Hughston Health Alert

6262 Veterans Parkway P.O. Box 9517 Columbus GA 31908-9517

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Quadriceps Contusions and Hip Pointers in Football

Football is a contact sport, with a high risk of injury. Knee, ankle, and head injuries, such as concussions, are the most common types of football injuries. However, despite being well padded, the anterior (front) thigh is a commonly injured part of the body.

Quadriceps contusion

Football is considered by many to be a "bone-bruising" sport. For the most part, this is very true. The quadriceps muscles (four muscles comprising the front of the thigh) (Fig. 1) are particularly susceptible to contusions (bruising). A quadriceps, or quad, contusion is literally a deep bruise of the muscle(s) of the thigh closest to the femur (thigh) bone. As a result, scar tissue can form and restrict muscle function. Symptoms of thigh contusions include pain, swelling, limping, and loss of knee motion.

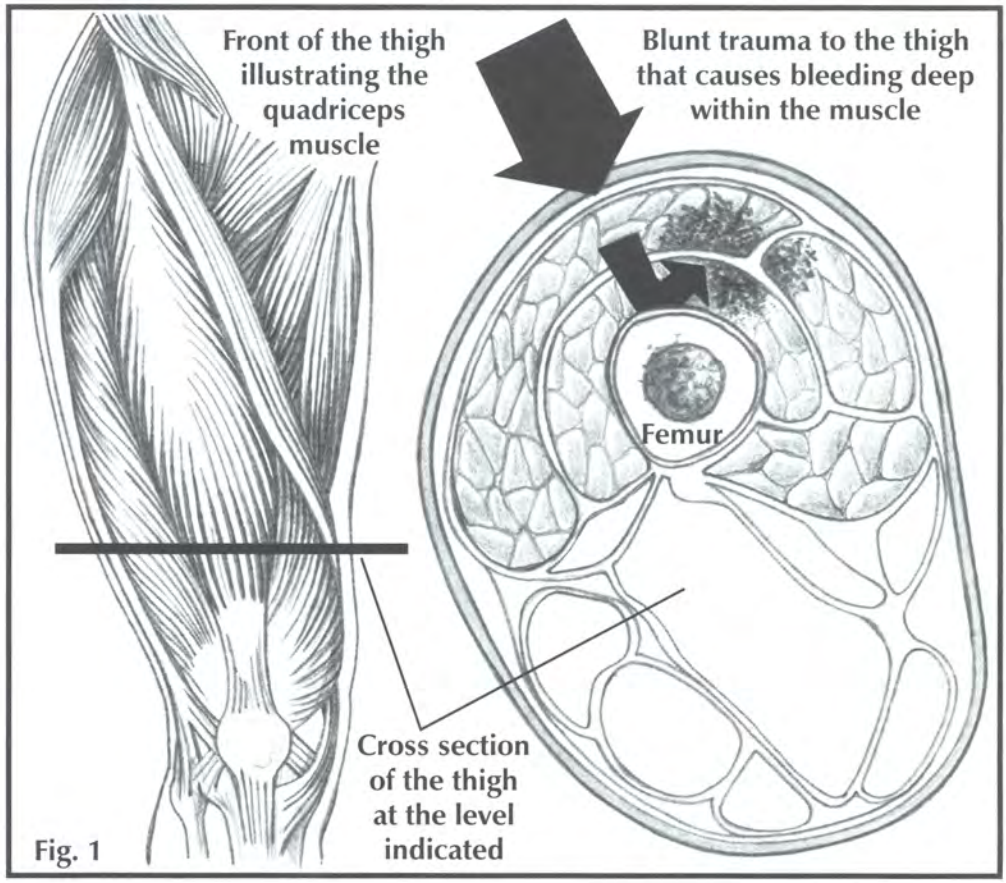

Fig. 1

Mechanism of injury

Thigh contusions are a result of direct blunt trauma. This refers to sudden forceful injury caused by a blunt object, such as a helmet or shoulder pad. This injury creates a force that is transmitted through the substance of the muscle. The damage, however, usually occurs in the layer closest to the bone. The quadriceps muscles are in contact with bone throughout the length of the thigh, and thus, are especially vulnerable. The muscle damage sustained can be either minor (involving only swelling on a cellular level) or major (involving rupture of the capillaries and leading to heavy bleeding). Heavy bleeding can prolong symptoms and delay your return to play.

