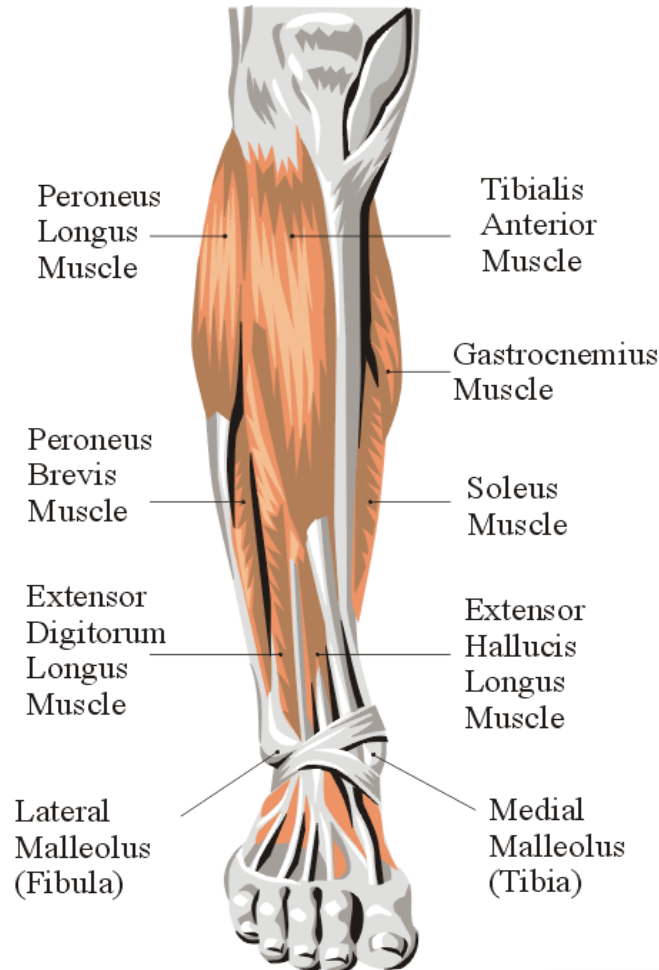


Temple Physical Therapy

A General Overview of Common Ankle, Foot and Lower Leg Injuries



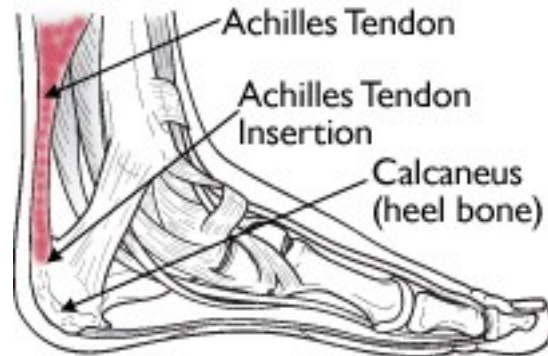
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Achilles Tendinitis

Achilles tendinitis is a common condition that causes pain along the back of the leg near the heel.

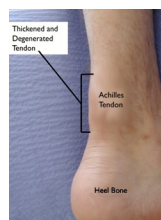


The Achilles tendon is the largest tendon in the body. It connects your calf muscles to your heel bone and is used when you walk, run, and jump.

Although the Achilles tendon can withstand great stresses from running and jumping, it is also prone to tendinitis, a condition associated with overuse and degeneration.

Description

Simply defined, tendinitis is inflammation of a tendon. Inflammation is the body's natural response to injury or disease, and often causes swelling, pain, or irritation. There are two types of Achilles tendinitis, based upon which part of the tendon is inflamed.



Noninsertional Achilles tendinitis

Noninsertional Achilles Tendinitis

In noninsertional Achilles tendinitis, fibers in the middle portion of the tendon have begun to break down with tiny tears (degenerate), swell, and thicken.

Tendinitis of the middle portion of the tendon more commonly affects younger, active people.

Insertional Achilles Tendinitis

Insertional Achilles tendinitis involves the lower portion of the heel, where the tendon attaches (inserts) to the heel bone.

In both noninsertional and insertional Achilles tendinitis, damaged tendon fibers may also calcify (harden). Bone spurs (extra bone growth) often form with insertional Achilles tendinitis.

Tendinitis that affects the insertion of the tendon can occur at any time, even in patients who are not active.



