



# HEAT



HELPING EDUCATE ATHLETES IN TRAINING

Dear Coach:

As the summer heats up, it will soon be time for two-a-days sessions, which we know are some of the most intense workouts your athletes will undergo throughout the year. That's why the American Football Coaches Association and the National Athletic Trainers' Association have teamed up with the Gatorade Sports Science Institute to launch a new educational initiative, **HEAT, Helping Educate Athletes in Training**, designed to help you better prepare your athletes for the grueling conditions of two-a-day workouts.

Two-a-day practices are a part of most early season conditioning programs. They allow for accelerated physical conditioning, increased strength training and skill development and can even help develop bonds between teammates. But because these workouts usually occur in the hot summer months, heat-related stress becomes a serious concern. Studies have shown that football players can lose as much as 24 pounds of fluid in 24 hours during two-a-day workouts. Additionally, athletes who are not properly acclimated to the heat are highly susceptible to injury.

Following are several sheets that provide valuable information to enable your athletes to avoid the pitfalls of two-a-day workouts. In addition to practical tips, the information also reinforces the NATA Fluid Replacement Position Statement that was released last year. On the back page, you'll find a quick reference guide that can be copied and shared with your athletes so they'll be able to stay at their best during these workouts.

Your athletes will work hard this summer to play at the top of their game. The HEAT program is designed to minimize the dangers of exhausting two-a-day practices and help your athletes get off on a great start to the season. You can also check out the Gatorade Sports Science Institute at [www.gssi-web.com](http://www.gssi-web.com) for more information.

Best regards,

Grant Teaff  
Executive Director  
American Football Coaches Association

Julie Max  
President  
National Athletic Trainers' Association

# Tips for Safer Two-A-Days

Injury rates increase during two-a-day workouts whether athletes are in peak physical condition or not. In fact, many athletes don't even make their starting lineup because of injuries incurred during preseason training.

Here are some tips to help ensure athletes stay at their best and prevent heat-related injuries during two-a-days.

## Encourage Athletes to Begin Conditioning Before Two-A-Days

Encourage athletes to begin conditioning in the heat two weeks before official practice begins. This allows athletes' bodies to cool more efficiently by increasing sweat production sooner than when they are not acclimated to the heat.

## Avoid Workouts During Unusually Hot Temperatures

Practice sessions during unusually hot and humid conditions should be limited to very moderate workouts, postponed until cooler times of the day or brought inside to avoid the heat.

## Make Fluids Part of the Playbook

Before, during and after competition, be sure to consume adequate amounts of fluid. Athletes can make sure they are properly hydrated by checking their urine color: lighter urine color indicates athletes are better hydrated. The longer the workout session, the more frequently fluids need to be replaced. Research shows that a sports drink containing a 6% carbohydrate solution, like Gatorade, can be absorbed as rapidly as water. But unlike water, a sports drink can provide energy, delay fatigue and improve performance.

## Use the Shade

Before practice, warm up in the shade and be sure to rest in the shade during breaks. Even during rest, exposure to heat can raise the body temperature, increase fluid loss and decrease the blood available to the muscles during workouts.

## Recommend Wearing Loose Fitting Clothing

Cotton blend, loose fitting clothing can help promote heat loss. The rule: the less clothing, the better.

## Be Prepared for an Emergency

Always have a cell phone on hand and be familiar with emergency numbers. Also keep ice and ice towels on hand in case of heat-related emergencies.

### Signs of Dehydration and Heat Illness

Dehydration can seriously compromise athletic performance and increase the risk of exertional heat injury. That's why it's important to recognize the warning signs.

- Thirst
- Irritability
- Headache
- Weakness
- Dizziness
- Cramps
- Nausea
- Decreased performance

Breaks allow body chance to cool and provide a good time for rehydration and nourishment.

# Fluid Guidelines for Two-A-Days

Proper hydration is the best safeguard against heat illness. Remember to have athletes drink before, during and after training and competition.

## Before Exercise

- ✓ 2 to 3 hours before exercise drink at least 17 to 20 oz of water or a sports drink.
- ✓ 10 to 20 minutes before exercise drink another 7 to 10 oz of water or a sports drink.

