

# Shin Pain and Athletes

Shin pain occurs most often in athletes involved in running, jumping, or high-impact sports. It can be caused by shin splints (also called *medial tibial stress syndrome*), a stress fracture of the tibia or fibula, or compartment syndrome (Figure 1). The most common cause of shin pain in runners is shin splints.

## Symptoms

For all the different causes of shin pain, athletes often feel pain, burning, or tightness along the shin at first. Here are particular symptoms of bone- and muscle-related shin pain.

Bone-related shin pain symptoms may include

- Pain in a very focal area of the shin (fingertip pain)
- Pain during and after running
- Pain that gets worse over time

Muscle-related shin pain symptoms may include

- Mild soreness
- Tightness or pressure in the shins with running
- Pain only with running, relieved by rest
- No pain with pushing on the bone
- Numbness, tingling, or weakness in the foot

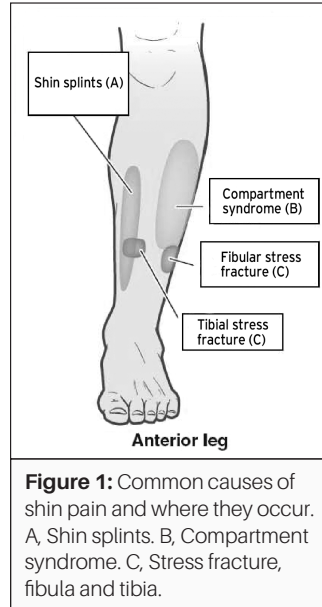
## Causes

Shin pain generally results from one or more of these issues.

- **Body mechanics (the way the body moves while in motion).** Athletes may experience pain due to poor body mechanics. Body mechanics can be influenced by different factors. For example, how a runner runs may be affected by foot type, running style, and hip and core (abdominal and back) muscle strength.
- **Too much exercise.** If athletes increase the amount or intensity too quickly, this can cause a problem. A helpful reminder is the “10% Rule”: no more than a 10% increase in frequency, duration, or intensity of exercise per week.
- **Bone density (bone strength).** Softer bones break more easily, so if a stress fracture did not result from poor body mechanics or rapid increases in training, low bone density might be the problem. The causes of *low bone density* include
  - Genetics. Low bone density tends to run in families.
  - Not enough calcium in the diet. The daily amount of calcium recommended for children and teens 9 to 18 years is 1,300 mg/d.

This is equal to 3 to 4 servings of milk, yogurt, cheese, or other sources of calcium.

- Irregular menstrual periods. Periods are irregular when they do not occur for more than 3 months or when less than 9 periods occur in 12 months. This can cause low levels of the hormone estrogen. Estrogen can help maintain appropriate bone density levels.



**Figure 1:** Common causes of shin pain and where they occur. A, Shin splints. B, Compartment syndrome. C, Stress fracture, fibula and tibia.

## Diagnosis

**Shin splints.** Before shin splints can be diagnosed, the doctor will need to examine the athlete and review their symptoms. A stress fracture is suspected when shin pain becomes more severe or more localized (in a focal area). Or there may be risk factors for weaker bones.

If needed, the doctor will order X-rays. X-rays may show a stress fracture if enough time has passed to see healing (4–6 weeks). However, X-rays can appear normal even with a stress fracture. Magnetic resonance imaging (MRI) may be needed to confirm a stress fracture.

**Compartment syndrome.** Athletes with compartment syndrome will have normal findings on X-rays and no evidence of bony abnormalities with bone scan or MRI, so they need another test. Compartment syndrome is confirmed by measuring pressure through a needle inserted into the muscle both before and after exercise.

## Treatment

A period of rest from running and other impact injuries may be needed for the stress fracture or shin splints to heal. Although the athlete may be able to run with shin splints, continuing to do so may cause the shin splints to progress to a stress fracture. During rest, cross-training with nonimpact activities (such as using an elliptical machine, biking, swimming, and weight lifting) can be done if the athlete is pain-free.

Ice and acetaminophen are effective for pain. However, nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen or naproxen, may actually slow the healing of some stress fractures. Other treatments like bone stimulators are controversial. In very rare cases, rest is not enough for a fracture to heal, and surgery is needed.

## Prevention

Shin splints and stress fractures can be reduced by allowing time to gradually build up to higher levels of impact (increase the level by no more than 10% per week). Because stress fractures in the shin usually start with shin splints, identifying and treating shin splints—before they progress—can prevent stress fractures. Maintaining healthy bone through a good diet (high in vitamin D and calcium), safe weight loss practices, and attention to any menstrual problems may also reduce the risk for stress fracture.

Compartment syndrome is more difficult to prevent. However, balancing low-impact conditioning with high-impact conditioning and selecting softer surfaces for running may be of help.

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