

Wetter is Better: Proper Hydration for Increased Performance

By Rob Lockey, CSCS

As the sun finally decides to take up residence in our hemisphere this summer, the many outdoor activity seekers are inclined to live in a dehydrated state while trying to improve their athletic abilities. This is not a safe way to play. To illustrate, I present the scenario of Joe Athlete, an avid Colorado cyclist. Joe has spent the winter and spring hating every moment on his indoor trainer trying to prepare for the Triple Bypass, and now has the warm sun to play under for two hours one summer day. Joe Athlete weighs 150 lbs before his ride and 145 lbs after the ride. He downed two water bottles and notes that he feels poorly at the end of the ride as well as the next day. Joe isn't taking into consideration important items with regards to his hydration, not only during exercise, but before and after.

It is recommended to take in 1 liter (34 oz) per hour of exercise to help stave off performance decrement. As little as 1% loss of body fluid can cause a performance decrement. Joe's two water bottles (1.4 liters or 48 oz) in two hours average out to .7 liters (24 oz) an hour. This puts him only $\frac{3}{4}$ of the way to proper hydration in the first hour and by the end of the second hour he has dropped to only $\frac{1}{2}$ the way to being adequately hydrated. Joe's 5 lbs weight loss during the ride calculates to a 3.3% change in body weight. Since fat and other calories take much longer than a two hour ride to burn off, Joe's weight loss is mostly water. This clearly contributed to some of the post-exercise fatigue and loss of power during the ride. His body is not thermo-regulating properly and the effects are seen in the less efficient physiological reactions in the body. If Joe can increase his hydration during exercise to a liter an hour, his losses will be much less in the same time period. He needs to try and put the bottle to his mouth every 5-10 minutes and get a couple of ounces each time.

Water would be recommended for Joe if his activity was less than an hour, and a carbohydrate (CHO) and electrolyte sport drink for activity longer than an hour. Pleasantly tasting flavored drinks (e.g. Gatorade, Accelerade, Powerade, HEED) also promote hydration, along with consumption of CHO and electrolytes. Sodium replaces lost electrolytes and the CHO helps to maintain blood glucose levels. The level of CHO (sugars) is important; it should be kept below 10% so as to minimize movement of blood to the intestine which can increase the effect of dehydration.

Pre and post exercise hydration is also important to performance. Joe possibly isn't drinking the suggested .4-.6 liters (13 – 20 oz) of water two hours before the exercise bout. This amount gives the urinary system sufficient time to regulate total body fluid volume and electrolyte balance at optimal pre-exercise levels, which helps delay or avoid detrimental effects of dehydration during exercise. After this exercise bout he should look to replace 120-150% of his weight loss if he wants to be ready for the next workout. At 120% he would need to drink 2.84 liters (96 oz) since he lost 5 lbs during the ride, though he should actually look to replace 150% of fluid loss. He should consume more than just water, since water-only hydration in the post exercise period can increase urination and cause negative

blood plasma changes. The dilution of electrolytes suppresses the release of antidiuretic hormone (ADH), which helps to direct reabsorption of water. If ADH is decreased, the body will actually dehydrate while you're trying to hydrate it. To combat this problem, hydration fluids should have electrolytes in it. Some CHO will help with the palatability, as well as replace depleted glycogen stores. Recovery is the main goal of this post-exercise hydration, which will help Joe with the fatigue he currently feels and future training.

Practice hydration everyday, all day, to become a better hydrator. Full training and racing potential cannot be realized in a dehydrated state. One of my favorite exercise physiology professors emphasized that success comes when you, "Drink early and drink often!"

Referenced from ACSM position stand, Jan 1996.

The table shown is a calculation of Joe Athlete's sweat rate, which can help determine proper hydration. The blank column is for the reader to calculate his/her own hydration needs.

Table to calculate sweat rate

	Item measured	Pounds (lbs)	Pounds (lbs)
A	Body weight before exercise	150	
B	Body weight after exercise	145	
C	Change in body weight (%) (A - B)	5lbs or 80oz (3.3%)	
D	Drink volume during exercise	48oz	
E	Urine volume	Not measured	
F	Sweat loss (C + D - E)	128oz	
G	Exercise time	2 h or 120 min	
H	Sweat rate (F/G)	1.06oz/min or 63.6oz/h or 2 2/3 24oz bottles or 1 gallon in 2hours	

Conversion: 1 lb of water = 16 oz = .47 liters

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