Insertional Achilles tendinitis

Cause

Achilles tendinitis is typically not related to a specific injury. The problem results from repetitive stress to the tendon. This often happens when we push our bodies to do too much, too soon, but other factors can make it more likely to develop tendinitis, including:



A bone spur that has developed where the tendon attaches to the heel bone.

- Sudden increase in the amount or intensity of exercise activity—for example, increasing the distance you run every day by a few miles without giving your body a chance to adjust to the new distance
- Tight calf muscles—Having tight calf muscles and suddenly starting an aggressive exercise program can put extra stress on the Achilles tendon
- Bone spur—Extra bone growth where the Achilles tendon attaches to the heel bone can rub against the tendon and cause pain

Symptoms

Common symptoms of Achilles tendinitis include:

- Pain and stiffness along the Achilles tendon in the morning
- Pain along the tendon or back of the heel that worsens with activity
- Severe pain the day after exercising
- Thickening of the tendon
- Bone spur (insertional tendinitis)
- Swelling that is present all the time and gets worse throughout the day with activity

If you have experienced a sudden "pop" in the back of your calf or heel, you may have ruptured (torn) your Achilles tendon. See your doctor immediately if you think you may have torn your tendon.

Doctor Examination

After you describe your symptoms and discuss your concerns, the doctor will examine your foot and ankle. The doctor will look for these signs:

- Swelling along the Achilles tendon or at the back of your heel
- Thickening or enlargement of the Achilles tendon
- Bony spurs at the lower part of the tendon at the back of your heel (insertional tendinitis)
- The point of maximum tenderness
- Pain in the middle of the tendon, (noninsertional tendinitis)
- Pain at the back of your heel at the lower part of the tendon (insertional tendinitis)
- Limited range of motion in your ankle—specifically, a decreased ability to flex your foot

Tests

Your doctor may order imaging tests to make sure your symptoms are caused by Achilles tendinitis.

X-rays

X-ray tests provide clear images of bones. X-rays can show whether the lower part of the Achilles tendon has calcified, or become hardened. This calcification indicates insertional Achilles tendinitis. In cases of severe noninsertional Achilles tendinitis, there can be calcification in the middle portion of the tendon, as well.

Magnetic Resonance Imaging (MRI)

Although magnetic resonance imaging (MRI) is not necessary to diagnose Achilles tendinitis, it is important for planning surgery. An MRI scan can show how severe the

damage is in the tendon. If surgery is needed, your doctor will select the procedure based on the amount of tendon damage.

Treatment

Nonsurgical Treatment

In most cases, nonsurgical treatment options will provide pain relief, although it may take a few months for symptoms to completely subside. Even with early treatment, the pain may last longer than 3 months. If you have had pain for several months before seeking treatment, it may take 6 months before treatment methods take effect.

Rest. The first step in reducing pain is to decrease or even stop the activities that make the pain worse. If you regularly do high-impact exercises (such as running), switching to low-impact activities will put less stress on the Achilles tendon. Cross-training activities such as biking, elliptical exercise, and swimming are low-impact options to help you stay active.

Ice. Placing ice on the most painful area of the Achilles tendon is helpful and can be done as needed throughout the day. This can be done for up to 20 minutes and should be stopped earlier if the skin becomes numb. A foam cup filled with water and then frozen creates a simple, reusable ice pack. After the water has frozen in the cup, tear off the rim of the cup. Then rub the ice on the Achilles tendon. With repeated use, a groove that fits the Achilles tendon will appear, creating a "custom-fit" ice pack.

Non-steroidal anti-inflammatory medication. Drugs such as ibuprofen and naproxen reduce pain and swelling. They do not, however, reduce the thickening of the degenerated tendon. Using the medication for more than 1 month should be reviewed with your primary care doctor.

Exercise. The following exercise can help to strengthen the calf muscles and reduce stress on the Achilles tendon.



- **Calf stretch**

Lean forward against a wall with one knee straight and the heel on the ground. Place the other leg in front, with the knee bent. To stretch the calf muscles and the heel cord, push your hips toward the wall in a controlled fashion. Hold the

position for 10 seconds and relax. Repeat this exercise 20 times for each foot. A strong pull in the calf should be felt during the stretch.

Physical Therapy. Physical therapy is very helpful in treating Achilles tendinitis. It has proven to work better for noninsertional tendinitis than for insertional tendinitis.

