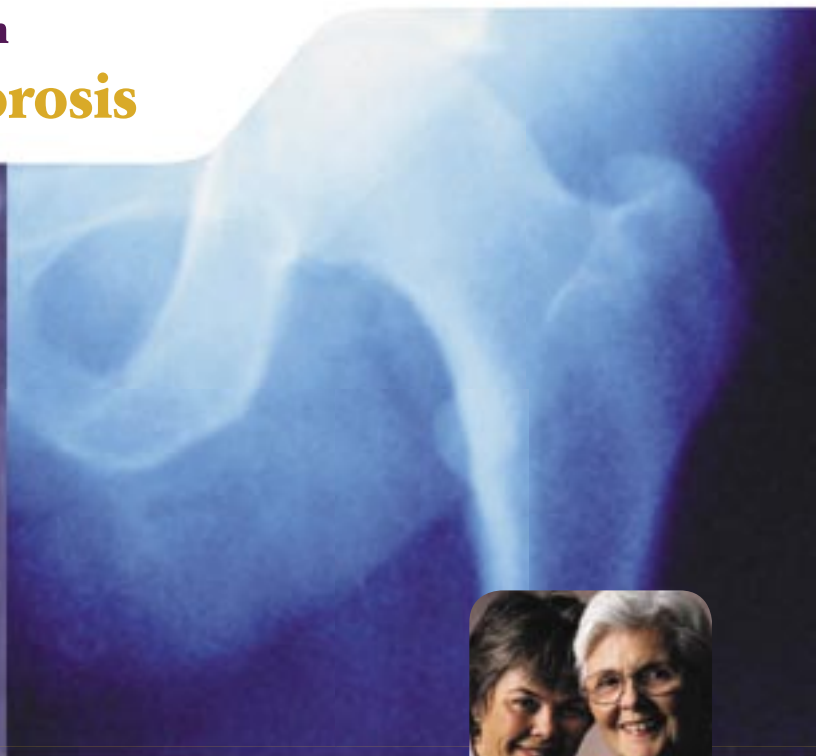
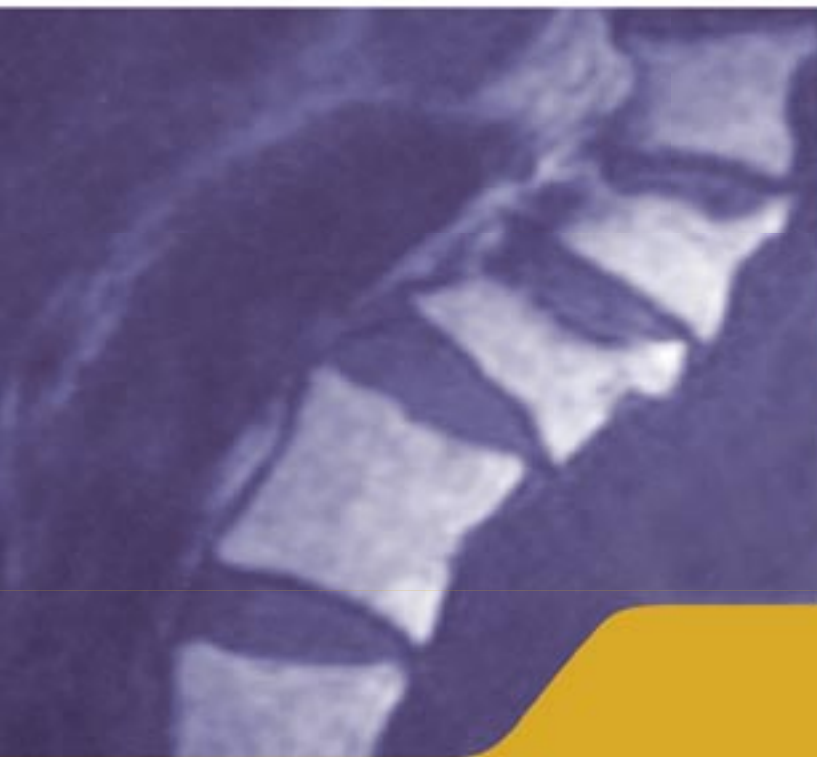


# The 2004 Surgeon General's Report on Bone Health and Osteoporosis



what it means to  
**you**



## About This Surgeon General's Report

The Surgeon General is the nation's highest-ranking public health officer. The President of the United States appoints the Surgeon General to help protect and promote the health of all Americans.

The Surgeon General gives Americans the best scientific information available on how to improve their health and reduce their risk of illness and injury. This booklet is about risks to our bones. The Surgeon General says that Americans need to do much more to protect their bone health.

The 2004 Surgeon General's Report on Bone Health and Osteoporosis was prepared by some of the country's top scientists, doctors, and public health experts. The full report is more than 400 pages long and took more than 2 years to complete. It is written for a scientific audience. However, Surgeon General Richard H. Carmona believes that the findings are very important to everyone. This booklet explains what the report says and what it means to you.

