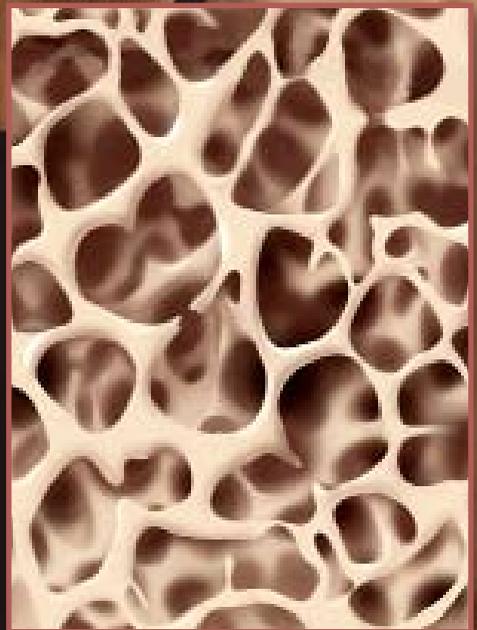


# Osteoporosis and Bone Loss

Diagnosis and  
Treatment

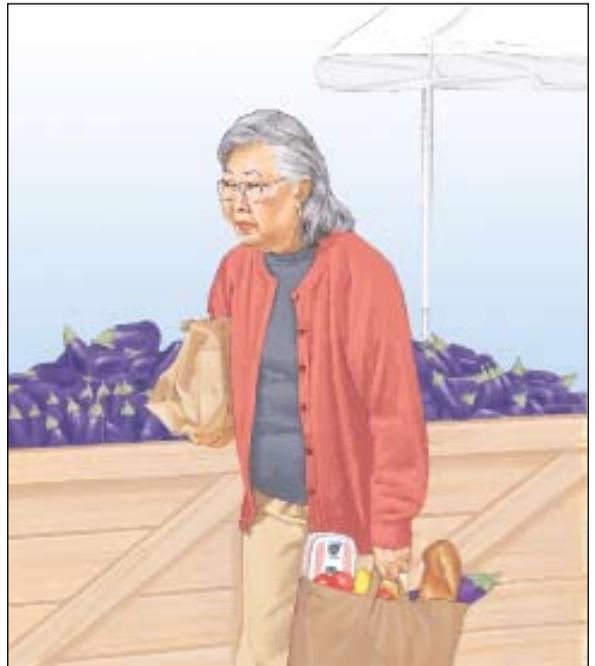


# A LIFETIME OF BONE HEALTH

Every year, millions of men and women are diagnosed with bone loss. This condition can lead to **osteoporosis**, a disease that weakens the bones. Weakened bones are more likely to **fracture** (break). But osteoporosis doesn't have to be a fact of life. With medication, diet, and exercise, you can work toward a lifetime of healthy bones.

## Bone Loss Affects Your Life

Bone loss changes your body and your life. It weakens your skeleton, which you need for support. It also increases your risk of fracture. 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 limit your ability to walk and take care of yourself. After a hip fracture, older people often require long-term care. Many enter nursing homes.



## You Can Take Action Now

Osteoporosis is a serious disease, but it can be prevented and treated. You're never too young or too old to start taking care of your bones. You and your healthcare provider can take steps now to protect your bone health. Start by learning your risks for developing osteoporosis.

# LEARNING YOUR RISKS

Osteoporosis can affect men as well as women. That's why everyone needs to take care of their bones. Some characteristics, called **risk factors**, make bone loss more likely. Find your risk factors below. The more risk factors you have, the more you need to start protecting your bones.

## Risks You May Have

- **Are you a woman? Are you past menopause?** The majority of people with osteoporosis are women. Those past menopause are more at risk.
- **Did your mother or father have bone loss or fractures?** Osteoporosis can run in families.
- **Are you Caucasian or Asian?** Osteoporosis affects all people, but mostly Caucasians and Asians.
- **Are you a man over age 65?** Men also lose bone, especially as they grow older.
- **Do you use certain medications?** Long-term use of some medications, including corticosteroids and anti-convulsants, can increase risk.
- **Is your body type thin, small, or petite?** People with these body types have less bone, so they're more at risk.

## Risks You Can Affect

- **Are you a woman with estrogen deficiency?** Early menopause (before age 45) and surgical removal of the ovaries can decrease estrogen levels. If estrogen isn't replaced, more bone is lost.
- **Is your diet low in calcium? Was it when you were a child?** A diet low in calcium, either in the past or present, increases risk of bone loss.
- **Do you avoid exercise?** Bones, like muscles, get weak without exercise.
- **Are you a heavy smoker? Were you in the past?** Smoking decreases the body's ability to make bone.
- **Do you drink a lot of alcohol? Did you in the past?** Alcohol also decreases the body's ability to make bone.
- **Do you drink a lot of coffee, soda, or other caffeinated beverages?** Too much caffeine can keep bones from getting enough calcium.



