

Osteoporosis

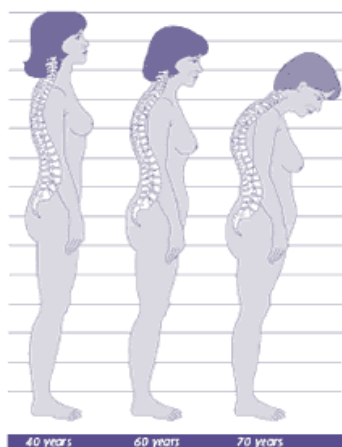
Bones go through a constant state of loss and regrowth. As a person ages, more bone loss than bone growth occurs. This can lead to a condition called osteoporosis. The bones then become thin and fragile and can fracture or break easily. This pamphlet explains:

- Risk factors of osteoporosis
- How it can be detected
- How you can help prevent it

What Is Osteoporosis?

Bone is made up of **calcium** and protein. There are two types of bone—compact bone and spongy bone. Each bone in the body contains some of each type. Compact bone looks solid and hard and is found on the outer part of bones. Spongy bone is filled with holes, just like a sponge, and is found on the inside of bones. The first signs of osteoporosis are seen in bones that have a lot of spongy bone, such as the spine, hip, and wrist.

Once made, bone is always changing. Old bone is removed in a process called resorption, and new bone is formed in a process called formation. From childhood until age 30 years, bone is formed faster than it is broken down. The bones become large and more dense. After age 30 years, the process begins to reverse: bone is broken down faster than it is made.



As spinal bones weaken, they collapse under the weight of the upper body

This process continues for the rest of your life. A small amount of bone loss after age 35 years is normal in all women and men. Most of the time, it does not cause any problems. However, too much bone loss can result in osteoporosis.

With osteoporosis, bones become thin and brittle because more bone is lost than formed. The bones are still the same size, but the outside walls of compact bone become thinner, and the holes in spongy bone become larger. These changes greatly weaken the bone.

Osteoporosis can pose a special threat to women. Estrogen—a female **hormone**—protects against bone loss. As a woman nears **menopause**, her body produces less **estrogen**. Hormone therapy slows bone loss after menopause. Estrogen has been shown to decrease the risk of hip fractures and spinal deformities. In women who have a uterus, estrogen is given along with another hormone—**progestin**. This decreases the risk of endometrial cancer, which occurs when estrogen is given alone.

However, bone loss begins to happen long before menopause. Often, by the time symptoms of osteoporosis show, a great deal of bone loss has already occurred.

Some symptoms of osteoporosis are back pain or tenderness. Signs include a loss of height more than what is normal for your age group, and a slight curving of the upper back. As the spinal bones weaken, they slowly collapse under the weight of the upper body. This causes a curving of the spine—often called a "dowager's hump."

Osteoporosis affects at least 10 million Americans—most of whom are women. Each year, more than 1.5 million fractures related to osteoporosis occur in the United States. One in two women older than 50 years will have a fracture related to osteoporosis in their lifetime. Fractures can be crippling and painful and cause lifelong disability.

Prevention

It is hard to grow new bone after it is lost, so prevention is important. Slowing bone loss helps build strong bones. To prevent osteoporosis, focus on building and keeping as much bone as you can. This can be done by doing weight-bearing exercises and choosing foods with enough calcium and Vitamin D. After menopause, your doctor may suggest medication to protect against bone loss if your bones show signs of early osteoporosis.

Exercise

Exercise increases bone mass before menopause and slows bone loss after menopause. Just as muscles become stronger with regular exercise, so do bones. Bones are strengthened by having the muscles pull on them. Bone loss will occur any time the bones are not used. For example, it becomes worse in people who are bedridden for a long time. Active women have higher bone density than women who do not exercise.

Most aerobic exercise is good for the heart and bones. To help prevent bone loss, the exercise should be weight-bearing, such as low-impact or step aerobics, brisk walking, and tennis. Even walking several blocks each day will slow bone loss. A little bit of exercise is better than none at all. If you have questions about the best exercise program for you, talk with your doctor or a professional who knows about health and exercise. Let him or her know if you have a physical problem that may limit your exercise.

Diet

Risk Factors

Compared with men, women are more at risk of osteoporosis because of menopause and because their bones are smaller and lighter than men's bones. Women who take certain medications (see box) or have certain medical conditions also are at increased risk of osteoporosis. The following factors can increase the risk of fractures caused by osteoporosis:

- Personal history of fracture
- Family history of osteoporosis
- Caucasian race
- Dementia
- Poor nutrition
- Low body weight
- Early menopause (younger than 45 years)—Bone loss increases after menopause because the **ovaries** stop making estrogen, which protects against bone loss.
- Removal of ovaries—If a woman has her ovaries removed before menopause, the sudden decrease in estrogen can result in rapid bone loss unless she takes a preventive treatment, such as estrogen.
- Prolonged **amenorrhea** before menopause (more than 1 year)
- Diet low in calcium (lifelong)
- History of falls
- Lack of exercise
- Alcoholism
- Vision problems
- Certain medications
- Bone loss can increase if your diet is low in calcium. Calcium slows the rate of bone loss. If the amount of calcium in the bloodstream is too low, it will be taken from the bones to supply the rest of the body.
- Good sources of calcium are dairy products, such as milk and yogurt. Other sources are leafy green vegetables, nuts, seafood, and juices and cereals that are fortified with calcium (see Table 1). A well-balanced diet is very healthy for bones.

