



## Bone Health

The statistics are staggering--50% of women and 25% of men over age 50 will have a fracture related to osteoporosis. Being overweight tends to increase bone density--bones become stronger to support the extra body weight. Bone loss is typical with weight loss from gastric bypass surgery, adjustable gastric banding surgery or dieting. Osteoporosis is a complicated disease, one that we still have a lot to learn about. What we do know is that you can do many things to make bone health a priority and keep on the right side of these statistics.

First of all let's look at some bone health terminology:

**Bone Mineral Density Testing:** Various bone mineral density (BMD) tests (may include measurements of the hip, wrist, spine, shinbone, finger, and heel) compare your BMD to that of a healthy 30-year-old adult. These tests provide a T-score. A T-score of 0 indicates a healthy bone mass. It is a good idea to be tested with a peripheral heel or wrist scan to obtain a baseline and then follow up with a more complete scan if the test score is low.

**Osteopenia:** A bone mineral density (BMD) lower than normal peak BMD, but not low enough to be classified as osteoporosis. A T-score of -1 to -2.5 indicates osteopenia.

**Osteoporosis:** Thinning of the bones with a reduction in bone mass due to the depletion of calcium and bone protein. A T-score of -2.5 or greater is indicative of osteoporosis.

Many factors affect bone health. Let's take a look at them:

**Gender.** Women are at greater risk due to their lower peak bone density (at age 20) and the hormonal changes that occur as they go through menopause. Men are also at risk, but bone density typically reaches lower levels later in life.

**Age.** All people begin losing bone mass after they reach peak BMD at about 20-30 years of age. The denser your bones are at age 30, the longer it takes to develop osteopenia or osteoporosis. It is easy to think of bones as stagnant, but bones are living tissue with blood vessels and nerves. Blood cells are created in the marrow. Bones are constantly being torn down and rebuilt. In our younger years, more bone is built than torn down. As we age and the rebuilding of bones decreases, bone density declines. Maximizing bone density throughout life will decrease the risks of osteoporosis in our later years.

**Family History.** Having a family history of osteoporosis, being thin, being white or being Asian increases the risk of osteoporosis.

**Chronic Dieting.** A diet low in calcium and vitamin D, or lacking other nutrients, will negatively affect bone density.

**Medications.** Long-term use of corticosteroids or other medications can weaken bones. Chemotherapy can have a negative effect on bone density.

**Sedentary Lifestyle.** Being inactive or bedridden for a long period of time will cause bones and muscles alike to atrophy or break down.

**Smoking and Excessive Alcohol Use.** Both smoking and excessive alcohol use can weaken bones.

**Caffeine.** Moderate caffeine consumption does not significantly affect calcium absorption or excretion, but large amounts can have a bone-thinning effect.

### **The Calcium Connection**

Your body uses calcium for many functions. It is essential for the development of strong bones and teeth, blood clotting, blood pressure regulation, muscle contraction and nerve transmission. Your body maintains a very close range of calcium in the bloodstream to preserve these essential functions. Women under 50 should be aiming for 1,000 milligrams of calcium a day. The recommendation increases to 1,200 mg (some experts recommend 1,500 mg) after menopause. Men should shoot for at least 800 mg daily. If you do not get adequate calcium from your diet, your body will take it from your bones. You can get adequate calcium from your diet if you choose high-calcium foods. If your diet does not provide enough calcium, then you will need supplements. Healthy bones are dependent on an array of nutrients being available and foods provide more of the necessary nutrients. Many bone-healthy foods contain protein, phosphorus and Vitamin D in addition to calcium. See Supplement Facts for more information.

### **Magnesium and Phosphorus**

These minerals are essential for calcium absorption and strong bones. A complete multivitamin and balanced diet should provide adequate levels of these nutrients.

### **The Vitamin D Factor**

Vitamin D helps the absorption of calcium in the intestines. An adequate Vitamin D level is essential to bone health. Our bodies obtain Vitamin D in two distinct ways: exposure to sunlight and diet. The best dietary sources are fatty fish, liver, and fortified foods and dairy products. Vitamin D deficiency is quite common in the United States. One study found 57% of hospitalized patients were Vitamin D deficient. Other studies show high levels of Vitamin D deficiency in obese individuals. A study in a northern climate found that 68% of children have low serum levels of Vitamin D in the winter season. 10-15 minutes of sun exposure on a sunny day (without sunscreen for this short time) twice a week and a dietary intake of 400–800 IU of Vitamin D daily should be

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adequate to prevent a deficiency. Most multi vitamins contain 400 IU of Vitamin D. Don't overdo it--too much of a good thing can be dangerous—excessive supplementation can rise to toxic levels.

