

## Shin splints

*Synonym: medial tibial stress syndrome*

### What are shin splints?<sup>[1]</sup> <sup>[2]</sup>

This is a complex syndrome characterised by exercise-induced pain in the lower leg. However, the term is not diagnostically precise and can be open to misinterpretation.

Medial tibial pain can be caused by stress fractures, periostitis, tendinopathy (tibialis posterior) and compartment syndrome (rarely). Interosseous membrane tears and fascial hernias are extremely rare causes.

Medial tibial stress syndrome is a common condition in active individuals, including athletes and military personnel. It presents as diffuse pain along the posteromedial border of the tibia associated with activity. Terminology for medial tibial stress syndrome has historically included such terms as shin splints, medial tibial syndrome, tibial stress syndrome, and soleus syndrome.<sup>[3]</sup>

Lateral shin splints are caused by anterior [compartment syndrome](#).

With experience, the diagnosis can be made from the history and careful palpation to elicit particularly any tenderness. MRI scan is the most useful investigation.

### What causes shin splints? (Aetiology)<sup>[2]</sup>

Excessive or unbalanced pronation may be a cause of shin splints. Contributing factors include varus hindfoot, excessive forefoot pronation, genu valgum, excessive femoral anteversion, and external tibial torsion.

# How common are shin splints? (Epidemiology)

[4]

- Shin splints tend to occur most often in athletes, military personnel and dancers. [5] [6]
- The incidence ranges 4-35% in athletic and military populations.
- Female gender, previous history of shin splints, fewer years of running experience, orthotic use, increased body mass index, increased navicular drop, and increased external rotation hip range of motion in males are all significantly associated with an increased risk of developing shin splints. [7] [8]
- People who are unfit who suddenly start exercising are at risk of developing a stress fracture of the tibia.
- Contributing factors may include varus hind foot, excessive forefoot pronation, genu valgum, excessive femoral anteversion and external tibial torsion.

## Symptoms [1]

The history is particularly important to make a precise diagnosis. Stress fractures should be considered in any patient who presents with tenderness or oedema after a recent increase in activity or repeated activity with limited rest. [9]

The pain and tenderness may be severe and are localised to the posteromedial border of the middle and distal third regions of the tibia. However, note particularly:

- Stress fracture causing crescendo pain (the person has to stop running). Tenderness is usually more localised with stress fractures.
- With other causes the pain initially tends to occur after running but later also occurs during running (although not enough to cause the person to stop running usually).
- When severe, climbing stairs can also be painful.
- In compartment syndrome the patients stop running after about fifteen minutes. The pain eases with rest straightaway although the muscle feels very tight (but with no bony tenderness).

# Differential diagnosis

Pain over the anterior aspect of the proximal tibia is often caused by referred pain from the patellofemoral joint ([anterior knee pain](#)). Other causes of shin pain include:

- Stress fracture (localised bone tenderness and overlying oedema).
- Chronic compartment syndrome (lateral shin pain may be due to a compartment syndrome of the tibialis anterior - see 'Lateral shin splints', below).
- Muscle strain.
- Tumour.
- Infection.
- [Paget's disease of bone](#).
- Tabes dorsalis.

## Investigations<sup>[1]</sup>

- X-rays: these are usually normal in periostitis; initial X-rays may be normal with stress fractures and so repeat X-rays are often indicated if clinical suspicion persists (bone scan is much more sensitive and preferred if available).
- MRI and bone scintigraphy have comparable specificity and sensitivity. It is important to first make a clinical diagnosis of shin splints because of high percentages of positive MRI scans in asymptomatic patients.<sup>[10]</sup>

## Shin splints treatment<sup>[1]</sup>

There is only limited evidence for specific methods of prevention. Stretching exercises, modification of training schedules and the use of protective devices such as braces and insoles are often advocated for prevention.<sup>[11]</sup>

- Rest is the key to treatment of stress fractures and periostitis.
- Management in the acute stage is rest, ice, mild elevation and a non-steroidal anti-inflammatory drug (NSAID).

- Advise the patient to wear shock-absorbing insoles in shoes and maintain fitness with non-weight-bearing exercises such as swimming or cycling.
- Once symptoms subside, the patient should start a steadily increasing exercise programme.
- A podiatrist can fit orthotics to prevent hyperpronation, if this is the causative factor.
- Stress fractures may take up to 12 weeks to heal completely. [2]
- Casting may be indicated.
- Fasciotomy of the posterior superior compartment may be indicated in severe cases. [2]

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## Further reading

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