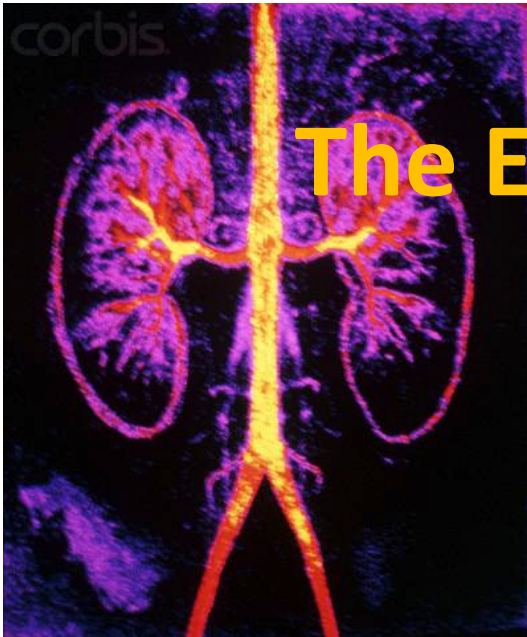


The Excretory System



The Elimination of Waste



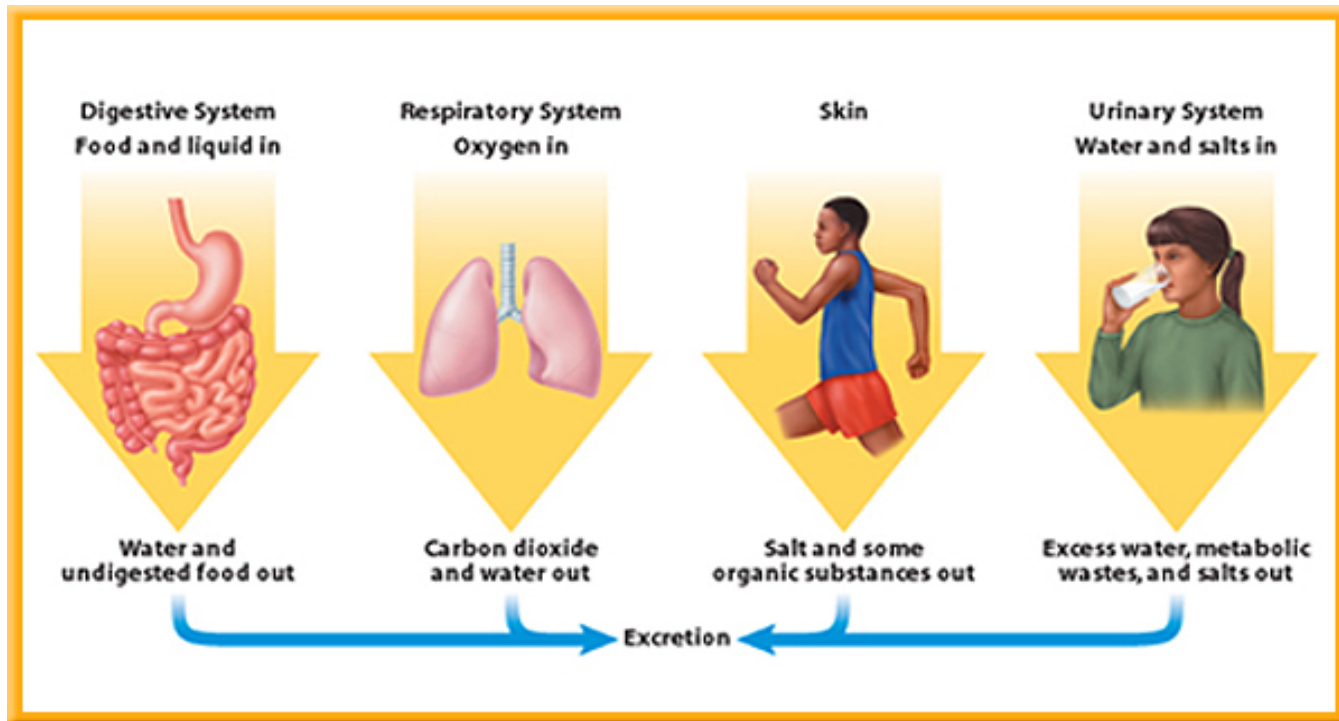
What is Excretion?

