Motivational Corner:

"Strength doesn't come from winning. Your struggle build your strength."

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.

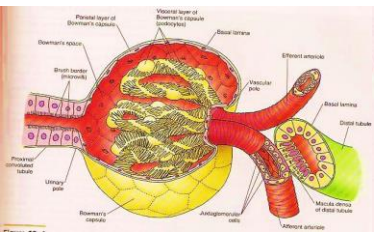
2-

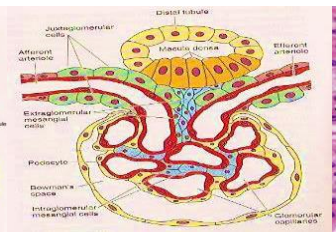
THE URINARY PASSAGE

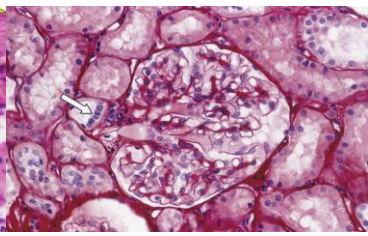
Extra notes: Gray
Important notes: Red

JUXTAGLOMERULAR APPARATUS

- **The macula densa**
  - of distal tubule: Tall cells with centrally-placed nuclei
- **Juxtaglomerular cells**
  - of afferent glomerular arteriole (modified smooth muscle of tunica media). Nuclei are round with granular cytoplasm
  - *They secrete renin
- **The extraglomerular mesangial cells**



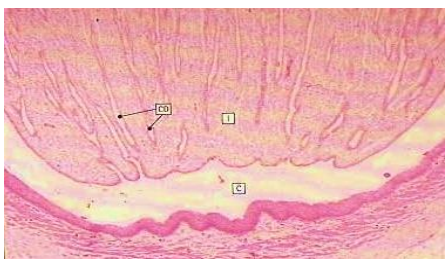




RENAL CALYCES:

- They are lined with:

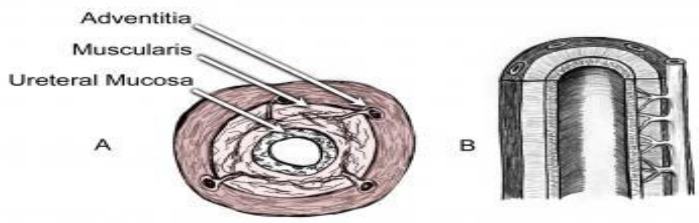
-**Transitional Epithelium**
-Lamina Propria
-Smooth Muscles



- Each calyx accepts urine from the renal papilla of a renal pyramid.

Minor Calyces → Merge to form → Major Calyces (has the same lining tissue as minor calyces) → Open into → Renal pelvis

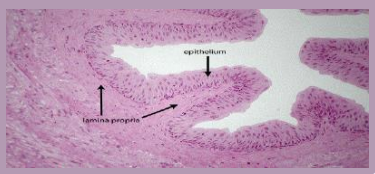
URETER: Has 3 layers



Mucosa

Formed of:

- Transitional Epithelium.
- Lamina Propria.



Muscularis (muscle coat)

Formed of 2 layers of smooth muscles in the upper 2/3:

- Inner longitudinal.
- Outer circular.

Formed of 3 layers of smooth muscle in the lower 1/3:

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

Adventitia

Fibrous C.T. covering

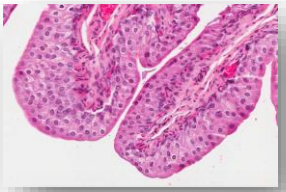
N.B. **No serosa**

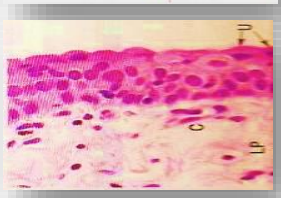
*Meaning no adjustment to peritoneum layer that covers the abdomen cavity.

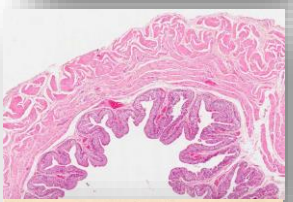
URINARY BLADDER

- It has the same structure as the lower third of the ureter.

