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REGENERATIVE ORTHOPEDICS & PAIN

Plantar Fasciitis

What is plantar fasciitis?

Plantar fasciitis is a painful inflammation of the bottom of the foot between the ball of the foot and the heel.

How does it occur?

There are several possible causes of plantar fasciitis, including:

- wearing high heels
- gaining weight
- increased walking, standing, or stair-climbing.

If you wear high-heeled shoes, including western-style boots, for long periods of time, the tough, tendonlike tissue of the bottom of your foot can become shorter. This layer of tissue is called fascia. Pain occurs when you stretch fascia that has shortened. This painful stretching might happen, for example, when you walk barefoot after getting out of bed in the morning.

If you gain weight, you might be more likely to have plantar fasciitis, especially if you walk a lot or stand in shoes with poor heel cushioning. Normally there is a pad of fatty tissue under your heel bone. Weight gain might break down this fat pad and cause heel pain.

Runners may get plantar fasciitis when they change their workout and increase their mileage or frequency of workouts. It can also occur with a change in exercise surface or terrain, or if your shoes are worn out and don't provide enough cushion for your heels.

If the arches of your foot are abnormally high or low, you are more likely to develop plantar fasciitis than if your arches are normal.

What are the symptoms?

The main symptom of plantar fasciitis is heel pain when you walk. You may also feel pain when you stand and possibly even when you are resting. This pain typically occurs first thing in the morning after you get out of bed, when your foot is placed flat on the floor. The pain occurs because you are stretching the plantar fascia. The pain usually lessens with more walking, but you may have it again after periods of rest.

You may feel no pain when you are sleeping because the position of your feet during rest allows the fascia to shorten and relax.

How is it diagnosed?

Your health care provider will ask about your symptoms. He or she will ask if the bottom of your heel is tender and if you have pain when you stretch the bottom of your foot. An x-ray of your heel may be done.

How is it treated?

Give your painful heel lots of rest. You may need to stay completely off your foot for several days when the pain is severe.

Your health care provider may recommend or prescribe anti-inflammatory medications, such as aspirin or ibuprofen. These drugs decrease pain and inflammation. Resting your heel on an ice pack for a few minutes several times a day can also help.

Try to cushion your foot. You can do this by wearing athletic shoes, even at work, for awhile. Heel cushions can also be used. The cushions should be worn in both shoes. They are most helpful if you are overweight or elderly.

An orthotics sole support, specially molded to fit your foot, may be part of your treatment. These supports can be particularly helpful if you have flat feet or high arches.

If your heel pain is not relieved by the treatments described above, your health care provider may recommend physical therapy. The goals of physical therapy are to stretch the plantar fascia and to strengthen the lower leg muscles, which stabilize the ankle and heel. Sometimes physical therapists recommend athletic taping to support the bottom of the foot. A splint may be fitted to the calf of your leg and foot, to be worn at night to keep your foot stretched during sleep. Another possible treatment is injection of cortisone in the heel. Surgery is rarely necessary.

How long will the effects last?

You may find that the pain is sometimes worse and sometimes better over time. If you get treatment soon after you notice the pain, the symptoms should stop after several weeks. If,

however, you have had plantar fasciitis for a long time, it may take many weeks to months for the pain to go away.

When can I return to my sport or activity?

The goal of rehabilitation is to return you to your sport or activity as soon as is safely possible. If you return too soon you may worsen your injury, which could lead to permanent damage. Everyone recovers from injury at a different rate. Return to your sport will be determined by how soon your foot recovers, not by how many days or weeks it has been since your injury occurred. In general, the longer you have symptoms before you start treatment, the longer it takes to get better.

You may safely return to your sport or activity when, starting from the top of the list and progressing to the end, each of the following is true:

- You have full range of motion in the injured foot compared to the uninjured foot.
- You have full strength of the injured foot compared to the uninjured foot.
- You can jog straight ahead without pain or limping.
- You can sprint straight ahead without pain or limping.
- You can do 45-degree cuts, first at half-speed, then at full-speed.
- You can do 20-yard figures-of-eight, first at half-speed, then at full-speed.
- You can do 90-degree cuts, first at half-speed, then at full-speed.
- You can do 10-yard figures-of-eight, first at half-speed, then at full-speed.
- You can jump on both feet without pain and you can jump on the injured foot without pain.

How do I prevent plantar fasciitis?

The best way to prevent plantar fasciitis is to wear shoes that are well made and fit your feet. This is especially important when you exercise or walk a lot or stand for a long time on hard surfaces. Get new athletic shoes before your old shoes stop supporting and cushioning your feet.

You should also:

- Avoid repeated jarring to the heel.
- Maintain a healthy weight.

