

OSTEOPOROSIS AND BONE LOSS



Diagnosis and Treatment
for Better Bone Health

Take Action for Stronger Bones

Every year, millions of women and men are diagnosed with bone loss. This condition can lead to **osteoporosis**, a bone disease that means bones are weak and easy to break (fracture). Bone loss and osteoporosis don't have to be a fact of life. With medication, diet, and exercise, you can improve the health and strength of your bones.



Bone Loss Affects Your Life

Bone loss increases your risk for a bone fracture. People with osteoporosis often break bones in the spine or hip. A spinal fracture can lead to severe back pain, deformity, and loss of height. This can cause problems with moving and breathing. Breaking a hip can be even more serious. A hip fracture can make it hard to walk and take care of yourself. After a hip fracture, older people often require long-term care. Many enter nursing homes.

Learn Your Risks

Some characteristics, called **risk factors**, make bone loss more likely. Check off the risk factors below that apply to you. The more risk factors you have, the more you need to take steps to protect your bones.

- Are you a woman? Are you past menopause?** Most people with osteoporosis are women. Those past menopause are even more at risk.
- Does a family member have bone loss or fractures?** Osteoporosis can run in families.
- Are you thin, small, or petite?** People with these body types have less bone, so they're more at risk.
- Are you a man over age 65?** Men also lose bone, especially as they age.
- Do you have a health condition?** Some conditions raise your risk for osteoporosis. These include rheumatoid arthritis, celiac disease, and an overactive thyroid or parathyroid gland.
- Do you use certain medications?** Long-term use of some medications, such as corticosteroids or anti-convulsants, can increase risk.
- Are you a woman with estrogen deficiency?** Menopause before age 45 or surgical removal of the ovaries can lower estrogen levels, leading to bone loss.
- Do you get too little calcium or vitamin D?** Low levels of these minerals increases bone loss.
- Do you get little exercise?** Like muscles, bones weaken without exercise.
- Are you or have you been a smoker?** Smoking can lead to low bone mass and fractures.
- Do you have more than two alcoholic drinks a day?** Too much alcohol can affect the body's ability to make bone.

You Can Take Action Now

Osteoporosis is a serious disease, but it can be prevented and treated. It's never too early or too late to start taking care of your bones. You can take steps to increase your bone strength and protect your health. Talk to your healthcare provider about getting started with a plan to prevent and treat bone loss.

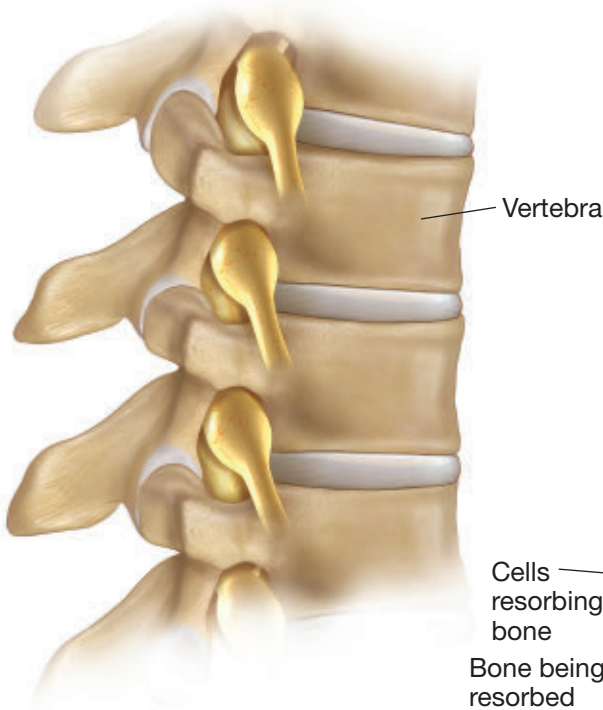
Bone Is Living Tissue

Your bones are living, growing tissue. They are always changing. The body has a system for maintaining a healthy level of bone. If this system gets out of balance, problems can result.