- During our everyday activities we produce a lot of waste.
- This **build up of waste is toxic** in our bodies and must be eliminated somehow...
- **Excretion is** the process of **eliminating** these **waste** products from our bodies.



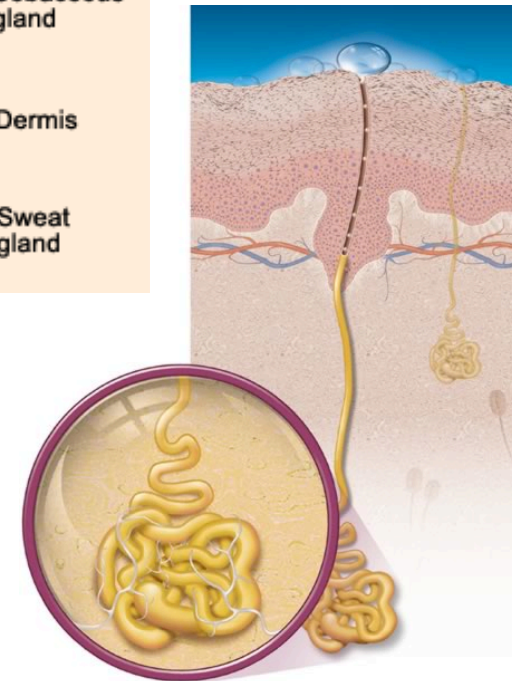
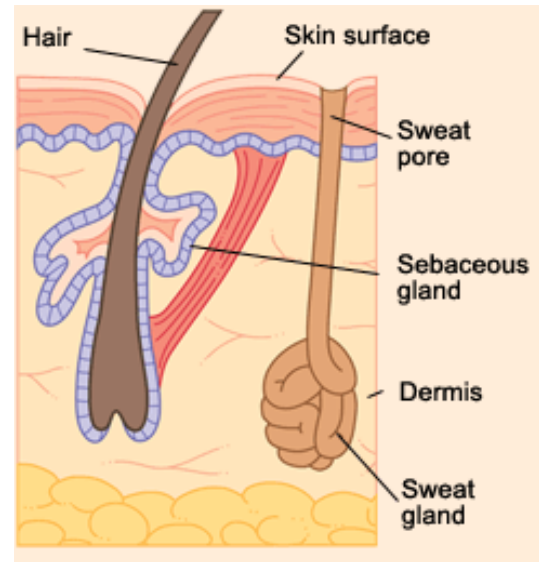
4 Systems used for Elimination

- Integumentary: **Sweat Glands** in Skin
- Respiratory: **Lungs**
- Digestive: **Intestines**
- Urinary: **Kidneys**



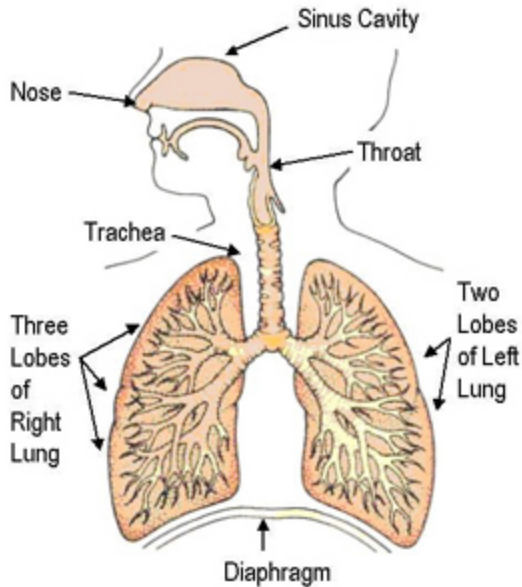
Sweat Glands

- About 2 500 000 found in the body
- They discharge secretions (sweat) by pores
- Sweating/perspiration **helps control our body temperature.**
- Our **sweat is made up of water and other waste materials that are from our blood.**



