

## Shin Splints

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The body is a wonderfully designed, complex arrangement of many different systems that – when healthy – work flawlessly together. While they don't always seem to tell us *what* we've done to irritate them, they have a certain knack for telling us *when* we've done too much. Such is the case with shin splints. Sometimes called "tibial stress syndrome," shin splints is a global term for aching pain in the lower leg, mostly associated with increased activity such as running or jumping. Pain is typically moderate to severe during activity, but can resolve quickly with rest and inactivity. Responsible for up to 13% of all running injuries, the pain and dysfunction associated with shin splints is very clear and tangible; the underlying cause however is much cloudier and sometimes controversial.

The lower leg (shin) is basically comprised of two bones, a main ligament connecting them, and a variety of muscles attaching to some or all of the three supporting structures. The Tibia is the large shin bone, on the inside of the lower leg. It articulates with the Femur (large thigh bone) to form the knee joint, and traverses to meet the foot and form the ankle. The bump on the inside of the ankle is actually the end of the Tibia. The Fibula is the smaller, more lateral shin bone which sits just below the knee and traverses down, forming the outside ankle bone. These two bones are connected together with a ligamentous-like structure called "the interosseous membrane." Additionally, the lower leg houses multiple muscles which cross the ankle and attach to the foot. Many are responsible for moving the ankle and/or the toes. Activities such as running or jumping require forceful action of these muscles in order to overcome body weight and gravity.

While it is clear that shin splints are the result of some pathology to the above-mentioned structures, the exact cause is often unknown. There is little doubt that the pain experienced is a result of increased activity, stress to the structures, and local inflammation or irritation. However, multiple theories exist. Research has been unable to determine whether the pain is specifically from inflammation of the bone or muscle, irritation of the interosseous membrane, tendonitis, increased pressure in the lower leg, or stress fracture of the tibia.

It is clear that certain factors commonly precipitate shin splint pain:

- An overall increase in higher level activity such as running or jumping is typically associated with the onset of pain.
- Activity on hard surfaces such as concrete or macadam, hard ground following a lack of rain, or wearing a rigid cleat or poorly cushioned shoes has been found to be associated with shin splints.
- Tightness or weakness in the muscles of the lower leg can not only affect the ability of the body to perform higher level activity without pain, it can also lead to misalignment of the foot and ankle.
- Foot pronation (or flat feet) is one such alignment issue that minimizes the body's ability to distribute forces for better shock absorption during activity.

The probability of shin splint pain can be minimized a variety of ways:

- Cross training on different surfaces can be beneficial;
- Running on an all-weather track or treadmill will provide a softer surface for landing;
- Using an elliptical trainer or bike will provide cardiovascular activity with less weight bearing;
- Shoes should be supportive and well cushioned, designed for the activity at hand;
- A good stretching and strengthening program, as well as a progressive warm up period prior to activity will enhance function of the muscles in the lower leg;
- Effects of pronation can be minimized by using arch-supporting shoe inserts;
- For severe cases, custom orthotics can be made.

When prevention fails, we must take measures allowing the inflammation and pain to subside:

- Rest is the key;
- Abstaining from activity will enhance healing and prevent further injury;
- Icing the shins daily for several days is often effective at decreasing pain and inflammation;
- Using anti-inflammatory medication – ibuprofen, naproxen, or aspirin can be helpful.

If pain persists despite these efforts, physical therapy is effective at further decreasing inflammation and stresses through the use of modalities and the prescription of appropriate stretching and strengthening exercises.

As the underlying inflammatory pathology must resolve, return to activity can not be rushed, or symptoms will return. Guidance from your CPRS Physical Therapist or Athletic Trainer may be beneficial to insure proper rehabilitation has occurred and that appropriate measures have been taken to avoid reoccurrence. As a rule, return to activity is appropriate only when one is able to fully do so without pain. Playing “through the pain” is unadvisable with shin splints, and will likely lead to increased pathology and a longer recovery.

Though a common injury in sports today, the underlying pathology of shin splints continues to be debated. Proper prevention techniques are beneficial in minimizing the risk of developing shin splints, but they can not always be avoided. Should symptoms occur, proper measures are required to restore full pain free function. Continued pain and dysfunction should be addressed with a physician or with your CPRS Physical Therapist. Should you have any additional questions or concerns, feel free to contact the closest CPRS Physical Therapy location via [www.cprsweb.com/locations.asp](http://www.cprsweb.com/locations.asp).

### **References**

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