

# **UROGENITAL SYSTEM**

## **THE URINARY BLADDER& URETHRA**

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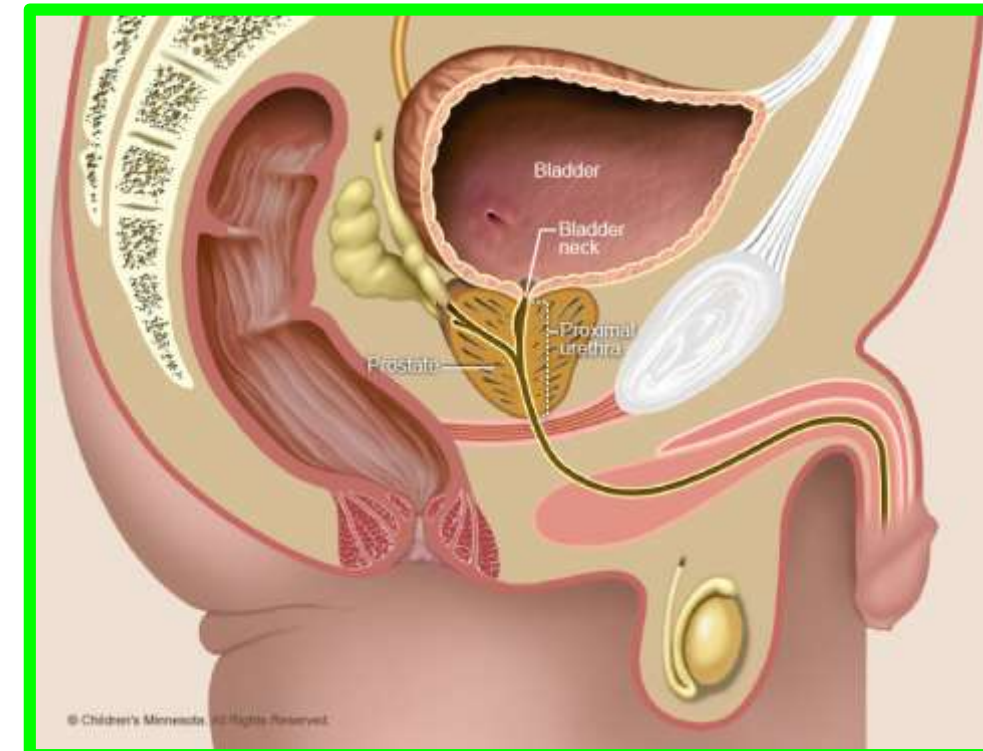
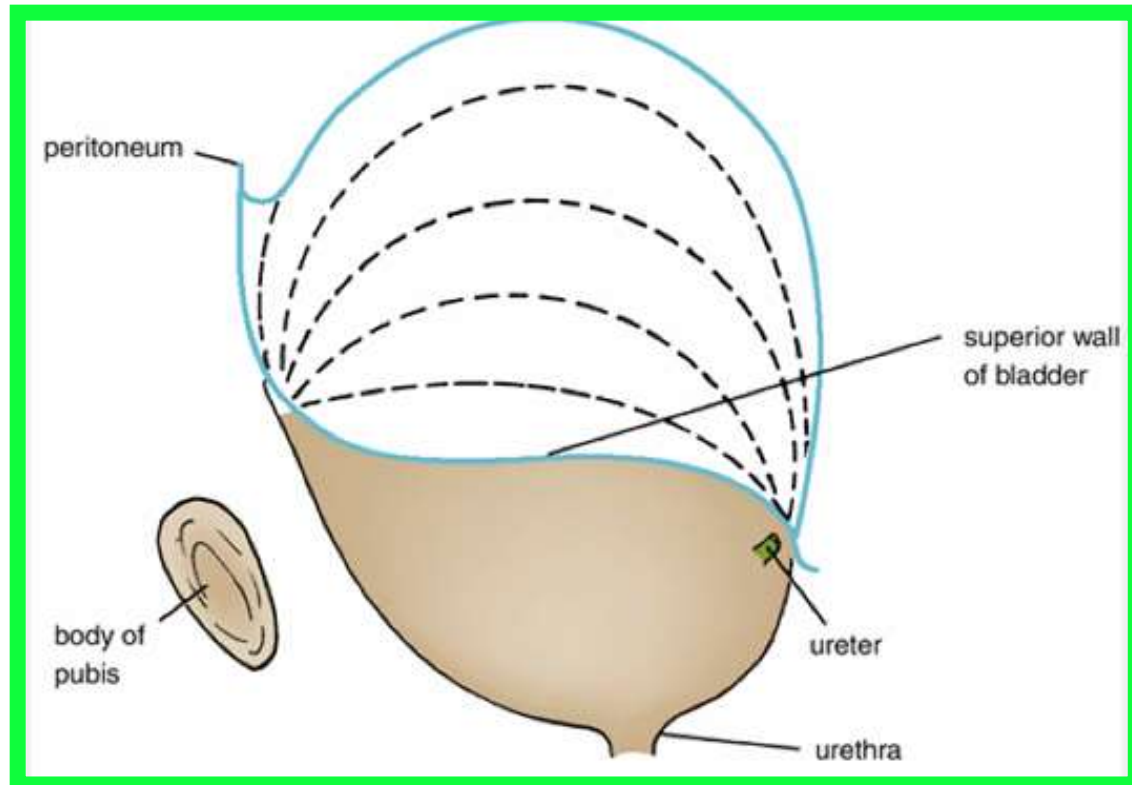
**College of Medicine / University of Mutah**

**Sunday 7 May 2023**

# Urinary Bladder

## \*\* Site:

- 1- During childhood, it is an abdominal organ because the pelvis is narrow.
  - 2- At puberty, it lies in the pelvic cavity.
- ❖ When the bladder is distended, it raises upwards above the upper border of the symphysis pubis and comes into direct contact with the anterior abdominal wall.
  - ❖ a full bladder may ascend to the level of the umbilicus.

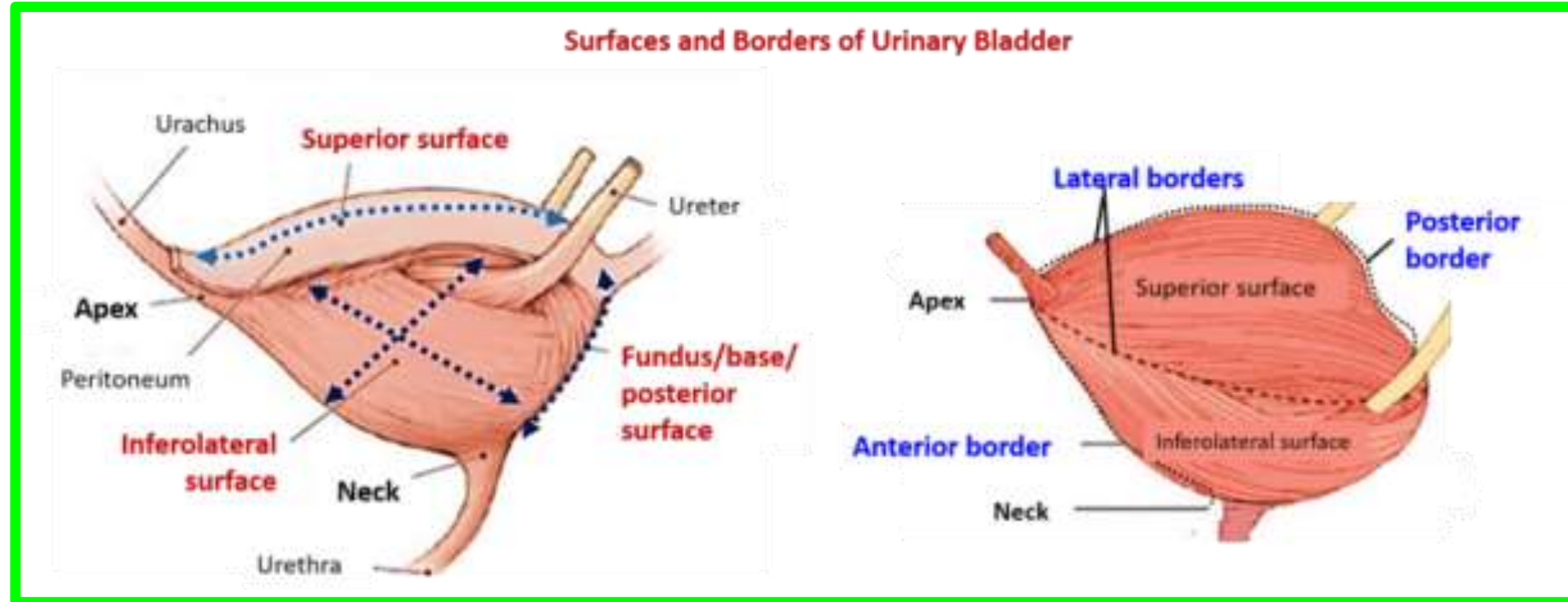


# Urinary Bladder

**\*\* Size:** the average capacity of the bladder is **250 cc** but it can accommodate up to **500 cc** of urine without discomfort. The walls of the bladder are composed chiefly of **the detrusor muscle**.

**\*\* Shape and surfaces:**

- When the bladder is hardened in situ, it has the shape of a **four-sided pyramid**.



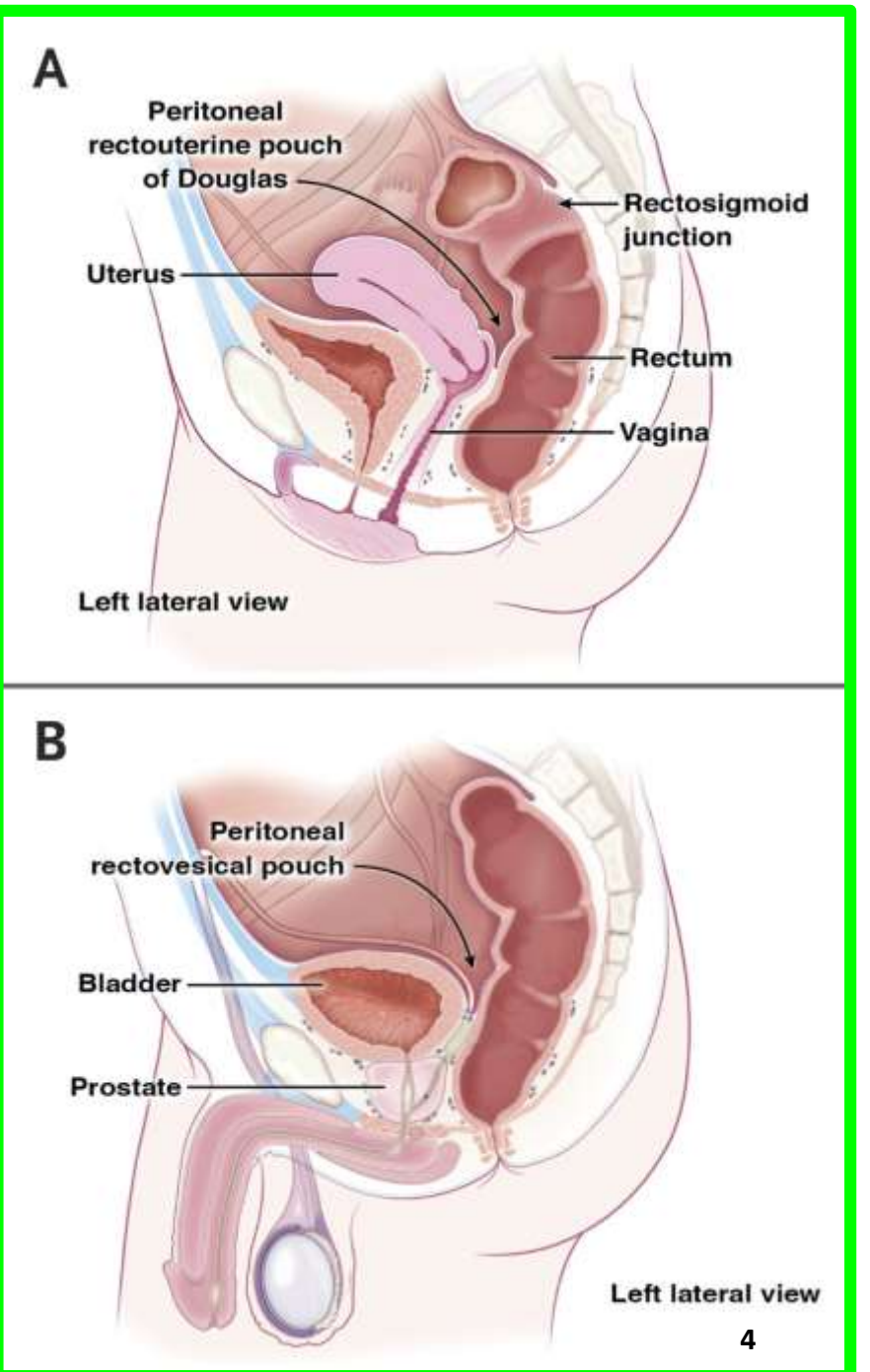
- It has **4 surfaces**, **superior**, **posterior (base)** and right and left **inferior-lateral**.
- **4 angles**, anterior (**apex**), inferior (**neck**), and 2 **posterior-superior**.

