

# The Excretory System

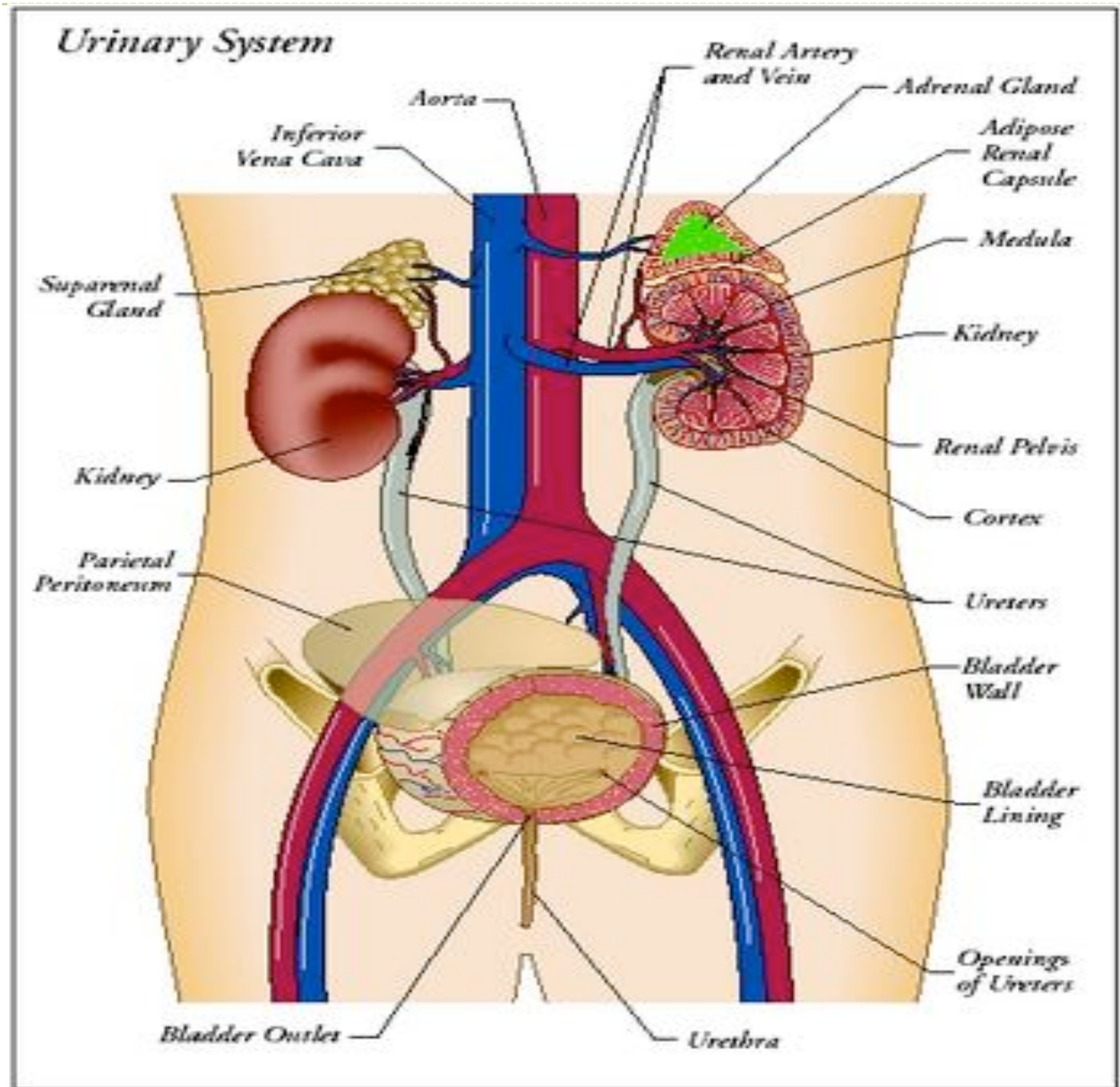




# THE SYSTEM

Fun Facts:

~You can contain over 2 pints of urine in your bladder!





