

Excerpt from *Sport Nutrition for Coaches*

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HYDRATION GUIDELINES FOR EXERCISE

Follow four rules to get your athletes to hydrate properly before, during, and after exercise. Have your athletes arrive at practice, conditioning, and competition well hydrated. When the body is sufficiently hydrated, urine will flow in large quantities and look light yellow rather than dark. Tell your athletes to look for this! The National Athletic Trainers' Association (NATA) 2000 position paper on hydration contains a urine color chart that you may want to post in the bathroom.

To ensure that your athletes are hydrated, have them focus on drinking liquids the hour before practice. It takes 60 minutes for 20 ounces of fluid to empty from the stomach and be absorbed by the intestine, so drinking ahead of practice makes sense. For example, if your practice is at 3 p.m., have your athletes drink 20 ounces of fluid starting around 2 p.m. so that they don't feel bloated once practice begins. You may have to talk with not just the athletes but also their teachers to make sure the athletes are allowed to drink during class. This leads to Rule 1:



“To ensure that your athletes are hydrated, have them focus on drinking liquids the hour before practice.”

Rule 1. Players must drink 20 ounces of fluid one hour before practice or competition.

What about fluid intake during practice or competition? A larger fluid intake during exercise leads to greater cardiac output, greater skin blood flow, lower core temperature, and reduced perceived effort of exertion. Fluid requirements can range from 14 to 40 ounces per hour depending on sweat rate, although most athletes consume less than 8 ounces of fluid per

hour of activity. Why is that? They don't have access to fluid, or they don't get fluid breaks. I hope that after reading this you put breaks into your practices! Other reasons may be that athletes put water in their mouths, swish it around, and spit it out. On a hot day, see what your athletes are doing. Pouring water on their heads? Not a route of entry into the body. Remind them that the slogan for Gatorade is **“Is it in you?” not “on you”!**

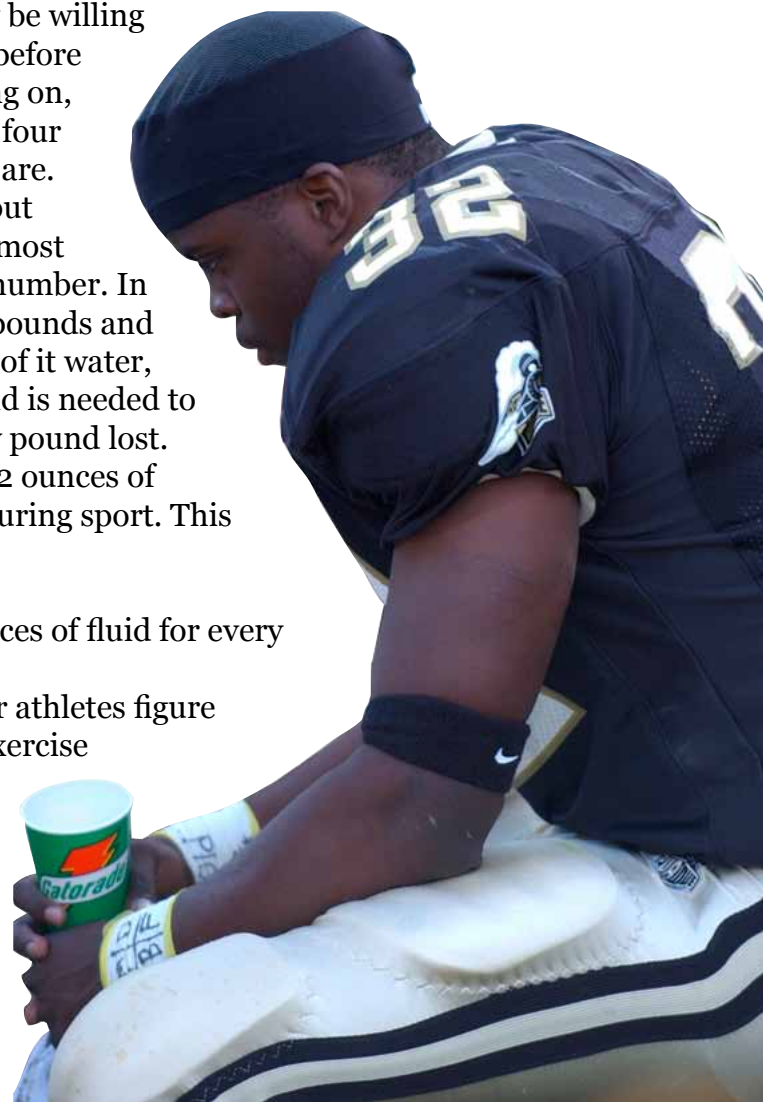
Another issue concerns how athletes drink fluid. If they bring a water bottle or sports bottle with a pop top, they are more likely to sip fluids rather than gulp. Sipped fluids take longer to empty from the stomach, so the result is inadequate fluid being consumed. Gulps are preferred over sips, so athletes should use a cup or unscrew the sports bottle and chug. Cool fluids may be preferred over ice-cold or room-temperature fluids, and your athletes may drink more. Thus, Rule 2 is as follows:

Rule 2. Players must drink 14 to 40 ounces of fluid, depending on their sweat rate, per hour of exercise.