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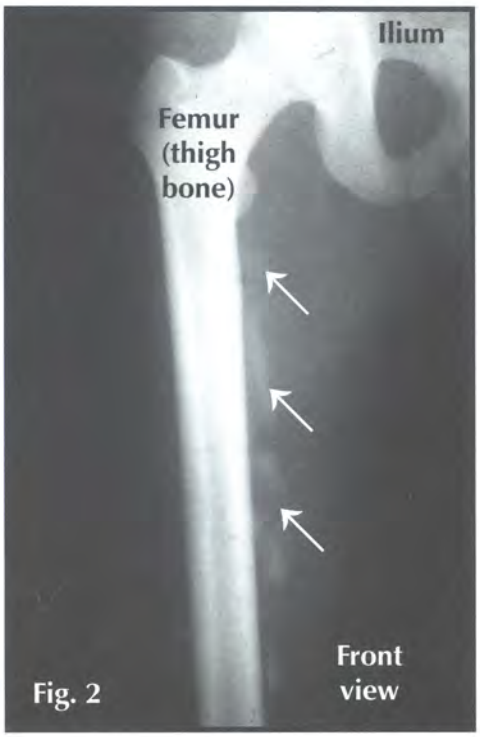
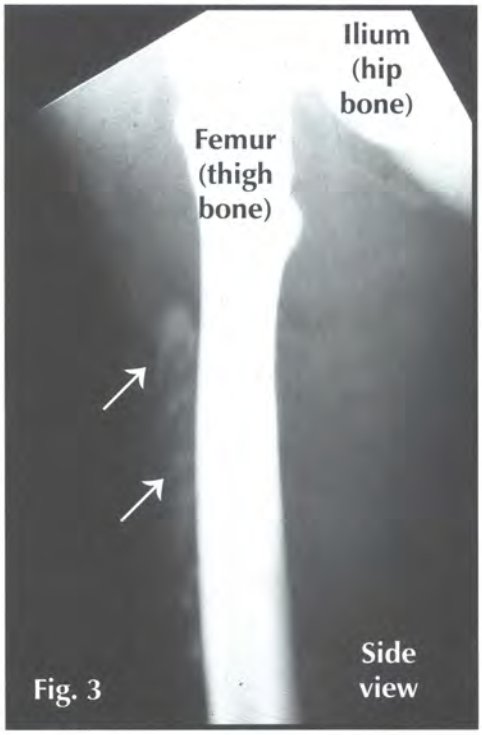


Myositis ossificans of femur 1 month after initial injury. Heterotopic bone is visible (arrows).



Myositis ossificans of femur 4 months later. More heterotopic bone has developed (arrows).

Myositis ossificans (heterotopic ossification)

Quad contusions can lead to a complication called myositis ossificans. Myositis ossificans literally means inflammation of muscle leading to bone formation. Heterotopic ossification means formation of bone in an unusual or peculiar place (Figs. 2 & 3). Myositis ossificans has been reported in 9% to 20% of all cases of quad contusions. When the quadriceps muscles bleed, a cascade of cellular responses can occur, causing heterotopic bone formation. The usually elastic, contractible components of the muscle become rigid. Some studies have identified the following risk factors for the development of myositis ossificans: 1) limited knee range of motion, 2) previous quad contusion, 3) treatment for a quad contusion that was delayed more than 72 hours, 4) knee effusion (swollen knee), and 5) injury sustained by playing football.

Treatment goals

The treatment plan should include limiting swelling and bleeding; minimizing the amount of scar formation; and preserving the elasticity, contractility, and strength of the injured and uninjured muscle tissue.

