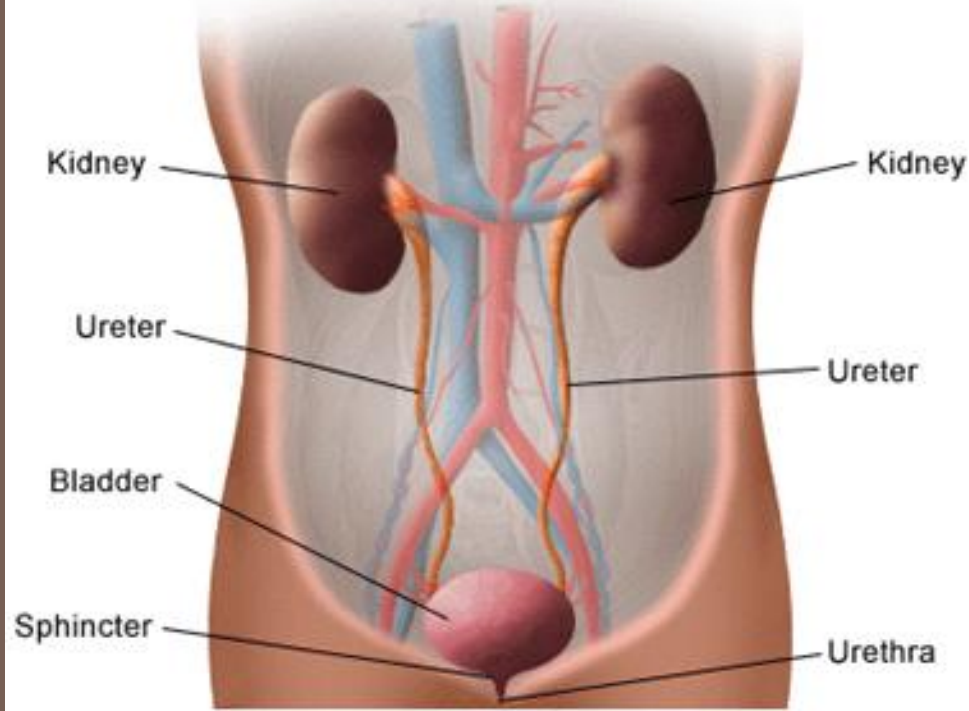


Front View of Urinary Tract



EXCRETORY SYSTEM

Objectives

- Describe the functions of the kidneys
- Identify the functional unit of the kidneys
- Describe the role of the liver in the excretory system
- Identify the two phases of blood purification

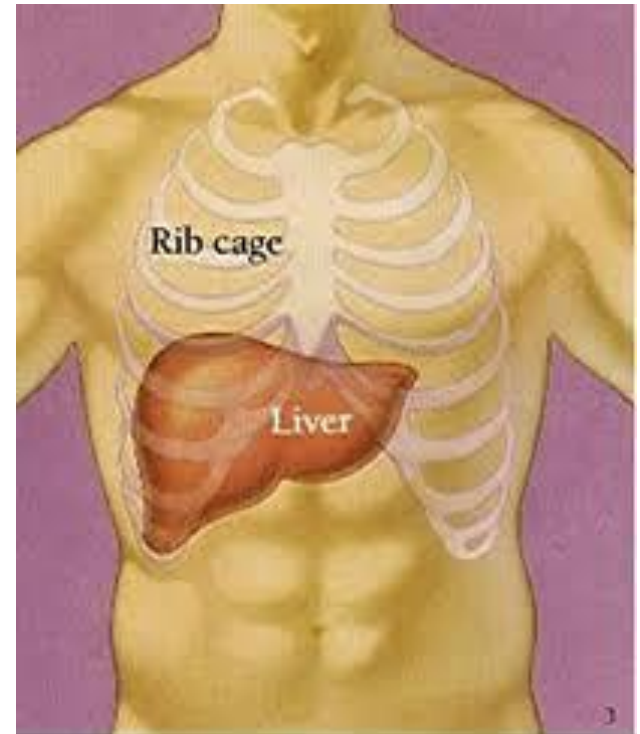
Function of the Excretory System

- Removes metabolic wastes from the body
- Metabolic wastes include:
 - ▣ Salts
 - ▣ Carbon dioxide
 - ▣ Urea – toxic compound produced when amino acids are used for energy



