DEHYDRATION

Dehydration impairs athletic performance whenever body fluid level falls below 98% of normal. The primary cause of dehydration is sweat loss, an essential body process which facilitates the release of body heat into the environment. When athletes don't replace what they lose in sweat, the physiological function of the body's heat management system is compromised, placing both the athletes' performance and physical well-being at risk.

The Dehydration Factors

Exercise Intensity

Since heat is a byproduct of muscular activity, when an athlete's exercise intensity increases, so does internal body temperature. The athlete's body then has to regulate that temperature by sweating more, meaning that the harder athletes work, the more sweat they will lose.

Environment

Elevated environmental temperatures activate the sweat mechanism and cause sweat rates to increase. The humidity of an environment also plays an important role by restricting the evaporation of sweat, which in turn restricts heat loss from the body.

Clothing & Equipment

Minimal, loose-fitting clothing helps promote heat loss by exposing sweat-laden skin to the air, allowing the sweat to evaporate more easily. Heavy clothing and equipment (e.g., football pads and helmet) can trap heat and sweat against the skin, forcing the body to produce more sweat to cool itself.

Fitness & Acclimatization

An athlete who is "more fit" will sweat sooner—and sweat more—than an athlete who is "less fit." The same is true for athletes who are accustomed (acclimatized) to exercise in the heat.

The Negative Impact on Performance

Cardiovascular Response

Dehydration strains the cardiovascular system by reducing blood volume. For every liter of fluid lost during prolonged exercise, body temperature rises by 0.3°C, heart rate elevates by about eight beats per minute, and cardiac output (the volume of blood pumped by the heart per minute) declines by 1 liter/min.

Internal Temperature Regulation

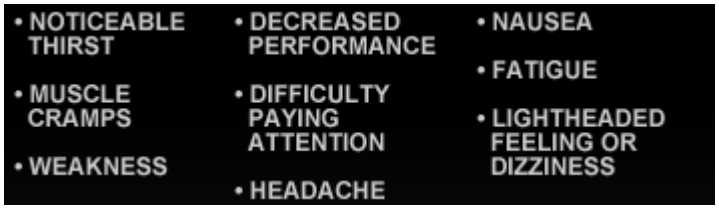
In addition to being responsible for nutrient and oxygen transport, the cardiovascular system also helps regulate body temperature by transferring heat produced by muscles to the skin. As dehydration increases, it becomes more and more difficult for the cardiovascular system to maintain a safe core body temperature, which rises 0.3°C for every liter of fluid lost during exercise. Over a prolonged period, this temperature elevation could lead to heat illness, a serious health risk.

Cognitive Performance

Dehydration can also negatively impact an athlete's decision-making performance, especially when the environment is warm.

Dehydration's Warning Signs

Sweat loss reduces blood volume and increases the concentration of sodium in the blood. This stresses the cardiovascular system and contributes to a faster increase in body temperature. Dehydration results in a number of symptoms that are important to remember.



Don't Wait for the Warning Signs

Dehydration's warning signs only occur when the body is already dehydrated. An athlete's best bet for peak performance is to drink to minimize weight loss during exercise but avoid over-drinking.

Simple Hydration Equation

The first thing you need to do is calculate how much water your body needs at rest. That's working at a desk, puttering around the house, reading and doing all of the other things you do throughout the day. This is your bare minimum water requirement – what your body needs to function.

The basic equation for determining this is by dividing your body weight in half. So, if you weigh 200 pounds, you would need 100 ounces of water per day if you're not doing anything strenuous. If you're working out, hiking, at a high altitude or outdoors a great deal, you're going to need to add to those 100 ounces.