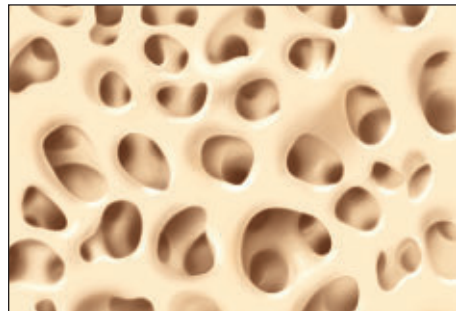
A Balanced System Supports the Body

The body is always making and losing (**resorbing**) bone. This process is called remodeling. **Bone-making cells** form new bone using calcium and other minerals. These minerals come from the food you eat. **Bone-resorbing cells** take bone apart. They do this so the minerals can be used to repair an injury or make new bone. When this system is in balance, the same amount of bone is built and resorbed. Bones stay strong and can support the body.

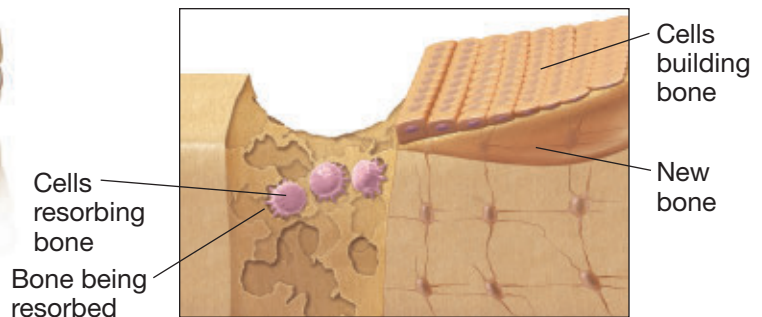
Side view of healthy spine



Close-up of bone



Close-up of bone cells

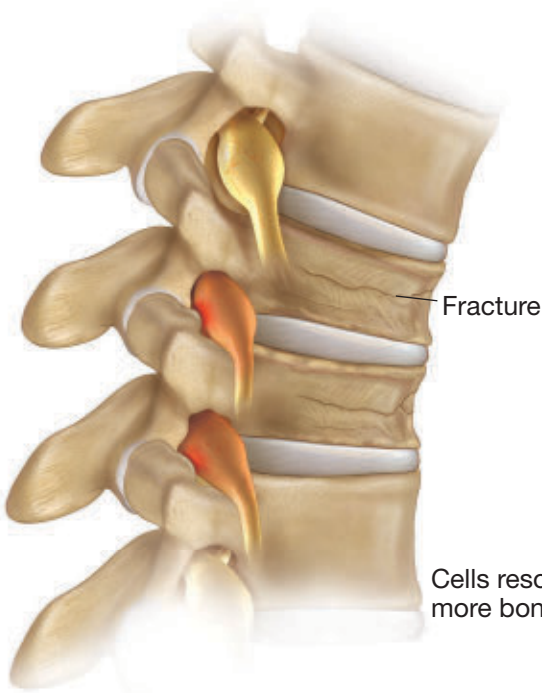


A balanced system keeps building and resorbing bone.

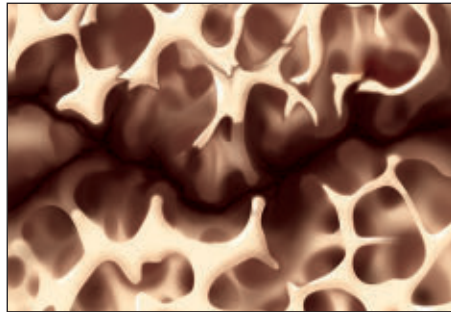
An Unbalanced System Can't Give Support

Changes in hormone levels, too little activity, taking certain medications, or not getting the right diet can unbalance the bone-making system. Then, the amount of bone lost is greater than the amount of bone made. This means the body loses bone, leading to **osteopenia** (bone becomes less dense). If this is not treated, osteoporosis will result. Weak bones can't support the body. In fact, they can fracture just from the weight of your body. This often happens in **vertebrae** (bones of the spine). When vertebrae fracture, parts of the spine compress. This can cause a hump to form in the spine.

