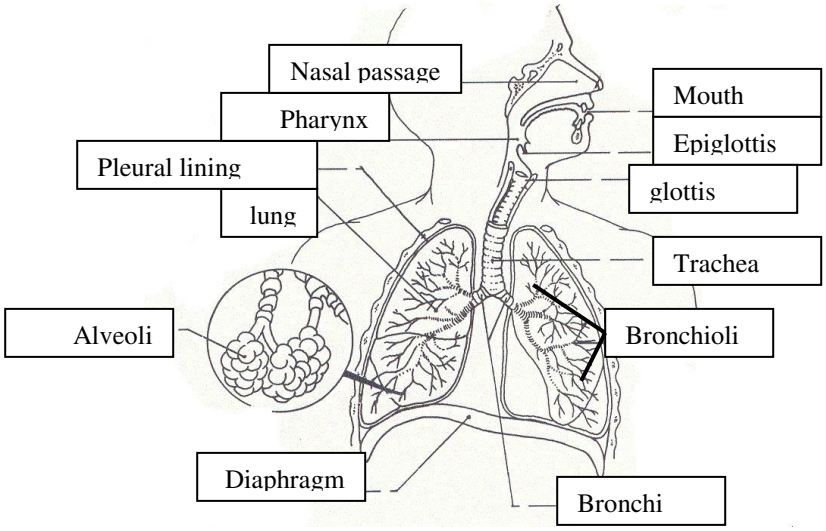
The Human Body Systems

I. Chapter 20 - Respiratory System

A. Body system designed to carry air to and from the lungs

B. Inspired air rich in **Oxygen** enters the body thru the **nostrils or mouth.** It travels through the **nasal passages** where it is **Cleaned, Warmed and Humidified.**

C. It then passes through the **pharynx** (back of the throat where nasal passages meet the back of the mouth), past the flap of tissue **(epiglottis)** that protects the **glottis** (the opening to the wind pipe) and then the Larynx or voice box. The air next enters the **Trachea**.



D. **Trachea**: Tube about 12 cm long by 2.5 cm in diameter
   1. Held open by cartilaginous rings
   2. Inside of tube is lined w/ **cilia**
      a) cilia beat and move mucous and debris out of the lungs
   3. The trachea branches into the right and left **Bronchi**

E. The two **Bronchi** branch into smaller and smaller **Bronchioles**: tubes inside the lungs
   1. Inflammation of the bronchi is called **bronchitis**.
   2. Bronchial spasms can result in the bronchi to close up and cause a decreased amount of air movement (**Asthma**) and air to be trapped in the alveoli. This air can be quickly reduced in oxygen causing loss of consciousness or even death.

F. Lungs: Located in the thoracic cavity bound on the bottom by the **diaphragm** (a flat sheet of muscle). Each lung and chest cavity wall is surrounded by a thin moist **Pleural** membrane.
   1. **Pneumonia** is a lung infection cause by bacteria, viruses or fungi.

G. **Alveoli**: Air sac at end of tubes that resemble a cluster of grapes
   1. lungs contain about 300 million alveoli
   2. gas exchange takes place between the air and the blood: carbon dioxide is exchanged for oxygen
   3. alveoli are surrounded by blood vessels called **capillaries**
   4. Surface area of the lungs is about 70 square meters

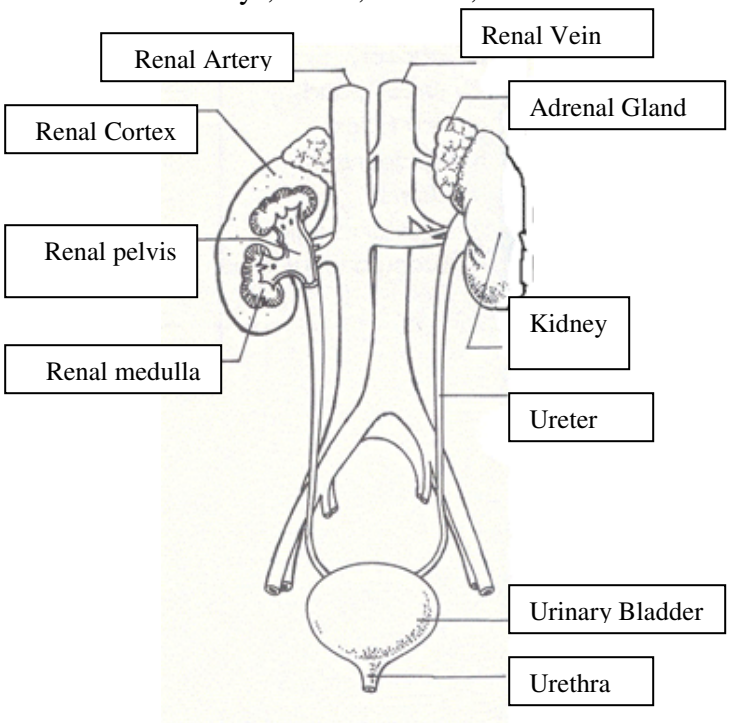
H. **Breathing**: The exchange of air into and out of the lungs
   1. **Inhale: Active Phase**: Intercostal (chest) muscles contract & expand the chest and the diaphragm contracts (lowers) causing lower pressure than atmospheric pressure and air rushes into the lungs
   2. Oxygen is absorbed and carbon dioxide is removed from blood

