

Excretory/Urinary System

I. Functions

- A. Excretion (remove wastes)
- B. Regulate Blood Volume
- C. Reg. Ion Concentration
- D. pH Reg.
- E. Vitamin D synthesis

II. Kidneys

- A. bean-shaped organ
- B. Posterior abdominal wall on either side of vertebrae
- C. Kidney Structure
 1. outer portion is cortex
 2. inner is medulla
 3. large funnel in middle is renal pelvis, funnels into ureter which connects to bladder
- D. Nephrons – functional unit of the kidney
 1. renal corpuscle - filtering portion; made up of a Glomerulus (ball of capillaries) inside a glomerular capsule (cup-like) that receives the filtrate.
 2. renal tubule
 - a. proximal convoluted tubule,
 - b. nephron loop (Loop of Henle) – extends into the medulla
 - c. distal convoluted tubule.
 - d. join to become a collecting duct.

III. Urine Formation

A. Filtration

1. H₂O, waste and stuff is filtered out of the glomerulus into the glomerular capsule

B. Reabsorption

1. 99% is reabsorbed into capillaries, solutes move by active transport (energy) H₂O by osmosis.
2. Proximal tubule – a.a., glucose, Na, K, Ca, HCO₃ and Cl are transported back to blood
3. Descending limb – dips into concentrated fluid in medulla and allows H₂O to move out, some solutes move in
4. Ascending – not permeable to H₂O, Na + Cl ions are transported out
5. Distal tubule + Collecting duct – more H₂O moves out as it goes through concentrated areas

C. Secretion – some solutes are secreted out

D. Urine formation is controlled by

1. Body fluid concentration
2. Hormones
3. Blood pressure
4. Vasoconstriction/dilation

IV. Urine Elimination

- A. out the renal pelvis

B. to the ureters

C. urinary bladder

1. hollow muscular

2. holds up to 1000mL

3. as it expands, receptors send AP to Spinal Chord

D. urethra – tube connects to the outside

E. Internal and external urinary sphincters – muscles surrounding urethra, controls

flow

V. Regulation of Extracellular Fluid

A. Thirst – nerves in hypothalamus detect concentration of blood and initiate sensation.

B. K, Ca, Na... are regulated by hormones