



## Commentaries on Viewpoint: Fragile bones of elite cyclists: to treat or not to treat?

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**Title: Considerations regarding the use of impact training as treatment to prevent bone fragility in elite cyclists.**

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**To the editor:**

The viewpoint offered by Hilkens and colleagues (1) is timely given the recent attention on Relative Energy Deficiency in Sport and long-term bone health in athletes (2). In addition to low bone mineral density (BMD) at multiple sites, endurance athletes with low energy availability (LEA) have exhibited thinner cortices, lower trabecular quality, and lower estimated bone strength at the tibia (3). Conversely, evidence suggests that frequently completing short bouts of high-impact exercise could increase BMD, cortical thickness and estimated bone strength at similar sites in an energy efficient manner (3). In adolescent male cyclists, approximately ten minutes of high-impact jumping daily increased total body and leg bone mineral content compared to a cycle only training group (4). The suggestion that impact training exerts such osteogenic effects (alongside cycle training) whilst incurring minimal energy cost is a crucial advantage given LEA is implicated in the pathogenesis of poor bone health in athletes (2). Furthermore, it seems feasible to integrate ten minutes of impact training into an elite cyclist's daily training schedule and this is unlikely to interfere with the intensity of subsequent cycling sessions given the bone specificity of the stimulus. We have previously described data that suggests impact exercise may benefit bone during periods of LEA (an important consideration in elite cyclists); however, regarding this hypothesis, controlled studies in athletic populations are not yet reported (3). Research

should focus on impact training as a treatment to prevent bone fragility in elite cyclists that regularly experience LEA during a prospective period.

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