Organs of the Excretory System

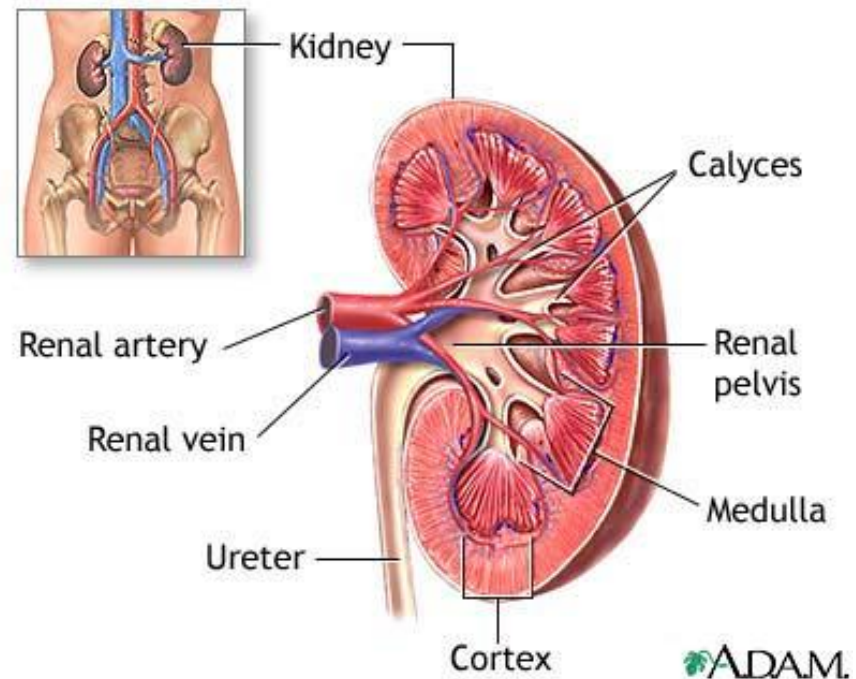
- Skin
 - ▣ Excretes excess water, salts, and some urea in sweat
- Lungs
 - ▣ Excretes CO₂
- Liver
 - ▣ Converts amino acids into useful compounds
 - ▣ Converts nitrogen wastes into urea



Organs of the Excretory System

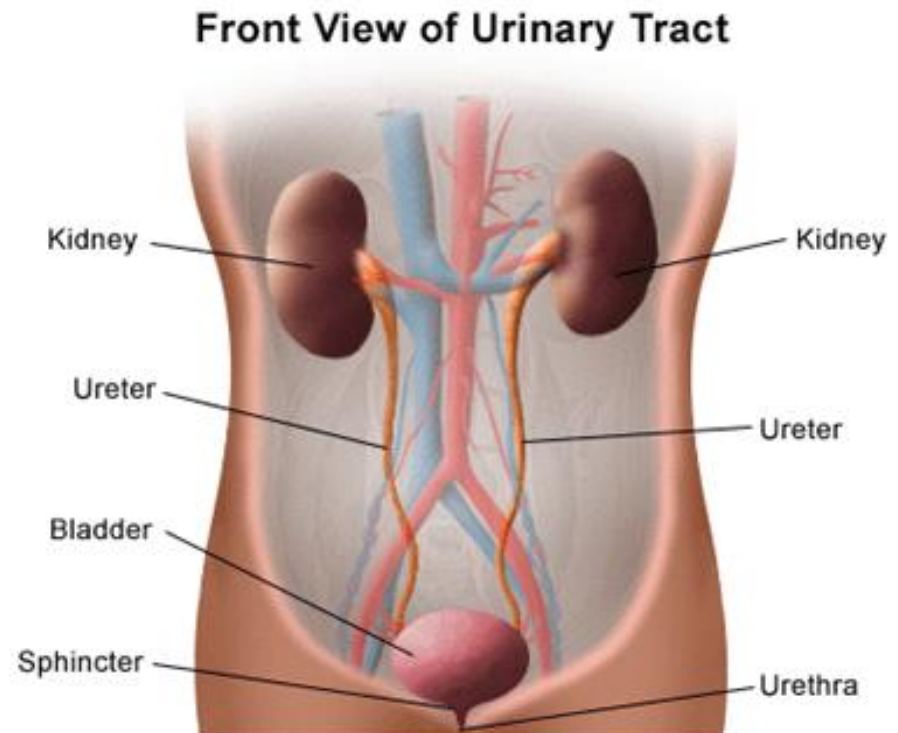
□ Kidneys

- Main organ of excretory system
- Remove waste products from blood (filters blood)
- Maintain blood pH
- Regulate water content of blood (blood volume)



