Hughston Health Alert

6262 Hamilton Road P.O. Box 9517 Columbus GA 31995-3199

VOLUME 3, NUMBER 3 | *For a Healthier Lifestyle* | SUMMER, 1991

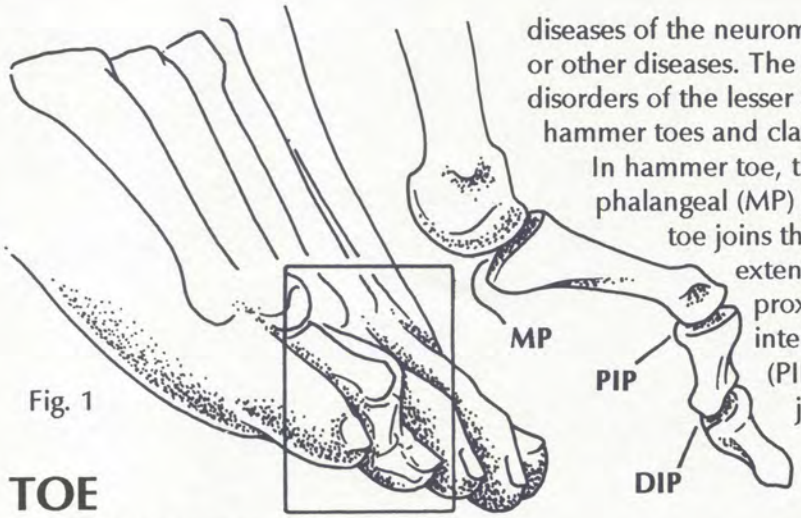

Fig. 1

TOE DEFORMITIES

Deformities of the lesser toes (toes other than the big toe) may be congenital (existing at birth) or acquired later in life. Causes of acquired disorders include improper shoe wear (most common), trauma, diseases of the neuromuscular system, or other diseases. The most common disorders of the lesser toes are hammer toes and claw toes.

In hammer toe, the metatarsophalangeal (MP) joint (where the toe joins the foot) is extended, the proximal interphalangeal (PIP) joint (first joint in the toe) is flexed, and the distal interphalangeal (DIP) joint (second joint in the toe) is extended (Fig. 1). This abnormal toe posture causes increased pressure within the shoe on both the top and base of the toe. These pressure points lead to painful calluses.

In claw toe, the PIP and DIP joints are flexed, causing excessive extension of the MP joint and giving the toe its characteristic "claw" appearance (Fig. 2). Frequently all of the lesser toes are involved and the patient experiences painful corns and calluses at the pressure points of each toe.

Conservative treatment of toe deformities is possible as long as the toes remain flexible. Pads and cushions over the pressure points, along with straps and restraints to force the toes into a more normal posture, may help. Such devices should be used in conjunction with shoes that have a deep toe box and a soft leather upper. A qualified shoe store salesperson can help in the selection of shoes.

When conservative measures fail or when the toes are no longer flexible, surgical intervention may be required to correct the posture of the toes and to alleviate points of pain and pressure. Unless corrected, corns and calluses can be expected to recur, regardless of shaving and padding techniques.

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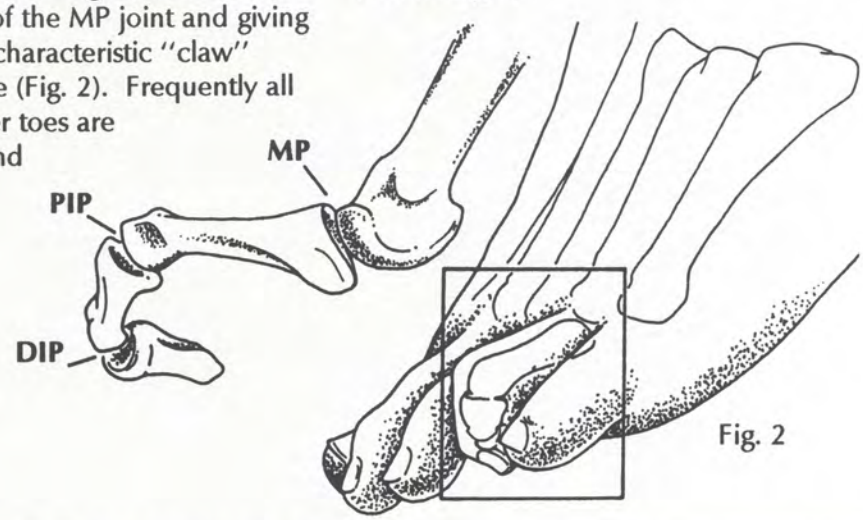

