

BODY FLUIDS

The total fluid present inside the body is known as body fluids. It is about 60 to 65% of the body weight (about 40 liters).

Composition of Body Fluids

The body fluids are made up of:

1. Water

2. Solids

The solid substances of body fluids are made up of organic and inorganic substances. The organic substances of body fluids are glucose, amino acids, fatty acids, hormones, enzymes. The inorganic substances of body fluids are sodium, potassium, calcium, magnesium, chloride, bicarbonate, phosphate and sulphate.

COMPARTMENTS OF BODY FLUIDS OR DISTRIBUTION OF BODY FLUIDS

The total amount of water present in the body is about forty (40) litres. It is distributed into two major compartments namely:

1. **Intracellular fluid (ICF):** The fluids present inside the cell is known as intracellular fluid. It is about 55% of the total body's water (about 22 litres).
2. **Extracellular fluid (ECF):** The fluid present outside the cell is known as extracellular fluid. It is about 45% of the total body' water (about 18 litres). The extracellular fluid is divided into five subunits namely:
 - a. Interstitial fluid and lymph
 - b. Plasma
 - c. Fluids in bone
 - d. Fluids in dense connective tissues like cartilage and
 - e. Transcellular fluid, that includes:
 - i. Cerebrospinal fluid (CSF)
 - ii. Intraocular fluid
 - iii. Digestive juices
 - iv. Synovial fluid in joints
 - v. Fluid in urinary tract
 - vi. Serous fluid: Intrapleural fluid, Pericardial fluid, Peritoneal fluid

FUNCTIONS OF BODY FLUIDS

1. It transports nutrients and other essential substances though out the body.
2. It excretes water, toxins, waste food and waste products.
3. It stimulates chemical activities and metabolic processes of cells.
4. It regulates the body temperature.
5. It helps the indigestive process of the body.
6. It maintains normal acid base balance.
7. It helps to moisten the skin.

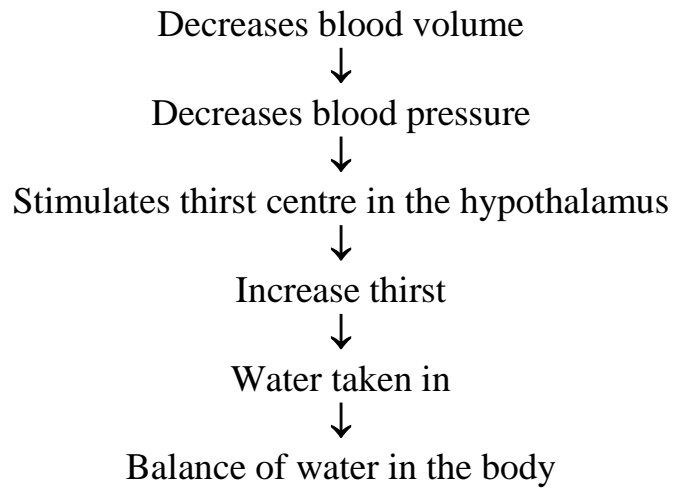
REGULATION OF BODY FLUIDS

The fluid balance is mainly regulated by two processes:

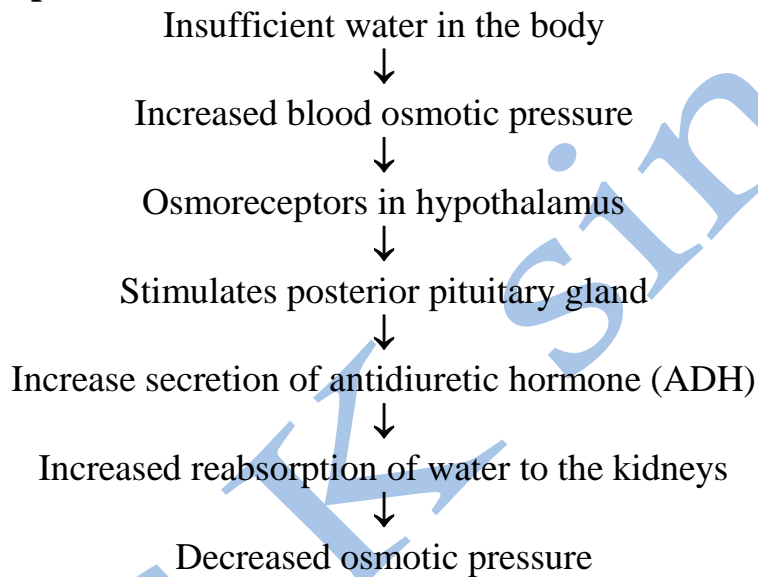
1. Thirst mechanism

Insufficient water in the body





2. Increased osmotic pressure



ELECTROLYTES

The solution which conducts electricity is known as electrolytes. It conducts electricity due to presence of mobile ions. It is also known as ions. Examples:- Sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), phosphate (PO_4^{3-}), sulphate (SO_4^{2-}), magnesium (Mg^{++}) etc.

Type of Electrolytes

The electrolytes are divided into two groups:

1. **Anions:** It is negatively charge and includes chloride, phosphate, bicarbonate and sulphate.
2. **Cations:** It is positively charge and includes sodium, potassium, calcium and magnesium.

Functions of Electrolytes

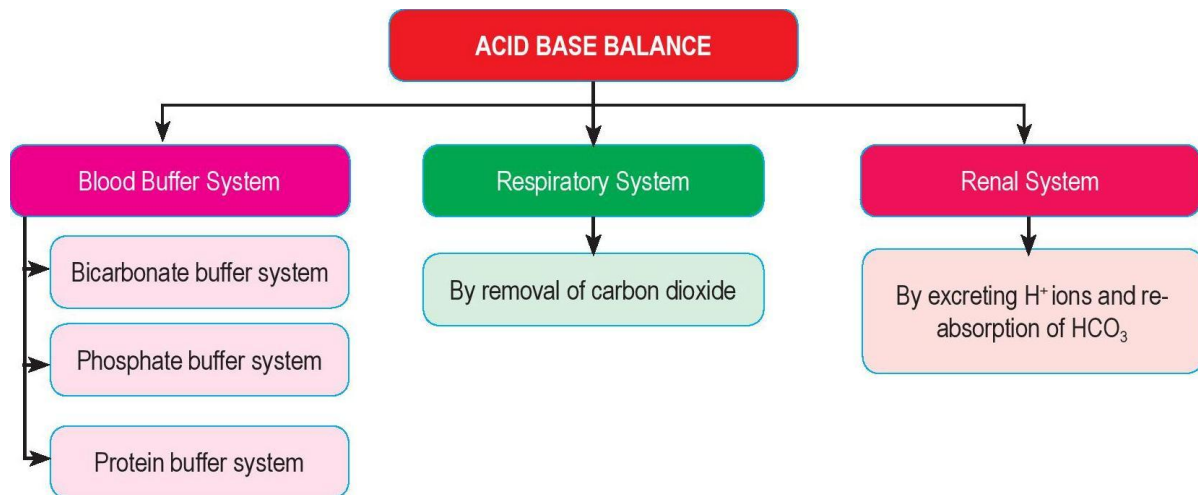
1. It controls water balance and fluid distribution in the body.
2. It regulates acidity (pH) of the blood.
3. It regulates oxygen level in the blood.
4. It involves moving nutrients inside the cells and waste products outside the cells.
5. It helps in the muscle contraction and nerve transmission.

ACID BASE BALANCE

The balancing act in the body between acidity and basicity is known as acid-base balance.

Regulation of Acid Base Balance

The acid base balance is regulated by three systems.



1. Buffer System

Any solution which can resist change in pH even on addition of small amount of strong acid or base is known as buffer system.

Types of buffer system

- Bicarbonate buffer system:** It is present in extra cellular fluid.
- Phosphate buffer system:** It consists of a weak acid.
- Protein buffer system:** It is present in the blood, both in the plasma and red blood cells.

2. Respiratory System

The lungs take part in the maintenance of acid base balance by removing the carbon dioxide from the body.

2. Renal System

The kidneys are maintaining the acid base balance of the body fluids by the secretion of hydrogen ions and by the retention of bicarbonate ions.

OSMOSIS

The passage of the solution of low concentration towards that of high concentration through a semi permeable membrane separating the solutions of different concentration is known as osmosis.

DIFFUSION

The movement of molecules in a solution from a higher concentration to lower concentration is known as diffusion.

