

Bone Health and Osteoporosis

Good bone health is important throughout your life. Your bones are responsible for providing structure and support for your body, protecting your organs and storing calcium. Good bone health may prevent osteoporosis, a condition in which bones become fragile and more likely to break.

Bone Health

To keep your bones healthy, we recommend these tips:

- Consume the recommended amount of calcium and vitamin D each day
- Exercise regularly
- Stop smoking
- Limit caffeine and alcohol

Calcium and Vitamin D

Making sure you have enough calcium and vitamin D every day is very important for maintaining bone health at all ages.

Calcium is needed for bone formation. In general, it is recommended that you get 1000 to 1200 milligrams (mg) per day of calcium from all sources, including diet and supplements. Your health care provider may recommend more or less depending on your personal needs. Eating a well balanced diet is the best way to consume the recommended amount of calcium. By adding healthy foods rich in calcium to your diet you can increase your calcium intake. For example:

- Low-fat cheeses, yogurt and milk
- Dark green leafy vegetables, such as collard greens, kale and broccoli
- Canned fish with bones you can eat, such as canned salmon and sardines

For more options, see the table below:

Food	Serving Size	Calcium Content in Milligrams (mg)
Buttermilk	1 cup	280
Cereal, calcium fortified	1 cup	250-1000
Cheese, American	1 slice (1 ounce)	150
Cheese, cottage	1 cup	50-150
Cheese, Swiss	1 slice (1 ounce)	220
Ice cream	½ cup	70-120
Juice, calcium fortified	1 cup	350
Lactaid [®] milk	1 cup	300-500
Milk	1 cup	275-300

Salmon, canned with bones	3 ounces	180
Soy milk, calcium fortified	1 cup	200-300
Yogurt	1 cup	250-450
Yogurt, frozen	½ cup	100

Vitamin D helps your body absorb calcium from food and supplements. The Dietary Reference Intake for vitamin D is 200 to 400 international units (IU) per day. This may be low, so the general recommendation is to obtain 800 to 1000 IU per day. The major food sources of vitamin D are fatty fish, such as salmon, and vitamin D fortified foods, such as dairy and cereal products. Also, sun exposure of about 20 minutes a day will cause the skin to make vitamin D.

Supplements

Most people do not get enough calcium or vitamin D from their typical diets. Therefore, your health care provider may recommend that you take an over-the-counter supplement. Remember, the recommended amount of calcium and vitamin D is from your diet and supplements combined. You should not consume more than 2500 mg of calcium per day or more than 2000 IU of vitamin D per day. If you eat calcium rich foods, you may need fewer milligrams per day of calcium in supplement form. Talk with your health care provider to determine the right amount of calcium and vitamin D for you.

When taking supplements, do not take more than 400 to 600 mg of calcium at one time. Higher doses are not well absorbed by the body. If you need to take a higher dose, take half in the morning and half in the evening.

If you have gastrointestinal side effects (such as constipation, bloating, nausea) while taking calcium supplements, look for a supplement made with calcium citrate, rather than calcium carbonate. It is milder on the gastrointestinal tract.

For a list of commonly available brand-name calcium and vitamin D supplements, please ask for a copy of “Calcium Supplements.”

Lifestyle Changes

Exercise

Two types of exercise are important for building and maintaining bones: weight-bearing and resistance exercises. Weight-bearing exercises cause your bones and muscles to work against gravity. Walking, dancing, tennis and stair climbing are examples of weight-bearing exercises. Swimming and bicycling are **not** weight-bearing exercises.

A second type of activity to improve bone strength is resistance exercise. These use muscular strength to improve muscle mass and strengthen bone. Resistance activities include weight lifting, such as using free weights and weight machines found in gyms and health clubs.

A goal for exercise is 30 minutes of moderate activity, such as brisk walking, every day.

Tobacco, Alcohol and Caffeine

The use of tobacco products (cigarettes and smokeless tobacco) leads to poor bone health. It is recommended to avoid using tobacco products. If you currently use tobacco products, consider quitting to improve your bone health. Contact M. D. Anderson's Tobacco Treatment Program for help with quitting, 866-245-0862.