# Urinary Bladder

## \*\* Peritoneal covering:

**a- In male** the peritoneum covers the superior surface and upper part of the base.  
- The reflection of the peritoneum from the rectum to the upper part of the base forming **the recto-vesical pouch.**

**b- In female** only the superior surface is covered by peritoneum.  
- The reflection of the peritoneum from the uterus to the superior surface of the bladder forming **the utero-vesical pouch.**



# Urinary Bladder

## \*\* Relations of the urinary bladder:

### A- Relations of the surfaces

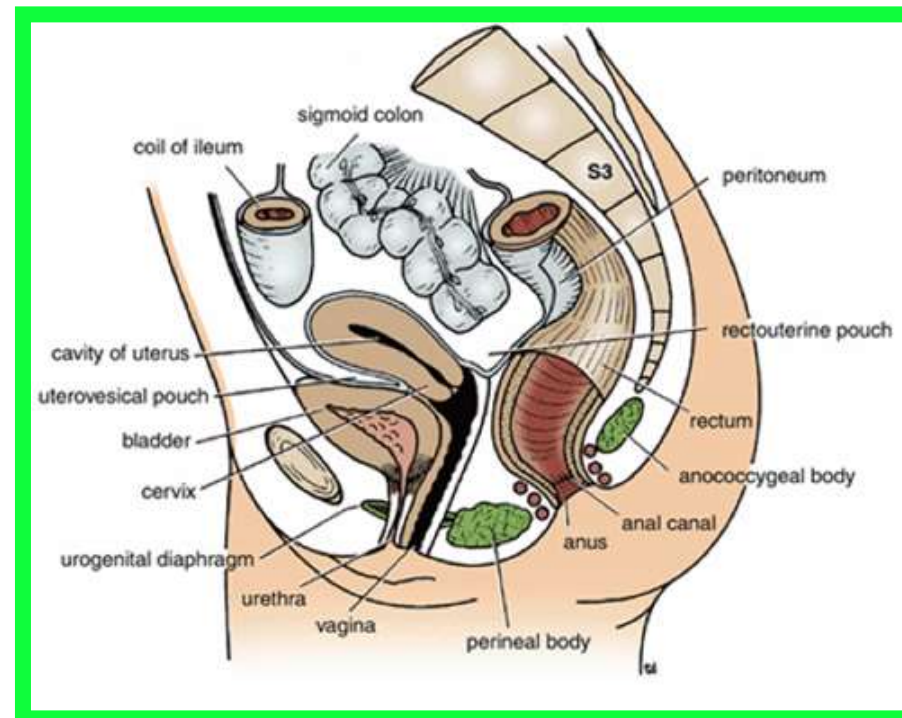
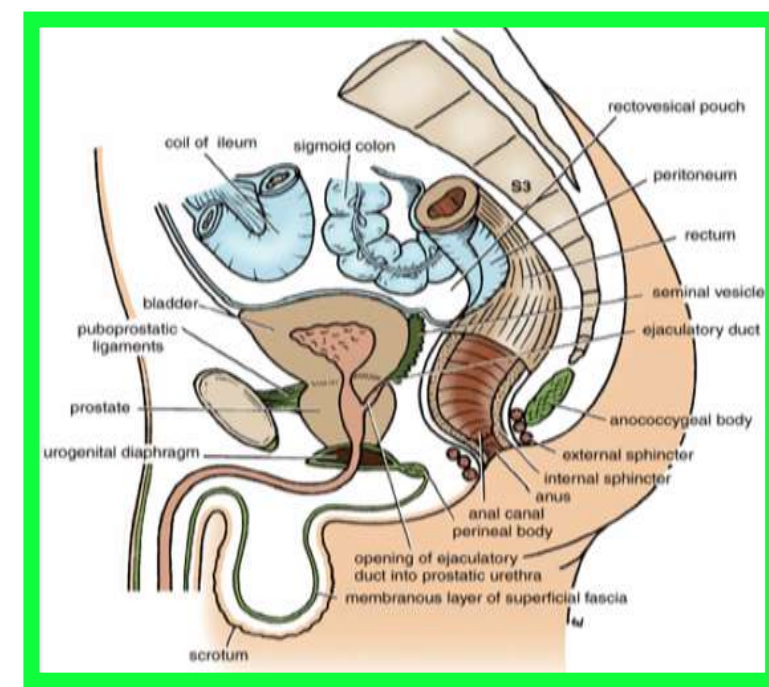
1- **Superior surface:** is covered by peritoneum

a- **In male:** It is related to

- 1) Sigmoid colon.
- 2) Coils of small intestine.

b- **In female:** It is related to

- 1) Anterior surface of the uterus.
- 2) Coils of small intestine.



# Urinary Bladder

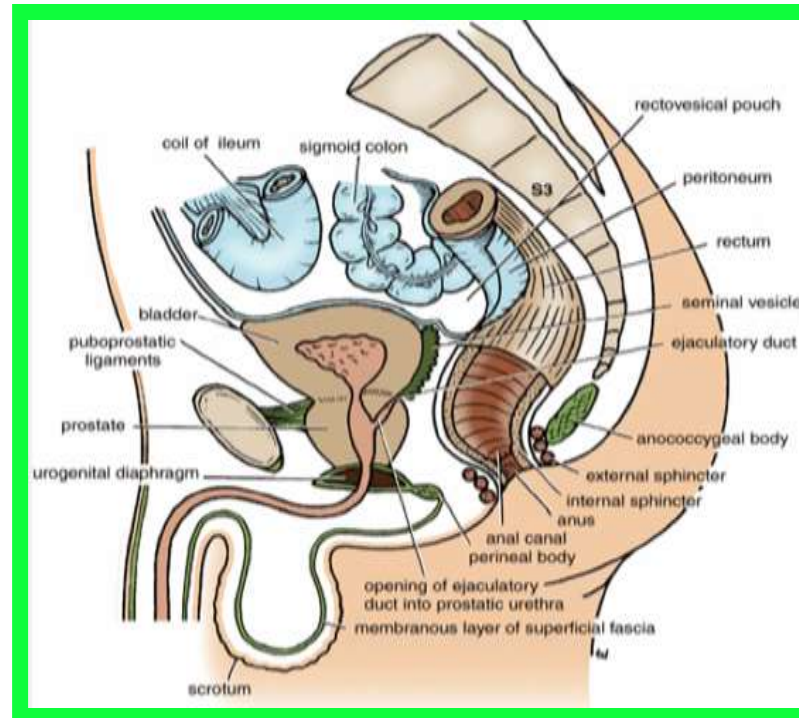
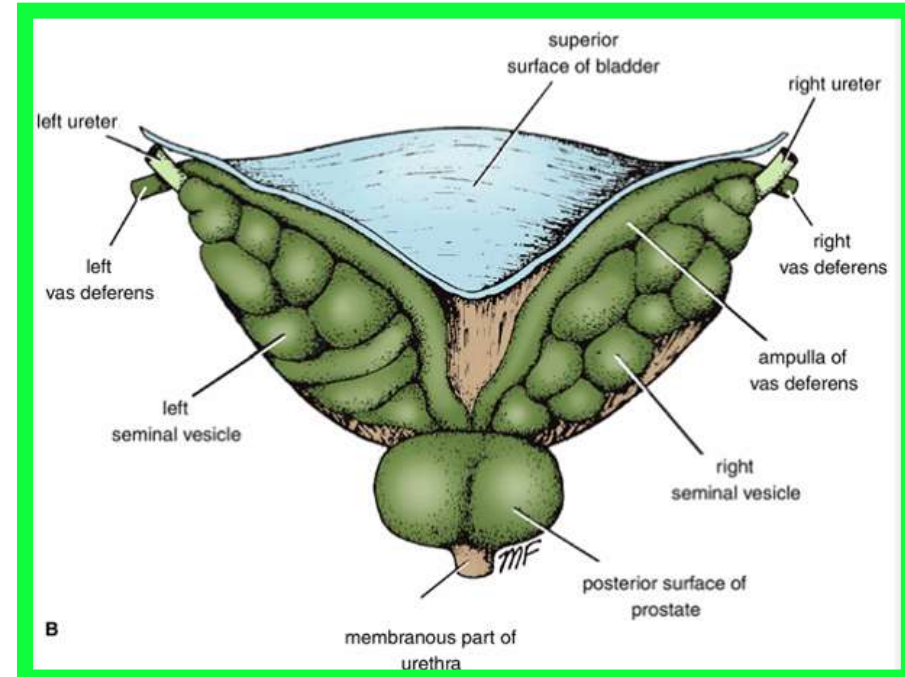
2- Base (posterior surface) of the urinary bladder;

a- In male:

1- The upper part is covered by peritoneum of the rectovesical pouch containing coils of small intestine.

2 - The lower part is related to the rectum separated from it by

- 1) 2 Seminal vesicles.
- 2) 2 Ampulla of the vas deference.
- 3) 2 Ejaculatory ducts.

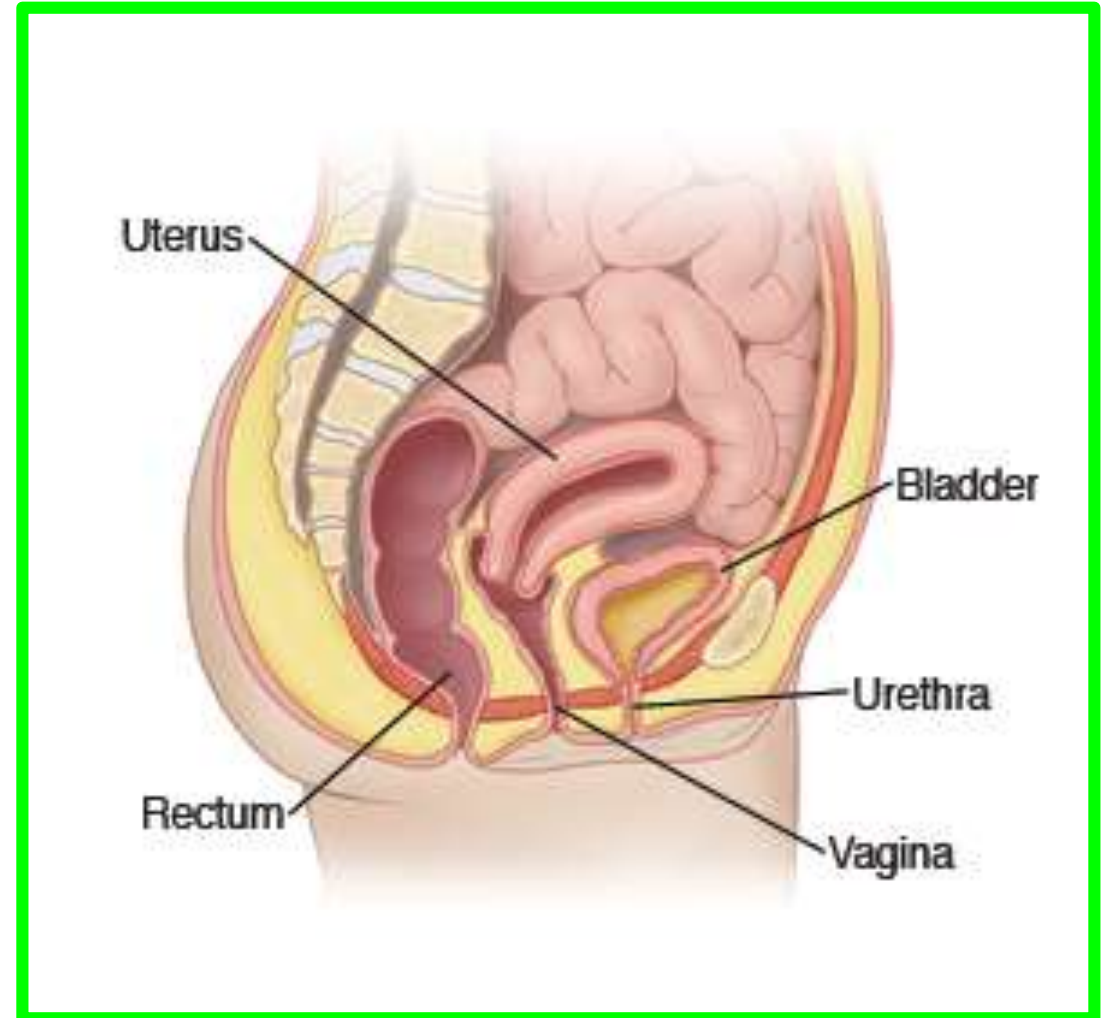


# Urinary Bladder

**b- In female:** has no peritoneal covering

- It is related to the rectum separated from it by

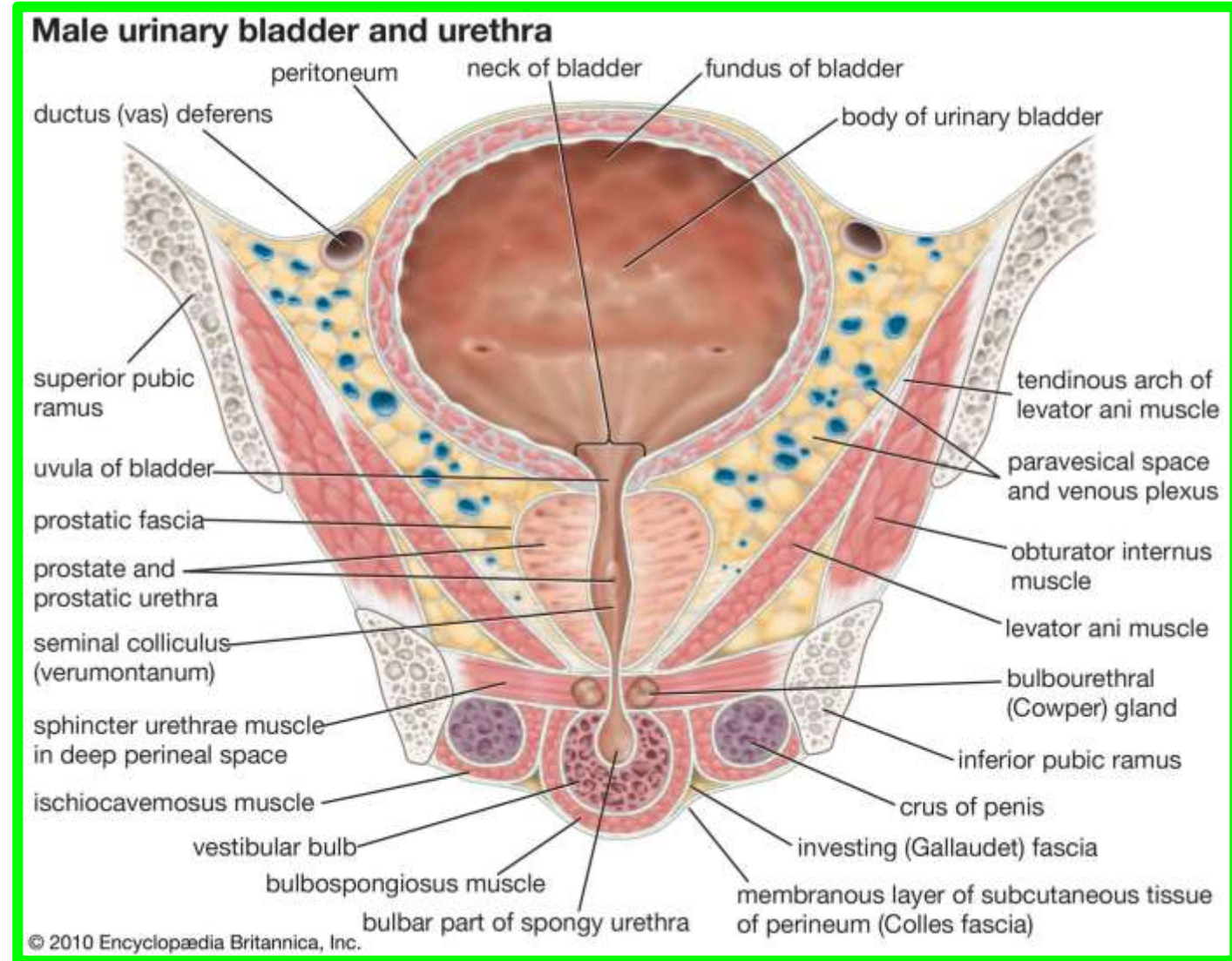
- 1) Cervix of the uterus.
- 2) Anterior wall of the vagina.