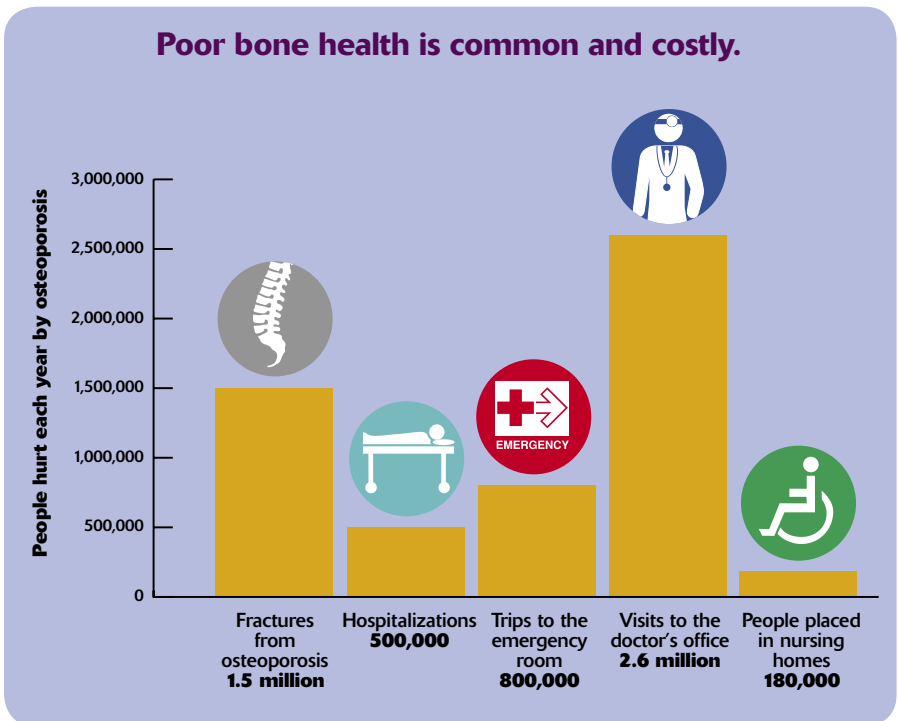
**Y**our bone health may be at risk. By 2020 half of all Americans over 50 will have weak bones unless we make changes to our diet and lifestyle. People who have weak bones are at higher risk for fractures. Americans are living longer, and this means that our bones need to stay strong so we can be active and enjoy life. Strong bones begin in childhood. With good habits and medical attention when needed, we can have strong bones throughout our lives.

Thirty years ago, little was known about bone disease. Even many doctors believed that weak and broken bones were just a part of old age and could not be avoided. Today we know that this is not true.

The Surgeon General wants you to know that you can improve your bone health by getting enough calcium, vitamin D, and physical activity. If you have osteoporosis or another bone disease, your doctor can detect and treat it. This can help prevent painful fractures. If you break a bone after the age of 50, this could be the first sign of weak bones.



*...with good habits and medical attention when needed, we can have strong bones throughout our lives.*



## Weak Bones Hurt Us All

“One in five people with a hip fracture ends up in a nursing home within a year.”

Broken bones are very painful at any age. Each year 1.5 million older people in this country suffer fractures because their bones have become weak. For older people, weak bones can be deadly.

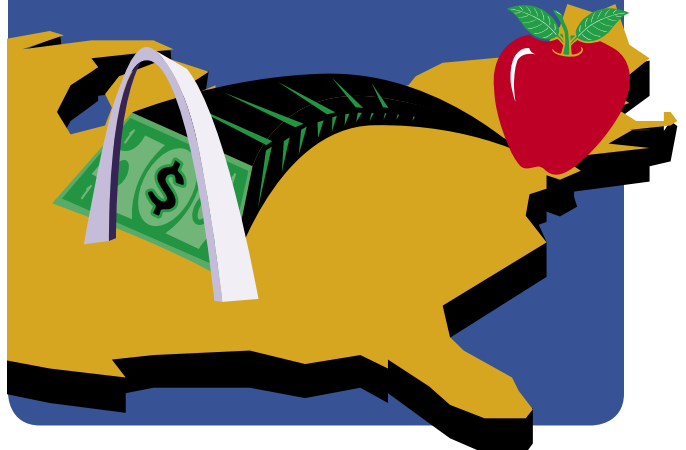
If you are elderly, a broken hip makes you up to four times more likely to die within three months. If you survive, the injury often causes your health to spiral downward. One in five people with a hip fracture ends up in a nursing home within a year. Many others become isolated, depressed, or frightened to leave home because they fear they will fall.

The cost of weak bones to Americans, their families, and our country is huge.

The medical expense for treating broken bones from osteoporosis is as high as \$18 billion each year. The cost of care for these patients and the work that is lost adds billions more.

Caring for bone fractures from osteoporosis costs America \$18 billion each year.