Return to play

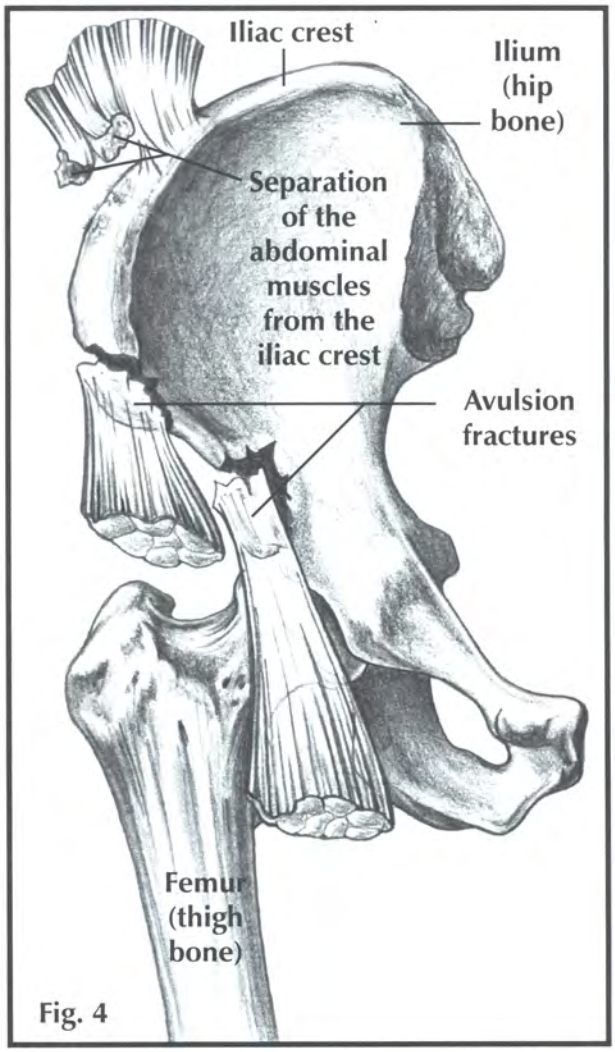
Athletes may return to non-contact participation when there is 120 degrees of pain-free active knee motion. Full participation may occur when the athlete has full range of motion and 90% of contralateral (opposite) leg strength, usually within 1 to 2 weeks. Upon return to contact sports after a quad contusion, the athlete should have the basic thigh pad modified with a ring-shaped pad to prevent further injury.

Hip pointer

Another injury of the anterior thigh (known as a hip pointer) occurs at the level of the hip or pelvis. The rectus femoris (one of the quadriceps muscles) and the abdominal muscles attach to a bone called the ilium. The abdominal muscles attach to a part of the ilium called the iliac crest. A hip pointer results from either a contusion to the iliac crest or from a separation of the muscle fibers from the iliac crest (Fig. 4). Symptoms include pain, tenderness, and difficulty walking.

Mechanism of injury

Like thigh contusions, a hip pointer usually results from a direct blow. A severe hip pointer can occur after a significant stretch injury that leads to tearing of the muscle fiber insertions at the iliac crest.



Management

Hip pointers should be treated early to minimize prolonged impairment. If your physician is suspicious of a fracture or avulsion (separation of the muscle from the bone), x-rays may be obtained (Fig. 5). This is especially important for younger athletes who may still be growing.

Return to play

Return to play is generally permitted once pain is tolerated and gait (walking) has returned to normal. Protective hip pads are helpful and recommended.

Like most debilitating injuries, it is important that you give yourself time to heal. Jumping back into the thick of things can make your condition worse than it already is. Remember, quadriceps contusions and hip pointers are not limited to football. So, be sure to follow your physician's suggestions and take the necessary preventive measures to ensure a safe and healthy return to normal activities and sports.

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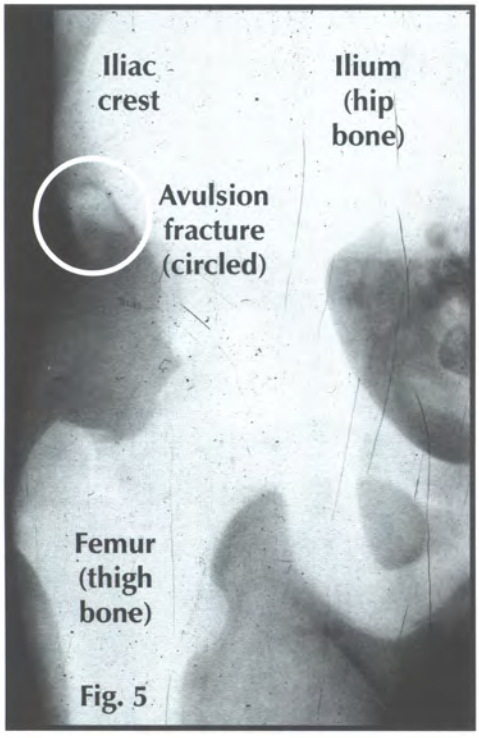


Fig. 5

Rehabilitation of Quadriceps Contusions and Hip Pointers in Sports

Quadriceps contusions and hip pointers are common injuries in sports. Immediate and appropriate action is vital in preventing complications that can keep you from your normal activities for a prolonged time.