# Urinary Bladder

3- **Two Inferolateral surfaces:** have no peritoneal covering and related to;

- 1- Retropubic pad of fat.
- 2- Obturator internus muscle.
- 3- Levator ani muscle.



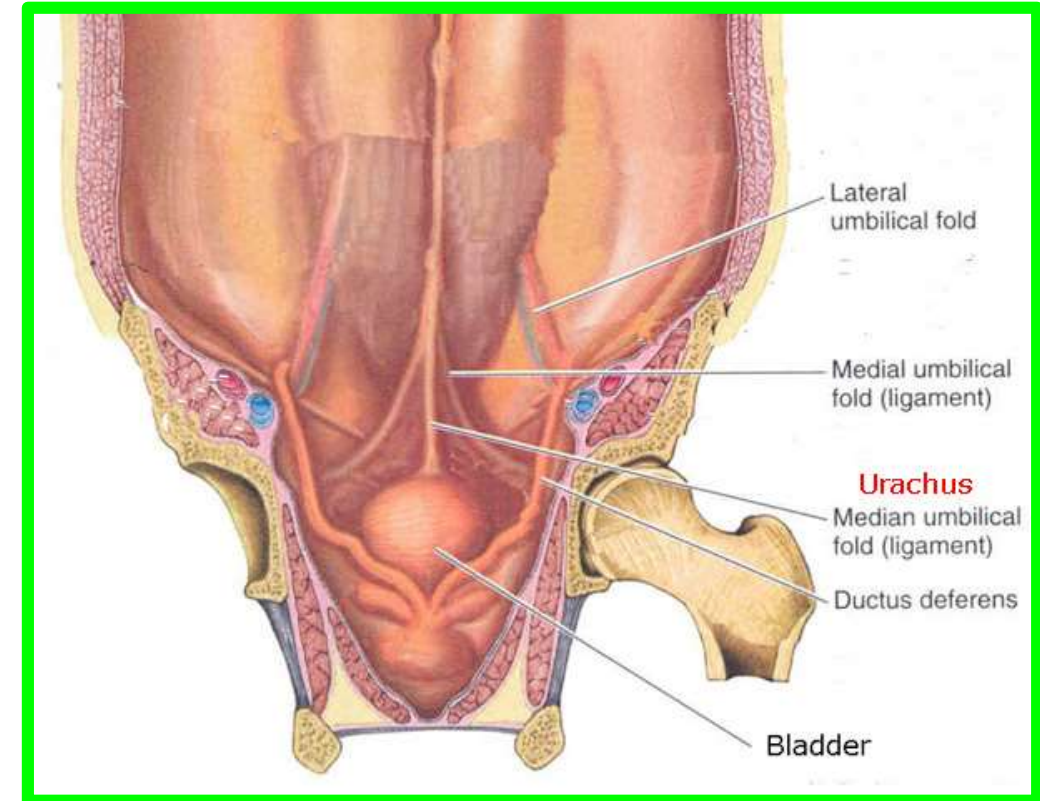
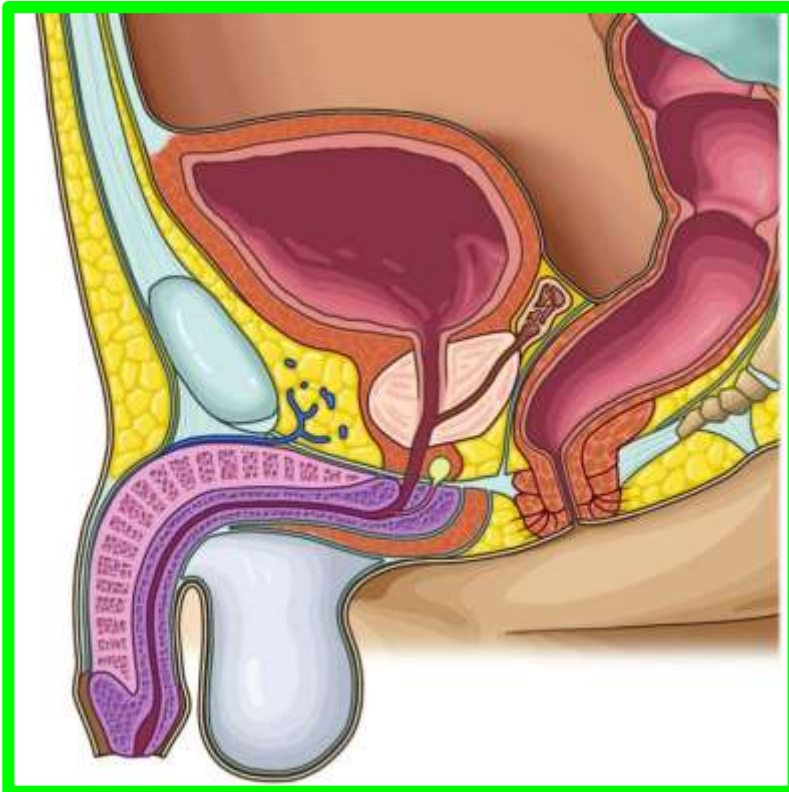


# Urinary Bladder

## B- Relations of the angles:

### 1- Apex:

- It is directed anteriorly and lies behind **the upper border of the symphysis pubis**. It is separated from these bones by the potential **Retropubic space (of Retzius)**
- It is continuous with the umbilicus by a **median umbilical ligament**.



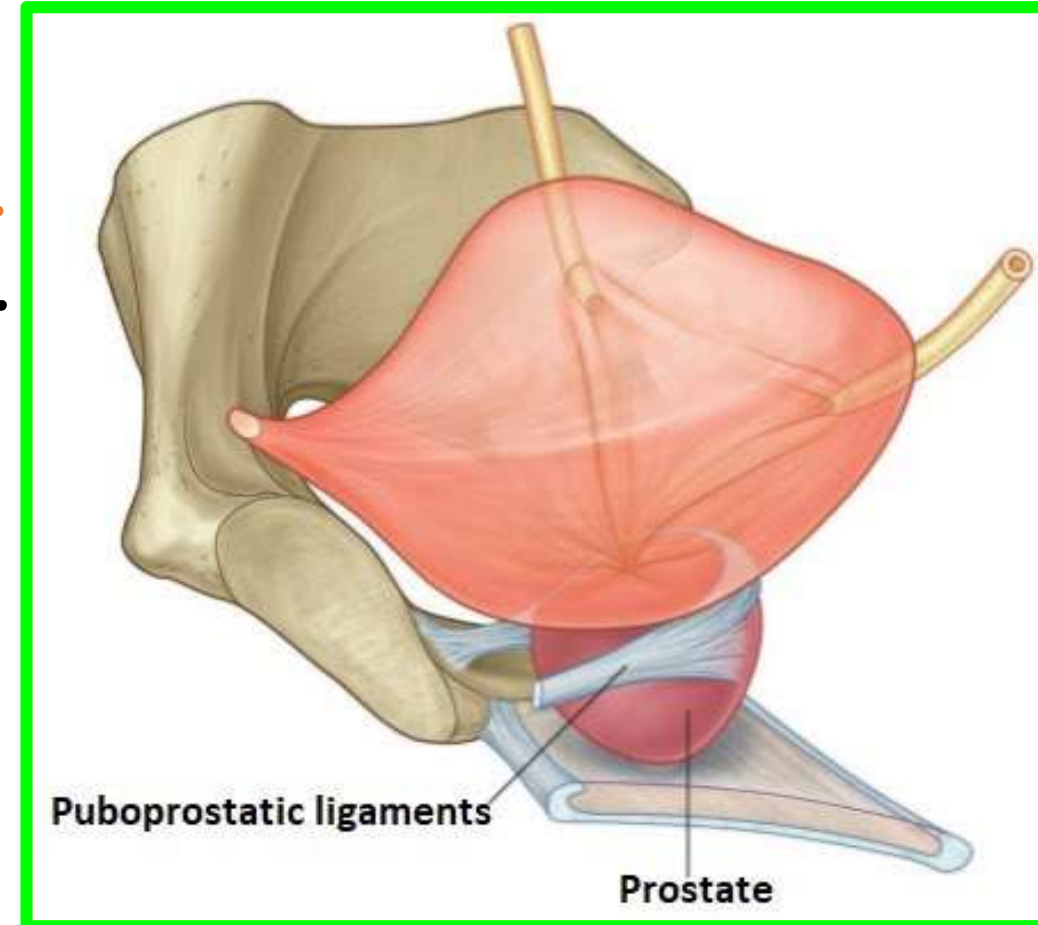
# Urinary Bladder

## 2- Neck (inferior angle):

- It lies **1.5 inches** behind the lower part of the symphysis pubis.
- It is pierced by internal urethral orifice.

## a- In male:

- Inferiorly; it rests on **the base of the prostate gland.**
- Anteriorly; attached to **the pubo-prostatic ligament.**
- Posteriorly, related to **the ejaculatory duct.**

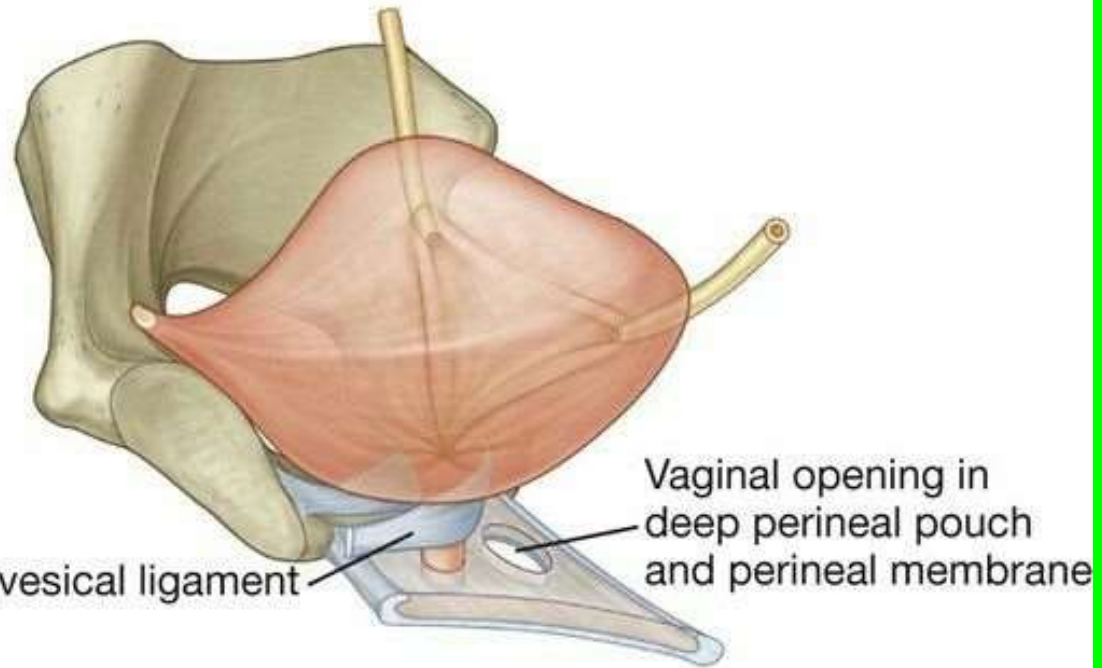
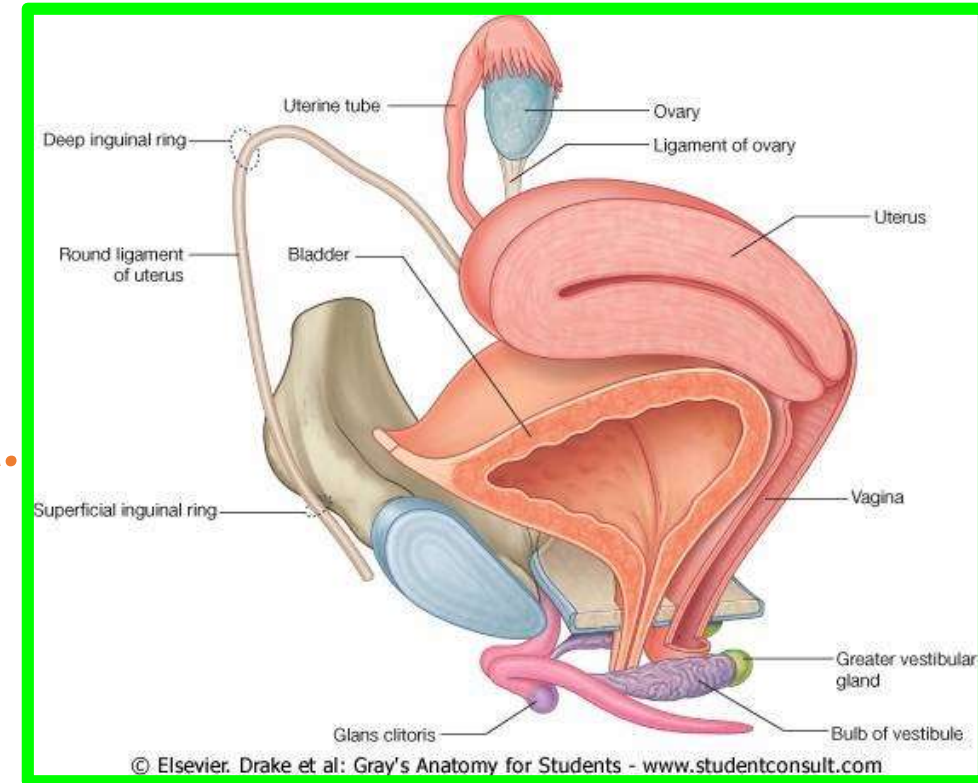


# Urinary Bladder

## b- In female:

- Inferiorly; it rests on **the pelvic fascia**.
- Anteriorly, attached to **the pubo-vesical ligament**.
- Posteriorly, related to **the anterior wall of the vagina**.