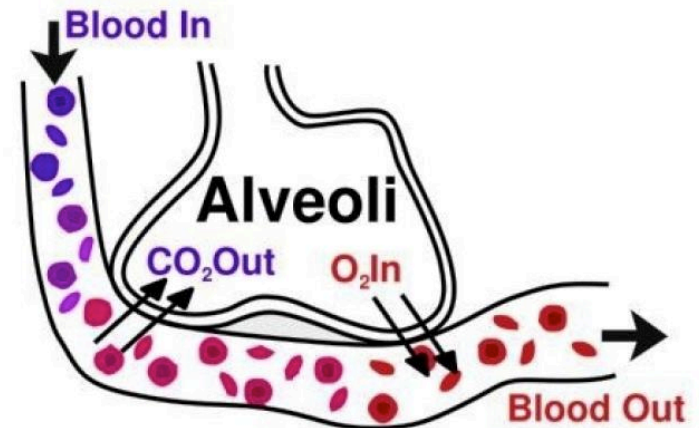
- This is why it plays an important role in the excretory system

Respiratory System (Lungs)



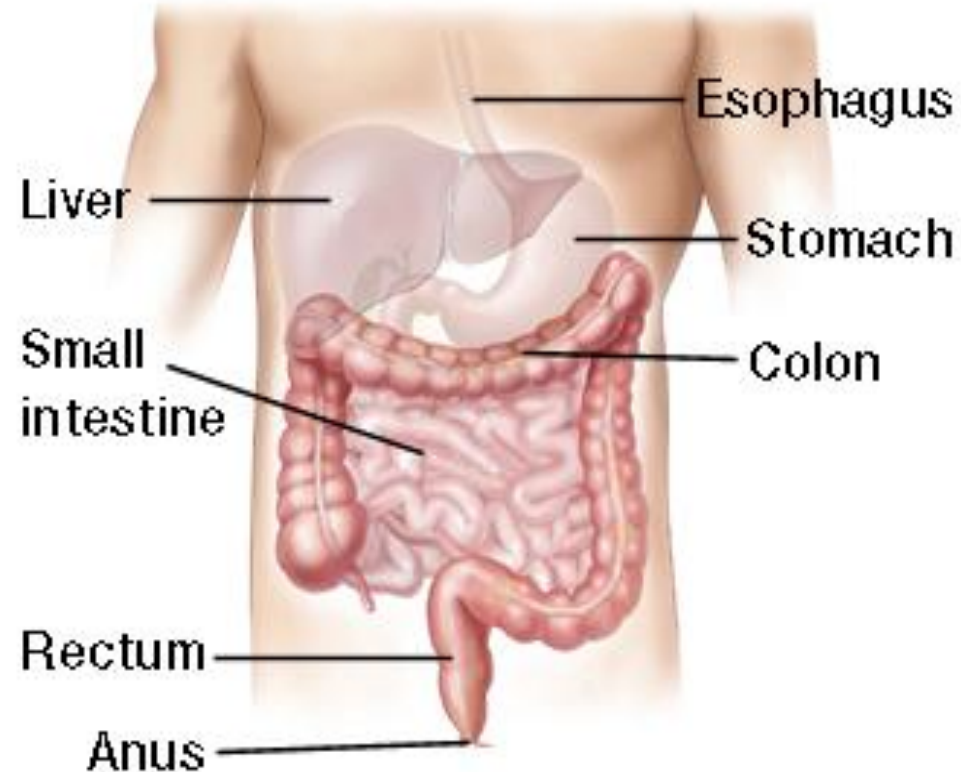
- **Capillaries** surround alveoli and **bring blood close** for the **oxygen** and **carbon dioxide** to **move by diffusion**

