



Hughston Health Alert

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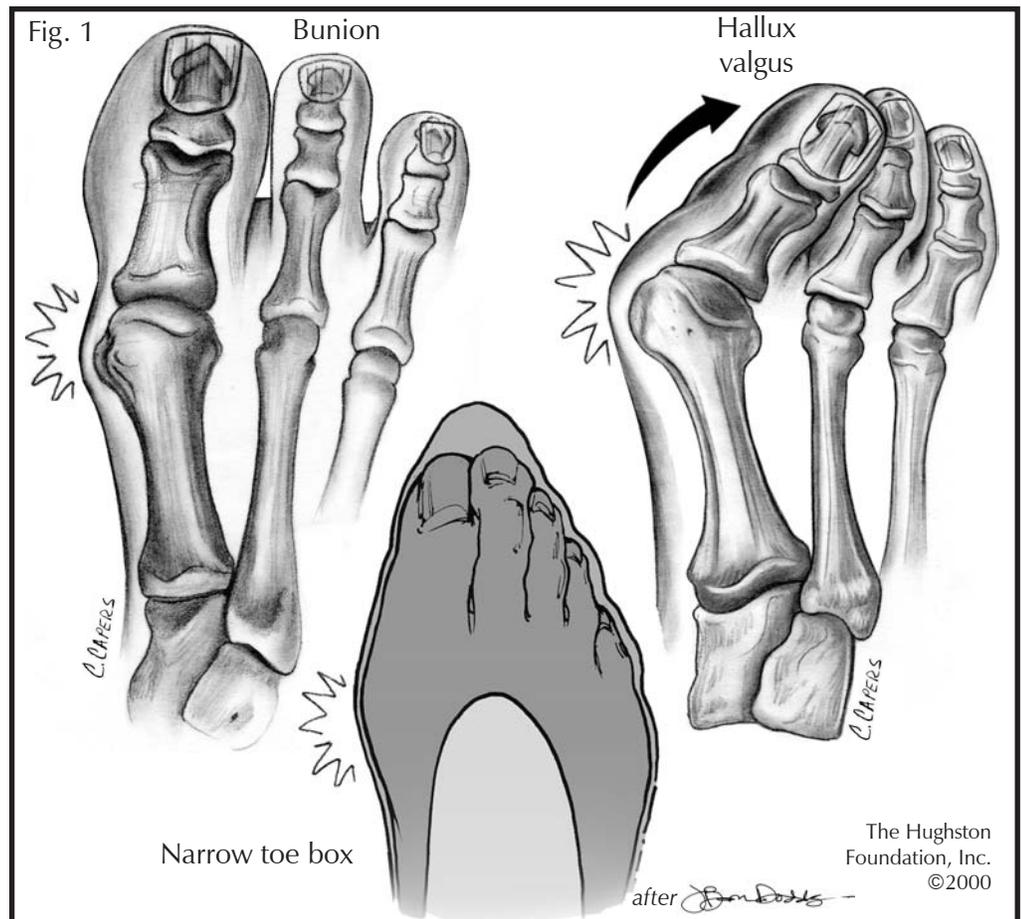
Forefoot Deformities

The forefoot can develop several deformities that can cause pain, functional problems, and deformities of other toes. Thick calluses form over points where the deformed area presses into the shoe, and they can ulcerate and become infected in severe cases. Proper treatment helps relieve the pressure points and your pain.

Great toe deformities

The largest of these deformities is a bunion, which is a bulge of the bone at the base of the great toe (Fig. 1). It protrudes to the outside of the foot and presses against the shoe. This pressure causes inflammation in the skin over the bunion and severe pain.

Often the great toe angles away from the bunion and presses against the small toes. This condition is called hallux valgus and can cause deformities in the small toes too. Some people have a greater tendency