Treating quadriceps contusions

Immediately after a direct blow to the front part of the thigh, ice should be placed over the injury site, with the knee bent all the way (Fig. 1). This position should be maintained for 20 minutes. Thereafter, ice should be continued for 20 minutes, every hour for the first 24 hours, with the knee straight. With the doctor's consent, a physical therapist or athletic trainer may use electrical stimulation with the ice to ease pain and swelling (Fig. 2). After the ice is removed, a thick

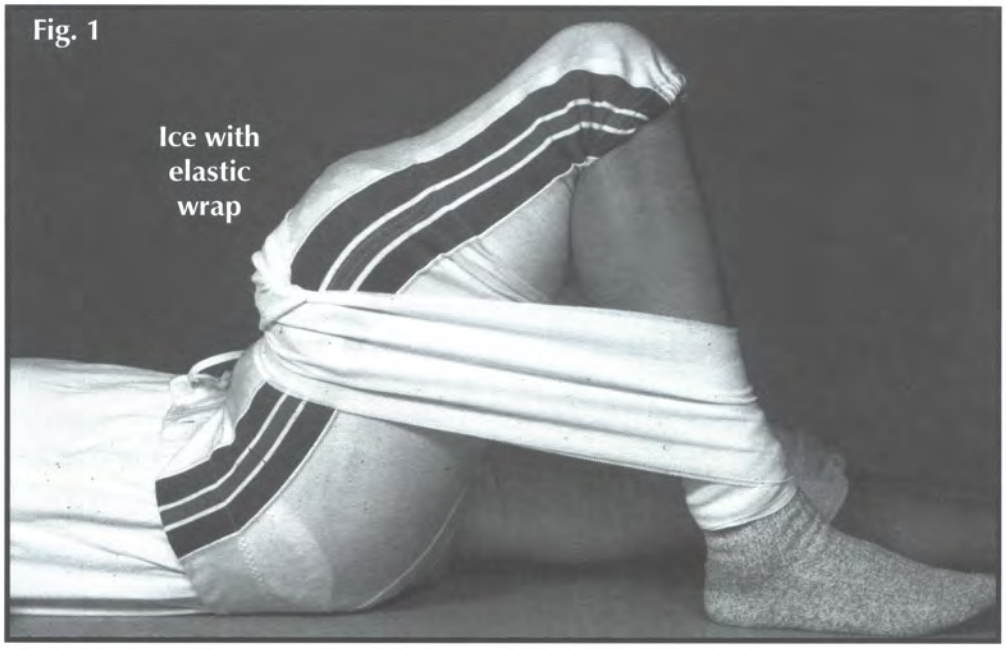


Fig. 1

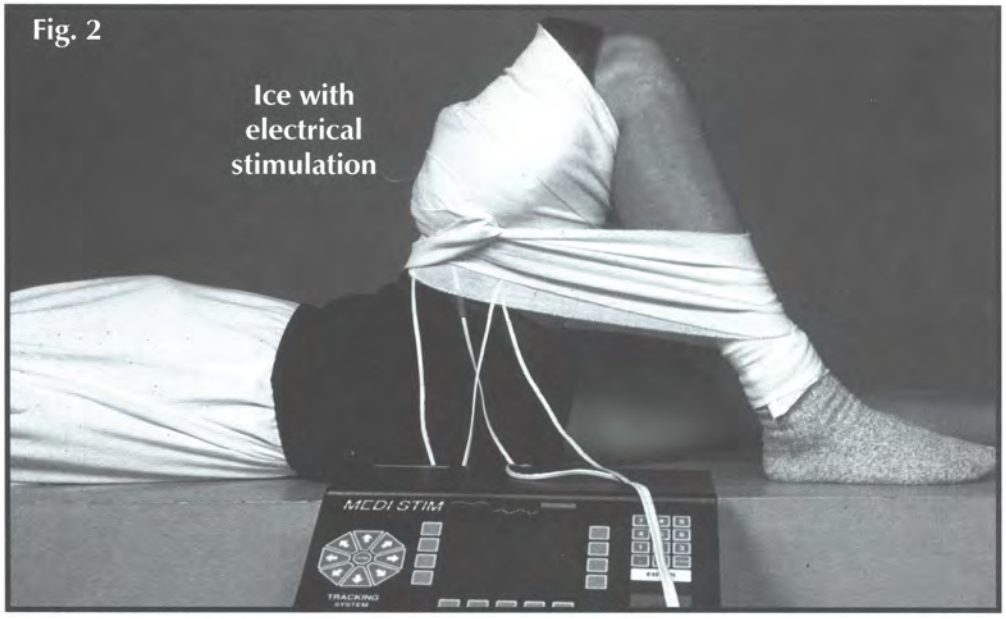
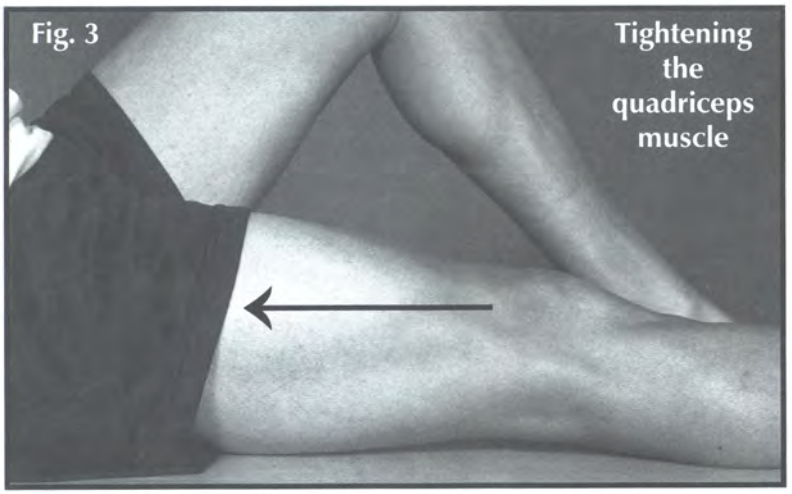


