

OSTEOPOROSIS AND OSTEOPENIA

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What is osteoporosis and osteopenia?

Osteoporosis is a problem in which bones are less dense and more fragile and thus at greater risk for fracture, even with a small amount of trauma. This disease often affects bones in the hip, spine, and wrist. *Osteopenia* is the term used for bones that have become somewhat less dense than normal, but not as severe as in osteoporosis. A person with osteopenia is at risk for getting osteoporosis.

What are the risk factors for osteoporosis?

In young healthy adults, bones continue to grow, reaching their greatest strength around ages 20 to 35. After that, bones slowly become weaker as you get older.

The risk of osteoporosis increases with age. Osteoporosis is most common in women after menopause, between the ages of 45 and 55. Osteoporosis is most common in white and Asian women, especially slender women, but it can occur in women of any race. In any given ethnic group, older women have about twice the risk for osteoporosis as older men. You are also at higher risk if you have a family history of osteoporosis.

In addition to aging, other causes of osteoporosis are:

- Prior fracture as an adult (in the absence of severe trauma)
- Current cigarette smoking
- Low body weight
- Frailty, for example: not being able to rise from a chair without help
- Long term use of certain drugs such as prednisone, heparin, and some but not all anti-seizure drugs. Hormone therapy for prostate cancer can also produce osteoporosis
- Conditions that impair gastrointestinal absorption such as sprue or Crohn's disease
- Hyperparathyroidism
- Alcoholism
- Severe liver disease
- Kidney failure
- too little calcium in the diet or eating disorders or too much dieting not enough weight-bearing exercise such as walking, dancing, or lifting weights
- intense exercise (such as marathon running), which reduces estrogen levels
- long periods of bed rest during serious illness, which speeds up the loss of calcium from bones

What are the symptoms?

You may have no symptoms until a bone breaks. Broken bones are the most common problem for people with osteoporosis. Often it's the hip, arm, or wrist that breaks. If you want to prevent or treat osteoporosis, the goal is to avoid fracture.

All bones can be affected by osteoporosis, but the worst osteoporotic fractures occur in the vertebrae of the spine and in the hip. Vertebral fractures can cause back pain, loss of height, curved spine, and stooped posture. Many vertebral fractures do not, however, cause any pain. A hip fracture almost always requires hospitalization and surgery. More patients with prostate cancer suffer fractures from the osteoporosis than the cancer.

How is it diagnosed?

Your health care provider may suspect that you have osteoporosis based on your risk factors, loss of height, or even from an x-ray taken for some other problem. There are no practical methods to assess overall bone strength, but bone mineral density (which can be measured) accounts for about 70% of bone strength and is the best way to predict the risk of fracture.

A DEXA [Dual Emission X-ray Absorptiometry] scan of the spine and/or hip is most often used and is the best test to predict bone mineral density. A DEXA scan uses x-rays, but instead of creating a picture by exposing film, it uses a detector and a computer to calculate bone density. The test is painless and typically takes less than 10 minutes. The results of the DEXA scan will be reported as a T-score. A T-score compares your bone density to that of healthy young adult; -1 or greater is normal; -2.5 or lower is osteoporosis; and between -2.5 and -1 is considered osteopenia. Deciding when to treat depends on both an individual's T-score and risk factors.

How is it treated?

Treatment does not cure osteoporosis, but it can slow down the loss of bone and rebuild some bone.

To maintain good bone health and prevent osteoporosis you should eat a balanced diet that includes adequate calcium and vitamin D (using supplements when necessary), engage in regular physical activity, refrain from smoking, and avoid heavy alcohol use (maximum 1 drink/day for women or 2 drinks/day for men). It is important to consume enough calcium and vitamin D throughout your life, in order to achieve maximal peak bone density in early and middle years and to maintain bone in later years. For most adults, **a daily intake between 1200 and 1500 mg of calcium and 400-800 IU of Vitamin D is both safe and effective.** If you have low bone density but not osteoporosis, your doctor may, depending on your situation, recommend a medication to reduce risk of developing osteoporosis and fracture. Weight-bearing exercise, such as walking or stair climbing, also helps keep your bones strong. Doing this kind of physical activity every day may help stop further weakening of your bones.

What medications are used for osteoporosis?

The goal of osteoporosis treatment is to avoid fracture. You should continue (or begin) to consume adequate amounts of calcium and vitamin D. To further reduce risk of fracture your doctor may suggest a medication, although the exact recommendation will likely depend on your situation. Both alendronate (Fosamax®) and risedronate (Actonel®), which are bisphosphonates, have been shown to decrease risk for hip and spine fractures in postmenopausal women with osteoporosis. They also appear to reduce risk of fracture in men with osteoporosis and in persons who take glucocorticoid medications, such as prednisone.

If I have osteoporosis, what can I do to reduce my risk of injury?

- Increase your activity level gradually (but avoid unusually high impact sports)
- Wear supportive shoes with low heels and non-slippery soles
- Use support for walking, such as a cane, if you need it
- Maintain a safe, well-lit, and uncluttered home to help prevent falls
- Avoid throw rugs on your floors at home
- Avoid icy, wet, or slippery surfaces, especially in the bathroom
- Use nonskid mats in the shower and bathtub

Calcium

Eating a balanced diet with enough calcium and vitamin D is a key step in the prevention of osteoporosis.