## Renal Artery

### Fun Facts:

~For a normal person at rest, the Renal Arteries carry up to 1.2 liters of blood at one time

~This is approximately  $\frac{1}{4}$  of the heart's output

~This means that the blood in the human body circulates through the kidneys once every four to five minutes!

- **Brings blood to the Kidneys** from the abdominal aorta
  - When the Renal Artery reaches the Kidneys, it branches into two, and then splits into many smaller veins into the Kidneys
- **The Renal Vein** returns the blood to the inferior Vena Cava



## Kidney- Function

### Fun Facts:

~You only need one Kidney to survive!

~If you only have one kidney, then it's size increases by 50% in order to make up for the missing one.

- **The kidney's function**
  - **Filter the blood.**
  - **Produce urine** that contains salts, toxins, and water.
  - Makes sure that **body tissues get enough water** to function properly.
  - **Controls the blood pressure**, and level of **salts in the blood.**
  - Controls **red blood cell productions** which carry oxygen throughout the body.
  - **Filters poisons from the body.**

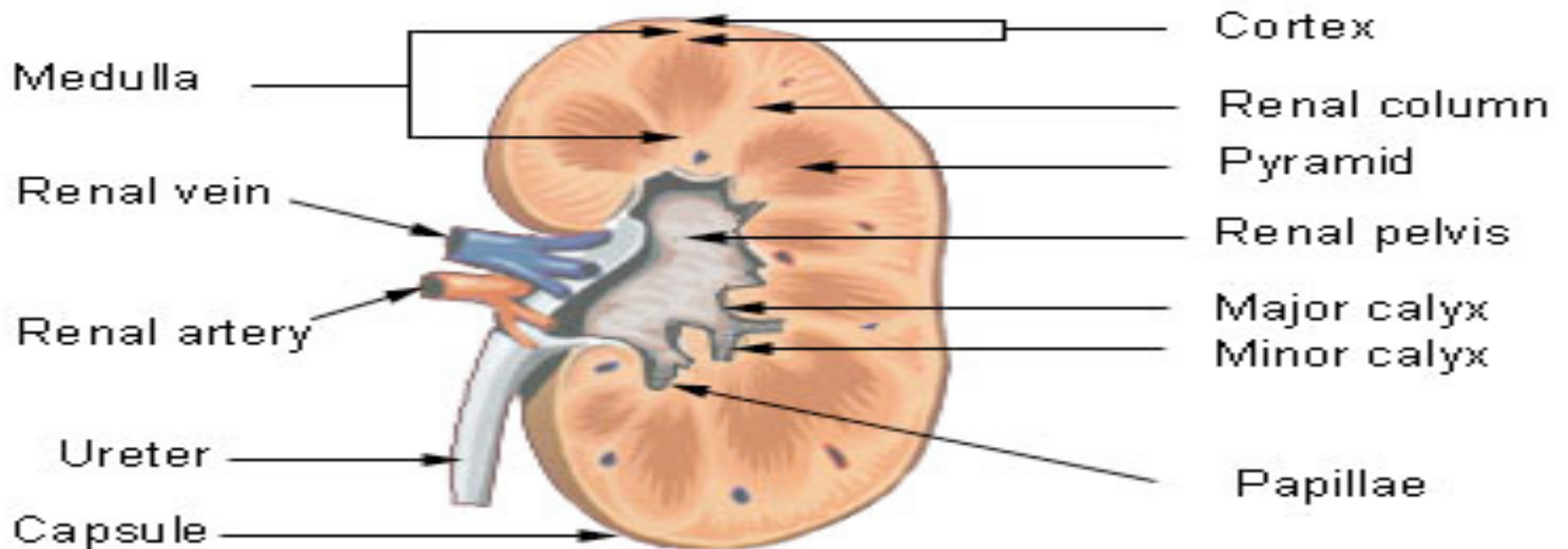
# Kidney Structure

Fun Facts:

Two kidneys - one on each side of the vertebral column.

