Hughston Health Alert

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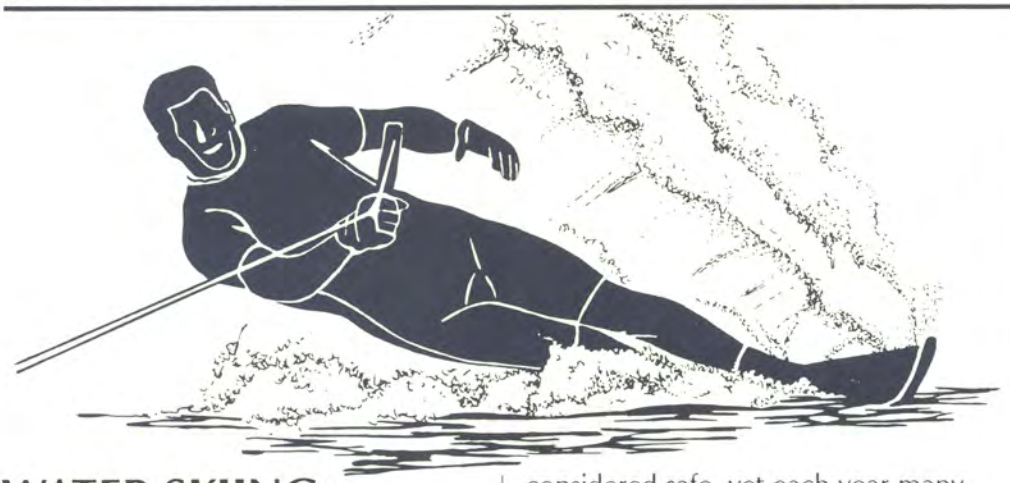

WATER SKIING SAFETY TIPS

Water skiing is a popular sport in the United States, enjoyed by 18 to 20 million people each summer. It is easy to learn and can readily be enjoyed with family and friends. As a non-contact sport, water skiing is generally considered safe, yet each year many serious injuries, and even deaths, occur. These injuries usually involve falls, the boat propeller, or collisions with underwater obstacles or other boats. For the most part, however, serious injuries can be avoided if proper safety practices are followed.

Each participant in the "ski team"--driver, skier, observer--has a significant role to play in avoiding injury and making water skiing the enjoyable activity it should be, but aside from these human participants, the most important consideration in water skiing safety is the boat.

The boat

Significantly underpowered or overpowered boats are inappropriate--and dangerous! Good maintenance is critical for reliable performance and safety. The passenger load should comply with Coast Guard regulations, and everyone should be positioned so that the boat is well balanced. On-board safety equipment should also comply with Coast Guard, state, and local regulations, and should include a throwable personal flotation device and fire extinguishers. Most states require that one personal flotation device per passenger be available in the boat and that it be worn during skiing. (Ski belts are generally inadequate flotation for passengers or skiers.)

The driver

Roughly a third of serious water skiing injuries and deaths are attributed to driver error. The driver of the boat **should not** be a novice. Pulling a skier is not the time to acquire experience driving a boat. The driver **should**

- know proper techniques for starting and turning while pulling a skier.
- know the proper way to bring the tow rope around to the skier in the water.
- be aware at all times of where the tow-rope is. (Tow-rope injuries are extremely common.)
- use the boat's horn, or other clear signal, to warn approaching boats that a skier is in the water.
- be thoroughly familiar with the waters being navigated, knowing the location of underwater stumps and sandbars.
- **turn the engine off** whenever the boat is near the skier in the water or whenever anyone is getting in or out of the boat. (With the engine idling,

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the propellers frequently continue to turn and can produce serious injuries.)

The skier

Physical conditioning, a well known part of preseason preparation for snow skiing, should not be neglected when it comes to water skiing. Quadriceps and shoulder strengthening exercises, as well as flexibility and stretching, make for a more enjoyable and injury-free summer.

