

Orthopaedic Observations

A Matter of Medicine...

TM Pending

“Be Good to Your Bones”

By Louis J. Iorio, M.D.



Osteoporosis is most prevalent in women, affecting 45% of women aged fifty and older. Though not widely recognized, the lifetime risk of death related to complications arising from osteoporosis approximates that of breast cancer.

Beyond providing mechanical support, bone serves a primary role in maintaining calcium homeostasis. The principal components of bone are osteoblasts that make new bone, osteoclasts that resorb bone and osteocytes that react to mechanical stresses by orchestrating the cellular responses within bone. The coordinated function of these different cell types allows the skeletal structures to respond to the level of mechanical stress to which we are subjected on a daily basis. As a result, inactivity leads to bone resorption and weakening. This is accompanied by a higher risk of fracture. Exercise that includes impact loading and weight bearing activities helps maintain bone structure and strength.

This is especially true in children who can increase their bone mass up to 6% by jumping down from a step regularly. Furthermore, the normal remodeling process in which bone is continually reabsorbed and new bone deposited leads to most of the skeleton being turned over every 15 years. This process changes substantially at around age forty. By that time we don't continue to reform bone to the full extent it was resorbed and a gradual weakening takes place.

Men and women typically achieve peak bone mass between ages 25 to 30. After that age men experience a slow decline in bone density. Women on the other hand, demonstrate a rapid decrease in bone density at menopause followed by a slower rate of decrease the remainder of their lives. At menopause women will lose 2% of the skeleton per year. For these reasons, it is critical that early in life we do everything possible to accrue and maintain optimum bone mass.

Calcium, Vitamin D and parathyroid hormone are the most critical factors necessary for regulating bone metabolism. There are many other factors that play important though less critical roles. Exposure of the skin to sunlight creates Vitamin D which is converted by the liver to 25 hydroxy Vitamin D. Low calcium levels stimulate parathyroid hormone which leads to formation of 1,25 dihydroxy Vitamin D by the kidneys. This fully active form of Vitamin D results in increased calcium absorption in the gut and increased retention by the kidneys.

Daily calcium requirements are 700 mg for children and 1300 mg from the teenage years to age 25. Adult intake should be 800 mg per day. Pregnant women should consume 1500 mg and lactating women 2000 mg per day. Post menopausal women and adults who have sustained a major fracture should receive 1500 mg per day. When trying to achieve peak bone mass, levels of Vitamin D should be 800 units per day.

In today's medical environment the principal focus of physicians must be preventing osteoporosis and associated fractures. To that end, DEXA scanning has allowed us to make great advances. World Health Organization Guidelines classify bone density as normal if an individual is within one standard deviation of ideal. Osteopenia is classified as less than one to 2.4 standard deviation below ideal. Values less than 2.5 SD are classified as osteoporosis and require treatment. Independent risk factors include body weight below 127 lbs., recent loss of body weight, history of a fragility fracture, maternal history of fragility fracture and smoking. In addition to calcium and Vitamin D supplementation bisphosphonates are the primary class of medications that have proved useful in treatment.

I hope this discussion will help highlight the importance of a healthy lifestyle that includes exercise and good dietary habits in an effort to maintain optimum bone health.

**Reference: Metabolic Bone Disease; Joseph Lane
AAOS Review Course Washington, DC 11/17-19/2006**

(Dr.Iorio's bio on the back side of page...)

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Dr. Iorio spent three years in undergraduate studies at Cornell University before acceptance to Medical School at the Albert Einstein College of Medicine in New York City. Dr. Iorio began his medical career in service to our country for nine years as an Officer in the United States Naval Reserve. He served tours of active duty at the Naval War College in Newport, Rhode Island and at the National Naval Medical Center in Bethesda, Maryland. It was at the National Naval Medical Center where Dr. Iorio decided to pursue a career in Orthopaedic Surgery.

Dr. Iorio completed his orthopaedic residency at the University of Medicine and Dentistry of New Jersey where he was appointed Administrative Chief Resident and was responsible for supervising and directing all residents. He subsequently completed a Fellowship in Foot and Ankle Surgery at the Lahey Clinic in Burlington, Massachusetts. He has practiced all aspects of General Orthopaedic Surgery, but has also had extensive experience in Spine Surgery and Surgery of the Foot and Ankle. He has published original research on Ankle Replacement Surgery as well as review articles addressing reconstructive forefoot surgery. Dr. Iorio has also developed expertise in treatment of Occupational Orthopaedic Injuries.

Dr. Iorio is available for emergent and non-emergent orthopaedic care on a daily basis and is the daytime on-call physician for The Orthopaedic Group, LLC.

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