- Microscopic structures in lungs called **alveoli are the sites of gas exchange**



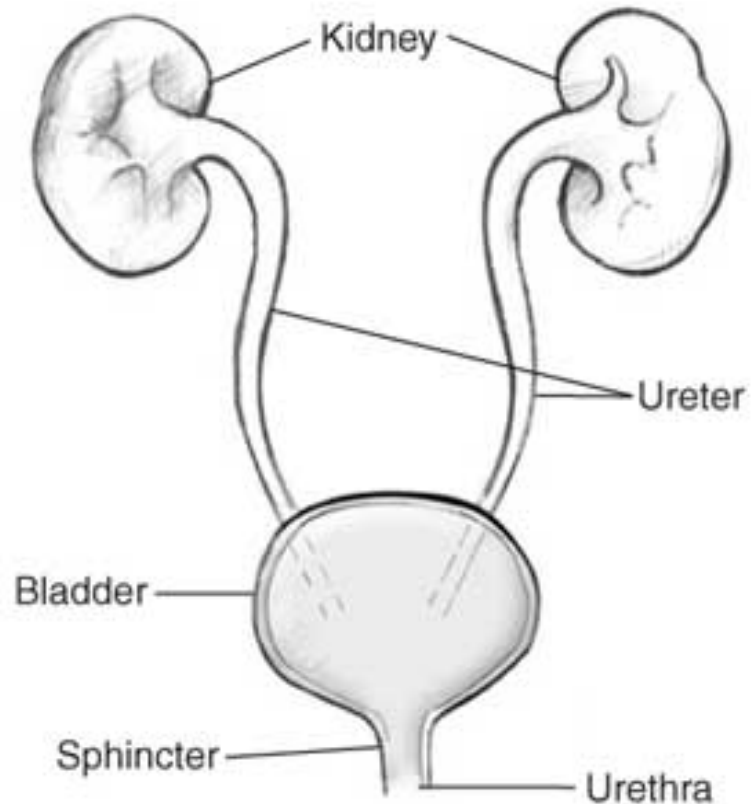
Digestive System (Large Intestines)

- About **5 feet** in length
- Tube –like structure used to pass solid material
- **Eliminates solid waste** that come from undigested (indigestible) food



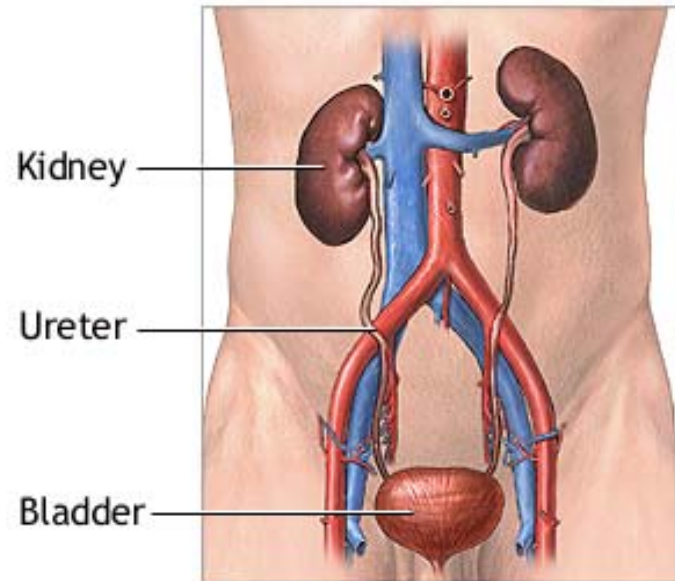
The Urinary System

- Composed of the following:
- **Kidneys**
- **Ureters**
- **Bladder**
- **Urethra**



