Bone Density

What is Osteoporosis?
Osteoporosis literally means porous bone. In osteoporosis, poor bone density and quality can lead to bones so weak that they might break with something as simple as bending over.

How is the Heel Ultrasound Test Different From the DEXA Scan?
People often ask how the heel screening differs from the DEXA scan. The DEXA scan is a somewhat invasive full body X-ray used to diagnose osteoporosis, etc. The heel ultrasound simply requires a bare foot and has proven to be an excellent screening tool for predicting risk of hip or spine fracture related to osteoporosis. It has proven as such because, as research shows, the bone mineral density (BMD) of the heel correlates with the BMD of the spine and hips, which are the areas most prone to fracture from osteoporosis.

Consider This:
Consider the bones a savings account for calcium, the most abundant mineral in the body. Calcium plays an important role in bone structure (99% of calcium in the body is stored in the bones). A certain blood level of calcium must also be maintained for other vital body functions. Therefore, if individuals do not take in enough calcium through their diets, it will be taken from their bones! Bones are constantly remodeling—giving and taking nutrients. When the taking exceeds the giving, problems can arise.

Statistics:
Osteoporosis is a major health risk for 28 million Americans. Ten million of those have osteoporosis while the rest have low bone mass. Osteoporosis is four times more common in American women than men. Half of all women and one in eight men over 50 will have an osteoporosis-related fracture in his or her lifetime. Every year, there are approximately 300,000 hip; 700,000 spinal; 250,000 wrist; and over 300,000 fractures at other sites. One-third of all postmenopausal women suffer serious bone deterioration. Bone loss is most rapid in the first 5-7 years following menopause (up to 20% may be lost!) Between the ages of 55 and 70, the average woman will have lost 30-40% of her bone mass. This means you have to establish healthy bones before it’s too late!

What are the Risk Factors and Causes of Osteoporosis?
Three factors attribute to osteoporosis:
(1) Accelerated bone loss at menopause in women or as men and women age
(2) Below optimal bone growth during childhood and adolescence resulting in failure to reach peak bone mass
(3) Bone loss due to disease conditions, eating disorders, or certain medications and medical treatments

Risk factors to consider include:
- Increased Age
- Female Gender
- Family History of Osteoporosis
- White, Asian and Native American Races
- Low Weight and Small Bone Structure (i.e., petite, thin build; under 127 pounds)
- Hormonal Deficiencies (primarily testosterone in men and estrogen in women (i.e., natural menopause, hysterectomy, etc.))
- Lifestyle:
  - Sedentary Lifestyle (little or no weight-bearing and resistance exercise)
  - Dietary Factors (primarily not consuming enough calcium and drinking too much alcohol)
  - Smoking
- Medications and Chronic Diseases (Osteoporosis can be caused by certain medications used to treat disorders like rheumatoid arthritis, an under-active thyroid, seizures, and gastrointestinal diseases.)

Men and Younger Participants:
In general, men are at risk of osteoporosis for the same reasons as women (see previous section on Risk Factors). These days, people living longer, and increased use of medications mentioned above, are just two reasons men have become more at risk of the disease. Today, two million American men have osteoporosis and 12 million more are at risk.

Our bones are under construction into our thirties. Therefore, it is not abnormal for younger participants to have low bone density readings. Before our bones are fully developed at age thirty-something, we can make an impact on our long-term bone health by ensuring we are doing what's necessary to have strong and healthy bones and, thereby, prevent osteoporosis.
How Can I Prevent Osteoporosis?

1. Proper Nutrition is absolutely necessary, especially during childhood and adolescence, to ensure you have the building blocks for healthy bones. The bone mass attained during childhood and adolescence might be the most important determinant of life-long bone health. Those with the highest peak bone mass after adolescence have the greatest protective advantage when the natural decline of bone density occurs. However, it is important to note that peak bone mass is influenced by proper nutrition through the mid-30s. Many vitamins and minerals help to form and stabilize the structure of bones, and are needed to prevent bone loss. These include vitamins A, C and K, phosphorus, magnesium, fluoride, and most importantly, vitamin D and calcium. Vitamin D is necessary for the body to absorb calcium from food. It is different from other nutrients because it is actually a hormone, and the body can make it itself with the help of sunlight. In fact, many people rely on sunlight to maintain adequate vitamin D nutrition. Just 10-15 minutes a few times a week, with a little skin in the sun, helps the body produce, and activate, vitamin D. One of the best sources of vitamin D is fortified milk. Other sources include eggs, liver, butter, and some fish. If you are watching your fat and cholesterol intake, the best choices are fortified skim milk, sunlight and certain fish. The adequate intake of vitamin D for adults is 200 IU for ages 19-50, 400 IU for ages 51-69, and 600 IU for those over 70. Vitamin deficient elderly women may show improvement with 800 IU. Note that more is not necessarily better. You can overdose on certain vitamins, so too much may actually be harmful. Calcium is the most important nutrient for attaining peak bone mass and for preventing and treating osteoporosis. It is important to note that individuals do not absorb 100% of all the nutrients they take in. For example, remember that vitamin D must be present in order for calcium to be absorbed. Also note that the body can only absorb up to 750mg of calcium at one time so you should divide your dose (i.e., take half with breakfast and half with dinner) if you require more than that as a supplement. The Recommended Dietary Allowances of calcium are 1000mg for adults up to age 50 and 1200mg for those over 50. Up to 1500mg per day may be recommended. There are certain factors that affect the amount recommended so you should consult your primary health care provider to determine what’s best for you. Calcium is found almost exclusively in milk products. Some foods, such as juices and cereals, are fortified with calcium. Mustard greens, kale, parsley, watercress and broccoli are good sources of available calcium. Spinach and Swiss chard are calcium-rich, but they contain binders that prevent calcium absorption in the body. For those of you who cannot or will not drink enough milk to meet recommendations, ways to add calcium to daily meals include, adding powdered nonfat milk to foods, particularly baked products; yogurt and kefir; puddings, custards, and baked goods which are prepared with appreciable amounts of milk; and calcium-fortified soy milk or tofu.

2. Regular exercise, especially resistance and high-impact activities, contributes to the development of high peak bone mass. Weight bearing and resistance on the bones, be it the weight of ones body or the pulling of muscles on bones during physical activity, cause them to lay down minerals.

3. Appropriate evaluation of individuals at risk is important in determining who should be treated for osteoporosis. Fracture prevention is the primary goal. In addition to the fracture risk associated with the low bone density of osteoporosis, it is important to look at risk of fall another predictor of fracture risk. Fracture risk has been consistently associated with a history of falls, low physical function such as slow moving and weak muscles, impaired thinking and/or vision, and the presence of environmental hazards such as throw rugs.

Signs, Symptoms, Diagnosis and Treatment:
The most common symptom in osteoporosis is a gradual loss of height, due to compression of the backbone. This can lead to a stooped posture and lower back pain. Often there are no obvious signs until a minor fall or normal activity results in a fracture. The most commonly used measurement to diagnose osteoporosis and predict fracture risk is based on assessment of bone mineral density. Therapies that enhance bone density and reduce risk or consequences of falls have been shown to reduce the risk of osteoporosis-related fractures. These include adequate vitamin D and calcium intakes, physical activity, hormone replacement therapy, and certain medications.

For further information visit www.nofo.org • www.osteo.org
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