Osteoporosis

Osteoporosis is a condition characterized by the reduction of bone density. An individual can have osteoporosis without knowing it because there are often no symptoms. Individuals may not be aware of their condition until after they suffer a bone fracture. Osteoporosis causes bones to become weak and fragile. Bone fractures, particularly in the hip and smaller bones, are a major concern with older individuals with untreated osteoporosis. A fracture that occurs during the course of normal activity is called a stress fracture. Hip fractures are one of the most common occurrences and are typically the result of a fall. With osteoporosis, hip fractures can occur as a result of trivial accidents. Hip fractures do not often heal well because of poor bone quality. Fractures of the spine can cause severe "band-like" pain that radiates from the back and down the side. Over time, repeated spine fractures can cause chronic lower back pain as well as loss of height or cause the spine to curve (dowager hump).

Normal bone is composed of protein, calcium and collagen. Bones that are affected by osteoporosis can break with relatively minor injury, unlike healthy bones. Fractures can be either in the form of cracking (as in a hip fracture), or collapsing (as in a compression fracture of the vertebrae of the spine). The spine, hips, and wrists are common areas of bone fractures from osteoporosis, particularly in older individuals.

The Importance of Nutrition

To build healthy bones, one must consume an adequate daily supply of calcium and vitamin D. However, incorporating daily dosages of calcium or vitamin D supplements alone are not sufficient treatments, and should not be considered an alternative to prescribed osteoporosis medication. Menopause, for example, can cause a rapid loss in bone density, and simply taking vitamin supplements will not effectively treat it.

Calcium, stored in bones and teeth, is the most abundant mineral in the body. Calcium is needed for muscle contraction, blood vessel contraction and expansion, the secretion of hormones and enzymes, and sending messages through the nervous system. A constant level of calcium is maintained in body fluid and tissues so that these vital body processes function efficiently. Bones constantly resorb and deposit calcium into newly deposited bone structures. The ratio between bone resorption and deposition changes, as individuals grow older. During childhood, there is a higher amount of bone formation and far less breakdown. In early and middle adulthood, these processes are relatively equal. In aging adults, particularly among postmenopausal women, bone breakdown exceeds formation, resulting in bone loss and increased risk for osteoporosis.

Vitamin D is important for maintaining bone strength. Vitamin D also helps the absorption of calcium from the intestines. A lack of Vitamin D may cause osteomalacia (softening of the bones due to defective bone mineralization), which further weakens the bones and increases the risk of fractures. Vitamin D has been shown to increase bone density and decrease fractures in older postmenopausal, but not in premenopausal women. Vitamin D comes from both diet and exposure to sunlight.
The Food and Nutrition Board of the Institute of Medicine has recommendations:

**Calcium**
The total daily intake of calcium should not exceed 2000 mg.

800 mg/day for children ages 1 to 10.

1000 mg/day for men; premenopausal women; and postmenopausal women also taking estrogen.

1200 mg/day for teenagers and young adults ages 11 to 24.

1200mg to 1500 mg/day for pregnant and nursing mothers.

1500 mg/day for post menopausal women not taking estrogen.

There is approximately 300 mg of calcium in an 8-ounce glass of milk.
There is approximately 450 mg of calcium in 8 ounces of plain yogurt.
There is approximately 200 mg of calcium in 1 ounce of cheese.
There is approximately 1300 mg of calcium in 1 cup of cottage cheese.
There is approximately 300 mg of calcium in 8 ounces of calcium-fortified orange juice.

**Vitamin D**
200 IU daily for men and women 19 to 50 years old
400 IU daily for men and women 51 to 70 years old
600 IU daily for men and women 71 years and older

Individuals with diagnosed osteoporosis are advised to ensure 400 IU twice per day.

*Osteoporosis and Low Bone Mass in Women*
The number of women age 50 and older who have osteoporosis, or are in the developmental stages, will increase from almost 30 million in 2002 to over 35 million in 2010 and to approximately 41 million in 2020. Women with low bone mass are estimated at almost 22 million in 2002, almost 26 million in 2010 and over 30 million in 2020.

*Osteoporosis and Low Bone Mass in Men*
Men with osteoporosis and low bone mass total over 14 million in 2002. This figure is expected to increase to over 17 million in 2010 and to well over 20 million in 2020.