



## **POSITION STATEMENT AND RECOMMENDATIONS FOR HYDRATION TO MINIMIZE THE RISK FOR DEHYDRATION AND HEAT ILLNESS**

**National Federation of State High School Associations (NFHS)  
Sports Medicine Advisory Committee (SMAC)**

**DEHYDRATION, ITS EFFECTS ON PERFORMANCE, AND ITS RELATIONSHIP TO HEAT ILLNESS:** •Appropriate hydration before, during, and after exercise is an important ingredient to healthy and successful sports participation.

- Rapid weight loss represents a loss of body water. A loss of just 1 -2% of body weight (1.5 to 3 pounds for a 150 pound athlete) can negatively impact performance. A loss of 3% or more of body weight can increase the risk for exertional heat related illness.
- Athletes should be weighed before and after warm weather practice sessions and contests to assess fluid losses.
- Athletes with high body fat percentages can become dehydrated faster than athletes with lower body fat percentages while working out under the same environmental conditions.
- All athletes have different sweating rates and some lose much more salt through their sweat than others.
- Poor acclimatization/fitness levels can greatly contribute to an athlete's dehydration problems.
- Medications and fevers can each greatly contribute to an athlete's dehydration problems and risk for heat illness.
- Environmental temperatures and humidity both contribute to dehydration and heat illness.
- Clothing, such as dark, bulky, or rubber protective equipment can drastically increase the chance of dehydration and heat illness.
- Wet bulb temperature measurements should be taken 10-15 minutes before practices or contests. The results should be used with a heat index to determine if practices or contests should be started, modified, or stopped.
- Even dry climates can have high humidity if sprinkler systems are scheduled to run before early morning practices start. This collection of water does not evaporate until environmental temperatures increase and dew points lower.
- A relative humidity of 35 percent and a temperature of 95 degrees Fahrenheit are likely to cause heat illness, with heat stroke likely.

- A relative humidity of 70 percent and a temperature of 95 degrees Fahrenheit are **very** likely to cause heat illness, **with heat stroke very likely**.

**WHAT TO DRINK DURING EXERCISES:** •For most exercising athletes, the ideal fluid for pre-hydration and re-hydration is water. Water is quickly absorbed, well tolerated, an excellent thirst quencher, and cost effective.

- The use of a sports drink with appropriate carbohydrates (CHO) and sodium as described below may prove beneficial in some general situations and for some individuals.
- Traditional sports drinks with appropriate CHO and sodium may provide additional benefit in the following general situations:
  - Prolonged continuous activity of greater than 45 minutes
  - Extremely intense activity with risk of heat injury
  - Extremely hot and humid conditions
- Traditional sports drinks with appropriate CHO and sodium may provide additional benefit for the following individual conditions:
  - Poor hydration prior to participation
  - Increased sweat rate
  - Poor caloric intake prior to participation
  - Poor acclimatization to heat and humidity
- A 6-8% addition of CHO to water is the maximum that should be utilized. Any greater concentration will produce slow emptying from the stomach and a bloated feeling to the athlete.
- The other ingredient that may be helpful is a low concentration ( 0.3 - 0.7 g/L) of sodium which may help with cramping.
- All fluids should be served cold to optimize gastric emptying.

**WHAT NOT TO DRINK DURING EXERCISE:** •Fruit juices with greater than 8 percent carbohydrate content and soda can both result in a bloated feeling and abdominal cramping.

- Beverages containing caffeine, alcohol, and carbonation are not to be used because of the high risk of dehydration associated with excess urine production, or decreased voluntary fluid intake.
- Athletes should be aware that nutritional supplements are not limited to pills and powders; many of these new fluids contain stimulants such as caffeine and/or ephedrine.
  - These stimulants may increase the risk of heart or heat illness problems when exercising.
  - Many of these drinks are being produced by traditional water, soft drink, and sports drink companies and may provide confusion to the sports community. As is true with other forms of supplements these "power drinks or fluid supplements" are not regulated by the FDA. Thus, the purity and accuracy of contents on the label are not guaranteed.
  - Many of these beverages, which claim to provide additional power, energy, etc., have additional ingredients that are not necessary, some that are potentially harmful, and some that actually include substances banned by such governing bodies as the NCAA and the USOC.

**HYDRATION TIPS AND FLUID GUIDELINES:** •In general, athletes do not voluntarily drink sufficient water to prevent dehydration during physical activity.

- Drink early, by the time you're thirsty, you're already dehydrated.
- Drink before, during, and after practices and games. Specifically, the *American College of Sports Medicine* recommends the following:
  - Drink 16 ounces of fluid 2 hours before exercise.
  - Drink another 8 to 16 ounces 15 minutes before exercise.
  - During exercise, drink 4 to 16 ounces of fluid every 15 to 20 minutes.
  - After exercise, drink 24 ounces of fluid for every pound lost during exercise to achieve normal fluid status within 6 hours.
- The volume and color of your urine is an excellent way of determining if you're well hydrated. Large amounts of clear urine mean you're hydrated, small amounts of dark urine mean that you need to drink more! A Urine Color Chart can be accessed at:  
<http://at.uwa.edu/admin/UM/urinecolorchart.doc>
- The NFHS SMAC strongly recommends that coaches, certified athletic trainers, physicians, and other school personnel working with athletes not provide or encourage use of any beverages for hydration of these youngsters other than water and appropriate sports drinks that meet the above criteria. They should also make information on the potential harm and lack of benefit associated with many of these other beverages available to parents and athletes.

### **References:**

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McKeag DB, Moeller JL. *ACSM's Primary Care Sports Medicine*. 2<sup>nd</sup> Ed, Philadelphia: Wolters Kluwer/Lippincott Williams & Wilkins, 2007.

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