



Medial Tibial Stress Syndrome (Shin Splints)

DESCRIPTION

Shin splints is a term broadly used to describe pain in the lower extremity brought on by exercise or athletic activity. Most commonly it refers to medial tibial stress or *periostitis*, an inflammation of the lining of the bone (periosteum).

COMMON SIGNS AND SYMPTOMS

- Pain in the front or more commonly in the inner part of the lower half of the shin (lower leg), above the ankle
- Pain that initially occurs after exercise, progressing to pain in the beginning of exercise that lessens after a short warm-up period
- With continued exercise and left untreated, constant pain that eventually causes the athlete to stop sports participation

CAUSES

Shin splints are caused by overuse from repetitive activity, which leads to breakdown of the tissues. Continued activity without repairing the breakdown leads to inflammation of the lining of the bone and the tendon insertions into the bone and its lining. This breakdown exceeds the ability of the tendon and periosteum to heal completely, resulting in injury, more inflammation, and pain.

FACTORS THAT INCREASE RISK

- Weakness or imbalance of the muscles of the leg and calf
- Poor physical conditioning (strength, flexibility)
- Inadequate warm-up and stretching before practice or play
- Sports that require repetitive loading or running, such as marathon running, soccer, walking, and jogging, particularly on uneven terrain or hard surfaces (concrete)
- Lack of conditioning early in practice or early in the season
- Poor running technique
- Flat feet
- A sudden change in activity level, distance, or intensity of a workout

PREVENTIVE MEASURES

- Appropriately warm up and stretch before practice and competition.
- Maintain appropriate conditioning that includes leg and ankle flexibility, strength and endurance, and cardiovascular fitness training.

- Ensure proper shoe fit with adequate cushioning.
- Wear cushioned arch supports.
- Use proper technique, and have a coach correct improper technique.
- Gradually increase activity and intensity, rather than doing so suddenly.
- Run on surfaces that absorb shock, such as grass, composite track, or sand.

EXPECTED OUTCOME

Shin splints are usually curable with appropriate treatment and a slow return to activity, which may take from 2 weeks to 2 or more months.

POSSIBLE COMPLICATIONS

- Frequent recurrence of symptoms may result in a chronic problem; appropriately addressing the problem the first time decreases the frequency of recurrence.
- Healing time is prolonged if the injury is not appropriately treated or not given adequate time to heal.
- Performance can be affected, or the athlete may need to end sports participation because of pain if activity is continued without treatment.

GENERAL TREATMENT CONSIDERATIONS

Initial treatment consists of rest; medications and ice to relieve pain; stretching and strengthening exercises of the foot, ankle, and leg; and modification of the activity that initially caused the problem. These can all be carried out at home for acute cases, although referral to a physical therapist or athletic trainer for further evaluation and treatment may be recommended. Arch supports (orthotics) for flat feet may also be indicated. Taping, casting, or bracing the leg may be recommended, and a slow return to activity is allowed after pain is gone. Rarely, surgery is attempted to remove the chronically inflamed tissue.

MEDICATION

- Nonsteroidal antiinflammatory medications, such as aspirin and ibuprofen (do not take for 7 days before surgery), or other minor pain relievers, such as acetaminophen, are often recommended. Take these as directed by your physician, and contact your doctor immediately if any bleeding, stomach upset, or signs of an allergic reaction occur.
- Topical analgesic ointments may be of benefit.
- Pain relievers may be prescribed as necessary. Use them only as directed, and take only as much as you need.

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HEAT AND COLD

- Cold is used to relieve pain and reduce inflammation for acute and chronic cases. It should be applied for 10 to 15 minutes every 2 to 3 hours as needed and immediately after any activity that aggravates your symptoms. Use ice packs or an ice massage.
- Heat may be used before performing stretching and strengthening activities prescribed by your physician, physical therapist, or athletic trainer. Use a heat pack or a warm soak.

WHEN TO CALL YOUR DOCTOR

- Symptoms get worse or do not improve in 4 to 6 weeks despite treatment.
- New, unexplained symptoms develop. Drugs used in treatment may produce side effects.

