

### Shin splints – or compartment syndromes

In the lower leg the muscles are divided into four compartments by fascia and the inter-osseous membrane that runs between the tibia and fibula, the two bones of the lower leg. This can lead to 'compartment syndromes' whereby inflammation or swelling in the muscles is contained by the fascia leading to pain due to compression of nerve tissue and ultimately to a compromising of the arterial blood supply.

Medial and anterior compartment syndromes are commonly known as 'shin splints' and are usually caused by abrupt changes in training routine, such as training on hard surfaces when usually training on soft, sprint training when used to doing distance work or just substantially increasing the amount of training being done.

The muscles of the anterior compartment are the anterior tibialis & extensors longus hallucis & digitorum & the deep structures are the anterior tibial artery & the deep peroneal nerve. Anterior compartment syndrome is common in runners due to the decelerative action of the anterior compartment muscles in stopping the foot 'slapping' when it hits the ground whilst running. It is made worse by hard surfaces & participation in prolonged unaccustomed exercise. Pain will manifest itself down the lateral side of the tibia. Whether swelling in this compartment is due to trauma or overuse, the first line of treatment is anything which reduces the inflammation.

The muscles of the medial compartment are the posterior tibialis and the flexors longus hallucis and digitorum. The deep structures are the posterior tibial artery and nerve. Medial compartment syndrome is the most common of the compartment syndromes and manifests itself by pain down the medial side of the tibia. These muscles play an important role in stabilising the ankle, plantar flexion (moving the foot downwards from the ankle as in pointing the toes) and eversion of the foot (rolling the outer border of the foot upwards towards the outside of the knee). Again, reduction of inflammation is a priority.

The lateral compartment comprises peroneus longus and brevis and the lateral popliteal nerve. The posterior compartment comprises gastrocnemius, soleus and plantaris. Syndromes in these compartments are rare. Lateral compartment syndrome can be brought on by a new pair of shoes changing the angle of inversion during exercise. If posterior compartment syndrome is experienced it usually affects the gastrocnemius when the knee is extended (straightened) and the ankle dorsi-flexed (bent up towards the knee) stretching the muscle to its limit, and can be acute (rapid) in onset. Injury is usually in the medial belly. Plantaris can be implicated in knee pain and soleus can bring on the compartment syndrome by increasing in size through training.