Hughston Health Alert

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

VOLUME 10, NUMBER 1 | *For a Healthier Lifestyle* | WINTER, 1998

FOR A HEALTHIER LIFESTYLE

Reflections from Dr. Hughston

A decade has passed since the first issue of the *Hughston Health Alert was published.* Over these 10 years, this superb publication has served to further the goals I envisioned for the Hughston Sports Medicine Foundation: to create an environment where like-minded people with a set of common beliefs about patient care and institutional and personal honesty and integrity could come together in an atmosphere of teaching and learning. Using sports medicine as the model, our goal was to develop the treatments and procedures that would provide every patient with the best orthopaedic care possible.

The *Hughston Health Alert,* with a quarterly distribution of more than 26,000 copies, provides information to patients and health care professionals about all aspects of musculoskeletal injury and disease. The continued positive comments I receive on its value to both patients and professionals are most gratifying.

While the vision of the Foundation is unchanged, the environment has changed considerably. Today the Foundation is at the center of an integrated musculoskeletal care delivery system, which is further supported by the Hughston Sports Medicine Center. The Hughston Sports Medicine Hospital, Rehabilitation Services of Columbus, and a full range of diagnostic and ancillary services also serve our patients. A statewide orthopaedic network currently under development in Georgia will provide even more resources in the future.

This 10th-anniversary issue of the *Hughston Health Alert* allows me the opportunity to reaffirm our goals for all the publications of the Foundation: research, education, training, and communication with both patients and health care professionals. We are proud to have the *Hughston Health Alert* as the cornerstone of our patient education efforts as we enter the 21st century.

Jack C. Hughston

A Letter from the Foundation CEO

Upon joining The Hughston Clinic, P.C. in July 1996, I didn't truly appreciate the overall scope and magnitude of the Hughston Corporation. Along with the corporation's many significant contributions to the treatment of musculoskeletal injuries and disease, I have also come to appreciate the tremendous value this organization offers in research, education, training, and publication of technical information and scientific articles.

Our significant growth and expansion of services secures our future in the health care industry. The Management Services Organization continues to grow and mature with a qualified administrative staff working hard to develop an "Integrated Service Delivery Model" centered around The Hughston Sports Medicine Foundation. This model will be supported by a statewide Hughston Orthopaedic Network. This patient care begins with wellness and fitness and spans the spectrum of diagnostic, inpatient and outpatient surgical, and clinical and rehabilitation services. It also benefits from the contributions of our Workers' Compensation Managed Care Organization and the evolving Occupational Medicine Services Division.

Our journey into the 21st century will, no doubt, be exciting. The Hughston Clinic, P.C., is currently a 43-physician group, specializing in multidisciplinary orthopaedic and sports medicine care. The clinics staffed by these physicians comprise a "Center of Excellence," providing treatment from 20 separate regional clinic locations throughout 4 states (Georgia, Alabama, South Carolina, and Colorado). Our goal is to make the Hughston Corporation one of the finest healthcare organizations in the industry. Quality patient care continues to be the cornerstone of our profession and of The Hughston Clinic, P.C.

James E. Crissey

Hughston Health Alert

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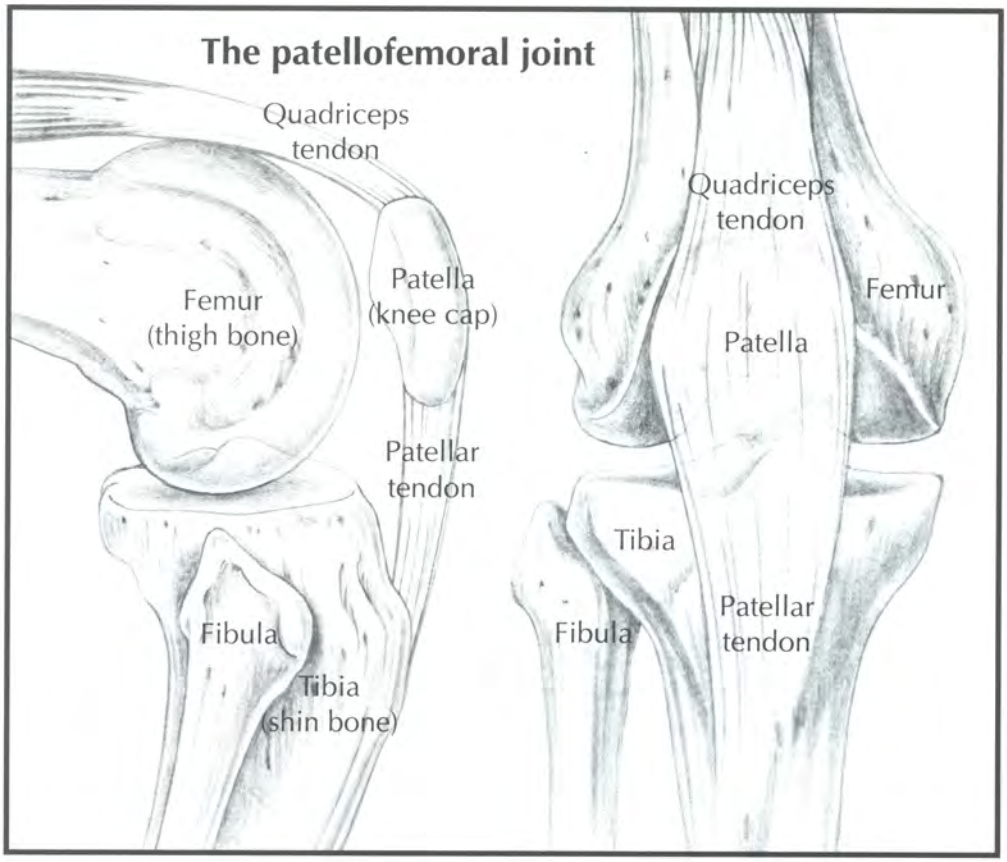
Knee Extensor Mechanism Problems

Are You Weak in the Knees?

