

EXCRETORY SYSTEM

Big Picture

The body must get rid of the waste products of cellular activity. The process of removing these wastes is called excretion. The excretory system not only gets rid of wastes, but it also maintains homeostasis by regulating the contents of blood. The kidneys are the main organs of the excretory system. They regulate the chemical composition of blood and excrete the remaining waste as urine.

Key Terms

Excretory System: The group of organs that work together to remove waste from an organism.

Kidney: One of a pair of organs in the human body that works to remove waste from the body and maintain homeostasis.

Large Intestine: Organ involved in removing solid waste from the body.

Liver: Organ involved in blood detoxification and glycogen storage. The liver maintains glucose levels in the blood by storing glucose as glycogen and also releasing glycogen as glucose back into the blood.

Skin: Organ involved in the removal of excess salt from the body through sweat.

Lungs: Organ involved in expelling carbon dioxide from the body.

Urinary System: Filters waste products and excess water from the blood and excretes them from the body.

Urine: The liquid waste product of the body.

Nephron: The structural and functional unit of the kidneys.

Ureters: Two tubes that move urine by peristalsis to the bladder.

Bladder: A hollow, sac-like organ that stores urine.

Urethra: A muscular tube that carries urine out of the body.

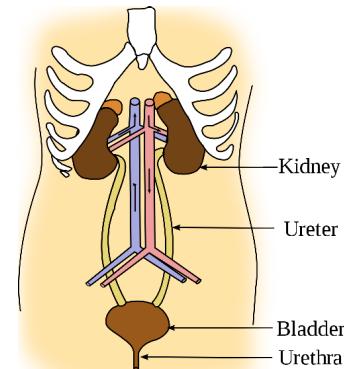


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Excretion

All processes in the body produce waste that needs to be removed. The **excretory system** includes several organs: the **kidneys**, the **large intestine**, the **liver**, the **skin**, and the **lungs**.

- The kidneys are the main organs of excretion and are part of the **urinary system**.
- The large intestine, which is also part of the digestive system, removes the solid wastes left after the digestion of food.
- Although you may not think of the skin as part of the excretory system, the skin is an organ that removes excess salt and water by sweating.
- The lungs, which are part of the respiratory system, remove water vapor and carbon dioxide.

Urinary System

The kidneys are a pair of organs that filter blood to form **urine** and reabsorb water.

Filtering Blood and Forming Urine

- Capillaries surrounding the **nephron** receive blood from the renal artery.
- Blood pressure forces fluid from the blood across the capillary wall.
- The filtered fluid then moves down the renal tubule. Some substances are reabsorbed into the bloodstream while others are secreted into the tubule.
- The fluid then enters a collecting duct. Some water will be reabsorbed into the bloodstream. The fluid that remains at the end of the collecting duct is urine.

Nephron

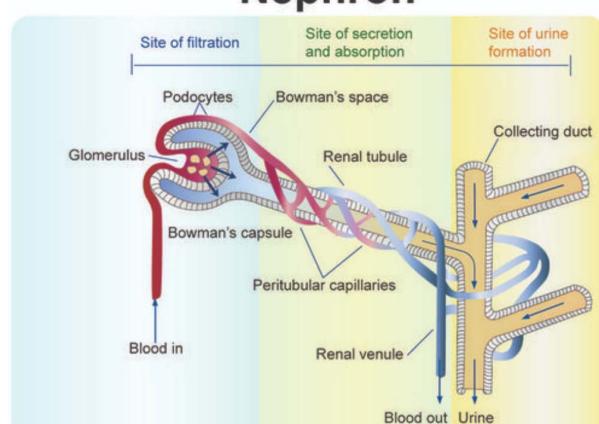


Figure: Nephron

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EXCRETORY SYSTEM CONT.

Urinary System (cont.)

Excretion of Urine

- From the kidneys, urine enters the **ureters**, which move the urine to the **bladder**.
 - The process of excreting urine from the body, urination, occurs when the bladder sends a nerve impulse that tells a sphincter to relax and release urine.
 - The urine travels out of the body through the **urethra**.

Homeostasis

- The kidney regulates electrolytes in the blood, blood pressure, and blood pH.
 - The kidney maintains homeostatic balance by secreting and reabsorbing ions and water from urine.
 - The kidney also removes the nitrogenous wastes urea and uric acid from the blood.

Kidney Disease

People only require one functional kidney to be healthy. Nevertheless, there are many diseases that impair kidney function.

- Kidney stones: Solid mineral crystals. Kidney stones can form in the kidney itself or in the ureter, often causing painful blockages of urine passage.
 - Bacterial infections: Common bacterial infections are those of the urinary tract and bladder.
 - Diabetes: Untreated diabetes can damage the capillaries surrounding nephrons, reducing their ability to filter blood.
 - Kidney failure: Kidneys cannot properly filter blood and form urine.
 - Kidney failure can only be cured by a kidney transplant, but it can be treated with dialysis. In dialysis, blood is filtered by machine.

Notes