*\$18 billion is a stack of dollar bills 1,119 miles high, or farther than the distance from New York to St. Louis, Missouri.*

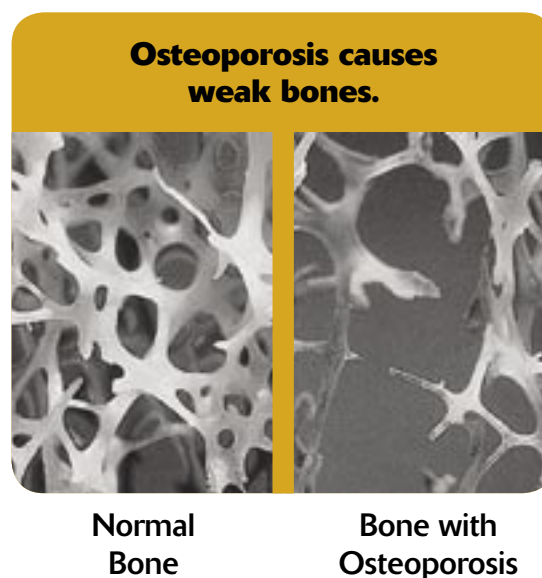


## Why Healthy Bones Are Important to You

Strong bones support us and allow us to move. They protect our heart, lungs, and brain from injury. Our bones are also a storehouse for vital minerals we need to live. Weak bones break easily, causing terrible pain. You might lose your ability to stand or walk. And as bones weaken, you might lose height.

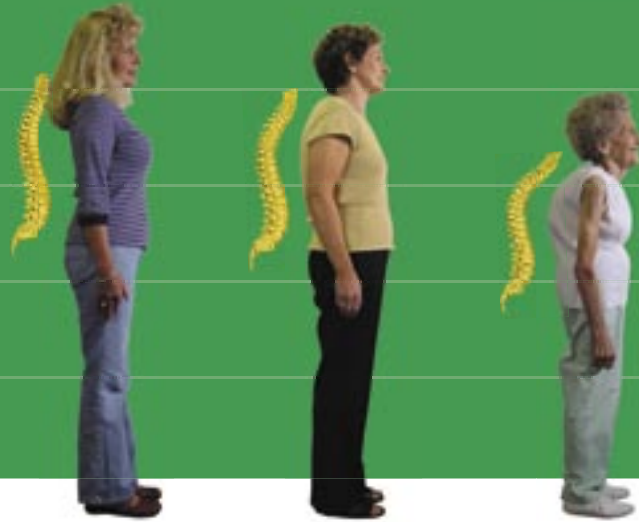
Silently and without warning, bones may begin to weaken early in life if you do not have a healthy diet and the right kinds of physical activity. Many people already have weak bones and don't know it. Others are making choices that will weaken their bones later.

There are several kinds of bone disease. The most common is osteoporosis. In this disease, bones lose minerals like calcium. They become fragile and break easily. With osteoporosis, your body's frame becomes like the frame of a house damaged by termites. Termites weaken your house like osteoporosis weakens your bones. If you have severe fractures from osteoporosis, you risk never walking again. Weak bones can break easily. This can be fatal.



*Bones may begin to weaken early in life. Prevent this with a healthy diet and the right kinds of physical activity.*

**Weak bones  
cause the  
spine to  
collapse.**



Fragile bones are not painful at first. Unfortunately, most people don't realize they have weakened bones until one breaks. By that time, it is hard to make your bones strong again.

The good news is that you are never too old or too young to improve your bone health. There are many things you can do to keep bones strong and prevent fractures. At all ages, a diet with enough calcium and vitamin D, together with weight-bearing physical activity every day, can prevent problems later. You can work with your doctor to check out warning signs or risk factors. When you are older, you can have your bones tested and take medicine to strengthen them.

The bad news is that few people follow the steps known to strengthen and protect their bones. That's the main reason for the Surgeon General's Report on Bone Health and Osteoporosis. Americans need to know the dangers of bone weakness and do more to prevent it.

//  
...you are  
never too  
old or too  
young to  
improve  
your bone  
health. //

## Don't Risk Your Bones

Many things weaken bones. Some are outside your control. If you have a family member who has bone problems, you could also be at risk. Some medical conditions can also make you prone to bone disease.

There are some things you can control:

- **Get enough calcium and vitamin D** in your diet at every age.
- **Be physically active.**
- **Reduce hazards in your home** that could increase your risk of falling and breaking bones.
- **Talk with your doctor about medicines** you are taking that could weaken bones, like medicine for thyroid problems or arthritis. Also talk about ways to take medicines that are safe for bones. Discuss ways to protect bones while treating other problems.
- **Maintain a healthy weight.** Being underweight raises the risk of fracture and bone loss.
- **Don't smoke.** Smoking can reduce bone mass and increase your risks for a broken bone.
- **Limit alcohol use.** Heavy alcohol use reduces bone mass and increases your risk for broken bones.



*Staying  
active helps  
strengthen  
bones.*

*fast* **fact**

*Many types of physical activity can contribute to bone health, but most people are not active enough.*

**Bones are not what  
you think they are**





**W**hen you think of bones, you might imagine a hard, brittle skeleton. In reality, your bones are living organs. They are alive with cells and flowing body fluids. Bones are constantly renewed and grow stronger with a good diet and physical activity.

The amount of calcium that makes up your bones is the measure of how strong they are. But your muscles and nerves must also have calcium and phosphorus to work. If these are in short supply from foods you eat, your body simply takes them from your bones.

