



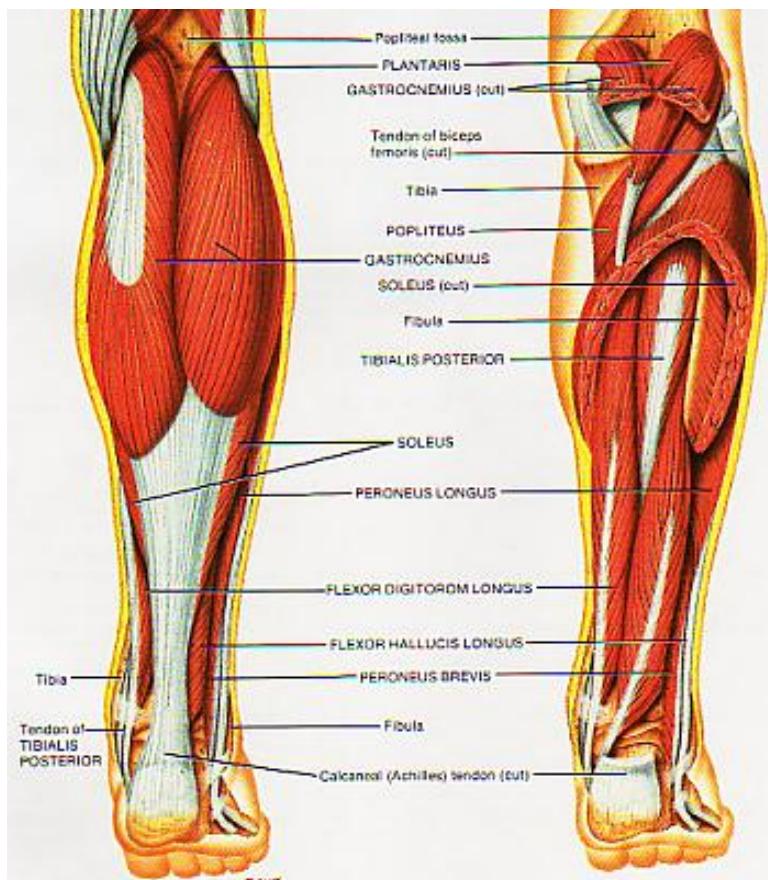
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Shin Splints

Although the term shin splints is often used to describe a variety of lower leg problems, it actually refers specifically to a condition called Medial Tibial Stress Syndrome (MTSS). To better understand shin splints, or MTSS, let us have a look at the muscles, tendons and bones involved.



As you can see from the diagram to the right, there are many muscles and tendons that make up the lower leg, or calf region. It's quite a complex formation of inter-weaving and over-crossing muscles and tendons.

The main components of the lower leg that are affected by the pain associated with shin splints are:

- The Tibia and Fibula.

These are the two bones in the lower leg. The tibia is situated on the medial, or inside of the lower leg. While

the fibula is situated on the lateral, or outside of the lower leg.

- There are also a large number of the muscles that attach to the tibia and fibula. It's these muscles, when overworked, that pull on the tibia and fibula and cause the pain associated with shin splints.

Specifically, the pain associated with shin splints is a result of fatigue and trauma to the muscle's tendons where they attach themselves to the tibia. In an effort to keep the foot, ankle and lower leg stable, the muscles exert a great force on the tibia. This excessive force can result in the tendons being partially torn away from the bone.

What Causes Shin Splints?

While there are many causes of shin splints, they can all be categorized into two main groups. Overload (or training errors), and Biomechanical Inefficiencies.

Overload (or training errors): Shin splints are commonly associated with sports that require a lot of running or weight bearing activity. However, it is not necessarily the added weight or force applied to the muscles and tendons of the lower leg, but rather the impact force associated with running and weight bearing activities.

In other words, it's not the running itself, but the sudden shock force of repeated landings and change of direction that causes the problem. When the muscles and tendons become fatigued and overloaded, they lose their ability to adequately absorb the damaging shock force.

Other overload causes include:

- Exercising on hard surfaces, like concrete;
- Exercising on uneven ground;
- Beginning an exercise program after a long lay-off period;
- Increasing exercise intensity or duration too quickly;
- Exercising in worn out or ill-fitting shoes; and
- Excessive uphill or downhill running.