Fig. 2

When surgery is necessary, it usually requires releasing the soft tissues (ligaments and tendons) of the connected joints. Sometimes transferring a tendon from the undersurface of the toe (flexor) to the top of the toe (extensor) dynamically corrects the abnormal toe posture. However, in cases of fixed (nonflexible) deformities, removal of a portion of the bone may be necessary to achieve adequate correction and pain relief. Many patients are hesitant about the "removal of bone" but are usually pleased with the results of such surgery. Some patients do require some shoe modifications or pads even after corrective surgery. This is usually to prevent new pressure areas from developing.

Another less common deformity of the lesser toes is a congenital "curly toe," usually an inherited deformity involving any or all of the lateral three toes (3rd, 4th, and 5th toes)(Fig. 3). In this deformity, the MP joint is in normal position and the PIP and DIP

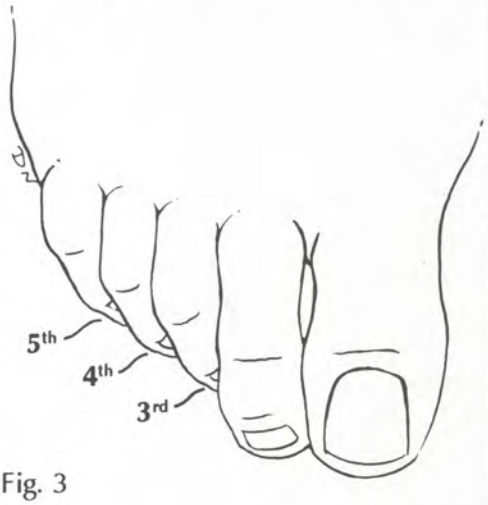

Fig. 3

joints are flexed. The adjacent toe often drifts over the affected toe. This deformity rarely causes any functional impairment, and treatment is usually sought to improve the appearance of the foot. During infancy, tape strapping to the adjacent toe is used to elevate the toe and stabilize it. Used nightly, these measures frequently correct or improve this deformity. More resistant cases that do not respond to taping and strapping almost always respond well to simple surgery. A flexor tendon release is performed through a small (3/8 inch to 1/3 inch) incision on the undersurface of the toe. Once the tendon is released, the toe can easily be held in a corrected posture by taping for 6 to 8 weeks. The position of the toes continues to improve and the function of the flexor tendons returns with time. Recurrence of the deformity is rare.

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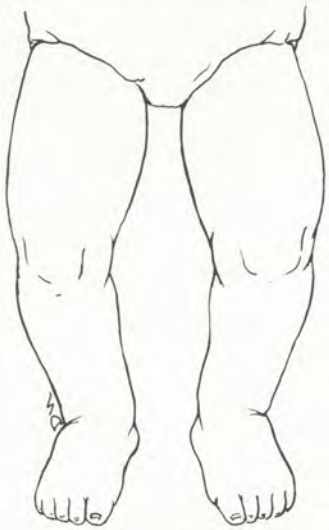

Leg Deformities in Children

Four major types of leg deformities in children can give the appearance of either "toeing-in" or bowlegs. Metatarsus adductus, internal tibial torsion, excessive femoral anteversion, and genu varum are rarely associated with a defect of the bones and joints of the legs. Rather, in the majority of cases, the deformed legs are considered variations of normal alignment. In most children, toeing-in and bowlegs are temporary conditions that tend to be outgrown.