The knee extensor mechanism allows you to ride a bicycle, kick a football, and run a marathon. It is a complex interaction of muscles, ligaments, and tendons that stabilizes the patellofemoral joint, which is made up of the patella (knee cap) and the end of the femur (thigh bone). This joint must be mobile enough to allow the patella to glide smoothly across the groove in the femur, yet must constrain the patella enough so it does not slide from side to side while maintaining normal tension in the front of the knee. This tension is needed to prevent your knee from giving way when the forward motion of your body decelerates (slows down or stops). Extensor mechanism problems are one of the most common ailments orthopaedists see and may be among the most difficult to diagnose and treat. They are often labeled anterior knee pain or patellar compression syndrome, which are catch-all terms—not a true diagnosis. Your doctor must find the true diagnosis, and he or she may have to examine your knee more than once to figure out the cause of your extensor mechanism pain and disability. In the meantime, a proper routine of rehabilitative exercises for the knee may relieve the pain.



Anatomy

The quadriceps, or front thigh, muscles (rectus femoris, vastus medialis—including the vastus medialis obliquus—vastus intermedius, and vastus lateralis)(see Fig. 1, page 2) insert into the patella and the extensor retinaculum. These

Inside This Issue:

- Rehabilitation for the Extensor Mechanism
- Cold Injuries: Hypothermia and Frostbite
- Concussions in Sports
- Events of the Winter Olympics

muscles act together to extend (straighten) the knee and to control the side-to-side movement of the patella. Cartilage on the undersurface of the patella is the thickest of any found in the body. This thick joint cartilage acts as a cushion, absorbing shock in the greatest weightbearing joint in the body during the process of deceleration.

The entire knee joint is covered by a thick, fibrous tissue—the capsule. This capsule contains a lining (the synovium) that produces fluid to lubricate the joint and reduce friction and wear. The outer layers of the capsule comprise the extensor retinaculum, which is formed by tendon-like sheets that continue from the quadriceps muscle to the tibia (shin bone) on either side of the patella. This fibrous tissue contains thick, tough bands of tissue or rope-like structures, known as ligaments, that further stabilize the patella and help prevent abnormal movement. The muscles and ligaments must work together in a balanced fashion to maintain normal patellar motion as the knee flexes and extends. If the muscle forces are unbalanced or there is a tear of a ligament or the retinaculum, the patella can become dislocated or slip and move abnormally. The patellar tendon is an extension of the extensor mechanism and connects the patella to the upper end of the tibia. A fat pad located behind the patellar tendon helps reduce friction between the patellar tendon and the tibia.

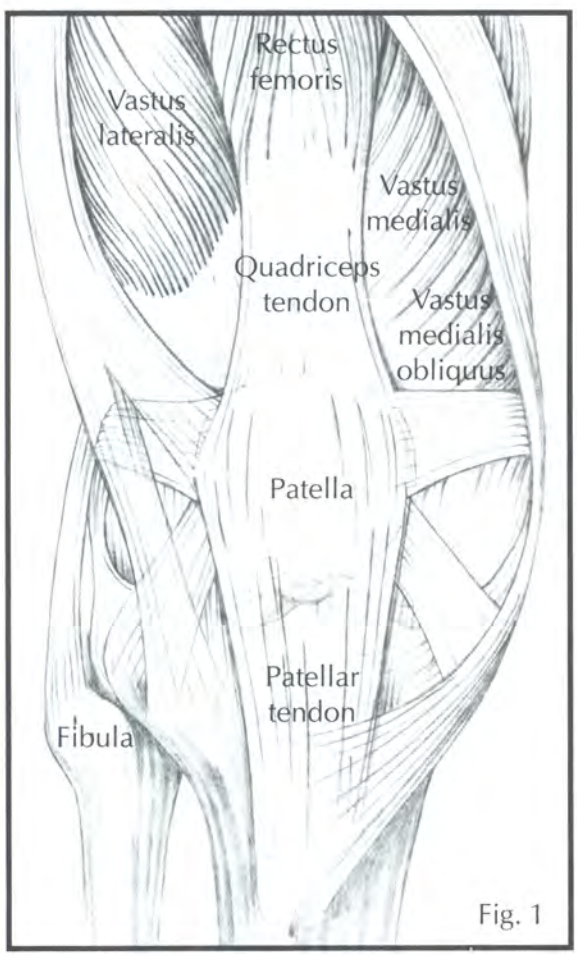


Fig. 1

Problems

Extensor mechanism problems can cause pain in the front of your knee. You may hear a snapping sound while walking, or you may feel like your knee is giving way. Repetitive activities, such as cycling, swimming, and running, may cause discomfort. You may also experience pain when descending stairs or when seated for long periods of time (for example, at the movie theater), and you may develop a buildup of fluid in your knee. These symptoms are often the result of plica irritation, fat pad impingement, patellar tendinitis, or patellar instability.