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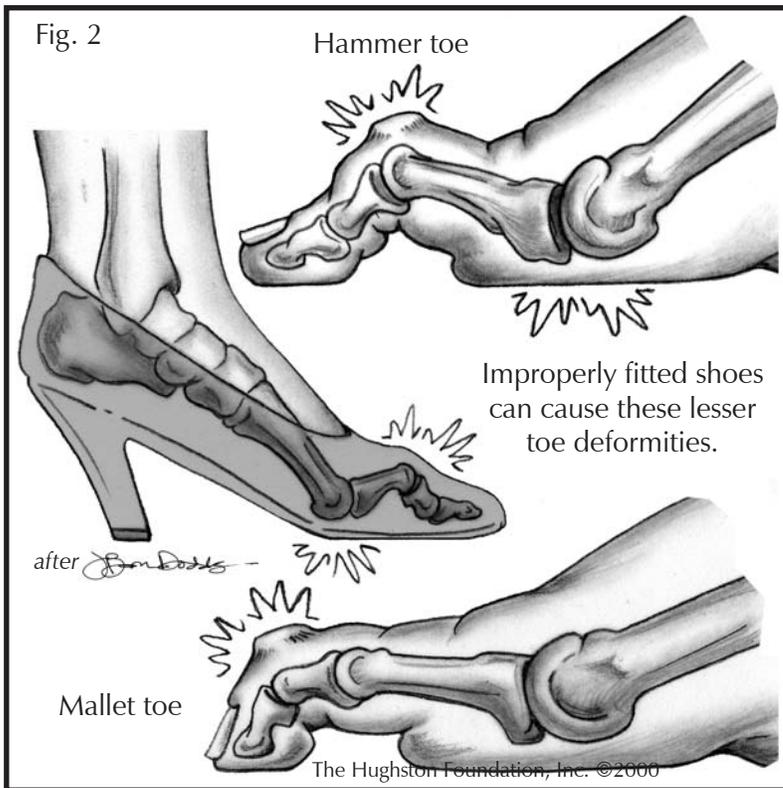
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than others to develop bunions and hallux valgus. Wearing shoes with heels and narrow toe boxes is a major cause of these deformities. Thus, women have 10 times the risk that men have for these problems.

Small toe deformities

The small toes generally can form two types of deformities: hammer and mallet contractures (Fig. 2). These

conditions most often affect the second toe because it usually is the longest and is forced into the tip of the shoe. Hammer toe means that the toe contracts all of its joints and curls upward. The curling creates pressure on the tip of the toe, on the top of its middle joint, and under the ball of the foot. The pressure produces severe pain at these points. Mallet toe causes just the tip of the toe to contract and



the bone and adjusting the ligaments (tissues that connect two bones) of the affected toe. Recovery takes time.

To correct the bunion deformity, the surgeon removes the bulging portion of the bone and tightens the toe's ligaments (Fig. 3). Sometimes, he or she needs to realign

can wear regular shoes, but you may have some soreness for several more months until the foot and toes completely heal.

Forefoot deformities cause severe pain or disability that may need to be treated with surgery. Remember, to prevent deformities, ensure that you wear low-heeled, properly fitted shoes that have wide toe boxes.

Stephen C. Hunter, M.D.
Columbus, Georgia

Further reading:

1. American Orthopaedic Foot and Ankle Society. *The adult foot.* <http://www.aofas.org/adult-foot.html> To order a hard copy of the brochure, send a self-addressed, stamped envelope to: AOFAS, 1216 Pine Street, Suite 201, Seattle, WA 98101. Specify the name of the brochure.
2. American Academy of Orthopaedic Surgeons. *Common foot problems.* http://www.aaos.org/wordhtml/pat_educ/commfoot.htm For a hard copy, send a self-addressed, stamped envelope to: AAOS, 6300 North River Road, Rosemont, IL 60018-4262. Specify the name of the brochure.

causes pressure on this area. Again, wearing tight, short shoes adds to the pressures that cause and aggravate small toe deformities.

Nonoperative treatment

Nonoperative treatment for these conditions focuses on relieving the pressure points. Wearing properly fitted shoes with toe boxes that allow toes to move freely can alleviate much pressure. Your shoes should have heels that are no higher than two inches and should have toe boxes that are no more than one-fourth inch narrower than the widest part of your forefoot. Special pads that you can purchase at the local pharmacy relieve pressure points on the ball of the foot and on the toes. However, these devices do not correct the deformities.