Metatarsus Adductus

Metatarsus adductus is a condition in which the front part of the foot bends in relation to the back, causing a toeing-in effect (Fig. 1). The foot is usually flexible and improves spontaneously. If it is stiff, plaster casts or modified shoes may be helpful.

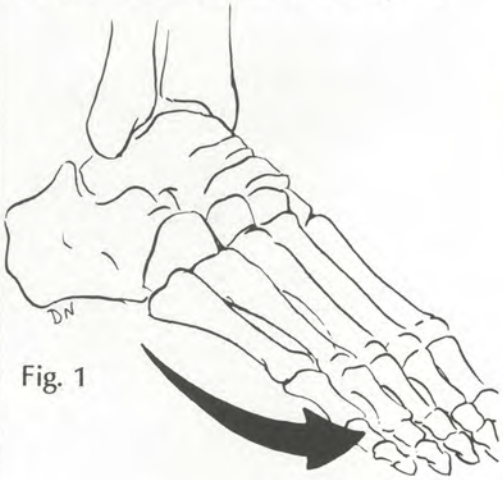

Fig. 1

Internal Tibial Torsion

This condition is an inward twist of the shin bone below the knee that creates a toeing-in effect (Fig. 2). In most children the leg tends to "unwind" during the first two years of life. Orthopaedic shoes, wedges or soles have little effect; although in a few cases, night braces may be used.

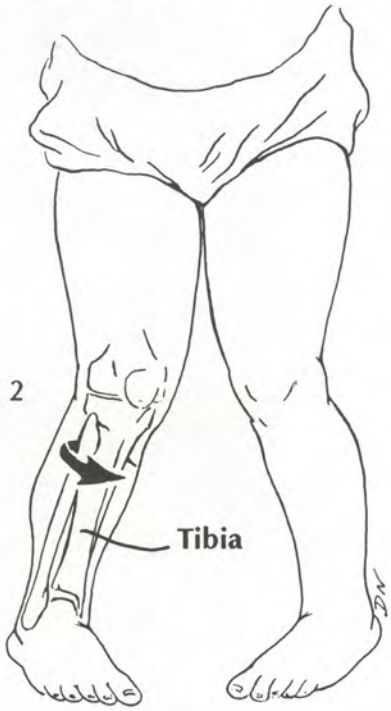

Fig. 2

Excessive Femoral Anteversion

Excessive femoral anteversion is an inward rotation of the thigh bone (Fig. 3). The condition is most obvious at 2 to 6 years of age, at which time the child seems to be toeing-in, but usually alignment improves with growth by age 10. Affected children appear clumsy and swing their legs to the side. Braces and straps are not used. In rare cases, corrective surgery is performed after age 10.

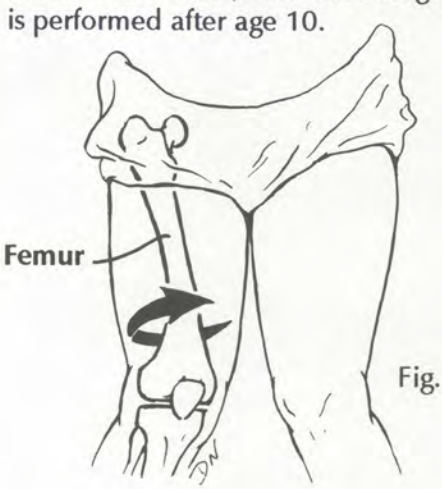

Fig. 3

Genu Varum (Bowlegs)

Bowlegs often occur as toddlers reach 18 to 24 months of age. The space between the knees then gradually disappears. An orthopaedist may look for other causes of this condition if bowlegs persist.

In the past, treatment of leg deformities has included shoe modifications, braces, and exercises. In most cases, however, these methods are only minimally effective and usually unnecessary. However, it is important for the physician and parents to monitor progress and to intervene if necessary.

Problems that cause toeing-in usually resolve with the child's growth. Even the occasional persistent case does not preclude normal activity. Operative correction is justified only in rare cases of persistent, severe deformity.