Irritation of the plica

The plica is a fold of the synovium. This tissue can become irritated when an increased force is placed on it by tight hamstring muscles behind the knee. Weak hip abductor muscles can also lead to irritation of this plica. In these situations, the plica rubs on the end of the femur, irritating it and causing pain, popping, snapping, or just aching when you are at rest.

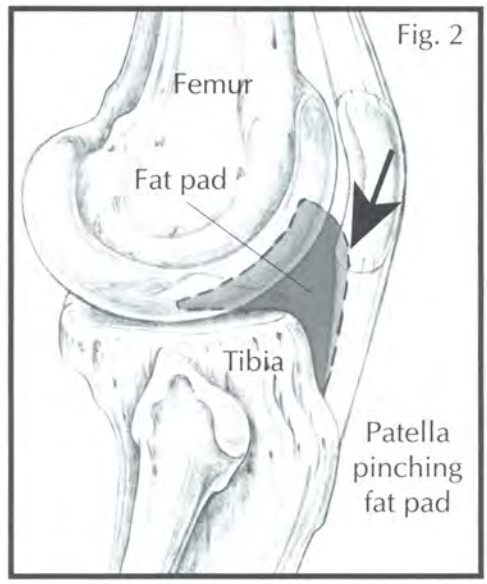


Fig. 2

Fat pad impingement

This condition occurs when the bottom of the patella pinches, or impinges on, the fat pad on top of the tibia (Fig. 2). If the fat pad is swollen due to irritation or injury, it becomes more susceptible to this condition. Patients who overextend their knee also predispose themselves to this situation. When the impingement occurs, the fat pad becomes irritated and then painful, and scar tissue can form. People with fad pad impingement typically walk with the knee extended; this produces the limp and the stiff-legged gait. Pain is felt in the area beneath the patellar tendon, and the normally soft fat pad may become larger, firmer, and irritated.

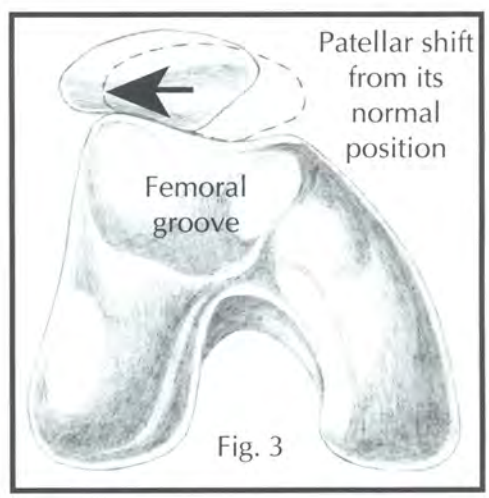


Fig. 3

Patellar tendinitis

This condition is seen in people whose activities, such as basketball, volleyball, and running, cause repetitive stress on the patellar tendon. The fibers of the tendon that insert into the lower portion of the patella become irritated. In severe cases, actual tearing of these fibers can occur. Once the patellar tendon is irritated, fluid may accumulate in the area under the patella. This area becomes very tender and painful, especially while you are walking or running.

Patellar instability

Rotating your knee while your foot is planted firmly can cause the patella to shift from its normal position in the femoral groove (Fig. 3). Sports, such as tennis or baseball, in which rapid changes of direction are required make the knee more susceptible to patellar dislocation or subluxation (partial or temporary dislocation). Differences in knee anatomy also play a role. For example, people who walk with any external (outward) rotation of the tibia or internal (inward) rotation of the femur may be predisposed to patellar instability. The angle between the femur and tibia can also predispose one to an abnormal position of the patella. Individuals who are severely knock-kneed are more likely to experience movement of the patella out of the femoral groove. When the muscles and ligaments of the patella are not strong enough, the knee cap can move out of its normal position and pop to the side of the knee. The knee then commonly gives way, causing the person to fall. The patellar dislocation is generally a traumatic event that is easily diagnosed, but a subluxation is often misdiagnosed or is not even recognized. With patellar subluxation, people often feel that their patella is slipping in and out of place, or simply that the knee is not stable beneath them.

Enough is enough

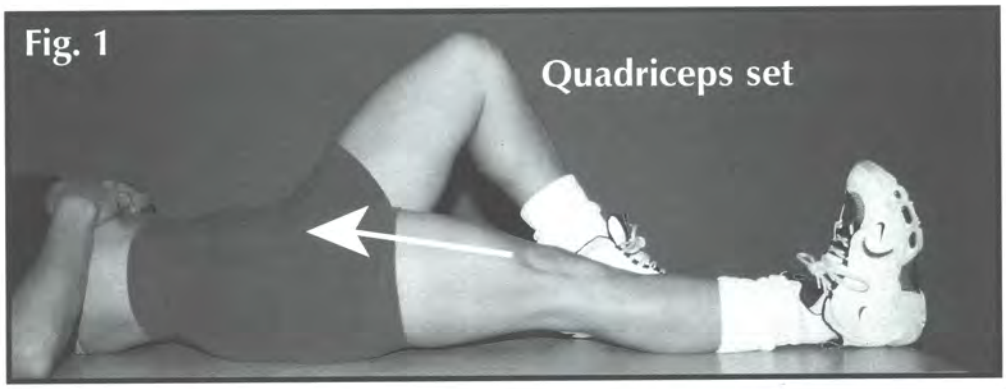
Don't let a knee extensor mechanism problem get the best of you. If you are troubled by any knee pain, especially if you have had an injury, make an appointment to see your doctor. Once the injury has been diagnosed, the proper treatment can be started, allowing you to return to your normal activities as soon as possible.