Side view of spine with osteoporosis

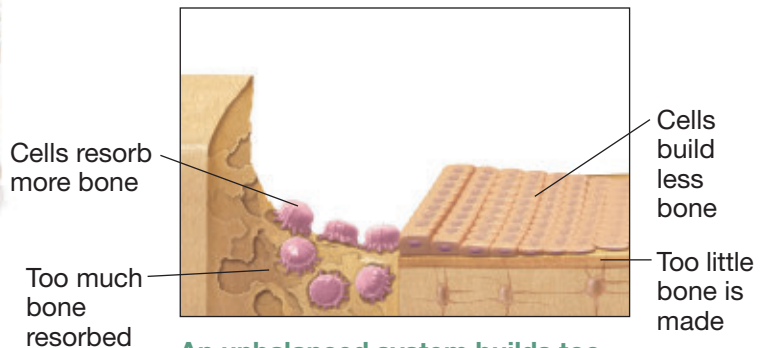


Close-up of bone with osteoporosis



Unhealthy bone is lacy and weak.

Close-up of bone cells in osteoporosis



An unbalanced system builds too little bone and resorbs too much.

Bones Change Over Time

Bones are always changing. That's why you can impact your bone health, no matter how old you are. The total amount of bone in your body is your **bone mass**. The goal is to keep your bone mass high.

Childhood

The body builds the most bone during these years. Boys and girls need foods rich in calcium. They also need plenty of exercise. Together, a proper diet and exercise help bones grow strong and healthy.

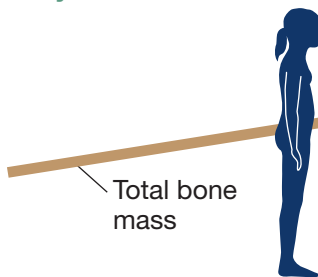
Young Adulthood to Age 30

During young adulthood, bones become their strongest. This is called **peak bone mass**. The same habits that built bone in childhood help keep bone healthy now.

Age 30 to Menopause

Near age 30 the body starts making less bone. But you can help slow the rate of bone loss. With frequent exercise and by getting plenty of calcium, the body can maintain bone mass.

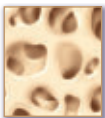
Amount of bone steadily increases.



Bone added

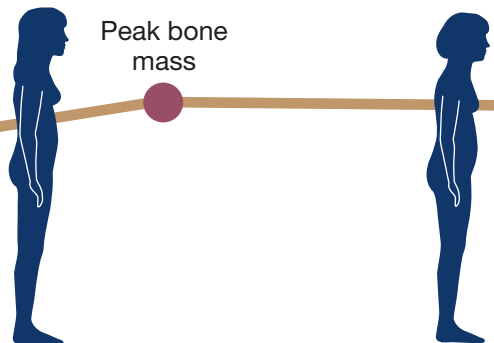


Bone lost



More bone is added than lost.

Bones reach peak bone mass.



Bone added



Bone lost



Bone added equals bone lost.

