What Is Plantar Fasciitis?
Many of us at one time or another experience heel pain and there are many different theories about what causes the problem. The Planar Fascia is a thick band of sinew that covers the entire sole of the foot. It is anchored to the bottom of the Calcaneus or heel bone and fans out to the forefoot -connecting to each toe. There are no muscles attached to the plantar fascia so it doesn’t move any joints. Its role is to provide a tether across the sole of your foot that helps prevent the arch of your foot from flattening out each time you step on it.

For the most part, the heel pain you feel is caused by microscopic tearing within the Plantar Fascia at its point of attachment to the heel bone. The causes for these micro tears include: carrying too much weight, too much or unusual activity and age-related, degenerative changes in the plantar fascia. The micro-tears lead to inflammation, swelling & pain usually felt just under your heel on the inner side, but may sometimes be felt on the outside of the heel. Once your activity ends, the plantar fascia is no longer taut and so the aching improves. Unfortunately, sitting or lying down also allows the inflamed tissue to swell up since it is no longer under tension. When you stand up after resting (especially when getting out of bed in the morning) the now swollen plantar fascia is suddenly stretched as it takes all your weight. This causes quite severe pain until the fluid (which accumulated while you rested) is squeezed out of the plantar fascia during those first few painful steps. You may also develop a limp and develop secondary tightness and sometimes pain in the calf, thigh, and hip muscles as well as your back.
Heel Spurs:
You may have already seen an X-ray of your foot or an X-ray report that shows a heel spur. These can look quite impressive and it seems only logical that it must hurt to walk on a spur. In truth, the heel spur occurs either as a result of calcification of the plantar fascia where it is anchored to the bone or (more commonly) of the muscle next to the plantar fasciitis. Surprisingly, the spur is not usually the cause of heel pain for most of us. Occasionally an especially prominent spur may cause a bursal sac to form on the bottom of your heel.

Clinical experience has lead to the following observations about “heel spurs”:
1. Treatment of the Plantar Fasciitis relieves the heel pain even though the spur remains!
2. Many people have severe heel pain due to Plantar Fasciitis but no spur!
3. Many people have a large heel spur on X-ray but have never experienced heel pain!
4. If surgery is required, the pain can be relieved by partially releasing or cutting the Plantar Fascia without removing the heel spur!

Treatment:
Now that you understand how the pain is generated, you are now better able to make some informed choices about treatment of your heel pain from the remarkable number of options. Our overall goal is to reduce the inflammation and pain in your Plantar Fascia, allow the micro-tears to heal and (if possible) prevent them from recurring. Stretching remains the mainstay of treatment. By regularly or continually stretching the Platar Fascia, you can keep the swelling from recurring and reduce the pain dramatically.

Stretching Your Plantar Fascia:
While sitting, place your sore right heel on the lower thigh of your opposite leg (as though you are sitting cross-legged). Grasp your toes with your right hand so that your fingers are pointing towards your right heel. Pull your toes up towards your right knee firmly. At the same time, massage the sole of your right foot (with your left hand) from the mid arch towards the sore heel. Each stretch/massage should take at least 2 minutes. Each will feel less painful than the previous. A variation of this involves rolling a tennis ball or a rolling pin, under the arch of your sore foot. You might also try freezing a soda bottle (3/4 full of water) and rolling it under your foot.
**Stretching Your Ankle & Calf:**

Stretches should take at least 30 seconds and should be uncomfortable but not painful. If you hold your breath while stretching, you are stretching too hard! Try stretching a little less strongly, but for a longer period of time. Remember you need to relax to let the muscles actually lengthen and you must hold the stretch long enough to give the fluid in the tissue ample time to move away.