Novices, who are not familiar enough with the sport to participate safely, are especially at risk. They need to be sure that they are instructed in proper techniques and that they are skiing with an experienced driver. Regardless of experience, any water skier **should**

- be a good swimmer, being able to swim at least 50 meters and tread water in place for 5 to 10 minutes.
- know how to position the ski bindings appropriately and make adjustments for proper fit.
- know how to avoid over-the-tip falls.
- know how to protect the head and neck during falls.
- learn the generally safer technique of falling backwards or to the side.
- know the hand signals commonly used to communicate with the boat.
- hold the tow-rope properly, **never** wrapping it around any part of the body (serious injuries may result).
- wear ski gloves, if necessary, to avoid blisters and hold the rope more comfortably.
- in a dual skiing situation, be constantly aware of the other skier's tow-rope, staying well clear of it in a fall.

The observer

The observer serves as a direct line of communication between the driver and the skier. In some states, a boat driver may pull a skier without an observer, with just a rearview mirror, but this is generally an unwise practice: the observer's assistance in an emergency situation can make the difference between life and death. The observer **should**

- along with the skier, be familiar with the hand signals commonly used to indicate speeds, turns, etc.
- be well seated in the boat to avoid falling during sudden turns or stops.
- be alert for floating objects and other boats.

Passengers who are not filling the role of observer also have a responsibility to be well seated in the boat, preferably wearing a personal flotation device. Each year passengers are injured or killed falling overboard because they are not prepared for the turns and sudden stops that are a part of the normal routine of water skiing.

Use common sense

Remember that alcohol and drugs are all too frequently associated with water skiing accidents. It should go without saying that these substances have no place in this sport.

The safety tips outlined here really boil down to just using some common sense. With sensible observation of these guidelines, water skiing can be a safe and enjoyable sport.

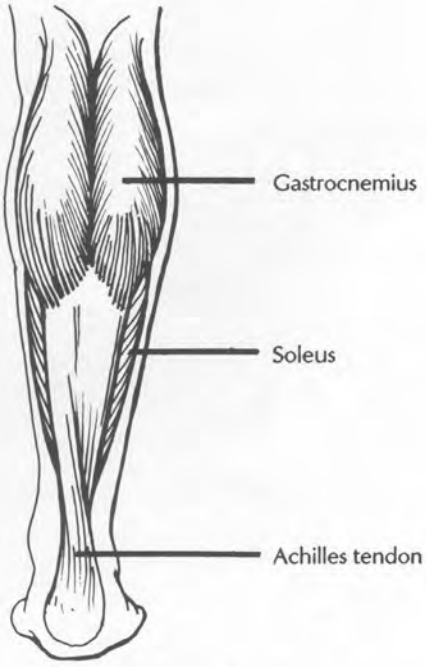
Kurt Jacobson, M.D.
Columbus, Georgia

TRAINING FOR A BETTER LIFESTYLE

Heel Cord Stretching

The heel cord is a term commonly used to describe the Achilles tendon and the calf muscles to which it is attached (Fig.1). These two muscles, the gastrocnemius and soleus, are responsible for walking, jumping, and running motions. The key to relief of pain caused by conditions such as plantar fasciitis and shin splints is stretching the heel cords. Active stretching for 5 to 10 minutes before and after activity should help relieve the pain. It is also an excellent warm-up exercise.

Figure 1



There are several good ways to stretch the heel cords. One of the most effective is the heel cord box (Fig. 2). Standing on the box--toes up, heels down--for 5 minutes three to five times a day provides a good, sustained stretch. Position the box with the high side away from a wall. Begin with the box far enough away from the wall to produce a comfortable stretching feeling in the back of your legs as you lean backward against the wall. Move the box progressively closer to the wall over a period of days until the box is against the wall and your heels are at the bottom of the box.

Figure 2

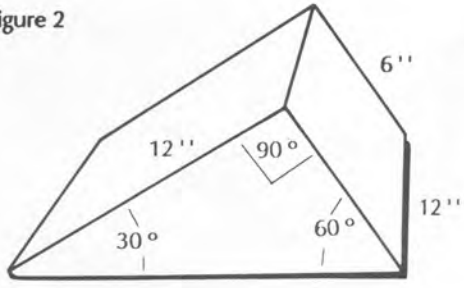


Photo by Y. Ehrhart

You can't very well take your heel cord box with you to the playing field or to the park to jog, so you need another simple stretching method. Lean against a wall or a tree, making sure your heels are flat on the ground (photo). The forward leg should be slightly bent. Lean into the tree until you feel a comfortable stretch in both legs. Maintain this position for a slow count of 15, change legs, and repeat.