Each day calcium is deposited and withdrawn from your bones. If you don't get enough calcium, you could be withdrawing more than you're depositing. That's why children and teens need to build their bones early so they have a "savings account" of calcium for later. Our bodies build up calcium in our bones efficiently until we are about 30 years old. Then our bodies stop adding new bone. But healthy habits can help us keep the bone we have.



*Do you spend your free evenings on the sofa or taking a walk?*

## When Bones Break

There is some natural bone loss as women and men age. As we grow older, bones can break or weaken if we don't take steps to keep them strong. The most common breaks in weak bones are in the wrist, spine, and hip.

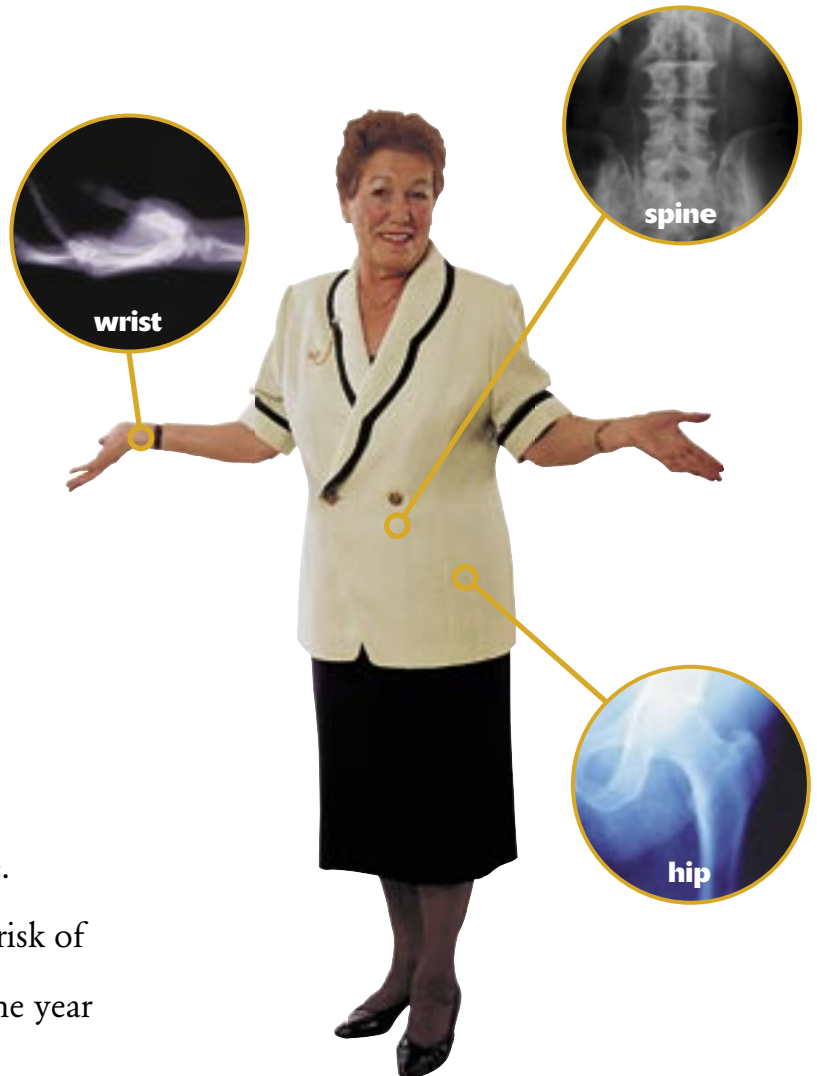
“The most common breaks in weak bones are in the wrist, spine, and hip.”

Broken bones in your spine are painful and very slow to heal.

People with weak bones in their spine gradually lose height and their posture becomes hunched over. Over time a bent spine can make it hard to walk or even sit up.

Broken hips are a very serious problem as we age.

They greatly increase the risk of death, especially during the year after they break.

