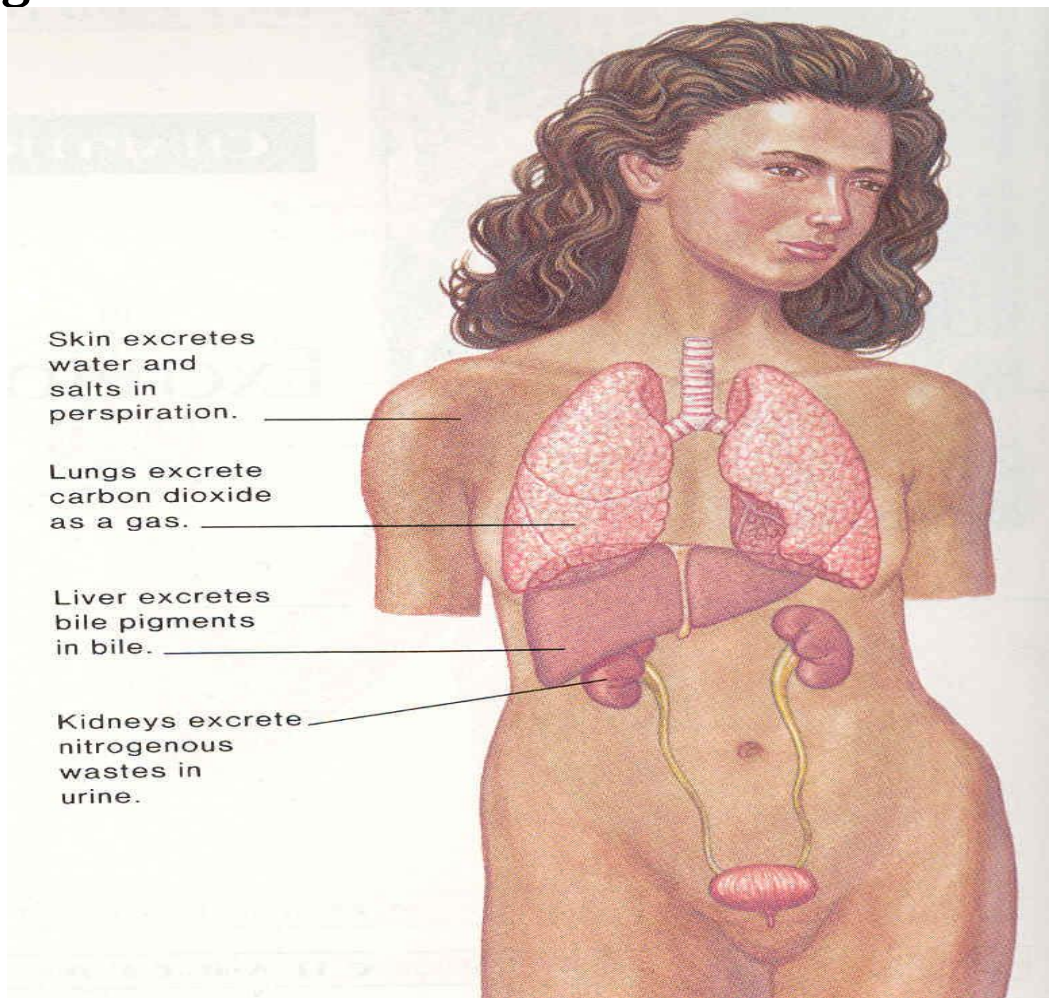
# Unit O Notes #1 – Excretion and The Urinary System

## *A) Excretion*- The removal of metabolic wastes from the body (these wastes are useless and potentially dangerous by-products of cellular reactions).

