

# Information and opinions supplied by the staff at **UP and RUNNING** (Sports Injury Clinics) Ltd

## Article 9: Plantar Fasciitis

### What is it?

Plantar Fasciitis is best described as pain in the sole of the foot or under the heel. It is often in the arch of the foot but can cause pain anywhere from the heel to the ball of the foot. It is characterised by an ache in the underside of the foot on weight bearing. It often follows bouts of exercise particularly running or walking and can appear to change in the exact area of pain, sometimes in the arch, sometimes in the heel etc. It can also manifest itself as a sharp pain under the heel (Policeman's heel). It is often worse in the morning or following prolonged rest as in sitting and eases with moderate activity levels.

The Plantar Fascia is a thick ligament (connective tissue) that runs from the heel to the ball of the foot. This strong tissue contributes to maintaining the arch of the foot under load. Its spring-like properties help cushion impact and assist in the toe-off action when running or walking. Therefore, the stress placed on this tissue during running is great.



### What causes Planar Fasciitis?

Here lies a conundrum! There is little consensus as to what plantar fasciitis is. Many experts believe it to be an inflammatory condition affecting the Plantar Fascia however other experts are not so convinced that it is inflammation at all. Similarly what causes it is also open to interpretation. A trawl of common published material suggests some of the following as possible causes of plantar fasciitis:

1. Overuse - such as too much running
2. Sudden increases in activity levels
3. Flat feet
4. High foot arches
5. Wrong shoe type
6. Overweight or sudden weight gain

7. Pronation/supination on heel strike
8. Tight calf muscles/Achilles
9. Middle age

### **What else could it be? (Differential diagnosis)**

Heel Spurs – a bony growth usually on the heel bone (Calcaneum)

Referred pain from another source – e.g. nerve entrapment

### **What can I do about it?**

This question requires some investigative work on the part of each athlete. Looking at the causes above and working out if any of them apply to you is the first obvious step.

1. How much mileage do you do? The body is a fantastic piece of kit that can adapt itself to the demands you place upon it. Indeed it positively thrives on being worked however like everything else it can be overused and may need rest.
2. Have you increased your mileage recently? If so try reducing the distances to levels that minimise or take away the pain. This is a trial and error method and will take time and patience but may work in the long term. Once you are pain free gradually begin to increase distances over time ensuring that symptoms do not return.
3. Flat feet (Pes Planus), or the opposite
4. High arches (Pes Cavus), are often cited as being causes of Plantar Fasciitis. Whilst there may be something in this theory there does not seem to be consensus here; if high arches are the cause of plantar fasciitis then flat feet ought to cure it and vice-versa? Similarly if flat feet are the cause why hasn't every athlete with flat feet got plantar fasciitis? Working with athletes from around the world one encounters a huge variety of different foot shapes and types but there seems little evidence that foot shape is a pre-cursor for plantar fasciitis. Moreover, putting orthotics in running shoes to correct foot shape seems to be fighting against nature however there are instances where orthotics can correct abnormalities particularly where these are inherited rather than acquired abnormalities. Expert advice must be sought in this case.
5. Shoe type and shoe condition are plausible causes of plantar fasciitis for similar reasons to the arguments stated for foot shape. We each have a natural foot shape, trying to force the foot into an unnatural position for that foot may give rise to problems. Seeking a shoe that fits your particular foot shape would appear to be more logical but may require the skills of an expert to ensure best fit.
6. Over-weight as a cause for plantar fasciitis has some credence given some of the arguments already given but is again not all encompassing. Plantar fasciitis affects all shapes and sizes and there are countless numbers of over-weight

runners who never suffer the condition. Furthermore excessive weight is a relative term; the Plantar Fascia has been proven to have incredible tensile strength and is designed as a shock absorber IF the front part of the foot strikes the ground first. IF being the operative word – many runners who suffer plantar fasciitis run with the heel striking the ground first!

