

# **Athletic Training Handbook**

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## **Introduction**

The sports medicine guidelines and compilations in this handbook are intended to be used as resources in assisting athletic trainers, coaches, student trainers and other athletic personnel in providing a safe environment for athletic practices, competitions and events.

While this handbook includes recommendations and resources to assist athletic trainers, coaches and managers, it is not submitted as an authoritative, required, or legal standard of medical care. These recommendations provide guidance to help protect the health and safety of student-athletes, but do not establish any rigid regiments that must be followed. These guidelines are not intended as mandates or to be considered all-inclusive.

Coaches and Athletic Trainers often are some of the first health care providers on the scene when injuries occur, and therefore they must be able to recognize, evaluate, and assess injuries and provide immediate care when needed.

Our goal for HSAA Sports Medicine is to provide student-athletes with the best medical care possible. We can attain this goal by working together to:

1. Prevent athletic injuries.
2. Treat and rehabilitate those injuries that do occur.
3. Provide first aid and emergency care as appropriate.

The information provided in this handbook is not intended to be a substitute for professional medical advice. A licensed health care professional should be consulted for diagnosis and treatment of any and all medical conditions, injuries, or emergencies.

## **Mandatory Medical Examination**

Prior to participation in any practice, competition or out-of-season conditioning activities, student-athletes who are beginning their initial season of eligibility should be required to undergo a medical examination by a physician. An annual examination should be administered within six months prior to participation in any practice, competition or out-of-season conditioning activities each year, and an updated medical history form provided to each coach or team administrator.

The purpose of the updated medical history is to assess problems that have occurred since the student-athlete's previous medical examination. The updated history should include a comprehensive questionnaire with height, weight and blood pressure recordings as well as documentation of a thorough cardiac exam and any other focused examination necessary.

## Conditioning, Stretching and Exercise

Although there are many benefits to warming up, most recreational athletes spend little or no time getting ready for exercise. Warming up prior to any physical activity does a number of beneficial things. Its primary and most important purpose is to prepare the body and mind for more strenuous activity. This occurs by increasing the core body temperature and subsequently increasing the temperature of the muscles. By doing this the muscles become much more loose, supple and pliable, therefore reducing the risk of severe muscle or tendon injury.

An effective warm up also allows for a gradual increase of both the heart rate and respiratory rate. This increases blood flow, which in turn increases the delivery of oxygen and nutrients to the working muscles. All this helps to prepare the muscles, tendons and joints for more strenuous activity.

The warm up activities are a crucial part of any exercise regime and especially in sports training. The importance of a structured warm up routine should not be underestimated when it comes to the prevention of sports injury. When done consistently and properly, a thorough warm up routine will allow all of the body systems to function together at their best with the least likelihood and potential for injury.

As a coach or trainer, it is important that you know the demands that your sport puts on the athletes that you work with and train them accordingly (including warm-up). Most sports, especially team sports, are anaerobic, which mean “without air”. These are short bursts of intense activity that rapidly depletes the body’s available oxygen and forces the body to pull on energy sources that are stored in the muscles. Weight lifting, sprinting (running or biking), isometric and interval training are all types of anaerobic sports. The aerobic energy system doesn’t kick in until 3-5 minutes of continuous activity and is often used as a warm-up for anaerobic activities. Football and basketball players, for instance, need to do short-to-moderate sprints and intervals, and have little need to run long distances. Aerobic sports, like track and long distance running, etc. require long, sustained training routines. Soccer players’ benefit from aerobic training and tennis can have both aerobic and anaerobic components, depending on how you play. Teach your athletes to train the energy system you need for your sport.

One of the most important warm up activities that helps to increase flexibility, improve performance and prevent injury is stretching. The goal of routine stretching exercises is to improve flexibility. Flexibility, aerobic conditioning and strength training are the three broad objectives to focus on as you prepare and maintain your body for the rigors and enjoyment of sports. Proper stretching actually lengthens the muscle tissue, making it less "tight" and therefore less prone to trauma and tears.

Everyone is different and we aren’t gymnasts; focus on maintaining adequate flexibility for your sport. Different sports emphasize different muscle groups; concentrate on the ones your sport utilizes. Remember, stretching is a critical part of the warm up, but stretching is NOT the warm up.