Barney Poole, M.Ed., P.T.
Columbus, Georgia

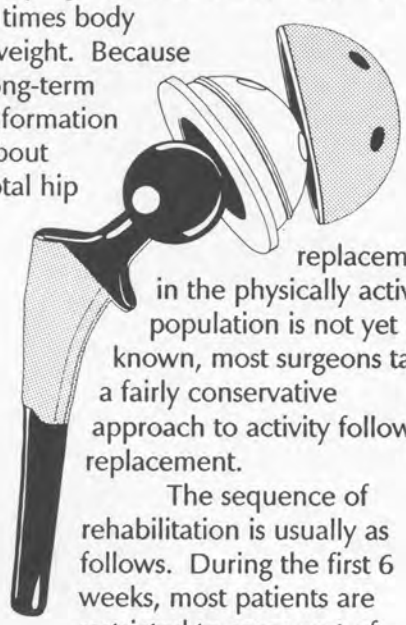
THE AGELESS ATHLETE

Activities after Total Hip Replacement

A total hip replacement is one of the most successful procedures available in orthopaedic surgery today. More than 150,000 total hip replacements are performed annually in the United States alone. The primary goal of the hip replacement is pain relief. Because this goal is readily achieved in a majority of patients, improvement in function is an additional benefit. While for many people the ability to walk and carry on routine activities of daily living without pain is enough, more and more total hip patients are asking questions about their limits of physical activity.

There is little actual scientific data to help the surgeon answer the patient's questions about activity limits. What is known is that total hip replacements have a limited life expectancy, which probably varies from patient to patient and depends on many different factors. Breakage and wear of the artificial joint are theoretically potential problems, but they have not been as significant a problem as has **loosening** of the prosthesis.

The forces generated in a total hip replacement during normal walking are about 1½ to 3 times body weight. With activities such as running and jumping, these forces can reach 4 to 6 times body weight. Because long-term information about total hip replacement in the physically active population is not yet known, most surgeons take a fairly conservative approach to activity following replacement.



The sequence of rehabilitation is usually as follows. During the first 6 weeks, most patients are restricted to some sort of partial weightbearing using either crutches or a walker. In the second 6 weeks, a single support, such as a cane or one crutch, is recommended. Driving an automobile is usually possible after the first 6 to 8 weeks. Once the patient has advanced to walking without any external supports (usually at about 12 weeks), general walking activities should be increased.

Ultimately, most total hip patients can participate in a number of rewarding recreational physical activities--for example, walking, bicycling, golf, hiking, hunting, swimming, rowing, and cross country skiing. High impact activities--running, jumping, heavy lifting, and contact sports--should be avoided because they increase the forces across the hip or involve strong bending and twisting forces.

Total hip replacement is an extremely gratifying operation for both the patient and the surgeon in the majority of cases. Particularly in younger individuals, and with increasing life expectancy, care of the total hip replacement is an important aspect of the patient's overall health. With common sense and careful preparation the patient can return to a full range of recreational and vocational activities well above and beyond the basic activities of daily living.

Carl Savory, M.D.
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EQUIPMENT REVIEW

Prophylactic Knee Braces

Knee ligament injuries are relatively common in athletes. Collision sports (football, ice hockey, rugby) and jumping sports (basketball, volleyball) have the highest incidence of knee ligament injury. These injuries are usually minor and result only in some loss of playing time, but some are quite severe and require surgery. Depending on the severity of the injury, some athletes may not recover full function even after surgery and may have long-term difficulty, perhaps ending their athletic careers. Athletes who can return to their sports may

miss as much as a full season.

Protective equipment has evolved considerably over the years. Players, coaches, athletic trainers, physicians, and equipment manufacturers have all contributed to making sports safer. It is not surprising that much attention has been focused on knee braces to protect normal knees from injury during collision and contact sports.

Types of knee braces

Knees with ligament injuries are placed in **rehabilitation braces** that limit motion and protect the knees as they heal. These heavy, bulky braces are used only in the initial healing period (about 8 to 10 weeks).