- In the **indentation** of the kidney, the **ureter and the renal vein** leave the kidney, the **renal artery** enters.
- On the outside of the kidney there is the renal cortex made up of many tubes and blood vessels.
- The renal medulla is in between the cortex and the center, and is made up of renal pyramids.
- The **cortex and the medulla** make the **functional tissue** of the kidney.
- **The Renal Pelvis' function is to collect the urine.**
- From the pyramids, the urine goes to the ureter.

## Frontal section through the Kidney



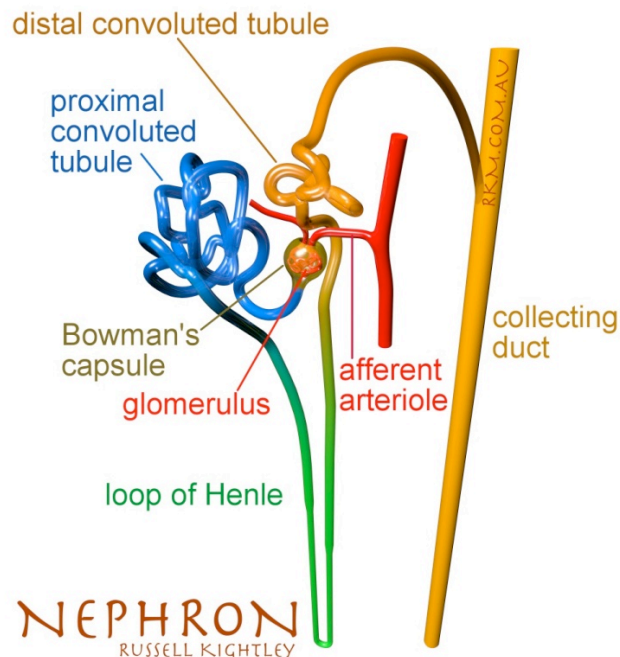


## Kidneys and Homeostasis

- In order to keep a steady, healthy condition, a kidney:
  - **Maintains water balance** in the human body.
  - **Takes the toxins out of the body** to keep the blood at a steady, healthy condition.
  - **Regulates the blood pressure** and the **red blood cell productions** that carry oxygen through the body.

# Nephron- Structure and Function

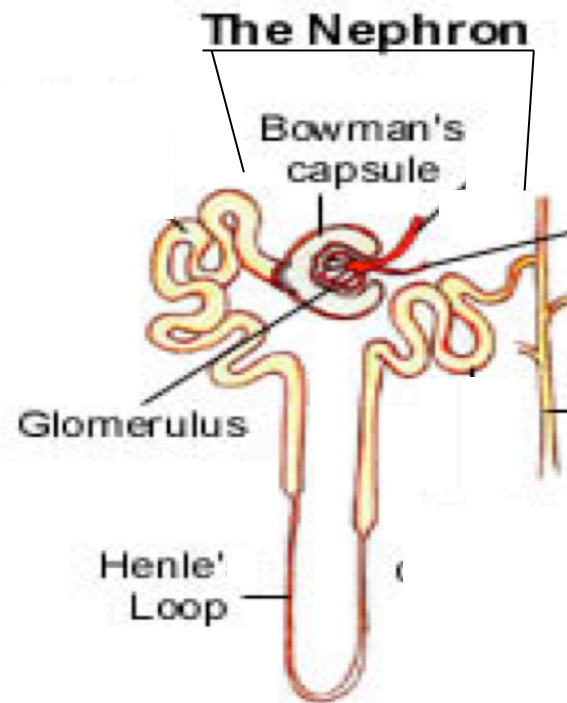
~There are approximately 1.25 million in each kidney



- **Function:**
  - Make the urine by removing waste and excess substances from the blood.
- **Structure:**
  - They are located at the cortex and the medulla of the kidneys.
  - Two parts: the renal corpuscle and the renal tubule.
  - The renal corpuscle contains the glomerulus.
  - Urine passes through the nephrons.