What about after exercise? Because everyone sweats and most don't drink enough fluid to replace all the losses that occur while they are active, they are going to need to drink enough after exercise to replete. None of us can tell by looking at ourselves how much fluid we lose when we sweat. The only way to know is to weigh before and after exercise. This is done routinely in certain sports, such as football, but not as much in tennis, soccer, cross country, or hockey. In addition, some people are really uncomfortable having to weigh. Try to obtain a few scales for your athletes, at least one for the males and one for the females if you coach both (perhaps parents may be willing to donate or purchase scales). Have athletes weigh before and after exercise (ideally nude or with little clothing on, because sweat-soaked clothes weigh more) three to four days in a row so they can see what their fluid losses are. If athletes are not comfortable weighing in public, put the scales in a private place. Remind them that the most important number is the difference, not the actual number. In other words, an athlete who begins practice at 150 pounds and weighs 147 pounds at the end has lost 3 pounds, all of it water, which he is going to need to replace. How much fluid is needed to replace this? The goal is 24 ounces of fluid for every pound lost. So this particular athlete is going to need to drink 72 ounces of fluid—3 times 24 ounces—to replace the fluid lost during sport. This gives us Rule 3:

Rule 3. After exercise, players must drink 24 ounces of fluid for every pound lost during exercise.

To curb excess drinking after exercise, have your athletes figure out their sweat rate and drink accordingly during exercise so they have less to replace afterward. This will also help to prevent overdrinking. Taking in too much fluid is just as dangerous as not consuming enough, because it usually results in water overload and



potential sodium loss. Hyponatremia, or low blood sodium, is becoming more common. It is caused by a combination of excess fluid intake, inadequate sodium intake, and excess sweat sodium losses. A hyponatremic athlete can suffer from headaches, nausea, vomiting, swelling in the extremities, and fatigue. If severely hyponatremic, an athlete can become comatose, have seizures, or develop pulmonary edema, and any of these can be fatal.

To determine how much fluid they need to drink to replace what was lost during exercise, athletes should use this equation:

$$\frac{\text{Pre-exercise weight} - \text{postexercise weight} + \text{fluid consumed during exercise}}{\text{Hours spent exercising}}$$

= Hourly sweat rate and number of ounces to consume per hour

Let's look at an example.

EXAMPLE

A 125-pound runner practices for two hours and drinks a total of 20 ounces of fluid during practice. After practice, he weighs 123 pounds.

125 pounds (preweight) - 123 pounds (postweight) = 2 pounds or 32 ounces

32 ounces + 20 ounces (fluid consumed during practice) = 52 ounces

52/2 (hours spent exercising) = 26 ounces per hour

Thus, 26 ounces is the runner's hourly sweat rate.



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This leads us to Rule 4.

Rule 4. Have athletes figure out their sweat rate so they know how much to drink per hour and have them bring a water or sports bottle!

Athletes must follow fluid strategies before, during, and after exercise. Being the hydration enforcer will help you get the most out of your athletes. The time you allot for fluid breaks will come back to you in a big way, with athletes who are healthier, happier, and better able to perform. So encourage them to drink early, often, and enough. They will have fewer injuries, less fatigue, and better concentration, and they will be able to give you more effort.



Figure hourly
sweat rates!

GO
TROYANS!

Have athletes
drink liquids
1 hour Before
Practice!

About the Author

Leslie J. Bonci, MPH, RD, CSSD, LDN is the director of sport nutrition at the University of Pittsburgh Medical Center. She is a certified specialist of sports dietetics, and she has been working in the areas of sport nutrition and general nutrition for over 20 years. Bonci works with sport teams and athletes at all levels. Her work at the professional level includes consulting with the Pittsburgh Steelers, Pittsburgh Penguins, Pittsburgh Pirates, and Milwaukee Brewers, as well as the Pittsburgh Ballet Theatre. She also works with the athletic departments at the University of Pittsburgh and the University of Texas at Austin and with coaches and athletes at 45 high schools. Bonci also works with Olympic athletes as a member of the USOC sport nutrition network.

In addition to working with these organizations, Bonci has been a featured speaker at several conferences, including the National Athletic Trainers' Association, the American Dietetic Association, and state coaches' meetings. She is a regular contributor to the Training and Conditioning Journal and to the *Runner's World* "Ask the Sports Dietitian" blog and has appeared on NBC's *The Today Show*.

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