Fully rehabilitated knees are placed in **functional braces** for extra protection during sports activities. These braces are lighter and smaller than rehabilitation braces and are designed to allow athletes to run and jump.

Prophylactic braces are intended to protect athletes' normal knees from injury, just as shoulder pads prevent shoulder injuries and helmets prevent head injuries. They are designed to be as light and unrestrictive as possible so that athletes can participate fully in their sports without being slowed down or otherwise hindered by the braces.

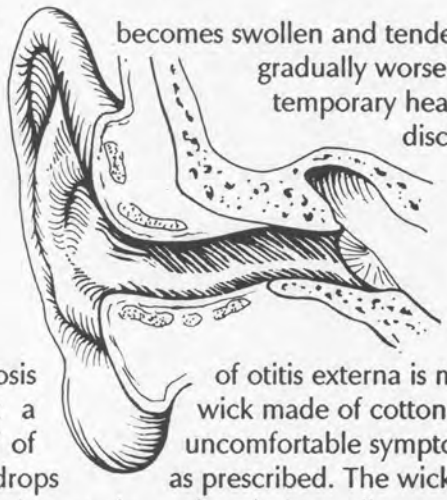
Several different companies manufacture prophylactic braces, with subtle design differences. This type of brace, sometimes called a **lateral knee brace**, usually consists of two heavy straps, one on the thigh and one below the knee, connected by a hinge positioned on the outside, or lateral side, of the knee joint. The brace allows unrestricted bending and straightening of the knee but resists bending from side to side. This is important because an athlete's knee is most commonly injured seriously when it is struck from the outside, such as a clipping injury in football. The knee buckles to the inside, damaging one or more of the major knee ligaments and often tearing the cartilage. All prophylactic knee braces on the market are designed to prevent this devastating type of injury. Costs vary, but the braces are generally expensive enough to place a financial burden on teams providing them for all their players.

Are prophylactic braces effective?

Use of prophylactic braces began about 1979. Since then, the braces have been worn by many collegiate and professional athletes. It makes good sense to wear a device that might prevent a career-ending injury, doesn't it? Unfortunately, in the early 1980's very little research was conducted to examine the effectiveness of these braces in preventing knee ligament injuries. In the last few years, however, several large studies have compared the injury rates of players wearing various prophylactic knee braces with those not wearing them. Their conclusions disagree. Some studies showed a slight decrease in the number of knee injuries, but others showed no change. Most disturbing is that several studies indicated that athletes wearing the supposedly

Swimmer's Ear

Swimmer's ear, or otitis externa, is an infection of the external auditory canal. It is more common in the summer but can happen any time of the year. Its onset is usually gradual and often involves some kind of minor trauma to the ear canal (such as that caused by swimmers' attempts to remove water from their ears).



The ear canal becomes swollen and tender to touch, and the pain becomes gradually worse. The swelling may cause some temporary hearing loss. There is also a characteristic discharge. The infection may extend into the soft tissues around the ear. The parotid gland, cartilage, bone and nerves may then become involved.

Treatment

Once the diagnosis of otitis externa is made, the physician may gently insert a wick made of cotton or gauze into the ear canal. Quick relief of uncomfortable symptoms can be obtained by regular use of ear drops as prescribed. The wick should be removed in 1 or 2 days but may have to be replaced, depending on the ear's response. If there is continued swelling and tenderness, with redness in surrounding tissues, the physician will probably prescribe an antibiotic to be taken orally.

Preventing swimmer's ear

If water or other material enters the ear, **very careful** cleaning should be done. Most otitis externa is caused by the index finger being placed in the ear canal.

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prophylactic braces might have a slightly increased risk of knee injury.

The American Academy of Orthopaedic Surgeons undertook an intensive examination of prophylactic knee braces in 1984, and concluded that there was no scientific evidence to support the use of these braces in their present form. Most orthopaedists do not presently recommend the use of these braces.

Exciting, however, is the possibility that careful scientific investigation will produce a brace design that will significantly reduce the number and severity of knee ligament injuries. This research is being done, and prospects for a safe and effective prophylactic knee brace are encouraging.

