Summary

A clinical classification and treatment programme has been developed for chronic medial tibial stress syndrome. Medial tibial stress syndrome has been reported to be either tibial stress fracture or microfracture, tibial periostitis, or distal deep posterior chronic compartment syndrome. Three chronic types exist and may coexist: Type I (tibial microfracture, bone stress reaction or cortical fracture); type II (periostalgia from chronic avulsion of the periostea at the periosteal-fascial junction); and type III (chronic compartment syndrome). Type I disease is treated nonoperatively. Operations for resistant types II and III medial tibial stress syndrome were performed in 41 patients. Bilaterality was common (type II, 50% type III, 88%). Seven had coexistent type II/III; one had type I/II. Preoperative symptoms averaged 24 months in type II, 6 months in type III, and 33 months in types II/III. Mean age was 22 years (15 to 51). Resting compartment pressures were normal in type II (mean 12 mm Hg) and elevated in type III and type II/III (mean 23 mm Hg). Type II and type II/III patients received fasciotomy plus periosteal cauterisation. Type III patients had fasciotomy only. All procedures were performed on an outpatient basis using local anaesthesia. Follow up was complete and averaged 6 months (2 to 14 months). Improved performance was as follows: type II, 93%; type III, 100%; type II/III, 86%. Complete cures were as follows: type II, 78%; type III, 75%; and type II/III, 57%. This experience suggests that with precise diagnosis and treatment involving minimal risk and cost the athlete has a reasonable chance of return to full activity.

For the past 20 years there have been various reports in the literature on patients with exercise-induced pain along the shin and especially along the anteromedial edge of the distal third of the tibia and the soft tissues just posterior to the bone, a condition commonly called 'chronic shin splints'. Authors have described this problem as primarily a stress fracture (Devas 1958; Stanitski et al. 1978; Walter & Wolf 1977), a medial tibial periostitis (Clement 1974; Mubarak 1982) or a distal deep posterior compartment syndrome (Byrk & Grantham 1983; Davey et al. 1984; Puranen 1974; Wallensten & Eriksson 1982). Since this cluster of problems was not clearly understood, Puranen (1974) advocated the use of the term 'medial tibial syndrome' and Mubarak (1982) 'medial tibial stress syndrome' as most appropriate for this condition. Few would disagree that the term 'chronic shin splints' has had such an imprecise history that it has served as much to obfuscate as illuminate discussions of this topic (Rasmussen 1974). Indeed, precise clinical descriptions of patient's symptoms
and findings are so frequently lacking, it is impossible to determine how to compare reports by one investigator to those of another (Bates 1985).

A clinical classification system and management programme for patients with chronic medial tibial stress is proposed in this article to clarify this problem for athletes. The classification system acknowledges the existence of all 3 of the above mentioned entities, but with some elaboration of aspects of each. The importance of using the classification system for the successful diagnosis, management, and prognosis of each type cannot be overemphasised. Posterior tibial tendonitis also occurs in this general anatomical area but its clinical features generally do not give rise to confusion in terms of diagnosis or treatment (Scheuch 1984).

Although the proposed classification system describes specifically the medial tibial stress syndrome, it applies equally to any case of chronic shin splints in other locations of the leg. It is the common contiguous presentation of these problems along the medial tibia that has led to the controversy about this syndrome, its causes, and its proper management. The exact incidence of chronic medial tibial stress is unknown but is less common than its acute counterpart. Acute shin splints occurred in 3.5% of midshipmen in a study by Andrich et al. (1974) and medial tibial stress syndrome represented 9.4% of 1179 patients seen in one sports medicine clinic (Orava 1980).

In this article detailed findings from a group of 41 patients who were evaluated and surgically treated for 2 forms of chronically resistant medial tibial stress syndrome will be discussed (Detmer, unpublished). All patients were seen at the University Hospital, University of Wisconsin-Madison, were treated between 1978 and 1984, and were drawn from an annual university student body of approximately 42,000 and students from numerous colleges and high schools around the state and nation. The incidence of chronic medial tibial stress, however, is not clarified by this article. No patients were lost to follow-up, and the mean postoperative follow-up was 6 months (2 to 12). A further description of the study population is presented in the context of each class of patients.

The proposed classification refers to chronic medial tibial stress syndrome. A patient is defined as having a chronic problem if he/she experiences precisely located pain which regularly reappears following at least one or more periods of rest sufficient to produce complete resolution of symptoms and if symptoms recur despite a programme of graded exercise and rehabilitation with proper equipment including orthotics, and despite the application of standard conservative therapeutic modalities such as icing.

The classification system separates the chronic problems of these patients into 3 basic types. Since the presence of one type does not preclude the co-existence of another type, multiple diagnoses can and do occur. However, virtually all patients can be differentiated into isolated or mixed examples of the 3 categories on the basis of clinical evaluation and the differing clinical course of each type.

1. Classification of Medial Tibial Stress Syndrome

The normal cross-sectional anatomy of the medial tibia is shown in figure 1. The critical anatom-