
What You Need To Know About
OSTEOPOROSIS

A Physical Therapist's Perspective



American Physical Therapy Association

What You Need To Know About Osteoporosis

Osteoporosis literally means “porous bones” — bones that were once strong have become fragile.

This insidious disease is sometimes called “the silent thief” because there are no symptoms. Yet it works little by little over a period of decades to rob your bones of calcium—a mineral that keeps them strong. Older women are the main victims of osteoporosis, as they suffer nearly 1.5 million fractures to the hips, forearms, and vertebrae each year. Because bones become thin and brittle, recovering from these fractures can be a long and complex process, with possible life-threatening complications.

Osteoporosis and low bone mass affects an estimated 28 million women and men age 50 and over. Eighty percent of the osteoporosis cases are women, yet a significant number of men also suffer from the disease. In addition to the toll it exacts in human suffering, osteoporosis costs our economy \$13.8 billion each year in health care expenses and lost productivity.

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The good news is that you can often prevent osteoporosis if you begin weight-bearing exercise, such as walking, running, gardening, or aerobics, and eat a calcium-rich diet from an early age. And if you already have osteoporosis—or you're at high risk for developing it—physical therapy can help make the difference in keeping you active and mobile.

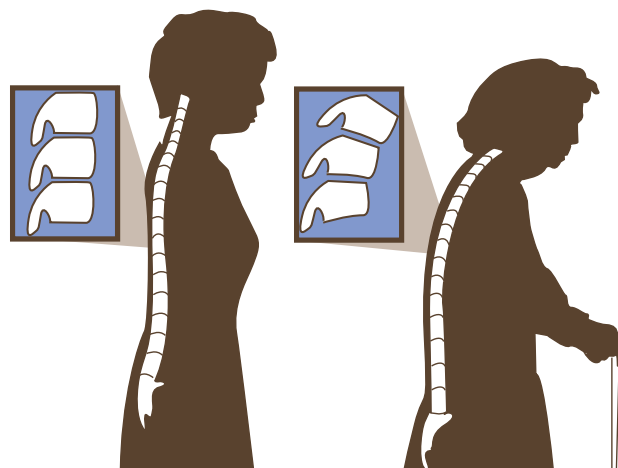
In this booklet you will find out:

- How the bones and spine are affected by osteoporosis;
- How to assess your personal risk factors;
- Why exercise, good posture, good diet, hormones, and lifestyle are important;
- The role of hormone therapy and drugs in treating osteoporosis;
- How young people can build a personal “bone bank”;
- How physical therapy can help people living with osteoporosis.

Understanding The Bones And Curvature Of The Spine

Bones are living tissue that constantly renews and destroys itself. **An individual's bone tissue reaches its peak mass in the late teens or early 20s**, although some bones may continue growing past age 30. Between the ages of 30 and 50, bones gradually start to lose mass and strength faster than the body can replenish it. For post-menopausal women, the problem is accelerated by diminishing levels of estrogen, a hormone that plays a pivotal role in regulating bone loss. The bones gradually become thinner and more prone to fracture. According to the National Osteoporosis Foundation, one out of every two women and one out of every eight men over age 50 has an osteoporosis-related fracture.

Kyphosis—a forward curvature of the spine—is a common symptom of osteoporosis. It is caused by



With osteoporosis, the spine is subject to compression fractures that cause the vertebrae to collapse. This may lead to forward curvature of the spine (as seen in the figure on the right).

compression fractures to the vertebrae (the individual bones which form the “backbone”) due to loss of bone mass. As a result of compression fractures, the individual vertebrae take on a flattened or wedge shape in the front and the upper spine settles into an exaggerated C-shaped curve. These fractures are not necessarily painful, and may go undiagnosed. If pain is present, the patient may mistakenly attribute it to muscle strain or a “bad back.”

It is normal for elderly people to lose 1-1¹/₂” in height due to degenerative causes such as *osteoarthritis* and the natural compression of the discs between the vertebrae. (Osteoarthritis, sometimes confused with osteoporosis, is an inflammation of the joints due to aging, wear and tear, or injury.) Osteoporosis can cause a more severe loss of height because of change in shape of the vertebrae due to fracture.

Are You At Risk For Osteoporosis?

While we don't yet know all the causes of osteoporosis, there are many factors that can help predict who is at risk. Respond "yes" or "no" to the statements below to get an idea of where you stand:

- My older relatives have a history of broken bones.
- I'm "petite" or thin.
- I drink heavily.
- I smoke.
- I consume a lot of caffeine and/or salt.
- I've been losing weight.
- My spine curves forward more than in the past.
- I have recently fractured my hip, wrist, or spine.
- I'm not sure if I get enough calcium in my diet.
- I don't like dairy products.
- I didn't like dairy products as a child.
- I don't exercise very much.
- My muscles are weak or sagging.
- I take thyroid medication, anti-convulsive medication, or cortisone-like drugs.

