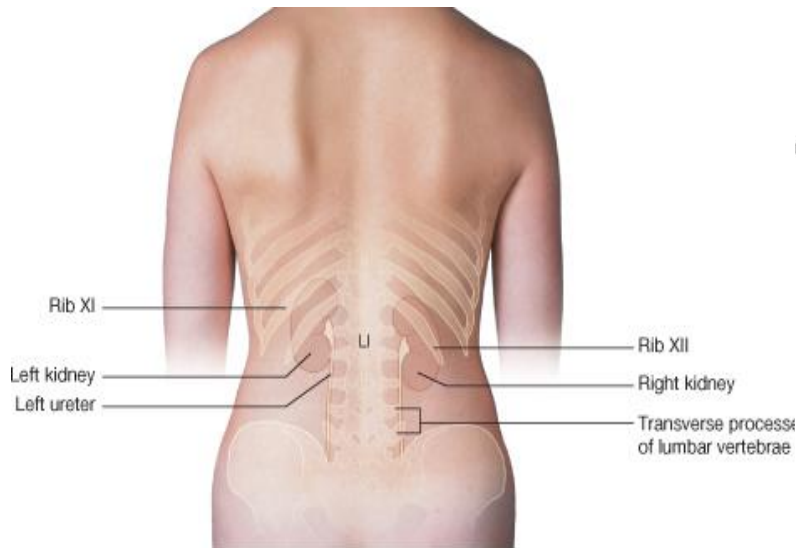
THE URETER-2



COURSE IN ABDOMEN:

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

THE URETER-3



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).

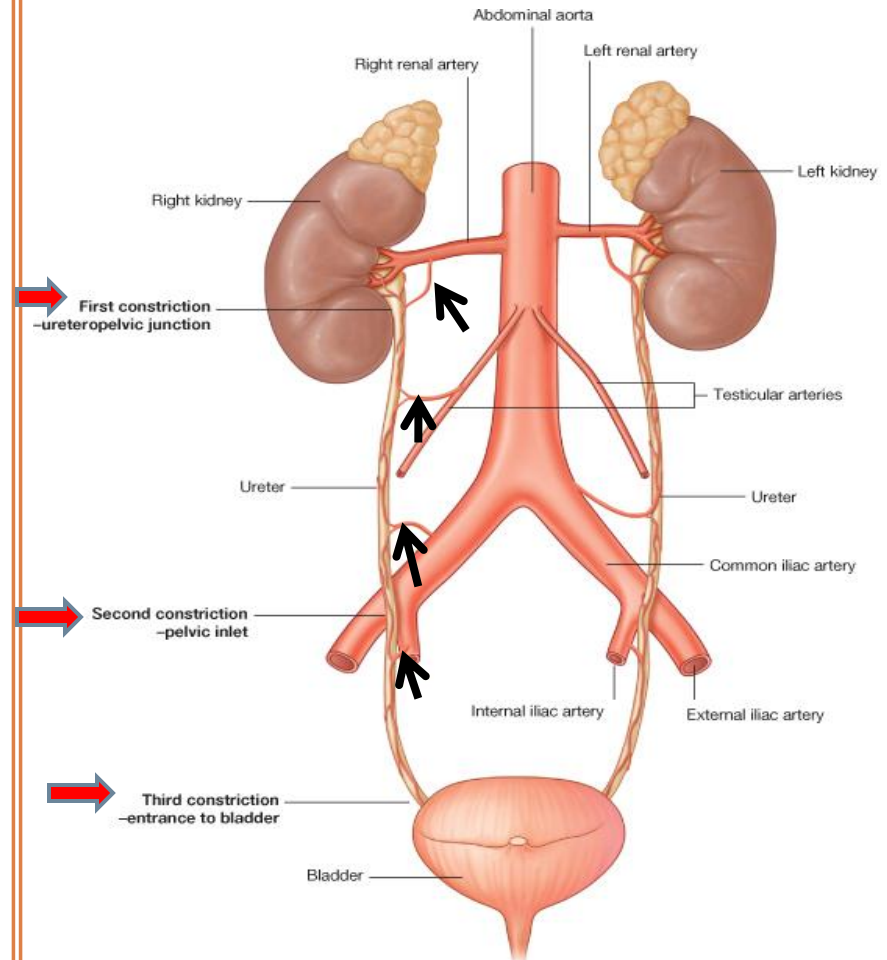
THE URETER-4

SITE OF CONSTRICTION (OBSTRUCTION-STONE IMPACTION)