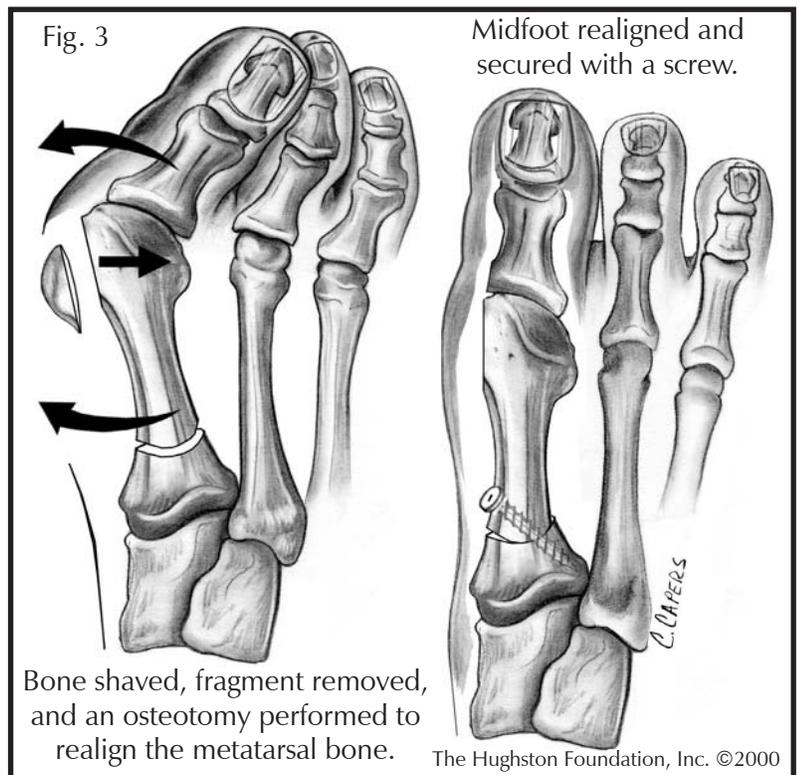
Operative treatment

If you have extreme or disabling pain, you may need surgery to correct the deformity and, thus, permanently resolve the pressure problems. Surgery involves shaving or cutting

the midfoot bone (below the toe) to correct more severe deformities. This procedure involves cutting the bone and stabilizing it with pins and screws.

The surgeon corrects small toe deformities by cutting out bony portions of the affected toe, loosening the ligaments, and putting in a temporary pin to allow the toe to heal straight.

To enable the foot to heal properly after surgery, you must wear protective shoes and splints and use crutches while continuing your daily activities. In two to three months, you



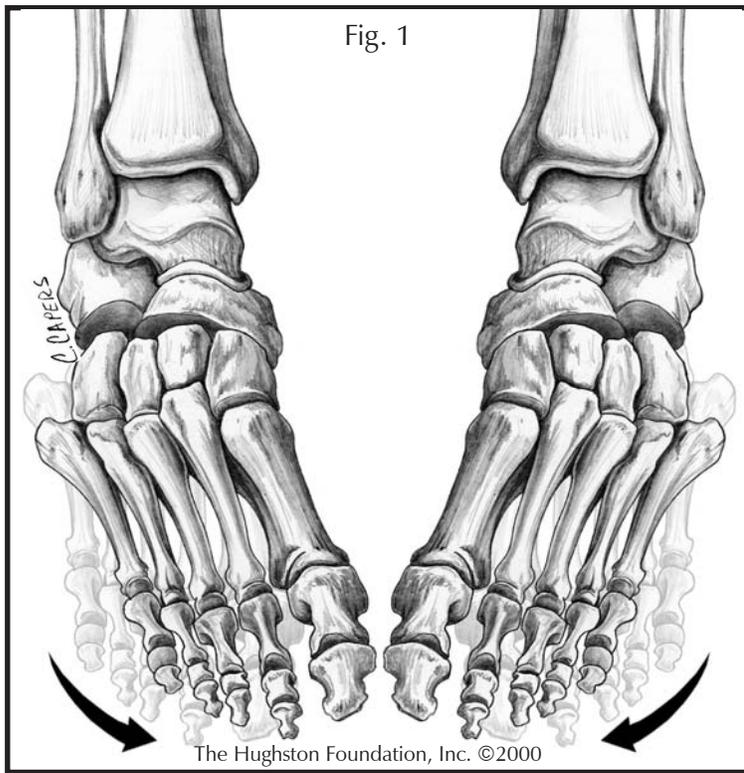


Fig. 1

In-Toeing in Children

Noticing that your child or grandchild's feet turn in can cause alarm, prompting a visit to the pediatrician or orthopaedist. Such a condition may become apparent shortly after the child is born or when the child begins to stand or walk. Often, the walking child seems to be clumsy or to trip over his or her feet. One or a combination of three processes most commonly cause in-toeing: metatarsus adductus, internal tibial torsion, and femoral anteversion. Fortunately, they rarely require treatment and usually get better with time.

Metatarsus adductus, often called pigeon toes, is the most common foot condition seen by orthopaedists who treat children. It occurs when the front of the foot is turned inward, facing the other foot (Fig. 1). Boys and girls are equally affected. Although the cause is not known, some doctors think it results from the child being tightly packed in the mother's womb.

Most children's feet straighten naturally without treatment. Occasionally, they need casts, orthoses, or special shoes to correct the condition. In rare cases, correction does not occur naturally or with nonoperative treatment, so the child may need surgery.