Fig. 2



felt or foam compression pad over the injury site and an elastic wrap around the thigh can help provide support and reduce swelling. The compression pad must be in place when the athlete is not using ice. The athlete can start gentle, pain-free quad sets (tightening the quadriceps muscle and holding for 5 seconds) (Fig. 3). Crutches are used; however, the athlete is encouraged to walk as normally as possible, while placing minimal weight on the injured leg.

The day after

For 20 minutes, every hour when possible (3 times per day minimum), ice is applied with the knee straight. Quad sets should be continued, and the athlete can begin to try to bend the knee as far as possible without assistance and without pain. The athlete continues to walk with crutches until walking can be done without pain, limping, or swelling.

Recommendations

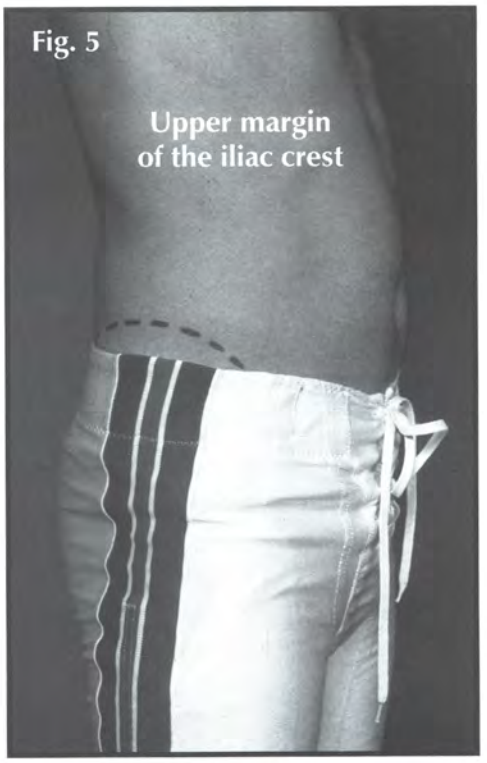
The athlete must work to regain full knee bending motion and gradually progress to pain-free strengthening and conditioning exercises, such as leg raises, stationary biking, and straight-ahead jogging. Certain activities, such as squatting, running downhill, and quick stopping and cutting, place a great deal of stress on the quadriceps. These activities should not be started until the athlete has full, pain-free motion and is jogging straight ahead without pain, limping, or swelling.