There is no doubt that time spent on warming up and cooling down will improve an athlete's level of performance and accelerate the recovery process needed before and after training or competition. Coaches must encourage athletes to regard the warm up and cool down as an essential part of both the training session and competition itself.

## Heat/Cold Issues

Heat-related illness is inherent to physical activity and its incidence increases with rising ambient temperature and relative humidity. Student-athletes who begin training in the late summer experience exertional heat-related illness more often than student-athletes who begin training during the winter and spring.

When exercising in conditions where the environmental temperature exceeds the body temperature, sweating is the primary method for cooling the body. This works through the evaporation of sweat, from the skin's surface. As humidity (*lots of moisture in the air*) increases, the rate of evaporation is much lower as the air is already saturated with water vapor. This greatly decreases the beneficial effects of sweat production.

Dehydration is also a risk factor for heat illness. Exercise in hot, humid conditions can cause significant dehydration in as little as 30 minutes. Athletes typically replace only 1/3 to 2/3 of sweat losses when they use thirst as a guide.

When the signs and symptoms of dehydration are overlooked or ignored, athletes will quickly fall victim to heat exhaustion, which is a serious medical condition. Because of a large loss of body fluid, the circulatory system can collapse, causing a sudden drop in blood pressure, which can lead to unconsciousness. There are many warning signs leading up to heat exhaustion which will, when heeded, allow you the opportunity to prevent this serious medical situation.

Increasing fatigue, severe cramps, weakness, inability to think properly or strange behavior, drenching sweats, dilated pupils, and nausea are all warning signs of heat exhaustion. A person with more severe heat exhaustion can have cold, pale, clammy skin, be agitated or disoriented, can complain of profound thirst and rapid onset of a severe headache.

Heat exhaustion is a serious medical condition. In cases of mild heat exhaustion, the first step is to get the victim in a cooler environment, out of the sun. Elevate the feet about 12 inches and have them lie down on a flat surface, this helps keep blood flowing to the brain. Remove protective gear and outer clothing and apply wet cool compresses to the skin of the victim, particularly on top of the head, around the neck, the center of the chest and abdomen, under the arms, between the upper thighs and behind the knees). Fan them down to help aid convection cooling. Do not use rubbing alcohol. Have them sip a non-carbonated sports drink or lightly salted water. Cool water will work fine if nothing else is available. In cases of moderate or severe heat exhaustion, call 911 and begin the above procedures until medical help arrives. Always remember, it's better to over-react in cases of heat exhaustion than to under-react. This is a potentially FATAL condition.

While less common in sports, cold-related illness is also inherent to physical activity outdoors and its incidence increases with dropping temperatures and in environments with wet or windy conditions (*or a combination of these*). All of these factors increase the risk of cold-related injury for student-athletes. Sports like football, baseball, soccer, and track and field that have seasons extending into late fall or early winter or begin in early spring, when weather holds the potential for the aforementioned conditions increase student-athletes' susceptibility to cold injury.

The signs and symptoms of mild hypothermia include vigorous shivering, increased blood pressure, core body temperature less than 98.6F(37.6C) but greater than 95.6F (35.6C), fine motor skill impairment, lethargy, apathy and mild amnesia.

## Hydration/Dehydration

Our bodies are constantly fluctuating between different stages of hydration. The old rule that you need eight glasses of water or fluid daily is just that--old. Your fluid needs depend on many factors, including body size, fitness level, training schedule and dietary factors such as caffeine consumption, which increases fluid loss from the body. Athletes need to drink regularly because thirst is not a reliable indicator of either dehydration or fluid needs. Thirst mechanisms don't kick in until an athlete has lost 2% of body weight as sweat—at this level sports performance is already impaired. So how much fluid you need is an individual matter.

Your best bet is to monitor urine color and frequency of urination. Pale yellow urine is a good sign that plenty of fluid is on board for waste excretion. (But don't judge your urine color within a few hours after taking vitamin supplements, since the unused vitamins, particularly the B vitamin riboflavin, turn your urine a bright yellow.) Frequent urination (at least every 3 hours) is another good sign that you're getting enough fluid.

Spread out your fluid intake over the day to keep body water levels steady and to ward off the threat of dehydration. And remember to drink past the feeling of thirst, since that sensation shuts off quickly once you begin drinking. In fact, it actually turns off before you've replenished lost fluids.