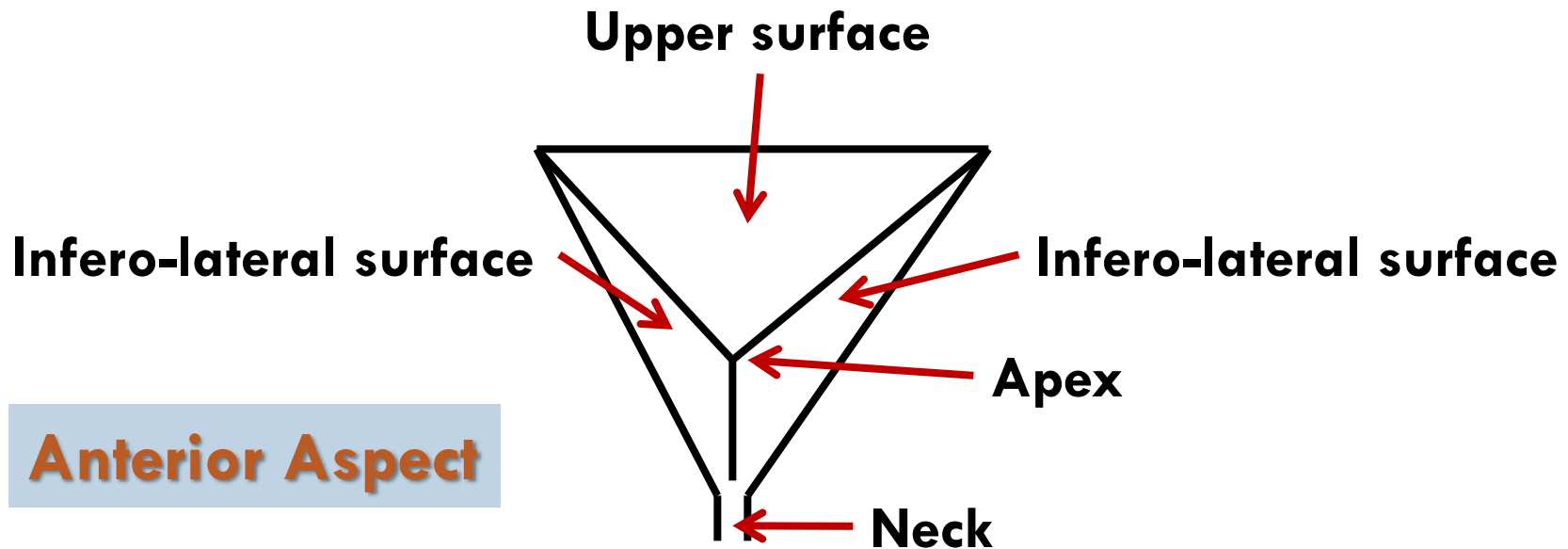
- At ureteropelvic junction
- At pelvic inlet (site of crossing of common iliac artery)
- At site of entrance to bladder

ARTERIAL SUPPLY:

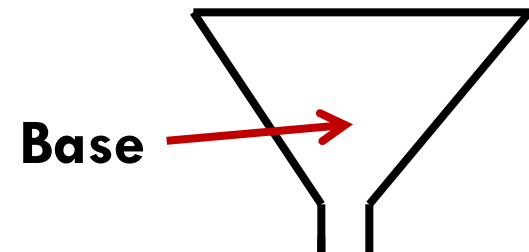
- Renal artery
- Gonadal artery
- Common iliac artery
- Internal iliac artery



THE URINARY BLADDER



Posterior Aspect



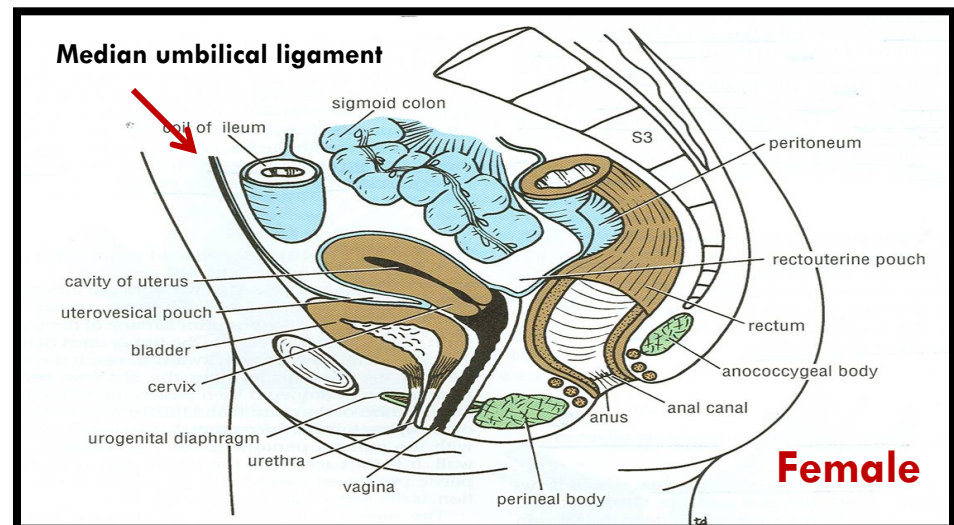
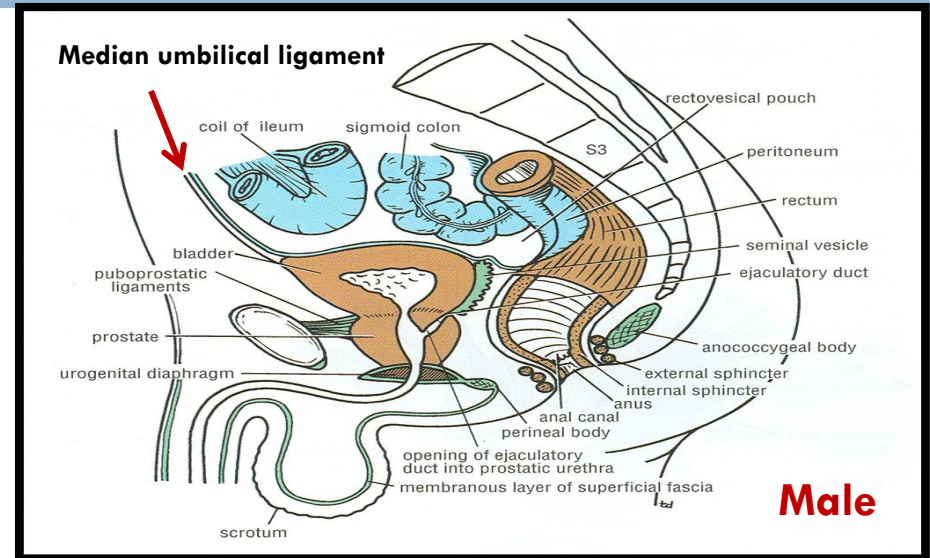
THE URINARY BLADDER-1