Internal tibial torsion and **femoral anteversion** are similar conditions, which

are often called knock knees. The former refers to twisting of the tibia (shin bone); the latter, to twisting of the femur (thigh bone) (Fig. 2). Each condition causes the foot to turn inward. Twisting of these bones is normal in a young child and typically resolves as he or she grows. With internal tibial torsion, the leg gradually straightens by age three; with femoral anteversion, by age eight. Pediatricians and orthopaedists once used special shoes, night splints, and cables to "untwist" these bones. However, treatment does not change the natural course of the conditions and, therefore, is not recommended. Straightening of the legs with surgery is rarely needed and is not performed until natural correction has stopped.

Although in-toeing usually results from one of these conditions, it also may be due to a less common condition

that requires special treatment. For example, it may occur if one or both parents had rotational deformity (twisting of the bones). In-toeing may occur in children with a condition such as cerebral palsy. Therefore, the doctor will take a careful medical history as part of the child's evaluation. Through the evaluation, an orthopaedist can determine what, if any, treatment is necessary for in-toeing in a child.

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Further reading

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2. Wenger DR, Rang M, eds. *The Art and Practice of Children's Orthopaedics*. New York, NY: Raven Press; 1993.

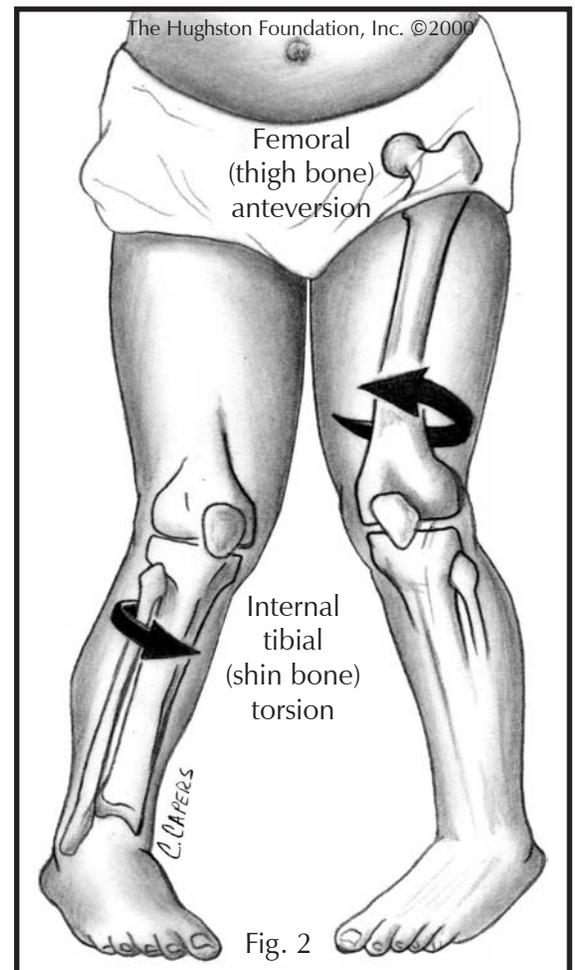


Fig. 2

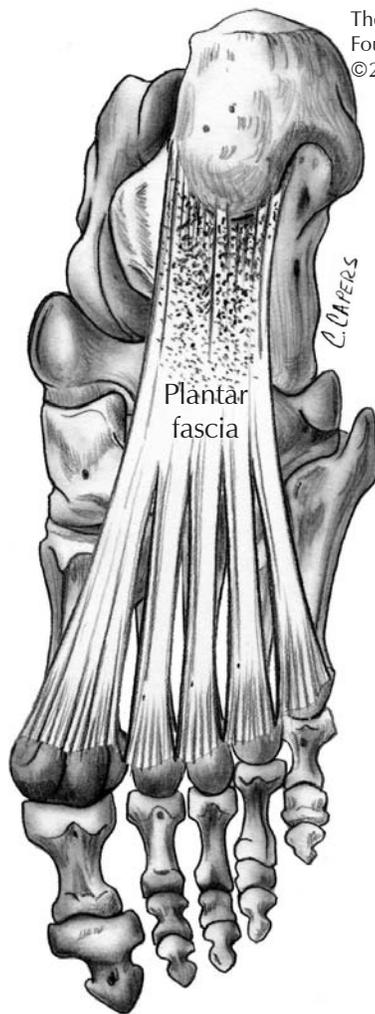
Heel Pain

Heel pain is a common condition in people of all ages and at a variety of activity levels. Usually, “heel pain syndrome” involves an inflammation or irritation of the plantar fascia (Figure). The plantar fascia is the ligament (tissue connecting two bones) under the foot that supports the arch. It originates from the calcaneus (heel bone), spans the arch, and inserts into the toes. Most commonly, an overuse injury involving the arch causes the plantar fascia to become inflamed with tiny tears where it attaches to the heel bone. The overuse injury can be caused by increased standing, change in activity level (i.e., new or more vigorous exercise program), increased body weight, poorly supportive footwear, or injury to the foot. A tight Achilles tendon (the tissue that connects the calf muscle to the heel bone) puts stress on the plantar fascia and is often associated with heel pain. Typically, the initial symptoms involve pain under the heel during the first few steps in the morning or after sitting for a long time. As the symptoms progress, pain can be present with every step and can become constant.