Superficial Layer	Superficial layer of transitional Epithelium that has dome shaped cells (in an empty bladder)
3 Layers of Smooth Muscle Cells	Inner and outer longitudinal (thin) and middle circular (thick) layers.
Outer Covering	Adventitia or serosa.

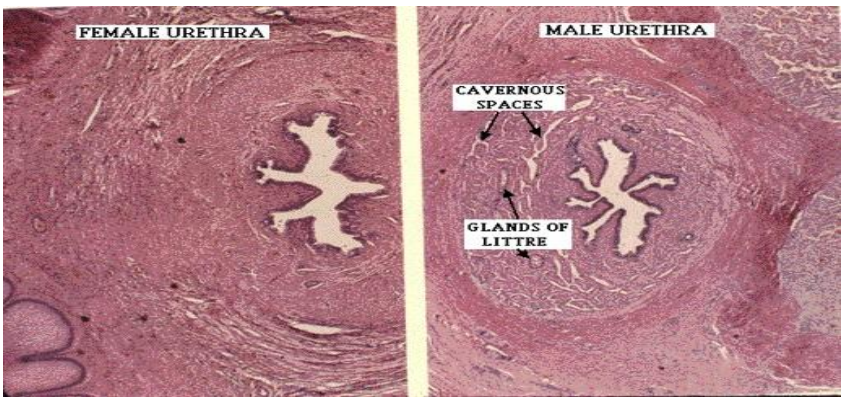


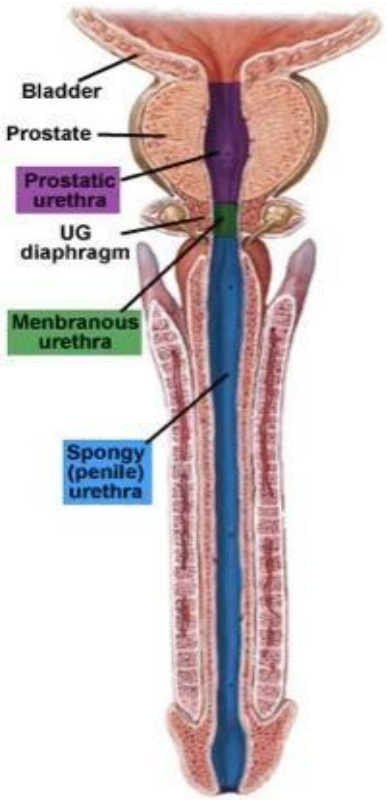




MALE AND FEMALE URETHRA

Female ♀	Male ♂
- Female urethra is short & lined by: **A- Epithelium:** 1-Transitional epith. Near the bladder. 2- Pseudostratified columnar epith. 3- Stratified squamous non-keratinized epith. **B- Sub-epithelial fibroelastic CT** that contains glands of Littre (mucus-secreting glands). **C- Smooth muscle:** inner longitudinal and outer circular layers.	- It is long and is divided into 3 regions: **1- Prostatic urethra:** is lined with transitional epith. **2- Membranous urethra:** is lined with: Stratified columnar epith. with patches of pseudustratified columnar epithelium. 3- **Penile (spongy) urethra**: is lined with: Stratified columnar epith. with patches of pseudustratified columnar epithelium. ****N.B. In navicular fossa (enlarged terminal portion):** Stratified squamous non-keratinized epith. N.B. The lamina propria contains mucus-secreting glands of Littre.





MCQs

1 c
2 d
3 a
4 b
5 a

1- interstitial cells located in matrix between glomerular capillaries are called:

a) Pericytes
b) Juxtaglomerular cells
c) Mesangial cells
d) Fibroblasts

2- what cells are sensitive to sodium concentration:

a) Visceral layer of bowman's capsule
b) Parietal layer of bowman's capsule
c) Pedicels
d) Macula densa

3- what structure do calyces open into:

a) Renal pelvis
b) Collecting duct
c) Renal corpuscle
d) Loop of henle

4- which of the following does not contain serosa:

a) Mucosa
b) Adventitia
c) Muscularis
d) Submucosa

5- tall cells with centrally placed nuclei of the distal tubule:

a) Macula densa
b) Juxtaglomerular cells
c) Mesangial cells
d) Podocytes

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Thanks you for checking our work, Good luck.
-Team histology.

HISTOLOGY
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