## 3- Postero-superior angles receive the ureters.

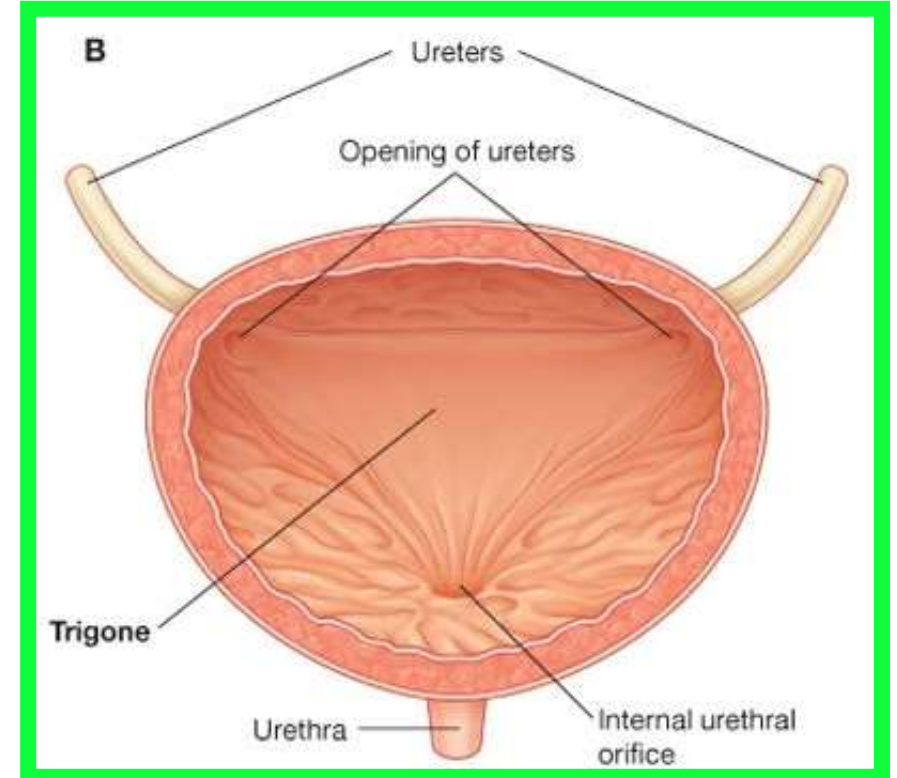
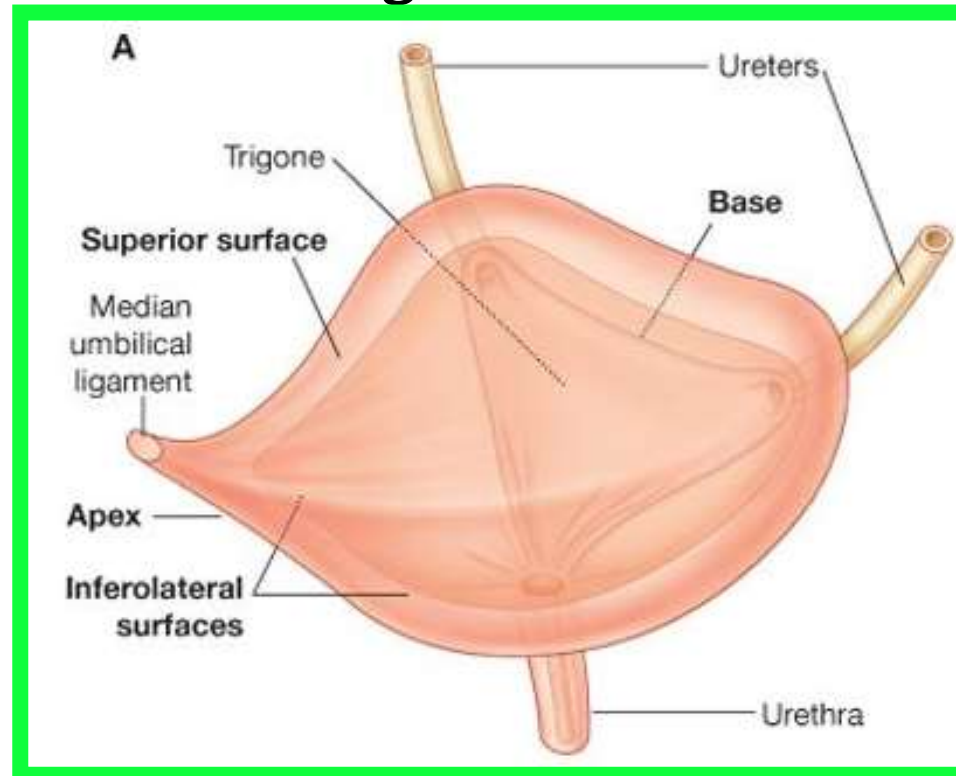


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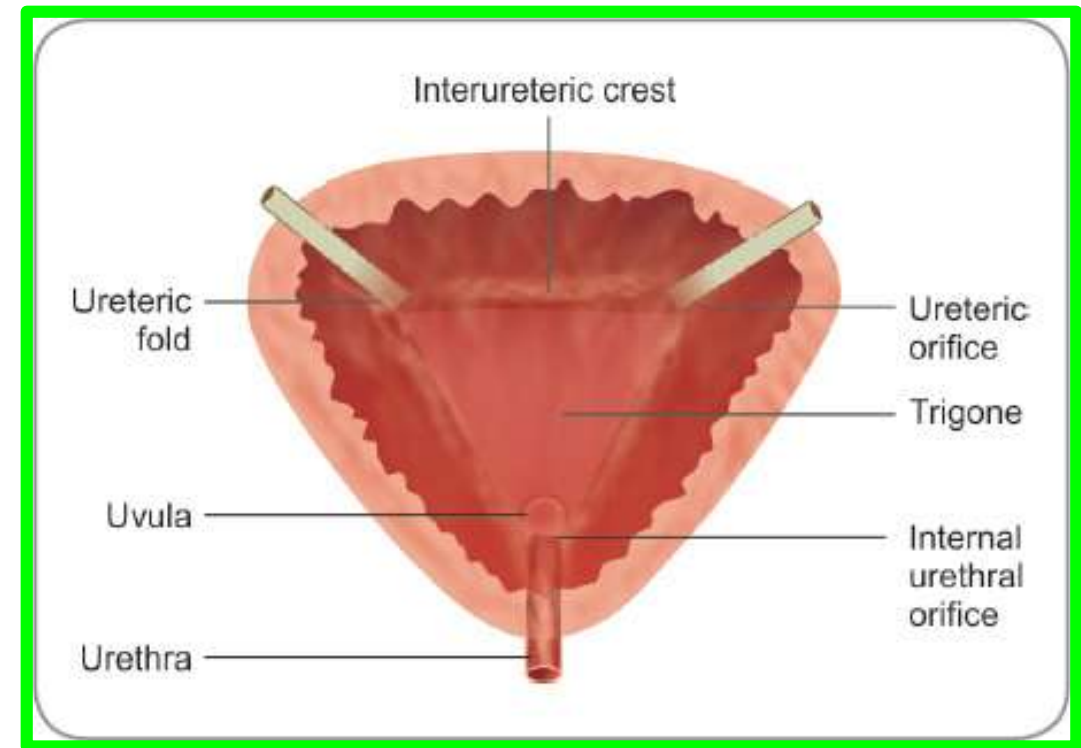
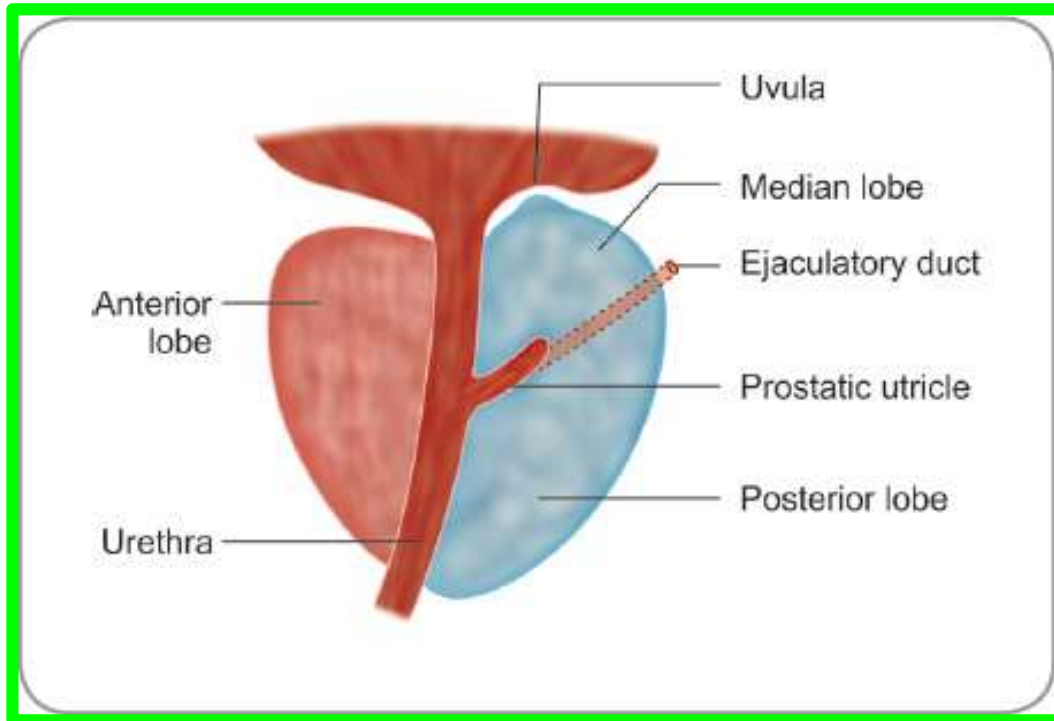
## \*\* Interior (mucosa) of the bladder:

- It is lined by **transitional epithelium** and **shows folds** except the trigone.
- **Trigone** (mesodermal in origin)
  - This is a **triangular area** on the posterior wall of the bladder wall.
  - It is bound by **3 lines** connecting the **2 ureteric orifices** and the **internal urethral orifice**



# Urinary Bladder

- **Interureteric ridge** between the **2 ureteric orifices**, forms the base of the trigone.
- **Internal urethral meatus** is situated **at the apex** of the trigone.
- In male, **Uvula** of the bladder is a slight elevation behind the internal urethral meatus. It is produced by the median lobe of the prostate.



