



Histology of urinary tract

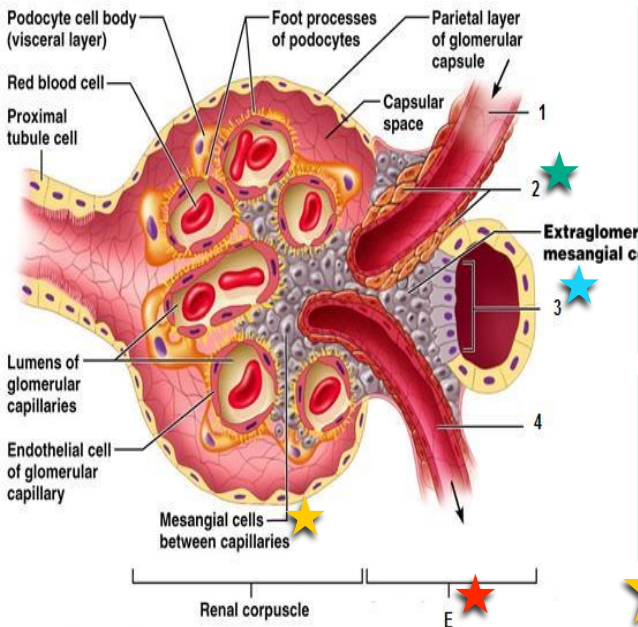
Renal Block


Objectives:

By the end of this lecture, the student should be able to describe

- 1. The microscopic structure of the Renal pelvis and ureter.**
- 2. The microscopic structure of the urinary bladder and male and female urethra**

Juxtaglomerular apparatus:

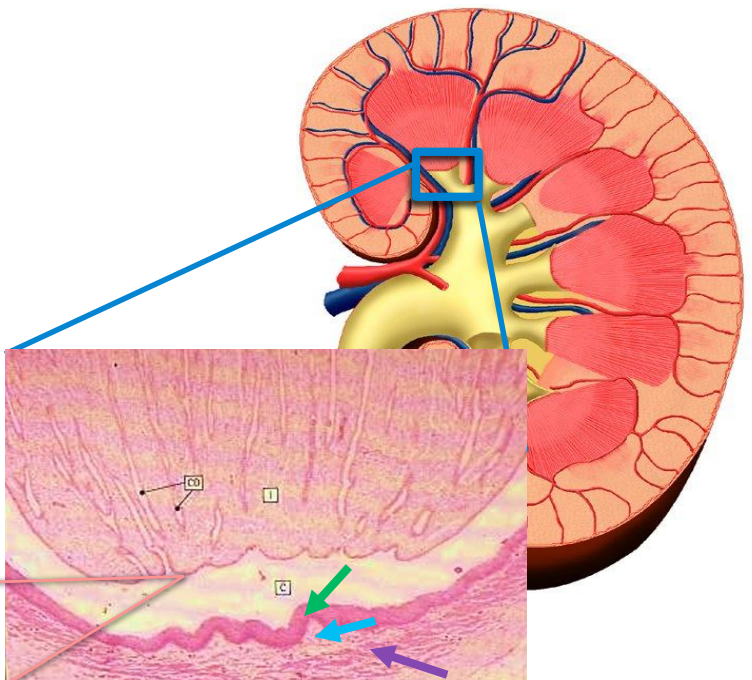
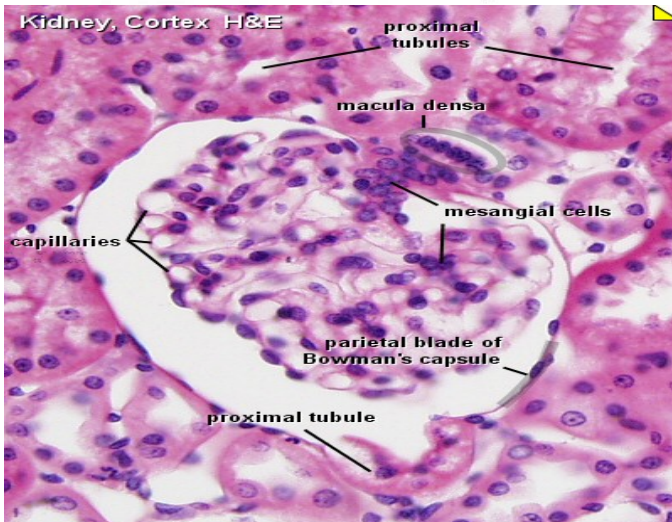