(SHAPE)

- 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**

THE URINARY BLADDER-2 (APEX)

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



THE URINARY BLADDER-3 (BASE)

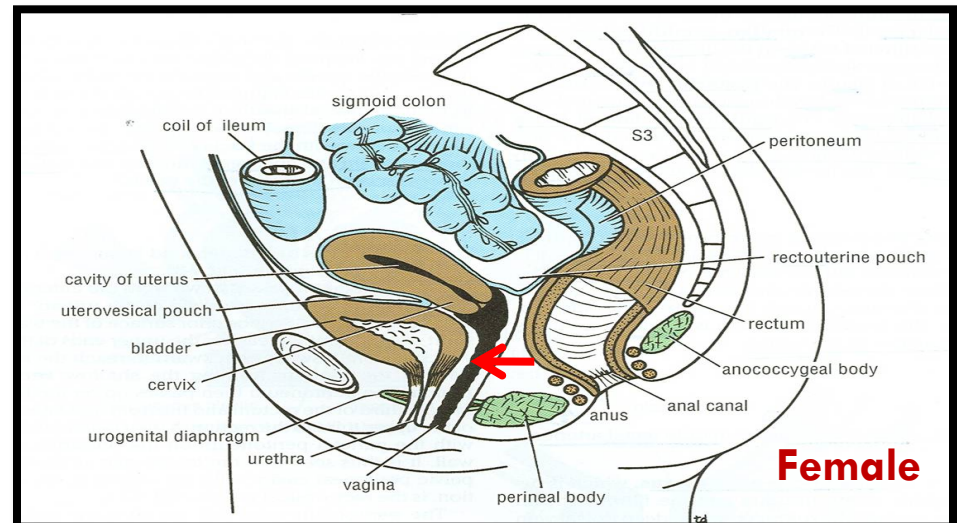
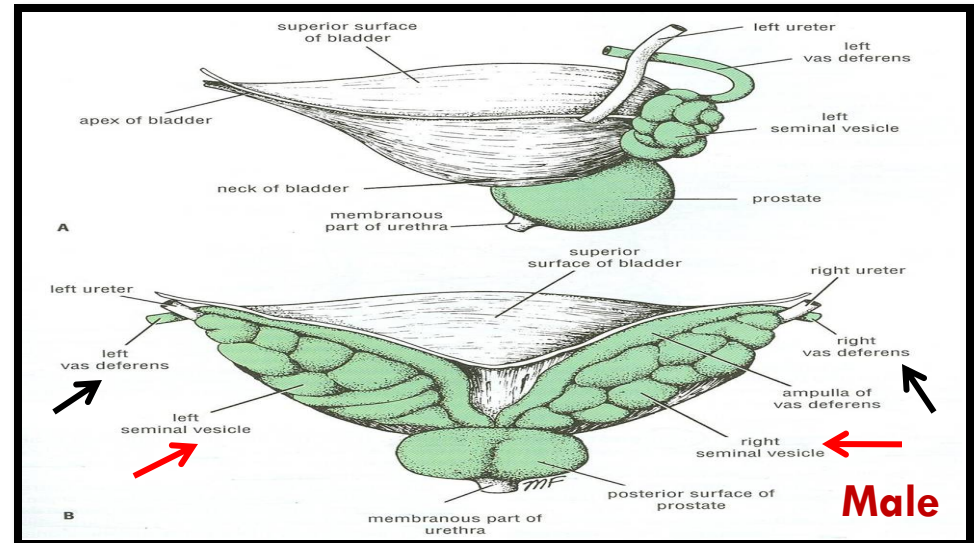
- Is directed backward

IN MALE:

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

IN FEMALE:

- Is related to vagina



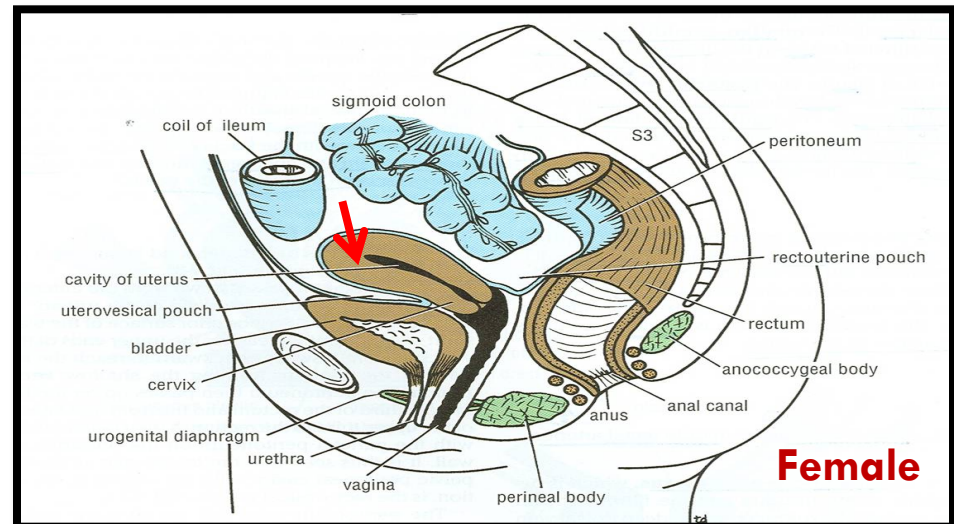
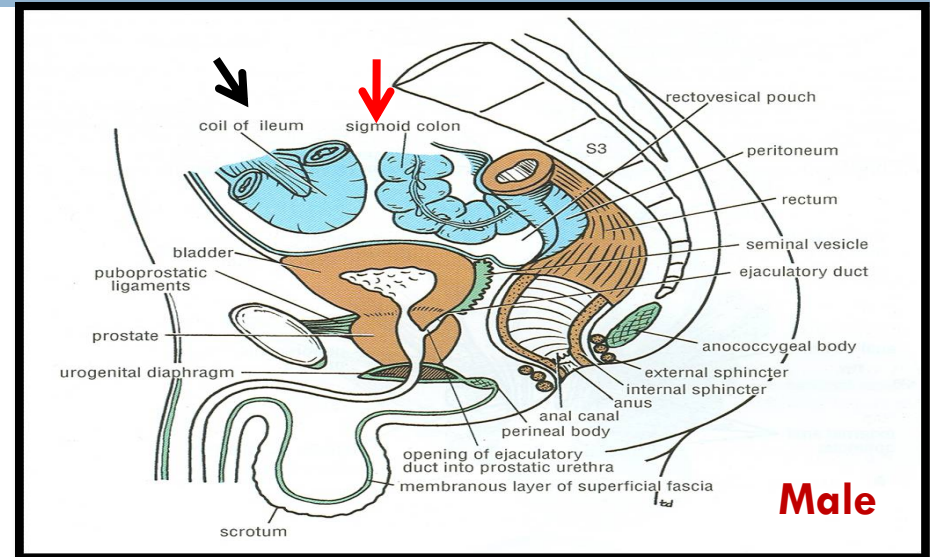
THE URINARY BLADDER-4 (SUPERIOR SURFACE)

IN MALE:

• Is related to coils of ileum & sigmoid colon

IN FEMALE:

• Is related to the uterus

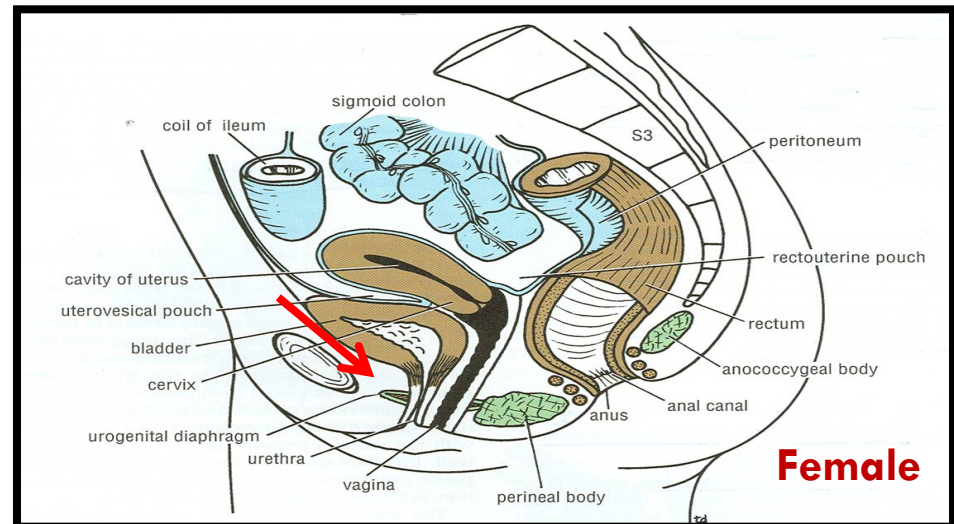
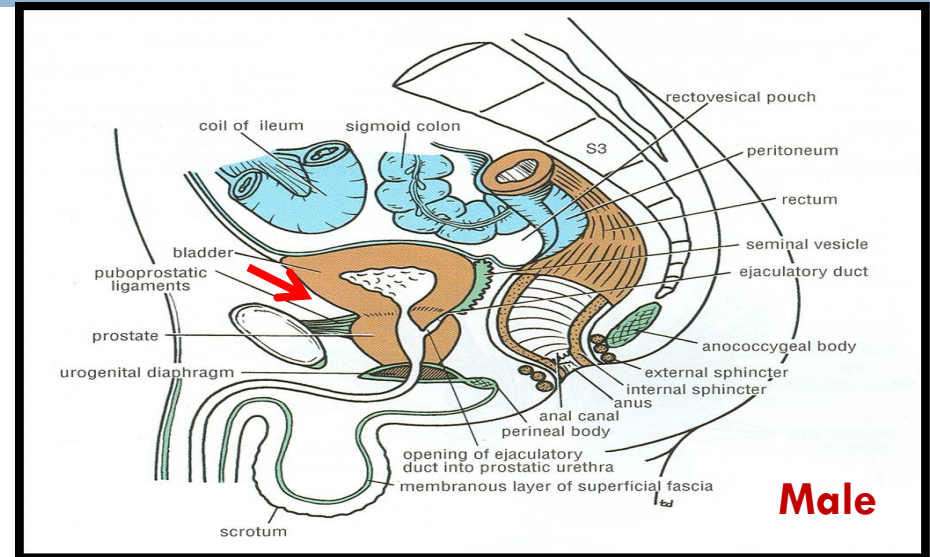


THE URINARY BLADDER-5 (INFERO-LATERAL SURFACES)