## What to Drink During Exercise

Drink early—Even minimal dehydration compromises performance. In general, every 10 to 20 minutes drink at least 7 to 10 oz of water or a sports drink. To maintain hydration, remember to drink beyond thirst. Optimally, drink fluids based on amount of sweat and urine loss.

- ✓ Athletes benefit in many situations from drinking a sports drink containing carbohydrate.
- ✓ If exercise lasts more than 45 to 50 minutes or is intense, a sports drink should be provided during the session.
- ✓ The carbohydrate concentration in the ideal fluid replacement solution should be in the range of 6% to 8% (14 to 18 g/8 oz).
- ✓ During events when a high rate of fluid intake is necessary to sustain hydration, sports drinks with less than 7% carbohydrate should be used to optimize delivery.
- ✓ Fluids with salt (sodium chloride) are beneficial to increasing thirst and voluntary fluid intake as well as offsetting the amount in lost sweat.
- ✓ Cool beverages at temperatures of 50° to 59° F are recommended.

## What Not to Drink During Exercise

- ✓ Fruit juices, carbohydrate gels, sodas and those sports drinks that have carbohydrate levels greater than 8% are not recommended as the sole beverage.
- ✓ Beverages containing caffeine, alcohol and carbonation are discouraged during exercise because they can dehydrate the body by stimulating excess urine production, or decrease voluntary fluid intake.

## After Exercise

Immediately after training or competition is the key time to replace fluids. Weigh athletes before and after exercise. Research indicates that for every pound of weight lost, athletes should drink at least 20 oz of fluid to optimize rehydration. Sports beverages are an excellent choice.

# Managing Two-A-Days

## Stay Cool

- ✓ Get in shape and acclimate
- ✓ Know the warning signs of dehydration and heat illness
- ✓ Don't rely on thirst to drink
- ✓ Drink on schedule
- ✓ Favor sports drinks
- ✓ Monitor body weight
- ✓ Watch urine color and caffeine intake
- ✓ Key in on meals as an opportunity to increase fluid intake
- ✓ Stay cool when you can

*From: Eichner, E.R. (1998). Treatment of Suspected Heat Illness. Int. J. Sports Med. 19:S150-153.*

## Stay Healthy

- ✓ Minimize the stresses of life
- ✓ Eat a well-balanced diet
- ✓ Avoid overtraining
- ✓ Sleep well
- ✓ Avoid rapid weight loss
- ✓ Avoid people with colds
- ✓ Keep hands away from nose and mouth
- ✓ Get a flu shot
- ✓ Stay hydrated and ingest carbohydrates during exercise

*From: Niemen, D.C. (1998). Immunity in Athletes: Current Issues. Sports Science Exchange 11(2): 1-6.*

## Stay Hydrated

- ✓ Drink throughout the day
- ✓ Drink at least 17 to 20 oz of fluid 2 to 3 hours before a practice or game
- ✓ Drink an additional 7 to 10 oz of fluid 10 to 20 minutes before competition
- ✓ Drink 28 to 40 oz of fluid per hour of play (at least 7 to 10 oz every 10 to 15 minutes) to replace sweat loss during exercise
- ✓ Drink at least 20 oz per pound of weight loss within two hours of finishing training or competition
- ✓ Optimal to have fluid intake match sweat and urine loss.

*From: Casa, D. et al. Journal of Athletic Training 35(2): 212-224, 2000.*



## Considerations for Preventing Heat Illness

### *Tips for Keeping Players from Falling into Danger Zones*

#### **Formula for Disaster**

Heat illness is an ever-present risk when athletes are engaged in high-intensity exercise. In football, the risk of heatstroke is increasingly more likely during high-intensity drills on a hot, humid day, particularly in an overweight, out-of-shape, unacclimatized, and dehydrated player wearing a dark-colored uniform and helmet. There are, however, a variety of steps that coaches and athletic trainers can take to increase the safety of play in hot temperatures and diminish the risk of dehydration and associated heat related injuries.