 **Juxtaglomerular cells** of afferent glomerular arteriole

- modified smooth muscle of tunica media.
- Nuclei are round with granular cytoplasm.

 **A-The macula densa** of distal tubule: Tall cells with centrally-placed nuclei

 **The extraglomerular mesangial cells**



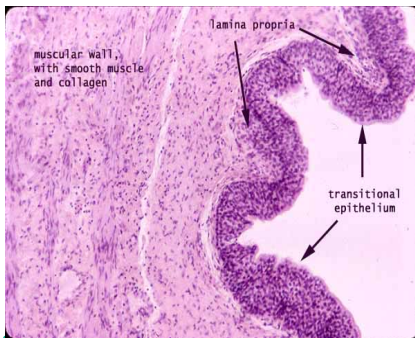
Within each renal pyramid the collecting tubules of each nephron unite to form renal papilla then the urine pass to minor calyx which unite → major calyx unite → renal pelvis

Each calyx major or minor is lined with:

- transitional epithelium
- lamina propria
- smooth muscle.

Ureter

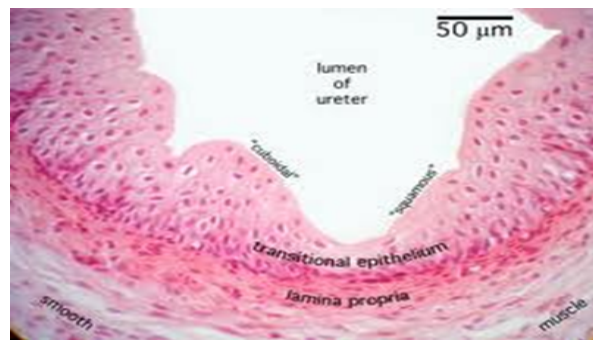
Has 3 layers



mucosa

formed of :

- Transitional epithelium
- lamina propria



Muscularis (muscle coat)

formed of 2 layers of smooth muscle in the upper 2/3:

- Inner longitudinal.
- Outer circular.

Is formed of 3 layers of smooth muscle in the lower 1/3: (due to it opening in bladder)

- Inner longitudinal .
- Middle circular.
- Outer longitudinal.



adventitia

fibrous C.T. covering.

N.B. **No serosa.**

Meaning no adjustment to peritoneum layer that covers the abdomen cavity.

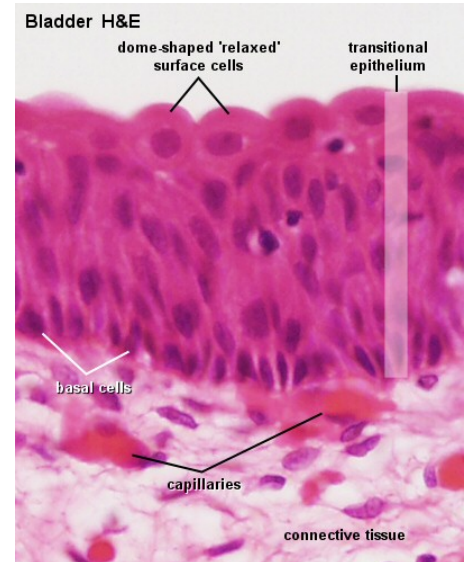
Urinary Bladder

Superficial layer: transitional epithelium has dome-shaped cells (in empty bladder).