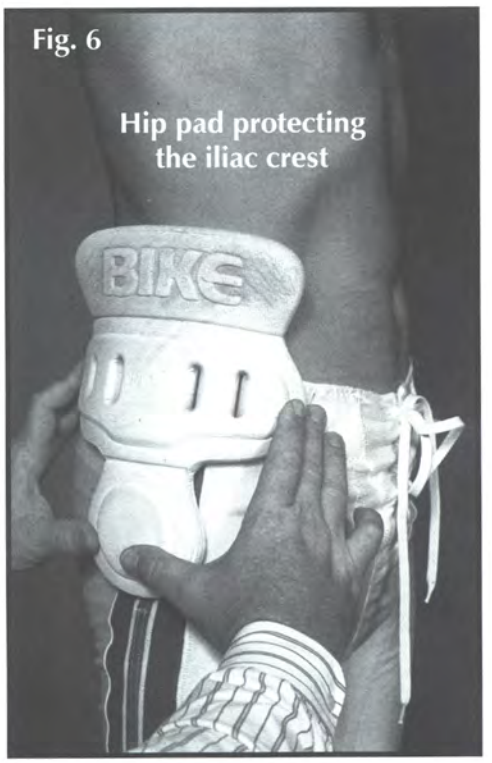
Preventing re-injury

When the athlete is ready to return to action, a large pad that covers the front and sides of the thigh is used. An impact or pressure relief pad (a foam donut covered by a hard plastic shell, such as Orthoplast) is highly recommended (Fig. 4). Prevention of quadriceps contusions may be possible with the use of large thigh pads that surround the front and sides of the thigh. In football, many position players (such as running backs) have large quadriceps muscles, but wear small pads when larger pads might instead offer better protection. In addition, the correct pants size is important to hold the thigh pad in place. Specialty girdles with built-in pockets for thigh pads can be used by any athlete in almost any sport.

Treating hip pointers

Hip pointers can be very painful and debilitating. Ice and crutches are the recommended immediate treatment. Electrical stimulation to





relieve pain can also be used with the ice. Ice is continued for 20 minutes, every hour, until the pain resolves. The athlete can gradually return to jogging and sport-specific drills as the pain allows. When the athlete returns to participation, extreme care should be taken to protect the injured hip with proper padding (Figs. 5, 6, & 7). A good way to prevent a hip pointer is to make sure hip pads are large enough to come up over the crest of the hip bone. Football hip pads can be used by athletes for most sports to protect and prevent hip injuries.

Prevention of quadriceps contusions and hip pointers through appropriate padding should be taken seriously by the athletes, parents, coaches, and athletic trainers. Unfortunately, despite the best precautions, these injuries still can occur and appropriate treatment is important for a quick, safe return to play.

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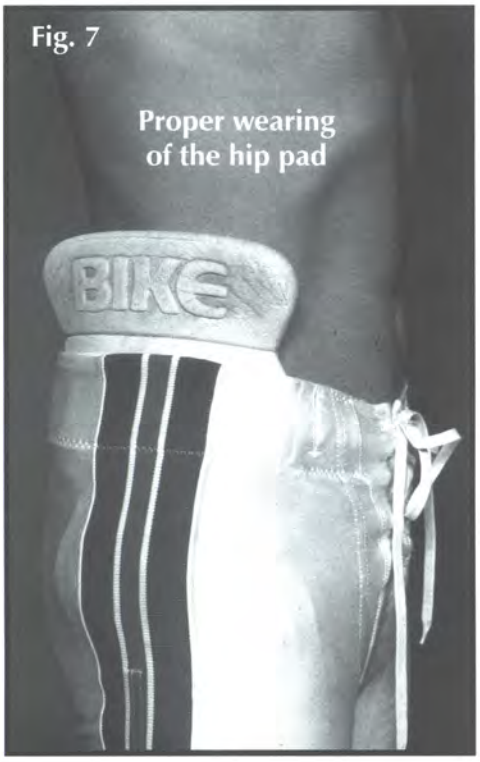

Fig. 7

Proper wearing of the hip pad

Heat and Sun Illnesses

Beat the Heat!

There are between 175 and 1250 heat deaths each year in the United States. Most of these deaths result from a general lack of knowledge about how and when heat injuries occur and how they should be treated.

The heat is on

Our bodies produce and maintain heat, even in excessively hot conditions. Our natural method for cooling off is sweat, which is best evaporated by low humidity and wind. But stagnant, humid air makes sweating (cooling) less effective. As our cooling sytem begins to fail, our body (much like a car) begins to overheat, which can lead to heat stroke or heat exhaustion.

What is heat stroke?

Heat stroke is the most serious of heat illnesses and is caused by a body temperature of 105° F or more, where your bodily cooling process fails; mental impairment and death can result. Most cases occur without warning, and a few cases progress from lesser heat injuries, such as heat exhaustion. The classic signs (fever, sluggishness, confusion, and hot and dry skin) may not be present. Heat stroke can damage vital organs, such as the liver, kidneys, and brain.

There are two categories of heat stroke: classic heat stroke and exertional heat stroke. Classic heat stroke mostly affects the elderly, chronically ill, those who do not exercise, and people taking certain medications (such as psychiatric drugs, decongestants, some blood pressure pills, diuretics, and antihistamines). This type of heat stroke is seen during heat waves in unaccustomed areas.

Exertional heat stroke occurs mostly in younger individuals who are strenuously exercising or working in hot conditions. This type of heat stroke results from increased heat production and may cause organ damage.

How do I treat heat stroke?

