

## What is it?

Shin splints, also called medial tibial stress syndrome or periostitis, is an overuse injury of the lower leg. It is caused by overuse of the lower leg muscles (calf, posterior tibial and flexor muscles of the toes). These muscles are important in maintaining your balance during standing, running and jumping. They attach to the shin (tibia) and repeated traction pulls at the attachment leading to inflammation of the periosteum: the fibrous layer that surrounds the bone.

## Symptoms

Symptoms of shin splints are sharp pains over the inside of the shin above the ankle (*figure 1*). The pain often affects both legs and gets worse when playing tennis (especially on a hard court surface), jumping, sprinting or jogging. Initially the pain improves after a good warm up but it then returns during exercise and persists after exercise.

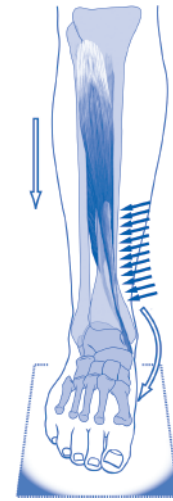


figure 1. Shin splints (periostitis)

## First Aid

It is advisable to modify your exercise pattern. You will need to reduce playing and training, but you do not have to stop altogether. Use ice to cool the area: hold an ice cube inside a tea towel and massage the sore area of bone for ten minutes on each leg. Make sure that your shoes are not worn out and that they provide good support and cushioning.

Have a (sports) physician or a (sports) physiotherapist examine the injury if it does not improve.

## How to Ensure the Best Recovery

Pain is an important signal and you should only return to exercise when the severe pain has subsided. If you are in pain - do not play or train through the pain as this will delay recovery. The rehabilitation program involves 3 tiers of exercise, working your way from light to demanding. Here are the stages, with instructions and tips for doing the exercises.

### Stage 1. Improving Normal Function

- Stretching of the deep calf muscles (*soleus, figure 2*). Take a step forwards - keeping the heel of the back leg on the ground. Bend the knee of the back leg as far as possible while keeping the heel on the ground. If necessary lean against a wall or hold onto a chair for support. You should feel a stretch low in the calf muscles. Hold it for 15 to 20 seconds. Rest for 10 to 20 seconds and then repeat the stretch protocol three times.
- Strengthening of the foot muscles (*figure 3*). The muscles in the foot help to maintain the foot arch and absorb shock, which can help in preventing shin splints. While sitting in a chair, write the letters of the alphabet in the air with your big toe – from A to Z. Lay a towel on the ground in front of you and use the toes to scrunch the towel up using gripping movements of the toes.
- Strengthening of the anterior shin muscles (*figure 4*). To strengthen the muscles at the front of the shinbone, lift the toes and foot towards the shin against the resistance of a rubber band. Perform three sets of 10 to 15 repetitions. The alternative, which requires some additional skill, is to bounce a tennis or football on your foot.
- Balancing exercises for the ankle (*figure 5*). Stand on one leg and spread your arms wide to keep your balance. Hold for 30 seconds. To make the exercise more difficult, bounce a tennis ball against a wall or close your eyes and rise up onto your toes.
- Strengthening the hip/buttock muscles (*figure 6*). This will prevent rotation of the thigh and hip while running and help reduce the load on the shinbone. Lie on your right side with your legs straight. Contract the muscles in the thigh and pull your toes up. Lift the left leg sideways, keeping the knee straight, until the foot is 20 to 30cm above the ground. Hold the leg in this position for 3 seconds and then lower it slowly. Perform this exercise slowly and build up to three sets of 15 repetitions. Perform this exercise with the other leg as well.
- Maintain your aerobic fitness: cycle, swim or aqua-jog for 15 to 30 minutes each day to maintain cardiovascular fitness.

## Stage 2. Build-up

As soon as you are able to perform the exercises described above without discomfort, you can consider returning to sport. Listed below are a few exercises to improve your sporting fitness.

