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Basics of electrolyte

Electrolytes are involved in many essential processes in your body.

They play a role in conducting nervous impulses, contracting muscles, keeping you hydrated and regulating your body's pH levels.

Therefore, you need to get an adequate amount of electrolytes from your diet to keep your body functioning as it should.

This article takes a detailed look at electrolytes, their functions, the risk of imbalance and possible sources.

What Are Electrolytes?

“Electrolyte” is the umbrella term for particles that carry a positive or negative electric charge.

In nutrition, the term refers to essential minerals found in your blood, sweat and urine.

When these minerals dissolve in a fluid, they form electrolytes — positive or negative ions used in metabolic processes.

Electrolytes found in your body include:

- Sodium
- Potassium
- Chloride
- Calcium
- Magnesium
- Phosphate
- Bicarbonate

These electrolytes are required for various bodily processes, including proper nerve and muscle function, maintaining acid-base balance and keeping you hydrated.

Needed to Maintain Vital Body Functions

Electrolytes are crucial to keeping your nervous system and muscles functioning and your internal environment balanced.

Nervous System Function

Your brain sends electrical signals through your nerve cells to communicate with the cells throughout your body.

These signals are called nervous impulses, and they're generated by changes to the electrical charge of the nerve cell membrane.

The changes occur due to the movement of the electrolyte sodium across the nerve cell membrane.

When this happens, it sets off a chain reaction, moving more sodium ions (and the change in charge) along the length of the nerve cell axon.

Muscle Function

The electrolyte calcium is needed for muscle contraction.

It allows muscle fibers to slide together and move over each other as the muscle shortens and contracts.

Magnesium is also required in this process so that the muscle fibers can slide outward and muscles can relax after contraction.

Proper Hydration

Water must be kept in the right amounts both inside and outside each cell in your body.

Electrolytes, particularly sodium, help maintain fluid balance through osmosis.

Osmosis is a process where water moves through the wall of a cell membrane from a dilute solution (more water and fewer electrolytes) toward a more concentrated solution (less water and more electrolytes).

This prevents cells from bursting from being too full or shriveling up due to dehydration .

Internal pH Levels

To stay healthy, your body needs to regulate its internal pH.

pH is a measure of how acidic or alkaline a solution is. In your body, it's regulated by chemical buffers, or weak acids and bases, which help minimize changes in your internal environment.

For example, your blood is regulated to stay at a pH of around 7.35 to 7.45. If it deviates from this, your body can't function properly, and you become unwell.

Having the right balance of electrolytes is fundamental to maintaining your blood pH level.

Electrolyte Imbalances Are Bad for Your Health

In some circumstances, electrolyte levels in your blood can become too high or low, causing an imbalance.

Disturbances in electrolytes can have a harmful effect on your health and can even be fatal in rare cases.

Electrolyte imbalances often occur due to dehydration caused by excess heat, vomiting or diarrhea. This is why you should be mindful of replacing any lost fluids when it's hot or when you're sick.

Some illnesses, including kidney disease, eating disorders and injuries like severe burns, can cause electrolyte imbalances as well.

If you have a mild electrolyte disturbance, you probably won't experience any symptoms.

However, more severe imbalances can cause symptoms like:

- Fatigue
- Fast or irregular heartbeat
- Numbness and tingling
- Confusion
- Muscle weakness and cramping
- Headaches
- Convulsions

If you suspect you have an electrolyte imbalance, be sure to discuss your symptoms with your doctor.

Do You Need More Electrolytes If You Sweat a Lot?

When you sweat, you lose both water and electrolytes, especially sodium and chloride.

As a result, long periods of exercise or activity, particularly in the heat, can cause significant electrolyte loss.

It's estimated that sweat contains about 40–60 mmol of sodium per liter on average.

But the actual amount of electrolytes lost through sweat can vary from person to person.

In the US, the maximum recommended intake for sodium is 2,300 mg per day — which is equivalent to 6 grams or 1 teaspoon of table salt.

Since around 90% of American adults consume way more than this, most people don't need to replace sodium lost from sweat.

However, certain populations, such as endurance athletes who are exercising for more than two hours or those who exercise in extreme heat, may want to consider drinking electrolyte-enriched sports drinks to replace their losses.

For everyone else, getting the normal amount of sodium from foods and drinking water to remain hydrated is enough.

Dietary Sources of Electrolytes

The best way to reach and maintain electrolyte balance is through a healthy diet.

The main food sources of electrolytes are fruits and vegetables. However, in the Western diet, a common source of sodium and chloride is table salt.

Below are some foods that provide electrolytes:

- **Sodium:** Pickled foods, cheese and table salt.
- **Chloride:** Table salt.
- **Potassium:** Fruits and vegetables like bananas, avocado and sweet potato.
- **Magnesium:** Seeds and nuts.
- **Calcium:** Dairy products, fortified dairy alternatives and green leafy vegetables.

Electrolytes like bicarbonate are naturally produced in your body, so you don't need to worry about including them in your diet.

Should You Supplement Your Diet With Electrolytes?

Some people drink electrolyte water or supplement with electrolytes like sodium and calcium to ensure they get enough.

However, a balanced diet that includes sources of electrolytes should suffice for most.

Your body can typically regulate electrolytes efficiently and keep them at the right levels.

But in some circumstances, such as during bouts of vomiting and diarrhea where electrolyte losses are excessive, supplementing with a rehydration solution that contains electrolytes could be useful.

The amount you'll need to consume will depend on your losses. Always read the instructions on over-the-counter replacement solutions.

Also note that unless you have low levels of electrolytes due to excessive losses, then supplementing can cause abnormal levels and possibly illness.

It's best to first consult your doctor or pharmacist before supplementing with electrolytes.

The Bottom Line

Electrolytes are minerals that carry an electrical charge when dissolved in water.

They're vital for your nervous system, muscles and maintaining an optimal body environment.

Most people meet their electrolyte needs through a balanced diet, though imbalance may occur if you're dehydrated due to illness or excess heat.

If you suspect you have an electrolyte imbalance, speak with your doctor.