- 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

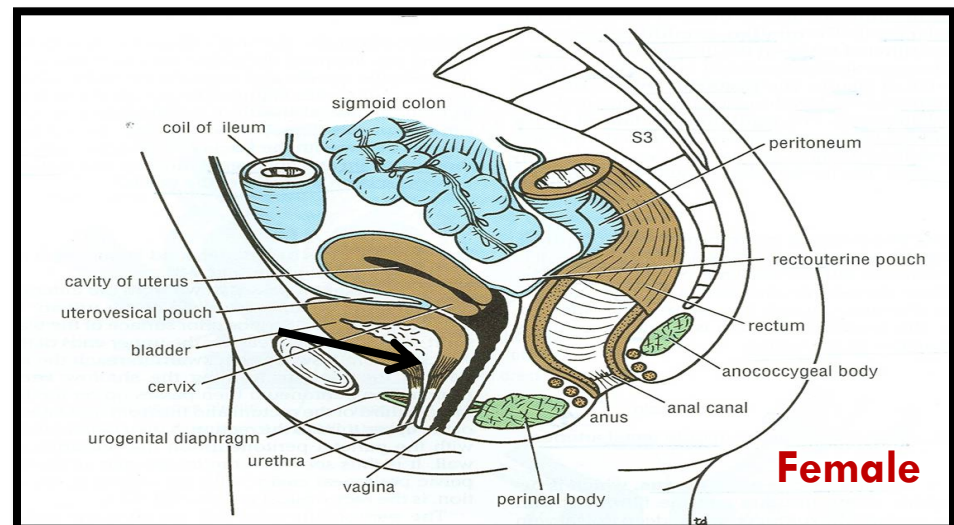
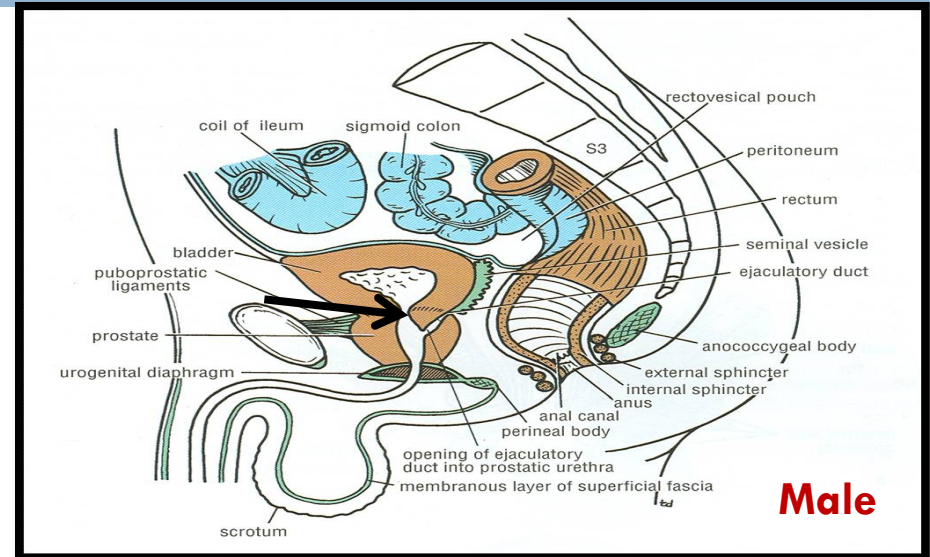


THE URINARY BLADDER-6 (NECK)

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

IN MALE:

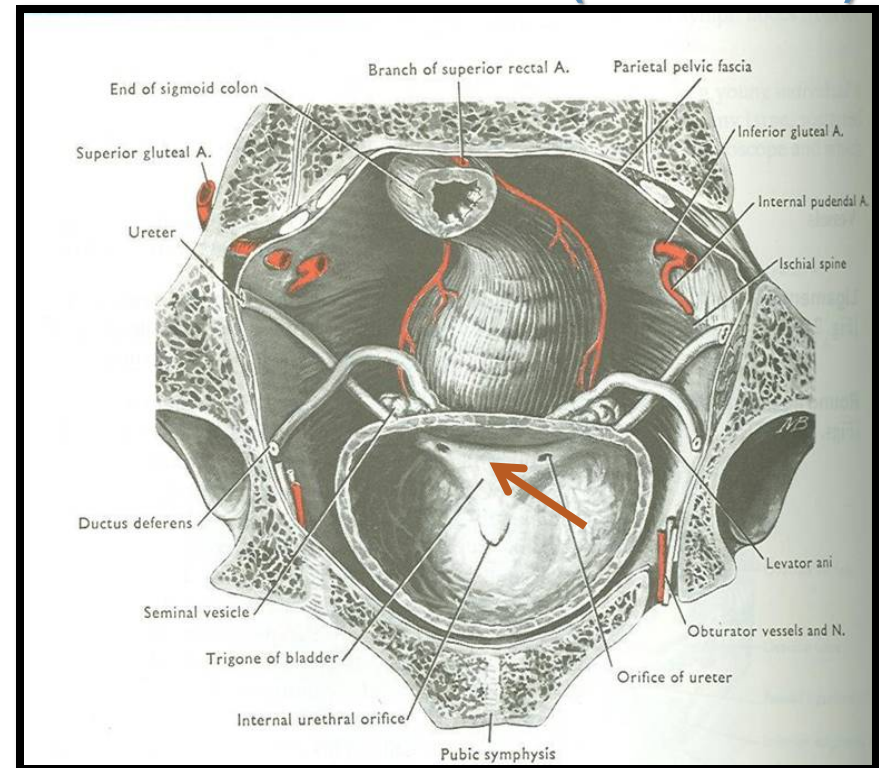
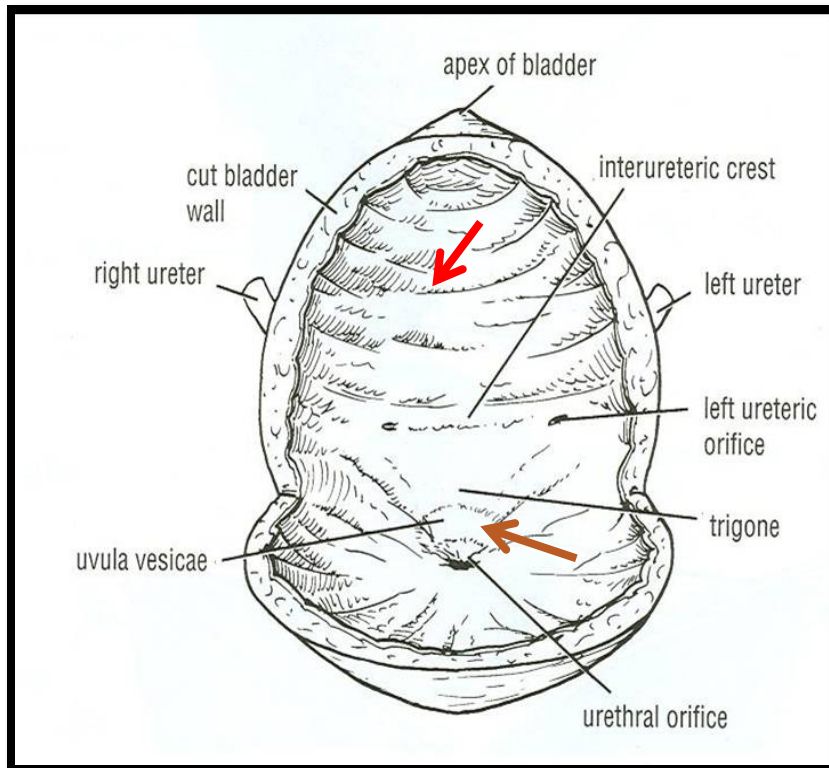
- Is related to upper surface of prostate gland



THE URINARY BLADDER-7 (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)

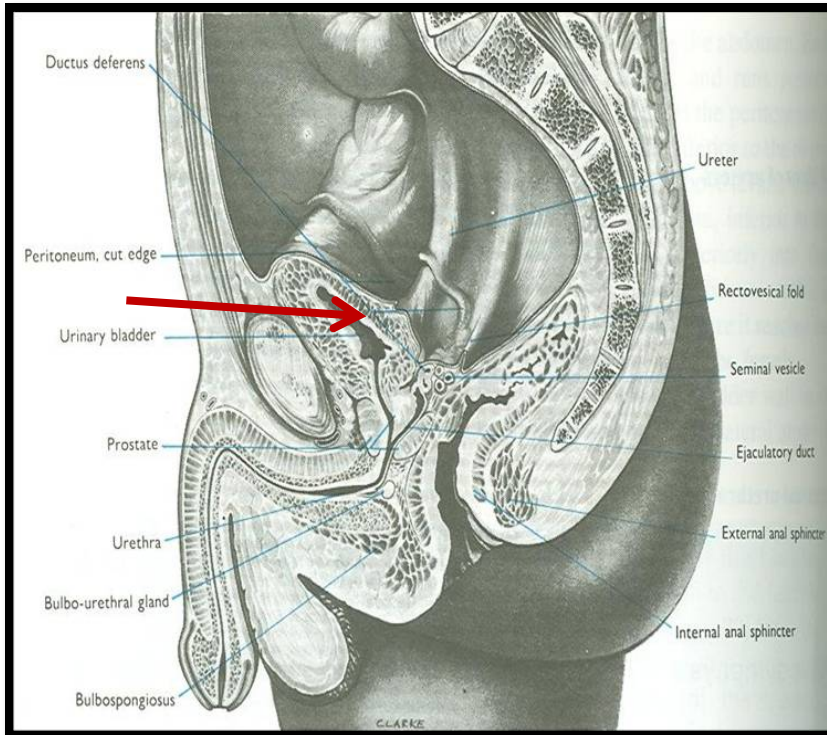


THE URINARY BLADDER-8

(CAPACITY)