- **Ankle Dorsiflexion (Soleus) Stretch**
  - Stand with both feet flat on the floor
  - Slowly bend both knees & press them forward
  - Keep both heels on the ground as you stretch
  - Hold the stretch 30 seconds then slowly straighten up
  - Repeat 5-10 times, 3 sets/day

- **Calf (Gastrocnemius) Stretch**
  - Stand about 2 feet from a wall or door
  - Stand approximately 18” from the wall
  - Place both palms on the wall in front of you at the level of your shoulders
  - Move your affected foot back at least a foot
  - Lean towards the wall while bending the knee on your unaffected side
  - Keep your affected knee straight & tuck your butt in until you feel your upper calf stretch
  - Hold the stretch 30 seconds then slowly relax
  - Repeat 5-10 times, 3 sets/day

**Stretching Splints:**

There are commercially available night splints which combine heel cord stretching with enforced resting of the inflamed tissue. To provide a continuous stretch on the plantar fascia, you can tape the arch of your sore foot or use commercial straps (FAB straps are 1 brand we recommend). These techniques are especially useful at night. The stretching action while you sleep can really help decrease the pain when you first get out of bed. Consider also using an arch support in your shoes (not because of flat feet but to keep further pressure on the plantar fascia thus reducing the swelling while walking).

**Reducing the Inflammation:**

This is vital to your recovery. At first, try to restrict your activity if possible or at least reduce any activities that are especially painful.

Over the counter Non-Steroidal Anti-Inflammatory Drugs (NSAIDS) may help a lot if you can take them without side effects. Prescription NSAIDS may be sometimes reduce these side effects though they may not be any more effective. Ice can help tremendously with swelling and pain.

Shoes with cushioned soles and additional shoe inserts with gel or other anti-shock cushions can help reduce the daily pounding on your feet (as will weight loss if your are overweight). Heel cups seem less effective for Plantar Fasciitis in my experience but they may help.
patients with a painful bursal sac on the bottom of their heel. To provide the most effective cushioning to the heel pad they should be a snug fit and often need to be custom-made by an Orthotist. Rarely, I will apply a walking cast for up to 3 weeks to stretch & rest the plantar fascia.

If all of these previous treatments do not reduce your pain, an injection of cortisone will usually help. Cortisone Injections are painful for a few seconds as I have to inject the medicine directly into the inflamed Plantar Fascia. Even though I mix local anesthetic with the cortisone to numb this pain, it takes a few seconds to deaden the nerve endings during the injection. The cortisone injection usually relieves most, if not all the pain, for up to 4 weeks. During this time it is especially important to continue the stretching program and shoe modifications to prevent its recurrence. Cortisone injections can be repeated if necessary as long as monthly improvement in your condition is occurring. The two major side effects of repeated cortisone injections into the Plantar Fascia are: spontaneous rupture of the fascia (during surgery we cut the fascia anyway), and (rarely) infection at the injection site.

**Strengthening Exercises:**
Marble pick-ups are easily done while sitting. Place some marbles on the floor in front of you. Pick up each marble with your toes and transfer to a suitable receptacle. Repeat for 10 minutes. To prevent personal injury, be sure to pick-up all the marbles before you stand! Towel curls are also done while sitting. Place a towel on a smooth floor in front of you. Keep you heel on the floor and pull the towel towards you using only the toes of your injured foot. Repeat 20 times.
Toe grabs are done while standing with your feet together. Rotate your knees outward and try to grab the floor with your toes. Hold this position for 10 seconds then relax. Repeat 20 times.

**Plantar Fascia Surgery:**
Fortunately this is rarely needed but release of your Plantar Fascia can be performed under local or general anesthesia if all the above treatments fail. Through a 1” incision on the inner side of the bottom of your heel, I surgically divide the inner half of the Plantar Fascia (without removing the spur). This stimulates a new healing process (like any other surgical scar) over the next few months. It is effective in relieving the pain in approximately 80% of patients. While most patients are substantially recovered within a month of surgery, some patients may take up to 6 months to recover.

**Further Information:**
For unbiased further information, go to my web site: [www.orthodoc.aaos.org/jeremyhatchmd](http://www.orthodoc.aaos.org/jeremyhatchmd) click on “patient Information Library” and scroll to Orthopaedic Education Links to the American Academy of Orthopaedic Surgeons web site (bottom of page). There are several excellent links to information on plantar fasciitis & heel pain in the foot & ankle section.

An excellent commercial but very detailed description of Plantar Fasciitis can be found at: [www.heelspurs.com](http://www.heelspurs.com) – Scott’s Booklet on Plantar Fasciitis, Heel Spur, Heel Pain is accurate and very informative. Please note that I do not endorse this web site or their products!