Eccentric Strengthening Protocol. Eccentric strengthening is defined as contracting (tightening) a muscle while it is getting longer. Eccentric strengthening exercises can cause damage to the Achilles tendon if they are not done correctly. At first, they should be performed under the supervision of a physical therapist. Once mastered with a therapist, the exercises can then be done at home. These exercises may cause some discomfort, however, it should not be unbearable.



- **Bilateral heel drop**

Stand at the edge of a stair, or a raised platform that is stable, with just the front half of your foot on the stair. This position will allow your heel to move up and down without hitting the stair. Care must be taken to ensure that you are balanced correctly to prevent falling and injury. Be sure to hold onto a railing to help you balance.

Lift your heels off the ground then slowly lower your heels to the lowest point possible. Repeat this step 20 times. This exercise should be done in a slow, controlled fashion. Rapid movement can create the risk of damage to the tendon. As the pain improves, you can increase the difficulty level of the exercise by holding a small weight in each hand.

- **Single leg heel drop**

This exercise is performed similarly to the bilateral heel drop, except that all your weight is focused on one leg. This should be done only after the bilateral heel drop has been mastered.

Cortisone injections. Cortisone, a type of steroid, is a powerful anti-inflammatory medication. Cortisone injections into the Achilles tendon are rarely recommended because they can cause the tendon to rupture (tear).

Supportive shoes and orthotics. Pain from insertional Achilles tendinitis is often helped by certain shoes, as well as orthotic devices. For example, shoes that are softer at the

back of the heel can reduce irritation of the tendon. In addition, heel lifts can take some strain off the tendon.

Heel lifts are also very helpful for patients with insertional tendinitis because they can move the heel away from the back of the shoe, where rubbing can occur. They also take some strain off the tendon. Like a heel lift, a silicone Achilles sleeve can reduce irritation from the back of a shoe.

If your pain is severe, your doctor may recommend a walking boot for a short time. This gives the tendon a chance to rest before any therapy is begun. Extended use of a boot is discouraged, though, because it can weaken your calf muscle.

Extracorporeal shockwave therapy (ESWT). During this procedure, high-energy shockwave impulses stimulate the healing process in damaged tendon tissue. ESWT has not shown consistent results and, therefore, is not commonly performed.

ESWT is noninvasive—it does not require a surgical incision. Because of the minimal risk involved, ESWT is sometimes tried before surgery is considered.

Surgical Treatment

Surgery should be considered to relieve Achilles tendinitis only if the pain does not improve after 6 months of nonsurgical treatment. The specific type of surgery depends on the location of the tendinitis and the amount of damage to the tendon.

Gastrocnemius recession. This is a surgical lengthening of the calf (gastrocnemius) muscles. Because tight calf muscles place increased stress on the Achilles tendon, this procedure is useful for patients who still have difficulty flexing their feet, despite consistent stretching.

In gastrocnemius recession, one of the two muscles that make up the calf is lengthened to increase the motion of the ankle. The procedure can be performed with a traditional, open incision or with a smaller incision and an endoscope—an instrument that contains a small camera. Your doctor will discuss the procedure that best meets your needs.

Complication rates for gastrocnemius recession are low, but can include nerve damage.

Gastrocnemius recession can be performed with or without débridement, which is removal of damaged tissue.

Débridement and repair (tendon has less than 50% damage). The goal of this operation is to remove the damaged part of the Achilles tendon. Once the unhealthy portion of the tendon has been removed, the remaining tendon is repaired with sutures, or stitches to complete the repair.

In insertional tendinitis, the bone spur is also removed. Repair of the tendon in these instances may require the use of metal or plastic anchors to help hold the Achilles tendon to the heel bone, where it attaches.

After débridement and repair, most patients are allowed to walk in a removable boot or cast within 2 weeks, although this period depends upon the amount of damage to the tendon.

Débridement with tendon transfer (tendon has greater than 50% damage). In cases where more than 50% of the Achilles tendon is not healthy and requires removal, the remaining portion of the tendon is not strong enough to function alone. To prevent the remaining tendon from rupturing with activity, an Achilles tendon transfer is performed. The tendon that helps the big toe point down is moved to the heel bone to add strength to the damaged tendon. Although this sounds severe, the big toe will still be able to move, and most patients will not notice a change in the way they walk or run.

