



LAURA M. ANDERSON, BPhysio, MMuscPhysio^{1,2,3} • STUART J. WARDEN, PT, PhD, FACSM, FASBMR^{4,5} • RICHARD W. WILLY, PT, PhD⁶
DANIEL R. BONANNO, BPod, PhD^{2,3} • HYLTON B. MENZ, BPod(Hons), PhD, DSc, FAHMS^{2,3}

Medial Tibial Stress Syndrome Needs a New Name—Make No Bones About It

WHAT'S IN A NAME?

Pain near the posteromedial border of the distal tibia is common, especially with activities that repetitively load the legs, including running, dancing, marching, and jumping. It has had many names over the years. What began as “shin soreness” evolved into “shin splints,” but the vague and nonspecific term “shin splints” never gained clinical traction.

Other names have been proposed to describe the condition, including “tibial fasciitis” and “tibial periostitis.” These names suggest a specific tissue source, but the underlying pathology remains elusive. More recently, “medial tibial stress syndrome” (MTSS) has entered the lexicon, as a way to better reflect the etiology. However, clinicians, athletes, and coaches find “tibial stress” confusing because it inaccurately implies the presence of a bone stress injury. Appropriate naming is important for effective communication with athletes and coaches, and in

developing and understanding strategies for managing and preventing tibial pain.

WHAT CAUSES PAIN NEAR THE POSTEROMEDIAL TIBIAL BORDER?

DIFFUSE MEDIAL LEG PAIN WITHOUT a clear isolated anatomical injury can be difficult to diagnose, and studies investigating pain near the posteromedial border of the distal tibia have found no conclusive or consistent evidence regarding the pathoanatomy or

pathophysiology.⁴ The periosteum and fascia have been implicated, with leading theories being that the pain is caused by traction at the origins and/or friction between the tendons of soleus, tibialis posterior, and flexor digitorum longus. However, people with clinically diagnosed MTSS have no greater occurrence of periosteal and tendinous changes than active asymptomatic counterparts.^{5,9}

Another prevailing trend is to classify MTSS as a bone stress injury. In a recent Delphi study, 72% of experts agreed that MTSS was a bone stress injury, although consensus was not reached.² Bone has been implicated, in part, after local microdamage and elevated cortical porosity were observed.^{1,10} However, microdamage was only found in 50% of biopsy specimens, and greater porosity and locally reduced cortical volumetric bone mineral density are normal responses to elevated loading.⁷ The tissue source or underlying pathology of medial leg pain is unknown.

IT'S TIME FOR SOME (TIBIAL) STRESS RELIEF

WHAT IS CURRENTLY CALLED “MTSS” is diagnosed clinically by the presence of exercise-induced pain along the posteromedial tibial border that can be provoked on palpation over a length of ≥ 5 consecutive centimeters.⁸ This definition does not always rule out other causes of exercise-induced leg pain,

● **SYNOPSIS:** Pain near the posteromedial tibia is common in running and jumping athletes. This problem has had many names, with “shin splints” and “medial tibial stress syndrome” (MTSS) the most common. The term shin splints is nonspecific and nondescript, and has never gained clinical traction. Similarly, the clinical use of MTSS with athletes and coaches is often met with confusion as “tibial stress” is frequently misinterpreted as indicating a bone stress injury. With no conclusive evidence regarding the pathophysiology of MTSS, we advocate renaming it “Load Induced Medial-Leg

Pain” (LIMP). LIMP avoids the use of “tibial stress,” which is problematic due to the unknown pathology of the condition and its confusion with bone stress injury. Using the term LIMP instead of MTSS gives clinicians, researchers, and athletes a clearer, more accurate way to approach managing exercise-related lower leg pain. *J Orthop Sports Phys Ther* 2025;55(10):621-622. Epub 18 August 2025. doi:10.2519/jospt.2025.13411

● **KEY WORDS:** bone, lower leg, medial tibial stress syndrome, running, tibia

¹The Injury Clinic, South Geelong, Australia. ²Discipline of Podiatry, School of Allied Health, Human Services and Sport, La Trobe University, Melbourne, Australia. ³La Trobe Sport and Exercise Medicine Research Centre, School of Allied Health, Human Services and Sport, La Trobe University, Melbourne, Australia. ⁴Department of Physical Therapy, School of Health & Human Sciences, Indiana University Indianapolis, Indianapolis, IN. ⁵Indiana Center for Musculoskeletal Health, Indiana University School of Medicine, Indianapolis, IN. ⁶School of Physical Therapy and Health Sciences, University of Montana, Missoula, MT. ORCID: Anderson, 0000-0002-1287-3293; Warden, 0000-0002-6415-4936; Willy, 0000-0002-1249-228X; Bonanno, 0000-0002-0825-0608; Menz, 0000-0002-2045-3846. The authors certify that they have no affiliations with or financial involvement in any organization or entity with a direct financial interest in the subject matter or materials discussed in the article. Address correspondence to Laura M. Anderson, The Injury Clinic, 100 Fyans St, South Geelong, VIC 3220 Australia. E-mail: laura@theinjuryclinic.com.au ● Copyright ©2025 JOSPT®, Inc

so a “diagnosis by exclusion” approach is followed.³ When indicated, imaging and other diagnostic techniques are used to rule out conditions such as bone stress injury and chronic exertional compartment syndrome. The use of imaging to exclude a bone stress injury confirms that the condition is not a bone disorder. It is time to remove “tibial stress” from the nomenclature.