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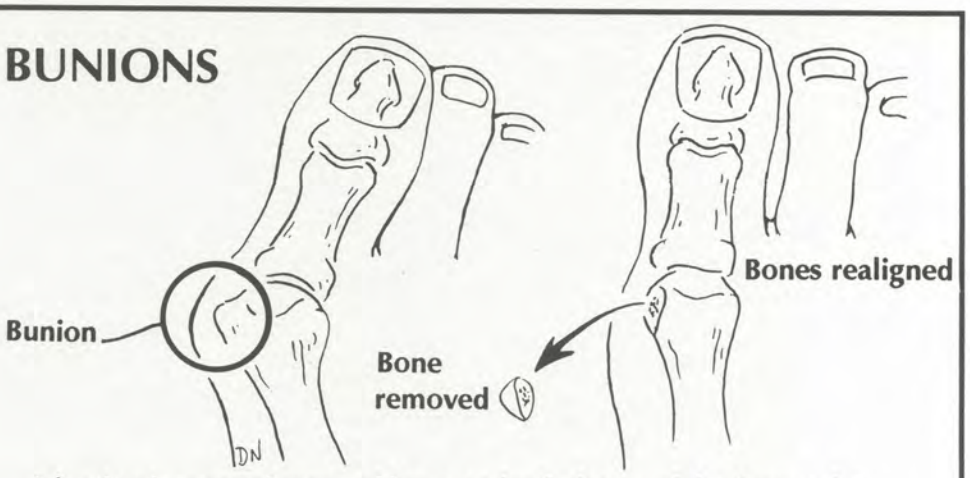
BUNIONS



A bunion is a prominence of bone and soft tissues of the foot at the base of the great, or big, toe. Often the great toe itself drifts toward the small toes, increasing the prominence of the bunion. This "drift" occurs when the bunion prominence stretches the ligament that usually holds the toe straight on the end of the foot.

Bunions are caused by a combination of structural abnormalities and environmental factors. A "splaying" of the forefoot bones creates a wide posture for the toes. Tight-fitting footwear can push the toes together, creating the angular postures that result in bone and bunion deformities.

Often bunions are painless and are seen only as cosmetic curiosities. Because medical intervention could create problems, painless bunions should be left alone. Symptomatic bunions usually cause pain and swelling over the bony prominence and are aggravated by tight footwear. Superficial bursitis over the bony prominence is the source of this pain. At times the deformity can be great enough to cause alterations in gait and secondary problems.

Specific treatment is limited to patients who have symptomatic bunions. All people with bunion deformities should select footwear with adequate toe and forefoot space. These shoes should allow complete freedom of the forefoot and toes to relieve pressure on bony prominences that become irritated and painful. Orthoses and night splints will not correct bunions, but they may help protect them from irritation.

Surgery may be needed to treat persistently painful and disabling bunions. The goals of the surgery should be not only to remove the painful deformity but also to realign the toe and forefoot to prevent recurrence of the painful problem. Resection of the bony prominence, along with realignment of the forefoot bones and tightening of the support ligaments of the great toe, will achieve this correction.

Healing after surgery is a long and somewhat uncomfortable process. Special shoes and splints are required to protect the foot during healing. Activities must be limited. The foot is the part of the body that is slowest to heal, and full recovery from bunion surgery can take several months.

Even after complete recovery from bunion surgery, comfortable shoes are a must. Environmental factors such as external pressures on the foot can cause bunions to recur. Tight shoes and high heels should be reserved for brief special occasions.

