

Shin Splints (Medial Tibial Stress Syndrome)

Shin splints is the name often given to exercise-induced pain in the lower leg, specifically along the front of the leg between the knee and the ankle - the area known as the shin. The exact cause of shin splints is not certain but they tend to be as a result of overuse and typically occur in runners. Rest is the most important treatment. Shock-absorbent insoles in your training shoes, graduated running programmes and regularly replacing your training footwear may help in prevention.

What are shin splints?

Shin splints is the name often given to exercise-induced pain in the lower leg, specifically along the front of the leg between the knee and the ankle - the area known as the shin.

Shin splints are really a symptom rather than a specific diagnosis because they are probably caused by a number of different problems. Shin splints are one of the most common problems in the lower leg in people who exercise or play sports.

In typical shin splints, pain is felt more over the medial (inner) part of your shin. Pain felt over the lateral (outer) part of your shin may not be due to shin splints and may be due to a compartment syndrome in your leg.

Shin splints are sometimes called medial tibial stress syndrome.

What causes shin splints?

Experts do not all agree on the cause of shin splints and the exact cause is not known. They are thought to be caused by overuse or overactivity and typically occur in runners. There are certain things that have been suggested that may make shin splints more likely. These include:

- A sudden increase in training frequency or intensity.
- A lack of calcium.
- Hard running surfaces.
- Running up an incline
- Previous leg injury.
- Poorly fitted or inadequate running shoes that do not support the foot and ankle.
- Various problems with muscles in the lower leg and foot position, including over-pronation of the foot.

(The foot (and ankle) normally roll slightly inward when we move. Over-pronation is where the foot rolls inward more than normal.)

Some experts suggest that shin splints are caused by small tears in the structure of the membrane between the two bones of the leg below the knee (the tibia and fibula). This structure is called the interosseous membrane. Others suggest that they may also be caused by inflammation of tendons (tendonitis), muscle sprains, or inflammation of the membrane surrounding the tibia and fibula bones (periostitis). Tiny fractures (microfractures) in the surface of the tibia have also been suggested as a cause.

What are the symptoms of shin splints?

The main symptom is pain in the shin area. The pain tends to be in the middle and lower shin and on the medial (inner) half. Pain first comes on after running or exercising. However, over time, the pain can come on during running or exercising. If severe, it may also come on when climbing stairs.



What else could the pain be?

Stress fractures of the tibia (one of the two bones in the leg below the knee) can also cause shin splint-type pain. A stress fracture is a type of incomplete fracture in a bone. Stress fractures tend to occur as a result of overuse and are known as overuse injuries.

Do I need any tests?

X-rays are usually normal in people with shin splints. The main reason that your doctor may suggest an X-ray of your leg below the knee is to rule out a stress fracture in one of the bones. However, not all stress fractures show up on X-rays.

In some cases, your doctor may refer you for a bone scan of your lower leg. This can help to differentiate between shin splints and a stress fracture. A bone scan involves an injection of a very small amount of radioactive material, usually into a vein in your arm. A gamma camera is then used that can detect the radiation emitted by the injected material. This can show up a stress fracture or changes that can occur in the bones in shin splints. An MRI scan is also sometimes used to help to tell the difference between shin splints and stress fractures.

What is the treatment?

Rest. This is the main treatment for shin splints. This means avoiding any activity, such as running, that may have led to the shin splints.

Ice. Applying ice to your shin and raising your leg may also help to relieve pain from shin splints. You can make an ice pack by wrapping ice cubes in a plastic bag or towel. (Do not put ice directly next to skin as it may cause an ice burn.) A bag of frozen peas is an alternative. Gently press the ice pack on to the injured part. The cold from the ice is thought to reduce blood flow to the damaged ligament. This may limit pain and inflammation. After the first application, some doctors recommend re-applying for 10 minutes every two hours (during the daytime) for the first 48 hours.

Elevation of the leg aims to limit and reduce any swelling. Keep the foot up on a chair to at least hip level when you are sitting. (It may be easier to lie on a sofa and to put your foot on some cushions.) When you are in bed, put your foot on a pillow.

Painkillers such as paracetamol are useful to ease pain. It is best to take these regularly initially. Anti-inflammatory painkillers are an alternative. There are many types and brands. They relieve pain and may also limit inflammation and swelling. Side-effects sometimes occur with anti-inflammatory painkillers. Stomach pain, and bleeding from the stomach are the most serious. Some people with asthma, high blood pressure, kidney failure, and heart failure may not be able to take anti-inflammatory painkillers.

What is the prognosis (outlook)?

With rest and treatment, you can fully recover from shin splints. However, they may recur if you do not look at the underlying cause of your shin splints.

When you have recovered from your shin splints, you may benefit from seeing a specialist such as a sports physiotherapist or a podiatrist. They may be able to help you to modify your exercise programme and may also be able to assess your legs, feet and shoes. This may show up some problems that may have caused your shin splints, such as over-pronation of your foot or poorly fitting training shoes. They may suggest the insertion of an insole inside your shoes.

Can shin splints be prevented?

Studies and trials have been done to look at preventing shin splints. No single prevention method has been found to be consistently effective and further trials are needed. However, one of the things that does show some promise is the use of shock-absorbent insoles inside shoes while you are exercising. Special insoles to correct over-pronation of your foot (if you have this) may also be helpful. You should also regularly replace your running shoes. Graduated running programmes that build in rest days may also help.

Further reading & references

- [Shin Splints/Medial Tibial Stress Syndrome](#), Wheeless' Textbook of Orthopaedics
- [Craig DJ](#); Medial tibial stress syndrome: evidence-based prevention. *J Athl Train.* 2008 May-Jun;43(3):316-8.
- [Story J, Cymet TC](#); Shin splints: painful to have and to treat. *Compr Ther.* 2006 Fall;32(3):192-5.
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Original Author: Dr Michelle Wright	Current Version: Dr Colin Tidy	Peer Reviewer: Dr John Cox
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