



Anesthesia Department

Urinary System

Human Biology (ANE106)

Year 1/ Spring semester

Lecture 6

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Urinary System



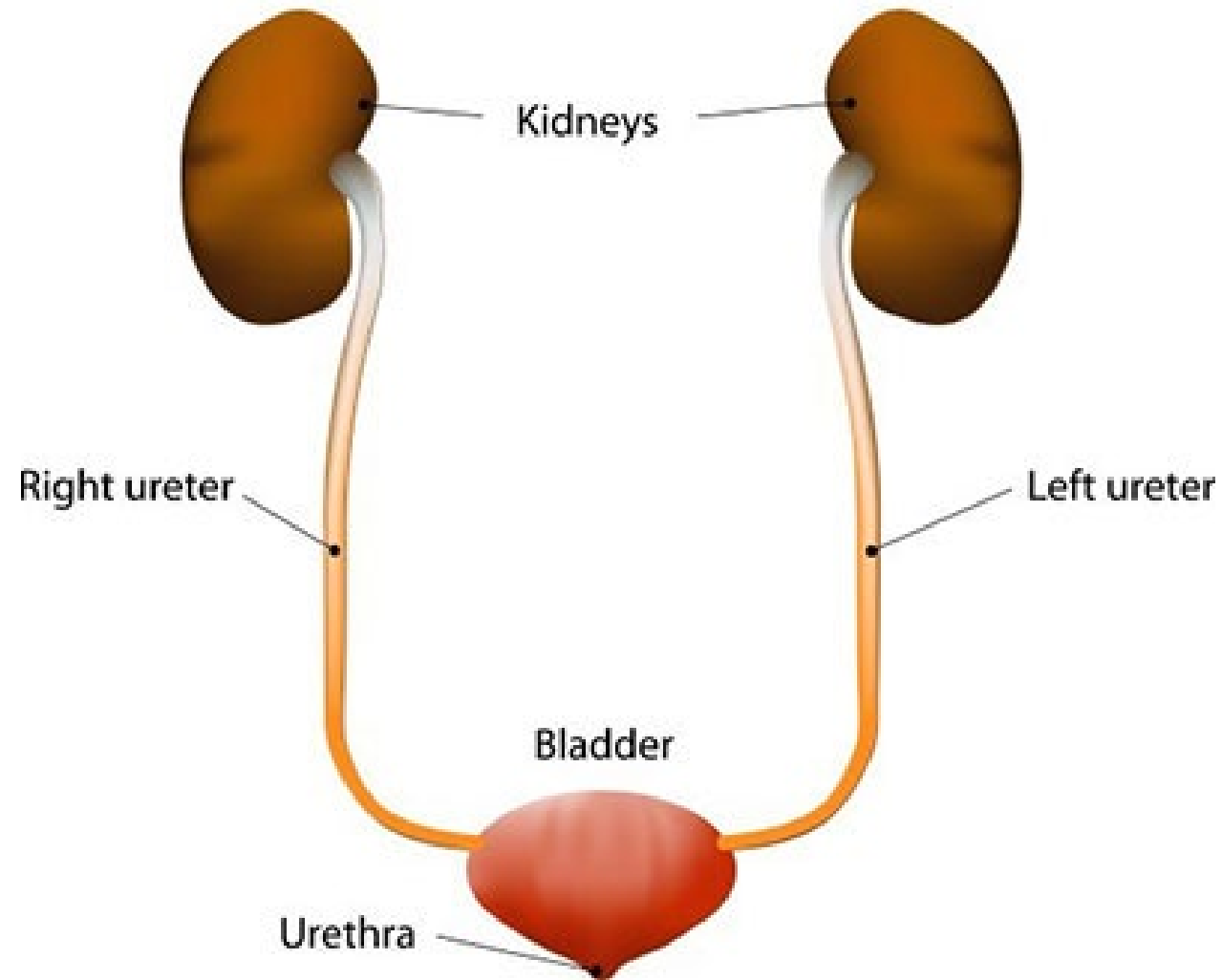
Urinary System

The urinary system is a group of organs responsible for filtering blood, removing metabolic wastes, maintaining fluid and electrolyte balance, regulating blood pressure, and producing urine.

Main Functions of the Urinary System

1. Excretion of metabolic wastes
2. Regulation of water balance
3. Regulation of electrolyte levels
4. Maintenance of acid-base balance
5. Regulation of blood pressure
6. Production of hormones
7. Formation and excretion of urine

Urinary System



Organs of the Urinary System

- 1. Kidneys:** Two bean-shaped organs that filter the blood and produce urine.
- 2. Ureters:** Two tubes that carry urine from the kidneys to the bladder.
- 3. Urinary Bladder:** A muscular sac that stores urine.
- 4. Urethra:** A tube that carries urine from the bladder to the outside of the body.