Organs of the Excretory System

- Ureter
 - ▣ Carries urine to urinary bladder
- Urinary bladder
 - ▣ Stores urine until it is excreted
- Urethra
 - ▣ Tube where urine is released



Kidneys

- 3 main parts:
 - ▣ Cortex
 - Outermost portion
 - ▣ Medulla
 - Inner portion
 - ▣ Renal pelvis
 - Funnel-shaped portion in the center

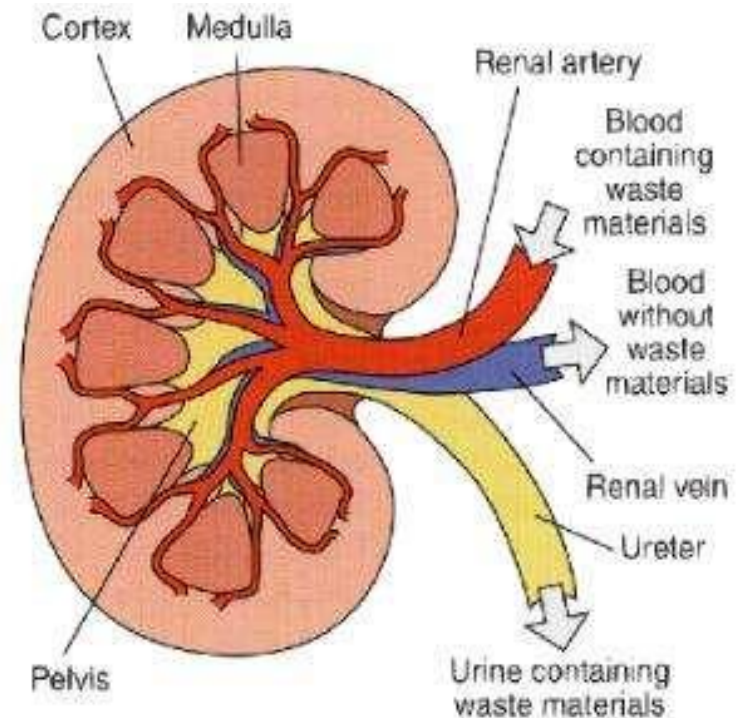
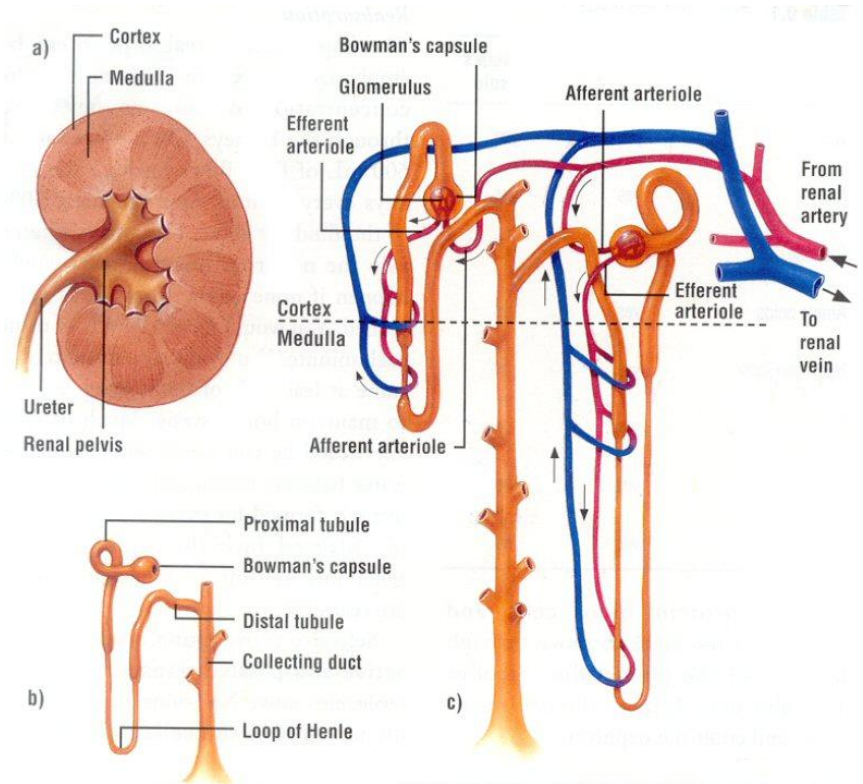


