NOTES: Urinary (Excretory) System (CH 15) Part 1 – Anatomy of the Urinary System
Urinary (Excretory) System...

*The urinary system consists of the kidneys, ureters, urinary bladder, and urethra.
Functions of the Urinary System:

1) remove salts and nitrogenous wastes from the blood
2) maintain normal water and electrolyte concentrations within body fluids
3) regulates pH and volume of body fluids
4) helps control red blood cell product and blood pressure
ORGANS OF THE URINARY SYSTEM

1) **KIDNEYS**: remove substances from the blood; form urine

2) **URETERS**: transport urine from the kidneys

3) **URINARY BLADDER**: stores urine

4) **URETHRA**: conveys urine to the outside of the body
• **KIDNEYS**

- located high on the posterior abdominal wall
- each kidney is divided into the:
  - **CORTEX**: outer region
  - **MEDULLA**: inner region
  - **PELVIS**: funnel-shaped region where superior end of ureters expands
KIDNEY FUNCTIONS:

1) remove metabolic wastes from the blood & combine them with water → formation of urine

2) secrete hormone erythropoietin → control of red blood cell formation

3) involved in activation of vitamin D

4) help to maintain blood pressure
KIDNEY BLOOD SUPPLY:

• RENAL ARTERIES: arise from abdominal aorta; supply blood to kidney

→ branches into smaller arteries & eventually into the AFFERENT ARTERIOLES

• blood returns to the inferior vena cava through the RENAL VEINS
• URETERS

➡ each ureter is about 25 cm long
➡ begin at the renal pelvis; extend downward and join the URINARY BLADDER from underneath
• URETERS

3 layers:
1) inner layer (mucous coat): continuous with the linings of the kidney (renal) tubules
2) middle layer (muscular coat): mostly smooth muscle fibers
   ➜ muscular walls propel the urine through peristalsis
3) outer layer (fibrous coat): connective tissue
Kidney stones may form in the renal pelvis and be passed through a ureter.
• URINARY BLADDER

- a hollow, distensible ("stretchable"), muscular organ
- stores urine and forces it into the URETHRA
• URINARY BLADDER

4 layers form the bladder’s wall:

1) inner layer (mucous coat): thickness varies as bladder expands

2) second layer (submucous coat): connective tissue and elastic fibers
3) third layer (muscular coat): smooth muscle fibers that form the **DETRUSOR MUSCLE**
→ part of the detrusor muscle surrounds the opening to the urethra: **INTERNAL URETHRAL SPHINCTER**

4) outer layer (serous coat): connective tissue + parietal peritoneum
• **URETHRA**

- conveys urine from the urinary bladder to the outside
- in females, urethra opens just **anterior to the vaginal opening**
- in males, urethra is **enclosed in the penis**
**URETHRA**

*female urethral pathway is shorter than in males; as a result, females are more prone to urinary tract infections*

(“CYSTITIS” = inflammation of the urinary bladder)