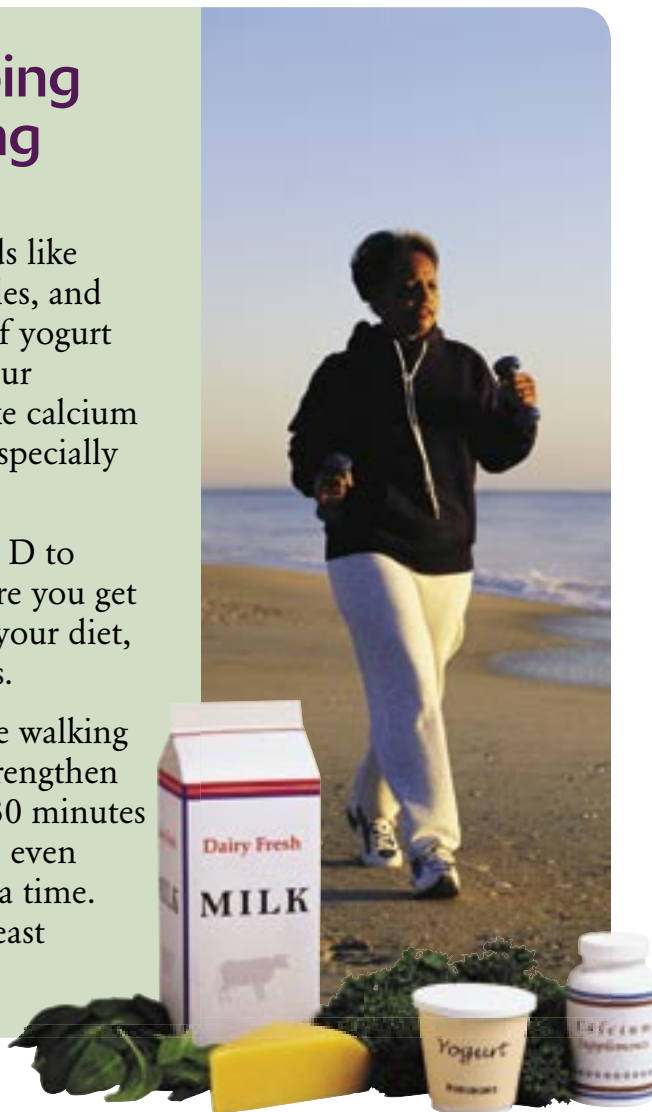


People who break a hip might not recover for months or even years. Because they often cannot care for themselves, they are more likely to have to live in a nursing home.

// Get your bone density checked if you have any kind of a fracture after age 50. //

## Tips for keeping bones strong

- Calcium is found in foods like milk, leafy green vegetables, and soybeans. Enjoy snacks of yogurt and cheese to increase your calcium. You can also take calcium supplements or eat food specially fortified with calcium.
- Your body needs vitamin D to absorb calcium. Make sure you get enough vitamin D from your diet, sunshine, or supplements.
- Even simple activities like walking and stair climbing will strengthen your bones. Get at least 30 minutes of physical activity a day, even if it's only 10 minutes at a time. (Children should get at least 60 minutes a day.)



*fast* **fact**

*Hip fractures are by far the most devastating type of broken bone. They account for about 300,000 hospitalizations every year.*



**You could be at risk**

**T**oo many of us assume we are not at risk for bone loss or fractures. We believe that if we haven't had any signs of bone damage, then our bones are strong. Because there are no obvious warning signs, even doctors often miss signs of the problem. Most of us have our blood pressure and cholesterol checked for heart health. Testing bone density is the surest way to check for bone health.

The risk of osteoporosis is highest among women. It is also higher for Whites and Asians than other groups. However, it's important to remember that it is a real risk for older men and women of all backgrounds.

That's why it is important to know the risks for poor bone health at all ages. There are many "red flags" that are signs that you are at risk for weak bones. (See page 24 for a checklist.) In addition, your calcium and vitamin D intake, level of physical activity, and medications should all be evaluated.

**Here are some clues that you are at risk:**

*Your older relatives have had fractures.*

*You have had illnesses or have been on medications that might weaken bones.*

*You are underweight.*



### **Why being active makes your bones strong**

When you jump, run, or lift a weight, it puts stress on your bones. This sends a signal to your body that your bones need to be made stronger. New cells are added to strengthen your bones. If you are right-handed, the bones in your right arm are slightly larger and stronger from the extra use.

# Bone Up On Your Diet

## Calcium

To keep your bones strong, eat foods rich in calcium. Some people have trouble digesting the lactose found in milk and other dairy foods, including cheese and yogurt. Most supermarkets sell lactose-reduced dairy foods. Many nondairy foods are also calcium-rich.



Nutrition Facts	
Serving Size 1 cup (236mL)	
Servings Per Container 8	
Amount Per Serving	
Calories 90	Calories from Fat 0
% Daily Value*	
Total Fat 0g	0%
Saturated Fat 0g	0%
Cholesterol 5mg	2%
Sodium 125mg	5%
Total Carbohydrate 13g	4%
Dietary Fiber 0g	0%
Sugars 12g	
Protein 8g	
Vitamin A 10%	Vitamin C 4%
Calcium 30%	Iron 0%
Vitamin D 25%	
* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.	
INGREDIENTS: MILK, VITAMIN D <sub>3</sub> ADDED.	

*Food labels, like this skim milk label, tell you how much calcium and vitamin D you get per serving.*

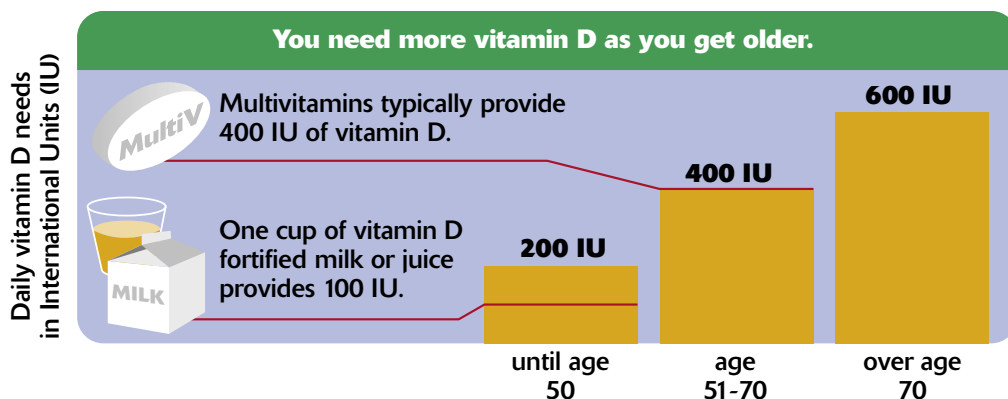
Your body needs calcium.	
If this is your age,	then you need this much calcium each day (mg).
0 to 6 months	210
7 to 12 months	270
1 to 3 years	500
4 to 8 years	800
9 to 18 years	1,300
19 to 50 years	1,000
Over 50 years	1,200