3. **Exhale: Passive Phase**: both chest and diaphragm relaxes causing air in the lungs to be pushed out.

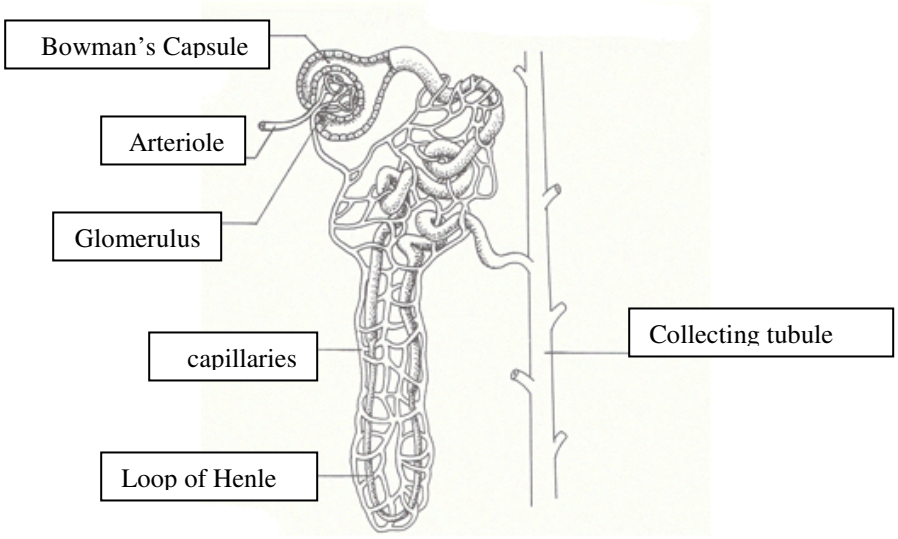
II. Chapter 20 - Excretory System

A. Body system that collects and removes the waste products (urea, salts, amino acids etc.) produced by the cells of the body

B. Organs involved include: the kidneys, ureter, bladder, urethra



1. **Kidney** – the major organ of the excretory system. Both are located in the lower back region of the body and is enclosed by connective tissue called a capsule. The kidneys are the filters of the excretory system. They control the balance between the quantity of salts and water in the blood.



a) **Cortex**: the outer portion of the kidney that contain the basic functional unit (nephrons). Nephrons are small independently filtering units of the kidney. About 1 million nephrons in each kidney

(1) **Nephrons** are complex units consisting of arterioles, venules, capillaries, **Bowman's Capsule** & the **glomerulus** (function mainly to filter the blood), **Loop of Henle** (functions mainly to reabsorb water)and the collecting tubule (collects **urine** as it forms from the filtration process).

b) **Medulla**: The inner portion of the kidney

c) **Renal Pelvis**: The central area of the kidney. Site where the collecting tubules combine to form the ureter

d) **Adrenal Gland**: The Endocrine gland located on top of the outside top of each kidney

2. **Ureter** (one from each kidney): the tube that connects the kidney to the urinary bladder
3. **Bladde**r: Strong muscular organ that stores the urine until released from the body through the urethra.
4. **Urethra**: connects and passes stored urine out of the body.

C. The body removes wastes in other ways also:

1. The **lungs** remove carbon dioxide and excess water each time we exhale
2. **Sweat Glands** also excrete water, salts and even small amounts of urea
3. **Live**r: Breaks down toxic substances, excess amino acids and other large molecules into smaller pieces that the kidney can then filter out of the blood.