## Taking the Next Step

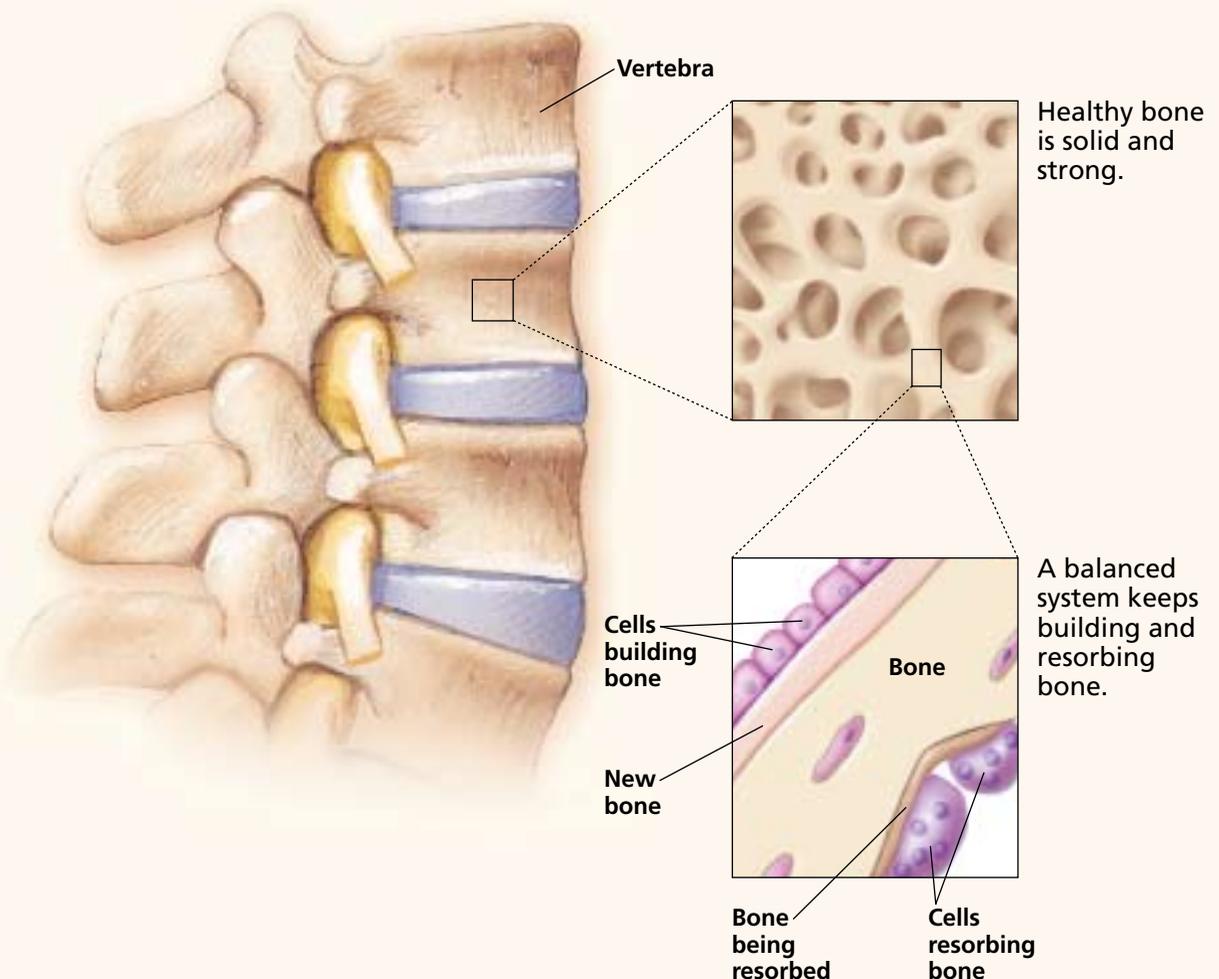
Now you know your risks. The next step is to protect your bone health by decreasing your risk factors. There isn't a single answer or cure for osteoporosis. Instead, a complete treatment plan includes medication, diet, and exercise. Your healthcare provider can help you get started.

# BONE IS LIVING TISSUE

Your bones are alive and always changing. Keeping bones properly fed and exercised helps them stay strong and able to provide support. The body has a natural system for maintaining bone. Understanding this system can help you learn how to maintain your bones.