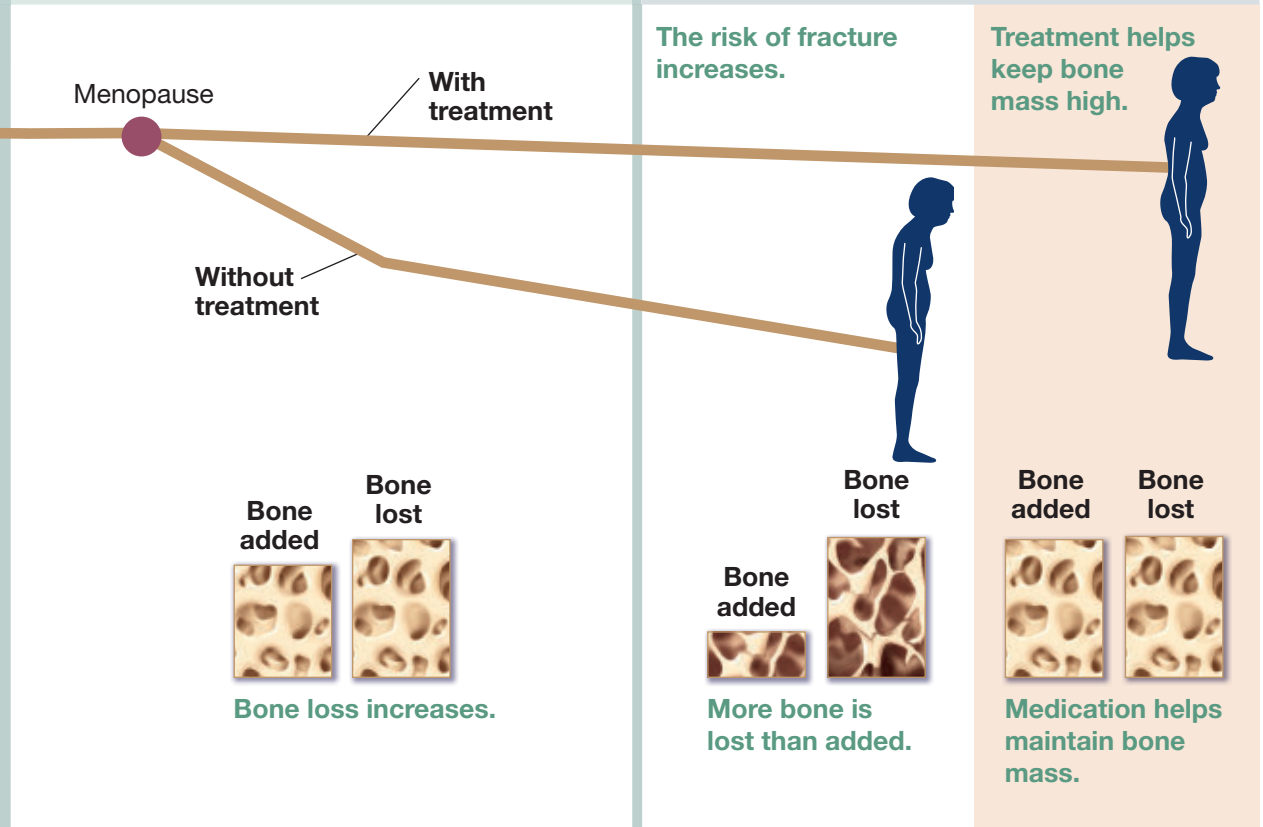


After Menopause

Menopause is when a woman no longer has periods. It will occur naturally or after removal of the ovaries. With menopause, the body makes less **estrogen** (female hormone). This speeds bone loss. In fact, a woman can lose up to one-third of spinal bone mass in the first 6 years after menopause. Treatment of this bone loss can help reduce the risk of fractures.

Later in Life

In later years, the body loses more bone than it makes. Bone density testing can tell you if your bone loss is a problem. Medication, diet, and exercise can help keep bones strong. This helps reduce risk of fracture. Preventing fractures helps improve the quality—and length—of your life.



Checking Bone Density

The strength of bones is measured by their **density (thickness)**. Higher bone density means bones are stronger and less likely to fracture. If you are at risk for bone loss, you may be referred for bone density testing.

Bone Density Testing

Bone density testing is safe, quick, easy, and painless. Testing can detect osteoporosis and help predict the risk of future fractures. Testing can also measure the response to treatment. Tests include:

- **Peripheral tests for screening.** They measure density in the finger, wrist, knee, shin, or heel. A common peripheral test is the quantitative ultrasound (QUS).
- **Central tests for diagnosis.** They measure density in the hip or spine. The main central test is the dual energy x-ray absorptiometry (DXA). The DXA is the standard bone density test.



Who Should Be Tested?

The National Osteoporosis Foundation recommends bone density testing for:

- All women age 65 and older and all men age 70 and older.
- Women who are menopausal or postmenopausal who have risk factors.
- Men between the ages of 50 and 69 who have risk factors.
- Any man or woman who has fractures after age 50.
- Men and women with certain health conditions, who take certain medications, or who receive certain cancer treatments.



T-Score Chart*	
Above -1	Normal Bone Mass
-1 to -2.5	Osteopenia (May need treatment)
Below -2.5	Osteoporosis (Usually needs treatment)

Common Testing Sites

With osteoporosis, bones in the spine, hip, wrist, and shoulder are more likely to fracture. Bone density testing is often done at one or more of these sites. The DXA scan is done by passing a machine over you while you rest on a special table.

Understanding Your Results

The results of your test may seem confusing at first. Don't be afraid to ask your provider to explain. Your results may be described in these ways:

- **Bone mineral density (BMD)** describes the denseness of the scanned bone. Your BMD is compared with the BMD of young, healthy bone to get a **T-score**.
- **Absolute fracture risk** uses your T-score and an assessment of personal risk factors (FRAX tool) to estimate your risk for fracture over the next 10 years.

* Adapted from National Osteoporosis Foundation and World Health Organization recommendations. Talk to your doctor about what your results mean for you.