- The mucosa of trigone is **smooth, vascular, elastic, and sensitive.**

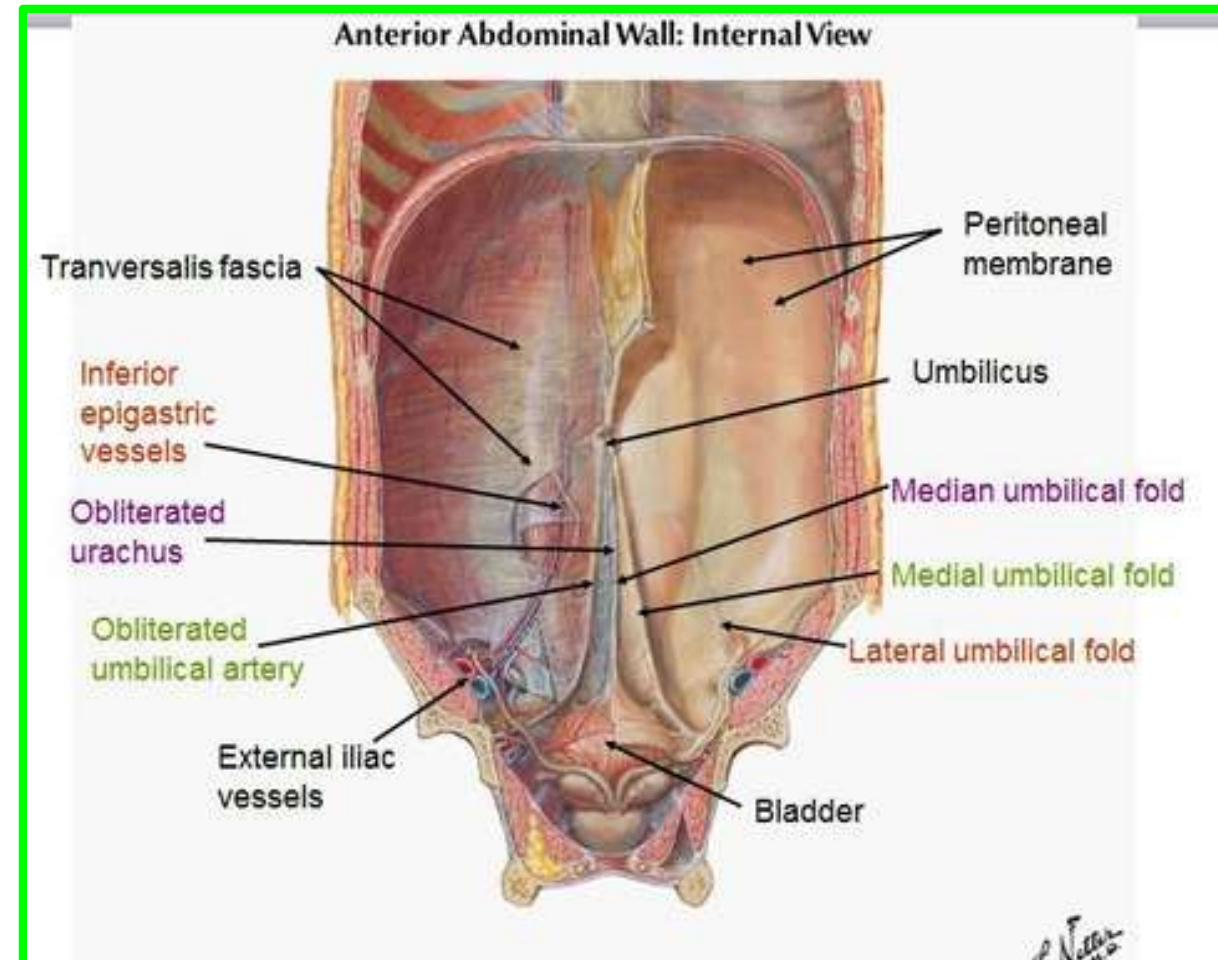
# Urinary Bladder

## \*\* Ligaments of the urinary bladder:

### A- True ligaments;

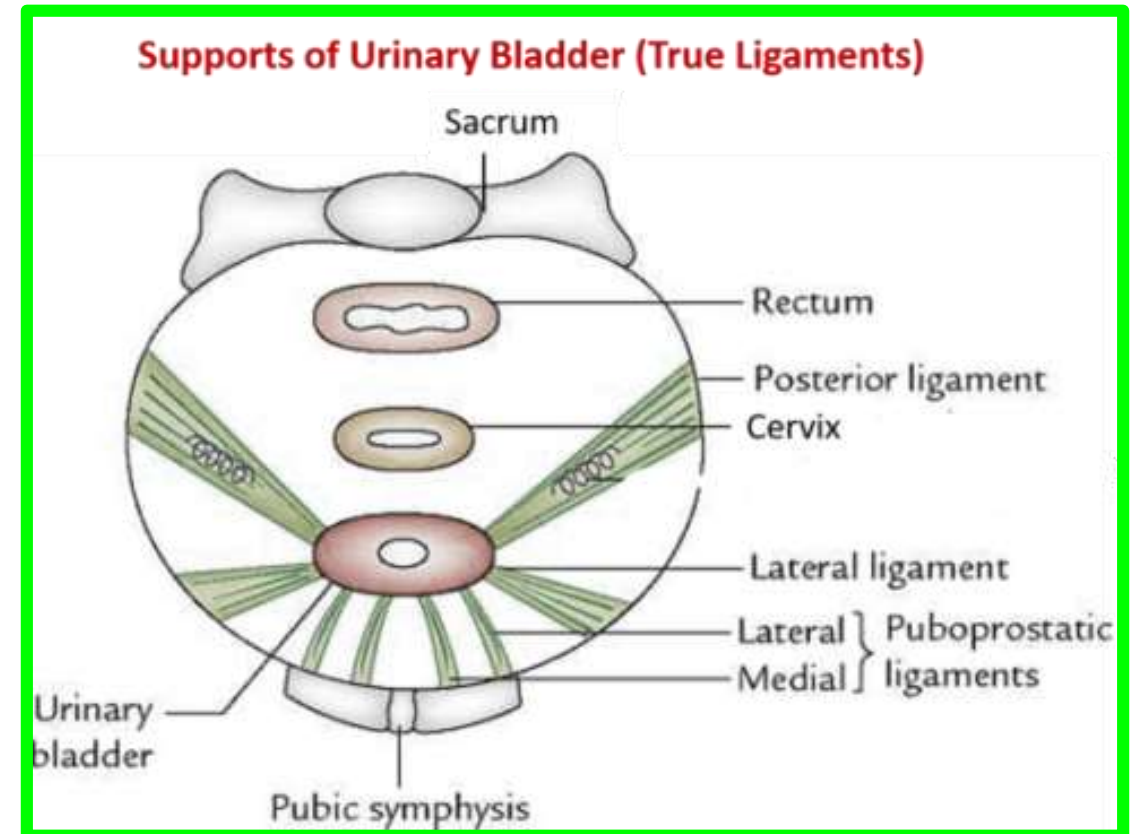
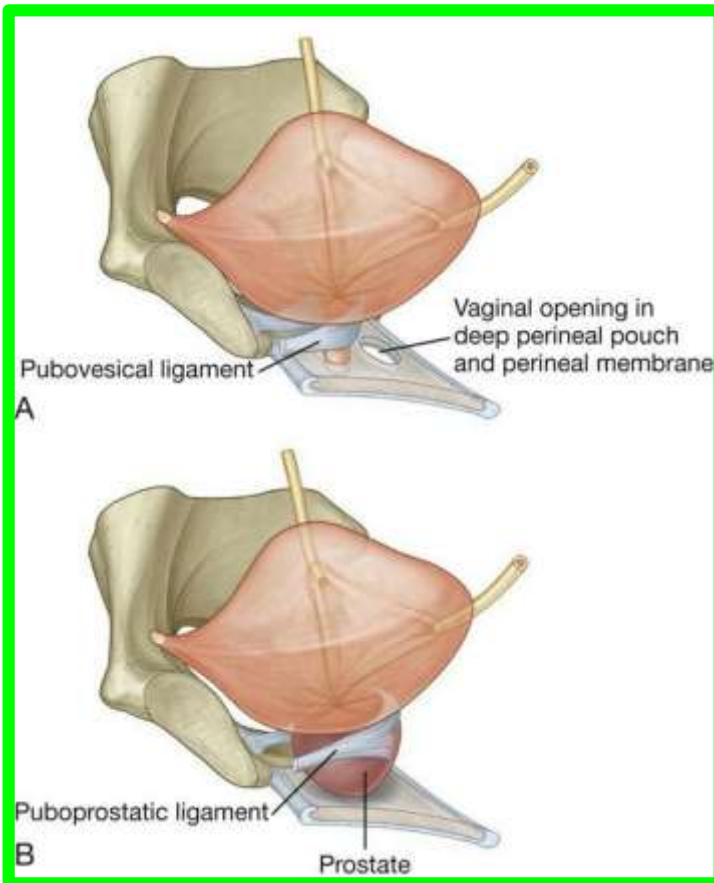
1- **Median umbilical ligament (obliterated urachus)** extending from the apex to the umbilicus.

2- **Two medial umbilical ligaments, obliterated umbilical arteries.**



# Urinary Bladder

- 3- Two Lateral true ligaments extend from the side of the bladder to the side of the pelvis.
- 4- Posterior true ligament extends from the bladder to the sacrum.
- 5- Pubo-postatic (male) Pubo-vesical (female) ligament; from the back of the pubis to the neck of the bladder.

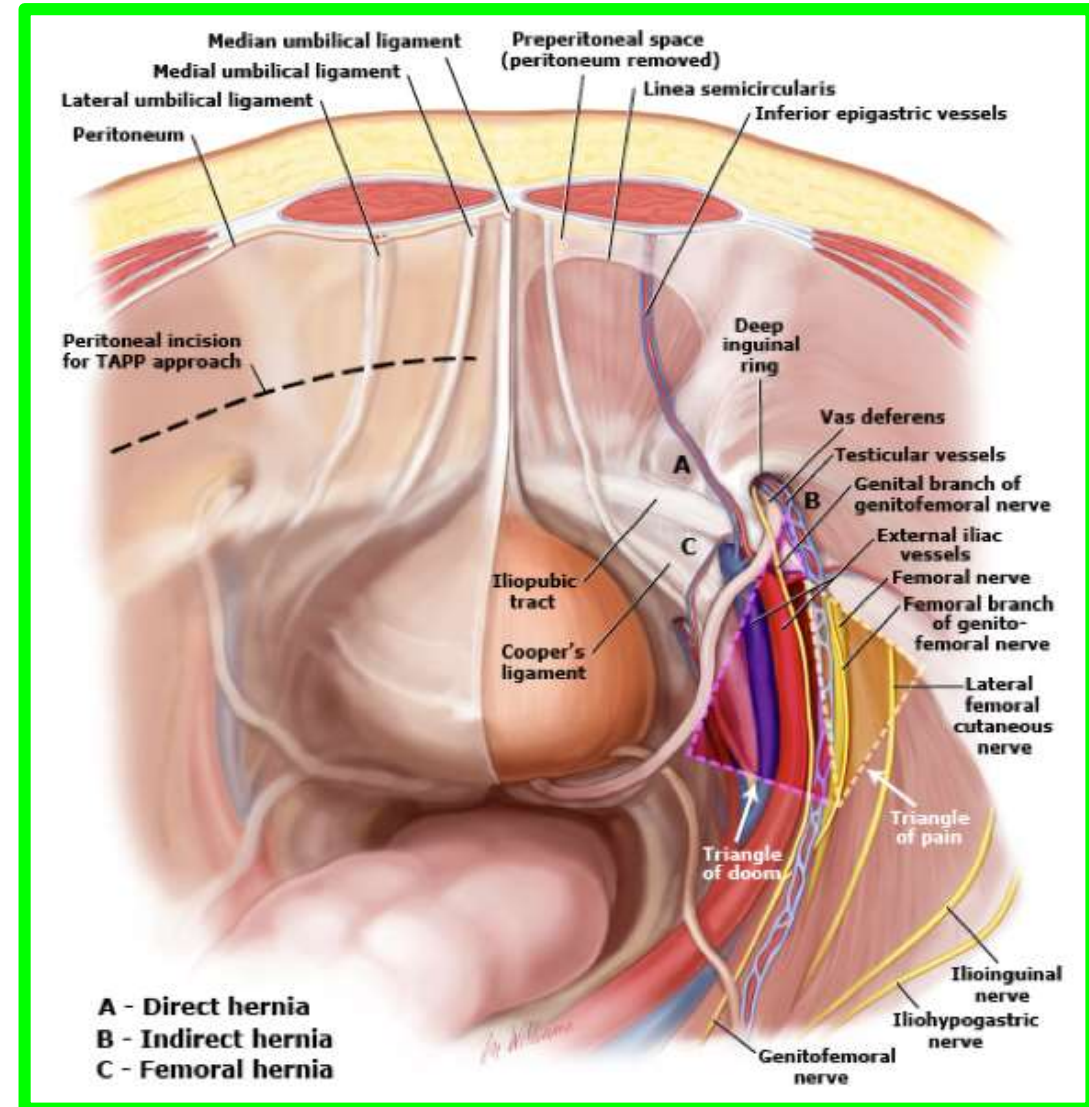


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# Urinary Bladder

B- False ligaments; made of the peritoneal folds covering the true ligaments.

- 1- Median umbilical fold.
- 2- Two medial umbilical folds.
- 3- Two lateral false ligaments.
- 4- Posterior false ligament.