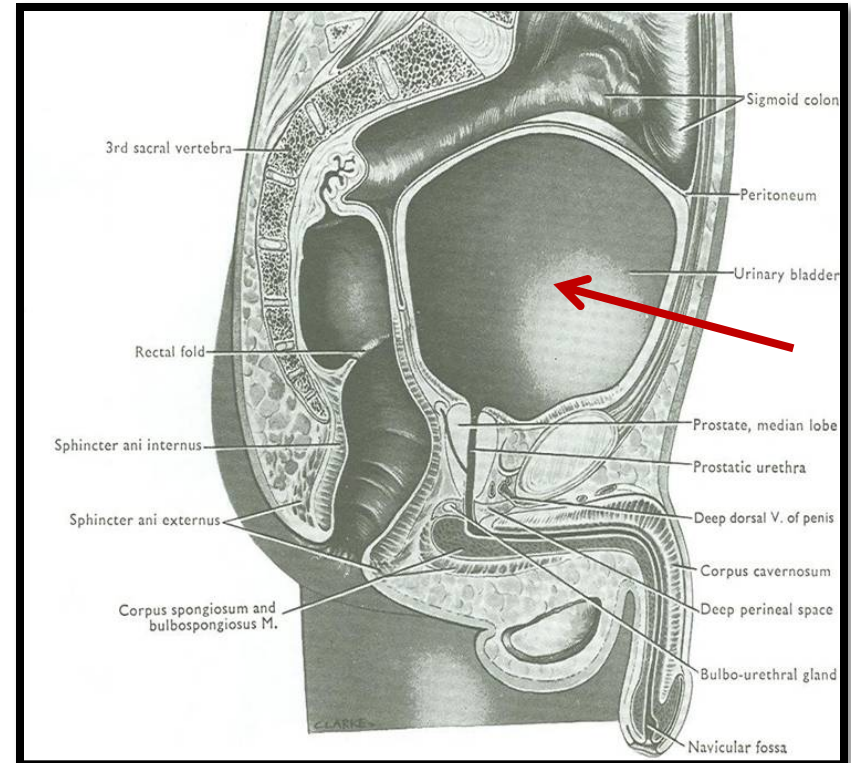
EMPTY

- Accommodates from 300 – 500 ml of urine



DISTENDED

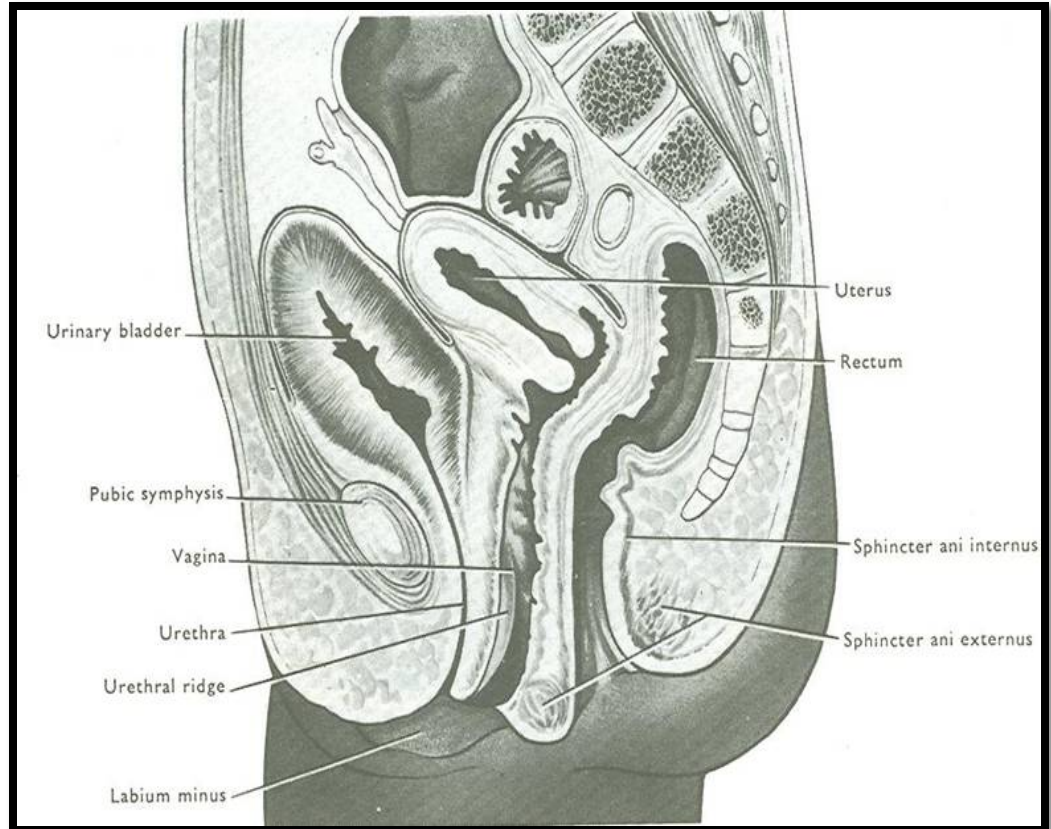
- Is circular in shape
- Bulges into abdominal cavity



THE URINARY BLADDER-9

(POSITION)

- Is found in abdomen until age of 6 years
- Begins to enter the enlarging pelvis from age of 6 years onward
- Is found entirely in pelvis at puberty



A median sagittal section of a newborn female child

THE URINARY BLADDER-10

(SUPPLY)

- **ARTERIES:** from internal iliac artery
- **VEINS:** into internal iliac vein
- **LYMPH:** into internal iliac lymph nodes
- **NERVES:**
 - 1) **Parasympathetic:** pelvic splanchnic nerves from S2, 3, 4
 - 2) **Sympathetic:** from L1,2
 - 3) **Sensory:** transmitting pain due to overdistention of bladder

MALE URETHRA (LENGTH: 20 CM)

PROSTATIC URETHRA (Length=3 cm):