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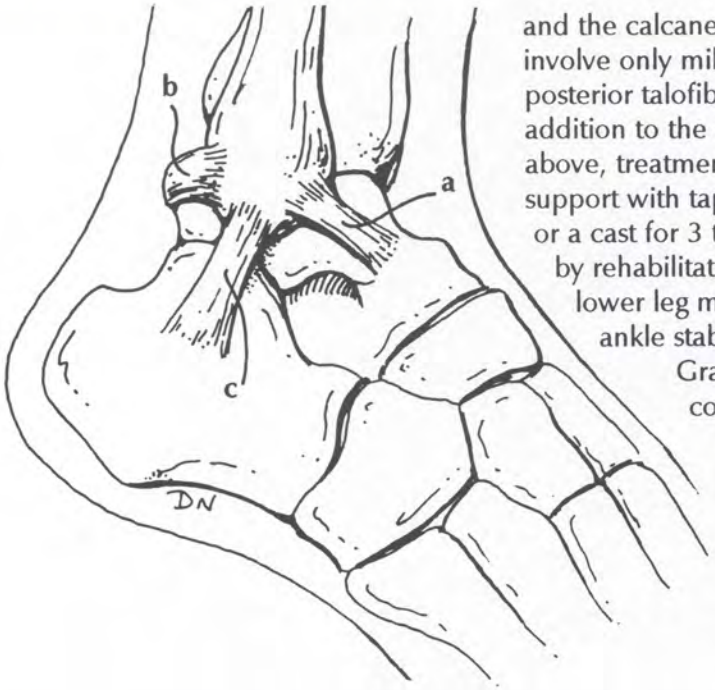
The Sprained Ankle

Sprained ankles occur frequently in all sports. Sprains may occur in any ligament in the ankle, but most sprains involve the lateral ligament complex--that is, the group of ligaments on the outside of the ankle. These ligaments are named for their location and the bones to which they are attached: a) the anterior talofibular ligament (front), b) the posterior talofibular ligament (back), and c) the calcaneofibular ligament (middle). (See illustration.) Sprains of the lateral ligament complex are produced by forced inversion and flexion movements of the ankle.

Ankle sprains are graded as 1, 2, or 3, depending on the extent of the injury. Grade 1 sprains are very mild, involving stretching of the ligaments or, perhaps, small partial tears, usually of the anterior talofibular ligament. Treatment consists of rest, the use of ice, compressive bandages, and elevation of the ankle, and early active use with the ankle bandaged, taped, or in a specialized splint.

Grade 2 sprains are complete tears of the anterior talofibular ligament and the calcaneofibular ligament but involve only mild stress to the posterior talofibular ligament. In addition to the measures mentioned above, treatment consists of providing support with tape, an inflatable splint, or a cast for 3 to 6 weeks, followed by rehabilitation of the ankle and lower leg muscles to improve ankle stability.



Grade 3 sprains involve complete rupture of all the ligaments of the lateral complex. Treatment of these serious sprains of the lateral ligaments is somewhat controversial. Because the injury results in gross instability, surgical repair may be necessary for some patients. Whatever treatment the physician chooses, complete restoration of muscle strength through physical therapy and rehabilitation is essential to avoid another sprain in the same ankle.

Residual weakness is common after any ankle sprain and can cause swelling and discomfort. Ankle stability can be improved over the long term by heelcord stretching and other exercises to strengthen leg and ankle muscles.

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Abdominal Exercise

The abdominal muscles (rectus abdominis) originate on the ribs and insert on the pubic bone. They are responsible for bending the spine forward and providing stability and support for the lower spine.

Many of us would eagerly trade a few pounds around our midsection for a nice, flat tummy. Unfortunately, we often waste time on exercises that are supposed to "flatten the tummy and trim waist and buttocks" but are actually targeting the wrong muscle groups.

Working the abdominals simply requires flexing the spine against resistance. A simple exercise that trains the abdominals is the "trunk curl." Lie on your back with your knees and hips flexed to 90%, resting your lower legs on a chair or bed. Pull the rib cage toward the pelvis by contracting the abdominal muscles. This eliminates any action of the hip flexor muscles, which are often used instead of the abdominals in popular exercise methods.

Barney Poole, P.T.
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Heat Precautions for Summer

The hot summer months put extra stress on an athlete exposed to high temperatures and high humidity. Exercising the muscles increases body temperature, which in turn triggers sweating. Sweat is mostly water with a little salt and is the body's primary method of regulating temperature. The evaporation of sweat is the body's cooling mechanism. If this heat-dissipating mechanism fails or if there is overwhelming heat stress, body temperature can rise to dangerous levels.