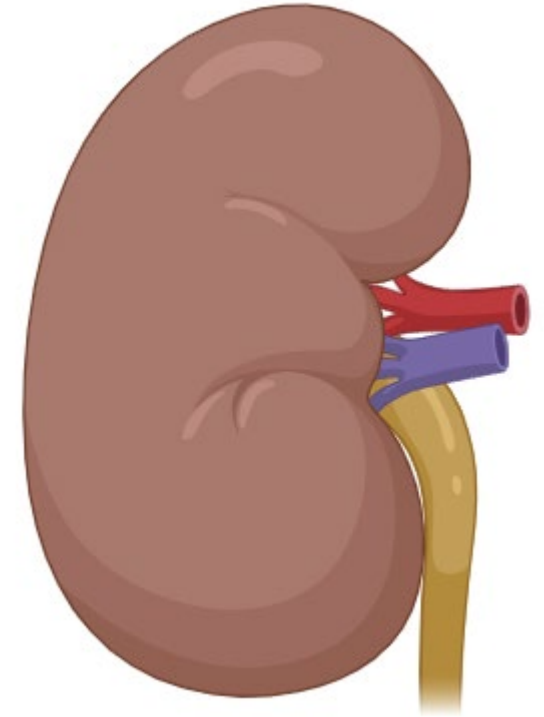
The Kidneys

Location

- The kidneys are located in the back of the abdominal cavity, one on each side of the spine.

