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New Position Paper Validates Positive Effect of Calcium Intake and Physical Activity on Bone Development

The National Osteoporosis Foundation (NOF) today released a position statement providing evidence-based guidance and a national implementation strategy to help children and adolescents achieve optimal bone health, or what is known as “peak bone mass,” early in life. Considered the first systematic review of its kind, researchers found strong evidence supporting a positive effect of calcium intake and physical activity on bone accumulation and growth.

The manuscript, titled “*The National Osteoporosis Foundation’s Position Statement on Peak Bone Mass Development and Lifestyle Factors: A Systematic Review and Implementation Recommendations*,” was recently published in the journal *Osteoporosis International* and highlights nutrition, physical activity and lifestyle factors involved in developing optimal peak bone mass, which is typically reached in one’s early 20’s. Optimizing peak bone mass and strength is a primary strategy to reducing the risk of osteoporosis and related fractures later in life.

“With osteoporosis and low bone mass responsible for two million broken bones every year, we’ve identified achieving peak bone mass as a key strategy to preventing fractures for future generations,” said Connie Weaver, PhD, Department of Nutritional Sciences, Women’s Global Health Institute, Purdue University. “Bone mass, density and strength, all factors associated with fracture in children and adults, are largely influenced by lifestyle factors. Our goal in releasing this position statement is to help implement a national strategy to prevent fractures and protect against osteoporosis by highlighting known nutrition and lifestyle changes that can be made to achieve peak bone mass.”

The study authors used a systematic evidence-based review process to consider the role of individual nutrients, food patterns, adolescent special issues (e.g. contraception), and physical activity on bone mass and strength development in infants, children and adolescents. The report assigns a grade to each of the factors considered and describes the underlying biology of the relationships.

According to the report, the best evidence points to the positive effects of calcium intake and physical activity, especially during the late childhood and peripubertal years—a critical period for bone building. Good evidence also supports the positive role of vitamin D and a detrimental effect of carbonated soft drink consumption on building bone.

According to the Institute of Medicine (IOM) the recommended daily allowance (RDA) of calcium for children, teens and young adults is as follows:

RDA Calcium

Age	Male	Female	Pregnant	Lactating
0–6 months*	200 mg	200 mg		
7–12 months*	260 mg	260 mg		
1–3 years	700 mg	700 mg		
4–8 years	1,000 mg	1,000 mg		
9–13 years	1,300 mg	1,300 mg		
14–18 years	1,300 mg	1,300 mg	1,300 mg	1,300 mg
19–30 years	1,000 mg	1,000 mg	1,000 mg	1,000 mg

* Adequate Intake (AI)

The study's recommendations for physical activity to achieve peak bone mass support the following: Intensity \geq 3.5x body weight; Session duration = 100 impacts; Frequency = 3 days per week; and Long-term duration \geq 7 months.

Despite the initial results, more rigorous trial data is needed to identify the effect of many other lifestyle choices on peak bone mass. Developing implementation strategies for the lifestyle modifications needed to promote peak bone mass and strength development within one's genetic potential requires a multi-sectored approach.

"We know that nutrition and exercise play an important role in bone health throughout the lifespan," said Taylor C. Wallace, PhD, senior director of science, policy and government relations at NOF. "In addition to calcium and vitamin D, consumption of other nutrients including dietary fiber, potassium, magnesium, and Vitamin C are also important for bone health."

Dairy, fatty fish (salmon, sardines, tuna), fruits (oranges, bananas, prunes), vegetables (spinach, kale, potatoes) and calcium and vitamin D fortified foods (juices, breakfast foods, soy milk) are all good options for building a bone healthy diet. For more information on food that is good for your bones visit <http://nof.org/foods>.

"We've long considered calcium intake and exercise to be critical factors for achieving and maintaining healthy bones and are pleased to see the first systematic review of the science behind peak bone mass validates our approach," said Amy Porter, executive director and CEO, National Osteoporosis Foundation. "With osteoporosis and low bone mass currently affecting 54 million Americans and only expected to grow as the population ages, we look forward to developing an implementation strategy to help individuals optimize their bone development and growth as it's a critical factor in preventing the rising toll of this debilitating disease."

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About the National Osteoporosis Foundation

Established in 1984, the National Osteoporosis Foundation is the nation's leading health organization dedicated to preventing osteoporosis and broken bones, promoting strong bones for life and reducing human suffering through programs of awareness, education, advocacy and research. For more information on the National Osteoporosis Foundation, visit www.nof.org.