## Bowman's Capsule

- This is the cup-like structure at the **end of a Nephron**.
- **It contains the Glomerulus.**







## Glomerulus

- Blood flows into it and it flows away through blood vessels.
- Blood enters and leaves the Glomerulus through the inner wall of the capsule.
- **It is the filter.**



## Loop of Henle

~Found in the Kidney  
of Mammals, Birds, and  
Reptiles

- Its **primary function** is to **recover water and sodium chloride from the urine.**
- This puts a limit on the amount of water intake needed to survive.
- **Long, U-shaped portion of the tubule** found in each Nephron of the Kidney.



## Ureter

- Muscular tubes that carry Urine from the Renal Pelvis to the Bladder.
  - These tubes have three layers:
    - ✦ The Outer: fibrous connective tissue
    - ✦ The Middle: to control the flow of urine
    - ✦ The Inner: creates mucus to coat and protect the surface of the cells
- Contractions and Gravity move the Urine to the bladder.



## Process of Filtration

- **Filtration:**
  - The movement of water and dissolved materials from an area of high pressure to an area of lower pressure.
  - Blood cells and other cells too large to be filtered out are left in the blood.
- 1<sup>st</sup> and basic filtering.

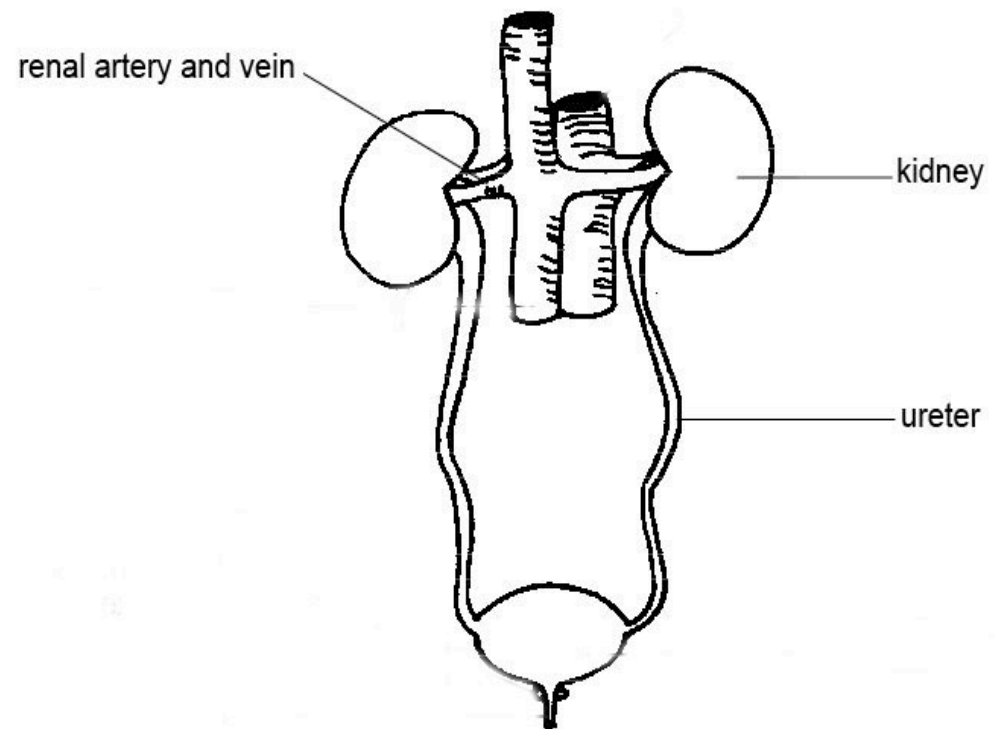


## Reabsorption

- After filtration, these are taken back(**REABSORBED**):
  - Water
  - Organic Nutrients
  - Vitamins
  - Sugars
- **2<sup>nd</sup> Filtering**