Diagram of a healthy kidney

Kidneys

- The functional units of the kidney are called **nephrons**
 - Located in the cortex
 - Each nephron has its own blood supply
 - Arterioles, venules, and capillaries
 - Removes toxins, urea, salts, and water to form urine
 - Wastes are released into collecting ducts that lead to the ureter
 - Purified blood exits the nephron through the venule

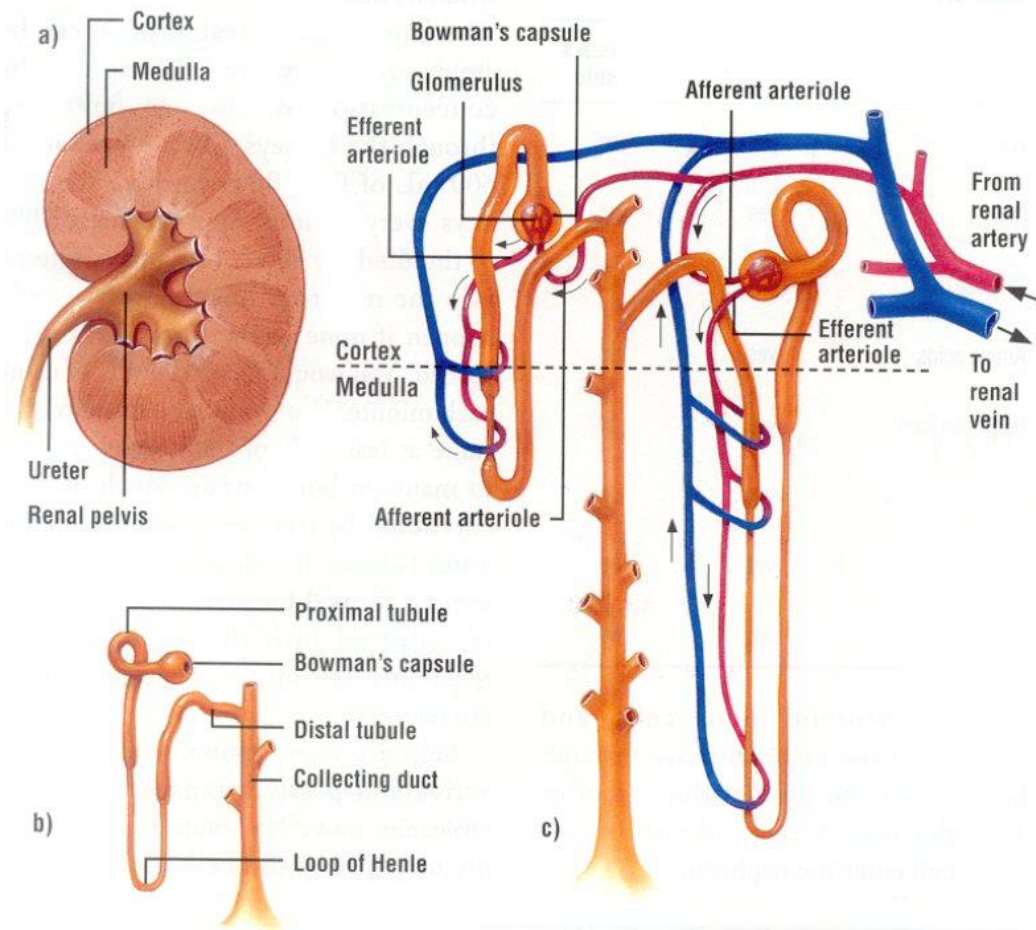


Kidneys

□ Blood purification occurs in 2 phases

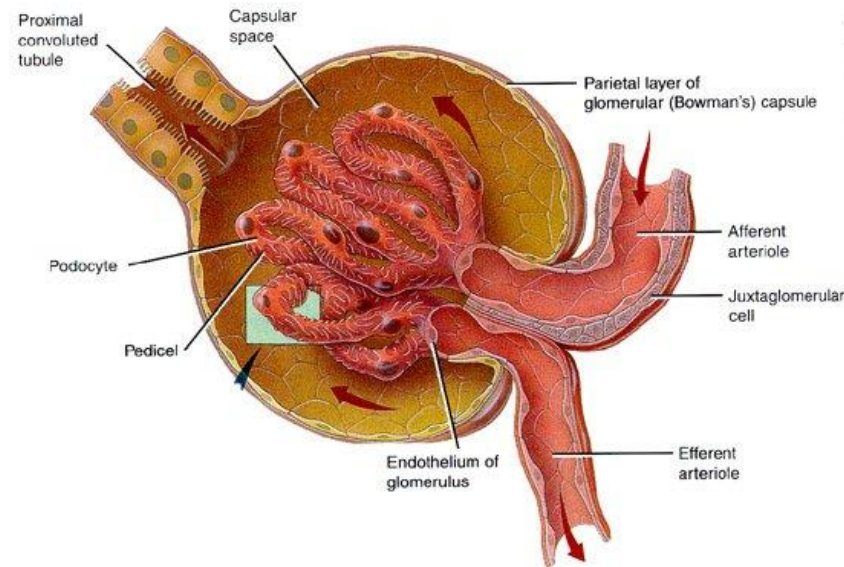
□ Filtration

□ Reabsorption



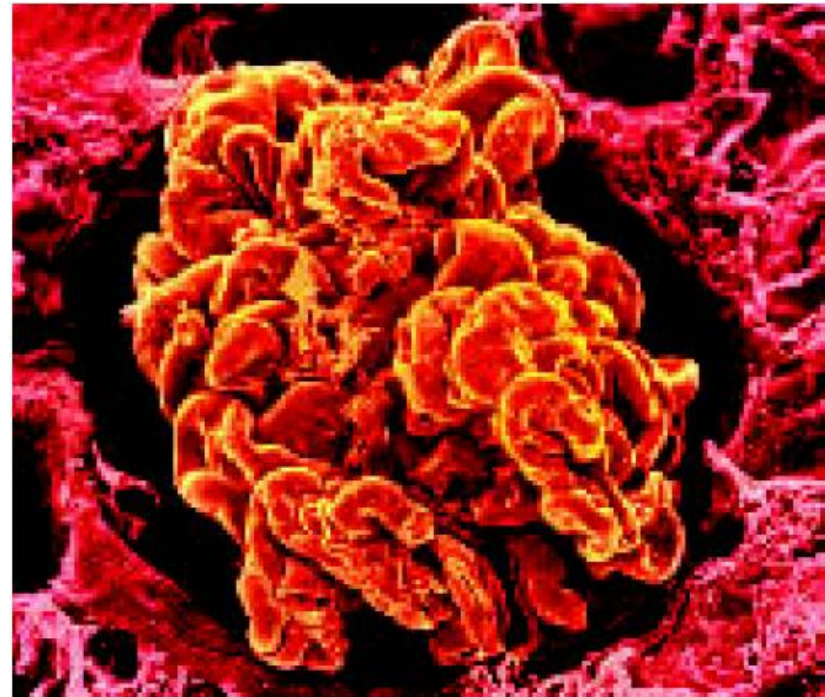
Filtration of Blood

- Takes place in the glomerulus
 - ▣ **Glomerulus** – small network of capillaries at the top of nephrons enclosed in the Bowman's capsule
 - ▣ **Bowman's capsule** – cup-shaped structure in the upper end of a nephron that encases the glomerulus
- Blood pressure forces small molecules (wastes mostly) out of the capillaries



Reabsorption

- Kidneys filter all the body's blood every 45 min.
- Most materials removed by Bowman's capsule makes its way back into blood
- Almost 99% of water is reabsorbed into blood by osmosis
- Glucose and other nutrients are reabsorbed by active transport



Urine Formation

- Materials not reabsorbed is emptied into a collecting duct
 - ▣ Called urine
- Urine is concentrated in the loop of Henle
 - ▣ **Loop of Henle** – section of nephron tubule in which water is conserved and the volume of urine is minimized
- Urine is stored in the urinary bladder until it is released through the urethra

Control of Kidney Function

- Activity of kidneys is controlled by the composition of blood
 - ▣ Some regulatory hormones are also involved
 - ▣ Ex: the more water that you drink, the less that is reabsorbed, and the excess is excreted in urine
 - ▣ Ex: the more salty foods you eat, the less that is reabsorbed into the blood, and the excess is excreted in urine

Notes Review

- Describe the functions of the kidneys
 - ▣ Remove waste products from blood (filters blood)
 - ▣ Maintain blood pH
 - ▣ Regulate water content of blood

Notes Review

- Identify the functional unit of the kidneys
 - ▣ Nephrons are the functional units of kidneys.

Notes Review

- Describe the role of the liver in the excretory system
 - ▣ Converts amino acids into useful compounds
 - ▣ Converts nitrogen wastes into urea

Notes Review

- Identify the two phases of blood purification
 - ▣ The two phases of blood purification are filtration and reabsorption.