

# Letter to the Editor

Dear Editor:

In the article "Sacral Stress Fractures: Magnetic Resonance Imaging Not Always Definitive for Early Stage Injuries" by Fredericson et al (May 2007, pp 835-839), the authors report the diagnosis of osteopenia in 2 female athletes with stress fractures. The definition of osteopenia is by T-score. Given the ages (21 years old and 18 years old) of the 2 women, a Z-score would be more accurate.

The International Society for Clinical Densitometry published a position statement regarding the diagnosis of osteoporosis in men, premenopausal women, and children.<sup>1</sup> In summary, they state that the World Health Organization (WHO) classification for osteoporosis should not be used in healthy premenopausal women because the relationship between bone mineral density (BMD) and fracture risk is not well established in this population. Z-scores, not T-scores, should be used.

In addition, the WHO classification should not be used in children (defined as a male or female under age 20), and a diagnosis of osteoporosis cannot be made in a child based on densitometric criteria alone. Z-scores, not T-scores, should be used, as it is not appropriate to compare the BMD of someone who has not yet achieved peak bone mass with an adult who has. Peak bone mass is usually defined as the maximum BMD achieved by age 40, as measured by dual-energy x-ray absorptiometry. Unfortunately, there are no well-established standardized reference databases for calculating Z-scores in children or adolescents younger than age 20. However, if Z-scores are  $-2.0$  or less, then these patients may be appropriately classified as having "low bone density for chronologic age."

In conclusion, both athletes may indeed have had stress fractures that truly represented insufficiency fractures, but either way Z-scores should be used to come to these conclusions. We felt this was an important opportunity to review this topic as treatment decisions are often based on these definitions.

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## REFERENCE

1. Writing Group for the ISCD Position Development Conference. Diagnosis of osteoporosis in men, premenopausal women and children. *J Clin Densitom.* 2004;7:17-26.

**Author's Response:** We would like to thank Dr. Del Sordi for pointing out that there are new ISCD guidelines for defining osteopenia/osteoporosis in premenopausal women that should be considered. We followed WHO criteria, which is the older system that defines osteopenia/osteoporosis by T-scores.

In the case of our 2 athletes, there were no established Z-score reference values for the hip BMD and the Z-scores for the lumbar spine were very similar to the T-scores and did not change our impression.

We believe the more important point for clinicians treating young female athletes to recognize is that stress fractures in cancellous bone, such as the sacrum, are often associated with low BMD and deserve further evaluation.<sup>1</sup>

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## REFERENCE

1. Marx RG, Saint-Phard D, Callahan LR, Chu J, Hannafin JA. Stress fracture sites related to underlying bone health in athletic females. *Clin J Sport Med.* 2001;11:73-76.

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