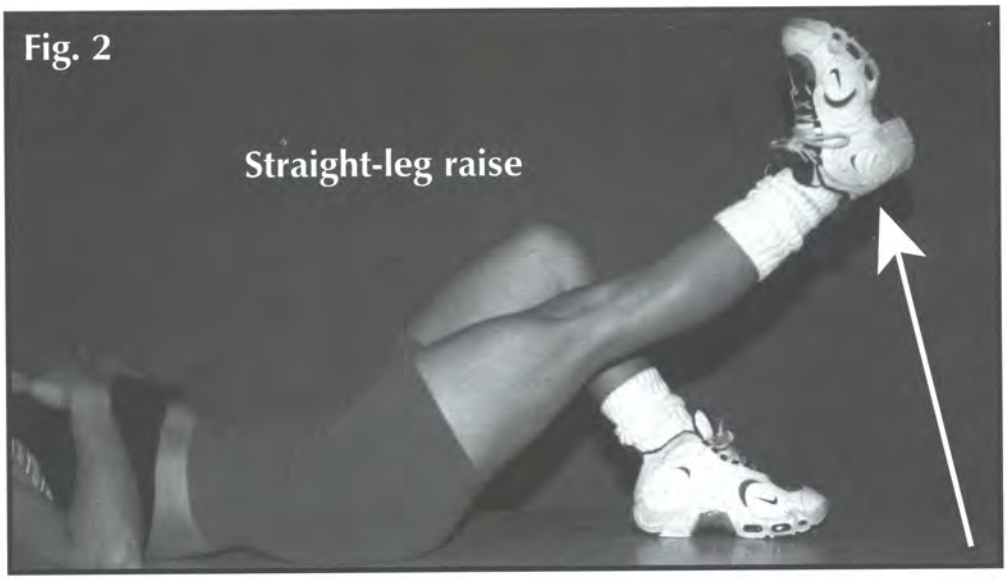
Robert J. McAlindon, M.D.
Auburn, Alabama

Rehabilitation for the Extensor Mechanism

Recovery from an extensor mechanism problem requires a disciplined rehabilitation program. Proper exercise selection and correct exercise technique can relieve knee pain and prevent further problems. Once the problem is diagnosed, a physical therapist will select an exercise program and teach you how to perform these exercises at home.

The main goal of rehabilitation is to strengthen the extensor mechanism, especially the vastus medialis obliquus (VMO) muscle that helps stabilize your patella (knee cap). If the VMO is not strong enough, it gets overpowered by the much larger vastus lateralis muscle. Initial exercises include quadriceps sets and straight-leg raises (Fig. 1,2). For some (but not all) extensor mechanism problems, a patient may gradually progress to mini





squats and side step-ups (Fig. 3,4). Knee extension machines must be avoided because they increase compressive loading on the patellofemoral joint, causing damage to the extensor mechanism.

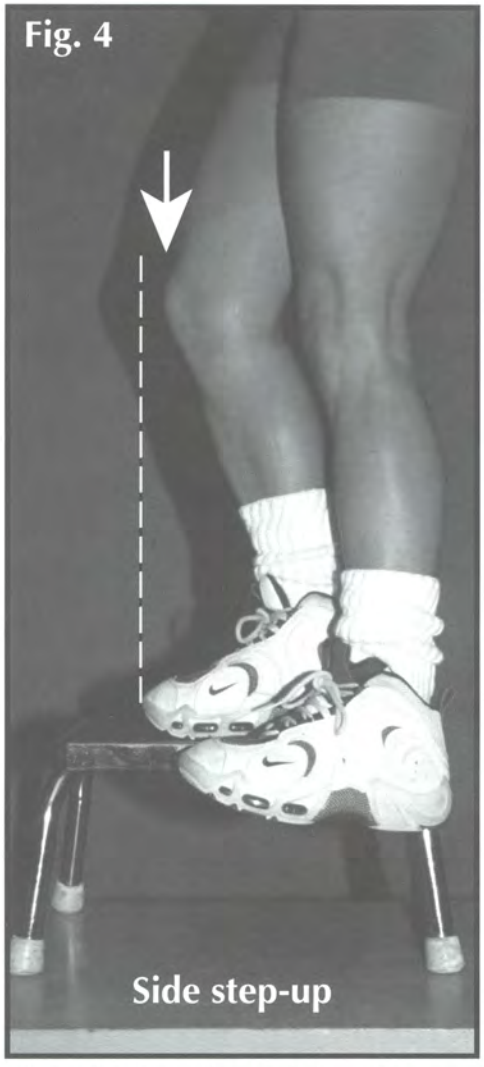
It is also important to know that what is happening at the front of the knee (the extensor mechanism) is affected by what is happening above the knee at the hip joint, behind the knee, and below the knee at the foot. The hip muscles, especially the hip abductors, stabilize the pelvis when you walk. If these muscles are weak, then increased stress is placed on your knee. Performing hip abductor strengthening exercises can prevent this from occurring (Fig. 5).

The bottom of your foot is supported by many muscles. Weakness of certain foot muscles, such as the posterior tibialis, can affect the way you walk, placing stress on your knee. Strengthening exercises for the posterior tibialis can improve the way you walk and take stress off your knee (Fig. 6).

The hamstring and calf muscles cross the back of your knee. If they are tight, the extensor mechanism must work harder to straighten the knee. This can cause tightness in your knee while walking or running. Or you may experience aching while you are sitting or resting after these activities. Hamstring and calf-stretching exercises are very important and will help with this problem (Fig. 7).

