

## Excretion

The biological process involved in the removal of harmful metabolic wastes from the body is called Excretion.

### Waste products

#### Nitrogenous waste products

- ❖ They are major waste products. the important nitrogenous waste products are Urea, Uric acid, Ammonia etc.
- ❖ Non nitrogenous waste products : Lactic acid, Oxalic acid
- ❖ CO<sub>2</sub>
- ❖ Excess Water
- ❖ On the basis of nitrogenous waste product excreted from the body it is divided into -

1. Ammonotelic 2. Ureotelic 3. Uricotelic

Category	Examples
Ammonotelic	Aquatic animals e.g., Bony fishes, tadpole of frogs
Ureotelic	Cartilagenous fish, Frog and Mammal
Uricotelic	Birds, Insect and Reptiles

## Excretion

In simpler organisms like Amoeba, removal of wastes takes place by simple diffusion from the body surface into the surrounding water.

Multicellular organisms utilize more complex excretory methods.

In human beings, they have a well defined Excretory System.

Excretory organ in human can be divided into :

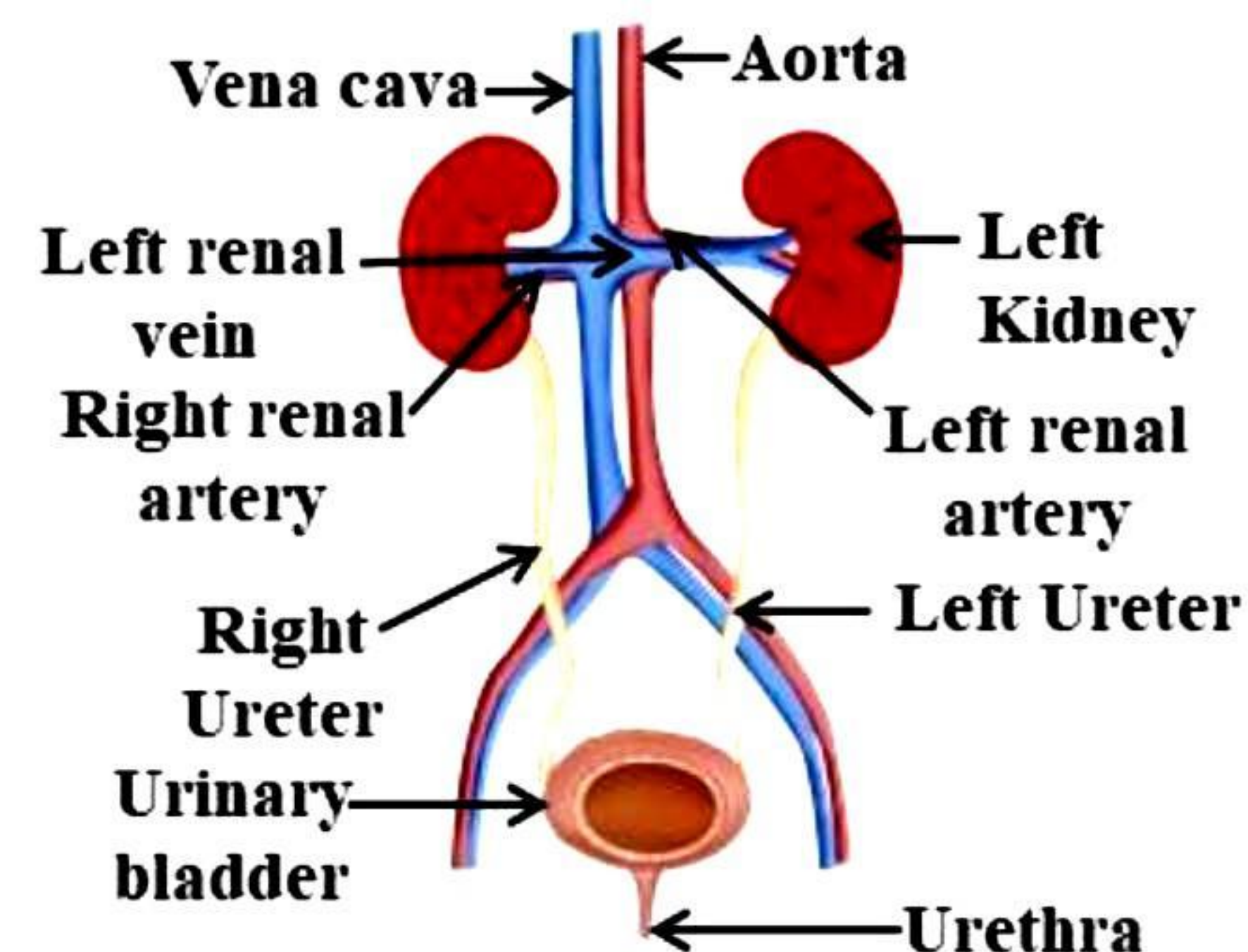
Primary/Major Excretory organs

Accessory Excretory organs

### Excretion in Human Being

Primary Excretory organs

- A pair of kidneys
- A pair of ureters
- A urinary bladder
- Urethra



Kidneys are located at the back in the abdomen lateral to vertebral column.

### Functions of The Kidney

Excretion of nitrogenous and other waste products

Water balance

Elimination of toxic chemicals

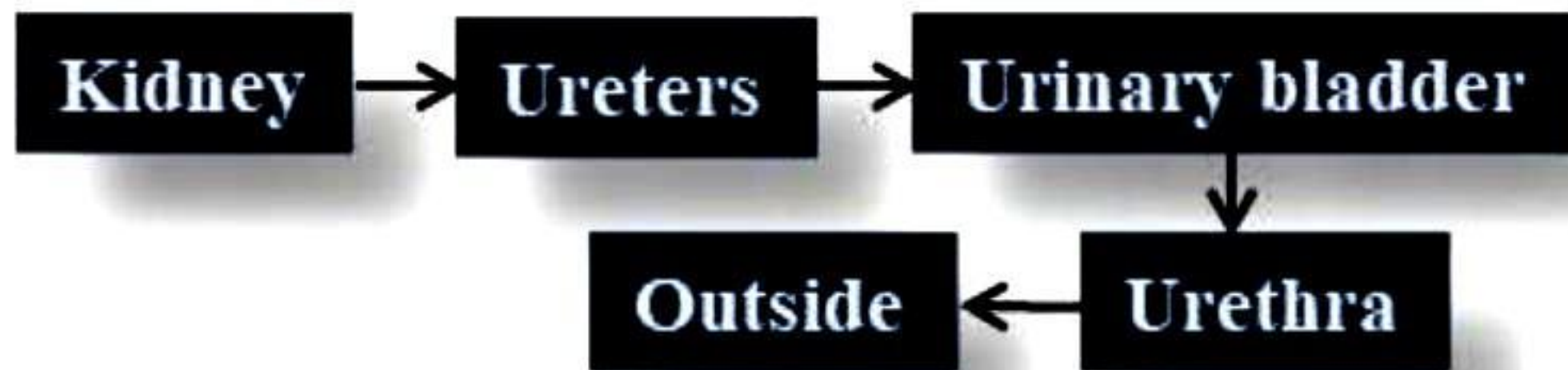
Maintenance of pH of body fluids

Nephron is the structural and functional unit of the kidney.

Each kidney of man is formed of about one million nephrons.