- Strengthening the calf muscles. Stand with your toes and metatarsal heads on the edge of a wooden step or bench (with your heel in the air) and stand up on tiptoes. Slowly lower yourself down until your heels are below the step/bench and you feel a good stretch in your calves. Take great care not to slip off the edge of the step/bench – do not do this exercise wearing socks or on steps that are carpeted. The exercise should be performed with a straight knee and then with a slightly bent knee. Do three sets of 10 to 15 repetitions.
- Make small quick steps on the spot, shifting support between the left and right leg.
- If this goes well, you can start running. Start off jogging and progress to short gentle sprints, followed by turning and pivoting exercises. Eventually you can include maximal sprints in the exercise.
- Following this you can do jumping exercises, such as hopping, skipping and lateral jumps (skating jumps) on alternate legs.

## Stage 3. Return to Play

If the injury is minor, there is no need to stop playing tennis altogether as long as you adapt your training in a sensible fashion. With more serious injuries, you should be able to return to training within six to twelve weeks.

- Try to play on clay courts as much as possible and avoid hard courts.
- Adapt your training programme by restricting the amount of running you have to do. Start off hitting the ball from inside an area measuring two square meters (approx. two square yards). In this way you can practise your footwork (taking small steps, positioning yourself correctly to hit the ball) without putting excess strain on the shins.
- If the adapted training goes well, you can gradually start doing more vigorous exercise, and increasing the distance you have to run to reach the ball (tennis drills from corner to corner).
- After this, introduce low volleys and serves and finally jump smashes can be added to the training program. When jump smashes can be performed without pain, you can resume playing practice matches.
- If you are pain free for two weeks of practice matches you are ready to get back to playing competitively.

## Preventing Re-injury

It is not always possible to prevent shin splints but these tips may help you:

- Be sure to perform a thorough warming-up before every training session or match - including stretching exercises for the calf muscles.
- You can use massage to help the recovery of the deep calf muscles after heavy training or matches. Do not use friction massage on the shinbone itself.
- The most common cause of shin splints is too much tennis. Remember this and watch out for periods in the year when the number of training sessions and matches increases quickly. Try to make any increase gradual.
- Shin splints are more common on hard courts than clay courts. If possible, play on softer surfaces and do any jogging on grass or soft paths.
- Wear properly fitting tennis shoes when playing tennis, and properly fitting trainers when working out. It is essential that the shoes are adapted to your weight and to the surface you will be playing on. Shoes should have good stability, good arch support and suitable shock absorption. If you over pronate, choose shoes with an anti-pronation device.
- If you have any (moderate) foot deformity, such as a bunion (hallux valgus) or high arches, you may need to wear special shoe inserts (orthotics). These should be custom made so that they help to correct your individual problem.

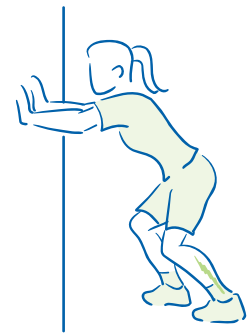


figure 2. Stretching of the short calf muscles (soleus)

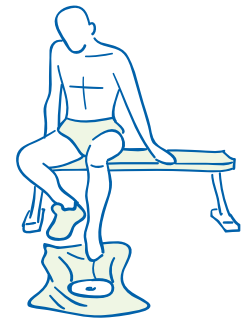


figure 3. Strengthening of the muscles of the foot

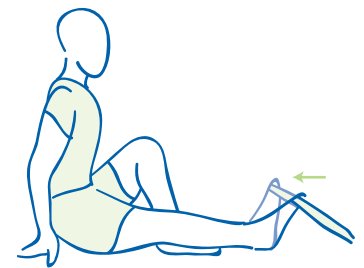


figure 4. Strengthening of the anterior shin muscles



figure 5. Balance exercise for the ankle

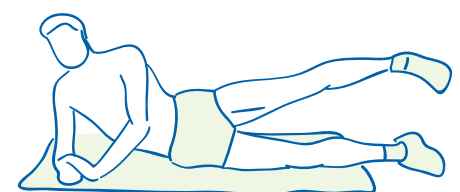


figure 6. Strengthening of the hip muscles