Acceleration slope of exercise-induced impacts is a determinant of changes in bone density.

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Abstract: High acceleration levels (>4g) seen during impact exercises have been shown to increase bone mineral density (BMD) in premenopausal women. The aim of this study was to examine how the other acceleration signal characteristics, i.e. the slope, area and energy of the signal are related to changes in bone density, using long-term quantification of physical activity. Daily physical activity was continuously assessed with a waist-worn accelerometer-based body movement monitor in 64 premenopausal women participating in a 12-month population-based exercise trial. The daily number of exercise-induced impacts at different slope, area and energy levels of the acceleration signal was analyzed. Physical activity inducing slopes 1000m/s(3), acceleration peak areas 2m/s or signal energies 75m(2)/s(3) was associated with BMD change in the hip (p

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