

# **Effects of Isolated Lumbar Extension Resistance Training on Bone Mineral Density of the Elderly**

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## **Abstract**

The purpose of this study was to determine the effect of aerobic (AER) (treadmill walking or stair climbing) and specific lumbar extension (LUMB EXT) resistance exercise (MedX) training on bone mineral density (BMD) of men (n=13) and women (n=22) 60-82 years of age. Subjects were healthy volunteers who were evaluated for maximum oxygen uptake ( $VO_2$  max), BMD (Lunar DPX-L) and isolated static LUMB EXT strength at 7 angles through a 72 degree range of motion before (T1) and after (T2) 6 month training. BMD was determined by PA and lateral lumbar scans. Subjects were randomized into AER(n=15), AER+LUMB EXT (n=14) training, or control(CONT, n=6) groups. AER training was conducted for 40-45 minutes, 3x/wk, at 75-80% of max heart rate reserve. LUMB EXT (n=14) training was 1x/wk using 1 set of 10-15 reps to volitional fatigue. AER and AER+LUMB EXT increased LUMB EXT strength (mean of 7 angles=14%) ( $p \leq 0.05$ ) and LUMB BMD. BMD results suggest changes in trabecular bone because data were only significant in the lateral scan. Changes in BMD correlated with changes in LUMB EXT strength for AER+LUMB EXT ( $r=0.67$  and  $0.73$  for body L2,3 and mid L2,3,  $p \leq 0.05$ ). These results indicate that 6 months of specific LUMB EXT training can increase BMD of the lumbar spine in the elderly.