

# **A COMPARISON OF FOREARM BONE MINERAL DENSITY AMONG COLLEGIATE GYMNASTS, DISTANCE RUNNERS, AND NON-ATHLETES**

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**Purpose:** Low regional bone mineral density (BMD) has been correlated with increased fracture incidence in several body regions. Higher forearm BMD has been observed in athletes of several impact loading sports and decreases the risk of Colles' fracture. The purpose of this study was to compare BMD in female collegiate gymnasts to a group of athletic controls (collegiate distance runners) and a group of non-athletic controls (non-athletes).

**Methods:** Female collegiate artistic gymnasts (n=11), collegiate distance runners (n=9), and college-age non-athletes (n=25) underwent whole-body and dominant forearm DXA scans to assess whole-body BMD and body composition and site-specific BMD of the dominant forearm. Weight and height were measured and used to determine BMI. Data for athletes were collected after the midpoint of their competitive seasons.

**Results:** Differences were found between gymnasts and non-athletes and between gymnasts and runners at the total radius, 1/3 distal radius, and ultradistal radius ( $p < 0.000$ ), with gymnasts exhibiting significantly higher BMD at the three forearm sites than either distance runners or non-athletes. Differences between runners and non-athletes were not significant.

**Conclusions:** The loading impact and site-specificity of gymnastics exercise on the forearm likely caused the increase in bone mineral density at both cortical and trabecular bone sites.