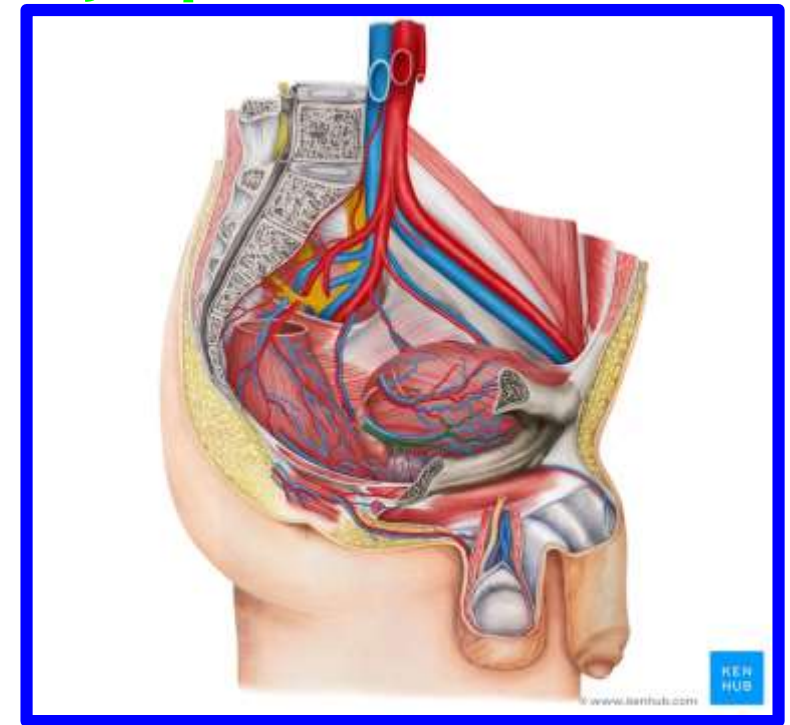
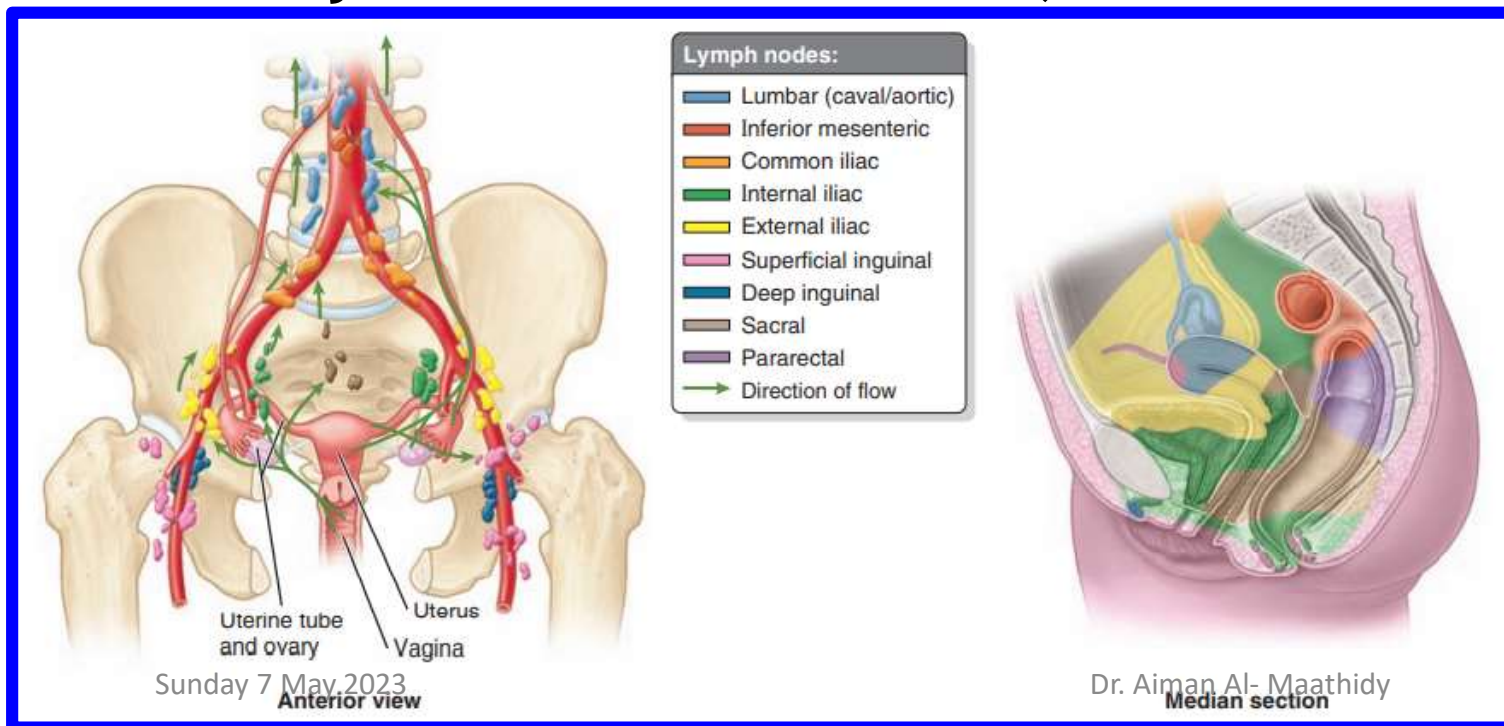
# Urinary Bladder

\* **Venous drainage:** The veins form a **venous plexus**; then drain into **the internal iliac vein**.

\*\* **Lymphatic drainage:**

1- Mostly into **the external iliac lymph nodes**.

2- Partly Into **the internal iliac, and common iliac lymph nodes**.



# Urinary Bladder

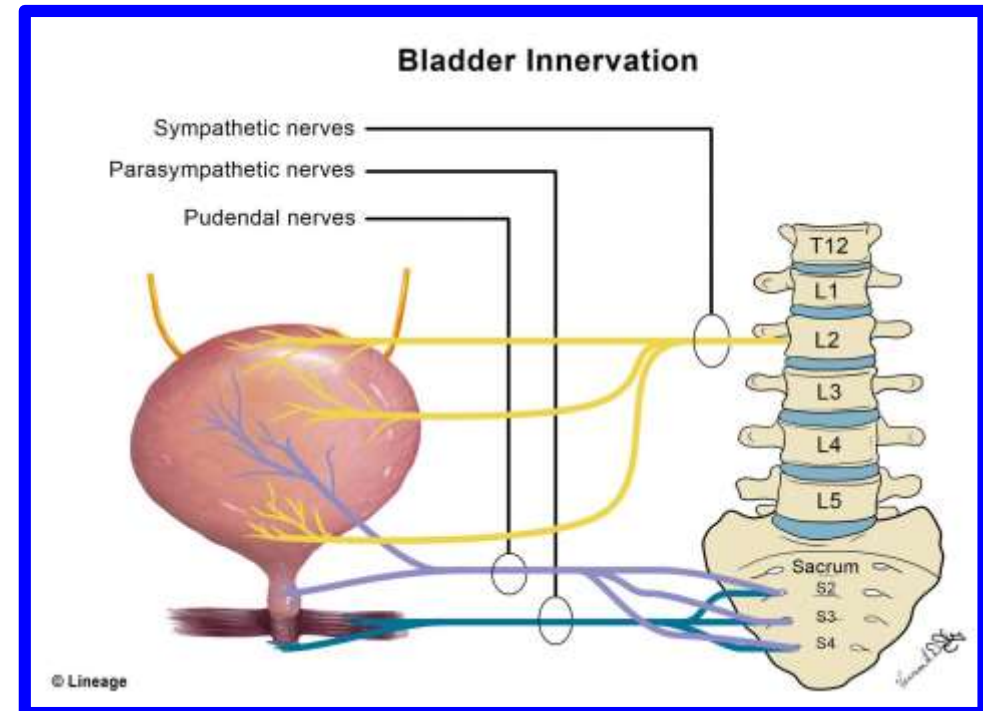
**\*\* Nerve supply:**

**a- Sympathetic from T11, 12 and L 1, 2 segments of the spinal cord.**

- It is inhibitory to the muscle wall and motor to the sphincter.

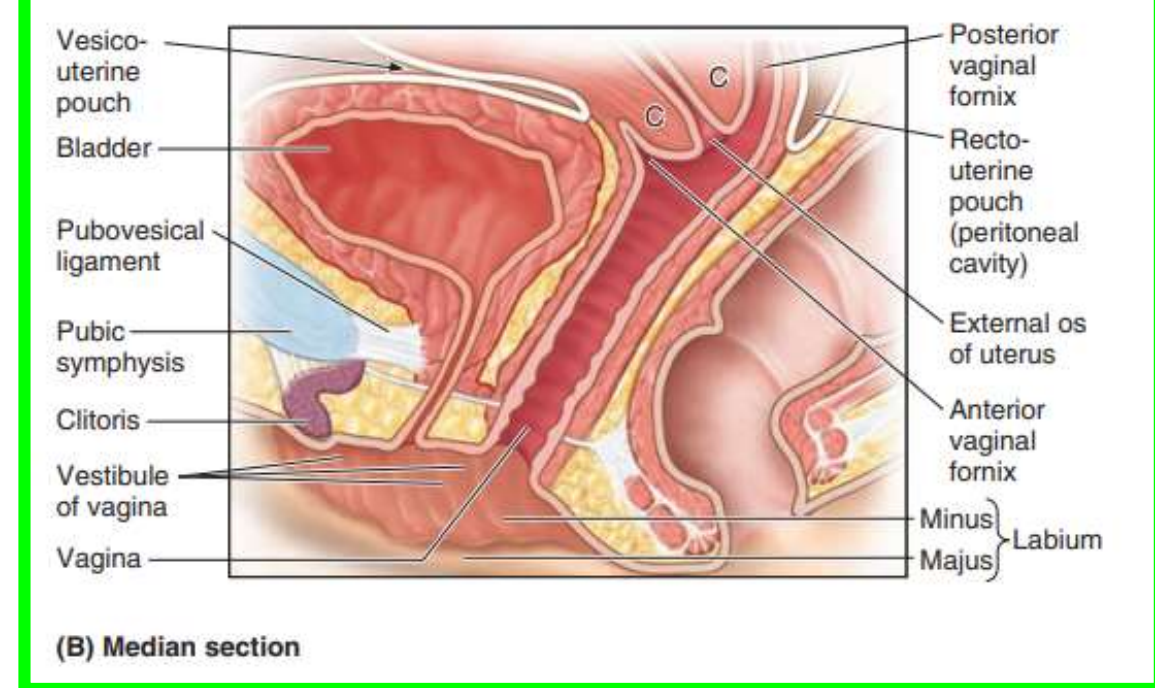
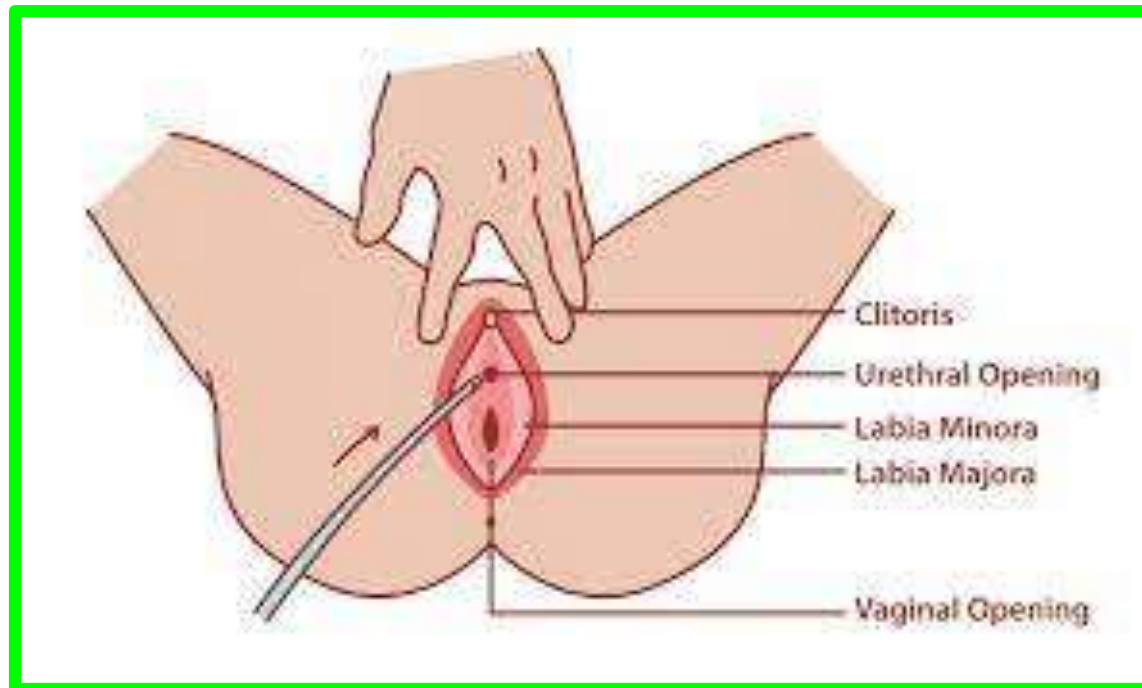
**b- Parasympathetic from S 2, 3, 4.**

- It is motor to the muscle wall and inhibitory to the sphincter (micturation).



# Female Urethra

- The female urethra is very short, approximately **4 cm long** and **6 mm in diameter**
- It is **wider and more dilatable** than the male urethra.
- It begins from the bladder neck at the **internal urethral orifice**, and descends downwards and forwards, traversing the deep perineal pouch.
- It opens by the **external urethral orifice** into **the vestibule of the vagina**.
- It is surrounded by **an internal urethral sphincter**.



# Male Urethra

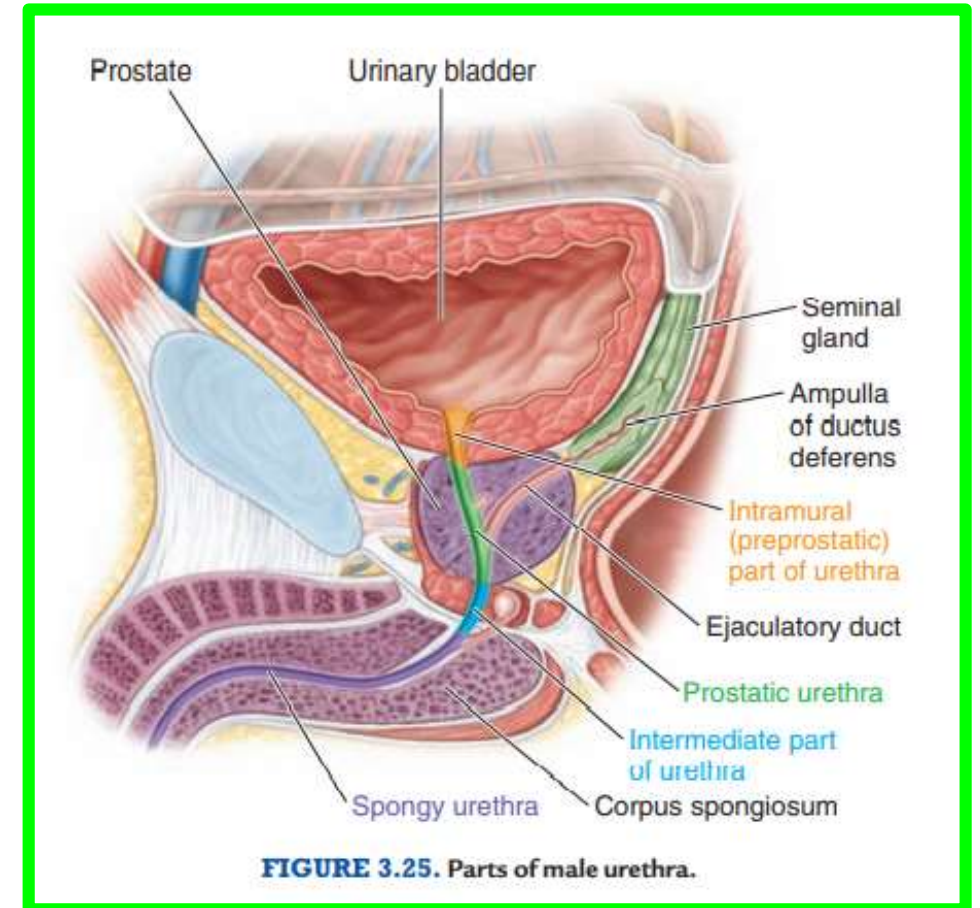
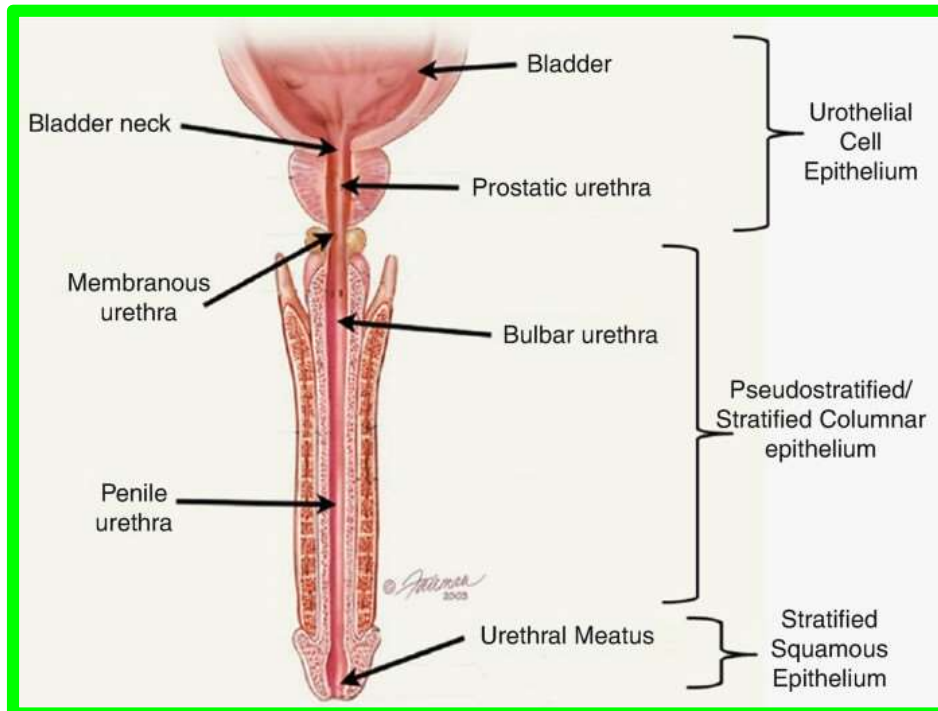
**\*\* Begins, from internal urethral orifice in the urinary bladder.**

