

Hydration for Peak Performance

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BACKGROUND

With warmer weather days just around the corner, it is important to revisit proper hydration strategies. Hydration is essential for all athletes, but especially youth cyclists who spend long times outdoors, training and racing in varied conditions. While the role of hydration and electrolyte replacement is often emphasized in hot and humid environments, cold and dry conditions should not be overlooked. Athletes may feel less thirsty in colder conditions and forget to take in enough fluids before, during, and after an event (Kenefick et al., 2004). However, fluid losses still occur through sweat and increased respiration. Hydration across all weather conditions supports body temperature regulation, cardiovascular function, and overall performance.

Youth athletes are particularly vulnerable because:

- **Surface area to mass ratio:** Young athletes have a greater surface area to mass ratio causing them to absorb more heat from the environment and putting them at significantly higher risk of dehydration and heat stress (Council on Sports Medicine and Fitness & Council on School Health [CSMF & CSH], 2011).
- **Young athlete thirst cues may be blunted:** research indicates that young athletes often do not consume enough liquids voluntarily and benefit greatly from reminders to drink water during activity (Nuccio et al., 2017).
- **Decreased sweat rate:** Young athlete sweat response is less efficient compared to adults (Council on Sports Medicine and Fitness & Council on School Health [CSMF & CSH], 2011).
- Young athletes may train and race for extended durations in heat.

HOW HYDRATION AFFECTS ATHLETIC PERFORMANCE

Losing as little as 2% of body weight through sweat loss can impair performance and increase perceived effort (Sawka et al., 2007). Water is involved in fundamental processes including thermoregulation and cardiovascular function. Evaporation of sweat from the skin is the primary cooling mechanism during exercise. Additionally, hydration affects cardiovascular function, which is responsible for delivery of oxygen and nutrients to working muscles (Casa et al., 2019). Significant sweat loss is associated with reduced plasma volume, resulting in a decrease of total blood volume. This leads to an increase in heart rate and a reduction in blood flow to muscles and other important tissues (Casa et al., 2000). Research also shows a strong link between hydration and decision making, focus, and reaction time (Lieberman, 2007). Thus, hydration status directly influences the "Engine" of a cyclist, with dehydration contributing to cardiovascular strain, impaired thermoregulation, and reduced cognitive function, which can lead to decrements in physical performance.

HYDRATION STRATEGIES AND RECOMMENDATIONS BEFORE, DURING, AND AFTER EVENT

PRE-EVENT HYDRATION:

Hydration starts before the event, like a race or everyday training! Ideally the athlete consumes adequate fluids throughout the day, starting hours before the event. A useful tool to monitor hydration status throughout the day is urine color. Urine should be lightly colored, like watered down lemonade (level 1-3 on the Armstrong scale) (Armstrong et al., 1994). Progressively yellow or brown urine (4 on the Armstrong scale) is a sign of dehydration. Proper preparation leading up to an event includes drinking water regularly throughout the day, supplementing with electrolytes as needed, and making sure to consume about 17-20 oz of water or sports drinks in the 2-3 hours leading up to the activity (Casa et al., 2000).

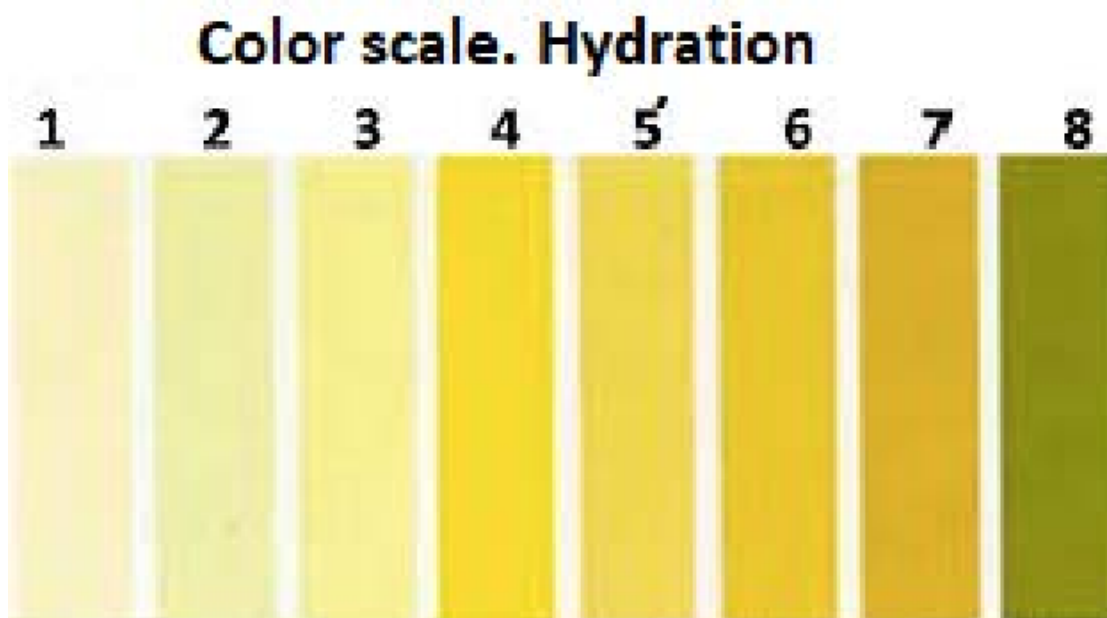


Figure Armstrong Scale to monitor urine color

HYDRATION DURING AN EVENT:

Fluid needs vary greatly between individuals and depend largely on conditions and individual sweat rates. Drinking before thirst may be necessary because thirst cues are often blunted and significant dehydration has been shown to negatively impact performance before the athlete reports any thirst (Kenefick et al., 2004). Simple strategies for event hydration include regularly consuming fluids (water, sports, or electrolyte drinks) every 15-20min, or when opportunity arises.

WHAT TO HYDRATE WITH?

For shorter events, less than 60min, hydrating with water is typically sufficient, providing that the athlete has started the activity/event well hydrated. During longer rides, however, water should be supplemented with electrolytes and carbohydrates to offset fluid and mineral loss and maintain energy levels throughout the activity (Jeukendrup, 2014).

POST-EVENT HYDRATION:

After exercise the goal is to restore fluid loss and support recovery. It is often recommended to consume 16-24 oz of fluids per pound lost during the activity. If fluid loss was significant, electrolyte beverages may help athletes restore hydration levels and sodium/mineral balance. It is also not necessary to consume all lost fluids at once but gently over 1-2 hours post activity.

SUMMARY AND RECOMMENDATIONS:

WHAT THIS MEANS FOR YOUNG ATHLETES

Hydration is not just about gulping fluids on race day, but it is important to build consistent habits to support training and race day performance. As little as 2% loss of body mass due to dehydration can decrease performance significantly. Simple strategies like monitoring urine color and frequency or checking body weight especially before and after long, hot rides can be useful and accessible tools to check hydration status and act accordingly. It is encouraged to listen to your own body, however, be aware that cues like thirst may be blunted during and after physical activity. Good hydration is a powerful tool for athletes to maximize performance in training and competition!

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