How much calcium do I need?

This depends on many factors, such as, age, gender, drugs, and bone mineral density. For most people, a daily intake between 1000 and 1500 mg of calcium is both safe and potent.

Minimum daily requirements for calcium are:

Children (4-8 years)	800 mg	Adults (51 or older)	1200 mg
Teenagers (9-18 years)	1300 mg	Pregnant or nursing women	1200 mg
Adults (19-50)	1000 mg	Postmenopausal women	1200-1500 mg

What foods are rich in calcium?

Dairy products are good sources of calcium. An 8-ounce glass of milk contains about 300 mg of calcium. Two slices of firm cheeses, such as American, Swiss, cheddar or mozzarella have about as much calcium as a glass of milk. Softer cheeses, like cottage

cheese, most often contain 1/3 to 1/2 this amount of calcium per serving. Other calcium-rich foods are yogurt, salmon, tofu, almonds (100 mg in a 2-ounce serving), and beans. Also, many foods such as orange juice and soy milk come in calcium fortified forms. The average American daily diet contains about 200 mg of calcium in non-dairy foods.

Milk Products	Calcium (MG)	Vegetables / Fruit	Calcium (MG)
Plain yogurt, 2%, 1 cup	415	Rhubarb, 1 cup	348
Nonfat dry milk, 1/4 cup	377	Collard/mustard greens, 1/2 cup	179
Skim milk, 1 cup	302	Kale, 1 cup	179
Buttermilk, 1 cup	285	White beans, 1 cup	170
Mozzarella cheese, part-skim, 1 oz	207	Beet greens, 1 cup	165
Ricotta cheese, part-skim, 1/4 cup	168	Broccoli, 1/2 cup	89
Cottage cheese, 2%, 1 cup	155	Okra, 1/2 cup	88
Pudding (with skim milk), 1/2 cup	150	Rutabagas, 1 cup	72
Parmesan cheese, 1 tbsp	69	Green beans, 1 cup	58
		Lima beans, 1 cup	55
Bean/Grain Products		Orange, 1 medium	52
Waffle/pancake (milk, egg added)	179	Cabbage, 1 cup	50
Tofu, 3 oz	150		
English muffin	96	Seafood	
Soybeans, 1/2 cup cooked	88	Salmon, 3-4 oz	225
Corn muffin	66	Oyster, 3 1/2 oz	100
Pita bread, 1 pocket	49	Clams, 1/2 cup	74
Fortified whole wheat cereal	48	Shrimp, 3 1/2 oz	50
Corn tortilla, one 6 inch	42	Haddock, 3 1/2 oz	42
Whole wheat dinner roll	34		
Brown rice, 1 cup	33		

What do I need to know about calcium supplements?

If you are not able to get your daily calcium requirements from dairy products and other foods, calcium supplements are a safe and potent way to get enough calcium. Here are a few tips for choosing a calcium supplement.

- The amount of calcium in supplements varies from 200 mg to 600 mg, and should be printed on the label.
- Read the label - a supplement 'serving' may contain 400 mg of calcium, but that 'serving' may be two tablets.
- Research suggests that calcium supplements are best absorbed when taken in doses of 500 mg of calcium or less. For this reason, your calcium supplementation should most often be split over the course of the day.
- Most often, chewable tablets are absorbed better than pills that are swallowed whole.
- If you use a non-chewable pill, you can check if it can dissolve well: place the pill in a glass of warm water for 30 minutes and then stir; if the pill dissolves in the water, it should also dissolve in your stomach.
- Some people taking calcium supplements are concerned about lead content. The FDA maximum for lead intake is 6.0 mcg/day. Lead-free calcium supplements include Tums, Walgreen's, Equate, Nature Made, Sundown (all calcium carbonate) as well as Citracal (calcium citrate). Two well known calcium supplements that contain lead are, Caltrate (3.43 mcg/day) and OsCal (1.74 mcg/day). These amounts assume an intake of 1500 mg of calcium per day.

Should I be taking calcium carbonate or calcium citrate?

- In general, calcium carbonate costs less, and is just as effective.
- Calcium carbonate is best absorbed when taken with meals. Calcium citrate can be taken at any time.
- If constipation is an issue, calcium citrate (Citracal) may be a better choice for some people.
- Most experts suggest that patients taking drugs that block stomach acid (this includes medications such as Zantac, Pepcid, Prilosec, or Protonix, but these are not all of the drugs) take calcium citrate rather than calcium carbonate.

Vitamin D

How much vitamin D do I need?

If you have been told to take a vitamin D supplement, a dose between 400-800 International Units (IU) per day is safe and potent. Older patients should take the 800 IU/day dose. Almost all multivitamins contain 400 IU/day. Also, many vitamin D supplements can be bought at most drug stores, food stores, and health food stores. Many calcium supplements also contain vitamin D in the right amount.

Can I get my vitamin D requirements from foods?

Very few foods are naturally rich in vitamin D. Milk is most often fortified with 125 IU of vitamin D per glass. There is also some vitamin D in eggs, organ meats, and fish such as salmon, sardines, and herring. Vitamin D is also manufactured in the skin right after direct exposure to sunlight. Sunlight exposure to the hands, face and arms for as little as 5-15 minutes, 2-3 times per week is helpful to produce vitamin D.