Medication for Bone Health

A complete bone health plan may contain medications. Some medications slow the rate of bone resorption. Others help the body build more bone. You may be prescribed more than one medication. Even with medication, you still need to exercise and get the right nutrients.

Bisphosphonates

Bisphosphonates (alendronate, risedronate, ibandronate, and zoledronic acid) help prevent and treat bone loss. Bisphosphonates are approved for use in people with low bone density who take corticosteroids. Some are also approved for men as well as women with osteoporosis.

Bisphosphonates come in pill form or are given by IV.

Benefits may include:

- Reducing bone loss
- Increasing bone density in the hip and spine
- Reducing risk of fractures in the spine, hip, and wrist

Side effects may include:

- Heartburn
- Nausea
- Abdominal pain
- Bone or muscle pain
- Jaw pain

Oral bisphosphonates (pills)

must be taken exactly as prescribed.

Take them:

- On an empty stomach.
- With a full glass of water (8 oz) first thing in the morning.
- 30 to 60 minutes before any food, drink, or other medications.
- While sitting or standing. Do not bend over or lie down for 30 to 60 minutes after taking the medication. This helps prevent reflux.

IV bisphosphonates (injections)

are given in your doctor's office.

Depending on the type of medication, they are given 1 or 4 times a year.



SERMs

Selective estrogen receptor modulators (**SERMs**) provide the benefits of estrogens without many of their side effects. SERMs (also called raloxifene) are taken as pills.

Benefits may include:

- Increasing bone density in the hip and spine
- Preventing bone loss
- Reducing risk for spinal fracture

Side effects may include:

- Hot flashes
- Leg cramps
- Increased risk for blood clots in the legs and lungs

Calcitonin

Calcitonin treats bone loss. It has few side effects but may not work as well as other medications. It is taken as a nasal spray used daily.

Benefits may include:

- Slowing bone loss
- Increasing spinal bone density

Side effects may include:

- Runny nose or congestion, bloody nose, headaches

Teriparatide and Abaloparatide

These medications are approved to treat women at very high risk for fractures. Both medications stimulate new bone growth. They are each offered as a daily injection and can be used for up to 24 months. Your provider can tell you more about the benefits and side effects of these drugs.

Denosumab

This medication is for women who have gone through menopause or men at risk for fracture. It may be used when other medications can't be taken or don't work well. It may slow bone breakdown, increasing bone strength. It is given as an injection twice a year. Your provider can tell you more about the drug's benefits and side effects.

Hormone Therapy for Women

The use of hormones (estrogen and progesterone) can help preserve bone density and reduce fractures. However, this therapy shows an increased risk of breast cancer, heart attack, stroke, and blood clots. Each woman should weigh the risks and benefits of this option with her doctor.

Daily Choices for Bone Health

You can do things every day to help your bones. Make sure to get enough calcium and vitamin D. If you smoke, talk to your provider about quitting. Also watch your intake of alcohol.

Getting Enough Calcium and Vitamin D

Calcium lets your body build and repair bone. Your body can't make calcium on its own. So you need to get it from food or supplements. You need a constant supply of calcium to help your bones stay healthy. Amounts of calcium are measured in milligrams (mg). Each day, you should get:

- 1,200 mg if you are a woman 51 years or older or a man 71 years or older.
- 1,000 mg if you are a man aged 50 to 70 years.

Vitamin D helps your body absorb calcium. Your body uses sunlight to make vitamin D. You also get vitamin D from fortified foods, but you likely need a supplement to get enough. Amounts of vitamin D are measured in international units (IU). Women and men age 50 years and older should get 800 to 1,000 IU of vitamin D a day.

Food Sources of Calcium and Vitamin D

Some foods are naturally rich in calcium. Others are fortified (have calcium, vitamin D, or both added). Good choices are listed below.

High in calcium:

- Milk
- Yogurt
- Cheese
- Canned sardines with bones
- Canned salmon with bones
- Bok choy
- Collard greens
- Kale
- Broccoli
- Tofu made with calcium sulfate

High in vitamin D:

- Milk
- Salt water fish
- Liver
- Egg yolk

Often Fortified with Calcium and/or Vitamin D (check food labels):

- Soy, rice, or almond milk
- Cereal
- Bread
- Orange juice
- Breakfast bars





Nutrition Facts	
Serving Size 1 container (170g) Yogurt	
Amount Per Serving	
Calories 100	Calories from Fat 0
% DV*	
Total Fat 0 g	0%
Saturated Fat 0 g 0%	
Trans Fat 0 g	
Cholesterol less than 5 mg	1%
Sodium 85 mg	4%
Potassium 250 mg	7%
Total Carbohydrate 19 g	6%
Sugars 14 g	
Protein 5 g	10%
Vitamin A 15%	• Calcium 20%
Vitamin D 20%	• Riboflavin 10%
Phosphorus 15%	• Magnesium 4%
Not a significant source of dietary fiber, vitamin C and iron.	
*Percent Daily Values (DV) are based on a 2,000 calorie diet.	