#### **Keep Them Cool**

The cooler they stay, the harder they can play. Taking frequent breaks to allow players to drink and cool down should be part of any successful football program. Fluid should always be available at arm's reach. Provide shaded areas and Cool Zones (or similar equipment) during rest breaks. Take advantage of cool breezes or fans to increase convective cooling. Practice duration and intensity should be reduced while increasing the frequency and duration of rest breaks. Have players sit in cold water tubs right after practice. Also spreading out two-a-days by holding team meetings and meals between the two practices allows players to be cooler during both practices and provides another opportunity for rest and recovery.

#### **Hydration is Key**

An important preventative step is to stay properly hydrated. That means both the right amount and the right kind of fluid need to be available to players at all times and they need to be given opportunities and encouragement to drink often. Water alone is simply not enough! Research consistently shows that drinking Gatorade before, during and after practice helps athletes stay better hydrated than water alone. This is not a promotional message. This is scientific fact. Athletes who drink only water have been shown to have poor voluntary intake and increased urine production. Water does not contain everything football players in the heat need to replace what they're losing in their sweat. Water has no electrolytes to promote fluid retention and no carbohydrates to fuel the muscles and brain.

#### **Gear Up for the Heat**

High temperatures and humidity can quickly overwhelm even well hydrated and acclimated athletes. A few days of moderate physical activity, lasting from 60 to 90 minutes will provide some initial acclimatization to the heat (greater blood volume, better sweat response, improved drinking), a critical step in reducing the risk of heat illness. Ideally, this should be accomplished just prior to the start of summer camp.

#### **Focus on High-Risk Athletes**

Larger athletes, especially those who are unfit, overweight, and not acclimatized to the heat, are especially high-risk candidates for heatstroke. Even when they are properly hydrated, physically fit, and acclimatized, some athletes can heat up faster than they cool down. An important safety measure is to make sure that athletes' temperatures and body weights are at their normal levels before practice, especially if they experienced symptoms of heat illness the previous day.

### **Limit Use of Full Pads When Heat and Humidity Rise**

Wearing full pads and helmets is obviously part of most football practices. But, when possible, coaches should move full-pad practices to early mornings or evenings when the temperature is the lowest. Working out in full pads during warm, humid weather can literally turn an athlete into a “heat bomb.”

### **Keep an Eye on Over-Motivated Athletes**

Pride can play a huge factor in heat-related injuries. Many athletes are determined to succeed no matter the cost and fail to alert coaches and trainers when they develop heatstroke symptoms. While they should definitely be aware of the signs and symptoms, a player can not be relied upon to correctly diagnose heat illness. Symptoms include belligerence, confusion, and irrational behavior. These players simply won't recognize the need to stop and will get angry when told to do so.

### **Train Them, Don't Strain Them**

Players can not be expected to perform high-intensity exercise until they are sufficiently acclimated to the heat. Most players will begin to show improved heat acclimation within four to five days, with ten to 14 days needed for most of the physiological adaptations to occur. Until that time, workout intensity and duration should be increased gradually.

### **Monitor Medications**

Some prescription, over-the-counter and recreational drugs can adversely influence heat production (by increasing metabolism) and heat loss (by decreasing sweating and/or skin blood flow). The risk of heat illness is much greater with individuals who consume these drugs. Instruct players to advise an athletic trainer or doctor about all the medications they are taking, both prescription and over-the-counter drugs.

### **Behavioral Risk Factors**

Athletes who have not been sleeping well, have recently been ill (with the common cold or flu, especially when accompanied by vomiting or diarrhea), are big consumers of alcohol, and those who are prone to dehydration (chronic under-drinkers on the field) are at increased risk of heat illness.

### **Cooling Cues**

Players who are at high risk of heat illness may respond well to pre-cooling before practice and games in hot weather. Research shows that a few minutes in a cold bath will slightly reduce resting core temperature, increasing the safety buffer for heat problems. Another benefit: improved performance in hot weather.

Using cold towels or splashing cold water on the face, head, and neck are no substitutes for adequate hydration and minimal clothing during exercise in the heat. The psychological relief associated with a splash of cold water has no effect on core temperature.

In emergency situations, cool first and transport second. Immersing a heat-stricken player in a tub of ice water is the best way to cool fast. Cellular damage from overheating occurs quickly, so every effort must be made for immediate cooling.