

# Strength Training Increases Regional Bone Mineral Density And Bone Remodeling In Middle-Aged and Older Men

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## **OBJECTIVES:**

Eighteen previously inactive, untrained males aged 50-70 were studied to determine the effects of a 16 week strength training program on bone mineral density and bone remodeling. Eleven subjects strength trained while 7 men remained inactive as controls subjects. Total spinal & femoral neck bone mineral densities, and markers of bone formation and resorption were measured before, during and after the training program.

## **RESULTS:**

Training increased muscular strength by an average of 45% on a three repetition maximum test and by 32% on a test of the knee extensors. Bone mineral density increased in the femoral neck by  $\approx 3.8\%$  and in the lumbar spine by  $\approx 2\%$ . However, there was no significant change in total body bone mineral density. There were no significant changes in muscular strength, bone mineral density, or any of the bone formation or resorption markers in the control group.

## **SUMMARY:**

These findings suggest that strength training increases regional bone mineral density by increasing bone formation. It is important to note that bone formation increased regionally i.e. in those areas where the “load” or resistance was applied. This same principle has been demonstrated before in studies of tennis athletes. Their dominant arms showed higher bone formation than their non-dominant arms, due to the “load” applied through continuous use with a tennis racket. Increased bone formation has important implications for the prevention and treatment of osteoporosis.

## **KEISER PIECES USED:**

Leg press, chest press, leg curl, lat pull down, leg extension, shoulder press, hip abductor, hip adductor, upper back, tricep, lower back.

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