Depending on the extent of damage to the tendon, some patients may not be able to return to competitive sports or running.

Recovery. Most patients have good results from surgery. The main factor in surgical recovery is the amount of damage to the tendon. The greater the amount of tendon involved, the longer the recovery period, and the less likely a patient will be able to return to sports activity.

Physical therapy is an important part of recovery. Many patients require 12 months of rehabilitation before they are pain-free.

Complications. Moderate to severe pain after surgery is noted in 20% to 30% of patients and is the most common complication. In addition, a wound infection can occur and the infection is very difficult to treat in this location.

Bunions

If the joint that connects your big toe to your foot has a swollen, sore bump, you may have a bunion.

More than half the women in America have bunions, a common deformity often blamed on wearing tight, narrow shoes, and high heels. Bunions may occur in families, but many are from wearing tight shoes. Nine out of ten bunions happen to women. Nine out of ten women wear shoes that are too small.

Too-tight shoes can also cause other disabling foot problems like corns, calluses and hammertoes.



With a bunion, the base of your big toe (metatarsophalangeal joint) gets larger and sticks out. The skin over it may be red and tender. Wearing any type of shoe may be painful. This joint flexes with every step you take. The bigger your bunion gets, the more it hurts to walk. Bursitis may set in. Your big toe may angle toward your second toe, or even move all the way under it. The skin on the bottom of your foot may become thicker and painful. Pressure from your big toe may force your second toe out of alignment, sometimes overlapping your third toe. An advanced bunion may make your foot look grotesque. If your bunion gets too severe, it may be difficult to walk. Your pain may become chronic and you may develop arthritis.

Relief from Bunions

Most bunions are treatable without surgery. Prevention is always best. To minimize your chances of developing a bunion, never force your foot into a shoe that doesn't fit. Choose shoes that conform to the shape of your feet. Go for shoes with wide insteps, broad toes and soft soles. Avoid shoes that are short, tight or sharply pointed, and those with heels higher than 2 1/4 inches. If you already have a bunion, wear shoes that are roomy enough to not put pressure on it. This should relieve most of your pain. You may want to have your shoes stretched out professionally. You may also try protective pads to cushion the painful area.

If your bunion has progressed to the point where you have difficulty walking, or experience pain despite accommodative shoes, you may need surgery. Bunion surgery realigns bone, ligaments, tendons and nerves so your big toe can be brought back to its

correct position. Orthopaedic surgeons have several techniques to ease your pain. Many bunion surgeries are done on a same-day basis (no hospital stay) using an ankle-block anesthesia. A long recovery is common and may include persistent swelling and stiffness.

Adolescent Bunion

Your young teenager (especially girls aged 10-15) may develop an adolescent bunion at the base of his or her big toe. Unlike adults with bunions, a young person can normally move the affected joint. Your teenager may have pain and trouble wearing shoes. Try having your child's shoes stretched and/or getting wider shoes. Surgery to remove an adolescent bunion is not recommended unless your child is in extreme pain and the problem does not get better with changes in shoe wear. If your adolescent has bunion surgery, particularly before they are fully grown, there is a strong chance his or her problem will return.

Bunionette

If you have a painful swollen lump on the outside of your foot near the base of your little toe, it may be a bunionette (tailor's bunion). You may also have a hard corn and painful bursitis in the same spot. A bunionette is very much like a bunion. Wearing shoes that are too tight may cause it. Get shoes that fit comfortably with a soft upper and a roomy toe box. In cases of persistent pain or severe deformity, surgical correction is possible.

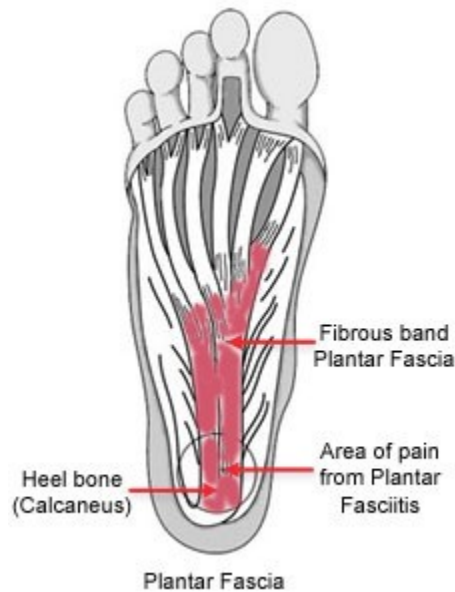
Plantar Fasciitis and Bone Spurs

Plantar fasciitis (fashee-EYE-tiss) is the most common cause of pain on the bottom of the heel. Approximately 2 million patients are treated for this condition every year.