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Plantar Fasciitis Rehabilitation Exercises

You may begin exercising the muscles of your foot right away by gently stretching them as follows:

- **Towel stretch:** Sit on a hard surface with your injured leg stretched out in front of you. Loop a towel around the ball of your foot and pull the towel toward your body keeping your knee straight. Hold this position for 15 to 30 seconds then relax. Repeat 3 times.

When the towel stretch becomes too easy, you may begin doing the standing calf stretch.

- **Standing calf stretch:** Facing a wall, put your hands against the wall at about eye level. Keep the injured leg back, the uninjured leg forward, and the heel of your injured leg on the floor. Turn your injured foot slightly inward (as if you were pigeon-toed) as you slowly lean into the wall until you feel a stretch in the back of your calf. Hold for 15 to 30 seconds. Repeat 3 times. Do this exercise several times each day.

When you can stand comfortably on your injured foot, you can begin stretching the bottom of your foot using the plantar fascia stretch.

- **Plantar fascia stretch:** Stand with the ball of your injured foot on a stair. Reach for the bottom step with your heel until you feel a stretch in the arch of your foot. Hold this position for 15 to 30 seconds and then relax. Repeat 3 times.

After you have stretched the bottom muscles of your foot, you can begin strengthening the top muscles of your foot.

- **Frozen can roll:** Roll your bare injured foot back and forth from your heel to your mid-arch over a frozen juice can. Repeat for 3 to 5 minutes. This exercise is particularly helpful if done first thing in the morning.
- **Towel pickup:** With your heel on the ground, pick up a towel with your toes. Release. Repeat 10 to 20 times. When this gets easy, add more resistance by placing a book or small weight on the towel.
- **Static and dynamic balance exercises**
 - A. Place a chair next to your non-injured leg and stand upright. (This will provide you with balance if needed.) Stand on your injured foot. Try to raise the arch of your foot while keeping your toes on the floor. Try to maintain this position and balance on your injured side for 30 seconds. This exercise can be made more difficult by doing it on a piece of foam or a pillow, or with your eyes closed.
 - B. Stand in the same position as above. Keep your foot in this position and reach forward in front of you with your injured side's hand, allowing your knee to bend. Repeat this 10 times while maintaining the arch height. This exercise can be made more difficult by reaching farther in front of you. Do 2 sets.

- C. Stand in the same position as above. While maintaining your arch height, reach the injured side's hand across your body toward the chair. The farther you reach, the more challenging the exercise. Do 2 sets of 10.

Next, you can begin strengthening the muscles of your foot and lower leg by using elastic tubing.

- **Resisted dorsiflexion:** Sit with your injured leg out straight and your foot facing a doorway. Tie a loop in one end of the tubing. Put your foot through the loop so that the tubing goes around the arch of your foot. Tie a knot in the other end of the tubing and shut the knot in the door. Move backward until there is tension in the tubing. Keeping your knee straight, pull your foot toward your body, stretching the tubing. Slowly return to the starting position. Do 3 sets of 10.
- **Resisted plantar flexion:** Sit with your leg outstretched and loop the middle section of the tubing around the ball of your foot. Hold the ends of the tubing in both hands. Gently press the ball of your foot down and point your toes, stretching the tubing. Return to the starting position. Do 3 sets of 10.
- **Resisted inversion:** Sit with your legs out straight and cross your uninjured leg over your injured ankle. Wrap the tubing around the ball of your injured foot and then loop it around your uninjured foot so that the tubing is anchored there at one end. Hold the other end of the tubing in your hand. Turn your injured foot inward and upward. This will stretch the tubing. Return to the starting position. Do 3 sets of 10.
- **Resisted eversion:** Sit with both legs stretched out in front of you, with your feet about a shoulder's width apart. Tie a loop in one end of the tubing. Put your injured foot through the loop so that the tubing goes around the arch of that foot and wraps around the outside of the uninjured foot. Hold onto the other end of the tubing with your hand to provide tension. Turn your injured foot up and out. Make sure you keep your uninjured foot still so that it will allow the tubing to stretch as you move your injured foot. Return to the starting position. Do 3 sets of 10.

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Plantar Fasciitis Exercises



Towel stretch



Standing calf stretch



Plantar fascia stretch



Static and dynamic balance exercises



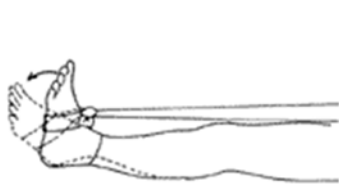
Towel pickup



Frozen can roll



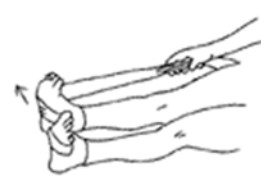
Resisted dorsiflexion



Resisted plantar flexion



Resisted inversion



Resisted eversion

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