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# How can you help athletes prevent and treat shin splints?

## Evidence-based answer

Encourage patients who are concerned about shin splints to decrease the intensity of their running; suggest rest and ice and foot orthoses, to treat the condition. Reducing running intensity probably reduces lower extremity soft tissue injuries (strength of recommendation [SOR]: **B**, low-quality randomized controlled trials [RCTs]), although doing stretching exercises doesn't. Rest and ice alone promote faster recovery than rest and ice combined with nonsteroidal anti-inflammatory drugs

(NSAIDs), a walking cast, or heel-cord stretching. (SOR: **B**, low-quality RCT). Although foot orthoses or insoles don't prevent lower limb injuries (SOR: **A**, systematic review), they do significantly relieve symptoms and promote return to running (SOR: **C**, poor-quality cohort studies). Lower limb fasciotomy can reduce symptoms caused by shin splints in athletes, but the rate of return to previous level of sports activity is modest at best (SOR: **C**, case series).

## Clinical commentary

### Review, rest, follow-up

Shin splints are an early indicator of abnormal stresses that cause periostitis along the tibia. Medial tibial stress syndrome (MTSS) is best thought of as part of a continuum, with shin splints at the mild end and tibial stress fracture at the severe extreme. I find that reviewing biomechanical forces and training schedules often helps prevent and treat injury. Aging footwear and training errors, including a rapid increase in training volume, are common culprits when biomechanics are normal. Adequate rest to allow the body to respond to the stresses

of training can help prevent stress-related injuries.

My treatment regimen for shin splints includes a period of relative rest that allows the runner to remain active but reduces the stresses placed on the tibia and musculature of the lower leg. Relative rest may comprise either reducing running distance and intensity or changing the mode of exercise to deep water running or cycling. Consider follow-up examination to ensure that the tibial pain doesn't become more localized, indicating a possible stress fracture.

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## Evidence summary

MTSS, or shin splints, is the most common cause of exertional leg pain in athletes. MTSS is an overuse injury characterized by pain along the posteromedial aspect of

the distal two-thirds of the tibia.

### Reduced running time, frequency, and distance may prevent injury

A systematic review of 12 trials of 8806

## FAST TRACK

### Stretching exercises don't reduce lower extremity soft tissue injuries

mostly young male military recruits, evaluated nonsurgical interventions to prevent lower limb soft tissue running injuries, including MTSS.<sup>1</sup> Five trials investigating stretching and 4 trials of shoe insoles showed no benefit. Three studies showed that reducing the duration of running (to between 15 and 30 minutes), frequency (to 1 or 3 days a week), or distance (to 16.5 fewer kilometers over 12 weeks) reduced the risk of all injuries. Methods and outcome measures of the studies were heterogeneous, limiting the generalizability of these results.

A prospective RCT of custom semi-rigid shoe orthoses in the boots of Danish army recruits found a significantly lower prevalence of MTSS at 3-month follow-up in the intervention group (13% compared with 24%,  $P=.005$ ;  $NNT=5$ ).<sup>2</sup> However, a systematic review of methods to prevent MTSS in sports found no high-quality studies in nonmilitary populations.<sup>3</sup> No difference in the incidence of MTSS was noted with shoe inserts, different combat boots, or stretching routines.

### **To treat shin splints, consider orthotics, rest, and ice**

Two studies retrospectively surveyed runners about their response to orthotics to treat MTSS.<sup>4,5</sup> In one study, 16 of 41 collegiate cross-country runners were prescribed orthotics; 14 (88%) reported relief or improvement in their symptoms and return to running within 4 weeks.<sup>4</sup> The other survey, of long-distance runners, found that 70% who had used or were using orthotics for a presumed diagnosis of MTSS reported complete relief or great improvement.<sup>5</sup>

A study of 97 US naval midshipmen who developed MTSS during summer training programs compared randomly assigned treatments of rest and ice to rest and ice plus anti-inflammatory medication (aspirin or phenylbutazone), rest and ice plus heel-cord stretching, or use of a short walking cast for 1 week.<sup>6</sup> Subjects assigned to a treatment program of rest and ice alone lost significantly fewer days

from running than the other treatment groups ( $P<.03$ ).

A recent RCT of soldiers with MTSS compared treatment with a leg orthosis with no orthotic use; all subjects underwent icing and activity modification.<sup>7</sup> No significant differences in outcome measures (days to completion of a 0.5-mile run, global rating of change, or number of treatment sessions) were noted between the treatment groups. Small sample size, high dropout rate, and small effect size limit the power of this study.

### **Fasciotomy can relieve symptoms but may not improve postop activity**

Three case series reported on deep posterior compartment fasciotomy to treat MTSS in athletes.<sup>8-10</sup> Surgery significantly reduced pain levels ( $P<.001$ ) by an average of 72% on the visual analog pain scale for 46 patients who had failed conservative therapy for at least 12 months.<sup>8</sup> However, only 41% returned to their pre-symptom level of sports activity. Another case series of mostly running athletes reported that 21 (78%) of 27 patients exhibited excellent or good healing after surgery.<sup>9</sup> In a series of 9 patients with an average of 39 months of symptoms, 5 reported complete relief at follow-up ( $42\pm 6$  months), and 7 trained more than they had preoperatively.<sup>10</sup>

One case series of superficial posterior compartment fasciotomy for MTSS in 35 athletes reported that, among the 32 athletes available for follow-up, 72% (23) reported improved symptoms, but 69% (22) had a lower level of activity postoperatively.<sup>11</sup>

### **Recommendations**

The American College of Sports Medicine (ACSM) recommends at least 7 to 10 days of rest from painful activities to treat MTSS.<sup>12</sup> Running in a pool and cycling to maintain aerobic fitness during the rest period are considered safe activities. Stretching and strengthening exercises are not recommended while symptoms persist. Patients should return to running

## **FAST TRACK**

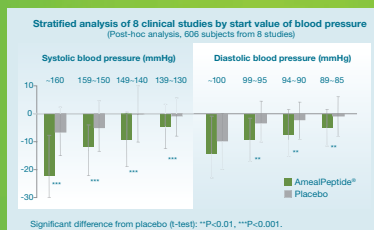
**Worn shoes and training errors are common culprits when biomechanics are normal**



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gradually. ACSM also suggests that orthotics are useful for preventing injury and treating some patients. ■

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