For women:

- My ovaries have been removed.
- I've reached menopause.
- I had an early menopause.
- I've never been pregnant.
- Before menopause, I had long periods of amenorrhea (absence of menstrual cycle).

A "yes" to any of these statements suggests that you may be at risk. More than one "yes" answer increases the likelihood that you will experience an osteoporosis-related fracture. In either case, it would be wise to consult your physician about taking a bone density test to measure the strength and thickness of your bones. There are actually several different tests for bone density, and all of them are painless and safe.

In many cases you won't even have to change into an examining robe.

The results of the test will assist your doctor in determining the degree of bone loss (if any). This information is helpful in deciding upon a course of medical treatment or physical therapy. Although treatment for osteoporosis may begin before you are tested, it is recommended that you have a bone-density test as soon as possible.

Preventing And Treating Osteoporosis

Exercise. Weight-bearing exercise and strength training are essential in the prevention and treatment of osteoporosis. When it comes to maintaining strong bones, "use it or lose it" is the order of the day. Strength training also improves strength and balance, which help prevent falls that lead to fracture. Exercise makes our bones strong and resilient, while inactivity leads to diminished bone mass and weakness. It's important to remember, though, that exercise—walking, jogging, stair-climbing, weight-lifting, aerobics, tennis, dancing, or some other form of weight-bearing or resistance exercise—must be done regularly to bring long-term benefits. The U.S. Surgeon General recommends at least 30 minutes of moderate exercise each day.

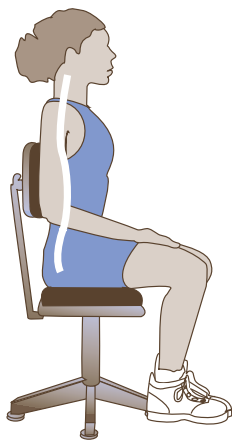
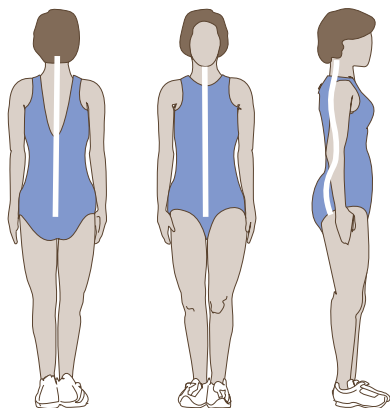
A physical therapist can custom-design a safe and effective exercise program to meet your needs, whatever your age and physical condition. If you already have osteoporosis, do not start an exercise program without first consulting your physical therapist or physician.

While regular exercise is essential in the treatment of osteoporosis, caution must be used to avoid fractures. Calisthenics which curve the spine forward, such as sit-ups, curl-ups, and toe touches, should be avoided. Also, the following exercise machines should be avoided: abdominal exercisers, bicep-curl

machines, cross-country ski machines, rowing machines, stationary bicycles with moving handlebars, and any other machine that involves trunk rotation or forward bending. These devices can cause vertebral fractures in people with significant osteoporosis. Sports that twist the spine (such as tennis, golf, and bowling) should also be avoided if you are at high risk for a fracture.

Posture And Body Mechanics. Good posture can't prevent osteoporosis, but it may help minimize the effects of the disease.

Proper posture is important in preventing the effects of osteoporosis. Here are back, front, and side views of good standing posture.

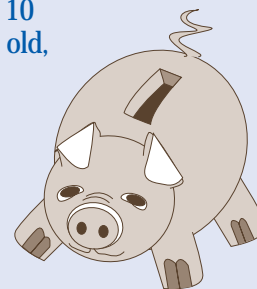


Good sitting posture means keeping your spine and head erect, and maintaining the three natural curves of your back. To do this, align the ears over the shoulders, and the shoulders over the hips.

Especially For Young People: How To Build Your “Bone Bank”

WHEN you're 10 or 20 years old,

it's hard to believe that someday you'll be 60. But the younger you are, the greater your opportunity to prevent osteoporosis—especially if you make regular “deposits” of exercise and calcium to your personal “Bone Bank.”



Here's how the Bone Bank works: Your body “deposits” more bone tissue than it “withdraws” until your early 20s, when peak bone mass is reached (although some bones continue to grow after that age). After that the pattern is reversed, with bone tissue withdrawals exceeding deposits.