Stewart Stowers, M.D.
Nashville, Tennessee

Athletic Training Corner

Q: What is an athletic trainer?
A: An athletic trainer is a certified health professional who works with athletes at the high school, college, or professional level. An athletic trainer may also work at a sports medicine clinic. His or her responsibility is the prevention, care, and rehabilitation of athletic injuries.

Q: Is there a certified athletic trainer at every high school?
A: Unfortunately, no. Only 1,538 certified athletic trainers are employed in high schools in the entire United States. There are only 101 high school athletic trainers in the seven-state area of Georgia, Florida, Alabama, Mississippi, Louisiana, Tennessee, and Kentucky. (In fact, there are fewer than 10 in the approximately 420 Georgia high schools.)

NUTRITION

Replacing Fluids and Electrolytes in Hot Weather

Adequate fluid intake is especially important in the heat of the summer months. Whether you are practicing football, mowing the lawn, or just going for a walk, you need fluid to maintain blood volume so that blood can move freely through your muscles. This blood flow transports heat to your body's surface for dissipation into the environment. (See **Heat Stress in Football**, page 6, for more information on the body's cooling mechanisms.) Sweat production and evaporation also aid your body in releasing heat; however, excessive sweating means the loss of electrolytes as well as fluid.

Fluid replacement

Fluid loss from the skin and respiratory surfaces can average 2 quarts per hour. Whenever you exercise or work hard in hot weather, you may find it quite a challenge to prevent hyperthermia (overheating) and avoid fatigue, a symptom closely associated with dehydration. Replacement of lost fluids is essential.

Rehydration Beverages

Water
Orange juice (1/5 strength)
Cranberry juice (1/6 strength)
Lemonade (1/10 strength)
Gatorade Thirst Quencher
Exceed Fluid Replacement and Energy Drink
Quickick
Sqwincher - The Activity Drink
10-K
USA Wet
Body Fuel

Tuna-Broccoli Casserole

A good electrolyte replacement

About 15 spears fresh broccoli, cut up, or 2 (10 oz) packages frozen broccoli
2 (7 oz) cans tuna, drained
1 can cream of mushroom soup
1/2 soup can milk
1 cup mozzarella cheese
1/2 cup bread crumbs or stuffing mix

Microwave fresh broccoli for 3 to 5 minutes, covered. Put in a shallow baking dish. Add flaked tuna. Mix soup with milk and pour over tuna mixture. Sprinkle cheese and bread crumbs on top. Bake at 350 degrees F for 20 minutes.
Yield: 6 to 8 servings.

From: *The Athlete's Kitchen, A Nutritional Guide and Cookbook,* by Nancy Clark, M.S., R.D., Bantam Books, 1983

Following intense exercise (playing or working), thirst is an inadequate guide to the amount of replacement fluid you really need. Intake of water and other fluids can prematurely dull your thirst mechanism, causing you to stop drinking too soon, before lost fluids are replaced, so you may need to force yourself to drink enough fluids to ensure adequate replacement.

Fluids should be consumed before, during, and directly after exercise. Ideally, you should weigh yourself before and after exercising in hot weather. Replace each pound lost with 1 pint of fluid for adequate rehydration.

Since your body absorbs cold fluids faster than warm ones in hot weather, you should use cold beverages for rehydration. Water and dilute fruit juices are good rehydration beverages. Commercial preparations known as "sports drinks" are also available. Undiluted carbonated beverages, and

caffeine- and alcohol-containing beverages, including beer, are not recommended for fluid replacement during or following exercise. Carbonated drinks make you feel full too soon, and caffeine and alcohol are diuretics.

Carbohydrate-containing beverages may promote rapid fluid absorption in the stomach, and also provide a quick source of energy for muscles during exercise. There is debate about the best source and concentration of carbohydrate for this purpose. Dilute fruit juices are widely recommended, as are some of the commercial preparations. One important advantage of the carbohydrate solutions over water may be their pleasant taste, making it easier to drink as much as you should.

Electrolyte replacement

Electrolytes are ionized mineral elements and salts vital to normal body functioning. Examples include sodium, potassium, chloride, and magnesium. Electrolytes are necessary for development of electrical potentials across cell membranes, thus affecting muscle contraction and nerve conduction. Each electrolyte has specific functions, as well. Sodium, for example, regulates body fluid volume, including blood volume, and helps maintain acid-base balance.