In most people, plantar fasciitis goes away spontaneously or with rest. However, healing takes a long time. A research study showed that healing time averages eight months.¹

Nonoperative treatment

The initial steps in treating plantar fasciitis include participating in a heel cord stretching program (see “Taking Care of Heel Pain,” p. 6), wearing supportive shoes, and avoiding going barefoot. Often, taking a nonsteroidal anti-inflammatory medication (such as aspirin or ibuprofen) is helpful. Using over-the-counter or custom-fitted arch supports relieves some stress on the arch and allows the plantar fascia to heal quicker. Heel lifts or pads can



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cushion the heel.

Other helpful treatments include wearing a night splint or fiberglass

cast. A night splint positions the foot at a 90° angle to the leg (like when standing), which prevents it from pointing downward. This treatment, which is applied when you rest or sleep, improves symptoms in most people.³ Even when all other nonoperative treatments have failed, a walking fiberglass cast sometimes rests the plantar fascia enough to allow it to heal properly. Usually, the cast is worn at all times for three weeks.

An injection of steroids (a strong anti-inflammatory medication) into the heel relieves symptoms in about one third of people. However, this treatment is not appropriate for everyone and cannot be administered often. Frequent injection carries some risk of weakening and rupturing the plantar fascia.

Physical therapy tools such as ultrasound, iontophoresis, and

phonophoresis help about half the people treated. New high-impulse ultrasound technology shows some promise in people who do not get better with other types of nonoperative treatment; these tools will be used more in the future.

Operative treatment

If your symptoms do not improve with nonoperative treatment and they continue for more than six months to one year, you may need surgery. Surgery is usually performed on an outpatient basis (i.e., you spend less than 24 hours in the hospital). The doctor makes a three-inch incision that exposes the inner and middle segments of the plantar fascia near the heel bone. Next, he or she lengthens the plantar fascia. The doctor also may release the plantar nerve from tissues that put pressure on it if it is irritated.

Postoperative treatment

After surgery, you wear a special shoe and begin walking as tolerated. By six weeks, you usually can wear your own shoes. You have maximum improvement by around three months. Seventy-five percent of people significantly improve with surgical treatment.

Heel pain takes time to get better, and you must wear supportive shoes, participate in special exercises, and use other treatments. Fortunately, most people with plantar fasciitis get completely well without surgery.

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Columbus, Georgia

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2. Gill L, Kiebzak G. Outcome of nonsurgical treatment for plantar fasciitis. *Foot Ankle Int.* 1996;17(9):527-532.
3. Wapner KL, Sharkey PF. The use of night splints for treatment of recalcitrant plantar fasciitis. *Foot Ankle.* 1991;12(3):135-137.

Lightning and Its Hazards

Lightning is the most consistent and significant weather hazard that athletes encounter. According to the National Severe Storms Laboratory, 100 fatalities and between 400 and 500 injuries requiring medical treatment occur from lightning strikes each year in the general American population. Even though the probability of being struck is extremely low, the danger increases when a storm is in the area and proper safety precautions are not followed.

The National Collegiate Athletic Association (NCAA) has developed guidelines for lightning safety. Prevention and education are the key factors in these guidelines. Prevention starts with having a plan of action. The first step in this plan is to designate a chain of command. One person monitors an approaching storm and informs the person in charge if he or she believes athletes need to be evacuated from the playing field. The person in charge of making the final decision about evacuation is usually a certified athletic trainer (ATC), game official, or coach. The game official and coach have duties during the game or practice that prevent them from adequately monitoring an approaching storm. Therefore, having someone who is familiar with lightning patterns serve as the storm monitor is imperative. The ATC on staff is the perfect choice.

The storm monitor must also obtain a weather report before the game or practice so that he or she is aware of any weather system that may affect the area. Some areas have a severe weather warning system through the National Weather Service. Storm monitors must familiarize themselves



with the warning system in their areas.

