SPORTS NUTRITION

Fluid for Athletes

Fact Sheet
Hydration

September, 2011

Drink Up!

These are times when your fluid requirements are higher.

⇒ Heat
⇒ Humidity
⇒ Hard training
⇒ Beginning of heat acclimatization

Also watch your hydration status during...

⇒ Travel
⇒ Altitude training
⇒ Surgery
⇒ Illness
⇒ Recovery days

Consult with your sports dietitian to identify individual fluid replacement strategies using sweat rate testing and USG monitoring.

Optimal hydration supports daily training and recovery. Dehydration's effects can take hours to days to recover. Athletes need to develop strategies to monitor and adapt their hydration plan to intensity, duration, and frequency of training, fitness level, and environmental conditions.

At a temperature of 68-70F an exercise-induced body weight loss of 1-2% does not appear to affect performance of less than 90-min. Once dehydration exceeds 2% body weight loss and exercising for greater than 90-min, performance decrements will likely occur.

Signs and Symptoms of Dehydration

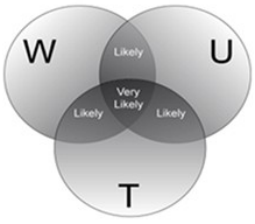
⇒ Lack of concentration
⇒ Early fatigue
⇒ High perceived exertion in training
⇒ Trouble tolerating heat
⇒ Delayed recovery
⇒ Muscle cramps

Monitoring Daily Hydration Status

Three indicators of dehydration can be used to monitor athlete's daily hydration status: 1) color of urine, 2) waking weight and 3) thirst. If two or more of these simple markers are outside the normal range , it is likely the athlete is dehydrated.

Urine Color	#
	1
	2
	3
	4
	5

The color of urine (U) is associated with urine specific gravity (USG, or the urine's concentration). USG measures the concentration of particles in the urine, with >1.020 indicating dehydration. USG should be assessed at first void of the morning, followed by a nude body weight (W). Using the urine chart below, athletes should aim for an AM urine color of less than 4 (pale yellow or the color of lemonade). Thirst is assessed subjectively as a "yes" or "no", recorded at the same time as U and W. Dehydration is indicated by a U of ≥ 4, W change of more than 1% (fluctuates to a greater degree in women before and during the menstrual cycle) and T is "yes."



Date	Nude weight this AM	Nude weight yesterday AM	Weight change	Thirsty Yes/No?	Urine color ≥ 4 Yes/No?	Dehydrated Yes/No?
8/2/11	144	143	-0.7%	No	2 (No)	No
8/5/11	145	142	2%	Yes	4 (Yes)	Yes
Your date here						

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Monitoring Daily Hydration Status

The best fluid to consume is water; however sports drinks have their benefits too because they combine fluid, electrolytes, and carbohydrate. Here are some suggestions to help increase fluid intake at training or competition.

- Drink cool (~59F) fluids in hot weather and warm fluids in cold weather. Fluid temperature can affect your body's ability to regulate heat and cold.
- Sodium is critical for optimal cellular rehydration and should be included in drinks when athletes do not have the opportunity to consume electrolytes naturally found in food
- Flavored sport drinks taste better which stimulates drinking, and thus, may improve hydration.
- Low fat milk and flavored milk have also been shown to be effective rehydration solutions.

Daily Hydration Plan

Time	What's happening	Fluid Intake
7am	Breakfast	Drink ~1-2 cups of water along with other fluids
9am	Training	Use body weight change during training to calculate fluid requirements 1lb loss in weight = 16 oz or 2 cups of sweat loss. Aim to replace ~80 - 100% of sweat losses. For long session consume sport drinks or water with gels or chews (note: these typically do not contain much sodium)
10:30am	Post training	Consume fluid to replace 150% of sweat lost in training Drink some low fat milk or flavored milk (see USOC Recovery Fact Sheet)
Midday	Lunch	Sip regularly. Drink water, diluted fruit juice, low fat milk
3pm	Mid-afternoon	Drink 1-2 cups (8-16 oz) of tea, ice tea, water, or sport drink (if you have another workout)
7pm	Evening meal	Drink ~2 cups (16 oz) of water
9-10pm	Before bed	Drink 1 cup (8 oz) of water herbal tea, or low fat milk
Note: Athletes should take the same precautions with sport drinks as with other sugar-containing beverages to prevent cavities and these include, 1) not swishing the sport drink and using a straw, 2) following intake with sugar free gum or any dairy products and 3) brushing teeth when possible		

Can You Overhydrate?

It is possible to consume more fluid than is lost during exercise. This can cause gastric discomfort. However, most importantly, drinking too much increases the risk for hyponatremia (i.e., dilution of plasma sodium levels), also called water intoxication. Sodium maintains blood pressure and is needed for nerves and muscles to perform properly. When plasma sodium levels drop from an imbalance of fluids, confusion, fatigue, headaches, muscle weakness, and nausea can occur. Water can actually enter the brain and cause swelling. Although not common, it is seen during ultra-endurance events lasting >4 hours and is most likely due to an over-consumption of water, resulting in weight gain. Signs and symptoms of hyponatremia are strikingly similar to dehydration. Thus, monitoring body weight before and after exercise is the best way to avoid overhydration. Athletes should not gain weight from drinking too much.