(A cup of milk or fortified orange juice has about 300 mg of calcium.)

## Vitamin D

Vitamin D helps your body absorb calcium.

As you grow older, your need for vitamin D goes up. Vitamin D is made by your skin when you are in the sun. For many, especially seniors, getting enough vitamin D from sunshine is not practical. Almost all milk and some other foods are fortified with vitamin D. If you are not getting enough calcium and vitamin D in your diet, supplements can be bone savers.



## Calcium Calculator

Help your bones. Choose foods that are high in calcium. Here are some examples.

Food	Calcium (mg)	Points
Fortified oatmeal, 1 packet	350	3
Sardines, canned in oil, with edible bones, 3 oz.	324	3
Cheddar cheese, 1 1/2 oz. shredded	306	3
Milk, nonfat, 1 cup	302	3
Milkshake, 1 cup	300	3
Yogurt, plain, low-fat, 1 cup	300	3
Soybeans, cooked, 1 cup	261	3
Tofu, firm, with calcium, 1/2 cup	204	2
Orange juice, fortified with calcium, 6 oz.	200-260 (varies)	2-3
Salmon, canned, with edible bones, 3 oz.	181	2
Pudding, instant, (chocolate, banana, etc.) made with 2% milk, 1/2 cup	153	2
Baked beans, 1 cup	142	1
Cottage cheese, 1% milk fat, 1 cup	138	1
Spaghetti, lasagna, 1 cup	125	1
Frozen yogurt, vanilla, soft-serve, 1/2 cup	103	1
Ready-to-eat cereal, fortified with calcium, 1 cup	100-1000 (varies)	1-10
Cheese pizza, 1 slice	100	1
Fortified waffles, 2	100	1
Turnip greens, boiled, 1/2 cup	99	1
Broccoli, raw, 1 cup	90	1
Ice cream, vanilla, 1/2 cup	85	1
Soy or rice milk, fortified with calcium, 1 cup	80-500 (varies)	1-5

### Points Needed:

babies/toddlers (ages 0-3) need .....**2-5**  
 children (ages 4-8) need .....**8**  
 teens need .....**13**  
 adults under 50 need .....**10**  
 adults over 50 need .....**12**

**Your  
total  
today**

*fast* **fact**

*Lack of calcium has been singled out as a major public health concern because it is critically important to bone health. The average American consumes far less than the amount recommended.*



**Protect your bones  
at every age**



**P**eople of all ages need to know what they can do to have strong bones. You are never too old or too young to improve your bone health.

### **Babies**

Bone growth starts before babies are born. Premature and low-birth-weight infants often need extra calcium, phosphorus, and protein to help them catch up on the nutrients they need for strong bones. Breastfed babies get the calcium and nutrients they need for good bone health from their mothers. That's why mothers who breastfeed need extra vitamin D. Most baby formula contains calcium and vitamin D.

### **Children**

Good bone health starts early in life with good habits. While children and young adults rarely get bone diseases, kids can develop habits that endanger their health and bones. Parents can help by encouraging kids to eat healthful food and get at least an hour of physical activity every day. Jumping rope, running, and sports are fun activities that are great for building strong bones. Children need the amount of calcium equal to 3 servings of low-fat milk each day. If your child doesn't drink enough milk, try low-fat cheese, yogurt, or other foods that are high in calcium.



**What if your toddler doesn't like to drink milk?**

*Include some low-fat cheese chunks or yogurt for snacks.*

*Make a cheesy sauce for vegetables or for a dip.*

*Offer strawberry or chocolate milk as an afternoon treat.*

**fast fact**

*Children should get at least an hour of physical activity every day. Adults should get at least 30 minutes every day.*



*Your teen years are very important for strengthening bones through healthy eating and physical activity.*

## Teens

Teens are especially at risk for not developing strong bones because their bones are growing so rapidly. Boys and girls from ages 9 to 18 need 1,300 milligrams of calcium each day, more than any other age group. Parents can help teens by making sure they eat 4 servings of calcium-rich and vitamin-D-fortified foods a day. At least one hour a day of physical activities—like running, skateboarding, sports, and dance—is also critical. Studies show that only half of all teens exercise vigorously on a regular basis, and one-fourth do not exercise at all. But take note: extreme physical exercise, when combined with under-eating, can weaken teens' bones. In young women this situation can lead to a damaging lack of menstrual periods. Teens who miss adding bone to their skeletons during these critical years never make it up.