Plantar fasciitis occurs when the strong band of tissue that supports the arch of your foot becomes irritated and inflamed.

Anatomy

The plantar fascia is a long, thin ligament that lies directly beneath the skin on the bottom of your foot. It connects the heel to the front of your foot, and supports the arch of your foot.



Cause

The plantar fascia is designed to absorb the high stresses and strains we place on our feet. But, sometimes, too much pressure damages or tears the tissues. The body's natural response to injury is inflammation, which results in the heel pain and stiffness of plantar fasciitis.



Risk Factors

In most cases, plantar fasciitis develops without a specific, identifiable reason. There are, however, many factors that can make you more prone to the condition:

- Tighter calf muscles that make it difficult to flex your foot and bring your toes up toward your shin
- Obesity
- Very high arch
- Repetitive impact activity (running/sports)
- New or increased activity

Heel Spurs

Although many people with plantar fasciitis have heel spurs, spurs are not the cause of plantar fasciitis pain. One out of 10 people has heel spurs, but only 1 out of 20 people (5%) with heel spurs has foot pain. Because the spur is not the cause of plantar fasciitis, the pain can be treated without removing the spur.



Heel spurs do not cause plantar fasciitis pain.

Symptoms

The most common symptoms of plantar fasciitis include:

- Pain on the bottom of the foot near the heel
- Pain with the first few steps after getting out of bed in the morning, or after a long period of rest, such as after a long car ride. The pain subsides after a few minutes of walking

- Greater pain after (not during) exercise or activity

Doctor Examination

After you describe your symptoms and discuss your concerns, your doctor will examine your foot. Your doctor will look for these signs:

- A high arch
- An area of maximum tenderness on the bottom of your foot, just in front of your heel bone
- Pain that gets worse when you flex your foot and the doctor pushes on the plantar fascia. The pain improves when you point your toes down
- Limited "up" motion of your ankle

Tests

Your doctor may order imaging tests to help make sure your heel pain is caused by plantar fasciitis and not another problem.

X-rays

X-rays provide clear images of bones. They are useful in ruling out other causes of heel pain, such as fractures or arthritis. Heel spurs can be seen on an x-ray.

Other Imaging Tests

Other imaging tests, such as magnetic resonance imaging (MRI) and ultrasound, are not routinely used to diagnose plantar fasciitis. They are rarely ordered. An MRI scan may be used if the heel pain is not relieved by initial treatment methods.

Posterior Tibial Tendon Dysfunction

Tendons connect muscles to bones and stretch across joints, enabling you to bend that joint. One of the most important tendons in the lower leg is the posterior tibial tendon. This tendon starts in the calf, stretches down behind the inside of the ankle and attaches to bones in the middle of the foot.

The posterior tibial tendon helps hold your arch up and provides support as you step off on your toes when walking. If this tendon becomes inflamed, over-stretched or torn, you may experience pain on the inner ankle and gradually lose the inner arch on the bottom of your foot, leading to flatfoot.

Symptoms

- Pain and swelling on the inside of the ankle
- Loss of the arch and the development of a flatfoot
- Gradually developing pain on the outer side of the ankle or foot
- Weakness and an inability to stand on the toes
- Tenderness over the midfoot, especially when under stress during activity

Risk Factors

Posterior tibial tendon dysfunction often occurs in women over 50 years of age and may be due to an inherent abnormality of the tendon. But there are several other risk factors, including:

- Obesity
- Diabetes
- Hypertension
- Previous surgery or trauma, such as an ankle fracture on the inner side of the foot
- Local steroid injections
- Inflammatory diseases such as Reiter's syndrome, rheumatoid arthritis, spondylosing arthropathy and psoriasis

Athletes who are involved in sports such as basketball, tennis, soccer or hockey may tear the posterior tibial tendon. The tendon may also become inflamed if excessive force is placed on the foot, such as when running on a banked track or road.

