

Water Balance & Functions

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There are three basic principles that are essential to understanding the balance and use of water in the human body: A unified whole, body water compartments, and particles in the water solution.

A Unified Whole – The human body forms one continuous body of water that is contained by a protective covering...your skin. Solvents within the water and membranes that separate the compartments control water movement to all parts of the body. Virtually every space inside and outside of the cells are filled with water-based body fluids. Within this environment, all processes that are necessary to life happen.

Body Water Compartments – The word compartment is generally used in human physiology to refer to a dynamic area within the body. Body water can be discussed in terms of total body water, or individual locations in the body, such as intracellular or extracellular. The human body is constantly shifting water to places of greatest need, and to maintain equilibrium in all parts.

Particles in the water solution – The concentration and distribution of particles in water, such as, sodium, chloride, calcium, magnesium, phosphate, bicarbonate, and protein, determine the internal shifts and balances among the compartments of body water.

Body Water Functions – The function of body water is that it acts as a solvent, serves as a means of transport, regulates temperature, and provides lubrication for the body.

- Solvent – Water is the basic liquid solvent for all chemical reactions in the body. Extracellular fluid (ECF) is the water on the outside of the cells in the body. Intracellular fluid is the total body water inside the cells.
- Transport – Water circulates throughout the body in the form of blood and other secretions. In this fluid it carries nutrients, secretions, metabolites, and other materials to be carried anywhere in the body to meet the needs of the cells.
- Thermoregulation – Water is necessary to maintain a stable body temperature. As the body temperature rises, sweat is released and evaporates from the skin, therefore, cooling the body.
- Lubricant – Water has a lubricating effect on moving parts of the body. For example, fluids in the joints help to provide smooth movement and prevent damage from friction.

Osmosis – Is the movement of water molecules from an area with a low solute concentration to an area with a high solute concentration. Osmotic pressure is the pressure that moves water across the membrane to equalize the solutions on both sides.