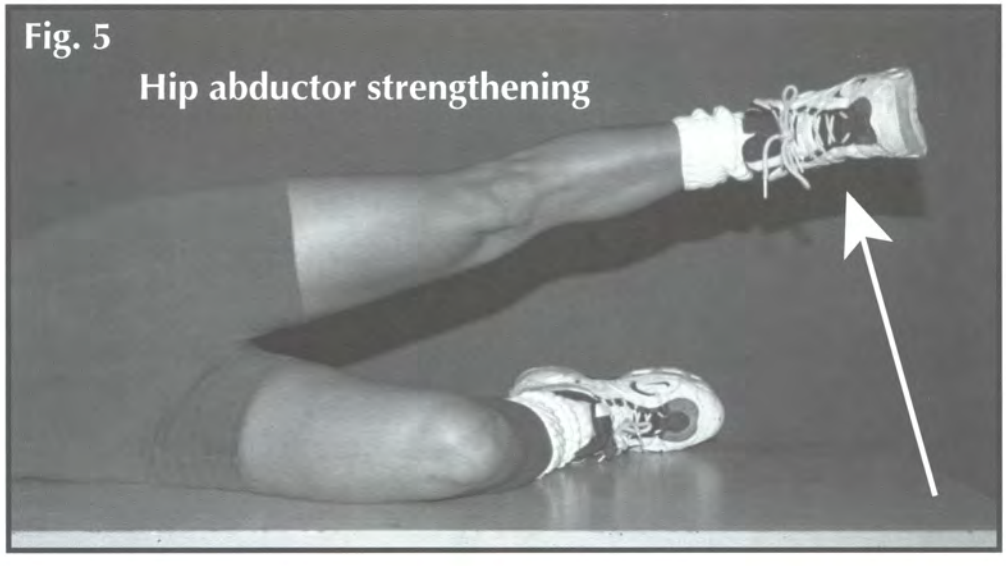
Strengthening exercises should be performed in three to eight sets of ten, three times per day (certain restrictions may apply depending upon your age and activity level). Low resistance (lifting only the weight of your leg and progressing to no more than a few pounds) and high repetitions (multiple sets of ten) are recommended. Stretching exercises should be performed in sets of five, three times per day, holding each

When squatting, keep your knees behind your toes.



Place the foot of your injured leg on the stool. Bend knee slightly so that your toes remain in front of your knee while doing this exercise.

Lie on your side, pointing your hip toward the ceiling.



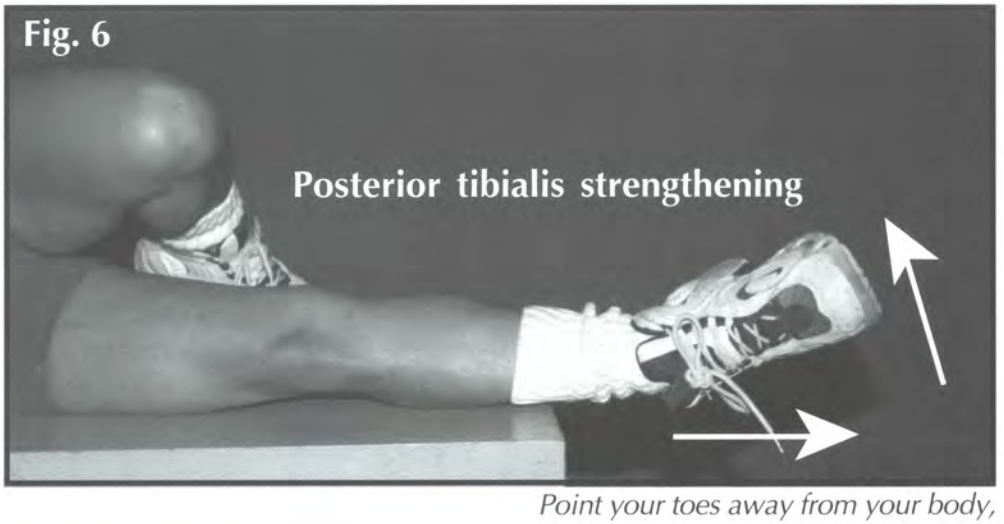
stretch for 30 seconds.

All exercises must be pain free. The expression "NO PAIN, NO GAIN" does not apply to rehabilitation of the extensor mechanism. If you do have pain, you should first make sure you are using the correct technique. If you feel that your technique is not the problem, or if you are not sure that your technique is correct, you should consult with your physical therapist.

Swelling of the knee should be monitored and controlled with rest, ice, compression, and elevation. Fluid buildup in the knee can prevent the quadriceps muscle (especially the VMO) from working properly. In addition, you must be diligent with your rehabilitation exercises. If you are not, your knee may continue to swell and be painful, and your extensor mechanism will remain irritated.