Most women do not consume enough calcium in their diets. In fact, many women get only one half of the daily amount of calcium they need. You may need to take calcium supplements. Ask your pharmacist to suggest one that is right for you. Women aged 51 years and older need 1,200 mg of calcium per day. The National Institutes of Health recommends 1,500 mg of calcium per day for postmenopausal women who do not take **hormone therapy** and all women older than 65 years. Be aware, however, that your body can only absorb about 500 mg of calcium at one time. If you take more, try to divide it into two doses.

Calcium cannot be absorbed without vitamin D. Milk that is fortified with vitamin D, including lactose-free milk, is one of the best sources. Another is sunlight.

Being in the sun for just 15 minutes a day helps your skin produce vitamin D and activates vitamin D in your body. You also can use vitamin D supplements. A woman should take the recommended daily amount of vitamin D, which is 10 micrograms for women aged 51–70 years and 15 micrograms for women older than age 70 years.

Detection

You should have a physical exam once a year during which your height is measured. All women aged 65 years and older or younger women who have had a bone fracture should be tested for bone mineral density no more than every 2 years. More frequent testing may be needed if new risk factors occur. Testing also may be suggested for postmenopausal women younger than 65 years who have one or more risk factors for osteoporosis.

Bone mineral density tests measure bone mass in the heel, spine, hip, hand, or wrist. Measuring one area can give your doctor a sense of your bone density in other parts of your skeleton. The devices used for the tests vary, but all involve X-rays or beams from other energy sources. You may be asked to lie on your side or back for the X-ray, or you may sit and place your hand or foot into a cylinder. The tests can take as little as 1 minute or as much as 40 minutes. A bone density test can help detect problems before a fracture occurs. A test also can help determine:

- Whether you have osteoporosis
- Your rate of bone loss
- Your risk of a future fracture

There are several ways to measure bone density. They are all painless and safe.

Dual-Energy X-ray Absorptiometry

Dual-energy X-ray absorptiometry (DXA) is used most often to measure the bone density of your spine or hip. It is currently the most accurate test available.

During the test, you lie down for 3–10 minutes while an arm-like device (an imager) scans your body. With this test you are exposed to a very small amount of

radiation—less than the amount in a normal chest X-ray.

After the test, you will be given a T-score. This is a number that is calculated when your DXA test results are compared to the average bone density of a healthy 30-year-old. A negative score means you have thinner bones than an average 30-year-old. A positive score means your bones are stronger and thicker than an average 30-year-old.

If your T-score is -1 to -2.5, you have low bone mass and are at increased risk for osteoporosis. A score of -2.5 or lower means you have osteoporosis. A low T-score may mean that you also are at increased risk of a bone fracture. In rare cases, low T-scores are caused by other medical conditions.

Other Methods

There are several other methods that can be used to measure bone density. However, none are as accurate as DXA, the preferred method.

Quantitative Computed Tomography (QCT). This method uses both ***computed tomography*** scanning and computer software to test the bone density of the spine. This test provides three-dimensional images and requires only a little more radiation than a DXA test.

Quantitative Ultrasonography. This test uses sound waves instead of radiation to measure bone density. During this test, you place your bare foot on the machine and sound waves are transmitted through your heel. Although this test may help predict the risk of fracture in your spine or hip, it often is not as accurate as other tests. This is because bone mass is not the same in all areas of the body.

Treatment

There are many treatment options available to help reduce the risk of fracture. Some need to be taken every day, some are weekly, and some are monthly. There is also an option of getting a yearly injection. No matter what dosing method you choose, the earlier treatment is started, the better it works.

Bisphosphonates

Bisphosphonates are medications used to prevent and treat osteoporosis. In cases of prevention, they are used to slow bone breakdown. To treat osteoporosis, they are used to help increase bone density and reduce the risk of fractures. These medications must be taken on an empty stomach. Although rare, side effects may include nausea, stomach pain, and digestive problems.

Exercise every day, even if you walk only a few blocks, and get enough calcium. Talk with your doctor about methods to prevent, diagnose, and treat osteoporosis.

Selective Estrogen Receptor Modulators

Women also can take a type of drug known as selective estrogen receptor modulators (SERMs) to help prevent or treat some of the bone problems that can occur during menopause. Raloxifene is a type of SERM that helps strengthen the tissues of the bones.

SERMs may be a good choice for women who need protection from osteoporosis, but cannot or do not want to take hormone therapy. This may include:

- Women at risk of breast cancer
- Women who cannot tolerate the side effects of hormone therapy
- Women who do not need relief from symptoms of menopause

Hormone Therapy

Starting estrogen at any time after menopause can help prevent bone loss. It can be a good choice for women who also have symptoms of menopause. However, it only protects bones for as long as you use it. When you stop taking hormone therapy, bone loss resumes. You and your doctor should decide whether this treatment is right for you.

Other Options

Another medication used to slow the breaking down of bone is called calcitonin. It can be given by injection or nasal spray. Parathyroid hormone also may be used to increase bone density and reduce the risk of fractures.

Finally...

To increase your chances of staying healthy, you have an important goal—to prevent bone loss.