An average-sized athlete can lose one to two liters (approximately 1-2 quarts) of sweat per hour during intense exercise. Sweat losses equal to 2 to 3 per cent of body weight cause impairment in thermal regulation, cardiovascular performance, and athletic performance. For most forms of exercise, cold water is the best fluid replacement. Salt is not necessary. The salt obtained from an average, well-balanced diet is generally adequate. Added glucose, which is present in commercial preparations, tends to slow water absorption from the gut and may also inhibit optimal body-cooling mechanisms. Neither thirst nor one's sense of the heat is an adequate guide for fluid consumption. High humidity allows less sweat to evaporate and thus presents an added danger.

For safer summer exercise, the following general precautions are advised:

●Adapt to heat slowly. Plan exercise for early morning or late evening. Avoid exercise during the warmest part of the day and in direct sunlight--thermal convection from the sun heats up playing surfaces. Take a rest (out of the heat) if you become lightheaded, excessively tired, or begin to experience muscle cramping. Remember, acclimatization to heat is achieved with repetitive, gradually increasing exposures.

●Take advantage of shade when you must be outside.

●Wear loose, light-colored, natural fiber clothing.

●Change clothes when they become saturated with sweat and are unable to absorb further.

●Drink cold water frequently during activity; do not wait until you are thirsty. For optimum hydration, drink before, during, and after exercise. We

suggest that the athlete consume 1/2 to 1 quart of cold water both 2 hours prior and, again, 15 to 20 minutes prior to exercise. The athlete should continue to drink one cup of water every 10 to 15 minutes during moderate to heavy exercise.

●Make sure the elderly and children have access to fluids and to fans or air conditioning.

●It is important to remember that some oil-based sunscreens may block the body's ability to cool itself by sweat evaporation.

●*Caution: Some people have an increased risk of heat problems.* Those who are otherwise healthy but are poorly acclimated or conditioned, those who are obese, and those who have had a previous heat injury are at greater risk. In addition, patients with cardiac disease, cystic fibrosis, eating disorders, or uncontrolled hypertension or diabetes need close medical supervision. Heat intolerance is also increased by certain medications such as antihistamines, anti-cholinergics, beta-blockers, diuretics, anti-depressants, and thyroid preparations. Of course, anyone with fever, vomiting, or diarrhea should postpone activity and remain in an air-conditioned area until recovered.

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Heat Cramps

Many recreational, amateur, and professional athletes have experienced heat cramps at one time or another during the course of an athletic pursuit. Heat cramps belong to a spectrum of interrelated heat illnesses, the most severe of which is heat stroke.

What are heat cramps?

Heat cramps are a muscular tightening and spasm occurring during or after prolonged exercise in the heat. Exquisitely painful, they usually occur in the larger muscles of the calf and thigh, although the abdominal or stomach muscles can be affected as well.

Why do they occur?

Many things contribute to heat cramps. One is working out or performing in a hot environment without having had adequate time (10-14 days) to acclimatize or adjust to the warmer temperature or higher humidity. Another risk factor is the

loss of a great amount of salt (sodium) through sweating during preceding workouts. Persons who have high blood pressure and who take diuretics (water pills) should be wary of exertion in a hot environment. Diuretics cause loss of sodium and potassium. When this loss is coupled with the additional sodium loss that occurs with heavy sweating during exercise, an individual is susceptible to heat cramps. This is particularly true in the first few weeks of diuretic therapy.

Are heat cramps serious?

Heat cramps should be recognized as a warning sign for potentially much more dangerous heat illnesses such as heat exhaustion and heat stroke, especially if the humidity and temperature are high. Heat exhaustion is marked by high body temperature (usually below 103°), profound fatigue, weakness, and headache. Heat stroke, the most severe heat illness, involves highly elevated temperature (over 103°), dangerous metabolic alterations, loss of consciousness, and possibly death if not treated promptly. Thus, it is important to heed the warning sign of heat cramps.