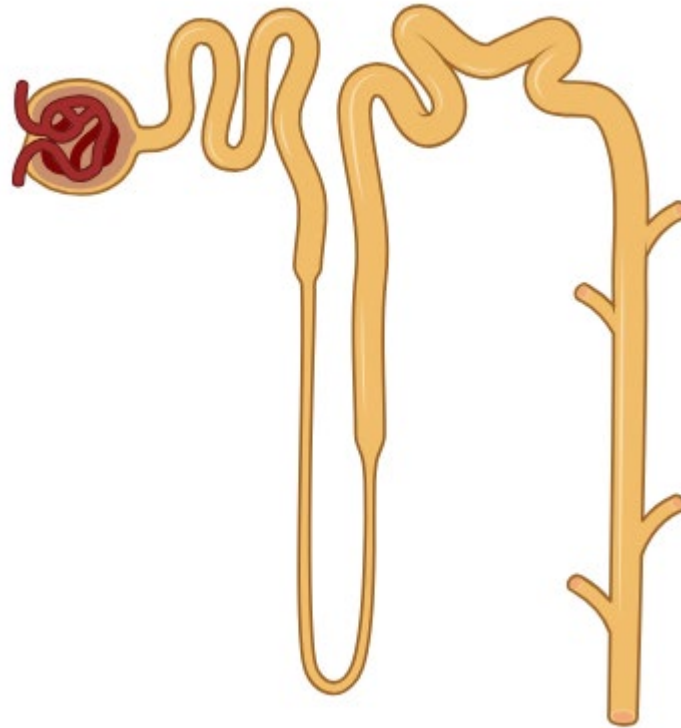
Characteristics

1. Bean-shaped
2. Dark reddish-brown color
3. About the size of a fist



The Nephron

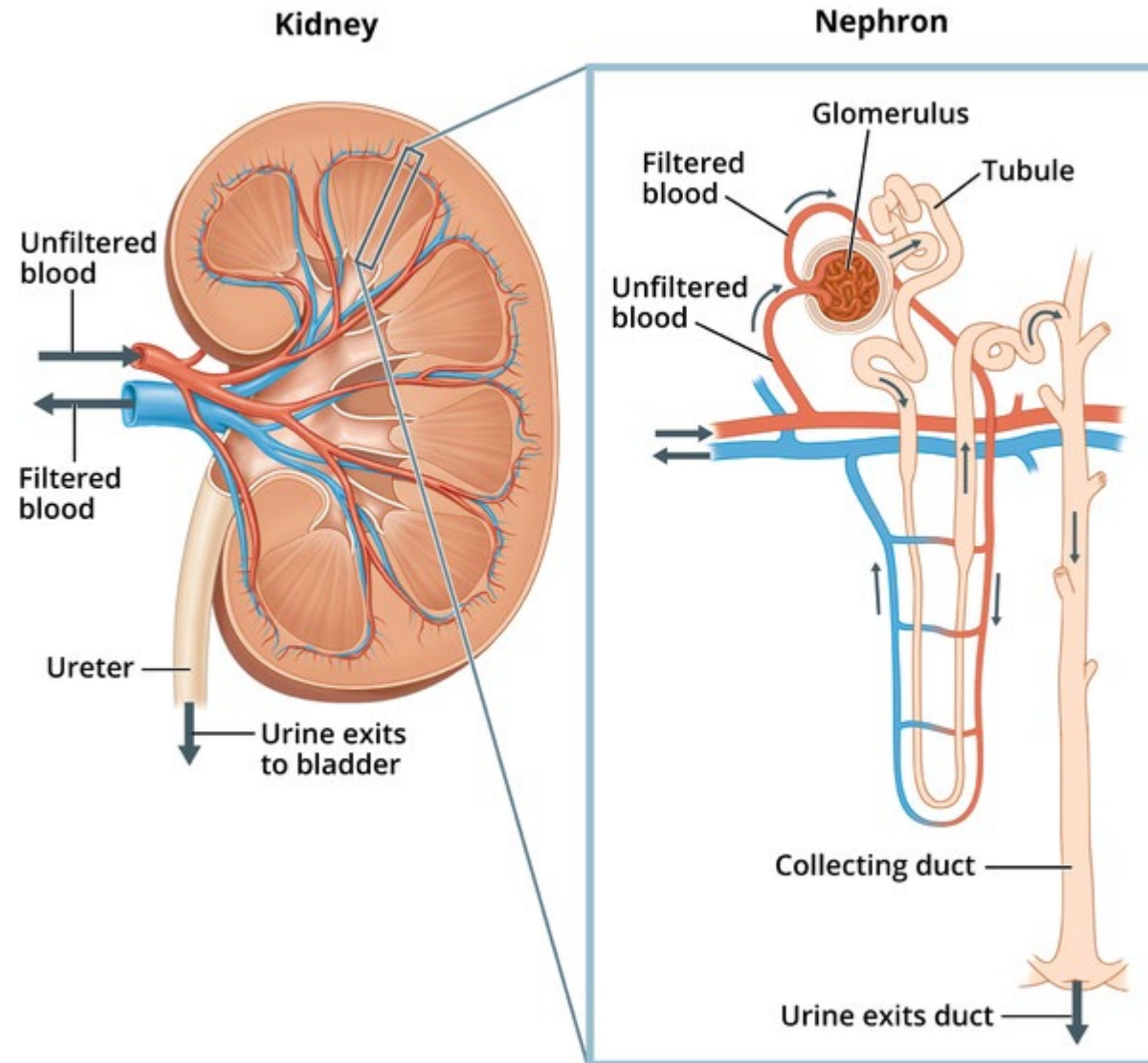
A nephron is the microscopic structural and functional unit of the kidney responsible for filtering blood and forming urine.



Main Parts of a Nephron

- **Glomerulus:** filters blood.
- **Bowman's Capsule:** collects the filtered fluid.
- **Tubule:** reabsorbs useful substances and water.
- **Collecting Duct:** carries urine toward the renal pelvis.

Main Parts of a Nephron



How Urine is Formed

Step 1: Filtration

Blood enters the kidneys.

The kidneys filter out:

