ANALYTIC

ATHLETE EXPERIENCE RELATED TO HYDRATION

Sweat loss and physical decline

Losing 2% body weight in sweat impairs performance, and 5% loss can reduce work capacity by 30%.
"A loss of sweat equal to 2% of body weight causes a noticeable decrease of physical and mental performance...may decrease the capacity for work by roughly 30% (6)."
Source: Jeukendrup, Asker, and Michael Gleeson. "Dehydration and Its Effects on Performance.

Heat Stress and Dehydration:

Dehydration increases the risk of severe heat stress symptoms, including tachycardia and potentially life-threatening conditions.
"The symptoms of exertional heat stress are tachycardia, hypotension, hyperventilation, vomiting, diarrhea, seizures, and coma (4)."
Source: Binkley, Helen M. et al. "National Athletic Trainers' Association Position Statement: Exertional Heat Illnesses."

Reduction in Cardiac Output and Endurance:

Dehydration reduces blood volume, which thickens blood, limits cardiac output, and impairs endurance, particularly affecting high-intensity and prolonged exercise. This reduced cardiac output is a key reason for decreased maximal aerobic capacity (VO2max).
Quote: "Dehydration causes a fall in plasma volume both at rest and during exercise, and a decreased blood volume increases blood thickness (viscosity), lowers central venous pressure, and reduces venous return of blood to the heart."
Source: Jeukendrup, Asker, and Michael Gleeson. Sport Nutrition-2nd Edition.

Cortisol Increase and Muscle Growth Inhibition:

Dehydration raises cortisol, which suppresses testosterone and hinders muscle growth during resistance training.
"Athletes in a dehydrated state had an increased level of cortisol...reducing the level of testosterone...required for muscle growth (3)."
Source: Brown, Jordana. "SimplyShredded.com."

The effect of body weight on mental performance

Even mild dehydration (2% body weight loss) significantly impairs both physical and mental performance, with greater losses (5% or more) reducing work capacity by up to 30%.
"Exercise performance is impaired when an individual is dehydrated by as little as 2% of body weight. Losses in excess of 5% of body weight can decrease the capacity for work by about 30%."
Source: Jeukendrup, Asker, and Michael Gleeson. Sport Nutrition-2nd Edition.

Impaired temperature regulation in the body

Dehydration lowers the body's ability to regulate temperature, leading to increased risk of heat stress symptoms, such as elevated core temperature, tachycardia, and even life-threatening conditions in severe cases.
Quote: "The larger rise in core temperature during exercise in the dehydrated state is associated with a bigger catecholamine response, and these effects may lead to increased rates of glycogen breakdown in the exercising muscle."
Source: Jeukendrup, Asker, and Michael Gleeson. Sport Nutrition-2nd Edition.