**\*\* Ends: external urethral orifice at the tip of the glans penis.**

**- The narrowest point in the whole male urethra**

**\*\* Length: It is about 20 cm long.**

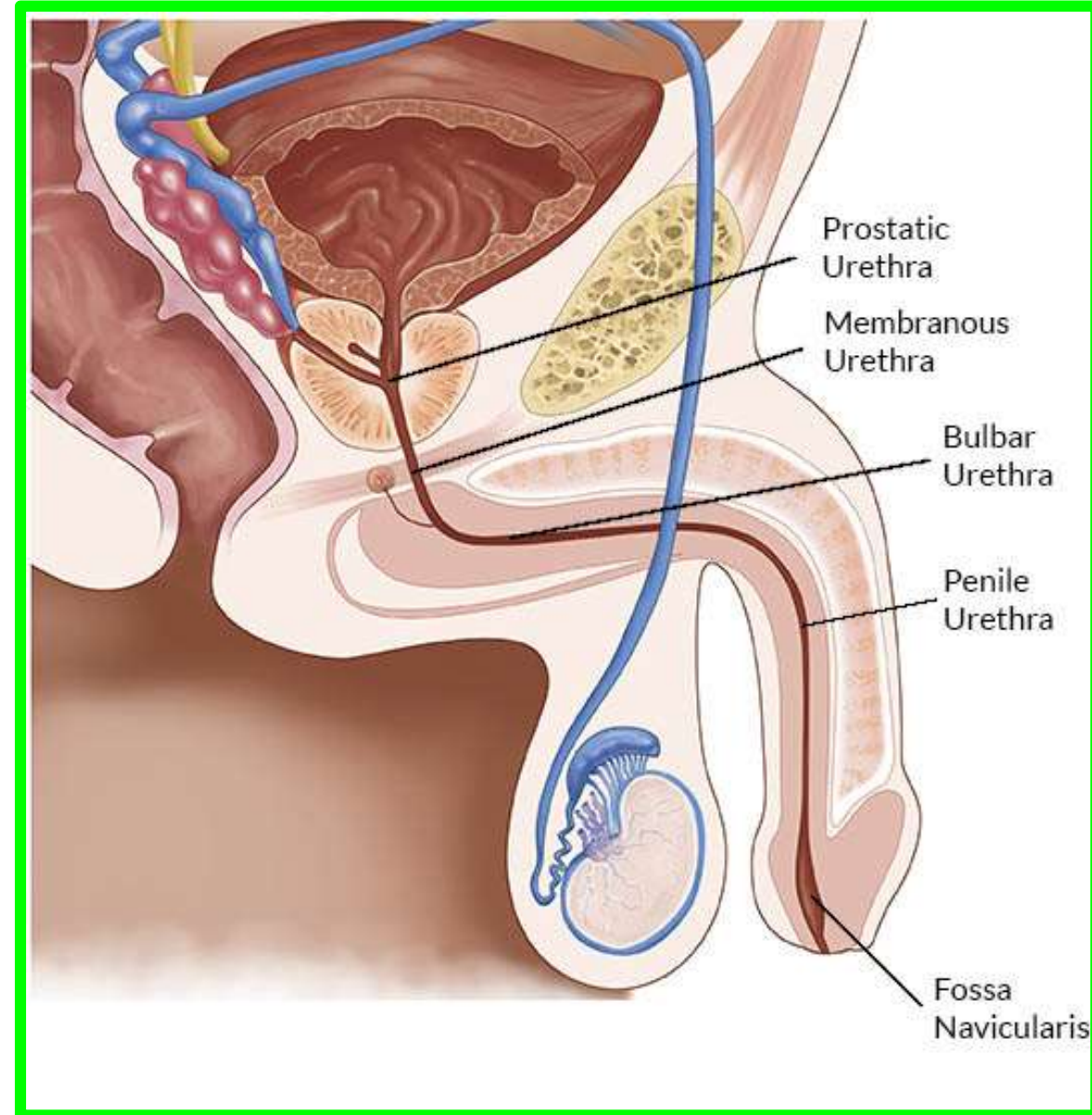
**\*\* Divisions (parts): It is divided into 3 parts**



# Male Urethra

I- Prostatic Urethra: about 3 cm long

- It pierces the **base of the prostate** and exits from its apex.
- It is **the widest and most dilatable division** of the male urethra.
- It lies **nearer the anterior surfaces** of the prostate.



# Male Urethra

- The posterior wall presents a number of features.

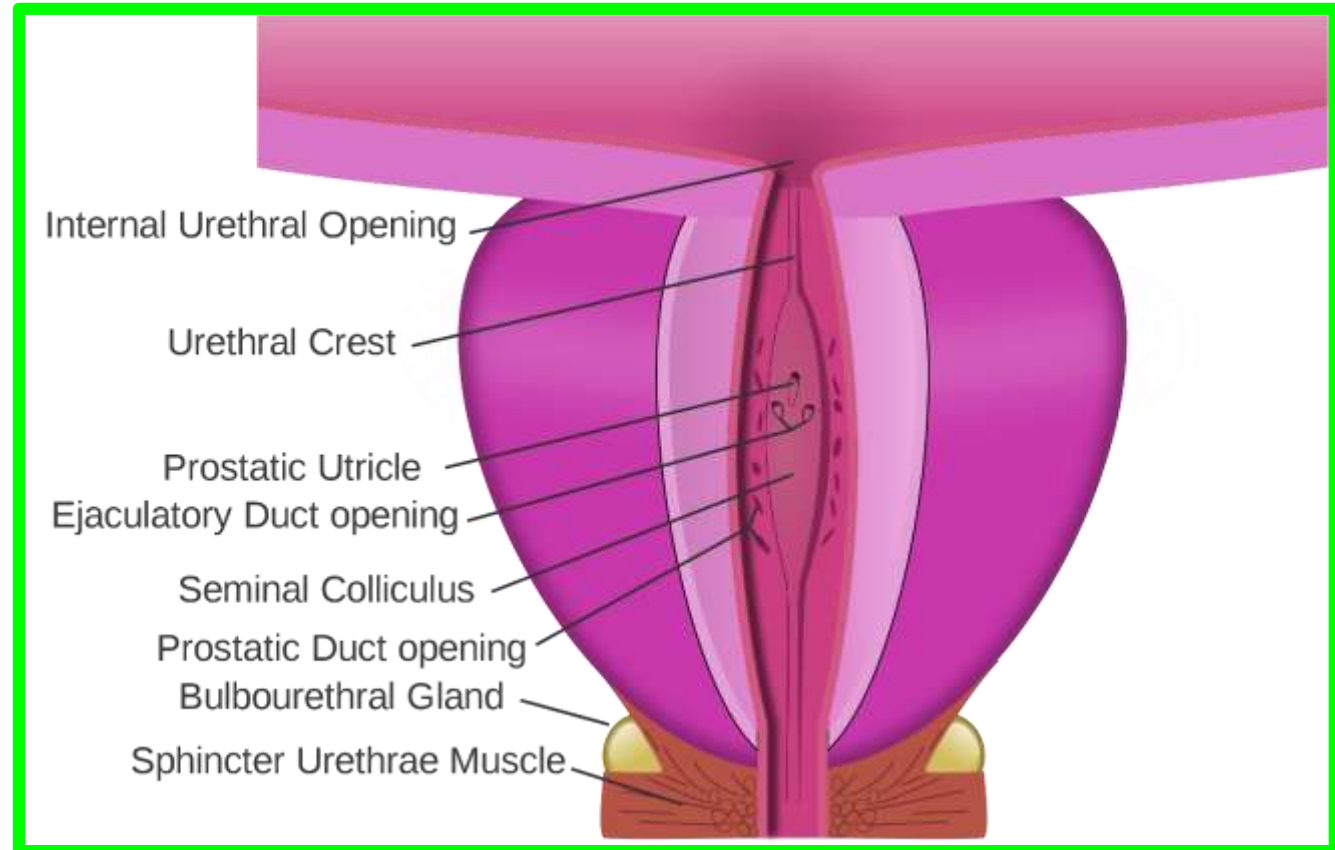
1- **Urethral crest**, a median longitudinal elevation.

2- **Prostatic sinuses**, shallow grooves around the urethral crest receiving the opening of the prostatic glands.

3- **Seminal colliculus** is a swelling in the middle of the urethral crest showing 3 openings;

a- The opening of the prostatic utricle (homologue the uterus in female).

b- 2 lateral openings of the ejaculatory ducts.



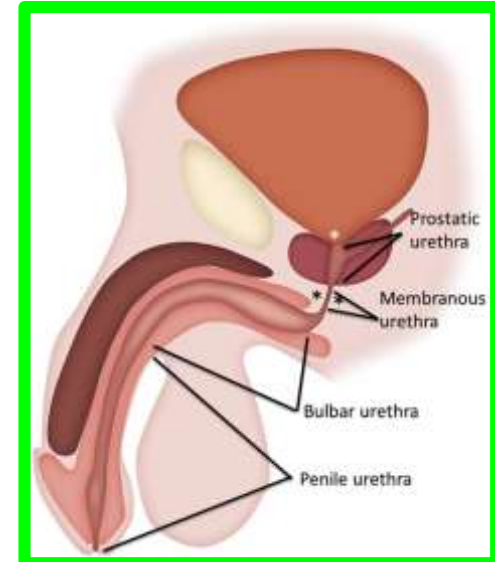
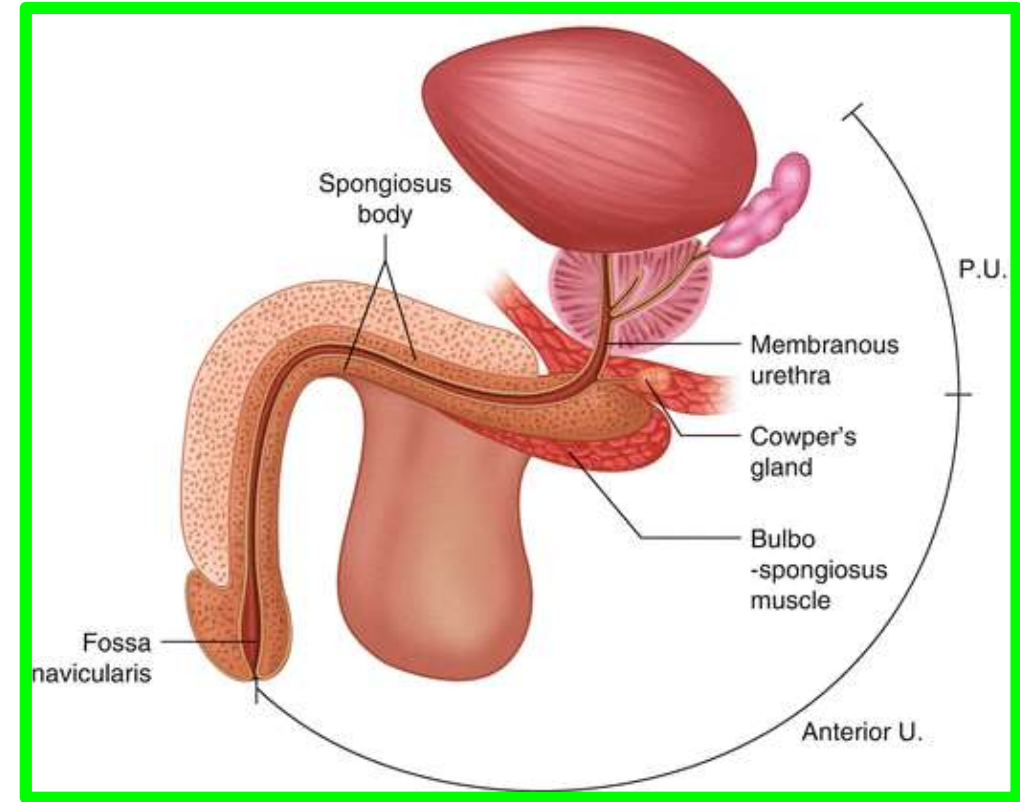
# Male Urethra

## II- Membranous Urethra: about 2 cm long

- It is the **narrowest division** of the male urethra.
- It **traverses deep perineal pouch**.
- It is surrounded by the **sphincter of the urethra**.

