

# Using Orthotics to Treat Shin Splints

By Abbie Najjarine  
BSc (Pod) - QMU UK  
Dip Pod - NSW



This condition is not just limited to sporting or highly active people. I have many patients who experience shin splints after being told by their GP to start walking as a means of healthy cardiovascular exercise.

Shin splints is an over-use syndrome and can be directly attributed to excessive supination or pronation. Excessive supination is a general cause of lateral shin splints, whereas excessive pronation is often attributable to medial shin splints.

From my experience, I have observed that at midstance, with the foot pronated and the tibia internally rotated, the tendon is pulled at its attachment to the tibia and the interosseous membrane. This repetitive stress initially produces tendonitis.

Some personal trainers advise their clients to train through the 'pain barrier' of the initial injury. However the chronic traction may produce periostitis. (Bruhner & Khan, 1993; Lorimer et al, 1997).

Understanding the muscles and tendons, and their attachments and insertions is absolutely essential in the diagnosis and treatment of shin splints.

Patients symptoms are also very useful and will assist the practitioner in identifying shin splints, and designing a

successful treatment regime.

Pain in the shin can be separated into 3 areas:

1. Medial shin pain
2. Lateral shin pain
3. Anterior shin pain

**Medial Shin Pain:** occurs when the patient engages in prolonged walking or running uphill. The patient will feel the pain along the tibialis posterior muscle and tendon. Sometimes it can be experienced close to the inferior medial collateral ligament attachment, all the way down to the navicular area.

At times the Tibialis Posterior tendon may slip over the medial malleolus due to tight Tibialis Posterior, attributable to a weak retinaculum. This is more likely associated with repetitive excessive STJ pronation, causing the Tibialis Posterior tendon to elongate as the foot collapses medially, hence causing medial shin pain. This constant elongation will develop minute tears and scarring in the muscle belly, and a pulling away from the tibia, causing inflammation and pain.

Differential Diagnosis: Compartment Syndrome and stress of the tibia.

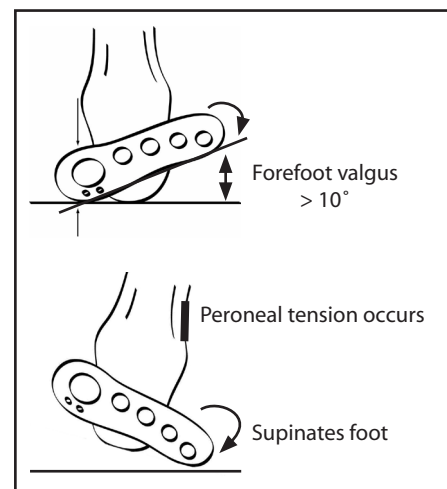
Treatment for Medial Shin Pain

- R.I.C.E technique
- Deep tissue massage therapy - to break down adhesions.
- Suction cup therapy - also to break down adhesion.
- Acupuncture at the point of pain - to reduce the pain.
- Orthotic therapy to control the excessive pronation.
- Low dye strapping - to mimic

orthotic and give additional support (short-term treatment only).

**Lateral Shin Pain:** the patient may feel this pain when undertaking excessive running and walking activities - and is mainly experienced when walking or running downhill. The biomechanical aspects of the foot may be a high forefoot valgus or fixed plantarflexed 1<sup>st</sup> ray, both of which may cause a supinatory effect.

When the foot is supinated it causes extreme stress on the peroneals and may cause elongation of the muscles and tendons. This is likened to medial shin splints in that the peroneal tendons may also slip off the lateral malleolus anteriorly causing irritation of the tendon. This is associated with weak retinaculum and tight peroneals trying to elongate to take up the slack of the forefoot deformity (see Fig. 1).