The second step in the prevention plan involves evacuation of the athletes. This step must be planned in advance of an evacuation. During evacuation, athletes are directed to a location that offers protection from the storm by having at least three walls and a roof. Metal structures are not considered adequate protection because the lightning can travel along the metal and strike the people inside the structure. Trees also do not provide adequate protection. Lightning can strike a tree, travel down it, and strike the people seeking shelter under it. Many people have lost their lives because they thought a tree offered a safe haven during a storm.

Education about lightning is a necessary part of the safety guidelines. Understanding lightning patterns can save your life. The two ways to determine whether lightning is close by are the flash-to-bang theory and the lightning prediction system. The flash-to-bang theory consists of counting the seconds between the lightning flash and the bang of

thunder. Every five seconds between the flash and the bang equals one mile. The NCAA recommends that at 30 seconds (when the lightning is only six miles away) the athletes need to be evacuated. Remember, lightning can strike up to 10 miles from the storm without previous lightning strikes to warn you.

The lightning protection system is an electronic monitoring system. It monitors energy from as far away as 15 miles and evaluates the energy field for lightning. The system automatically gives a signal to warn everyone in the area that lightning has been detected.

To prevent a catastrophic event, respond sensibly when lightning is in the area. Gambling with lightning is not a risk worth taking. If you are not sure it is safe to be in the area, evacuate immediately.