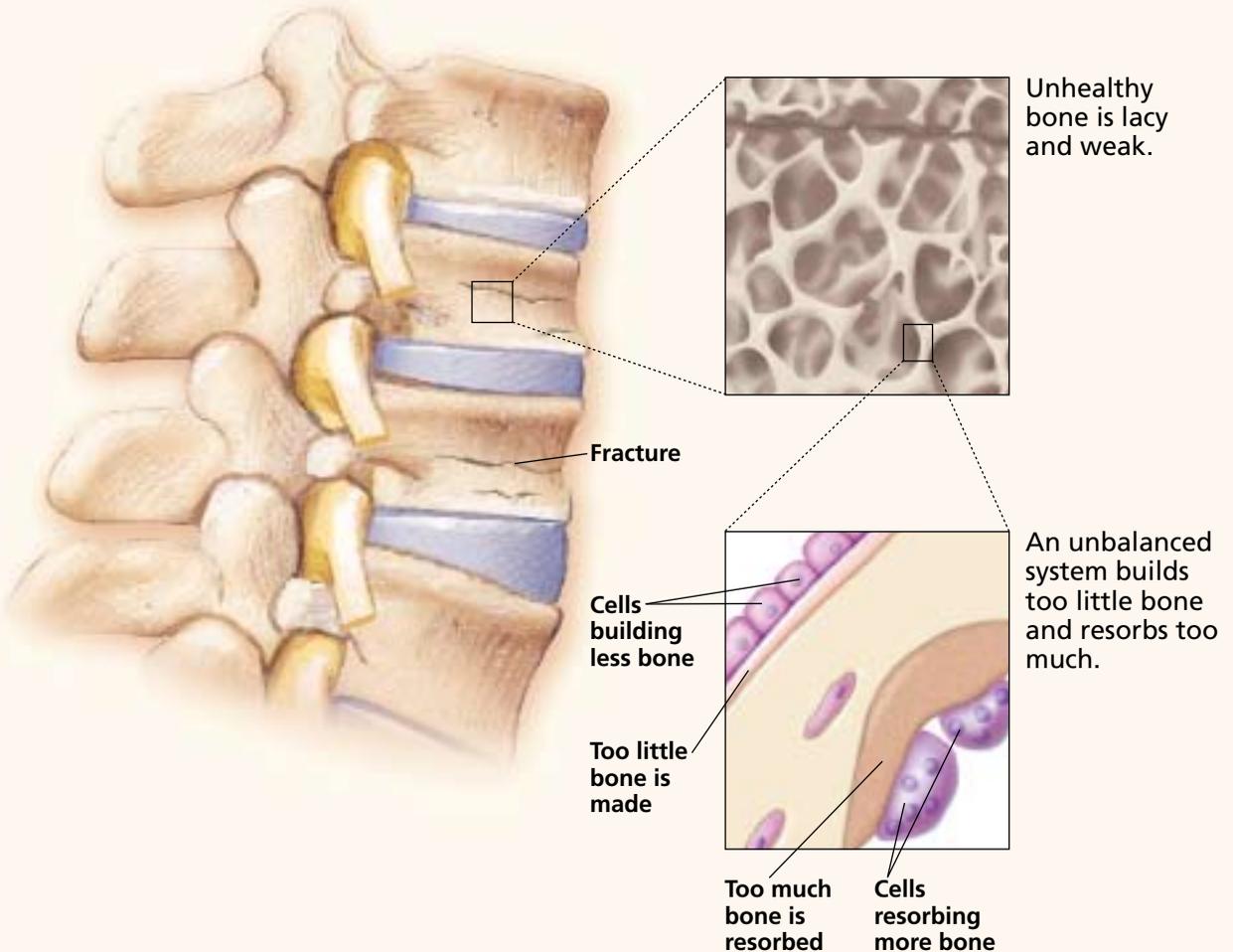
## A Balanced System Supports the Body

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 bone-making system is in balance, the same amount of bone is built and resorbed. This way, bones stay strong and are able to support the body.



# An Unbalanced System Can't Give Support

Changes in hormone levels, activity, medications, or diet can affect the bone-making system. When the system gets out of balance, the amount of bone lost is greater than the amount of bone made. This can cause **osteopenia** (when bone starts to become less dense). Left untreated, bone loss gets worse, leading to osteoporosis. 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 causes the back to bend or hump over.



# BONES CHANGE OVER TIME

The bone cells you have today aren't the ones you were born with. Bones are always changing. That's why you can have an impact on your bone health, no matter how old you are. Keep in mind: 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.



## After Menopause

Menopause is when a woman stops having monthly periods. It may occur naturally, or it may happen after surgery to remove the ovaries. After menopause, the body makes less **estrogen** (a female hormone). This increases bone loss. In fact, a woman can lose up to one-third of her spinal bone mass in the first 6 years after menopause. Treatment may be needed to reduce risk of fractures.