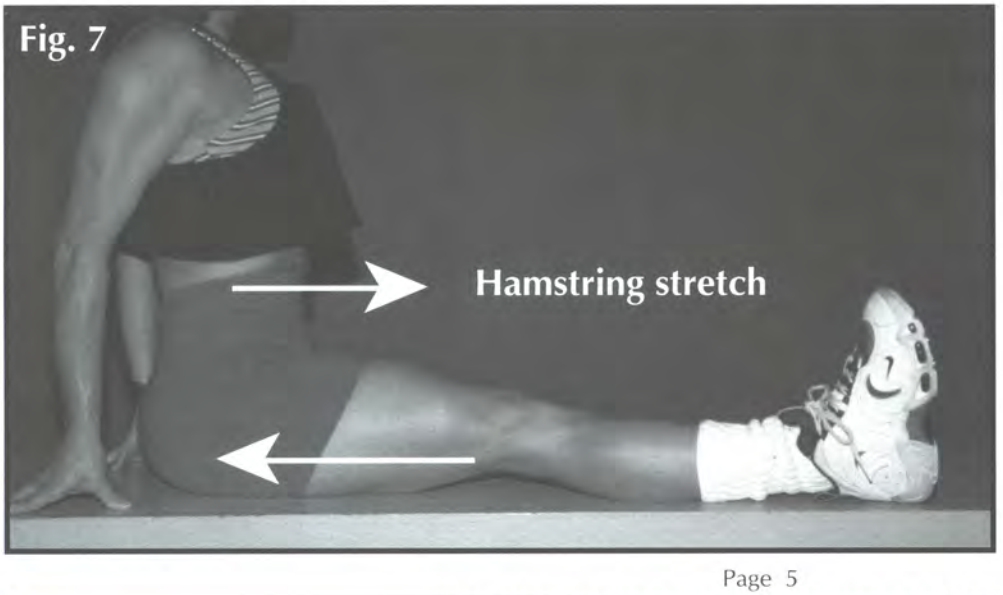
It takes a lot of effort and patience to comply with a disciplined extensor mechanism rehabilitation program, but the end result is well worth it!

Teri L. Mingee, M.S., P.T.
Columbus, Georgia



Point your toes away from your body, and turn your foot inward so that your big toe is pointing up.

Keep your back straight while stretching your hamstring.



Concussions in Sports

When you think of sports that produce head injuries, you may immediately think of football, hockey, or boxing. To a certain extent, you are right! In fact, more than 250,000 head injuries occur in football alone each year. But head injuries can and do occur in sports, such as gymnastics, cycling, and even swimming, that are not considered contact sports. Although major head injuries (skull fracture or blood clot) get the most attention, minor head injuries should not be easily dismissed. It is important that we recognize the severity of these injuries and provide the proper treatment.

Determining the severity of head injuries

There are several grading systems used to classify a head injury. The most frequently used system is the Colorado Medical Society's Guidelines of the Management of Concussion in Sports. It provides the examiner with a way to evaluate the athlete's head injury and to determine when the athlete can safely return to competition.

Grade I

A Grade I concussion, or mild bruising of brain tissue, is the most common form of head injury. Unfortunately, it is also the most difficult to recognize. It is commonly known as "having your bell rung." Although there is no loss of consciousness, the athlete may briefly appear or act confused; however, he or she is able to remember all events following the impact.

The athlete should be removed from competition for at least 20 minutes and examined every 5 minutes to rule out the development of postconcussive symptoms. Symptoms include headache and dizziness and impaired orientation

(knowing where you are, who you are, and what day it is), concentration, and memory.

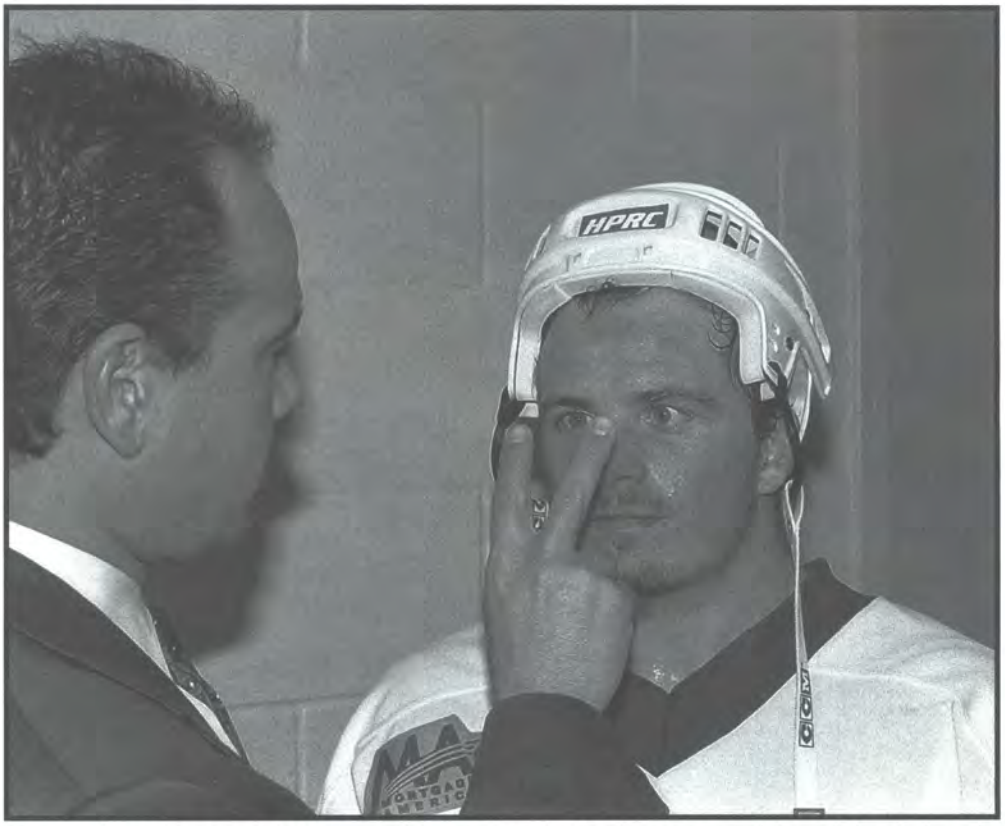
Athletes with a Grade I concussion cannot return to competition until they show no symptoms of this injury while undergoing examinations, both at rest and with exertion. After returning to competition, athletes are watched carefully because they are susceptible to a second head injury. If a second head injury does occur, the athlete is removed from competition for the day.