But here's where the smart saving comes in: If you reach your 20s after having many years of adequate daily calcium and exercise, you'll have built a healthy “bank account” to draw on when your body starts to deplete your bone mass. You'll have a considerable head start in preventing osteoporosis—and if you continue getting enough calcium in your diet and exercising on a regular basis, you can minimize or prevent the effects of osteoporosis as you get older.

Good posture—when you are standing—is straight vertical alignment of your body from the top of your head, through your body’s center, to the bottom of your feet. When sitting, good posture means keeping the spine and head erect while maintaining the three natural curves of the back. A soft, narrow pillow behind your waist will help keep your spine in a neutral position.

Vertebral fracture in the spine, commonly seen in people with osteoporosis, leads to poor posture—and an impaired sense of balance. To counteract this problem your physical therapist may prescribe certain exercises to improve your posture and sense of balance. These can help you improve muscle strength while increasing your mobility.

Calcium. One of the most important ways to help prevent osteoporosis is by including enough calcium in your diet. Calcium is found in dairy products and, to a lesser degree, in dark green vegetables such as broccoli and kale. Unfortunately, surveys show that most Americans don’t get enough calcium.

If you avoid dairy products because of concerns about fat intake, remember that skim milk, fat-free yogurt, and ice milk retain 100% of their calcium while sparing you the fat and extra calories. If you are lactose intolerant, you may want to try reduced-lactose or lactose-free dairy products, which are also rich in calcium.

Calcium supplements in tablet or capsule form can help you ensure that you’re getting enough of this vital mineral. While it is preferable to obtain calcium from food, supplements are a viable way to satisfy average daily calcium requirements.

The table on the next page will help you calculate how much calcium you need.

Recommended Calcium Intakes*

(milligrams per day)

Children And Young Adults

	Amount
1-10 years	800-1,200
11-24 years	1,200

Adult Women

Pregnant and lactating	1,200-1,500
25-49 years (pre-menopausal)	1,000
50-64 (post-menopausal) taking estrogen	1,000
50-64 (post-menopausal) not taking estrogen	1,500
65+ years	1,500

Adult Men

25-64 years	1,000
65+ years	1,500

*Source: National Institutes of Health

In addition to calcium, some physicians recommend taking Vitamin D to help combat osteoporosis. Also, 15-20 minutes of exposure to sunlight every day boosts the body’s production of Vitamin D. Be sure to talk to your doctor before you add any of these supplements to your diet—taking excessive amounts of any vitamin or mineral supplement is potentially harmful.

Lifestyle. Alcohol, smoking, caffeine, diet, and certain drugs can all increase your risk of developing osteoporosis. Here is some basic advice:

- Stop smoking. Smoking can bring on early menopause, increase bone loss, and interfere with estrogen therapy.
- Limit your consumption of alcohol. Heavy drinking in itself can contribute to osteoporosis.
- Cut back on coffee, tea, and cola. The caffeine in these drinks increases the amount of calcium lost in the urine. Try to keep your intake to three

cups of coffee a day or less (or the equivalent in tea or cola).

- Some studies suggest that phosphorus (contained in carbonated drinks) and *excessive* consumption of salt, protein, and fiber, can increase the amount of calcium lost in the urine.
- Don't go on fasting diets or prolonged diets. You may be cutting out calcium as well as calories.
- Avoid laxatives. They interfere with calcium absorption.
- If you take cortisone-type drugs, review the dosages and discuss possible alternatives with your physician.

Hormones. The hormone estrogen affects the growth and loss of bone mass in women. When the amount of estrogen in the body declines (after menopause or removal of the ovaries), the body begins to lose more bone tissue than it creates.

Estrogen replacement therapy (ERT) is an effective—but not risk-free—treatment for osteoporosis. ERT may slightly increase the risk of certain cancers; on the other hand, it may also help prevent heart disease, vaginal dryness, and bladder problems. Because ERT requires a long-term commitment to be effective, be sure to discuss potential benefits and drawbacks with your physician.

Medications. There has been great progress in the development of medications specifically designed to combat osteoporosis. Again, you should discuss the pros and cons of specific drugs with your doctor.

