

Heel Pain

Overview, Risk Factors, Causes, Symptoms

Podiatrist developed and monitored.

[Podiatrist Advisor List](#)

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Overview

Heel pain is one of the most common forms of foot pain in adults. It often occurs as a result of daily activities and exercise. The heel bone (calcaneus) is the largest bone in the foot and the heel is the first part of the foot to contact the ground during walking.

Two structures located on the bottom (sole) of the foot are primarily associated with heel pain: the plantar fascia, a band of fibrous connective tissue, and the flexor digitorum brevis muscle, which supports the arch and flexes the four small toes.

Normally, as the foot absorbs the weight of the body during walking, the arch area joint locking mechanism provides about 80% of the stability of the foot. The other 20% of biomechanical stability is provided by the plantar fascia and muscles, tendons, and ligaments. (See [Anatomy of the Foot and Ankle](#)).

Gait abnormalities can cause inflammation of the structures attached to the heel bone, resulting in heel pain. Inflammation of the plantar fascia, called **plantar fasciitis**, is the most common cause of heel pain.

Plantar fasciitis often causes pain that is more severe following a period of rest (e.g., after sleeping). This condition is also called **post-static dyskinesia**, which means "pain after rest."

Sometimes, muscle strain and tension pull at the origin site on the bottom surface of the heel bone producing an inflammatory response that begins making new bone. This interim condition is called **periostitis**. The forming **bone spur** grows forward in the direction of this pulling. Heel spurs can irritate nerves and cause pain.

Incidence and Prevalence

Heel pain is most common in active people over the age of 40. This increased prevalence may result from a decrease in the elasticity of the plantar fascia and a slowing of the healing process with age. Heel pain also is relatively common in active children and adolescents between the ages of 8 and 13. Pediatric heel pain frequently occurs on the bottom rear of the heel or the sides.

Heel pain occurs in both heels (bilaterally) in less than 30% of cases. The left heel is commonly the first to be affected. The opposite heel may follow with similar symptoms, often as a result of compensation.

Risk Factors and Causes

Misalignments caused by abnormalities in the structure of the feet increase the risk for heel pain. Other risk factors include the following:

- Engaging in strenuous exercise (especially repetitive jumping and running)
- Obesity
- Standing for prolonged periods
- Wearing shoes that do not fit properly

To reduce the risk for heel pain, it is important to wear shoes or sneakers that fit correctly and to **warm up** properly before exercising.

The most common cause for heel pain is inflammation of the fibrous connective tissue on the sole of the foot (plantar fasciitis). Other causes include the following:

- [Achilles tendonitis](#)
- Bone bruises
- Excessive pronation (tendency of the foot to roll inward)
- Haglund's deformity (bony growth at the back of the heel that usually occurs when shoes repeatedly aggravate tissue and underlying bone)
- Heel spurs (also called bone spurs)
- Inflammatory conditions (e.g., ankylosing spondylitis, diffuse idiopathic skeletal hyperostosis, rheumatoid arthritis, bursitis)
- Sever's disease (relatively common condition in active growing children and adolescents)
- Soft-tissue sarcoma of the foot (rare)
- Stress fractures
- [Tarsal tunnel syndrome](#) (nerve entrapment that may cause pain on the sole of the foot)

Signs and Symptoms

Heel pain varies in severity. In most cases of plantar fasciitis, pain is more severe following periods of inactivity (e.g., in the morning), subsides with activity, and increases in severity with prolonged activity. This occurs because inactivity causes the muscles in the foot to tighten, increasing the strain on the plantar fascia and aggravating heel spurs, if they are present. The muscles stretch with mild activity and the heel pain subsides. Prolonged or strenuous activity increases inflammation and the severity of heel pain.

Other symptoms of plantar fasciitis include **swelling**, **redness**, and **heat**.

Diagnosis

Diagnosis of heel pain may involve a history of symptoms, a physical examination, and imaging tests (e.g., x-rays, ultrasound, [magnetic resonance imaging](#) [MRI] scan). Imaging tests are used to detect heel spurs, stress fractures, and hardened deposits (calcifications) that may contribute to heel pain.

Treatment

Heel pain is difficult to cure and often takes months to subside, but most cases can be resolved using conservative treatment methods. Conservative treatment includes the following:

- Avoiding activities that worsen the condition (e.g., prolonged standing, strenuous exercise)
- Applying ice to the area to reduce pain and inflammation
- Wearing well-cushioned shoes that fit properly

[Orthotics](#) and **shoe inserts** can provide proper support, correct misalignments and imbalances in the foot, and alleviate pressure on heel spurs. Anti-inflammatory **medications** such as ibuprofen may be used to reduce pain and inflammation. **Physical therapy** also may be used to relieve heel pain.

Podiatrists may administer **corticosteroid injections** to reduce painful inflammation in the heel. Corticosteroid injections can be painful, and a technique called **ionophoresis** may be used instead to produce similar results with less pain. In this procedure, an electrical charge is applied to the area and pulls the medication through the skin. Injections also may be given with ultrasound guidance and are less painful under these circumstances due to the precise delivery of medication to the affected area.

A rigid **splint** may be worn on the foot to keep it at a 90-degree angle during sleep. This prevents the muscles from tightening, reduces strain on the plantar fascia in the morning, and allows healing to occur in the lengthened position. In some cases, a walking **cast** is worn for about 5 weeks.

Extracorporeal shock wave therapy (ESWT) is a noninvasive surgical procedure that uses sound waves to treat chronic heel pain. This outpatient procedure takes about 30 minutes and is usually performed under general anesthesia.

ESWT is not used to treat some types of heel pain (e.g., rheumatoid arthritis, infections, tarsal tunnel syndrome) and the procedure is contraindicated in patients who have a bleeding disorder and those who take blood-thinning medications (e.g., warfarin, heparin). This treatment may not be covered by insurance.

Most patients are able to resume normal activity the day after receiving extracorporeal shock wave therapy. Heavy lifting and strenuous exercise should be avoided for 4–6 weeks. **Side effects** include bruising, mild pain, numbness, tingling, and swelling.

Conventional **surgery** may be necessary to treat severe heel pain that does not resolve or that continues to worsen after 6 months of treatment. Surgery for heel pain may involve release of the plantar fascia by endoscopic methods or surgical removal, or surgical removal of a heel spur or bursa (fluid filled sac).

The procedure to release the plantar fascia is performed through a small incision in the side or bottom of the foot. The surgeon cuts the fascia, and possibly the flexor digitorum brevis muscle, so that it no longer pulls on the heel bone. If a heel spur is present, it is removed.

Following surgery, the structures that maintained the arch of the foot may no longer function properly, and the arch is weaker and may flatten. In this case, imbalances in the structure of the foot can develop, causing [hammertoes](#) or [bunions](#). [Orthotics](#) should be used to provide extra support and keep the foot properly aligned.

Prevention

According to the **American Podiatric Medical Association (APMA)**, the following tips may help prevent heel pain:

- Consult a physician before beginning an exercise program.
- Begin exercising slowly.
- Purchase shoes that fit correctly and replace them regularly.
- Stretch properly before and after exercise.
- Avoid uneven walking surfaces and stepping on rocks as much as possible.
- Avoid going barefoot on hard surfaces.
- Vary the incline while walking or running on a treadmill.
- If heel pain occurs, stop immediately. Do not try to exercise through the pain.



Back View of Foot Muscles