Electrolytes lost during exercise can usually be replaced through the diet. The amount of processed foods typical in the American diet is probably adequate to replace the sodium lost during moderate exercise. You may replace magnesium and potassium losses by including plenty of fresh vegetables, fruits, and fruit juices in your hot weather meals.

Jessie Wright, M.S., R.D., L.D.
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Heat Stress in Football

Heat stress problems are extremely common in football. Because these problems are often treated by the players themselves or by coaches, statistics on the actual incidence of heat stress in football just aren't available. Heat stress problems range from relatively minor, rapidly reversible situations to life-threatening emergencies (Table 1). Besides the potentially serious health consequences, the major effect of heat stress on athletes is poor performance. Performance is often significantly impaired even before heat stress becomes evident.

Table 1

Recognition of Heat Stress

Heat cramps
Usually involve legs or abdomen

Heat exhaustion
Dizziness, lightheadedness, fainting
Fatigue
Headache
General weakness
Gastrointestinal discomfort, nausea, vomiting
Pale, moist skin

Heatstroke
Central nervous system malfunction:
- Aggressiveness or irritability
- Restlessness or delirium
- Confusion or disorientation
- Muscular incoordination
- Incoherent speech
- Unconsciousness
- Seizures

Hot, flushed, dry skin

What causes heat stress problems?

When heat produced by the body and heat transmitted to the body from a hot environment exceed the body's ability to dispose of the heat, heat stress occurs. The human body is designed to function within a narrow internal temperature range. To maintain its operating temperature, the body must rid itself of the tremendous amount of heat that working muscles produce. Heavy football equipment increases muscular work and therefore heat production. This excess heat could cause death in 15 to 20 minutes if it were allowed to accumulate. However, the heat moves from the muscles into the blood. The body then disposes of it primarily in two ways.

First, the amount of blood flow to the skin increases. This "hot" blood can passively transfer heat to the environment, or its heat can be used to evaporate sweat. Passive heat transfer requires that the air temperature be lower than the skin temperature. If the air temperature is higher, the body is likely to gain rather than lose heat.

In hot weather, sweat evaporation is the main method of heat loss. Excess body heat converts sweat on the skin into water vapor. For this cooling method to be effective, there must be adequate sweat production; the excess heat must be transported to the skin by adequate blood flow; the skin must be exposed to the air; and, finally, the air must be able to accept the additional water. This last factor is affected by the humidity. The higher the humidity, the greater the water content of the air--and the less additional water that can be accepted. Death from heatstroke has occurred at temperatures below 75° F when the humidity was extremely high (95%). Sweating is ineffective as a cooling mechanism when the sweat cannot evaporate.

Sweat production during exercise in the heat can average 1 to 2 quarts per hour. With continued play or work, blood volume (50% water) decreases. When the blood volume drops so low that it can no longer meet the demands of the exercising muscles and

the rest of the body's needs, heat stress occurs. Inadequate blood flow to the muscles results in weakness, fatigue, and cramps. Inadequate blood flow to the brain results in headache, dizziness, and nausea, and eventually unconsciousness and seizures. Inadequate blood flow to the skin results in elevated body temperature because heat transfer from the muscles to the skin is decreased, as is sweat production.

Adequate hydration

To maintain adequate blood volume and sweat production, the football player must drink enough fluids before, during, and right after participation to keep his body water level on "full." This is critical to performance because exercising in the heat diverts blood to the skin for cooling purposes, which leaves less blood for the muscles. Appropriate hydration optimizes the blood volume available to the exercising muscles and vital organs. (See **Replacing Fluids and Electrolytes**, page 5.)

Unfortunately, drinking according to thirst will not replace lost body water. Players must force themselves to drink an appropriate amount of fluid. They should drink 12 to 20 ounces of **cold** water or other dilute fluid before exercise and at least 8 ounces for every 15 to 20 minutes of play. The method of providing fluids to the team should be the same during practices and games so that players develop good habits and automatically drink enough. Adequate fluid intake is the players' responsibility, but coaches must make this a priority or it will be neglected, and poor performance and heat stress will be inevitable.