An MRI or CT scan is recommended for any athlete who continues to complain of a headache or other symptoms that persist for a week after the initial injury. If a player sustains three Grade I concussions in a season, it is recommended that the player be removed from competition for the season and not be allowed to return to contact sports for at least 3 months. The athlete may only then return after showing no symptoms during exertional testing.

Grade II

The difference between a Grade II and a Grade I concussion is the presence of post-traumatic amnesia (loss of memory after the injury). After sustaining a Grade II concussion, an athlete does not remember events following the impact and may not be able to recall events that led up to the injury.

Athletes are removed from competition for the day after suffering a Grade II concussion. A complete neurologic (nervous system) examination of the athlete is performed immediately. If there are no neurologic symptoms, the athlete may be sent home provided that friends or family members are able to frequently check on the athlete over the next 24 hours. Otherwise, the athlete may be required to stay in a hospital for a 24-hour observation period.



Team physician examining an athlete to evaluate the extent of the athlete's head injury and to determine if the athlete is able to return to action.

The injured athlete is re-evaluated the following day and again in one week by a physician. If there are no symptoms after one week and no symptoms during testing (both at rest and with exertion), the athlete may return to practice or competition. If an athlete suffers a second Grade II concussion, he or she is removed from competition for a period of one month. An injured athlete may return to play only after exertional testing reveals no symptoms. If a third Grade II concussion occurs, the athlete is removed from competition for the season.

Grade III

Unlike a Grade I head injury, Grade III head injuries are easily recognized and apply to any athlete who loses consciousness for any period of time.

These athletes are examined on the field of play for neck injuries, and they are properly immobilized and taken to a hospital by an ambulance. Neurologic evaluation is done immediately. The athlete is kept in the hospital if any neurologic symptoms persist. If the neurologic exam is negative and the athlete's mental status is normal, the player can go home provided that he or she is not alone. Again, frequent checks must take place over the next 24 hours by friends or family members.

An athlete with a Grade III concussion may return to practice only after being symptom free for a period of two weeks. Before returning to action, the player must again be evaluated at rest and with exertion. If symptoms return, the athlete is removed from play for the season. If an athlete sustains two Grade III concussions or if an MRI or CT scan shows an abnormality, his or her playing season is ended, and a return to any contact sport in the future is discouraged.

P. Dean Cummings, M.D.
Columbus, Georgia

Cold Injuries

Hypothermia and Frostbite

Cold injuries are usually due to prolonged exposure to cold temperatures, although they can occur with brief exposure to extremely cold conditions. They occur because our body's ability to generate heat and to limit heat loss is quite limited. For heat regulation, our body uses its core (internal organs such as the brain and heart) and its shell (skin, muscles, and limbs). Cold injury to our body's core is called hypothermia, and cold injury to our body's shell is called frostbite. Hypothermia and frostbite commonly occur together, but they can occur separately.

What is hypothermia?

Hypothermia is a decrease in core body temperature from exposure to a cold environment. Surprisingly, hypothermia can even occur at mild temperatures if exposure is prolonged. Our body's natural defenses against the cold are quite limited. Initially, the blood vessels in our skin constrict to reduce heat loss and to keep blood flowing to the vital organs. Shivering (involuntary muscle contraction) and the increased release of hormones result in increased heat production. However, blood vessel constriction and hormone release are usually inadequate to maintain our body's temperature in cold environments. Individuals who drink alcohol, as well as those who suffer from fatigue, spinal cord injuries, or poor nutrition, are at greater risk for hypothermia.

Treatment of hypothermia

To help someone with hypothermia, contact the emergency medical system immediately. Remove all cold, wet clothing and replace it with warm, dry clothing to prevent further heat loss. If the person is not breathing or has no pulse, begin cardiopulmonary resuscitation (CPR), and do not stop until emergency medical personnel arrive. If the patient is not alert or is unconscious, take care to immobilize the neck when moving the patient: moving a patient with a fractured neck can result in permanent nerve damage or paralysis.

Avoid rapid rewarming with hot water or massaging cold extremities. If done improperly, it could lead to serious tissue damage. Therefore, a trained person should handle the rewarming process. In addition, do not give alcohol or nicotine products to someone suffering from hypothermia.

What is frostbite?

Frostbite is a localized cold injury to a body part that may occur with or without hypothermia. Frostbite commonly affects specific body parts, such as the feet and toes or the hands and fingers. In some instances, tissue damage is so extensive it may require amputation.

Cold injury to our body's core is called hypothermia, and cold injury to our body's shell is called frostbite.

When human tissue is exposed to near-freezing temperatures, the tissue temperature decreases. As the tissue temperature decreases, it goes through four phases of frostbite. In the first phase, the blood vessels constrict, causing inadequate blood flow and oxygen delivery to the tissues. In the second phase, the tissue temperature drops below 24.8°F, and ice crystals form in the tissues. Unless the body part is rewarmed, frostbite will progress to the third and fourth phases. In the third phase, fluid leaks from the blood vessels into the damaged tissue. In the fourth phase, the blood vessels clot, resulting in irreversible loss of blood flow to the damaged tissue.

