

II.Excretion: The process by which metabolic wastes are eliminated to maintain homeostasis.

B.Common Forms of excretion: Skin, Lung Liver, Kidneys

C.Role of Excretion in maintaining homeostasis: The kidneys are critical to keeping the body in its ideal homeostatic condition. Homeostasis is the maintenance of stability in all the body's systems. One element of homeostasis is maintaining a constant temperature in the body. The kidneys help this by excreting urine and other metabolic waste matter. The kidneys also maintain the correct level of salt and ion levels in the blood, and the right amount of acidity in the blood

D. The skin excretes excess water, salts and a small amount of urea in sweat. By releasing in very small amounts, this eliminates wastes from the body.

E.Components of the urinary system:

Kidneys: filter blood

Ureters: carry urine to the bladder

Bladder: stores urine

Urethra: releases urine to external environment

Associated blood vessels;

Renal artery: carries blood containing urea to kidney

Renal vein: carries filtered blood away from the kidney.

F. Formation of urine: Filtration, passing a liquid or gas through a filter to remove wastes, occurs in the renal corpuscles. Nearly 180 liters of filtrate pass from the blood into nephron tubules every day, but most get reabsorbed, the process by which water and dissolved substances are taken back into the blood. The body then convert the wastes into urine.

Glomerulus: A small, dense network of capillaries(very small blood vessels) encased in the upper end of each nephron, where the filtration of blood mainly takes place.

Bowman's capsule: A hollow, cup- shaped structure that encases the glomerulus.

Renal Tubule: The renal tubule is an important structure in the kidney that contains tubular fluid, a filtrate that eventually becomes urine, and is excreted from the body. Renal tubules are part of the nephron, the basic functional unit of the kidney. Each normal human kidney has about 800,000 to one million nephrons, and each nephron has a renal tubule.

Loop of Henle: A section of the nephron tubule that is responsible for conserving water and minimizing the volume of the filtrate.

Capillaries:Very small blood vessels

Collecting duct in the nephron: The urine that remains in the nephron tubule is emptied into a collecting duct. From the collecting duct, urine flows to the ureter of each kidney.

G.Forms of nitrogenous wastes: Ammonia, Urea, and uric Acid

H.Deamination: the removal of an amino group from an amino acid or other compound

Role of liver in producing nitrogenous wastes: Converts nitrogenous wastes, a product of protein breakdown, into a less toxic urea. Urea, which is highly soluble is then transported throughout the blood to the kidneys for elimination from the body.

I. Different Excretory products of various organism: Single-celled organisms have most of their wastes diffuse out into the outside environment. Multicellular organisms, and animals in particular, must have a specialized organ system to concentrate and remove wastes from the interstitial fluid into the blood capillaries and eventually deposit that material at a collection point for removal entirely from the body.

J. Role of ADH(anti diuretic hormone) in regulating urine volume and concentration: ADH causes the

kidneys to reabsorb more water and to excrete less water in the urine. If the blood contains excess water, ADH secretion stops and more water is excreted.

K. Kidney Stone: sometimes substances like calcium, magnesium or uric acid salts in the urine crystallize and form kidney stones. When kidney stones block a ureter, they cause great pain.

Treatments: Ultrasound waves that pulverize the stones into smaller fragments, which are eliminated with the urine.

L. Urinary Tract infection (UTI): A UTI is an infection in the urinary tract. Infections are caused by microbes (organisms too small to be seen without a microscope). Bacteria are the most common cause of UTIs. Normally, bacteria that enter the urinary tract are quickly removed by the body before they cause symptoms. But sometimes bacteria overcome the body's natural defenses and cause infection.

Risks: Being female, sexually active, using certain types of birth control, having a blockage like a kidney stone in the urinary tract, or having a suppressed immune system

Treatment: UTIs are treated with antibiotics that can kill the bacteria causing the infection. The antibiotic prescribed will depend on the type of bacteria causing your UTI. Antibiotics are taken for a few days depending on the condition.

Avoiding UTI: Drinking lots of fluid, mainly water, urinate often, wear loose fitted clothing.

M. Kidney Failure: When kidneys can no longer cleanse the blood and maintain a state of homeostasis in the body, a person is said to have a kidney failure. A person with kidney failure must receive dialysis or undergo a kidney transplant.

Role of dialysis: A machine that performs the role of the kidneys. The patient's blood is pumped through the machine, cleansed and pumped back into the body. The procedure is painless, but is very time consuming. Most patients receive dialysis 3 times a week for 4 hours. To prevent the buildup of fluid and harmful materials between treatment, patients must restrict fluid intake and eat foods that are low in potassium, phosphorus and salt.