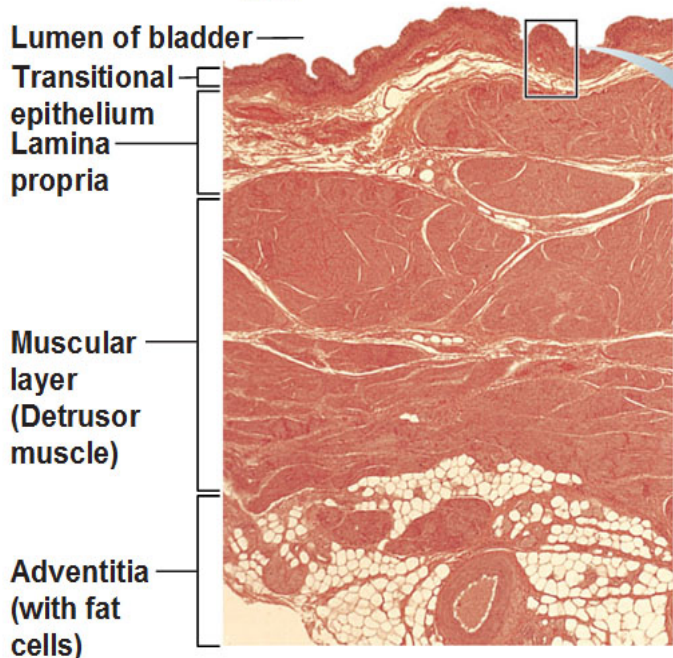
It has 3 layers of smooth muscle

- inner longitudinal
- outer longitudinal
- middle circular

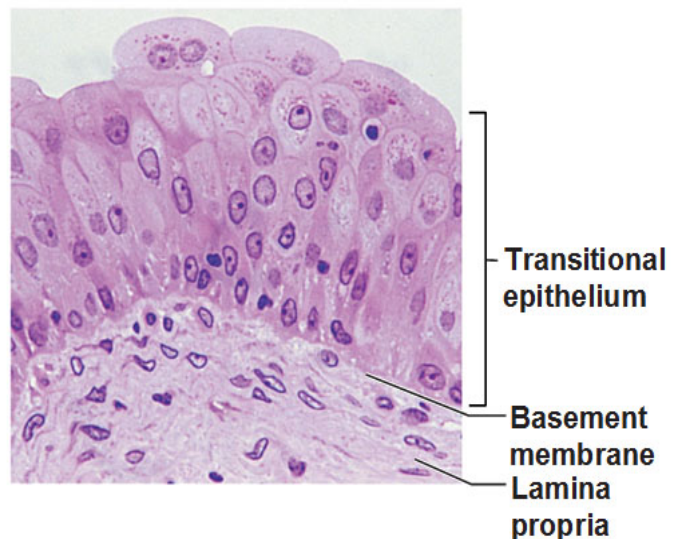
Adventitia or serosa. Depending on how near is to peritoneum layer.



Histology of the Urinary Bladder

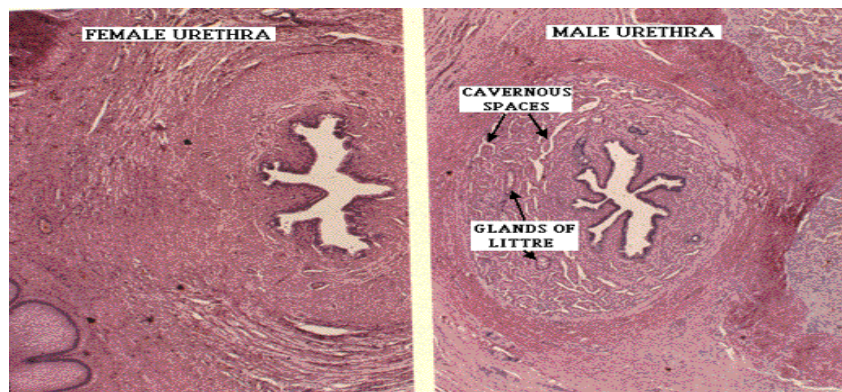


(a) Micrograph of the bladder wall (17X)



