

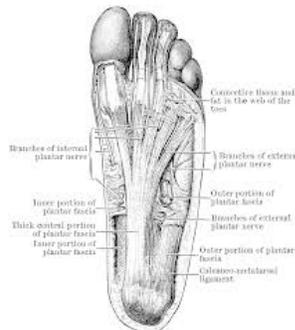
# Foot Pain

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## Plantar Heel Pain

The function of the plantar fascia is to provide static support to the longitudinal arch of the foot. It also assists in providing shock absorption, by stretching during loading. It is tensioned during foot pronation (at mid-stance of walking), and on toe off as dorsiflexion of the toes helps to re-supinate the



runners, ballet dancers, jumping sports, & in army recruits due to repetitive marching.

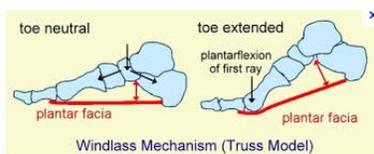
6. Fat pad atrophy. One possible cause of this is corticosteroid injection.

7. Fat pad contusion. This can occur acutely or due to overuse. Pain tends to be more lateral than medial. There is sometimes associated redness.

8. Tarsal tunnel syndrome, leading to posterior tibial nerve entrapment.

Possible causes of plantar heel pain include:

1. Pes planus (flat feet), resulting in increased strain on the fascia.
2. Pes cavus (high arches), due to reduced shock absorption through the foot.
3. Sports which excessively load this area, including running, dancing, and jumping / landing sports.
4. Unsupportive footwear.
5. Overuse, such as an increase in running load, or long hours spent standing / walking.
6. Lack of dorsiflexion range of motion, either due to calf tightness or ankle joint restriction.
7. Restricted 1<sup>st</sup> MTP extension.
8. Tight myofascia of the calf, hamstrings or gluteals.
9. Poor hip control.
10. Weakness of the intrinsic muscles of the foot.
11. High BMI.



supinate the foot (known as the 'windlass mechanism').

Plantar 'fasciitis' is due to a breakdown of collagen at

the origin of the plantar fascia at the heel. It is a non-inflammatory condition, similar to tendinopathy, & for this reason it has been suggested the condition should be re-named "plantar fasciosis".

The classic description is pain underneath or on the medial side of the heel, worse on rising from bed & from sitting, and worse with prolonged weight-bearing. It will affect up to 1 in 10 people in the general population.

**Differential diagnosis:** Other conditions that can cause pain in this region include:

1. Lateral or medial plantar nerve entrapment. The patient will describe pain in the medial heel or ankle region.
2. Tibialis posterior dysfunction. (See our website for a description of this condition).
3. Lumbar spine referral. Direct referral of pain, S1 radiculopathy, or neural tension along the course of the sciatic nerve, can lead to localized heel pain.
4. Bone bruise due to calcaneal trauma.
5. Calcaneal stress fracture. This may occur in

**Investigations:**

Ultrasound may demonstrate thickening / swelling

or hypoechoic changes (similar to Achilles tendinopathy), and sometimes intra-substance tears or rupture.

45% of patients with plantar heel pain have a calcaneal spur (as do 20% of the pain-free population). However the spur has been shown to be unrelated to cause of the pain, and plain X-ray is therefore not recommended.

**Treatment:** depending on the predisposing factors, treatment may consist of:

1. Stretching of the calf, flexor hallucis longus and plantar fascia.
2. Ice after aggravating activities.
3. Fascial releases along the arch using massage techniques, and home stretches with a frozen bottle or golf ball.
4. Deep tissue releases or dry needling for the muscles & fascia of the calf, thigh, or hip region.
5. Mobilisation of stiff joints of the lower limb, particularly the ankle, subtalar, TMT & 1<sup>st</sup> MTP joints.
6. Low dye taping to support the arch.
7. Silicone gel heel pads for short-term pain relief.
8. NSAID's for pain relief.
9. Strengthening for the intrinsic muscles of the foot.
10. Strengthening for the hip & core muscles.
11. Supportive footwear and / or orthotics.
12. Night splinting or a Strasbourg sock.



#### Other interventions:

The use of *corticosteroid injection* is controversial. Most of the literature suggests that this intervention is of no particular benefit for plantar heel pain. It can give short-term relief, but the medium & long-term benefits are unproven. There is good evidence that this treatment increases the risk of plantar fascia rupture. In one study of 765 patients with a diagnosis of plantar fasciitis, 65 were found to have a rupture. 86% of these reported a previous cortisone injection. In another study of 37 patients with rupture, all had received a previous cortisone injection. Long term follow up found that 52% of

these had ongoing problems. Reported complications of plantar fascia rupture include chronic dorsal and lateral mid-foot pain, swelling, foot weakness, lateral plantar nerve dysfunction, hammer-toe deformity, metatarsal pain, and metatarsal stress fracture.

There is conflicting evidence for the use of *extracorporeal shockwave therapy*, which has been trialed for various tendinopathies & for plantar heel pain. There is no evidence for the benefit of *therapeutic ultrasound* or *laser*.

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