

URINARY PASSAGE

- ▣ **Editing file**
- ▣ **Important**
- ▣ **Doctor notes / Extra**



Objectives:

By the end of the lecture, the student should be able to describe the microscopic structure of:

- The Renal pelvis and ureter.
- The urinary bladder and male and female urethra.

Juxtaglomerular apparatus

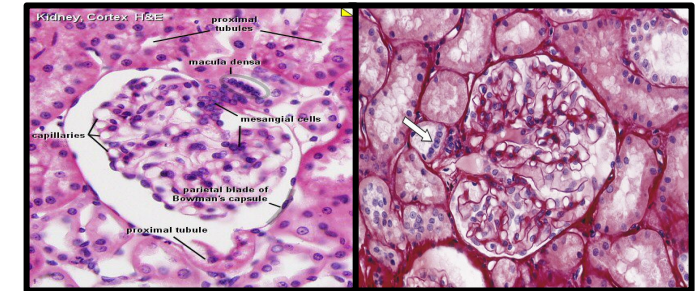
It has 3 components:

A-The macula densa of distal tubule, they are tall cells with centrally-placed nuclei

B-Juxtaglomerular cells of afferent glomerular arteriole, they're modified smooth muscle of tunica media. Nuclei are round with granular cytoplasm, **they secrete renin.**

C-The extraglomerular mesangial cells.

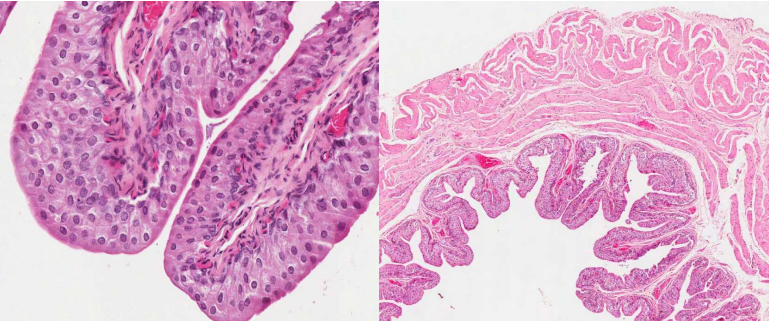
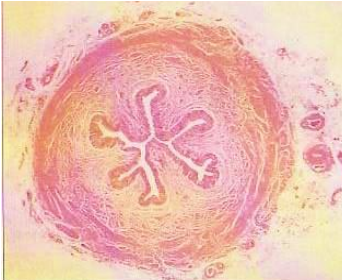
The cells communicate with each others by gap junction



Renal Calyces

- Each calyx accepts urine from the renal papilla of a renal pyramid.
- They are lined with **transitional epithelium** lamina propria and smooth muscle.
- Minor calyces merge to form major calyces (with same lining tissue as minor calyces).
- Major calyces open into renal pelvis.



Ureter around 25cm		Urinary Bladder
1. Mucosa: Is formed of transitional epith. and lamina propria.		It has the <u>same</u> structure <u>as</u> the lower third of ureter. (except: the <u>urinary bladder</u> is with serosa while <u>ureter</u> is without serosa)
2. Muscularis (muscular coat):		Superficial layer of transitional epithelium has dome-shaped cells (in empty bladder).
upper 2/3:	lower 1/3:	
A- Inner longitudinal. B- Outer circular.	It has 3 layers of <u>smooth muscle</u> : 1) Inner longitudinal. 2) Middle circular. 3) Outer longitudinal.	
3. Adventitia: fibrous C.T. covering. No serosa.		Its outer covering is adventitia or serosa. Part of urinary bladder cover with Adventitia and other part cover with Serosa

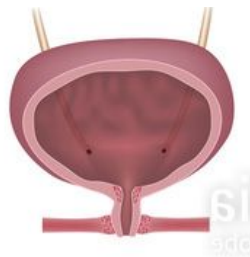
Female Urethra **short** and **lined** by :

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.



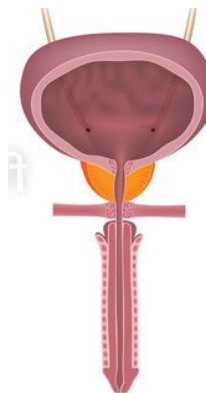
Male Urethra **long** and is **divided** into:

1- Prostatic urethra:

is lined with transitional epith.

2- Membranous urethra: is lined with:
Stratified columnar epith. with patches of
pseudostratified columnar epithelium.


3- Penile (spongy) urethra: is lined with:
Stratified columnar epith. with patches
of pseudostratified columnar epithelium.




- ▣ In **navicular fossa** (enlarged terminal portion): **Stratified squamous non-keratinized epith.**
- ▣ The **lamina propria** contains mucus-secreting glands of Littre.

Quiz

1. They secrete renin
 - A. macula densa of distal tubule
 - B. Juxtaglomerular cells
 - C. extraglomerular mesangial cells
 - D. Interstitial cells
2. Renal Calyces lined with
 - A. Pseudostratified columnar epithelium
 - B. Stratified columnar epithelium
 - C. Stratified squamous non-keratinized epithelium
 - D. transitional epithelium
3. Which of the following is true about urinary bladder
 - A. Its adventitia has no serosa
 - B. Its adventitia has serosa
 - C. The structure is the same as upper third of ureter
 - D. has 2 layers of smooth muscle
4. Prostatic urethra is lined with
 - A. transitional epithelium
 - B. Pseudostratified columnar epithelium
 - C. Stratified columnar epithelium
 - D. None of them
5. Sub-epithelial fibroelastic C.T in female contain
 - A. glands of Littre
 - B. patches pseudostratified columnar epithelium
 - C. navicular fossa
 - D. All
6. What is the correct passage of urine out of these sequences
 - A. Renal pyramid > major calyces > minor calyces > renal pelvis
 - B. Major calyces > minor calyces > renal pyramid > renal pelvis
 - C. Renal pelvis > major calyces > minor calyces > renal pyramid
 - D. Renal pyramid > minor calyces > major calyces > renal pelvis

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