1. Waste products
2. Excess water
3. Excess salts

How Urine is Formed

Step 2: Reabsorption

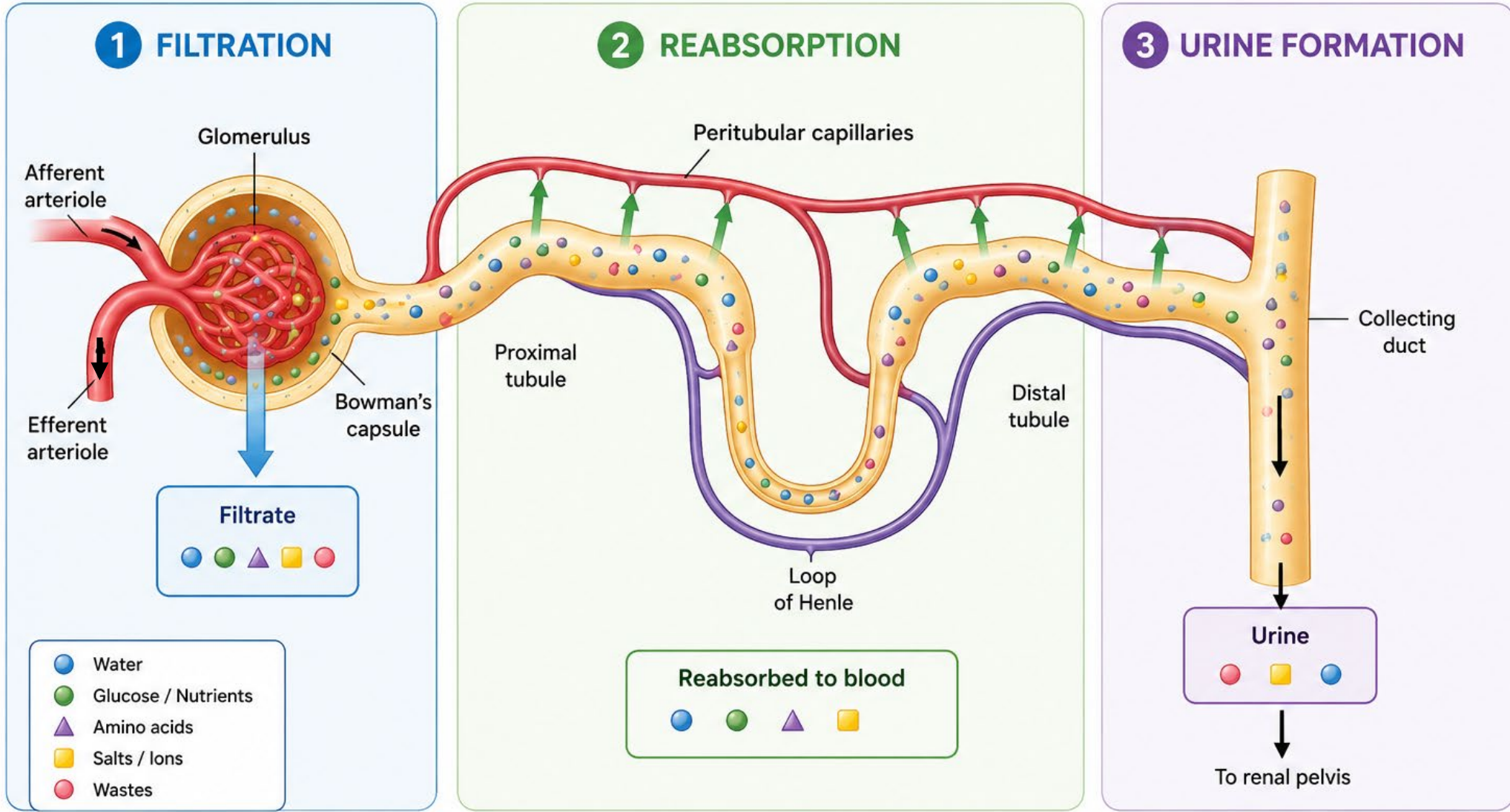
1. Useful substances are returned to the bloodstream, including:
2. Most water
3. Nutrients
4. Important minerals

How Urine is Formed

Step 3: Urine Formation

- The remaining waste and excess water become urine.