Limiting alcohol can improve bone health. Currently there is not a recommended limit on alcohol consumption for bone health. However, to reduce your cancer risk, it is recommended that men consume no more than two drinks per day and women consume no more than one drink per day. A drink of alcohol is defined as 12 ounces of regular beer, 5 ounces of wine or 1 ½ ounces of hard liquor.

Also, limit caffeine in your diet. Caffeine may affect the amount of calcium that is absorbed and used by your body.

Osteoporosis

Osteoporosis is a condition in which a person's bone mass is lost faster than it can be replaced. This results in bones that are weak, less dense and more likely to break.

What causes osteoporosis?

Risk factors for bone loss include:

- Gender – women are four times more likely to be affected than men.
- Aging
- Lack of exercise; sedentary lifestyle
- Use of tobacco products
- Consuming alcoholic drinks
- Many drugs, including steroids, hormonal agents, blood thinners, anticonvulsants and certain chemotherapy drugs
- Menopause, the stopping of menstrual periods in women, can be natural, surgical, or drug-induced. Early menopause is one of the strongest predictors of the development of osteoporosis in women.
- Low testosterone production in men – known as hypogonadism
- Calcium or vitamin D deficiency
- Other diseases such as hyperparathyroidism, hyperthyroidism, multiple myeloma and Cushing's syndrome
- First degree relative with osteoporosis or history of fracture

What are the symptoms?

Most of the time, a person does not know he or she has osteoporosis until a bone breaks. The bones of the hips, spine and wrists have the greatest risk of fracture.

How is it diagnosed?

The diagnostic test used for measuring bone mass is an x-ray called a **bone densitometry**, also referred to as a Bone Mineral Density (BMD) test. The first test, sometimes performed when a woman reaches menopause, serves as a baseline to compare and track any bone loss over a period of time. Bone mineral density is often measured before or during cancer treatment. Ask for a copy of “Bone Mineral Density Test.”

What can I do to prevent osteoporosis?

Good bone health may prevent osteoporosis. For more details, refer to the beginning of this document.

Are there medications that can help?

Prescription medications may stop or slow bone loss and reduce the risk of bone fractures. Some of these medications include:

Alendronate (Fosamax[®]) is approved for both the prevention (5mg per day or 35 mg once a week) and treatment (10 mg per day or 70 mg once a week) of postmenopausal osteoporosis. Alendronate reduces bone loss, increases bone density and reduces the risk of spine, wrist and hip fractures.

Ibandronate (Boniva[®]) is approved for the treatment of postmenopausal osteoporosis and is the first once-a-month (150 mg) medicine.

Parathyroid hormone or teriparatide (Forteo[®]) is approved for the treatment of osteoporosis in postmenopausal women and men who are at high risk for a fracture. Forteo[®] promotes new bone growth and greatly increases bone mineral density. Research studies have shown a decrease in fractures of the spine, hip, foot, ribs and wrists in postmenopausal women. Research studies have shown a decrease in fractures of the spine in men, but more research is needed to evaluate the effect on other bones. Forteo is self-administered as a daily injection for up to 24 months.

Raloxifene (Evista[®]) is approved for the prevention and treatment of postmenopausal osteoporosis. Raloxifene increases bone mass and reduces the risk of spine fractures. Data is not yet available to demonstrate that raloxifene can reduce the risk of hip and other non-spine fractures.

Zoledronic Acid (Reclast[®]) is approved for the treatment of postmenopausal osteoporosis. It is the only once-a-year medicine, given by infusion in your health care provider’s office. Reclast[®] increases bone density and reduces the risk of spine, wrist and hip fractures.

Risedronate (Actonel[®]) is approved for the prevention and treatment of postmenopausal osteoporosis. Taken daily (5 mg dose), weekly (35 mg dose) or monthly (150 mg dose), risedronate slows bone loss, increases bone density and reduces the risk of spine and non-spine fractures.

Ask your doctor if you have questions.