**- Metabolic wastes include ammonia→ urea, water, salts, carbon dioxide, uric acid and bile pigments.**



## Organs Involved In Excretion :

**1. Skin – Excretes perspiration (a solution of water, salt, and some urea)**
- **Primary role of perspiration is thermoregulation, secondary role is excretion.**
- **Urea concentration increases in sweat during times of renal failure (kidney)**

**2. Liver –Helps break down old red blood cells and release of Bile.**
- **Yellow pigment (Urochrome) released from the breakdown of heme in the liver. This pigment is then deposited into the blood and later removed by the kidneys.**

**3. Lungs – Expiration removes carbon dioxide but it also results in the loss of water.**

**4. Intestine – Certain salts, such as those of iron and calcium are excreted directly into the lumen of the intestine by the epithelial cells lining it. These salts become part of the feces. ** Do not confuse this with Elimination of undigested food !**

**5. Kidneys – Excrete urine, which contains a combination of many of the end products of cellular metabolism.**

***B) Water Entrance and Excretion:***

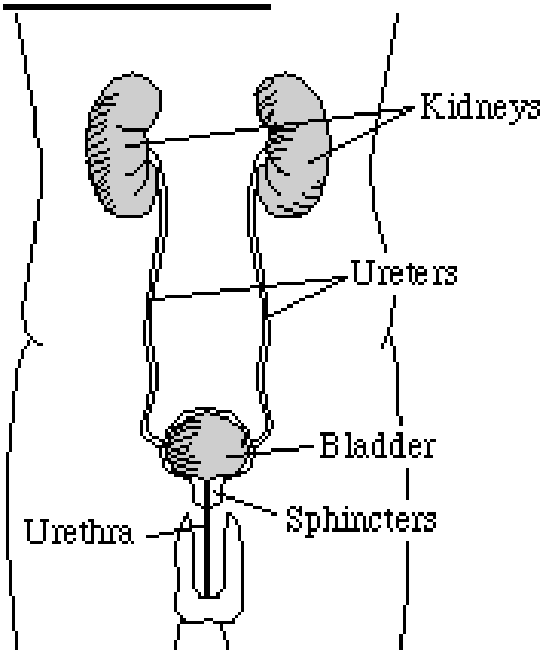
**- Water is one of the main end-products of aerobic cellular respiration. It plays a crucial role in influencing blood volume and blood pressure; Therefore, water must be closely regulated.**

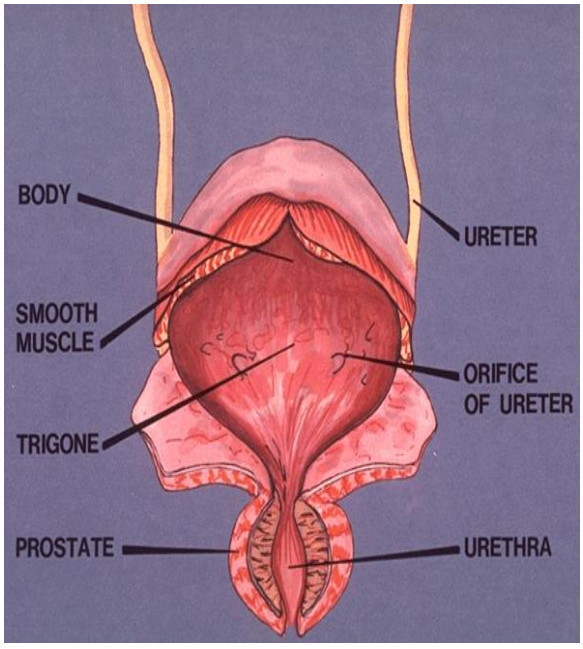
**Enters:**
**1. Drink water. 2. Absorbed from foods eaten.**

**Exits:**

1. ****Exhalation/Expiration**
2. **Perspiration**
3. **Expectorating (flem)**
4. **** Urination**
5. **Tears (small amounts)**
6. **Defecation**