FINDING A LABEL WHEN A CAUSE IS UNCLEAR

CLINICIANS HAVE PREVIOUSLY FACED the challenge of naming conditions when the tissue source is uncertain. Examples include nonspecific low back pain, patellofemoral pain, greater trochanteric pain syndrome, and plantar heel pain, to name a few. When the pathology or tissue source (or when there may be multiple tissues and pathologies involved) is unknown, we advocate for speaking plainly: pain near the posteromedial border of the distal tibia is “load-induced medial leg pain” or LIMP.

LIMP avoids the problematic phrase “tibial stress,” which we argue is a misnomer due to the unknown pathology of the condition and its confusion with bone stress injury. “Load induced” works because it indicates the underlying cause and indicates that both prevention and treatment need to consider load management. LIMP identifies the location of symptoms as being “medial leg,” without implying a specific tissue source (ie, the tibia). It also omits “syndrome,” which typically refers to a group of symptoms. In LIMP, there is only 1 symptom: pain.

LIMP SUPPORTS A FOCUS ON OPTIMAL LOADING

LIMP RESULTS FROM REPETITIVE loading that exceeds the tolerance of local tissues. As a load-induced entity, management focuses on an optimal loading approach. Loading can continue

as long as it does not make symptoms worse than they were the day before. This contrasts low-risk bone stress injuries of the posteromedial tibia where the optimal load approach only allows loading if it induces no pain (0 out of 10 on a numeric pain-rating scale).⁶

Management strategies for LIMP should aim to moderate lower leg loads and/or improve tissue capacity. These will vary based on an athlete’s performance and experience level. Some running athletes may need to avoid rapid spikes in training load or speedwork, while others may need to focus on gradually building tissue capacity through progressive resistance training to enable a greater tolerance to their current running loads. For many, a combination of these strategies will be necessary.

Other modifiable factors that may reduce lower leg loads should be explored in runners with LIMP, such as running with a higher cadence and/or duty factor and reducing stride length. These changes may reduce internal loads in the short term while tissue capacity improves or may be adopted as longer-term strategies to improve load attenuation.

SUMMARY

MAKE NO BONES ABOUT IT—MTSS needs a new name. Changing terminology from MTSS to LIMP provides clinicians, researchers, and athletes with a clearer, more accurate way to view exercise-related lower leg pain. LIMP better fits with what is known about the condition, without a misleading assumption of what it could be. ●

STUDY DETAILS

AUTHOR CONTRIBUTIONS: L.M.A., S.J.W., R.W.W., D.R.B., and H.B.M. all contributed equally to this editorial. L.M.A., S.J.W., R.W.W., D.R.B., and H.B.M. were actively involved in the planning, writing, and final approval of the manuscript. No other individuals contributed materially to this editorial.

DATA SHARING: There are no data in this manuscript

PATIENT AND PUBLIC INVOLVEMENT: Not applicable.

REFERENCES

1. Gaeta M, Minutoli F, Vinci S, et al. High-resolution CT grading of tibial stress reactions in distance runners. *AJR Am J Roentgenol*. 2006;187:789–793. <https://doi.org/10.2214/AJR.05.0303>
2. Hoening T, Hollander K, Popp KL, et al. International Delphi consensus on bone stress injuries in athletes. *Br J Sports Med*. 2025;59:78–90. <https://doi.org/10.1136/bjsports-2024-108616>
3. Milgrom C, Zloczower E, Fleischmann C, et al. Medial tibial stress fracture diagnosis and treatment guidelines. *J Sci Med Sport*. 2021;24:526–530. <https://doi.org/10.1016/j.jsams.2020.11.015>
4. Moen MH, Tol JL, Weir A, Steunebrink M, De Winter TC. Medial tibial stress syndrome: a critical review. *Sports Med*. 2009;39:523–546. <https://doi.org/10.2165/00007256-200939070-00002>
5. Okunuki T, Nagamoto H, Katsutani H, et al. Relationship between medial tibial stress syndrome and the adipose tissue along the posteromedial tibial border and the crural chiasma. *Phys Sportsmed*. 2025;53:299–308. <https://doi.org/10.1080/00913847.2025.2462979>
6. Warden SJ, Edwards WB, Willy RW. Optimal load for managing low-risk tibial and metatarsal bone stress injuries in runners: the science behind the clinical reasoning. *J Orthop Sports Phys Ther*. 2021;51:322–330. <https://doi.org/10.2519/jospt.2021.9982>
7. Weidauer LA, Eilers MM, Binkley TL, Vukovich MD, Specker BL. Effect of different collegiate sports on cortical bone in the tibia. *J Musculoskeletal Neuronal Interact*. 2012;12:68–73.
8. Winters M, Bakker EWP, Moen MH, Barten CC, Teeuwen R, Weir A. Medial tibial stress syndrome can be diagnosed reliably using history and physical examination. *Br J Sports Med*. 2018;52:1267–1272. <https://doi.org/10.1136/bjsports-2016-097037>
9. Winters M, Bon P, Bijvoet S, Bakker EWP, Moen MH. Are ultrasonographic findings like periosteal and tendinous edema associated with medial tibial stress syndrome? A case-control study. *J Sci Med Sport*. 2017;20:128–133. <https://doi.org/10.1016/j.jsams.2016.07.001>
10. Winters M, Burr DB, van der Hoeven H, Condon KW, Bellemans J, Moen MH. Microcrack-associated bone remodeling is rarely observed in biopsies from athletes with medial tibial stress syndrome. *J Bone Miner Metab*. 2019;37:496–502. <https://doi.org/10.1007/s00774-018-0945-9>

Copyright of Journal of Orthopaedic & Sports Physical Therapy is the property of JOSPT, Inc. d/b/a Movement Science Media and its content may not be copied or emailed to multiple sites without the copyright holder's express written permission. Additionally, content may not be used with any artificial intelligence tools or machine learning technologies. However, users may print, download, or email articles for individual use.