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Taking Care of Heel Pain

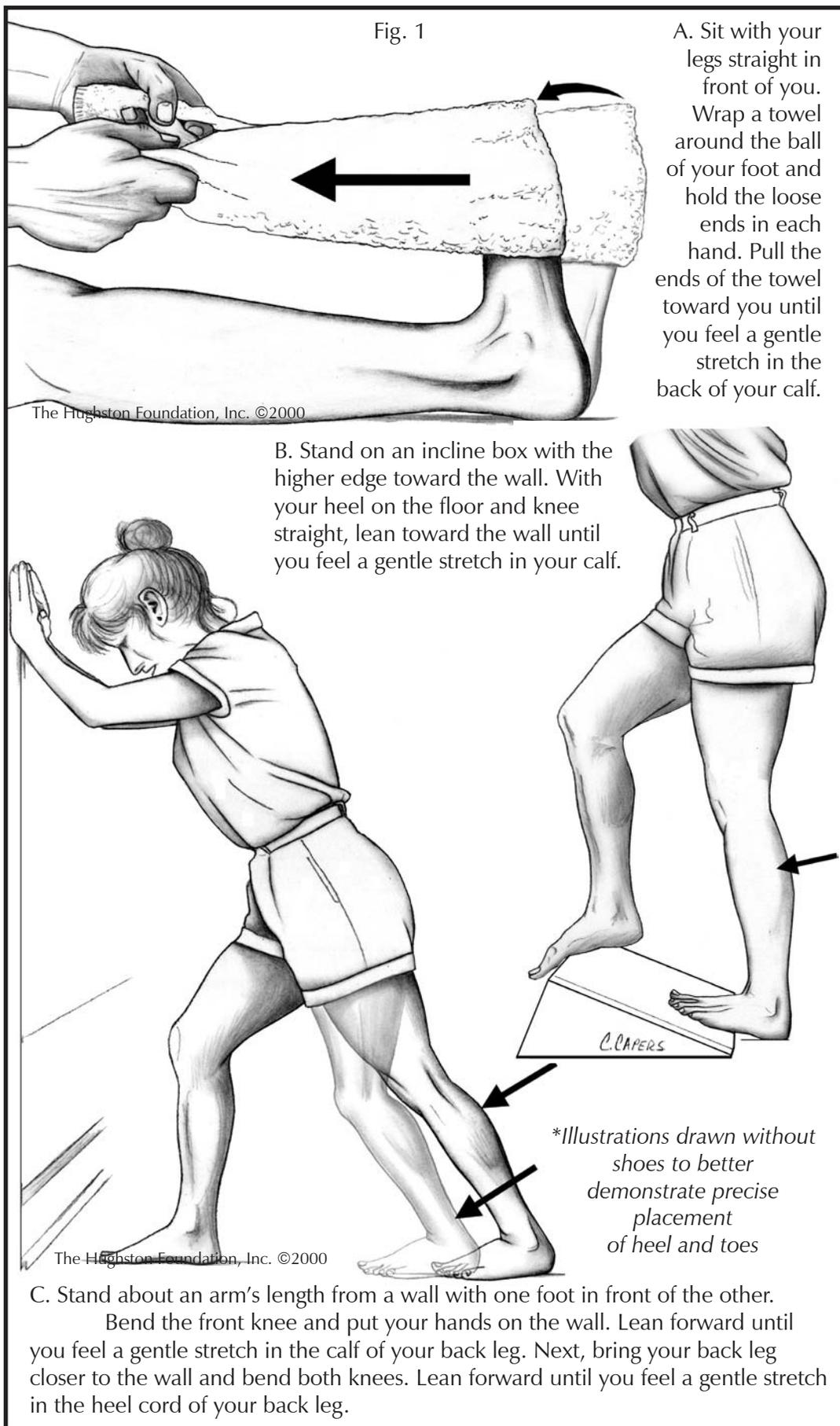
Stretching

Heel pain can be very aggravating, especially when taking those first steps in the morning. The key to decreasing and possibly eliminating heel pain is to stretch your heel cord and plantar fascia. The heel cord is the Achilles tendon, which connects the gastrocnemius and soleus muscles in the calf to the heel bone. The plantar fascia is a thick tissue that runs along the bottom of your foot, connecting the heel bone to the toes and maintaining the arch.

You can stretch your heel cords as shown in Figure 1A-C and your plantar fascia as shown in Figure 2. You can also stretch your plantar fascia by modifying the exercise shown in Figure 1C. Place a rolled towel under the toes of your back foot when doing the stretch; you will feel a gentle stretch along the bottom of your foot in addition to the back of your calf. Each stretch should be painfree and held for 30 seconds. Complete five repetitions of the stretches four to five times each day. When stretching in the standing position, keep your heels down and your toes pointed straight ahead or slightly inward. Always do standing stretches with your shoes on*. In addition to these stretches, your doctor may recommend that you wear a splint that maintains a gentle stretch on your heel cords overnight.

Additional pain relievers

Treatments to add to your stretching program include



wearing good-quality shoes, icing the painful area, and massaging the arch. Do not walk barefoot; walk in shoes with good heel and arch supports such as high-quality walking or running shoes. Keep a pair of shoes next to your bed so you can put them on before taking your first step. Your doctor may recommend that you wear an additional arch support or a heel cup in the shoes.

Icing your foot can help relieve pain. Rub a frozen bottle of water or an ice cup over the tender areas for five minutes two times each day (Fig. 3). Massage your foot by rolling a tennis, golf ball, or baseball along your sole and heel. This friction massage can help break up adhesions and stretch the plantar fascia. Do this for five minutes two times each day.

If you are a runner or just started a walking or running program, evaluate your training for errors such as warming up improperly, increasing mileage too quickly, running hills excessively, running on surfaces that are too hard, or wearing broken down shoes. Adjusting your training program can help relieve your pain. While recovering from heel pain, walk or jog in a pool or crosstrain by biking and swimming. These activities maintain your cardiovascular fitness without stressing your heel cord or plantar fascia.

Heel pain takes time to go away. Be patient and remember that no treatment is a substitute for **STRETCHING!**

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2. Cornwall M, McPoil T. Plantar fasciitis: etiology and treatment. *J Orthop Sports Phys Ther*. 1999;29:756-760.