## ***C) Urinary System Structures and Their Functions:***




**1. Kidney –Protected by adipose (fat) tissue, muscles, and ribs.**

**a. Filter wastes from blood to make urine.**

**b. Regulate electrolytes (positive/negative ions)**

**2. Ureters – Muscular tubes that transport urine from kidney to the bladder.**

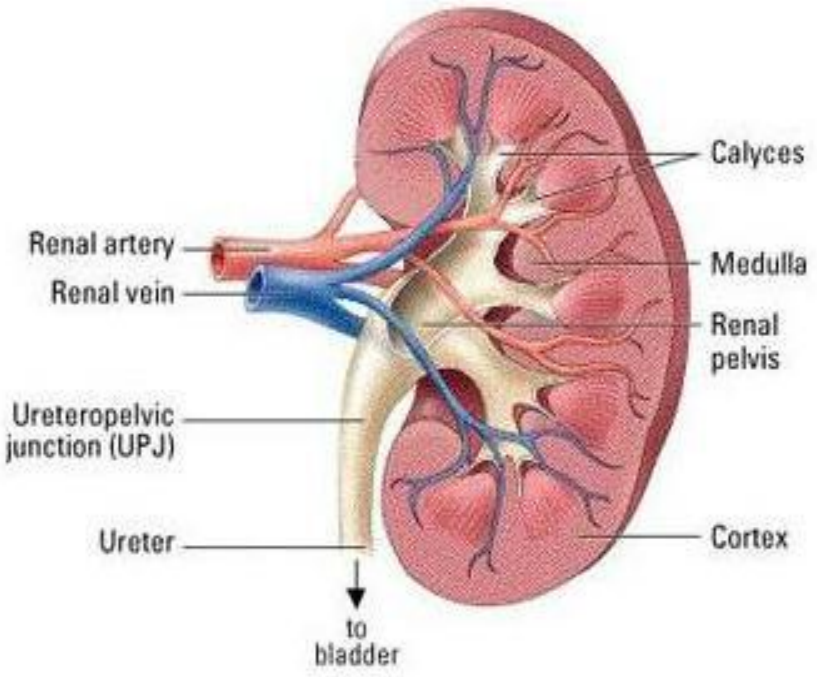
**3. Urinary Bladder – Stores urine - maximum (600 ml)**

**4. Urethra - Elimination of urine (double function in male : also used to deliver sperm)**

**When a kidney is sliced longitudinally (sagittal section), it shows 3 regions.**

INTERNAL STRUCTURE OF THE KIDNEY

**source** http://faculty.washington.edu/zeman/kidney.jpg



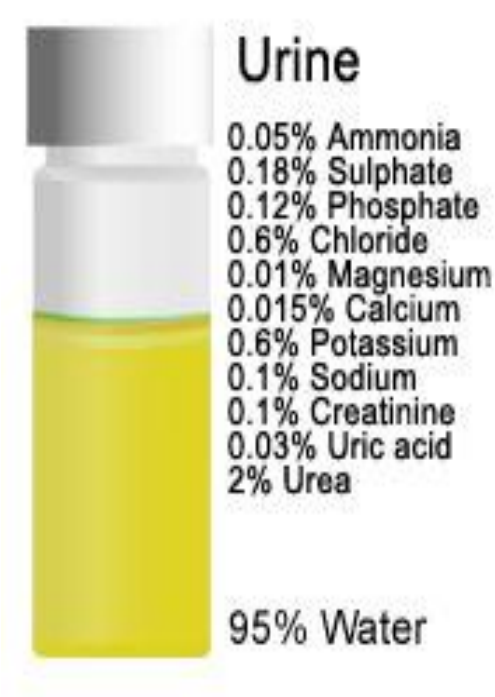

**i. <u>Outer</u> granulated region is called the *renal cortex.***

**ii. Striated or lined <u>middle</u> layer is called the *renal medulla.***

**iii. <u>Inner</u> cavity called the *renal pelvis* is where urine collects.**

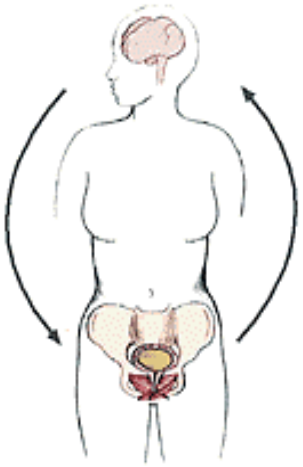
**- The kidney lies in the lower, dorsal part of the abdomen. They receive blood from the <u>renal arteries</u>.**

**- The wastes, called <u>urine</u> collects in the <u>pelvic</u> region of each kidney from there they are conducted by <u>peristalsis</u> down the ureters to the <u>urinary bladder</u>.**




**- When the urinary bladder becomes full, stretch receptors trigger <u>urination</u>, and the fluid is excreted.**

The brain sends nerve signals telling muscles to hold urine or let it out.



Nerves send signals to the brain. The signals tell when the bladder is full or empty.

# The Urine Goes to the Urinalysis Lab

Urine can provide information about:

- Kidney function
- Urinary tract disorders
- Diabetes
- Liver disorders
- Metabolic disorders
- Muscle trauma
- Hormonal disorders
- Drug use