

WATER: The Athlete's Most Important Nutrient

*Sources: ICSN, International Center for Sports Nutrition
USOC, United States Olympic Committee – Sports Medicine Division
USSF, United States Soccer Federation – Sports Medicine Committee*

Forget about every other question that you have about nutrition until you've figured out how to stay hydrated. Being smart about water intake can separate good performance from great performance.

You are mostly water. In fact, if you took the water out of a 180-pound lean body, there would be about 55 pounds left. Because your muscles, your brain, your blood and sweat are mostly water, your body doesn't work like it should when it doesn't have enough water. You don't think as clearly, your endurance is compromised and your heart works harder.

When you're severely dehydrated, sweating stops and your body overheats. The result-fatigue, weakness, dizziness, and collapse, or worse. In fact, every year, deaths in young healthy athletes are linked to severe dehydration.

Sweat It Out

Sometimes you don't even see sweat, like when you swim. But you sweat whenever your body heats up from working out. Sweat is your body's cooling system. Evaporation of sweat from your skin cools you down.

When you sweat, you lose water from your body and that water must be replaced. Replacing the water takes a plan.

Dehydration: A shortage of water in the body.

Don't Rely on Thirst

You might be thinking, "What's the big deal? Won't drinking when I'm thirsty guarantee that I'm hydrated?" Surprisingly, no. During exercise, for reasons not totally understood, humans don't drink enough to prevent dehydration. You need to drink before you're thirsty and keep drinking after you no longer feel thirsty.

Drink It In

Forget about the old rule of drinking 8 glasses per day. You probably need more than that on most days. Counting how many glasses you drink is only one way of keeping track of what you need. A better way of making sure you're hydrated is to check your body weight before and after practice. For accuracy, weigh in minimal clothing if there's privacy, and afterwards, change out of the sweaty clothing before you weigh. The weight lost during practice or competition is not fat, it's water loss.

One pint of water weighs one pound. To replace the water, drink one pint of fluid for every pound you lost. (One pint = 16 ounces = 500 ml = ½ liter). It is critical to replace the water loss as quickly as possible. Before your next workout, your weight should be back up to normal.

If you can't check your weight, pay attention to your body for signs of dehydration. Your mouth should not be dry. Your urine should be lemon-colored most of the time.

More than one episode of dark yellow urine is a warning sign that you don't have much reserve. (Exception: Vitamin supplements can turn your urine yellow-orange, even if you are hydrated.) Loss of appetite, stomachaches, and muscle cramps can be other warning signals of dehydration.

When?

Drink before, during and after working out. Drink a pint or so of fluid a few hours before exercise. This will help make sure you are hydrated and give you enough time to urinate if you need to beforehand.

Keep drinking during exercise. And don't worry about getting too much fluid. If you're sweating, your body needs a constant supply. Your stomach might gurgle, but your body will absorb and use the fluid. Feeling sick and cramping have been blamed on too much water when in fact, stomachaches and muscle cramps are usually signs of not drinking enough fluid.

Drinking fluids after workouts is extremely important. Even when drinking fluids during a workout, many athletes become dehydrated. Athletes working out in the heat for several hours can lose 10 pounds. That's more than a gallon of water.

Hydration Tip: Fill your water bottle and keep it in plain sight so you remember to drink it.

What Should I Drink?

Your body needs water. But remember water comes in all sizes, shapes and colors. Milk is 90% water. Juice and most soft drinks are 89% water, sport drinks are 94% water, and even pizza is 50% water. And it all counts. Nearly everything that passes your lips provides water for your body, and in fact, research shows that most hydration happens at meals from the combination of food and beverages.

Research also shows that we tend to drink more if the fluid is flavored and if a variety of fluids are available.

Keys to Hydration

When you have figured out how to stay hydrated, especially when you sweat heavily, you have accomplished the single most important performance-enhancing aspect of nutrition.

Water is your most important nutrient.

Outline for Heat Illnesses

Source: USOC Sports Medicine Division

Heat illnesses are common problems for both athletes and non-athletes in hot, humid weather. Heat Cramps, Heat Exhaustion, and Heat Stroke start from similar circumstances: poor adjustment to hot weather and relative dehydration. These conditions can be severe and need emergency medical attention. All are preventable if certain procedures, such as time to adjust to heat, adequate fluids, and normal dietary electrolyte intake, are followed.

Heat Cramps

Cause

Inadequate adjustment to hot weather, heavy sweating; decreased blood levels of electrolytes; fluids and electrolytes not adequately replaced; unreplaced weight loss from previous workout/day.

Clinical signs and symptoms

Muscles in arms, legs, and/or abdomen spasm uncontrollably, accompanied by heavy sweating.

