

# Plantar Fasciitis

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## **What is this injury?**

The plantar fascia is a strong band of connective tissue that extends from the base of the toes, along the bottom of the foot, to the bottom of the heel. Plantar fasciitis is inflammation of the plantar fascia with resulting pain. The pain may be isolated to the heel or may appear at different points on the bottom of the foot from time to time. Some think that plantar fasciitis pain is caused by irritation of nerves from tissue swelling or inflammation, but that is debatable.



*Plantar Fasciitis Injury Diagram*

## **How does the injury occur?**

During walking, the plantar fascia experiences tension up to twice the body weight with each step. While this is normal, those who spend much time on their feet, such as nurses, waitresses/waiters, and mail carriers, often experience plantar fasciitis. Athletes involved in tennis or other racquet sports, race walking, jogging, or running also show a higher incidence of plantar fasciitis than do those participating in other activities. Thus, it's clear that plantar fasciitis is predominantly an overuse injury. In fact, any activity that results in prolonged tension and stress on the plantar fascia may cause plantar fasciitis. It is possible that changes in footwear may play a role in causing plantar fasciitis, no matter what activity is occurring.

Those who are overweight are prone to plantar fasciitis. This is true even for sedentary people who get little physical activity. Abnormalities of the foot and ankle joints may predispose some individuals to the

development of plantar fasciitis (specifically, over-pronation in the subtalar joint).

### ***What are the symptoms?***

The primary symptom of plantar fasciitis is pain upon taking first steps in the morning, which may or may not reappear in the course of the day. Pain is often isolated to the bottom of the heel. However, it may radiate across the bottom of the foot from heel to toes. The pain has been described by some as migratory—that is, it tends to locate at different places along the plantar fascia at different times. Pain from this condition can vary from mild to severe and in some cases even be debilitating. Most commonly, pain from plantar fasciitis, with proper treatment, lasts one to three months. In some cases, discomfort to varying degrees becomes permanent.

### ***How is the injury diagnosed?***

The health care professional will determine the center of pain by pressing on the heel. If the pain is mainly in the bottom of the heel, the most likely diagnosis is plantar fasciitis, especially if the pain is evident with first steps upon arising in the morning.

### ***How is the injury treated?***

One treatment is to reduce the volume and intensity of the activities causing pain. For the walker, jogger, runner, or tennis player, this means doing cross training to maintain cardiovascular fitness. In this regard, swimming or cycling is recommended. The activity that caused the condition should be avoided until it can be done without pain.

Nonsteroidal anti-inflammatory agents, such as aspirin or ibuprofen, may be prescribed by the health care professional. Taken as directed, these drugs usually relieve pain and reduce inflammation.

Ice packs or ice massage for 15 minutes three times daily may be effective. Application of heat is not generally recommended, as heat expands the bone and connective tissue, perhaps exerting greater pressure on nerves and thereby increasing pain. If heat is used, follow it with application of ice.

If the condition persists without sign of alleviation, physical therapy in the form of ultrasound or massage treatment may be helpful. Personalized orthotics may relieve the condition and also prevent recurrence. It may be helpful to wear a night splint to help alleviate the condition. Also, it is sometimes necessary (although not very common) to undergo corticosteroid injections for treatment.

Rarely, surgery is required. This involves disconnection of the plantar fascia at the heel. Surgical treatment is successful in about 75 to 80 percent of cases and is viewed as an absolute last resort.

### ***How long will the effects of the injury last?***

First cases treated early may be cured within a month. A more likely scenario, however, is to see complete relief within six to 12 weeks once appropriate treatment has been taken. Recurrences of plantar fasciitis are more difficult to cure. An injury duration of six months is not uncommon in recurrent cases. Sometimes, even with aggressive treatment, recovery is delayed for a year or more. Unfortunately, recurrences are fairly common, and a pattern in which plantar fasciitis reappears every several months may evolve.

### ***When can I return to my sport or activity?***

This is a critical question. Too often, the patient recovering from plantar fasciitis returns too soon to activity, often just as improvement begins. This impatience must be resisted, and return to activity delayed, until

activity can be done with no pain. Even then, the duration and intensity of the activity must be low level with gradual increments over time. Pain upon performance indicates further injury to the plantar fascia and can easily lead to recurrence of the injury. Each recurrence makes the patient more prone to future incidents.

### ***How can I prevent the injury?***

As noted above, recurrences of plantar fasciitis may best be avoided by delaying a return to activity until the activity can be performed with no pain. Cross-training techniques offer a solution to interruption of training.

Using a personalized, fitted orthotic device may prevent recurrence of plantar fasciitis. Well-fitting shoes designed for the activity and with appropriate arch support may serve the same purpose. Orthotic devices and shoes must be replaced from time to time as wear dictates. Worn-out arch supports and orthotic devices are of no use and may even be counterproductive.

Tightness of the muscles of the back of the lower leg (calf muscles) exert tension through the heel cord (Achilles tendon) to the plantar fascia. Exercises to stretch the calf muscles are preventive as well as therapeutic. Some of these exercises are described below.

As a preventive measure, the plantar fascia itself may be passively stretched. This technique is rehabilitative as well as preventive; the method is described below.

### ***Rehabilitation?***

As has been emphasized, a critical treatment component of plantar fasciitis is avoiding the activity that caused the injury until the activity can be done without pain. This may be viewed also as a rehabilitative technique. During rehabilitation, athletes should maintain activity levels through alternate forms of exercise, such as cycling or swimming.

Stretching and strengthening exercises for rehabilitation of plantar fasciitis should be done upon arising in the morning and at three other times during the day. For symmetrical development of both legs, and to prevent plantar fasciitis in the currently unaffected foot, exercises should be applied to both the right and left foot and leg.

If pain at the heel or sole of the foot occurs during stretching exercises, back off from the amount of stretch. Pain indicates possible further damage to the already injured fascia.

Tightness of the muscles of the calves may contribute to plantar fasciitis, so stretching the calf muscles is important to rehabilitation, as is stretching of the plantar fascia itself. The following exercises stretch the plantar fascia, the calf muscles, and the Achilles tendon.

1. *Assisted Dorsiflexion/Plantar Fascia Stretch.* Sit on the floor or ground with both legs outstretched. Use a towel or elastic band and wrap it around the affected foot. Use the towel to provide resistance to upward movement of the forefoot. Pull toes upward with the help of the elastic band, then allow them to return to the starting position. Ten repetitions are recommended. This exercise may be done several times a day.