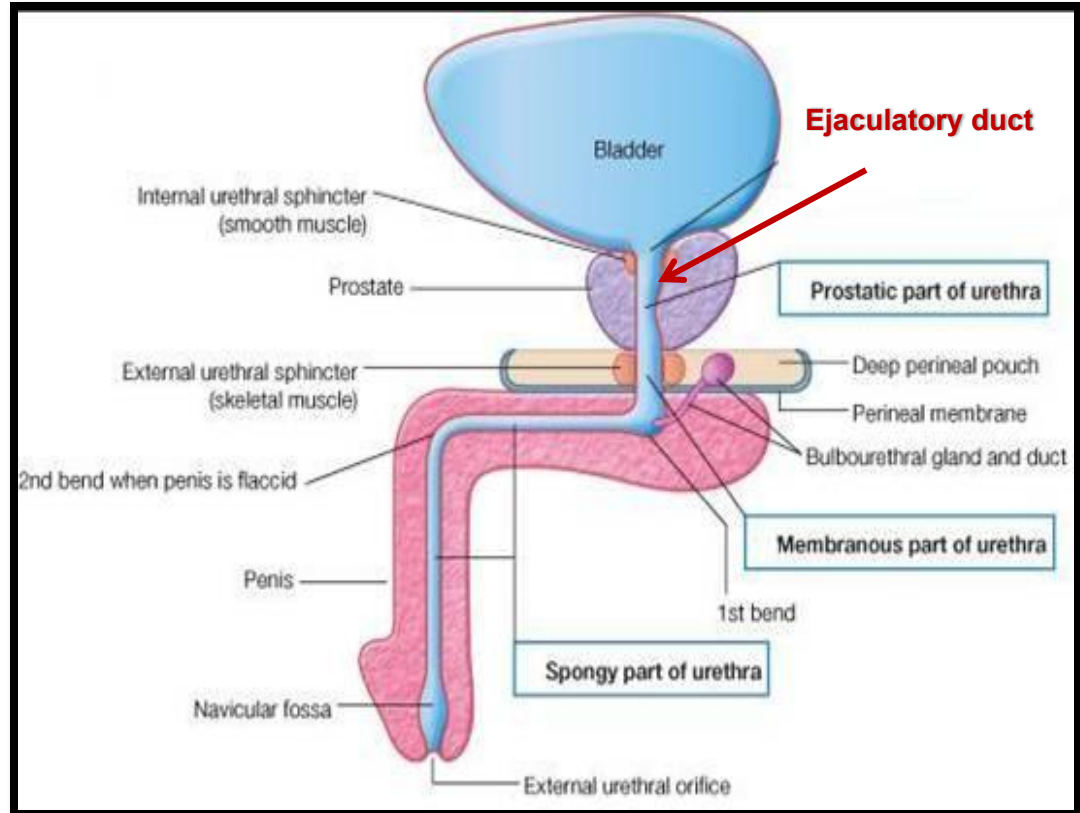
- Widest & most dilatable
- Extends from neck of bladder inside prostate gland

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)



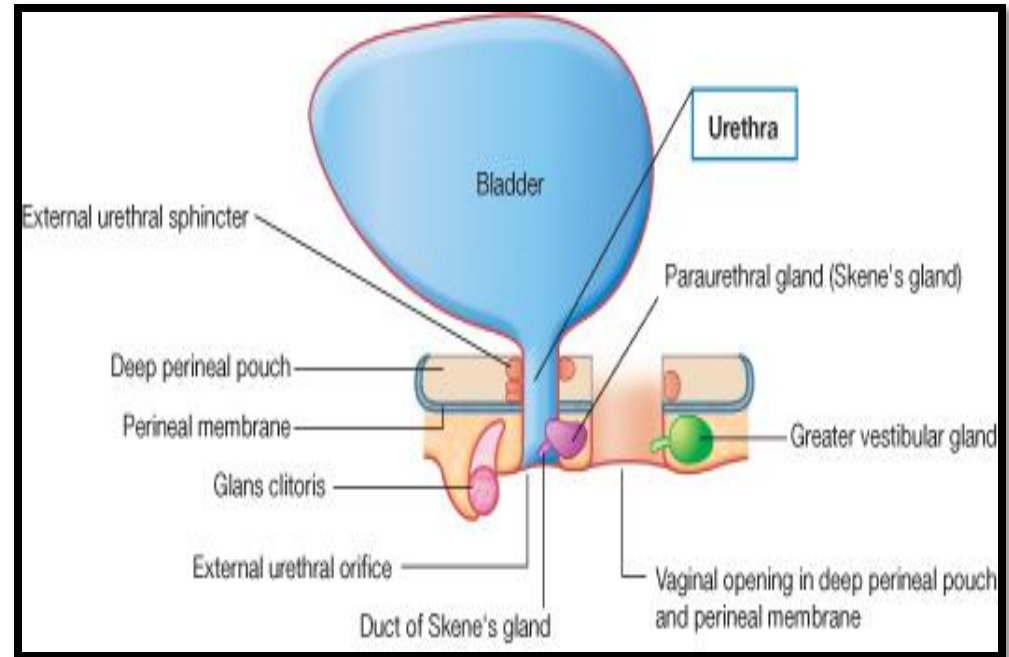
Structures openings into prostatic urethra:

- 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)**



INTRAVENOUS UROGRAM



A urogram (Post micturation): demonstrates a bladder stone.

SUMMARY-1

URETER:

- ***Beginning:*** as continuation of renal pelvis
- ***Course:*** descends anterior to: psoas major & end (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)

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 opens 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)

QUESTION 1

- Which one of the following structures is related to the inferolateral surface?
 - 1) Prostate gland
 - 2) Sigmoid colon
 - 3) Retropubic fat ←
 - 4) Seminal vesicle

QUESTION 2

- Which one of the following is the site of uvula vesicae?
 - 1) In the superior surface of urinary bladder.
 - 2) Behind the internal urethral orifice. ←
 - 3) Between the 2 ureteric orifices.
 - 4) In relation to the apex of urinary bladder.



**THANK YOU
&
BEST WISHES**