Kidneys

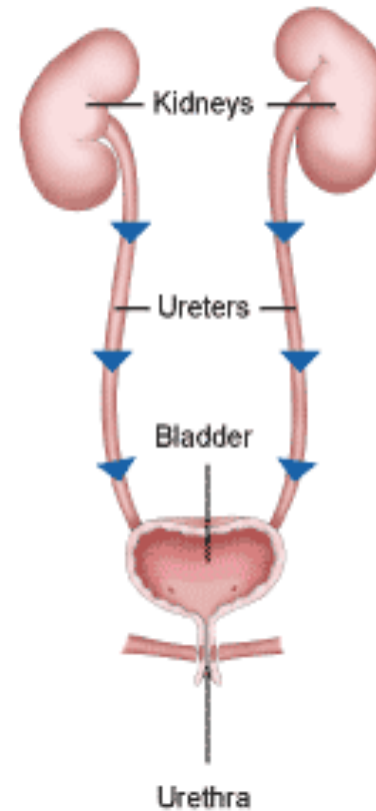
- Two reddish **bean-shaped** organs
- **Eliminate waste** and **maintain water balance (homeostasis)** through the production of **urine**



Ureters

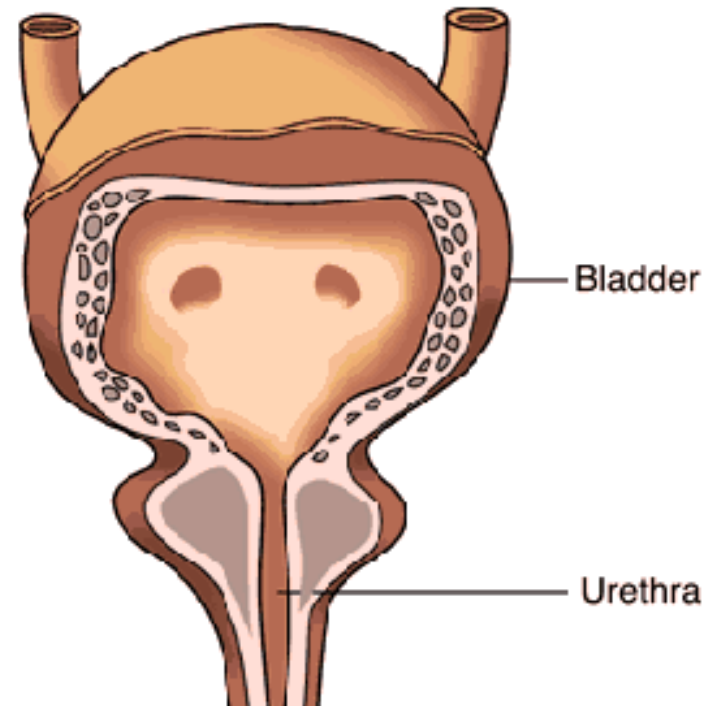
- Two **tubes** (25cm) in length; links a **kidney to the bladder**
- Transport urine produced in the kidneys to the bladder

Normal flow of urine (blue arrows)



Bladder

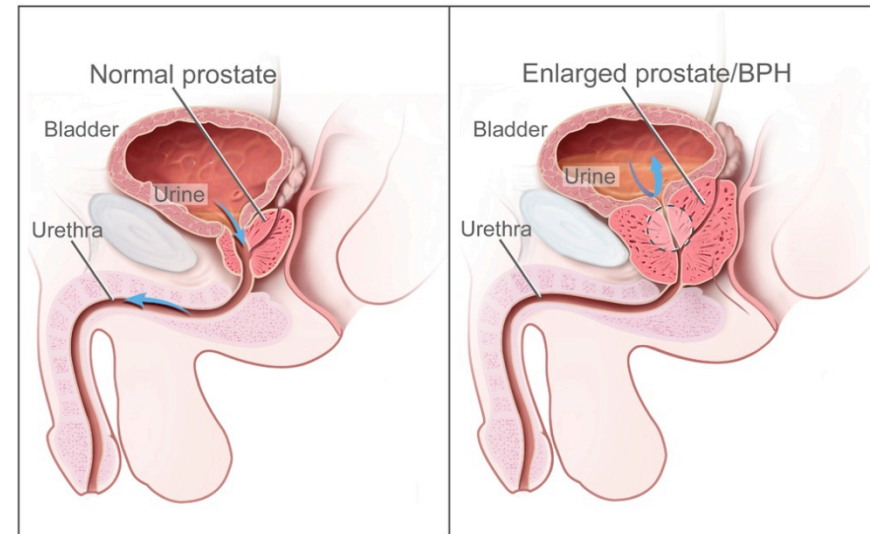
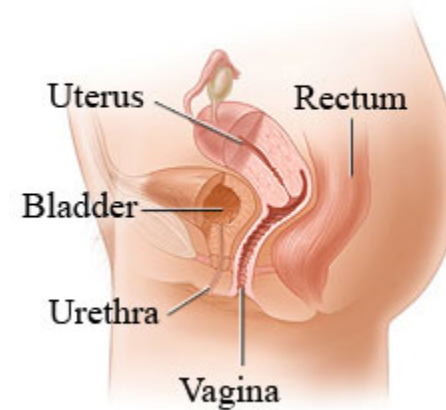
- Pear-shaped reservoir with **elastic walls** & **stretch receptors**
- Stores urine until it is released through urination (**sphincters**)
- The bladder can hold about **1 liter** of urine