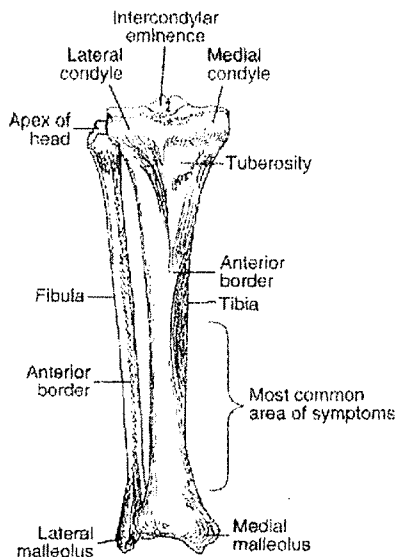
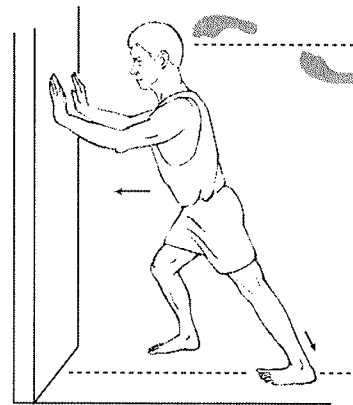


FIGURE 1 From Nicholas JA, Hershman EB: *The lower extremity and spine in sports medicine*, St Louis, 1995, Mosby Year Book, p 852; modified from Clanton TO, Schon LC: Athletic injuries to the soft tissues of the foot and ankle. In Mann RA, Coughlin MJ, eds: *Surgery of the foot*, ed 6, St Louis, 1993, CV Mosby.

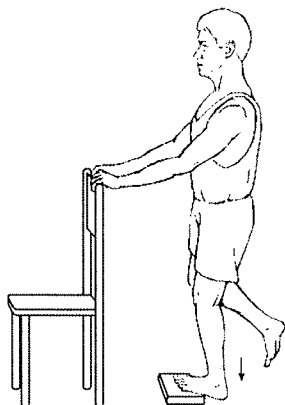
RANGE OF MOTION AND STRETCHING EXERCISES
 Medial Tibial Stress Syndrome

These are some of the *initial* exercises you may use to start your rehabilitation program, until you see your physician, physical therapist, or athletic trainer again, or until your symptoms resolve. Please remember:

- Flexible tissue is more tolerant of the stresses placed on it during activities.
- A *gentle* stretching sensation should be felt.

**FLEXIBILITY • Gastrocnemius Stretch**

1. Stand one arm's length from the wall as shown. Position the calf muscle to be stretched behind you as shown.
2. Turn the *toes in* and *heel out* of the leg to be stretched.
3. Lean toward the wall, leading with your waist and allowing your arms to bend. First do this exercise with your knee straight, then bend it slightly. *Keep your heel on the floor at all times.*
4. Hold this position for ____ seconds.
5. Repeat this exercise ____ times, ____ times per day.



FLEXIBILITY • Gastrocnemius Stretch

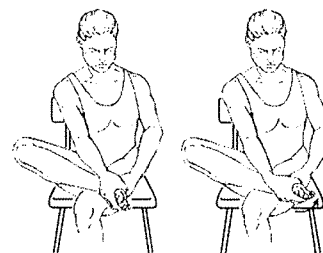
Note: This exercise can place considerable stress on your foot and ankle and should only be done after specifically checking with your physician, physical therapist, or athletic trainer.

1. Place your toes and the ball of your foot on a stack of books or on the edge of a stair. Your heel should be off the ground.
2. Hold on to a chair or stair rail for balance, and allow your body weight to stretch your calf.
3. First do this exercise with your knee straight, then bend it slightly.
4. Hold this position for ____ seconds.
5. Repeat this exercise ____ times, ____ times per day.