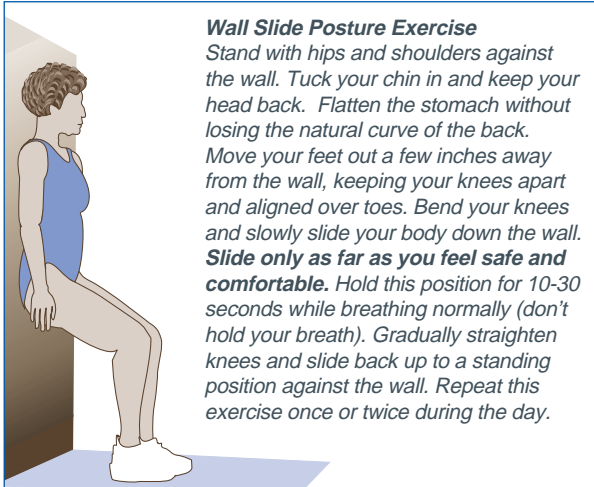
How Physical Therapy Can Help

The goal of physical therapy in treating osteoporosis is to restore mobility, function, strength, and confidence, and to enhance the safety and security of your everyday life. In consultation with your physician, a licensed physical therapist can help reduce pain, prevent fractures, promote healing if a fracture is present, and help strengthen your bones through a program of exercise designed especially for you. Here's how it works:

Evaluation. Your physical therapist will begin by taking a detailed medical history. He or she will observe your general body mechanics, and may ask you to perform a series of simple physical tests to assess your condition and your capabilities. Problems with range of motion, balance, posture, strength and endurance, and body mechanics may be discovered during these tests.

Treatment. If you have an existing fracture to the vertebrae, hip, or wrist, your physical therapist can provide instructions on how to perform basic everyday activities (such as getting out of bed, loading the dishwasher, vacuuming, etc.). The physical therapist may fit you with a support to ease pain, suggest corsets and hip padding for protection should you fall, and provide you with special devices, such as long-handled “grabbers” for reaching objects. If pain persists, the physical therapist may use other treatments such as manual techniques and physical therapy modalities.

Exercise. Whether you're recovering from a fracture or trying to prevent one, exercise will likely be part of your physical therapy treatment program. Exercise is fundamental to slowing the progression of osteoporosis. Your physical therapist can design exercises to improve your posture and enhance your sense of balance. Most of these are simple and can be done at home with no special equipment.



Wall Slide Posture Exercise

Stand with hips and shoulders against the wall. Tuck your chin in and keep your head back. Flatten the stomach without losing the natural curve of the back. Move your feet out a few inches away from the wall, keeping your knees apart and aligned over toes. Bend your knees and slowly slide your body down the wall. **Slide only as far as you feel safe and comfortable.** Hold this position for 10-30 seconds while breathing normally (don't hold your breath). Gradually straighten knees and slide back up to a standing position against the wall. Repeat this exercise once or twice during the day.

Living With Osteoporosis

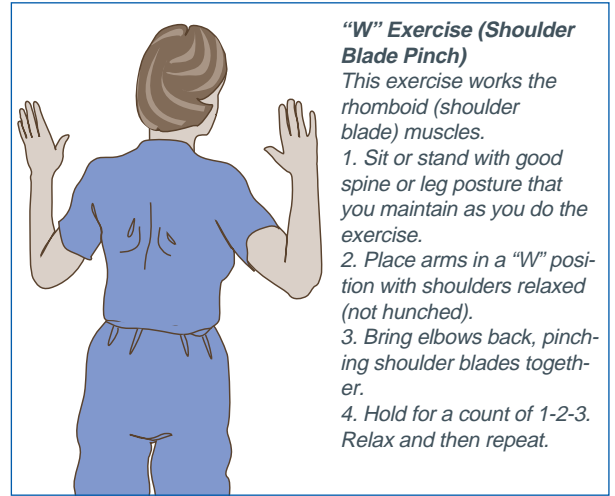
Falls. Preventing falls is a serious matter for people who have osteoporosis. Studies show that about 1/3 of people over age 65 fall each year, and that the most common type of fall is from a standing height or less. Falling can cause fractures, limit your mobility, and lead to dangerous medical complications.

Your physical therapist may design exercises for coordination, balance, and posture. In addition, he or she can help identify safety hazards in your home.

Falls prevention programs, sponsored by physical therapy departments or osteoporosis support groups, are also effective. These programs may involve home safety checks, seminars on avoiding falls, and information on exercises to improve balance and coordination.

If You Fall:

- Drop whatever you're carrying so that you can break the fall with your hands. It's better to break your wrist than your hip.
- If you think you've sustained a fracture, don't move and don't let others move you until medical assistance arrives.