## Later in Life

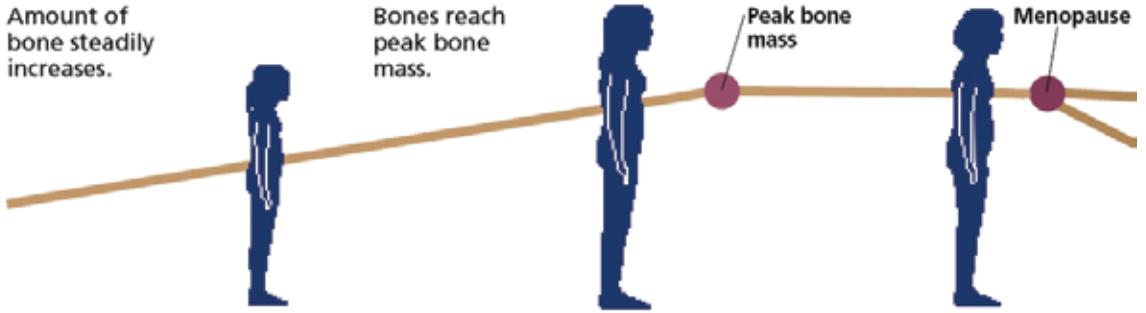
Now both men and women need to take extra care to help their bones. In later years, the body loses more bone than it makes. Bone density testing can tell you if your bone loss is a problem. Medication, diet, and exercise can help keep your bones strong. This helps reduce your risk of fracture. It also helps improve the quality—and length—of your life.

Amount of bone steadily increases.

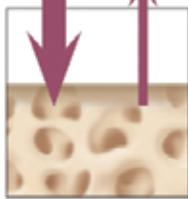
Bones reach peak bone mass.

Peak bone mass

Menopause



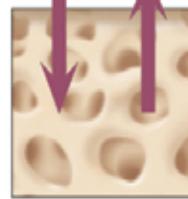
Bone added Bone lost



Total bone mass

More bone is added than lost.

Bone added Bone lost



Same amount of bone is added and lost.

Menopause

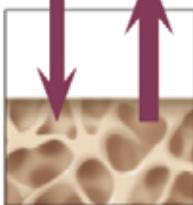
With treatment you can maintain bone mass.

Treatment helps keep bone mass high.

The risk of fracture increases.

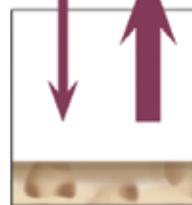
Without treatment more and more bone can be lost.

Bone added Bone lost



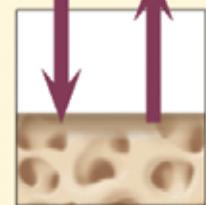
Bone loss increases.

Bone added Bone lost



More bone is lost than is added.

Bone added Bone lost



Medication helps maintain bone mass.

# CHECKING YOUR BONE DENSITY

The strength of bones is measured by their **density** (thickness). High bone density means bones are less likely to fracture. If you are at risk for bone loss, your healthcare provider may refer you for bone density testing. In some cases, you may be sent for repeat testing.

## Bone Density Testing

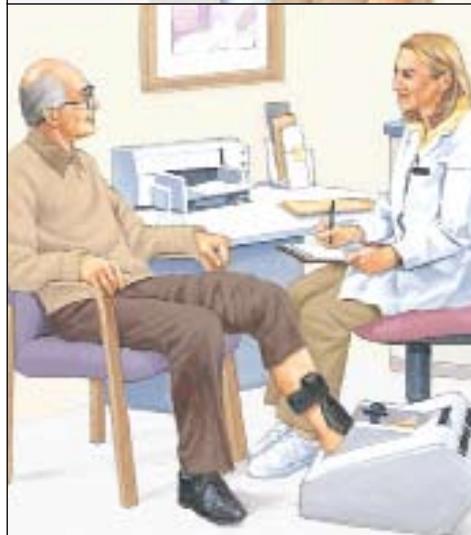
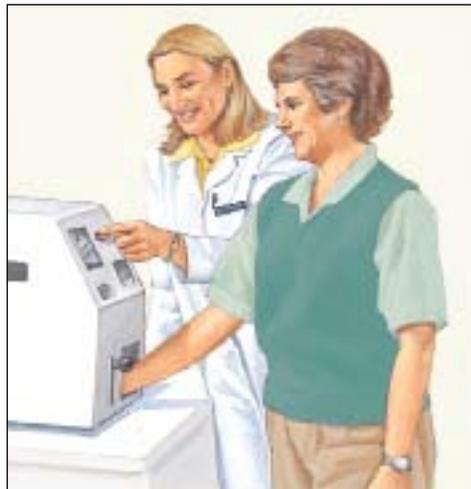
Bone density testing is safe, quick, easy, and painless. Testing can detect osteoporosis before a fracture happens. It can also predict the risk of future fractures. And testing can measure the response to treatment. There are two types of tests that you may have:

- **Peripheral tests** are used for screening. They measure density in the finger, wrist, knee, shin, or heel. A common peripheral test is the **quantitative ultrasound (QUS)**.
- **Central tests** are used 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?