How Nephrons Form Urine

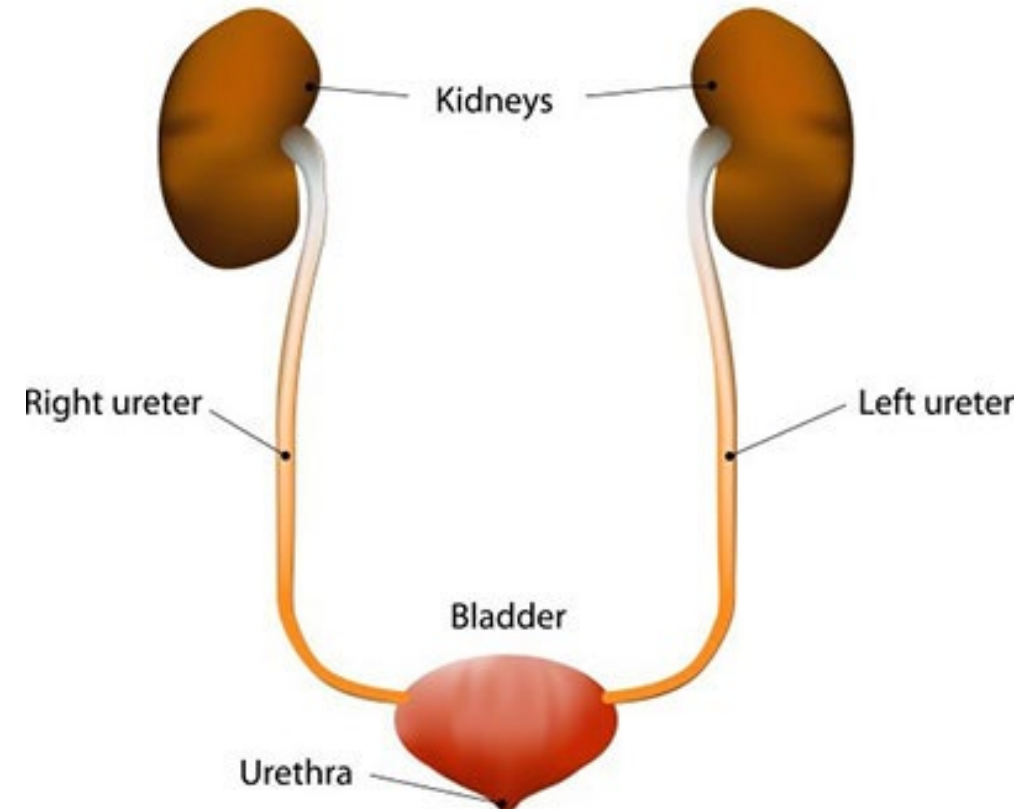


Ureters

The ureters are narrow muscular tubes that transport urine from the kidneys to the bladder.

Features

- One ureter from each kidney
- About 25–30 cm long
- Move urine by rhythmic contractions



Urinary Bladder

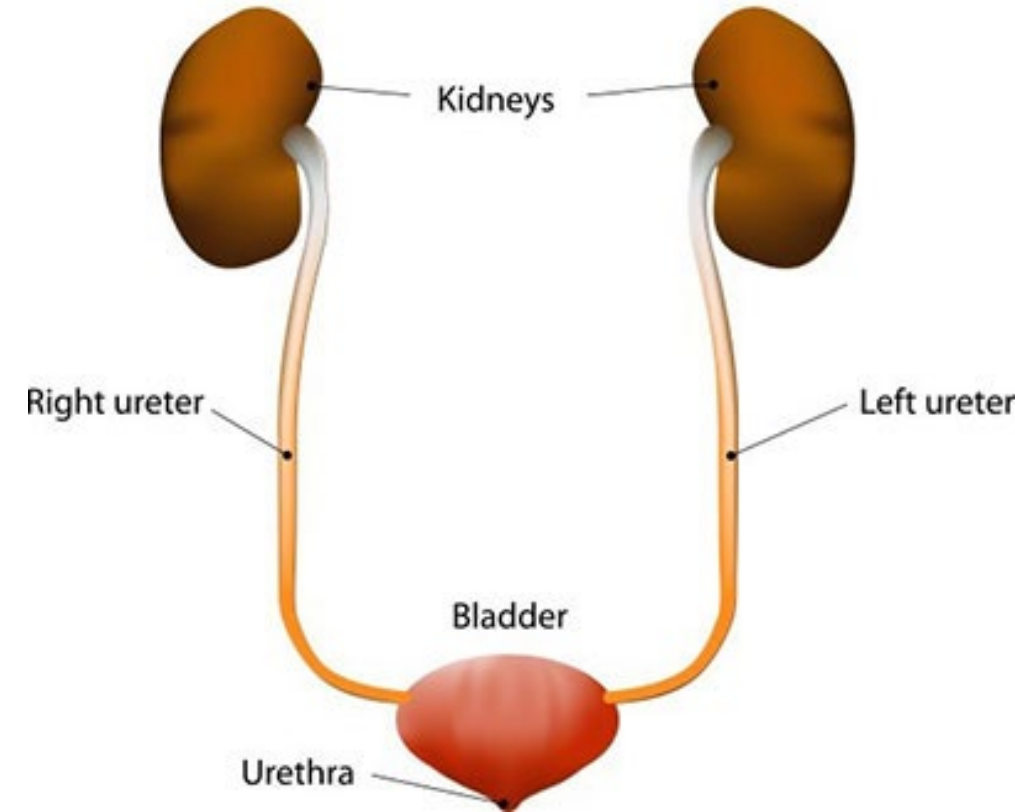
The urinary bladder is a hollow muscular organ that stores urine.

Functions

- Temporary storage of urine
- Expands as it fills

Capacity

An adult bladder can hold approximately 400–600 mL of urine.



Urethra

The urethra carries urine from the bladder to the outside of the body.