Monitoring fluid intake

An excellent way to monitor fluid intake is to document each player's nude weight before and after practices and games. Weight loss after a single session is due to loss of body water. At least 90% of the lost water weight should be regained before the athlete plays again. These weighings are especially valuable early in the season, during two-a-day practices, during play in high risk conditions (high temperature and/or high humidity), and for monitoring high risk athletes.

Staying cool

Ensuring that ample skin is exposed to allow proper sweat evaporation is an important way to assist the body's cooling mechanism. This is difficult in football since the uniform covers much of the body and interferes with the sweating process, especially when it becomes wet and sticks to the skin. Changing sweat-soaked clothing improves sweat evaporation. Loose-fitting jerseys allow air to get to the skin. Skin exposure can be improved by wearing fishnet or high-cut jerseys, or by tying the jersey into a knot in front to shorten it. Low-cut socks should be worn, and unnecessary tape should be avoided.

The head can be an excellent point of heat dispersal because of its large blood supply. In hot weather, the helmet should be removed as frequently as possible. Removing some of the uniform and equipment during halftime is also a good idea.

Other ways to prevent heat stress

Begin heat acclimatization, or conditioning, **now**. Players should exercise daily in the heat for at least 2 weeks before the first practice. Begin with 30 to 45 minutes per day and work up to 2 hours. Heat acclimatization "teaches" the body's cooling mechanism to kick in earlier, increasing blood volume and sweating, which results in a lower body temperature at rest and during exercise.

Know what conditions place a player at special risk for heat stress (Table 2).

Avoid long, vigorous warm-ups that unnecessarily increase body temperature prior to actual play. Perform as much of the warm-up as possible in the shade.

Table 2

High Risk Factors for Heat Stress

- Alcohol use or a "hangover"
- Age (preteens)
- Excessive weight loss (greater than 5% body weight) during practices or games
- A previous heat stress problem
- Inadequate sleep
- Interior lineman (increased body fat and decreased aerobic conditioning)
- No heat acclimatization
- Recent fever or gastrointestinal illness

Keep players cool when they aren't playing.

Eliminate from practice and games players with recent fever or gastro-intestinal illnesses.

Learn the symptoms of heat stress (Table 1) and the importance of discontinuing play when any of these symptoms occur.

Know first aid measures to treat a heat stress victim (page 8). Know how to handle a serious heat stress problem when no medical personnel are on hand.

The ultimate solution to the problem of heat stress in football is to avoid playing in hot weather. This solution is generally unacceptable, so prevention is the key. The success of preventive measures depends upon the commitment of **everyone** involved in the sports program. As long as athletes continue to compete in the heat, heat stress will occur, but a preventive program can decrease its incidence and severity--and maximize athletic performance.

Dan Joyce, M.D.
Lancaster, Pennsylvania

First Aid for Heat Stress

1. Get the person into a cool area.
2. Have the person lie down with feet elevated.
3. Remove as much clothing as possible.
4. Cool the person by any available method.

   Examples: Fanning
   Water (hose, wet towels, cold bath/shower)
   Ice or ice packs applied to the front of the neck, the armpits, the backs of the knees, and the groin region (locations of major arteries).
5. The person who is mentally alert and not nauseated should take frequent, small sips of cold water.
6. Get the person to a hospital on an emergency basis if the symptoms don't resolve rapidly, if there is any sign of central nervous system malfunction, or if there is nausea or vomiting.

The Hughston Health Alert is a quarterly publication of the Hughston Sports Medicine Foundation, Inc. The Foundation's mission is to help people of all ages attain the highest possible standards of musculoskeletal health, fitness, and athletic prowess. Information in the Hughston Health Alert reflects the experience and training of physicians at the Hughston Orthopaedic Clinic, P.C., of physical therapists and trainers at Rehabilitation Services of Columbus, Inc. and Committed Fitness Systems, of physicians who trained as residents and fellows under the auspices of the Hughston Sports Medicine Foundation, Inc., and of research scientists and other professional staff at the foundation. The information in the Hughston Health Alert is intended to supplement the advice of your personal physician, and should not be relied on for the treatment of an individual's specific medical problems.

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First Thursday of every month (August 3, September 7, October 5), 7:00 p.m. to 9:00 p.m. Call Vivian at (404) 576-2128 for more information.

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