Once a heat cramp begins, the pain usually prevents further athletic activity. The recreational athlete should stop his or her activity with the onset of the cramp. Professional and college athletes, who have immediate access to medical care, may continue under close supervision.

How are heat cramps treated?

Treatment of heat cramps is straightforward and simple. First, the individual should cease athletic activity and rest in a cooler environment. The affected muscles can then be massaged to relieve the pain. It is helpful to drink a low concentration salt solution made by adding one teaspoon of table salt to one quart of water. Various commercial fluid replacement drinks (Gatorade, Exceed) will also replace lost sodium and can even be diluted with water in a 50/50 mixture. If cramps persist despite these measures, the individual should consult a physician.

Prevention of heat cramps

Avoiding extremely hot and humid environments during exercise and drinking generous amounts of water before, during, and after exercise will prevent most heat cramps.

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Fluid Loss and Replacement

Water is an essential ingredient for life. Sixty percent of our body weight is made up of water. Our bodies are not, of course, reservoirs full of sloshing water, but all of the cells that make up our muscles, tissues, bones, vessels, and even blood are composed chiefly of water. Water gives us our form and is the medium by which nutrients are transported; without water our bodies would be like a river run dry--we would be unable to ferry goods downriver, or fish for sustenance.

The body depends on a daily fluid intake that is balanced against the amount lost from sweating, perspiration, waste elimination, and exhalation of moist air. Normally, we consume about 2.5 quarts or roughly 10 cups of water a day to replace fluid losses. Not all of that is in the form of water or other beverages we drink; some of it is contained in foods we eat. During exercise in hot weather, we sweat more and breathe faster to cool our bodies down. Our metabolism increases under such conditions. All of these factors contribute to water loss. To maintain our fluid balance we must consume more fluid than usual.

A simple way to gauge fluid loss is to weigh before and after exercise or practice, or at the beginning and end of the day. For each pound lost, 2 cups of fluid should be consumed to replace the lost water. For athletes in competitive endurance events, water intake becomes even more important and added attention should be given to drinking 3 to 6 ounces of cool fluids at refrigerator temperature (41°F), every 10 to 15 minutes. The cooler temperatures allow faster gastric (stomach) emptying, which in turn gets the fluid into the bloodstream faster. Because the thirst mechanism is not a good indicator of the need to replace fluids, it is necessary to drink as much as is tolerable, preferably through regular and timely consumption.

Water is the most important fluid that an athlete can consume. Despite this fact, "sports drinks" with various ingredients are ever more popular and have been successfully marketed as capable of improving athletic performance. Regardless of the hype and cost, remember that 97% or more of any of those drinks is water. Research does show some value in consuming drinks with a small amount of glucose (2.5%) and traces

of electrolytes that help replace losses and provide another source of energy. These drinks may be particularly helpful for long endurance events such as marathons in which most of the body's available glucose is consumed after 90 minutes of exercise. The bottom line is - - monitor and replace fluid loss as you exercise.

Kenneth M. Bielak, M.D.
Columbus, Georgia

NUTRITION

Carbohydrate Loading

Much of the energy used by the body during intense exercise comes from glycogen. Carbohydrates consumed in the diet are converted into stores of glycogen in the muscles. When energy is needed, the glycogen converts into a fuel called glucose.

During low-intensity exercise or during the normal activities of daily living, the body depends on about equal stores of fat and carbohydrates (glycogen). However, energy-intense activities are fueled more heavily by glycogen. During high-intensity endurance exercise such as long-distance running, glycogen can become the body's only source of energy. Physical activities requiring glycogen can be sustained only as long as the muscle stores hold out; when glycogen is gone, fatigue occurs.

Carbohydrate loading can increase the supply of glycogen available to the muscles, thereby increasing endurance during periods of exercise. A diet high in carbohydrates will markedly increase the amount of glycogen stored in muscles that are regularly exercised. Carbohydrate loading is recommended only for athletes who participate in endurance events that last more than one hour, and some experts believe that in highly trained athletes it may not be needed.