Treatment

Drink fluids; gently stretch and massage cramped muscles; rest in cool environment; apply ice to cramped area; watch for breathing or heart problems.

Prevention

Maintain adequate fluid intake by replacing sweat losses: 15-30 minutes before exercise, drink 16 oz. of fluid; during exercise, drink 8oz. every 15 minutes; and after exercise drink 16 oz. of water/electrolyte drink (i.e., PowerAde, Gatorade) for every pound of body weight loss; increase fitness; wear light colored and/or lightweight (i.e. mesh) clothing; do not use alcohol, coffee, caffeinated drinks, or soda pop for fluid replacement.

Heat Exhaustion

Cause

Long exposure to hot and/or humid environment; heavy sweating; fluids and electrolytes not replaced adequately; unreplaced weight loss from previous workout/day.

Clinical signs and symptoms

Skin cool, pale and moist; heavy sweating; headache; dizziness; poor coordination; mental dullness; enlarged pupils; nausea; vomiting; fatigue; weakness; thirsty; small urine volume (bright yellow color); possibility of unconsciousness.

Treatment

Stop activity; rest in a cool area; sponge with cool water; drink water if conscious (replace weight loss with 16 oz of fluid for each pound of body weight); watch for breathing or heart problems; refer to physician attention if recovery does not occur quickly.

Prevention

Maintain adequate fluid intake by replacing sweat losses; 15-30 minutes before exercise drink 16 ounces of fluid, during exercise drink 8 ounces every 15 minutes, and after exercise drink 16 ounces of water-electrolyte drink (i.e. Powerade, Gatorade for every pound of body weight lost; increase fitness; wear light colored and/or lightweight (i.e. mesh) clothing; do not use alcohol, coffee, caffeinated drinks, or soda pop for fluid replacement; allow time for rest and cool down.

Heatstroke

Cause

Body's temperature control system stops working.

Clinical signs and symptoms

Hot, dry and red skin; no sweating; rapid pulse; confusion; dizziness; unconsciousness; rectal temperature as high as 104°-106° Fahrenheit.

Treatment: Medical Emergency!

Immediate emergency cooling (e.g. cool room, put body in tub of ice water, ice cloths with a fan blowing on skin) and transport immediately to hospital; check temperature; watch for breathing or heart problems (may need CPR)

Prevention

Maintain adequate fluid intake by replacing sweat losses; 15-30 minutes before exercise drink 16 ounces of fluid, during exercise drink 8 ounces every 15 minutes, and after exercise drink 16 ounces of water/electrolyte drink (i.e. mesh) clothing; do not use alcohol, coffee, caffeinated drinks, or soda pop for fluid replacement; allow time for rest and cool down.

(Thanks to Mark Stein, ATC, for his help with this project.)

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Water Content of Common Foods and Drinks

Item	Water Content
Diet soft drinks, tea, coffee	99%
Sport Drinks	94%
Milk	90%
Soup	90%
Soft Drinks, soda pop, juice	89%
Yogurt	80%
Corn	76%
Baked Potato	74%
Cooked Rice	73%
Cooked Pasta	66%
Taco	59%
Chicken	54%
Ground beef	53%
Pizza	50%

Prepared by the U.S. Olympic Sports Medicine Division and the International Center for Sports Nutrition.
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USOC Medical Emergency Procedures

Heat Illness Guidelines

Recognition

Heat Cramps

Musculature spasm of extremity and abdomen

Heavy sweating

Core temperature normal or slightly elevated

Heat Exhaustion

Cool, moist, pale or flushed skin

Headache and dizziness

Strong, slow pulse

Weakness, confusion, and fatigue

Nausea, vomiting

Heat Stroke

Usually, hot, dry, flushed skin

Headache and dizziness

Strong, slow pulse

Heavy sweating, thirst

Fluid and electrolyte depletion

Enlarged pupils

Possible unconsciousness

Management

Heat Cramps

Cease activity and remove from heat
Rest and drink cool fluids
Monitor for change in symptoms

Heat Exhaustion
Cease activity and remove from heat
Sponge with cool water
Slowly administer cool fluids orally if conscious
Monitor for change in symptoms

Heat Stroke
Activate EMS
Remove wet clothing and sponge with cold water
Monitor symptoms
Remove from heat

Referral

Heat Cramp/Heat Exhaustion
Contact consulting physician if complications occur or symptoms do not resolve

Heat Stroke
Activate EMS

Follow Up

Heat Cramp/Heat Exhaustion
Maintain adequate fluid intake, adequate rest and cooling periods, acclimatize to environment, physician release if indicated

Heat Stroke
Physician release to activity
Maintain adequate fluid intake
Adequate rest and cooling periods
Acclimatize to environment

Notify Head ATC or designee and appraise of situation

Notify the emergency contact of the patient if they are a minor