High-impact sports associated with increased risk of stress fracture among adolescent girls

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Adolescent girls participating in high-impact physical activity, specifically basketball, running and gymnastics/cheerleading, appear to be at increased risk for developing stress fractures, according to a report posted online today that will appear in the August print issue of *Archives of Pediatrics & Adolescent Medicine*.

"Weight-bearing activity stimulates bone remodeling and thus increases bone mass density, but very high levels of activity may be detrimental to bone health and increase the risk of stress fracture," the authors write as background information in the article. "Although stress fractures are relatively uncommon, they affect as many as 20 percent of young female athletes and military recruits."

Alison E. Field, Sc.D., of Children's Hospital and Harvard Medical School, Boston, and colleagues examined data on 6,831 girls between the ages of 9 and 15. Participants were daughters of women enrolled in the Nurses' Heath Study II, and data were collected using self-report questionnaires between 1996 and 2004.

During seven years of follow-up, 267 girls (3.9 percent) developed a stress fracture. Family history of osteoporosis or low bone mass density was strongly associated with the risk of stress fracture. Girls reporting a family history of osteoporosis or low bone mass density were almost twice as likely to develop stress fracture. Additionally, girls who engaged in eight or more hours of physical activity a week were twice as likely to develop a stress fracture as those who engaged in less than four hours of

activity per week.

When examining high-impact sports individually, only basketball, running, and gymnastics/cheerleading were independently associated with increased risk of stress fracture. Neither nonimpact activity nor medium-impact activity was predictive of increased risk, but each hour of high-impact activity increased the risk of stress fracture by approximately 8 percent.

Older age at the start of a girl's menstrual period also increased the risk of developing stress fracture. Each one-year delay in onset of menstruation was associated with an approximate 30 percent increase in risk. Being underweight, overweight and engaging in disordered eating were not associated with the risk of developing stress fracture.

"Our study observed that high impact activities, specifically basketball, running and gymnastics/cheerleading, significantly increase risk for stress fracture among adolescent girls. Thus, there is a need to establish training programs that are rigorous and competitive but include varied training in lower-impact activities to decrease the cumulative amount of impact in order to reduce the risk of stress fracture," the authors conclude. "Therefore, clinicians, parents and coaches should continue to promote activity to young girls but should make sure that training hours are not excessive, thereby not compromising bone health."

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