Diagnosis

The diagnosis is based on both a history and a physical examination. Your physician may ask you to stand on your bare feet facing away from him/her to view how your foot functions. As the condition progresses, the front of the affected foot will start to slide to the outside. From behind, it will look as though you have "too many toes" showing. You may also be asked to stand on your toes or to do a single heel rise: stand with your hands on the wall, lift the unaffected foot off the ground, and raise up on the toes of the other

foot. Normally, the heel will rotate inward; the absence of this sign indicates posterior tibial tendon dysfunction. Your doctor may request X-rays, an ultrasound or a magnetic resonance image (MRI) of the foot.

Treatment

Without treatment, the flatfoot that develops from posterior tibial tendon dysfunction eventually becomes rigid. Arthritis develops in the hindfoot. Pain increases and spreads to the outer side of the ankle. The way you walk may be affected and wearing shoes may be difficult.

The treatment your doctor recommends will depend on how far the condition has progressed. In the early stages, posterior tibial tendon dysfunction can be treated with rest, nonsteroidal anti-inflammatory drugs such as aspirin or ibuprofen, and immobilization of the foot for 6 to 8 weeks with a rigid below-knee cast or boot to prevent overuse. After the cast is removed, shoe inserts such as a heel wedge or arch support may be helpful. If the condition is advanced, your doctor may recommend that you use a custom-made ankle-foot orthosis or support.

If conservative treatments don't work, your doctor may recommend surgery. Several procedures can be used to treat posterior tibial tendon dysfunction; often more than one procedure is performed at the same time. Your doctor will recommend a specific course of treatment based on your individual case.

Surgical options include:

Tenosynovectomy

In this procedure, the surgeon will clean away (debride) and remove (excise) any inflamed tissue surrounding the tendon.

Osteotomy

This procedure changes the alignment of the heel bone (calcaneus). The surgeon may sometimes have to remove a portion of the bone.

Tendon transfer

This procedure uses some fibers from another tendon (the flexor digitorum longus, which helps bend the toes) to repair the damaged posterior tibial tendon.

Lateral column lengthening

In this procedure, the surgeon removes a small wedge-shaped piece of bone from the hip and places it into the outside of the calcaneus. This helps realign the bones and recreates the arch.

Arthrodesis

This procedure welds (fuses) one or more bones together, eliminating movement in the joint. This stabilizes the hindfoot and prevents the condition from progressing further.

Shin Splints

Description

The term "shin splints" refers to pain and tenderness along or just behind the inner edge of the tibia, the large bone in the lower leg. Shin splints--or medial tibial stress syndrome as it is called by orthopaedists--usually develops after physical activity, such as vigorous exercise or sports. Repetitive activity leads to inflammation of the muscles, tendons, and periosteum (thin layer of tissue covering a bone) of the tibia, causing pain. The bone tissue itself is also involved.

Risk Factors

- Flatfeet or abnormally rigid arches
- Running/jogging
- Dancing
- Sudden increase in training or new vigorous impact training
- Military training

Certain factors seem to contribute to shin splints. The condition commonly affects runners, aerobic dancers, and people in the military. Shin splints often develop after sudden changes in physical activity, such as running longer distances or on hills, or increasing the number of days you exercise each week. Flat feet are another factor that can contribute to increased stress on the lower leg muscles during exercising.

Treatment

Nonsurgical Treatment

Nonsurgical treatment for shin splints includes several weeks of rest from the activity that caused it. Other forms of conditioning can be substituted. The doctor may recommend that you take anti-inflammatory medications, or use cold packs and mild compression to feel better. Stretching exercises can also help.

In most people, the pain is not so bad with ordinary walking. After several weeks of rest, low-level training may begin. Be sure to warm up and stretch thoroughly before you exercise. Increase training slowly. If you start to feel the same pain, stop exercising immediately. Use a cold pack and rest for a day or two. Return to training again at a lower level of intensity. Increase training even more slowly than before.

Surgical Treatment

Very few people need surgery for shin splints. Surgery has been done in very severe cases of shin splints that do not respond to nonsurgical treatment. It is not clear how effective surgery is, however.

An accurate diagnosis is very important. Sometimes, other problems may exist, which will have an impact on healing.

Other Causes of Shin Pain

Stress fracture

When shin splints are not responsive to treatment, your doctor may want to make sure you do not have a stress fracture. A bone scan and magnetic resonance imaging (MRI) can often show if a fracture is present. The diagnostic tests, causes of shin splints, and treatment regimens all bear a similarity and relationship to stress fractures. It is possible that there is a relationship between shin splints and stress fracture, but this has not been clearly identified.