Frostbite symptoms typically start with a sensation of extreme coldness, followed by numbness, and then clumsiness. Superficial frostbite results in numbness and the development of clear, fluid-filled blisters. Deeper frostbite causes deeper blisters filled with purplish fluid. In all types of frostbite, the damaged tissue may swell and darken in color after rewarming.

Treatment of frostbite

If someone is suffering from hypothermia and frostbite, the hypothermia should be treated first; if the body shell is rewarmed before the body core, blood can pool in the extremities, possibly causing cardiac arrest.

If the frostbite victim is close to an emergency facility, do not attempt rewarming. You can prevent further heat loss by replacing any wet clothing with dry clothing.

If medical help is more than 2 hours away, rewarm the body part in warm water (104-108°F). Great effort must be taken to prevent refreezing after rewarming, because refreezing results in almost certain tissue death. Do not massage the affected area and do not expose the tissue to excessive heat—either can result in increased tissue damage.

How do I prevent cold injuries?

To prevent hypothermia and frostbite in cold conditions, wear layered clothing to create insulation. This should include mittens or gloves, a cap or hood, thermal underwear, and multiple layers of socks. Be sure to change wet garments promptly and drink plenty of fluids to avoid dehydration.

Tim W. Allari, M.D.
Columbus, Georgia

Events of the Winter Olympics

Nagano, Japan will play host to the 1998 Winter Olympic Games. Beginning on February 7, viewers in countries far and wide will have a chance to watch the spectacles and heroics of the world's best athletes. The main categories of events for the Winter Games are biathlon, bobsledding, figure skating, ice hockey, luge, alpine skiing, freestyle skiing, Nordic cross-country skiing, Nordic ski jumping, Nordic combined, and speedskating. The popular figure skating events include singles, pairs, and ice dancing. Alpine skiing consists of slalom, giant slalom, and downhill events. Freestyle skiing comprises moguls, aerials, and ballet. Also, included in the freestyle category is snowboarding, which has been a demonstration sport but will become a medal sport for the first time at the 1998 Winter Games. Nordic cross-country comprises classic (conventional parallel stride), freestyle (any technique is legal, including parallel and skating), and relay events. The Nordic combined event combines cross-country skiing and ski jumping, which is a demanding test because it requires endurance for the cross-country portion and speed and power for jumping. Speed-skating is divided into short-track (4-6 skaters competing at the same time on a 111-meter track indoor track) and long-track (2 skaters on an outdoor 400-meter track) competitions.

Grant L. Jones, M.D.
Columbus, Georgia

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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Health Hint

We all know that warming up before exercise is important. However, some of us may not know that cooling down after exercise is just as important. It helps your body recover by allowing your heart rate to gradually slow down, and it reduces the buildup of lactic acid—thereby preventing sore muscles. Slowing down the pace of your exercise or stretching are ways to cool down and should be done slowly for about 5 minutes.

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Reflections from the Past Editor

Ten years ago, the physicians of The Hughston Clinic decided to publish a health information newsletter for our patients. Because I had worked my way through school in a television journalism job and was thus "the most qualified," I was promptly elected to launch the project and was named the newsletter's first Editor. With the skills and tireless efforts of our staff, Betty Clements, Carol Capers, and Carol Binns (plus a crash course in newsletter publication), Volume 1, Number 1 was produced in a few months' time.

In the ensuing years, I had the good fortune to work with many talented writers and editorial board members. When I feared my inspiration was beginning to lag, Dr. Todd Schmidt stepped up to become the next Editor, bringing a fresh perspective that has kept each issue interesting.

Many changes have occurred in 10 years. The Hughston Orthopaedic Clinic has become The Hughston Clinic, emphasizing our commitment to total patient wellness, and the *Hughston Health Alert,* which was originally designed for *our* patients only, has now reached the stature of a national publication. The important things, however, remain constant. The medical writers and illustrators along with new editorial board members remain committed to producing a quality publication. The *Hughston Health Alert* continues to provide a wealth of informative articles. Most importantly, our readers renew their subscriptions in record numbers each year. My partners and I have taken much pride in seeing the newsletter grow to reach so many. Our greatest satisfaction, however, comes from knowing we are able to give something back to you our readers—something we hope improves your pursuit for a healthier lifestyle. In doing so, we further Dr. Hughston's dream for the Clinic and Foundation that bear his name.

Fred C. Flandry

A Letter from the Present Editor

This issue marks the 10th anniversary of the *Hughston Health Alert,* which was created to provide information on the prevention and treatment of orthopaedic and sports-related problems, as well as health and fitness topics. Education is one of the guiding principles of the Hughston Sports Medicine Foundation, with the *Hughston Health Alert* being an important part of our efforts. We are extremely proud of how our publication has grown and developed.

Being editor of the *Hughston Health Alert* these past five years has been an absolute pleasure. Our main goal has remained the same: to create an avenue of communication with our patients by creating easy-to-read, illustrated articles that explain the causes, symptoms, and treatments of specific conditions.

As our society moves further into the information age, we will continue to develop new ways in which you can obtain material from the *Hughston Health Alert* and other resources within the Foundation. Be sure to bookmark our World Wide Web site for information on the educational resources available. One day we hope to have the entire *Hughston Health Alert* library on-line and indexed, providing easy access to its informative articles.

We hope you will continue to find the *Hughston Health Alert* and the programs of the Foundation educational and beneficial to your well being. And we hope that you will remain with us, making these next ten years just as memorable.

Todd A. Schmidt

1988-1998

Hughston Health Alert 10th Anniversary

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