## Urine pathway

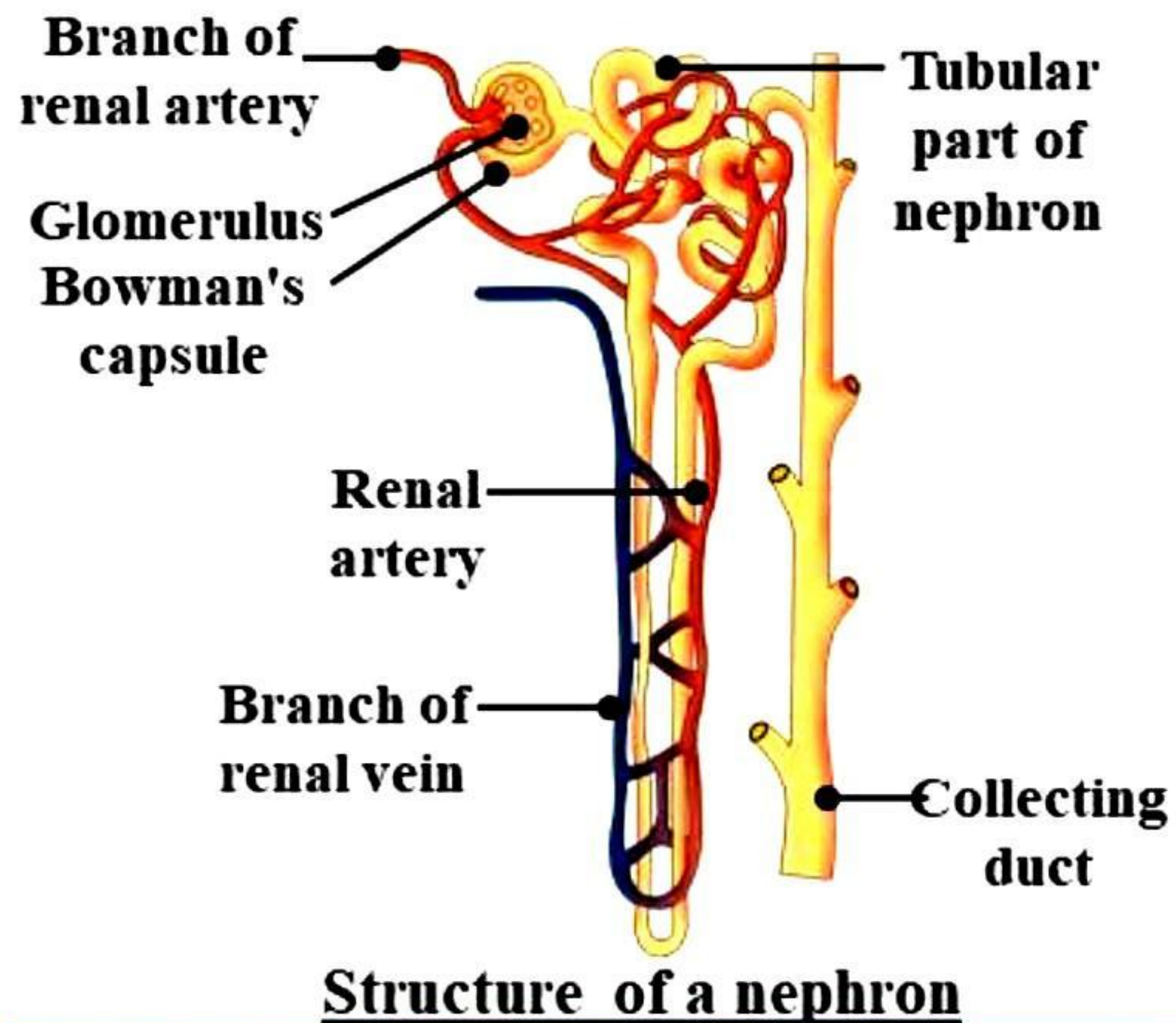


## Accessory Excretory Organs

- Through skin
- By Liver
- Through lungs

Nephron is the structural and functional unit of the kidney.

Each kidney of human is formed of about one million of nephrons.



## Excretion

### Excretion in Plants

Plants get rid of gaseous waste material through stomata.

Excess of water is excreted out by Transpiration.

In some plants excretory wastes are stored in leaves and by shedding of these leaves, plants get rid of excretory materials.

Some waste products are stored in the form of resins and gums in old xylem.

Plants also secrete some undesirable materials into the soil around them.