Nearly all the bio-chemical reactions that occur in body cells depend on water and electrolyte (sodium, potassium, calcium, chloride, phosphorous, magnesium, etc.) balance. These balances are not only vital to maintaining life but also affect physical and mental performance.

Dehydration can compromise athletic performance and increase the risk of exertional heat injury. Various studies by NATA\* have shown that athletes do not voluntarily drink sufficient water to prevent dehydration during physical activity. Drinking behavior can

be modified by education, increasing accessibility, and optimizing palatability. As a coach or trainer, it is your responsibility to build in and encourage adequate water breaks into your training routine.

### **What are signs of dehydration and how do I prevent it?**

If you have dry mouth, lightheadedness, a headache, fatigue or muscle cramps -- stop running, rest and drink fluids (sports drinks). If symptoms are more severe-- shortness of breath, high body temperature, nausea or incoherence, seek medical help immediately. Even when the temperature is as low as 60 degrees, you're still at risk for dehydration. The easiest way to help prevent dehydration is to consume fluids at a regular rate beginning at least 6 hours prior to the start of exercise.

### **Suggested Hydration Guidelines**

A proper hydration protocol considers each sport's unique features. If rehydration opportunities are frequent (i.e. baseball, football, track and field), the student-athlete can consume smaller volumes at a convenient pace based on sweat rate and environmental conditions. If rehydration must occur at specific times (i.e. soccer, distance running), the student-athlete must consume fluids to maximize hydration within the sport's confines.

During activity, you can lose up to two cups (one pound) of sweat for every 300 calories burned, depending on the weather conditions. Again, stay ahead of the game by drinking fluids before, during and after your workouts

To measure fluid loss, weigh yourself before and after a workout. Replace each pound lost with two cups of fluid. Water is best, but sport drinks may be helpful for activities lasting longer than 60 to 90 minutes. The most important point is to drink fluid, whether it's water or a sports drink. (*See Appendix A for Hydration Handout*)

*[Although rare, there can be a risk of drinking too much water and suffering from hyponatremia or water intoxication. Clearly, drinking the right amount of the right fluids is critical for performance and safety while exercising.]*

### **Sports Drinks**

Fluids are absorbed through the stomach and into the bloodstream faster when their osmolality closely matches that of body fluids such as blood. Sports drinks contain dissolved minerals (sodium, potassium, etc.) and carbohydrates, whereas water doesn't, so water doesn't reach the bloodstream as quickly.

These nutrients also play important roles in regulating fluid balance in the body. In other words, they help determine how much fluid enters into muscle fibers and other cells, how much remains in the blood, and so forth. Again, because sports drinks contain these nutrients, they do a better job of allowing the body to maintain optimal fluid balance, which is an important aspect of hydration that few athletes consider.

A third advantage of sports drinks over water with respect to hydration is that the sodium content of sports drinks stimulates thirst, so athletes usually drink more when they have a sports drink than when they have plain water.

Sports drinks have other advantages over water for athletes and exercisers that go beyond better hydration. Specifically, the calories in sports drinks have been shown to increase energy and endurance, limit the immune system suppression that sometimes follows hard workouts, reduce exercise-induced muscle damage, and promote faster recovery.

Water is by far the most popular fluid choice during exercise. However, sports drinks actually do a better job of hydration, while also providing other benefits that water does not. Water is a great drink choice outside of workouts, but during exercise you're much better off with a sports drink.

*The NATA\* recommended fluid intake is to drink 17-20 oz of fluid 2-3 hours before exercise, then another 7-10 oz 10-20 minutes before exercise. During exercise the NATA recommends 7-10 oz of fluid every 10-20 minutes and at least 20 oz per pound of weight loss after exercise within two hours. Some of the warning signs of dehydration are a dry mouth, fatigue, muscle cramps, headaches, light-headedness, infrequent urination, and nausea.*

NOTE: With the increased activity that comes with sports there is an increased need for calories to provide energy. The athlete should consume complex carbohydrates such as breads, pasta, fruits, and vegetables. Stay away from high fat and high salt foods. Protein is important for rebuilding of muscle tissue and should be increased if insufficient amounts are not normally consumed. Stay away from soft drinks and candy as well because they are high in simple sugars. Also, avoid dairy products immediately before any rigorous workout.