Urethra

- **Tube** (3-4cm) in length in women
- 20cm in length in men
- **Transports urine** from the bladder to the **outside**

Normal female pelvic anatomy

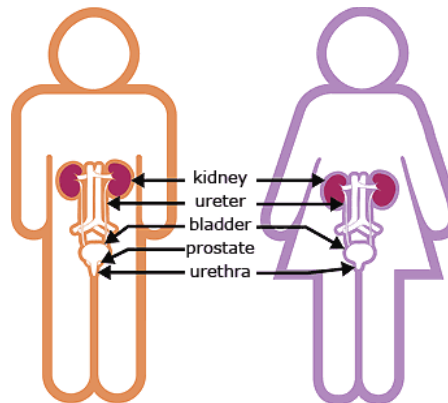


Composition of Urine

- The kidneys help maintain the **blood in balance (homeostasis)**
- They maintain **mineral concentration** and the **amount of water** found **in the blood**
- If an excess of either is found in the blood, the kidneys will simply excrete them



- The **kidneys filter** blood
- They remove waste by producing a liquid **Urine**
- **Urea** is the **main waste product** from the blood (made up of carbon dioxide, nitrogen and oxygen)
- It is **created by the breakdown of proteins** and ***amino acids*** used by the cells of our body



- Urine is made up of the following:
- **Water (95%)**
- **Urea (2.5%)**
- Minerals
- Substances that are excess in the blood
- **Protein, glucose, fats or blood cells (indication of health problems)**
- Traces of medication, drugs...



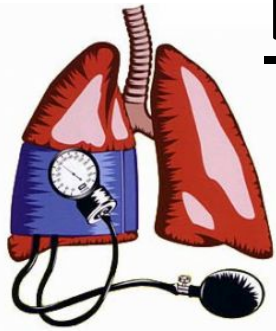
Urine

0.05% Ammonia
0.18% Sulphate
0.12% Phosphate
0.6% Chloride
0.01% Magnesium
0.015% Calcium
0.6% Potassium
0.1% Sodium
0.1% Creatinine
0.03% Uric acid
2% Urea

95% Water



- The amount of urine produced depends on the concentration of **minerals** and **water** in the body.
- If concentration of **minerals** is **low**, kidneys will **excrete more water**.
- If concentration of **minerals** **high**, kidneys **excrete less water** and we **feel thirsty!!!**



Kidney Disorders and Diseases

1. Hypertension: High Blood Pressure

- Narrowed arteries in the kidneys can damage kidneys.
- **Too much fluid can also raise blood pressure**
- Damaged blood vessels may stop the removal of wastes or fluid from the body

