

Please Pass the Electrolytes

By Randy Bernard

Now that summer is upon us and race season is in full swing, the temperature at some events is approaching triple digits. Most endurance athletes know the importance of consuming fluids and some type of fuel, but the most overlooked component of a nutrition strategy is often electrolytes. Let's take a look at electrolytes and the importance they play in the success of the endurance athlete.

What are Electrolytes? I know, most of you are thinking that it has got to be some new type of flashlight that doesn't need batteries, but not exactly. Electrolytes are chemical substances used in the formation of electrically charged particles (ions) in body fluids. The most common electrolytes are:

- sodium
- potassium
- chloride
- calcium
- magnesium
- bicarbonate
- phosphate
- sulfate

Electrolytes are used to create electrical energy necessary for many body functions including transmission of nerve impulses and muscle contractions. In simple terms, many normal bodily functions are dependent on these substances. Consistent replenishment of electrolytes is as important as the fuel you consume and the water you drink during exercise. Normal body functions, not to mention performance, are severely compromised if adequate levels of electrolytes are not present, especially in the heat and/or when exercise goes beyond the two-hour mark. The analogy that I often use with athletes is that electrolytes are similar to the electrical current in your house. You can have a house full of gadgets, but without the electricity nothing will work properly.

Electrolytes During Exercise When we exercise our bodies sweat in an effort to cool down. Sweating causes large losses of sodium and chloride. Both of these electrolytes are monitored closely through hormonal receptors throughout the body. If there is an imbalance of electrolytes kidney function may be increased or decreased. In other words, the body has very effective mechanisms to regulate and re-circulate sodium and potassium. In order to replace the losses we have while sweating our bodies require a low-sodium approach to electrolyte replacement. In essence, we want to work with our body's natural hormone and enzyme mechanics, not against it.

The truth is that the human body needs very minute amounts of sodium to function normally. We need only 250 mg of sodium each day, athletes maybe 500 mg, which is easily supplied by natural, unprocessed foods. However, the average American consumes

approximately 6000 to 7000 mg per day. The average athlete stores at least 8,000 mg of dietary sodium in tissues and has these stores available during exercise.

Replacement Theory So now that we know electrolytes are important, the big question is how much do I take? Unfortunately, there's a problem with this because individual sweat-losses vary greatly and the human body does not and cannot efficiently replace what it spends during exercise activity at any intensity above walking pace. Electrolytes lost are not replaced by electrolytes consumed.

The body replaces only between 35-45% of what it loses during exercise. If we try to replace all the fluids at once, we end up with dilutional hyponatremia (overly diluted blood sodium levels) or water-intoxication. If we attempt to replace all the fuels that we spend, the stomach will back up in total rebellion, and refueling will come to a grinding halt. And, if we try to replace all the electrolytes we lose in equal amounts, a number of hormonal triggers may create all sorts of problems such as gastric stress, edema, or muscle spasm and cramping. If you want to see your effort come to a complete halt, forget to take in electrolytes or take in too many electrolytes from an unbalanced formula and watch it happen!

The solution for proper electrolyte replacement during endurance exercise is to do it gradually and in a way that does not override normal body mechanics. Most athletes perform successfully using from **80-300 mg. sodium per hour in prolonged endurance events.** Sodium is necessary but not by itself and not in mega-dose quantities.

Test During Training Electrolyte replacement during exercise is a necessary procedure that is also highly individual. This is because everyone's body is different, their sport is different, training duration and intensities are different, and weather conditions are different. Establish a protocol that works for your individual body sweat rate and at various environmental conditions. Electrolyte replacement should be proven during training so that on race day just follow what you have practiced.

So the next time you are training for an endurance event make sure that you have considered one of the keys to your success and don't forget to "Please pass the Electrolytes."

REFERENCES

Some content provided by Steve Born © 2001, *Endurance Marketing Group*. www.e-caps.com. E-Caps provide electrolyte replacement products.