All men and women with risk factors should talk to their doctors about bone density testing. The National Osteoporosis Foundation recommends bone density testing for:

- All postmenopausal women under age 65, with one or more risk factors in addition to menopause.
- All women age 65 and older.
- Postmenopausal women with fractures.
- Women who are thinking about treatment for osteoporosis.
- Women who have been on hormone therapy for a long time.

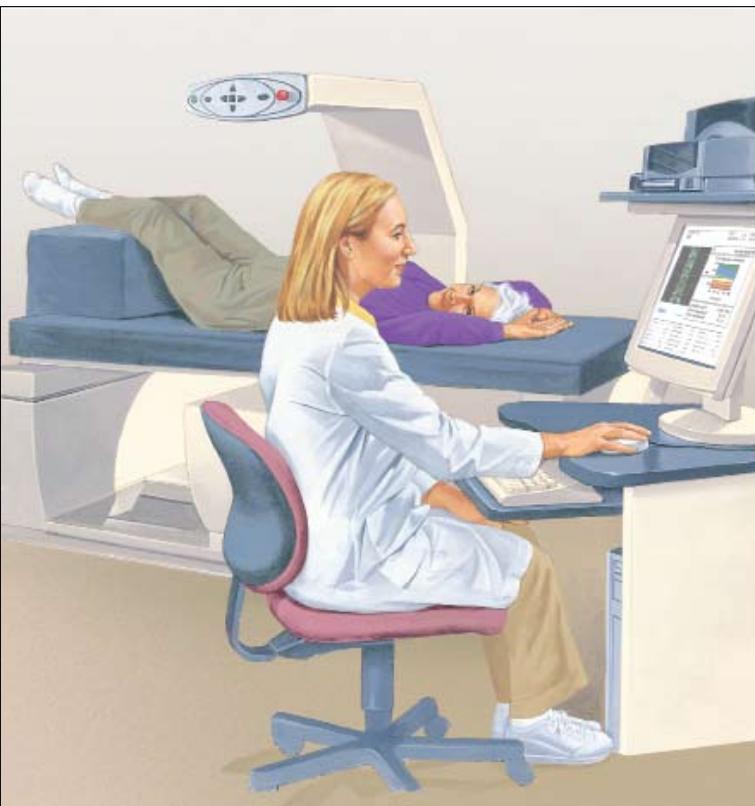


## Common Testing Sites

Any bone can fracture, but with osteoporosis some bones fracture more easily. These include bones in the spine, wrist, shoulder, and hip. That's why bone density testing may be done at one or more of these sites.

## Understanding Your Results

The results of your test may seem confusing at first. Don't be afraid to ask your provider to explain. Your **bone mineral density (BMD)** describes the thickness of the bone that was scanned. Your healthcare provider will compare your BMD with the BMD of young, healthy bone. The result is called a **T-score**. Bones remodel at different rates. So, a healthy T-score in the wrist doesn't mean the spine is also healthy. That's why more than one site may be scanned.



T-Score Chart\*

Above -1	<b>Normal Bone Mass</b>
-1 to -2.5	<b>Osteopenia</b> (May need treatment)
Below -2.5	<b>Osteoporosis</b> (Needs treatment)

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

# PROTECTING BONES WITH MEDICATION

Prescription medication is part of a complete treatment plan. Some medications slow the rate of bone resorption. Others help the body build more bone. Some do both. Depending on your needs, your provider may prescribe more than one medication. Keep in mind that even with medication, you still need to exercise and get plenty of calcium.

## Bisphosphonates

Bisphosphonates (known as alendronate and risedronate) offer consistent results with few side effects. These medications 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 and must be taken exactly as directed.

