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Inflammation of the plantar fascia a thick band of connective tissue that spans the arch of the foot from the calcaneus (heel bone) to the bases of the toes. (Fig. 1) the function of this tissue is to contribute to support of the longitudinal arch and mechanically is important after the heel comes off the ground as the foot propels the body forward. Individuals with true plantar fasciitis have pain and tenderness along the entire longitudinal arch and the discomfort is accentuated by the foot pushing off.

Heel Pain may be a component of the arch pain associated with plantar fasciitis but is more frequently seen in isolation. Patients with pain and tenderness localized to just the centre, or inner aspect of the heel are given diagnosis of Heel Pain Syndrome (HPS). Although in many instances HPS is likely due to inflammation of the plantar fascia only at its attachment in the heel it may also be due to a number of other factors which can be difficult to diagnose and distinguish from localised plantar fasciitis. These other possibilities include nerve entrapment, stress fracture or bone inflammation and bursitis.

At the initial assessment an X-ray of the heel is usually taken to rule in or out the possibility of a bone causing the pain. Although a heel spur may be identified on this X-ray it remains unclear whether this spur contributes to the pain or not. The fact that many people with this type of spur have no pain, and that removing the spur often does not relieve the pain in patients with HPS cast doubt on its role as a cause of the discomfort.

A surgery for HPS and plantar fasciitis has at best inconsistent results, a detrimented effect in normal foot mechanics and a significant risk of secondary foot pain. Non-operative measures are emphasized in the treatment protocol and surgery is considered only as a last resort. This hand out is a guide to the stretching we have found most effective, which together with custom orthosis (shoe inserts) specifically fabricated for this condition, form the basis of a highly successful program we have put together for this problem.

### **PLANTAR FASCIA PRE-STRETCHING**

Many people with HPS and PF have what is referred to as start up pain. This means that when they first start to walk after lying in bed, or sitting they experience moderate to severe discomfort with the first few steps. This phenomena is caused by tension suddenly developing in the inflamed fascia as it is initially stretched with weight bearing and push off. Prestretching the fascia prior to standing after prolonged immobility will reduce start up pain.

fully extend your knee (i.e. straight out) and place both hands on your knees.

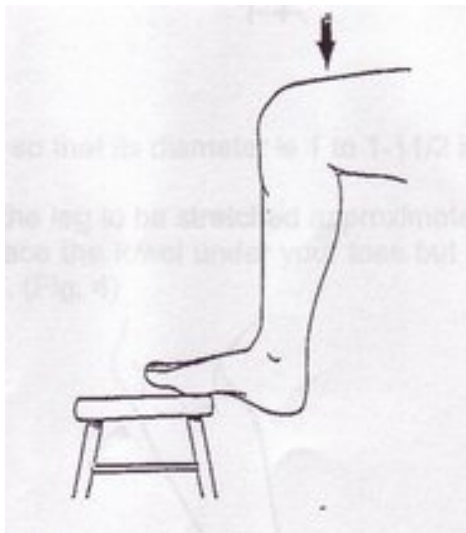
**Step #2** Point your toes towards your head bending your foot upwards at the ankle. The more effort you put into this motion the better the stretch.

**Step #3** Hold this position as long as possible. (Minimum 30 seconds)



**Prestretch #2** (Alternate to #1)

**Step #1** Place the ball of your foot on the edge of a stool while seated with knee flexed.



**Step #2** Exert downward pressure on the knee with your hands. Hold this position for 30 seconds to a minute. Repeat as necessary.

designed to stretch the plantar fascia most effectively, utilizing a mechanical principle known as creep. Creep is a phenomena occurs when a sustained stress is applied to a deformable material. If creep takes place the material (or tissue) does not return to its original length when the force is removed, but rather has undergone some permanent deformation. In the case of the plantar fascia, an increase in length. Therefore these plantar fascia stretches should be sustained for the recommended times to allow creep to occur.

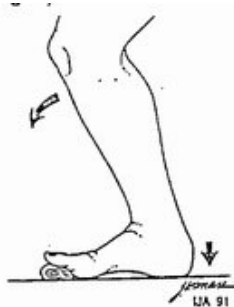
### Stretch #1

- Step #1** Position yourself with the ball of your foot on the edge of a stair.
- Step #2** Holding the rails for balance allow your heels to sink downwards. You should be relaxed and no active muscle contraction in your legs should be necessary.
- Step #3** Hold this position for 4 to 5 minutes.



### Stretch #2

- Step #1** Roll a towel tightly so that its diameter is 1 to 1-1½ inches.
- Step #2** With your toes of the leg to be stretched approximately 1-1½ feet away from a table, or a wall, place the towel under your toes but allow the ball of your foot rest on the ground.



leg straight back for balance.

the ground, now force your knee towards the wall.

**Step #5** This position is difficult to maintain for long periods of time, but the longer you can do it the better. Minimum time for each stretch should be 30 seconds. Total stretching time of 2 to 3 minutes should suffice.

**Stretch #3 Alternative**

**Step #1** Sit with leg crossed, hold toes until tight band is felt.

**Step #2** Hold for a count of 10 and repeat 10 times at least once daily.

