

# GUIDE TO ELECTROLYTES

Electrolytes are minerals that carry an electric charge and conduct electrical signals throughout our bodies. They help us regulate water distribution, maintain acid-base balance, and transmit nerve impulses. They also contribute to energy generation and blood clotting. The follow is a review of the main electrolytes.

## Potassium (K)

- Main intracellular fluid (ICF) cation
- Affects a cell's electrical status when permeating cell membranes
- Regulates cell excitability
- Balances ICF osmolality and ICF osmotic pressure

## Magnesium (Mg)

- A leading ICF cation
- Contributes to enzymatic and metabolic processes (i.e. protein synthesis)
- Modifies neural communication, heart function and skeletal muscle response

## Phosphorus (P)

- Main ICF anion
- Acts as a hydrogen buffer and acid/base balance
- Formation of red blood cells
- Supports energy storage and carbohydrate, protein, and fat metabolism

## Sodium (Na)

- Main extracellular fluid (ECF) cation
- Activates nerve and muscle cells
- Helps maintain acid-base balance
- Helps govern normal osmolality
- Maintains fluid balance in the blood

## Chloride (Cl)

- Main ECF anion
- Helps maintain normal ECF osmolality
- Affects body pH
- Plays a vital role in maintaining acid-base balance; combines with hydrogen ions to produce hydrochloric acid

## Calcium (Ca)

- A major cation in teeth and bones; found in fairly equal concentrations in ICF and ECF
- Helps cells maintain their shape and adhere to one another
- Acts as an enzyme activator within cells
- Aids blood coagulation
- Affects cell membrane permeability and firing level
- Important role in muscle contraction
- Inhibitory affect on neurons

## Bicarbonate ( $\text{HCO}_3^-$ )

- Present in ECF
- Primary function is regulating acid-base balance
- Affected by food, medications, kidney and lung function