7. The above comment brings me on to a discussion topic of heel strike running as opposed to front foot running. There has been much debate recently over what has been called “bare foot running”. Whilst the name is not immediately connected it effectively means the same as fore foot running since if one were to run in bare feet the tendency is to gradually change to fore foot running due to the pain and discomfort of heel strike (see author’s comments at the end of this article). However let us look at pronation and supination on heel strike as causes of plantar fasciitis. Again some counter arguments here because if pronation were the cause of PF then supination should surely solve the problem and vice versa? There are of course strong arguments to suggest that the kinetics of the foot can be altered in either case thereby causing strain elsewhere. Many years of research on this topic seem not to have yet proved pronation or supination as the cause of PF.
8. Tight calf muscles/Achilles as a cause of PF has many advocates due in part to the fact that the two conditions are often synonymous. Certainly the fascia which eventually becomes part of the plantar fascia is continuous from the head to the toes and has recently been discovered to have contractile tissue (previously it was thought to be inert). This theory however does not explain why the fascia or the calf muscles were tight in the first place.
9. Finally we come to middle age as the cause of PF. Yes many middle-aged people, runners or not, acquire PF but they are certainly not the only age group to suffer. They are however the age-group where running becomes a way of fighting the ravages of ageing. These are often the late developers in running terms and perhaps other factors as discussed earlier come in to play here such as overuse, too much too soon etc. Walkers are also stricken by PF and again these are often those in middle/late age who use walking as the main fitness component. By middle-age there is a general wear-and-tear of the body particularly of the joints but since the PF is not a joint can age be a factor?

### **Authors Comments**

I must stress at the outset that these views are mostly empirical and that the research to corroborate them is in its infancy and, like so much research, may never be proven or disproven. I must also stress that I do not possess all of the answers however after a lifetime of working in sport from grass roots to elite athletes I have encountered Plantar Fasciitis on many occasions. In my early years I used conventional wisdom and traditional methods to treat this condition but with limited success. Over the past 20 years I have developed a totally different perspective that has transformed patient outcomes with PF.

It is asking the question WHY? that brought my thinking to where it is now. Why has this patient got this condition? Why are the calf muscles tight? Why is the pain

stronger after rest? Why does the area of pain change? Why does the intensity of the pain alter from day-to-day or hour-to-hour? Why are there so many different treatments for one simple problem?

There is a common factor in most of the cases of PF and that is tightness in and around the lower leg. I say lower leg because it is not always only the calf muscles that are tight however in the majority of people suffering from PF it is the calf. So why is there lower-limb tightness?

Muscle tightness can be caused by several reasons. One of these reasons is some form of pathology and whilst extremely rare should never be discounted. However let us look at the more common reasons.

1. Doing too much training. This is often the case for example if there are insufficient periods of rest between exercise bouts causing the build-up of residual fatigue. For muscles to become stronger they need to be stressed. Stress causes microscopic damage to the muscles which triggers production of more fibres to cope with that stress but this muscle regeneration occurs during periods of rest – insufficient rest limits this adaptation.
2. Delayed Onset Muscle Soreness or D.O.M.S. is that kind of muscle soreness one gets after doing a new sport or exercise, or too much of an existing exercise, and lasts usually for two or three days. This is more soreness not stiffness but when suffering with DOMS it feels stiff!
3. Muscle strain or tear. This can vary from slight strain to complete rupture or anywhere in between. This stiffness is the body's way of protecting the muscle from further damage. The muscle fibres around the damaged area go into a "protective spasm" in order to stop the damaged fibres from being torn even more.
4. By far the most common form of muscle tightness is neurogenic, an impingement to the nerves that operate that muscle or group of muscles. Muscles are activated by nerve impulses sent from the brain via the nerves to the working muscles. These impulses travel via electrochemical means at around 300 feet per second and tell the muscles which section or sections of muscle need to be recruited for the task. If there is interference to these messages then there is a change to the intensity of the signal and therefore to the muscle tone. This hypertonic muscle state affects not just muscle but fascia too!

This represents a quick overview and is not intended to upset those colleagues of mine in the various university sports science departments in which I have worked or studied. However what it does point to is that if after appropriate rest the muscle tightness, and in this case PF has not resolved it is unlikely to be any of the causes from one to three above and signals time to get some help. By the same token all of the stretches, ice packs, foot rolling, massages etc. will largely prove ineffective in the long term.

The message is a simple one; do not treat the symptoms – find the cause and treat it.

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