

Researchers discover age of onset of puberty predicts adult osteoporosis risk

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A team of researchers led by Vicente Gilsanz, MD, PhD, director of Clinical Imaging at The Saban Research Institute of Children's Hospital Los Angeles, determined that the onset of puberty was the primary influence on adult bone mineral density, or bone strength. Length of puberty did not affect bone density.

Reduced bone mineral density leads to [osteoporosis](#), resulting in bones becoming increasingly brittle and at risk for fracture. Osteoporosis is a significant public health issue with the cost of treatment in 2010 estimated at \$10 billion. This condition affects 55% of Americans aged 50 and older.

The Bone Mineral Density in Childhood Study is an ongoing multicenter study examining bone development in healthy children and teenagers of both sexes and ethnic groups in the United States. For this analysis, the investigators studied 78 girls and 84 boys who had just entered puberty, until they reached [sexual maturity](#).

"Puberty has a significant role in [bone development](#)," explained Dr. Gilsanz. "During this time, bones lengthen and increase in density. At the end of puberty the epiphyseal plates close, terminating the ability of the bones to lengthen. When this occurs, the teenager has reached their maximum adult height and peak bone mass. We found that early puberty was associated with greater bone mass while later puberty resulted in less."

Adolescents with short stature sometimes undergo medical intervention to delay puberty in an effort to achieve greater height. This study indicates that prolonging the growth period by delaying puberty may have unexpected consequences in later life.

The 2000 National Institutes of Health Consensus Development Conference on Osteoporosis Prevention, Diagnosis, and Therapy identified bone mineral deposition during adolescence as a critical determinant of osteoporosis risk later in life. The care of patients with osteoporosis is difficult, and most therapies increase bone density by small amounts yet requires long periods of treatment. In contrast, during puberty large increases in bone density occur over a short period of time.

Given that the rate of decline of bone mass in adulthood is approximately 1% to 2% each year, a 10% to 20% increase in bone density resulting from a natural early puberty corresponds to an additional 10 to 20 years of protection against the normal age-related decline in bone strength.

More information: The article was published in the *Journal of Pediatrics*.

Provided by Children's Hospital Los Angeles

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