Tendonitis

Tendonitis can be present, especially if there is a partial tear of the involved tendon. MRI can also help the doctor diagnose the presence of tendonitis.

Chronic exertional compartment syndrome

An uncommon condition called chronic exertional compartment syndrome involves swelling of muscle with exertion. This happens within the muscle's usually tight compartment in the leg. These compartments are nonyielding. Swelling can raise pressure within the compartment to levels so high that blood will not flow into the muscle. This causes severe pain and is best treated surgically. The tests that are used to diagnose chronic exertional compartment syndrome are highly specialized and not easily available. They involve measuring the pressure within the leg compartments immediately after exercise.

Stress Fractures



One of the most common injuries in sports is a stress fracture. Overcoming an injury like a stress fracture can be difficult, but it can be done.

What is a stress fracture?

A stress fracture is an overuse injury. It occurs when muscles become fatigued and are unable to absorb added shock. Eventually, the fatigued muscle transfers the overload of stress to the bone causing a tiny crack called a stress fracture.

What causes a stress fracture?

Stress fractures often are the result of increasing the amount or intensity of an activity too rapidly. They also can be caused by the impact of an unfamiliar surface (a tennis player who has switched surfaces from a soft clay court to a hard court); improper equipment (a runner using worn or less flexible shoes); and increased physical stress (a basketball player who has had a substantial increase in playing time).

Where do stress fractures occur?

Most stress fractures occur in the weightbearing bones of the lower leg and the foot. More than 50 percent of all stress fractures occur in the lower leg.

What activities make athletes most susceptible to stress fractures?

Studies have shown that athletes participating in tennis, track and field, gymnastics, and basketball are very susceptible to stress fractures. In all of these sports, the repetitive stress of the foot striking the ground can cause trauma. Without sufficient rest between workouts or competitions, an athlete is at risk for developing a stress fracture.

Are women more susceptible to stress fractures than men?

Stress fractures affect people of all ages who participate in repetitive sporting activities, like running. Medical studies have shown that female athletes seem to experience more stress fractures than their male counterparts. Many orthopaedic surgeons attribute this to

a condition referred to as "the female athlete triad": eating disorders (bulimia or anorexia), amenorrhea (infrequent menstrual cycle), and osteoporosis. As a female's bone mass decreases, her chances of getting a stress fracture increase.

What are the symptoms of a stress fracture?

Pain with activity is the most common complaint with a stress fracture. This pain subsides with rest.

How are stress fractures diagnosed?

It is very important that during the medical examination the doctor evaluates the patient's risk factors for stress fracture.

X-rays are commonly used to determine stress fracture. Sometimes, the stress fracture cannot be seen on regular x-rays or will not show up for several weeks after the pain starts. Occasionally, a computed topography (CT) scan or magnetic resonance imaging (MRI) will be necessary.

How are stress fractures treated?

The most important treatment is rest. Individuals need to rest from the activity that caused the stress fracture, and engage in a pain-free activity during the six to eight weeks it takes most stress fractures to heal.

If the activity that caused the stress fracture is resumed too quickly, larger, harder-to-heal stress fractures can develop. Re-injury also could lead to chronic problems where the stress fracture might never heal properly.

In addition to rest, shoe inserts or braces may be used to help these injuries heal.

Prevention

Here are some tips developed by the American Academy of Orthopaedic Surgeons to help prevent stress fractures:

- When participating in any new sports activity, set incremental goals. For example, do not immediately set out to run five miles a day; instead, gradually build up your mileage on a weekly basis.
- Cross-training -- alternating activities that accomplish the same fitness goals -- can help to prevent injuries like stress fractures. Instead of running every day to meet cardiovascular goals, run on even days and bike on odd days. Add some strength training and flexibility exercises to the mix for the most benefit.
- Maintain a healthy diet. Make sure you incorporate calcium- and vitamin D-rich foods in your meals.
- Use the proper equipment. Do not wear old or worn running shoes.

- If pain or swelling occurs, immediately stop the activity and rest for a few days. If continued pain persists, see an orthopaedic surgeon.
- It is important to remember that if you recognize the symptoms early and treat them appropriately, you can return to sports at your normal playing level.