Reading Food Labels

When food shopping, read the “Nutrition Facts” label. To figure the amount of calcium in a food, add a zero onto the percentage. For instance, 20% daily value is the same as 200 mg of calcium.

Look for foods with vitamin D.

Look for foods high in calcium.

Taking Supplements

It’s best to get calcium from the foods you eat. If you can’t get enough, supplements can help. Calcium and vitamin D supplements come in many varieties. Your healthcare provider can help you decide which supplements are best for you. Be sure to tell your provider about all of the medications, herbs, and other supplements you take.

Quitting Smoking

Smoking is bad for your overall health. It’s also bad for your bones. Smoking decreases bone density and can slow healing from a fracture. If you smoke, the best thing you can do to protect your bones is to quit. Talk to your healthcare provider about stop-smoking aids and programs.

Limiting Alcohol

Small amounts of alcohol are fine. But too much can affect your bone mass. Limit your alcohol to no more than 2 drinks a day.

Exercise for Bone Health

Medication and diet are only part of your treatment plan. Your bones also need exercise. When you're active, bones respond by growing stronger. It is even more effective as part of a complete treatment plan.

Being Active

An active lifestyle can help you build stronger bones. It can help you maintain a healthy weight. Best of all, it can help you feel happier. You don't have to work out in a gym. Take walks with friends. Spend an afternoon gardening. Wander through a museum. Enjoy making activity part of your life. Work with your healthcare provider to choose the right activities for you.

Types of Activities

Weight-bearing

Walking, jogging, tennis, and gardening are weight-bearing activities. These activities place force on the bones. The force comes from your own body weight. The bones respond by growing stronger.

Muscle-strengthening (Resistance)

These activities include the use of free weights, rubber stretch bands, and weight machines. They help make muscles and bones stronger. They also help improve your strength, balance, and posture. This helps reduce your risk for a fall.

Non-weight-bearing

Swimming and bicycling are non-weight-bearing activities. These don't improve bone density, so they shouldn't be the only type of activity you do. But they do help control your weight. They also help keep your heart, lungs, and muscles strong.



Preventing Falls

People with low bone density are at risk for falls that can lead to fractures. This risk is even greater if you've already had a fracture. Take steps to increase your safety and prevent falls.

Home Safety

- Keep a flashlight by the bed. Place nightlights in bathrooms and hallways.
- Remove or fasten loose rugs, carpeting, and stair treads.
- Keep cords out of walkways.
- Keep stairs free of clutter.
- Make sure handrails are secure.
- Install handholds in the bathroom.
- Use a shower stool. Also, apply nonslip strips to the tub or shower floor.

Keeping Your Balance

Keeping your balance is the key to preventing fractures caused by falls. To help:

- Use handrails on stairs and escalators.
- If you need glasses, wear them. Use them when you go out. And wear them if you get up to go to the bathroom at night.
- Wear shoes that fit properly and have slip-resistant soles.
- Pay attention while you walk. Don't talk on the phone, carry too many items, or rush.
- Don't walk with your hands in your pockets. Keep your hands free for balance.
- Avoid walking outside at night, in dark areas, and on wet or icy surfaces.
- Talk to your healthcare provider about avoiding medications that alter your sense of balance.
- Use a cane or walker if recommended by your healthcare provider.





Protecting Your Future

You have the tools to build strong bones for life. Have your bone density tested. Then, follow the treatment plan your healthcare provider sets out for you. For more information, look to the resources below.

Resources

National Osteoporosis Foundation
www.nof.org

NIH Osteoporosis and Related Bone Diseases National Resource Center
800-624-2663
www.bones.nih.gov

Office on Women's Health, U.S. Department of Health and Human Services
800-994-9662
www.womenshealth.gov

Also available in Spanish

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