## Adults

Adulthood is a time when we need to look carefully at our bone health. As adults, we need 1,000 to 1,200 milligrams of calcium, depending on our age, and at least 30 minutes of moderate physical activity every day. Activity that puts some stress on your bones is very important.

### Adults: keep your bones strong with physical activity.



**Physical activity at least 30 minutes every day**



**Strength training 2-3 times a week**



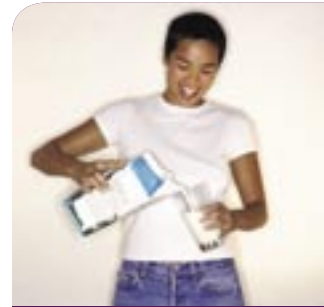
**Balance training once a week**

Many women over 50 are at risk for bone disease, but few know it. At menopause, which usually happens in women over 50, a woman's hormone production drops sharply. Because hormones help protect bones, menopause can lead to bone loss. Hormone therapy was widely used to prevent this loss, but now it is known to increase other risks. Your doctor can help advise you on protecting bone health around menopause.

### Seniors

Seniors can take steps to help prevent bone problems. Physical activity and diet are vital to bone health in older adults. Calcium, together with vitamin D, helps reduce bone loss. Activities that put stress on bones keep them strong. Find time for activities like walking, dancing, and gardening. Strengthening your body helps prevent falls. Protecting yourself against falls is key to avoiding a broken hip or wrist. All women over 65 should have a bone density test.

Seniors should also know that recent studies conclude that anyone over age 50 should increase his or her vitamin D intake to 400 International Units (IU) per day. After age 70, 600 IU per day are needed.



*You are  
buying  
lunch. Do  
you choose  
milk or a soft  
drink?*

## *fast* **fact**

*Osteoporosis is a serious risk for any aging man or woman. Ten million people in the United States over the age of 50 have osteoporosis of the hip. About 4 in 10 women over 50 and 1 in 10 men will break a hip, spine, or wrist.*

# Falls Break Bones

## **You can prevent most falls.**

Falls are not just the result of getting older. But as you age, falls become more dangerous. Most falls can be prevented. By changing some of the things listed here, you can lower the chances of falling for you or someone you love.

### **1. Begin a regular exercise program.**

Exercise is one of the most important ways to reduce your chances of falling. It makes you stronger and helps you feel better. Exercises that improve balance and coordination, like dancing and Tai Chi, are the most helpful. Consider joining an organized program at your local community center or gym.

### **2. Make your home safer.**

- Remove things you can trip over from stairs and places where you walk.
- Remove all small rugs.
- Don't use step stools. Keep items you need within easy reach.
- Have grab bars put in next to your toilet and in the bathtub or shower.
- Use non-slip mats in the bathtub and shower.
- Use brighter light bulbs in your home.
- Add handrails and light in all staircases.
- Wear shoes that give good support and have non-slip soles.

### **3. Ask a health care professional to review your medicines.**

Ask your doctor, nurse, pharmacist, or other health care professional to review all the medicines you are taking. Make sure to mention over-the-counter medicine, such as cold medicine. As you get older, the way some medicines work in your body can change. Some medicines, or combinations of medicines, can make you drowsy or light-headed, which can lead to a fall.

### **4. Have your vision checked.**

Poor vision increases your risk of falling. You could be wearing the wrong glasses or have a condition such as glaucoma or cataracts that limits your vision.



## Live Well, Live Strong, Live Long

It's never too late or too early to improve your bone health. The average American eats too little calcium. And nearly half of us do not get enough physical activity to strengthen our bones.

The same healthy lifestyle that strengthens your bones strengthens your whole body. You might not hear as much about bone health as other health concerns. But healthy habits are good for all your organs, including your bones.

- **Be physically active every day**—at least 60 minutes for children, 30 minutes for adults. Do strength-building and weight-bearing activities to build strong bones.
- **Eat a healthy diet.** Educate yourself on proper nutrition. Be aware that certain foods are naturally rich in calcium and vitamin D. Get the recommended amounts of calcium and vitamin D daily.
- **Reduce your risks of falling.** Check your home for loose rugs, poor lighting, etc. Take classes that increase balance and strength—like Tai Chi or yoga. Make stretching a part of your workout.

Even people who know better don't always do what's good for their bones. Make yourself an exception. Be aware of your risks and work to reduce them. Get help from your family and friends and your doctor, nurse, pharmacist, or other health care professional. Building healthy bones begins at birth and lasts your whole life.

“Building healthy bones begins at birth and lasts your whole life.”



*fast* **fact**

*A simple and enjoyable way to improve your balance is to take a class in dancing. Consider ballroom, western, salsa, or modern dance. Classes are offered by many community groups and adult education facilities.*

A female doctor with dark hair, wearing a white lab coat over a light blue t-shirt, is seated at a desk and talking to a patient. The patient's blonde hair is visible on the left side of the frame. The doctor is looking towards the patient with a slight smile. The background shows a clinical setting with a white wall and a window. A blue semi-transparent banner is overlaid at the bottom of the image, containing white text.