(b) Epithelium lining the lumen of the bladder (360X)

Urethra



Female ♀

Female urethra is short 4 cm and lined by :

Epithelium:

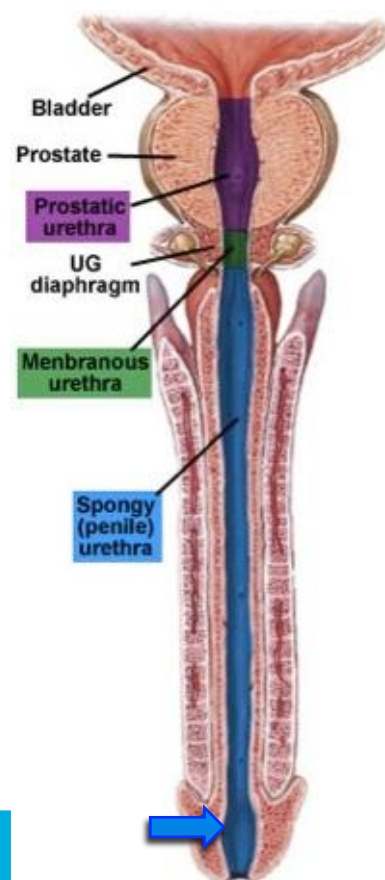
- Near the bladder: Transitional epithelium.
- medial area :Pseudostratified columnar epithelium.
- near end :Stratified squamous non-keratinized epithelium.

- **Sub-epithelial fibroelastic CT lamina propria**

that contains **glands of Littre** (mucus-secreting glands). to keep the Stratified squamous wet to avoid dryness and cracking

Smooth muscle:

inner longitudinal and outer circular layers



Male ♂

It is long 20 cm and is divided into 3 regions:

Prostatic urethra: is lined with transitional epithelium.

Membranous urethra: is lined with:

- Stratified columnar epithelium
- patches of pseudostratified columnar epithelium.

Penile (spongy) urethra: is lined with:

- Stratified columnar epithelium.
- patches of pseudostratified columnar epithelium.

In navicular fossa (enlarged terminal portion): Stratified squamous non-keratinized epithelium.

The lamina propria contains mucus-secreting **glands of Littre**.

Summary

Urinary Passage

Renal Calyces

- Lining:
 1. Transitional Epith.
 2. Lamina propria
 3. Smooth muscle
- Accepts urine from renal papilla
- Minor calyces → Major calyces → Renal pelvis

Juxtaglomerular Apparatus

- Macula densa:
 - Tall cell with centrally placed nuclei
- Juxtaglomerular cells:
 - Nuclei are round
 - They secrete renin & angiotensin
- Extraglomerular mesangial cells

Ureter

- Mucosa:
 1. Transitional Epith.
 2. Lamina propria
- Muscularis:
 - Upper 2/3:
 - a. Inner longitudinal
 - b. Outer circular
 - Lower 1/3:
 - a. Inner longitudinal
 - b. Middle circular
 - c. Outer longitudinal
- Adventitia:
 - Fibrous C.T. covering
 - No serosa

Urinary Bladder

- Superficial layer:
 - Transitional epithelium with dome-shaped cells
- Smooth muscle layers:
 1. Inner longitudinal
 2. Middle circular
 3. Outer longitudinal
- Outer covering Adventitia or Serosa

Female Urethra

- Short
- Lined:
 1. Epithelium
 2. Sub-epithelial fibroelastic C.T.
 3. Smooth muscle

Male Urethra

- Long
- Regions:
 1. Prostatic urethra
 2. Membranous urethra
 3. Penile (spongy) urethra

Motivation Corner

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Thank you for checking our work

For any correction, suggestion or any useful information do not hesitate to contact us: histology434@gmail.com