### **The Protein Component**

Bones are one-third collagen. Collagen is a protein that provides flexibility to bones--another reason to reach that protein goal every day. But excessive protein can have a negative impact on bone health.

### **The Exercise Impact**

Weight bearing exercise (your legs and feet are supporting your weight) encourages the body to create stronger bones. Just as muscles grow stronger when used, bones become denser when you place demands on them. Weight lifting and weight bearing exercises are the most effective. Start a regular exercise program during the rapid weight loss phase to minimize both bone and muscle loss, and then keep it up to maintain a healthy weight, strong bones, muscle strength, and a robust metabolism.

### **The Parathyroid Hormone Complexity**

Parathyroid hormone works to keep a normalized level of calcium in the blood. It works in several ways to do this. One way is to increase the conversion of Vitamin D to its active form. It also decreases the excretion of calcium from the body and mobilizes calcium from the bones. Some studies indicate that supplementation with calcium citrate may be more effective than calcium carbonate in suppressing parathyroid hormone activity--resulting in a lower bone mass loss.

### **Supplement Facts**

Calcium isn't absorbed in large amounts so it is best to spread the supplement throughout the day.

Take your calcium supplement with meals to increase absorption.

For the calcium to reach your bones, you need to make sure you are obtaining an adequate amount of Vitamin D. An intake of 400 IU to 800 IU daily should be adequate. Remember that 10-15 minutes of sun exposure twice a week is also an effective way to boost your body's Vitamin D status.

Calcium citrate has been shown in some studies to be more bio-available (20-50%) than calcium carbonate, but either source will help to keep your bones strong.

If you find you are gassy or bloated when starting a calcium supplement, decrease the amount and then slowly build up to the recommended amount.

Chewable or liquid calcium supplements may be better absorbed than pill forms.

Do not take calcium supplements at the same time as iron supplements. Iron is best absorbed when taken on an empty stomach with a small amount of citrus juice or another Vitamin C source.

Medications for Bone Loss. If you have bone loss, medications can slow the loss of calcium from bones. These medications can greatly reduce the risk of fracture. A newer medication can actually build bone. If you and your doctor determine that a medication for bone loss is in your best interest, be sure that you are getting adequate calcium, vitamin D, phosphorus and magnesium from your diet or supplementation.

#### Maximize Your Bone Density:

Your bones don't reach their greatest density until you are 20-30 years old. For those younger than 30, a diet and lifestyle that increase bone density will have long-term benefits. To maximize bone density, get plenty of calcium and vitamin D through your diet and enjoy a little time (10-15 minutes twice a week) in the sun without sunscreen. Exercise on a regular basis, don't smoke, and avoid caffeine, cola, and excessive alcohol. If you're older than 30, it's not too late to make these lifestyle changes and slow the loss of bone density, delay osteopenia, and delay or prevent osteoporosis.

#### Calcium Content of Selected Foods and Beverages

Food/Beverage	Serving Size	mg Calcium
Yogurt, plain, low fat	1 cup	415
Yogurt, fruit flavored, no added sugar	1 cup	245-384
Sardines, with bones	3 oz	324
Milk, low fat	1 cup	302
Milk, buttermilk	1 cup	285
Orange juice (calcium fortified)	6 oz	200-260
Salmon, canned	3 oz	181
Pudding, made with instant mix	½ cup	153
Cottage cheese	1 cup	138
Tofu	½ cup	138
Spinach, cooked	½ cup	120

#### Did you know...

75% of American adults do not meet the current recommendations for calcium intake. Your body constantly breaks down and rebuilds bone--so calcium intake throughout life is important.

Peak bone mass is achieved by age 20-30. A woman may lose 20% of her bone mass in the first years following menopause.

In addition to building strong bones and teeth, calcium helps your heart, muscles, and nerves to function properly and your blood to clot.

55% of those over age 50 have low bone mass.

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Calcium carbonate supplements are best absorbed when taken with meals--no more than 500 mg of calcium at one time.

Calcium citrate may be more effective at protecting against bone loss than calcium carbonate.

Regular weight bearing exercise, such as walking or strength training, helps to keep your bones strong.

Excessive alcohol consumption and smoking decrease bone density.

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