**Your doctor can help  
protect your bones**

**T**alk to your doctor about bone health. Together you can evaluate your risks. Some things to discuss include your current health, your diet and physical activity levels, and your family background.

Your doctor can look at your age, weight, height, and medical history. From that he or she can determine if you need a bone density test. Broken bones are a “red flag” for your doctor. If you break a bone after the age of 50, talk to your doctor about measuring your bone density. Even if you broke a bone in an accident, you might have weak bones. It is worth checking.

Your doctor might recommend a medical test called a bone mineral density test. Bone density tests use x-rays or sound waves to measure how strong your bones are. These tests are quick (5 to 10 minutes), safe, and painless. They will give you and your doctor an idea of how healthy your bones are. All women over 65 should have a bone density test.

Your doctor might also want to do a blood test to check for a vitamin D deficiency or abnormal calcium levels.



*All women  
over 65  
should have  
a bone  
density test.*



*A 50-year-old woman breaks her wrist when she trips on a rug. Should she ask for a bone density test even if her doctor doesn't bring it up?*

**YES!**

If your doctor finds that your bones are becoming weaker, there are things you can do to make them stronger. You can be more physically active, change your diet, and take calcium and vitamin D supplements. If your bones are already weak, there are medicines that stop bone loss. They can even build new bone and make it less likely that you will suffer a broken bone.

Your doctor might suggest medications to help you build stronger bones. To reduce the chance that you might fall, have your vision checked. When you speak to your doctor, be prepared with a list of questions and concerns. The list on the next page should help get you started.

## See Your Doctor

While osteoporosis is the most common disease that harms bones, certain other conditions can also be harmful. Your doctor can help you learn if you are at risk and can help you treat these conditions.

- Rickets and osteomalacia—Too little vitamin D causes these diseases in children and adults. They can lead to bone deformities and fractures.
- Kidney disease—Renal osteodystrophy can cause fractures.
- Paget's disease of bone—Bones become deformed and weak, which can be caused by genetic and environmental factors.
- Genetic abnormalities—Disorders like osteogenesis imperfecta cause bones to grow abnormally and break easily.
- Endocrine disorders—Overactive glands can cause bone disease.



## What to discuss with your doctor

Talk with your doctor, nurse, or other health care professional about your bone health. Use this checklist to start your discussion.

- Ask to check your risk for bone disease.
- Discuss your need for a bone density test.
- Talk about any fall, even ones in which you were not hurt. Tell him or her about any broken bones you've had.
- If you have fallen, ask about the need for a full evaluation. Tests include vision, balance, walking, muscle strength, heart function, and blood pressure.
- Go over all the medications you are taking (including over-the-counter ones). Do this at least once a year. This helps avoid dangerous drug interactions and taking higher doses of drugs than you need, which can lead to falls.
- Ask if your doctor checks vision. Annual vision checks can help eliminate bone-breaking falls.
- Know your calcium and vitamin D intake. Report your totals to your doctor.
- If you would like to try a new physical activity, ask about the best choices for you.

*fast* **fact**

*Bone disease is often a "silent" disorder until it causes a fracture.*

## Are you at risk for weak bones?

### Check any of these that apply to you.

- I'm older than 65.
- I've broken a bone after age 50.
- My close relative has osteoporosis or has broken a bone.
- My health is "fair" or "poor."
- I smoke.
- I am underweight for my height.
- I started menopause before age 45.
- I've never gotten enough calcium.
- I have more than two drinks of alcohol several times a week.
- I have poor vision, even with glasses.
- I sometimes fall.
- I'm not active.
- I have one of these medical conditions:
  - Hyperthyroidism
  - Chronic lung disease
  - Cancer
  - Inflammatory bowel disease
  - Chronic hepatic or renal disease
  - Hyperparathyroidism
  - Vitamin D deficiency
  - Cushing's disease
  - Multiple sclerosis
  - Rheumatoid arthritis
- I take one of these medicines:
  - Oral glucocorticoids (steroids)
  - Cancer treatments (radiation, chemotherapy)
  - Thyroid medicine
  - Antiepileptic medications
  - Gonadal hormone suppression
  - Immunosuppressive agents

***If you have any of these "red flags," you could be at high risk for weak bones. Talk to your doctor, nurse, pharmacist, or other health care professional.***



# Acknowledgments

This public document was prepared by the U.S. Department of Health and Human Services under the direction of the Office of the Surgeon General to make information in *The 2004 Surgeon General's Report on Bone Health and Osteoporosis* available in plain language to improve health literacy on this topic. Health literacy is the ability of an individual to access, understand, and use health-related information and services to make appropriate health decisions.

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# You are never too old or too young to improve your bone health.



## For more information

For more information on your bone health, talk to your doctor, nurse, pharmacist, or other health care professional.

More information about the Surgeon General's Report is available on the Surgeon General's website at

**[www.surgeongeneral.gov](http://www.surgeongeneral.gov)**

More facts and advice are available from

National Institutes of Health Osteoporosis and Related Bone Diseases

~ National Resource Center

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**[www.osteoporosis.gov](http://www.osteoporosis.gov)**

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