### Benefits may include:

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

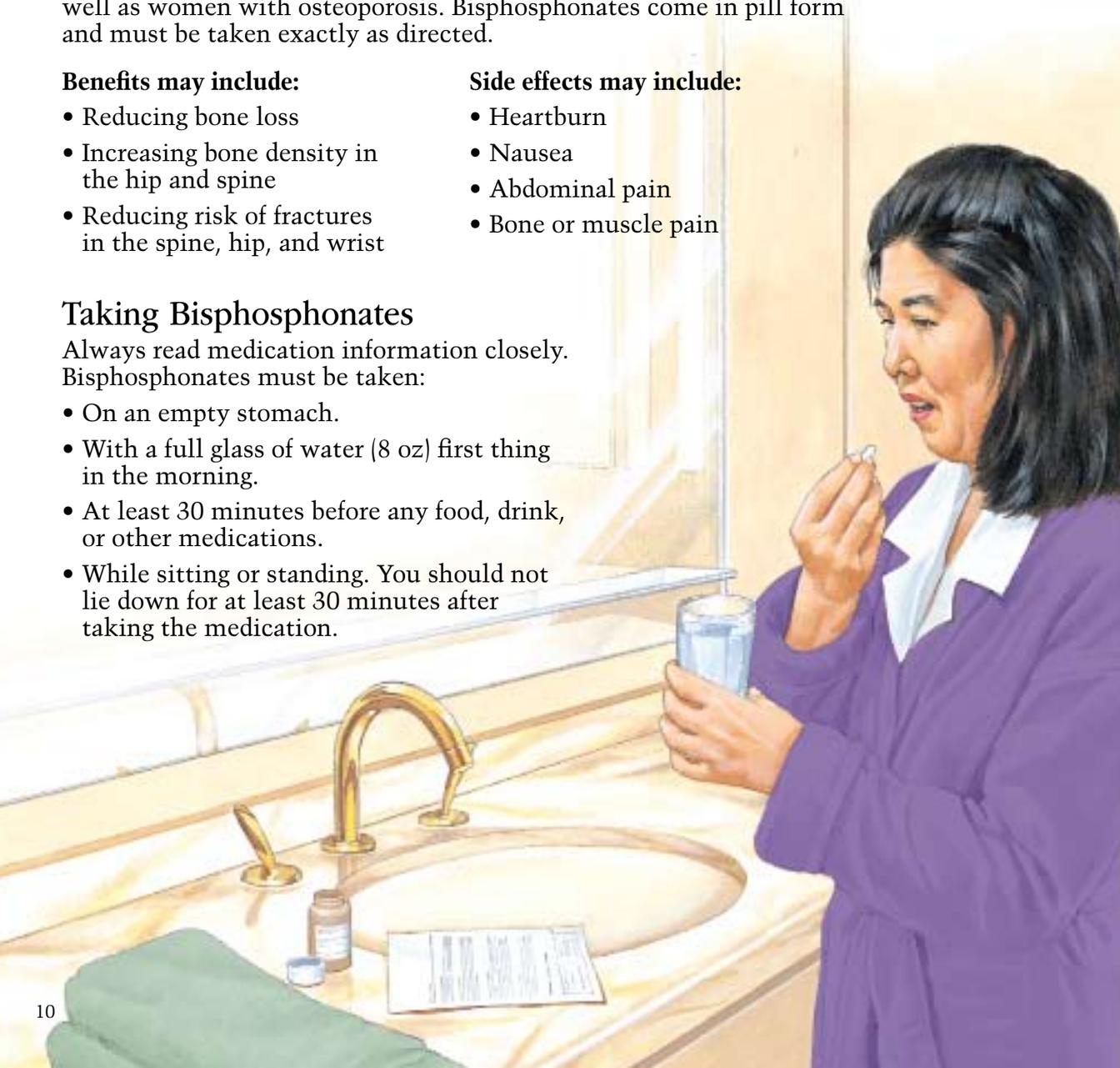
### Side effects may include:

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

## Taking Bisphosphonates

Always read medication information closely. Bisphosphonates must be taken:

- On an empty stomach.
- With a full glass of water (8 oz) first thing in the morning.
- At least 30 minutes before any food, drink, or other medications.
- While sitting or standing. You should not lie down for at least 30 minutes after taking the medication.





## SERMs

Selective estrogen receptor modulators (SERMs) were developed to 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 of spinal fracture

**Side effects may include:**

- Hot flashes
- Leg cramps
- Increased risk of blood clots in the legs

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## Calcitonin

Calcitonin is prescribed to treat bone loss. It has few side effects but may not be as effective as other medications. Calcitonin is offered as a nasal spray, and is used daily.

**Benefits may include:**

- Slowing bone loss
- Increasing bone density in the spine

**Side effects may include:**

- Runny nose or congestion, bloody nose, headaches

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## Teriparatide

Approved to treat men and women, teriparatide (also called human parathyroid hormone or PTH) stimulates new bone growth. It is offered as a daily injection, and can be used for up to 24 months.

**Benefits may include:**

- Increasing bone density in the spine and hip
- Reducing risk of fracture in the spine and hip
- Fast acting

**Side effects may include:**

- Nausea
- Leg cramps
- Dizziness

---

## Hormone Therapy

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.



## Reading Food Labels

When shopping for food, be sure to read the “Nutrition Facts” label. To choose bone-healthy foods, check:

- **Calcium.** To find out how much calcium is in a food, add a zero onto the percentage. For instance, 20% daily value is the same as 200 mg of calcium.
- **Vitamin D.** This vitamin helps your body absorb calcium.

Look for foods fortified with vitamin D.