## Secretion

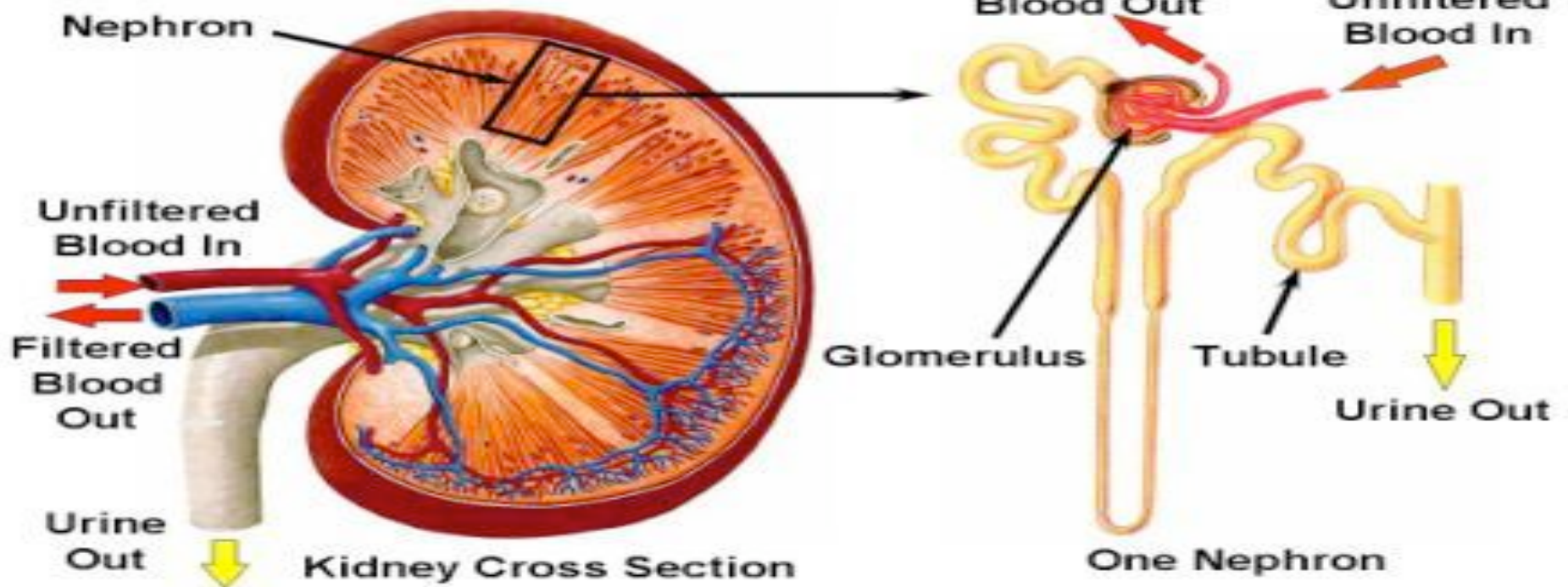
- Urine is **released**
  - What's different?
    - ✦ **All waste**
    - ✦ **Anything useful to the body has been filtered out**



## How Urine is Eliminated from the Body

1. Blood enters the kidney through the Renal Artery.
2. Blood enters a Nephron in the Kidney.
3. Filtration- In the glomerolous-blood is taken away.
4. Reabsorption- In the Loop of Henle –nutrients and water are taken away.
5. Secretion- waste leaves through Ureter to the bladder.

### Parts of the Nephron





Questions?





*Activity Time!*