Kidney Disorders and Diseases

2. Diabetes

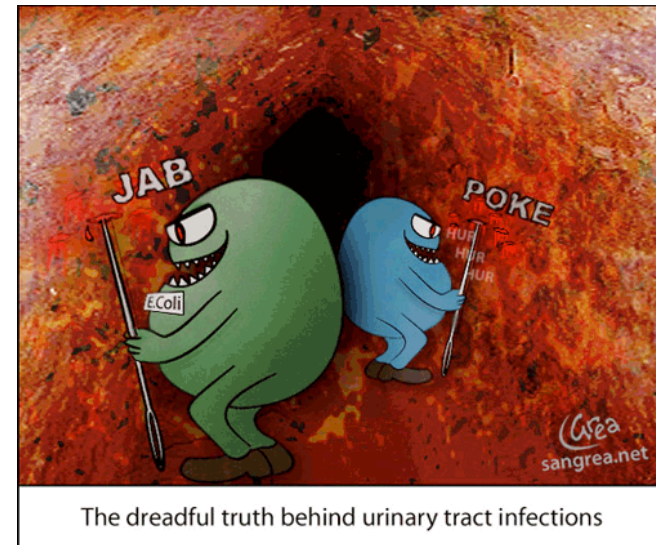
- Glucose found in urine
- **High glucose levels can damage blood vessels, stopping them from filtering blood**
- Can also damage nerves that tell bladder when it is full, which can lead to bladder lining being damaged and possible other infections.



Kidney Disorders and Diseases

3. Urinary Tract Infection (UTI)

- Caused by *E. Coli* bacteria
- **More common in women** than in men
- Can lead to **Kidney Infection** –
when it moves upwards



Kidney Disorders and Diseases

Urinary Tract Infection (UTI)

Symptoms include:

- **Burning** sensation during urination
- Increased frequency of urination
- Blood in urine



Kidney Disorders and Diseases

5. Proteinuria

- **High amounts of protein found in urine**
- Caused by damaged tubules in kidneys
- Sign of chronic **Kidney Disease**
- Proteins found in blood seep into urine as kidneys are filtering blood
- The protein is supposed to stay within the body

Kidney Disorders and Diseases

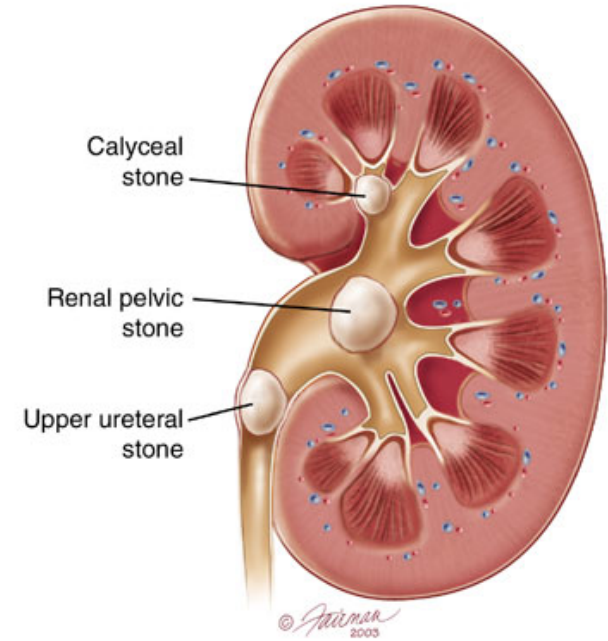
6. Kidney Stones

- Hard insoluble crystallized stones found in urinary tract
- **Accumulation of calcium in blood** (80%), uric acid (5%) or magnesium (2%)
- Stones pass down ureters

Kidney Disorders and Diseases

Kidney Stones

- Very **painful**
- Can shutdown kidneys temporarily
- Can be broken up by **ultrasound**, surgically removed, or pass through system on their own



Kidney Disorders and Diseases

7. Kidney Failure

- Kidneys stop functioning
- Renal dialysis can be used on a short –term basis to filter blood
- Hooked up to **dialysis machine for several days a week**
- Major change in lifestyle
- Kidney **transplant eventually needed**