<b>Nutrition Facts</b>	
Serving Size 1 container (170g) Yogurt	
Amount Per Serving	
<b>Calories</b> 100	Calories from Fat 0
<hr/>	
	<b>% DV*</b>
<b>Total Fat</b> 0 g	<b>0%</b>
Saturated Fat 0 g	<b>0%</b>
<i>Trans</i> Fat 0 g	
<b>Cholesterol</b> less than 5 mg	<b>1%</b>
<b>Sodium</b> 85 mg	<b>4%</b>
<b>Potassium</b> 250 mg	<b>7%</b>
<b>Total Carbohydrate</b> 19 g	<b>6%</b>
Sugars 14 g	
<b>Protein</b> 5 g	<b>10%</b>
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.	

Look for foods high in calcium.

## Taking Supplements

It's best to get vitamins and minerals from the foods you eat. If you can't get enough, you may want to take supplements. Be sure to tell your healthcare provider which medications, herbs, and supplements you are taking.

- **Calcium** supplements come in many varieties. The citrate form is easiest to absorb. Your healthcare provider or pharmacist can tell you which calcium supplement is best for you.
- **Vitamin D** supplements are also available. You should get 400 to 800 IU of vitamin D a day. Sunshine helps the body to make its own vitamin D. But too much vitamin D can be harmful. Talk to your doctor or dietitian about how much is best for you.



## Making Choices

The health of your bones is up to you. Every day you can choose to eat healthier and to live better. If you're at risk for bone loss, or if you're recovering from a fracture, try to limit or avoid:

- Smoking
- Alcohol
- Caffeinated drinks

# EXERCISING FOR LIFE

Medication and diet are only part of your treatment plan. Your bones also need exercise. Activity places force on the bones. The bones respond by growing stronger. When used in a complete treatment plan, activity is even more effective.

## Being Active

An active lifestyle can enrich your health in many ways. It can help you build stronger bones. It can help you maintain a healthy weight. And best of all, it can increase your sense of well-being. You don't have to work out in a gym to be active. You can take walks with friends. Or spend an afternoon gardening. You can even wander through a museum. Be creative. Enjoy making activity part of your life.

## Choosing Your Activity

Some kinds of exercise help build strong bones. Other kinds are best for maintaining a healthy weight. Work with your healthcare provider to choose the right activities for you.

### Weight-bearing

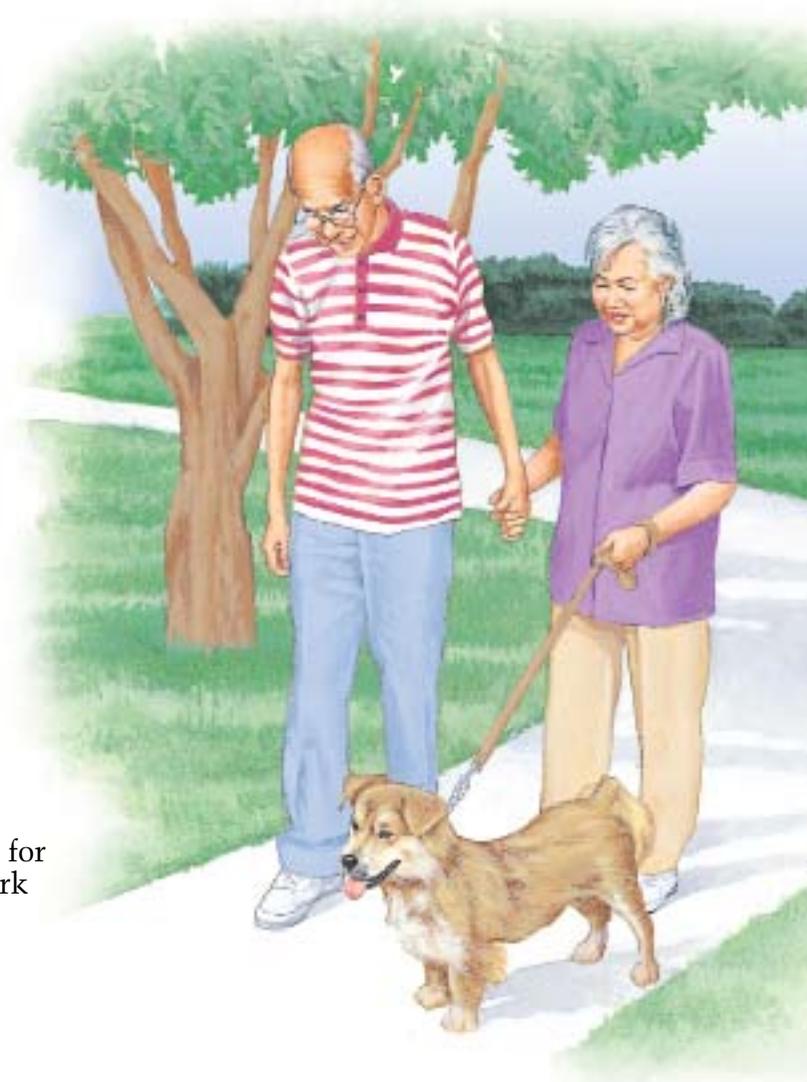
Walking, jogging, tennis, and gardening are weight-bearing activities. These activities place force on the bones. The force comes from your own body weight. The bones respond by growing stronger.