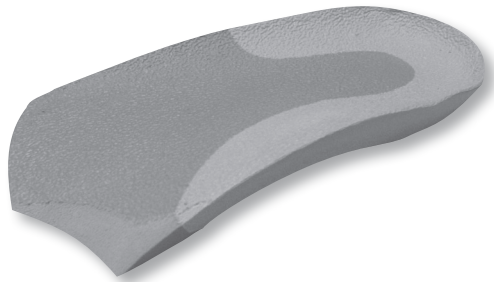
**Figure 1:** In gait the valgus forefoot inverts the foot to get ground contact, causing lateral shin pain (Anterior View).

This means that as the forefoot valgus (in gait) wants to reach the ground, it throws the foot into supination, hence tearing the peroneal muscles and causing inflammation and tenderness to touch, and difficulty walking.

Differential Diagnosis: Compartment Syndrome and stress of the tibia.

### Treatment for Lateral Shin Pain

- R.I.C.E. technique
- Deep tissue massage along the peroneal muscles.
- Suction cup therapy to break up scarring and adhesions.
- Acupuncture at the point of pain.
- Strapping with a valgus wedge added for short term relief.
- Orthotic therapy (with the appropriate forefoot additions) to control the supination.
- Add a 1<sup>st</sup> ray cut-away to the orthotic if the patient has a plantarflexed first ray (see Figure 3).



**Figure 3:** Orthotic with a 1<sup>st</sup> Ray Cut-Away Modification

Anterior Shin Pain: the patient normally feels the pain after running or walking and is mainly associated with uphill and downhill walking and running.

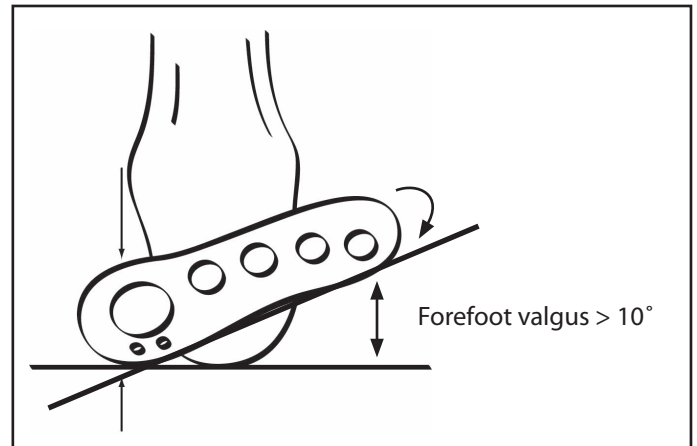
Biomechanically, it is related to supination at heel strike and then pronation at the mid stance to toe off stage.

During the gait cycle the Tibialis Anterior muscle inverts the foot for ground clearance at late swing phase. If there is a forefoot valgus of  $>10^\circ$  the foot will supinate at heel strike and the ground reaction force on the lateral side will then throw the foot into pronation at mid stance of gait to toe off. In this circumstance the Tibialis Anterior will elongate and cause tearing to occur at the muscle belly especially on the

lateral tibial crest and cause adhesion.

In short, during swing phase the tibialis anterior contracts causing the foot to invert and dorsiflex. At lateral foot strike the ground reaction forces propel the foot into pronation in early midstance to late midstance, causing a sudden pull of the tibialis anterior. This firstly causes a shortening of the tibialis anterior, then a sudden lengthening of the tibialis anterior from midstance to the toe-off stage.

Differential Diagnosis: Compartment Syndrome and stress of the tibia.



**Figure 4:** Anterior View

### Treatment for Anterior Shin Pain

- R.I.C.E. technique.
- Deep tissue massage at the Tibialis Anterior and along the lateral tibial crest.
- Suction cup therapy
- Acupuncture on the adhesion to help break down scarring.
- Orthotic therapy - not only to control pronation, but also the supination at heel strike.

### References:

BRUNKER, P., & KHAN, K. (1993) Clinical Sports Medicine, Sydney: McGraw-Hill Book Company

LORIMER, D., FRENCH, GWEN, & WEST, S. (1997) Neales Common Foot Disorders: Diagnosis and Management, 5th Edition, Melbourne: Churchill Livingstone