Treatment of heat stroke involves rapid cooling of body temperature to less than 102.2° F. Evaporative cooling is best: a large fan blows while lukewarm water is sprayed or sponged over the victim. Immersion in an ice-water bath is an alternate. If the victim is far from a health care facility, he or she should be removed from the hot environment and placed in shade or a cool shelter. Unnecessary clothing is removed, and the victim is sprayed with lukewarm water and fanned. If available, ice packs may be placed in the groin and armpits, where large blood vessels act as cooling radiators.

Preventing heat injuries

Most heat injuries can be prevented by knowing the risk factors. They include dehydration, heavy clothing, prolonged exertion (athletics, military exercises, outdoor work), poor conditioning, lack of adaptation, obesity, sleep deprivation, alcohol, poor living conditions, aging, chronic (long-lasting) disease, saunas, and some medications. A major risk factor is a prior heat stroke, which makes you more susceptible to having another one.

Dehydration is avoided by drinking cool water before and during heat exposure (1½ to 2 cups before, then 1 cup every 20 minutes during heat exposure). Sports drinks that are too sweet, which can interfere with fluid absorption, may be diluted to half strength by adding water. Work and rest cycles can prevent overexertion. During summer sport training programs, the hydration of athletes should be monitored with practice weigh-ins and weigh-outs; athletes who have lost excess water weight (2-3% of body weight) are at higher risk for a heat injury. Despite popular belief, salt tablets should be avoided. Clothing should be loose, breathable, and light in color, and activities should

be planned for cooler morning or evening hours whenever possible.

Acclimatization through gradual, daily exposure to heat reduces most forms of heat illness. This natural adaptation takes 10 to 14 days and allows your body to cool off more efficiently. The effects are not permanent, however, and modest continued exposure is needed to maintain them.

Minor heat illnesses, such as heat cramps (cramps in large working muscles), heat edema (swollen feet or ankles), and heat syncope (fainting), do not cause lasting effects and are usually avoided by limiting exposure and becoming acclimatized.

Heat exhaustion

Heat exhaustion, although not as dangerous as heat stroke, is a serious injury. It can progress to heat stroke if not treated immediately. Heat exhaustion itself does not cause damage to vital organs, nor does it cause mental impairment. The body temperature of someone suffering from heat exhaustion is less than 102°F. Symptoms include sweating, headache, dizziness, nausea and vomiting, muscle weakness, cramps, and blurry vision. Dehydration and chronic salt depletion can cause this illness.

How do I treat heat exhaustion?

First, the victim is removed from the hot environment. Then, the victim is cooled off, as with heat stroke. Finally, fluids must be replenished.

Sun illnesses

Our sun emits radiation, and fortunately most harmful radiation is absorbed by the atmosphere. Of the remaining radiation, ultraviolet radiation (UVR) causes the most problems. UVR levels are highest during summer months, especially between 9:00 A.M. and 3:00 P.M. UVR passes through clouds, even causing sunburn on a cloudy day. Environmental factors such as snow, sand, and water reflect UVR and can increase exposure.

There are two main types of UVR: UV A and UV B. UV A causes tanning and had been regarded as safe; however, recent studies suggest that prolonged exposure can lead to cataracts. UV B is more harmful and is responsible for most skin injuries.

How does UVR affect me?

Sunburn is the most common reaction to UVR exposure, resulting in reddened, painful, and blistered skin. The skin cells suffer short-term damage, but repeated exposures can also lead to skin thickening, discoloration, wrinkles, and cancer. Sunburn can occur after just 20 minutes of exposure in peak conditions. Individuals with different skin types have different responses to UVR. Light-skinned persons tend to burn easily, while dark-skinned persons do not.

Snow blindness (photokeratitis) is sunburn of the eye. This painful condition is caused by the heightened exposure from the reflective surface of snow, sand, or water. It usually occurs

at higher altitudes, but can affect people who live near a body of water. Snow blindness is temporary, but sun exposure over the years can lead to a cataract (hardening of the eye's lens). Intense light conditions (such as staring at an eclipse) can irreversibly damage the retina (back part) of the eye and cause vision loss.

How can I limit UVR exposure?

Protective clothing (such as long-sleeve shirts and hats) and avoiding peak sunlight hours of 9:00 A.M. to 3:00 P.M. are recommended. Sunscreens help by absorbing UVR before it penetrates into the skin to cause damage. Sun Protection Factor (SPF) is a scale that rates effectiveness; the higher the number, the more protection. Various products resist sweat and water to different degrees. Sunscreen of at least SPF 15 should be worn on exposed areas and reapplied according to the instructions. Sun damage begins in childhood and is cumulative; therefore, children should always be protected. Although sunscreen does offer some protection, you should not spend endless time in the sun.