Dietary changes should be initiated one week before the event. During the first half of the week, the athlete continues high intensity training and eats a diet low in carbohydrates. During the three days before the event, training should be decreased to mild exercise while beginning high carbohydrate consumption. Another point to remember when considering increasing glycogen storage is that each gram of glycogen is stored with about 2.7 grams of water. Fluid retention is a side effect.

Meals for the carbohydrate loader should include 70% of total calories from carbohydrates. (An athlete's usual diet provides 50% of calories from carbohydrates.) Complex carbohydrates such as whole-grain breads, cereals, and pasta should provide much of the athlete's nutrition. Starchy vegetables such as corn, peas, and beans are also significant carbohydrate choices. Sugar-containing beverages and sugar added to foods should be limited. Care should be taken also to limit additions of fat sources such as oils, margarines, and salad dressings because they can lower the percentage of carbohydrate in the diet.

Diets high in carbohydrates tend to be low in iron, zinc, and vitamin B12, since these nutrients are found primarily in high protein food sources. Because these nutrients are stored by the body, and because glycogen loading is done only for a short period, low intake of these nutrients is of limited concern. The athlete should attempt, however, to consume a variety of foods before, during, and after an event to ensure adequate stores of these and other nutrients. A balanced nutritional intake is important for training and is almost always adequate for peak performance during an event, as well as for long-term good health.

Jessie Wright, M.S., R.D., L.D.
Columbus, Georgia

High Carbohydrate Diet for a 125 Pound Male

Breakfast
1 cup oatmeal
2 tbsp. raisins
1 cup skim milk
1 grapefruit
water or unsweetened beverage

Midmorning Snack
10-12 plain cookies
1/2 cup white grape juice

Lunch
2 slices bread
2 oz. sliced turkey
1 tsp. salad dressing
1 cup sliced tomato on lettuce
2 tbsp. fat-free salad dressing
1/2 cup low-fat yogurt
water or unsweetened beverage

Midafternoon Snack
3 cups popcorn
1/2 cup apple juice

Dinner
2 cups pasta
1 cup spaghetti sauce
1-2 cups tossed vegetable salad
2 tbsp. fat-free dressing
1 slice whole grain bread
1 peach
water or unsweetened beverage

Snack
1 cup unsweetened dry cereal
1 cup skim milk
1 banana
Total calories = 2200

RESEARCH

Hylan Gel

Hylan Gel, a highly viscous (thick) gel-fluid developed by Biomatrix, Inc. of Ridgefield, NJ, is currently being evaluated at the Hughston Sports Medicine Foundation for its effectiveness in the treatment of osteoarthritis. The results of investigations conducted here and at several centers across the nation will be used to assist the FDA in deciding if the benefits of the substance warrant its approval for unrestricted use.

Called viscosupplementation by its developers, treatment using Hylan Gel has been a common form of therapy in veterinary medicine since the early 1970s. Injection of the gel has been found to relieve joint pain in race horses with traumatic osteoarthritis. Development of the treatment in humans has followed closely behind, and initial testing in Europe has shown that patients treated with Hylan Gel show a significant decrease in pain and increase in mobility. There have been no side effects from the substance itself in these studies.

The treatment involves injecting a small amount of Hylan Gel into the joint space of the affected knee. The gel then acts mechanically by "cushioning" the joint and chemically by changing the properties of the synovial fluid in the joint. The duration of the therapeutic effect varies, but many patients have experienced relief for 18 to 26 weeks after a series of three injections.

David Curd, M.S.
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Postmaster: Send address changes to Medical Writing, Hughston Sports Medicine Foundation, Inc., P.O. Box 9517, 6262 Hamilton Road, Columbus GA 31995-3199 USA. Telephone (404) 576-3322.

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HSMF CALENDAR

Hughston Sports Medicine Foundation
Chattahoochee Valley Arthritis Club
First Thursday of every month
(Aug. 1, Sept. 5, Oct. 3),
7:00 p.m. to 9:00 p.m.
Contact: Vivian (404) 628-5915

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