## III- Spongy (Penile) Urethra about 15 cm long

- It transverse the bulb of the penis and corpus spongiosum.
- It presents 2 dilatation
  - a. **Intrabulbar fossa**, at its beginning in the bulb.
  - b. **Fossa terminalis (navicularis)** at its termination in the glans.



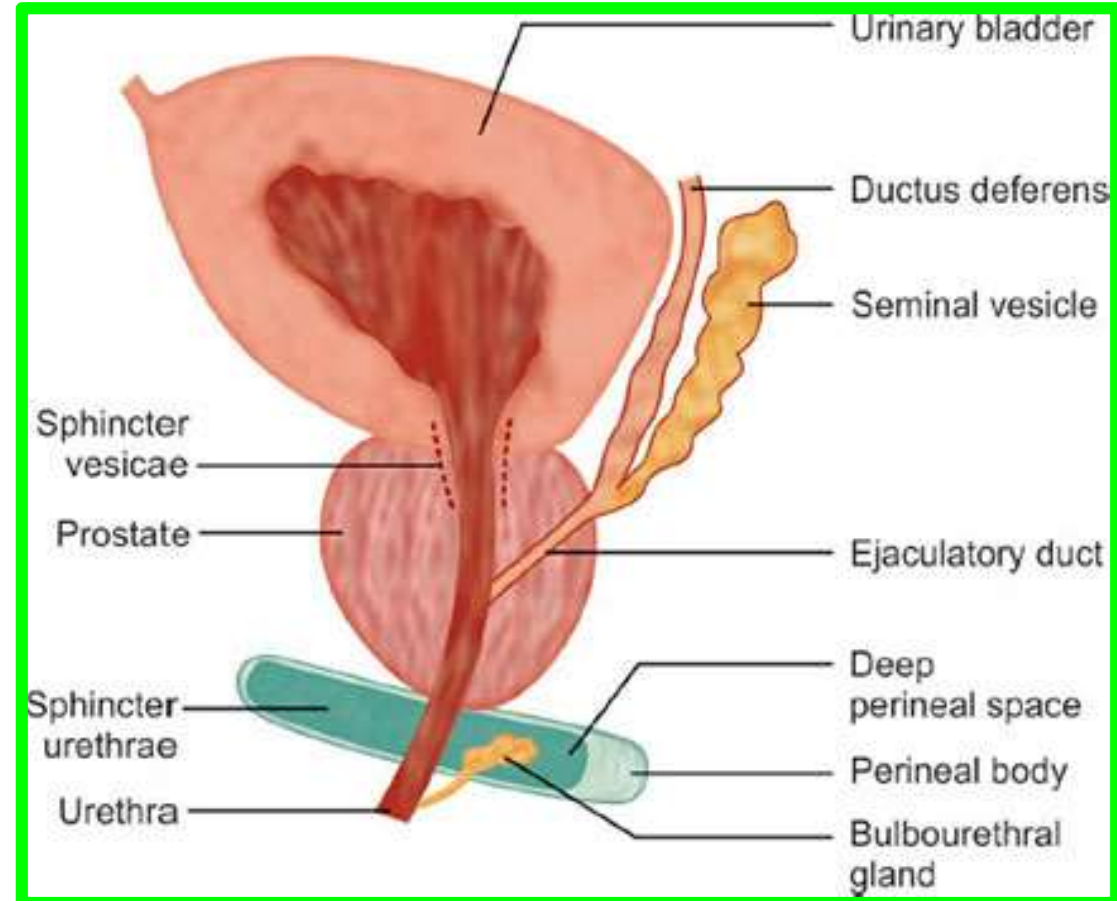


## \*\* Urethral sphincters:

### 1- Internal urethral sphincter (sphincter vesicae).

- It surrounds the neck of the bladder and the prostatic urethra above the opening of the ejaculatory ducts.

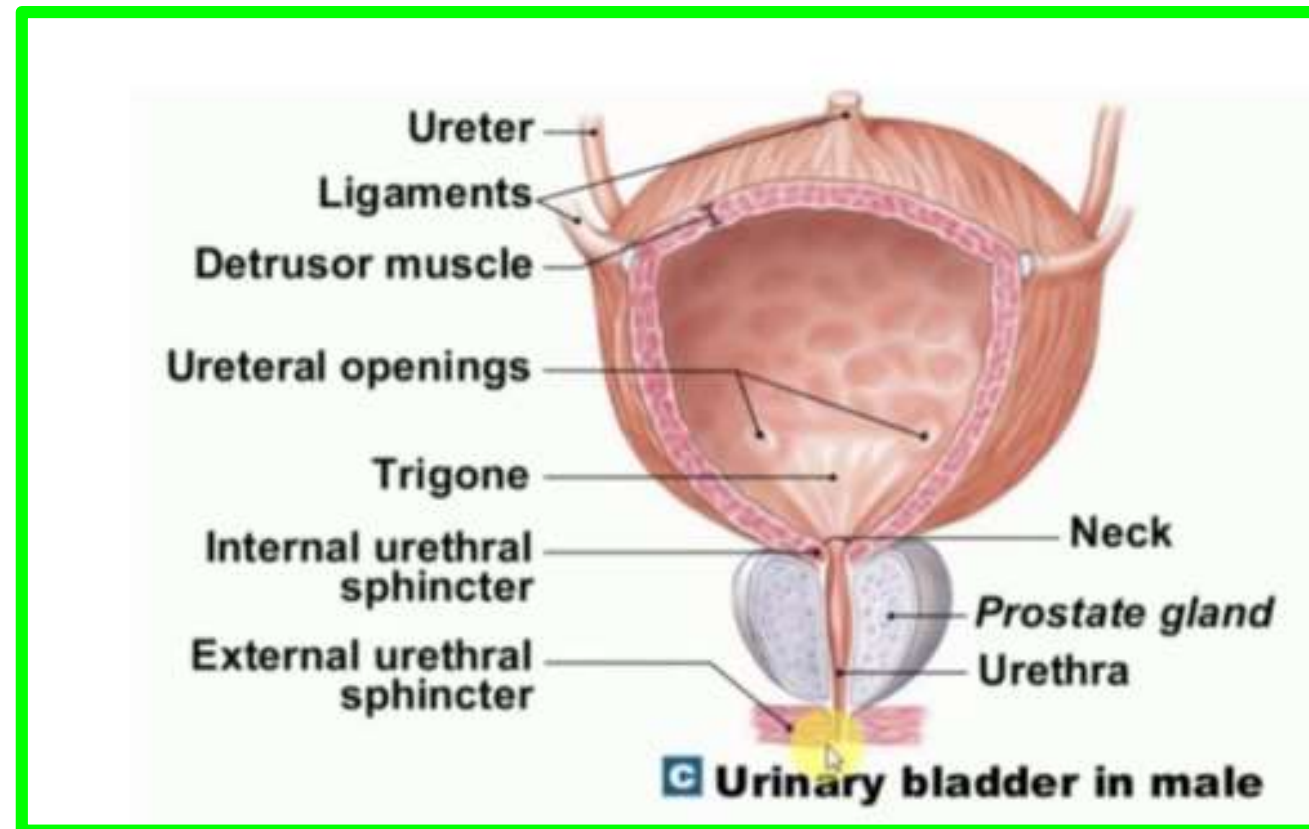
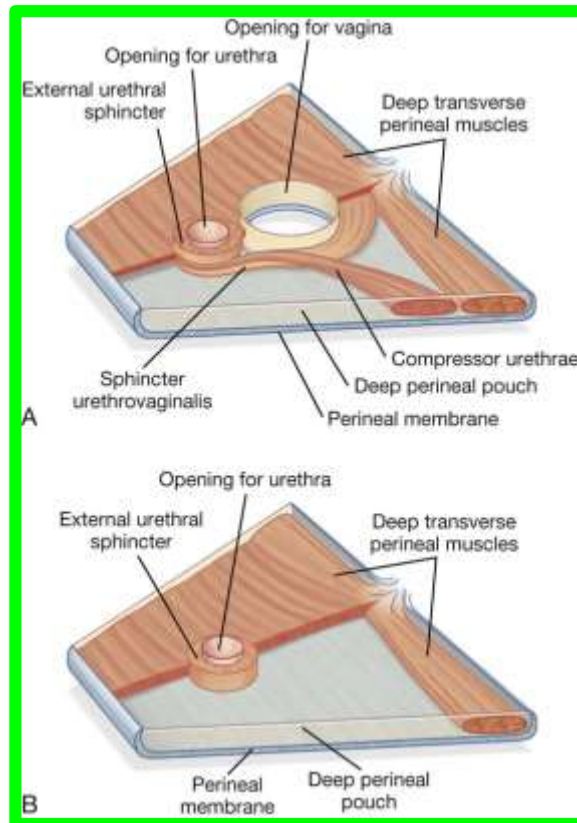
- ✓ It is smooth muscle fibers.
- ✓ It is **involuntary** and supplied by **autonomic fibers**.
- ✓ This sphincter contracts during ejaculation to prevent retrograde ejaculation (ejaculatory reflux) of semen into the bladder.



# Male Urethra

## 2- External urethral sphincter (sphincter urethrae)

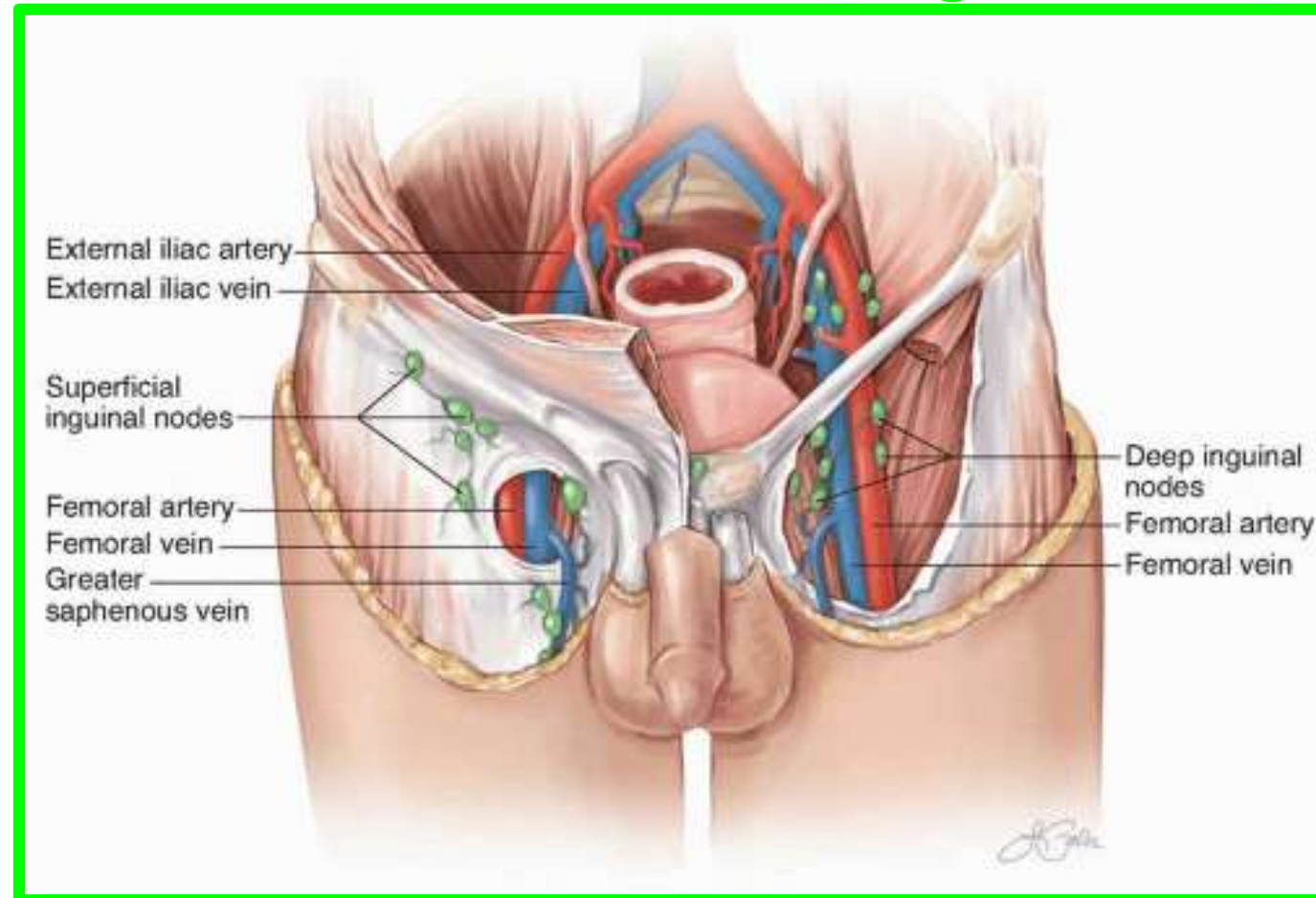
- It surrounds the membranous urethra in the deep perineal pouch.
- It is a striated muscle fibers.
- It is voluntary and supplied by the perineal branch of the pudendal nerve.




# Male Urethra

## \*\* Lymphatic drainage

- 1- The prostatic and membranous parts drain into the internal iliac lymph nodes.
- 2 - The penile (spongy) urethra drains into the deep inguinal lymph nodes.





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