### Resistance

Archery is one kind of resistance activity. Other kinds include using rubber stretch bands, free weights, and weight machines. These activities apply force to the bones by way of the muscles. This strengthens the bones.

### Non-weight-bearing

Activities like swimming and bicycling are non-weight-bearing. They don't benefit bone density, but they can help you maintain a healthy weight. They can also help keep the heart, lungs, and muscles strong.



# THINKING ABOUT SAFETY

People with low bone density are at risk for falls and fractures. This risk is even greater if you've already had a fracture. Take a minute to think about your safety and the safety of your loved ones. Are there ways to increase your home safety? Do you have friends or family who might need your help?

## Home Safety

A large part of life is spent at home. To make your home safer:

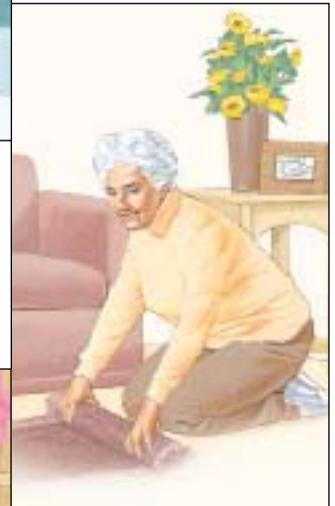
- Keep a flashlight by the bed. Place nightlights in bathrooms and hallways.
- Remove or fasten loose rugs, carpeting, and stair treads.
- Keep cords out of walkways.
- Keep stairs free of clutter. And make sure handrails are secure.
- Install handholds in the bathroom.
- Use a shower stool. Also, apply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



## Personal Safety

Keeping your balance is the key to preventing fractures caused by falls. Talk to your healthcare provider about avoiding medications that alter your sense of balance. To increase safety:

- Use handrails on stairs and escalators.
- Wear glasses, if you need 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.
- Walk slowly and watch where you're going.
- 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.



# PROTECTING YOUR FUTURE

You have the tools to build strong bones for life. Now is the time to use them. Have your bone density tested. Take medication as prescribed. And eat healthy, calcium-rich foods. Then celebrate your health through activities with loved ones. For more information, contact the resources listed here.

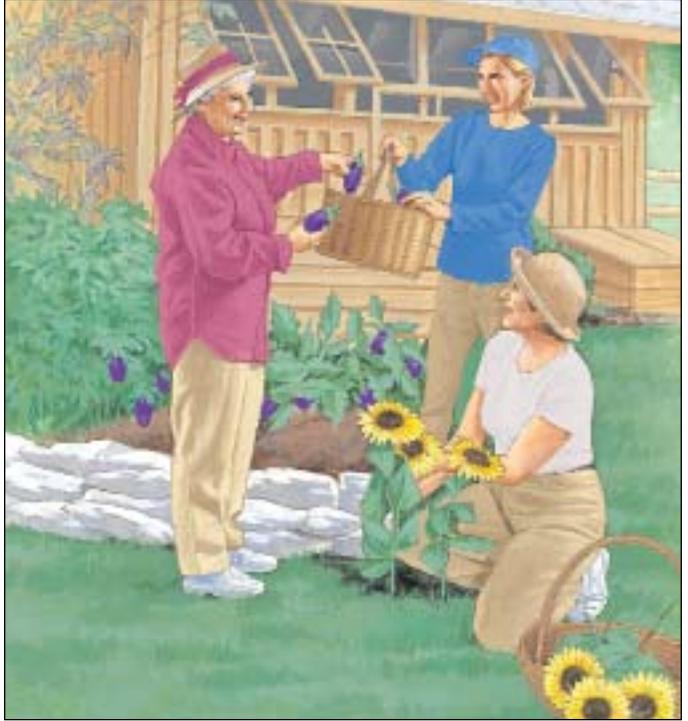
## Resources

**National Institutes of Health  
Osteoporosis and Related  
Bone Diseases**

[www.niams.nih.gov/health\\_info/bone](http://www.niams.nih.gov/health_info/bone)

**The National Women's Health  
Information Center**

[www.womenshealth.gov/  
faq/osteoporosis.cfm](http://www.womenshealth.gov/faq/osteoporosis.cfm)



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