Biomechanical Inefficiencies: The major biomechanical inefficiency contributing to shin splints is that of flat feet. Flat feet lead to a second biomechanical inefficiency called over-pronation. Pronation occurs just after the heel strikes the ground. The foot flattens out, and then continues to roll inward.

Over-pronation occurs when the foot and ankle continue to roll excessively inward. This excessive inward rolling causes the tibia to twist, which in-turn, over stretches the muscles of the lower leg.

Other biomechanical causes include:

- Poor running mechanics;
- Tight, stiff muscles in the lower leg;
- Running with excessive forward lean;
- Running with excessive backwards lean;
- Landing on the balls of your foot; and
- Running with your toes pointed outwards.

How to Prevent Shin Splints

Prevention, rather than cure, should always be your first aim. I was very surprised when researching this topic at the number of articles that totally neglected any mention of preventative measures. They all talked of treatment and cure, but only one out of twenty took the time to address the issue of prevention in any detail.

Even before any sign of shin soreness appears there are a number of simple preventative measures that can be easily implemented.

Since about half of all lower leg problems are caused by biomechanics inefficiencies, it makes sense to get the right advice on footwear. Your feet are the one area you should not "skimp" on. The best advice I can give you concerning footwear, is to go and see a qualified podiatrist for a complete foot-strike, or gait analysis. They will be able to tell you if there are any concerns regarding the way your foot-strike or gait is functioning.

After your foot-strike has been analysed, have your podiatrist, or competent sports footwear sales person recommend a number of shoes that suit your requirements. Good quality footwear will go a long way in helping to prevent many lower leg problems.

Apart from good footwear, what else can you do? The following three preventative measures are not only very effective, but crucial.

Firstly, a thorough and correct warm up will help to prepare the muscles and tendons for any activity to come. Without a proper warm up the muscles and tendons will be tight and stiff. There will be limited blood flow to the lower legs, which will result in a lack of oxygen and nutrients for those muscles.

Secondly, flexible muscles are extremely important in the prevention of most lower leg injuries. When muscles and tendons are flexible and supple, they are able to move and perform without being over stretched. If however, your muscles and tendons are tight and stiff, it is quite easy for those muscles and tendons to be pushed beyond

their natural range of movement. To keep your muscles and tendons flexible and supple, it is important to undertake a structured stretching routine.

- Kneeling position, the runner points his toes out behind and gently sits back on heels pressing the tops of the feet towards the ground.
- Standing arm's length from the wall, place hands on wall, keep feet and knees straight, lean forward as far as possible.
- Standing with feet flat, bend knees forward as far as possible keeping heels on floor.

And thirdly, strengthening and conditioning the muscles of the lower leg will also help to prevent shin splints.

- With a partner hold down the others feet which are flat on the ground. With resistance on their toes, have them lift their toes up.
- Sitting with left ankle on right knee, apply pressure to inside of foot (near large toe) with hand, and turn foot up and in, using leg muscles.
- Same position as above, apply pressure to outside of foot (near small toe) with hand, and turn foot down and out using leg muscles.
- Same position as above, apply pressure to top of foot (near toes) with hand, and lift foot using leg muscles. Repeat with right ankle on the left knee.
- Sitting on a table or chair attach a weight (a bucket filled with rocks works well) around the foot. Without bending your knee move the foot up and down from the ankle.
- Anchor one end of an elastic band to the leg of a table or sofa. Stretch the band, and then loop it around the end of the foot. Move the foot up and down and side to side against the bands resistance.
- Draw each letter of the alphabet with the big toe of each foot in the air.
- While standing erect raise up and down onto your toes several times. If that is too easy you can make it more challenging by performing the same exercise while standing on a step and allow your calves to stretch over the edge of the step.
- In a sitting position lower and raise the feet with the heels on the ground as high and quickly as possible for 60 seconds. I have athletes do this exercise during the school day while sitting at their desk.
- Walking down steep hills.
- Walking on toes.
- Walking on heels.
- Walking with feet turned inward and outward.
- With socks off, gather up a towel that is flat on the floor, using only the toes.

- Pick up marbles using the toes.
- Off-season training. One of the most effective ways to eliminate shin splints is to do some type of running in the off season. An increase in mileage should never exceed more than 10% per week.