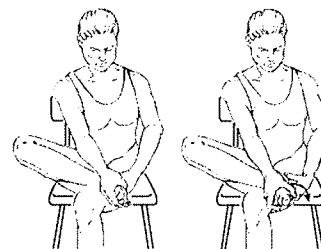
RANGE OF MOTION • Ankle Plantarflexion

1. Sit in the position shown.
2. Using your hand, pull your toes and ankle down as shown so that you feel a gentle stretch.
3. Hold this position for ____ seconds.
4. Repeat this exercise ____ times, ____ times per day.



RANGE OF MOTION • Ankle Inversion

1. Sit with your weak leg crossed over the other leg.
2. Grip your foot as shown, and turn the sole of your foot up and in so that you feel a gentle stretch on the outside of your ankle.
3. Hold this position for ____ seconds.
4. Repeat this exercise ____ times, ____ times per day.



RANGE OF MOTION • Ankle Eversion

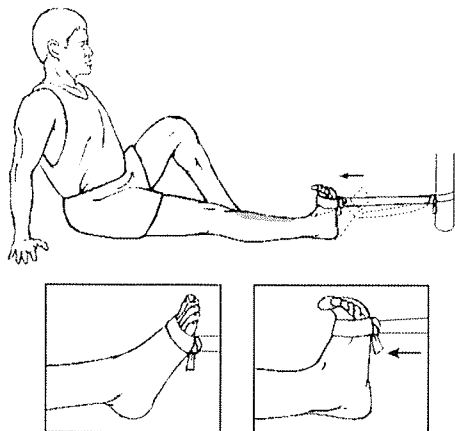
1. Sit with your weak leg crossed over the other.
2. Grip the foot as shown, and turn the sole of your foot up and out so that you feel a gentle stretch on the inside of your ankle.
3. Hold this position for ____ seconds.
4. Repeat this exercise ____ times, ____ times per day.

STRENGTHENING EXERCISES Medial Tibial Stress Syndrome

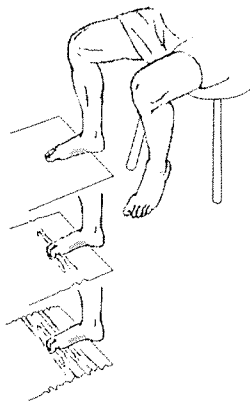
These are some of the *initial* exercises you may use to start your rehabilitation program, until you see your physician, physical therapist, or athletic trainer again, or until your symptoms resolve. Please remember:

- Strong muscles with good endurance tolerate stress better.
- Do the exercises as *initially* prescribed by your physician, physical therapist, or athletic trainer. Progress slowly with each exercise under their guidance, gradually increasing the number of repetitions and weight used.

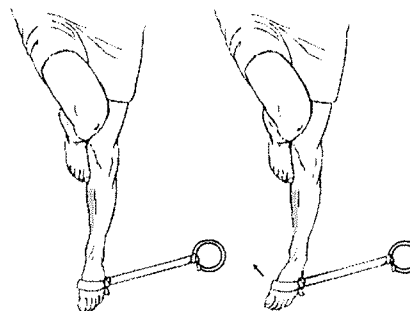
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**STRENGTH • Dorsiflexion**

1. Attach one end of an elastic band to a fixed object, such as the leg of a table or desk. Loop the other end around your foot as shown.
2. *Slowly* pull your foot toward you. Hold this position for ____ seconds, and *slowly* return to the starting position.
3. Repeat this exercise ____ times, ____ times per day.

**STRENGTH • Towel Curls**

1. Sit in a chair on a noncarpeted floor. Place a towel in front of you, and place your foot on the towel as shown. You may also stand to do this exercise.
2. Pull the towel toward you with your toes, keeping your heel on the floor. Move the towel with your toes only. Do not move your knee or ankle.
3. If this is too easy, place a light weight—a book, hand weight, or canned food—at the far end of the towel.
4. Repeat this exercise ____ times, ____ times per day.

**STRENGTH • Ankle Inversion**

1. Attach one end of an elastic band to a fixed object, such as the leg of a table or desk. Loop the other end around your foot.
2. Turn your foot in as far as possible, attempting to push your little toe down and in. Hold this position for ____ seconds.
3. *Slowly* return to the starting position.
4. Repeat this exercise ____ times, ____ times per day.