The best way to protect your eyes is to wear polarized sunglasses. Polarized sunglasses filter out UVR and should be worn for most outdoor activities (including driving). These glasses may reduce the long-term risk of cataracts. "Glacier" glasses with side shields are recommended for high-intensity snow or sea conditions. Non-polarized glasses are dangerous; they trick the eye into an illusion of less light, but do not block harmful radiation.

Heat and sun illnesses are serious. By taking a few preventive measures, however, you can continue to enjoy the outdoors and cut down on the risk of injury.

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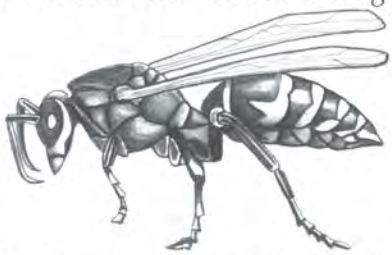
Insect Bites & Stings

During the spring and summer months, it is hard to ignore the appearance of all the common insects. While most insects are simply a nuisance, others can cause anything from a mildly painful bite to a severe allergic reaction. Anyone who spends even a small amount of time outside is exposed to these potential hazards. The most common culprits are bees, wasps, mosquitoes, and biting ants. While prevention is the key, treatment of bites and stings after they occur is also important.

Bees and wasps are generally aggressive only when threatened. The head and neck are the most common sites of stings, followed by the arms and legs. Pain is usually immediate, followed by rapid swelling, redness, and itching at the site of the sting. If you are allergic to bee stings, you may have a severe, life-threatening allergic reaction consisting of shortness of breath, wheezing, hives, nausea, vomiting, and fever. Allergic reactions need immediate medical treatment.

Mosquitoes and ants are not as hazardous as bees and wasps, but they can be annoying. Most forms of insect repellent can ward off pesky mosquitoes and ants. Be sure to avoid ant hills because most biting ants (especially fire ants) become aggressive when they feel threatened.

A stinger that is still in the skin needs to be removed. Scraping it with a knife, razor blade, or the edge of a credit card is most effective. Do not try to remove the stinger with tweezers because that can worsen the person's reaction. Mild bee or wasp stings can usually be treated with an antihistamine (such as Benadryl), over-the-counter cortisone cream, or calamine lotion for the itching. Oatmeal baths may also be effective. A home remedy for itching consists of a paste of unseasoned meat tenderizer (Adoph's) and water applied to the location of the sting for



10 to 15 minutes. Ice applied to the site of the sting also often decreases the skin reaction. If you or a family member has a known severe allergic reaction to bee stings, then you should have a bee sting kit (EpiPen or Ana-Kit) in your possession at all times. You should also consider wearing a Medic Alert tag to let others know of your condition.

In order to prevent or at least reduce the likelihood of getting stung, the following guidelines should be observed: avoid wearing brightly colored clothing or sweet-smelling perfumes; avoid angering bees or wasps by coming in close contact with their nests; and keep sweet-smelling foods or drinks tightly covered, especially if you know bees are nearby.

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What are Ingrown Toenails?

Ingrown toenails are a common problem that usually involve the big toe. The nail plate cuts into the skin edge or nail bed and causes irritation, inflammation, and infection. Common factors that can cause this condition include constricting shoes (too narrow or tapered), nails that are not trimmed straight across, and nails that are bent or curved in (hereditary or from injuring the root of the nail). Occasionally, a bone spur will form beneath the nail and cause pain. Treatment for the early stages, where the skin edge is red and irritated, is wearing properly fitted shoes with plenty of space in the toebox; soaking your toe in warm water (15 minutes, twice a day); and taking cotton from a Q-tip and placing it under the corner of the nail. If you see any pus (infection), you should consult your physician for possible removal of the nail edge and/or antibiotics. With a first-time ingrown nail, the nail edge can usually be removed after the toe is numbed with a nerve block. For recurring cases, the root of the nail may need to be partially removed in order to prevent the ingrown portion from regrowing.

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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 Clinic, P.C., of physical therapists and athletic trainers at Rehabilitation Services of Columbus, Inc., 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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Hughston Sports Medicine Center Callaway Gardens Triathlon

Sunday, September 6, 1998
7:30 A.M.
1K Swim 30K Bike 8K Run

The 16th Annual Callaway Gardens Triathlon will be held in beautiful Callaway Gardens, Pine Mountain, GA. The Callaway Gardens Triathlon is the longest "running" triathlon in the Southeast and has recently been named one of the top ten races in the country.

For further information, contact the Event Hotline: **(770) 565-5208.**

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