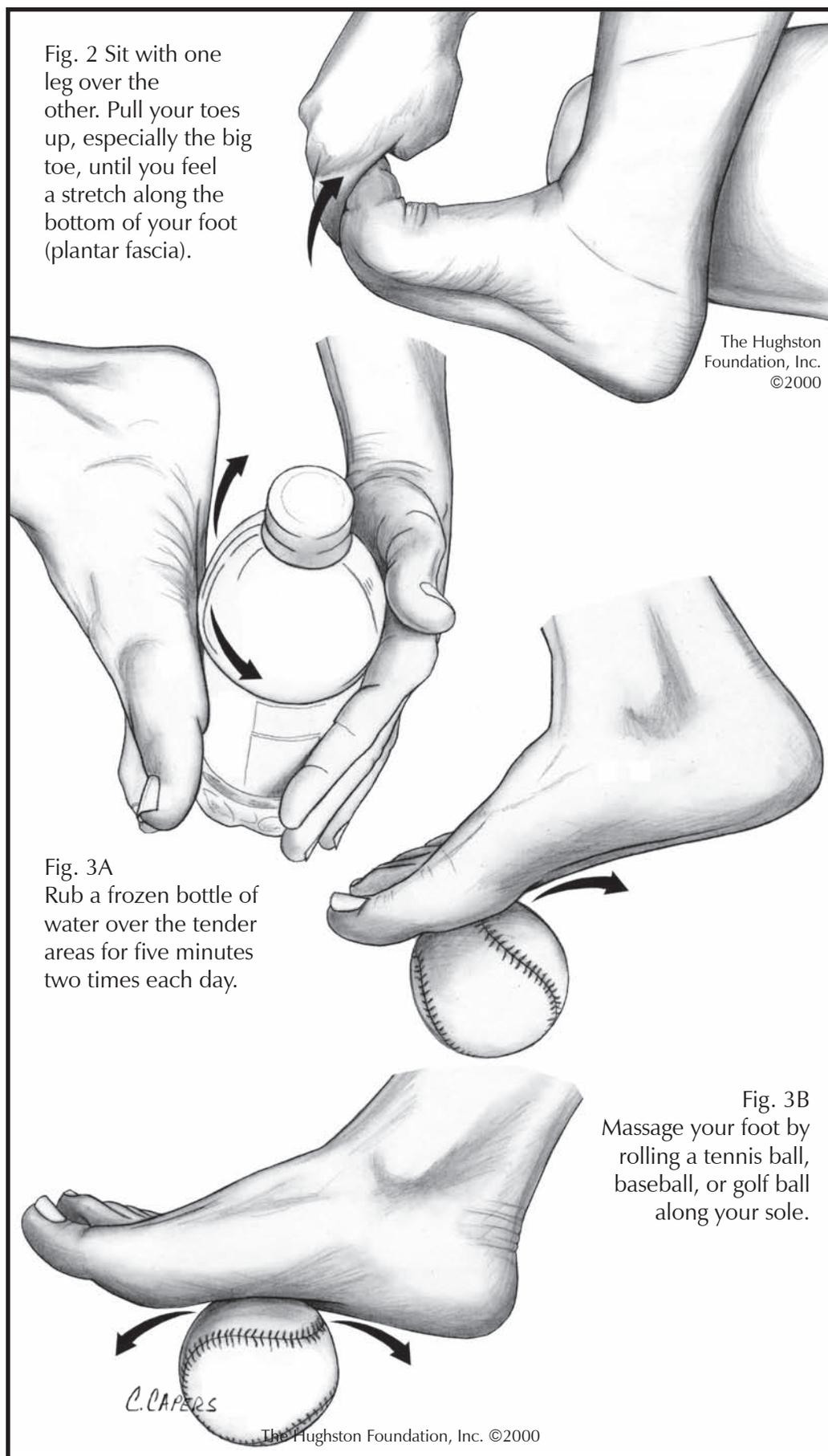


Fig. 2 Sit with one leg over the other. Pull your toes up, especially the big toe, until you feel a stretch along the bottom of your foot (plantar fascia).

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Fig. 3A Rub a frozen bottle of water over the tender areas for five minutes two times each day.

Fig. 3B Massage your foot by rolling a tennis ball, baseball, or golf ball along your sole.

C. CAPERS

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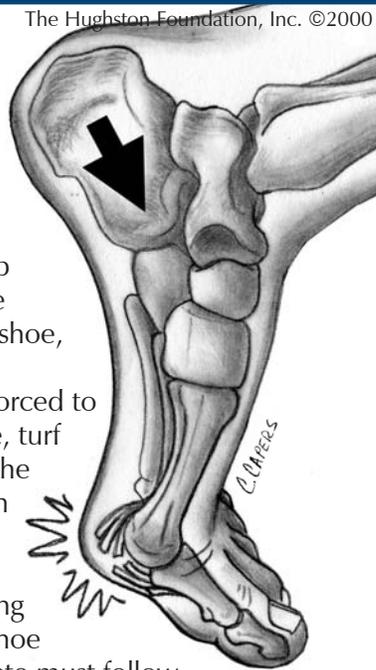
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Turf Toe

Turf toe describes a sprain of the ball of the foot at the great toe. A sprain means that the ligaments (tissues connecting two bones) are stretched or torn. This injury most commonly affects football athletes playing on artificial turf with "turf shoes." When the athlete tries to stop quickly, the shoe grabs the turf. As the great toe slides over the insole and hits the inside of the shoe, it is sprained.

The great toe can also be injured when it is forced to extend more than it normally can. For example, turf toe can occur when the athlete is standing on the balls of the feet and another athlete pushes him or her forward, hyperextending the great toe.

A doctor needs to examine the athlete who may have turf toe. Treatment consists of applying ice, heat, and tape or stiff-soled inserts in the shoe to restrict movement of the great toe. The athlete must follow the prescribed treatment to alleviate this disabling condition and to return to his or her normal level of function.



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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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Suggested readings and classic references for articles contained

in this issue can be found on www.hughston.com

Health Hint

Beating the Heat

1. Take advantage of shade when you must be outside.
2. Wear loose, light-colored, natural-fiber clothing.
3. Change clothes when they become saturated with sweat and are unable to absorb further.
4. Drink cold water frequently during activity; do not wait until you are thirsty. For optimum hydration, drink before, during, and after exercise.



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