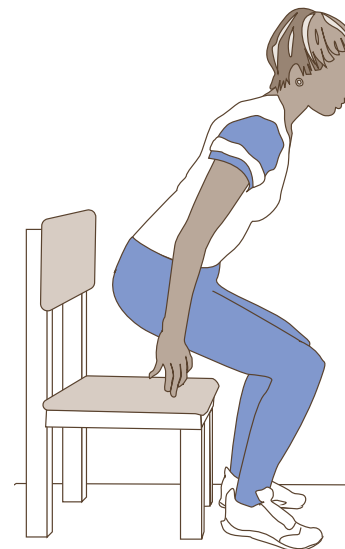
"W" Exercise (Shoulder Blade Pinch)

This exercise works the rhomboid (shoulder blade) muscles.

1. Sit or stand with good spine or leg posture that you maintain as you do the exercise.
2. Place arms in a "W" position with shoulders relaxed (not hunched).
3. Bring elbows back, pinching shoulder blades together.
4. Hold for a count of 1-2-3. Relax and then repeat.

Take Care Of Yourself. There are many things you can do to ease the effects of osteoporosis:

- Follow the exercise, diet, medication, and activity modification advice of your physician or physical therapist. Consult your doctor or pharmacist about possible side effects from your medications. Be particularly concerned about such side-effects as light-headedness, drowsiness, impaired balance, or



Sitting Exercise

Aim for the front of the chair and sit down with your trunk straight, using your arms to reach behind you. Lower yourself into a normal sitting posture. Reverse the process to get up. Repeat 5-10 times in a row, 2-3 times each day as an exercise.

Making Your Home Safe

Bath. Install grab railings by the tub, shower, and toilet. Use non-skid carpeting, mats, and adhesive strips. A padded shower seat and hand-held shower head will make bathing safer and more convenient.

Kitchen. Keep items used every day within easy reach to avoid bending and stooping. Use long-handled “grabbers” to reach lightweight items on upper shelves.

Stairs. Railings on both sides are a must. Mark the first and last steps with brightly-colored tape. Make sure there are light switches at both the top and bottom of the stairs.

Outside: Use gritty weather-proof paint on steps.

Bedroom. Keep nighttime temperature above 65°. Place telephones and light switches within reach of the bed. And, before getting out of bed, sit on the side of the bed for a minute or two before standing. This helps to avoid dizziness.

Lighting. Good lighting is important in every room of the house. Install light switches at the entrance and exit to every room.

Living Room. Keep cords and telephone wires out of the way. Cover slippery surfaces with carpeting or non-skid floor wax. Any rugs should have non-skid padding.

Telephones. Install extensions or place cordless phones in as many rooms as possible.

loss of coordination—anything that could increase the possibility of falling.

- Keep the nighttime temperature in your house above 65°. Exposure to cold temperatures for a long period may cause dizziness.
- Use a cane, walker, or walking stick as necessary. Be especially careful when walking on wet and icy surfaces.
- Wear low-heeled, rubber-soled shoes. You're more likely to slip on waxed floors or stairs when wearing slippers, smooth-soled shoes, or socks.

Tips For Everyday Living. If you have osteoporosis, even the most common everyday activities can be a challenge—and a risk. The following suggestions will help you reduce the possibility of injury.

- Sit in chairs with straight or molded backs; your feet should be able to touch the floor. Chairs with arm rests are best. Avoid sitting in low, overstuffed couches, chairs, and recliners.
- While cleaning the house: Try to keep your upper body straight. Don't twist the torso. Bend from the knees (not the waist) when necessary. When vacuuming, hold your torso straight, keep your upper arms at your side, and rock back and

To avoid fracture when going from a sitting position to lying on your back, be sure to lie down on your side first, then roll onto your back. Reverse this process to get up.



Coughing or sneezing can cause vertebral fractures in people with osteoporosis. Use one hand to support your back when you cough or sneeze. Do not bend forward from the waist.



forth on legs that are spread apart. Don't lean forward with your upper body.

- To make the bed: Pull up one layer at a time on one side at a time. Keep your knees bent and back straight. Avoid reaching across the bed.
- To lift groceries: Use plastic bags with handles, and have them packed lightly. Carry one bag at a time, holding the weight close to your body.

Whatever your age, you can reduce the risk or effects of osteoporosis through good diet, exercise, and lifestyle choices. And if you have osteoporosis, your licensed physical therapist can help reduce your pain and risk of injury while helping your return to a more active and mobile life.

About APTA

The American Physical Therapy Association (APTA) is a national professional organization that represents more than 75,000 members.

Physical therapists are vital members of the multidisciplinary health care team. They provide treatment and can refer clients to other health care specialists. APTA serves its members and the public by promoting understanding of the physical therapist's increasing role in the health care system. APTA also promotes excellence in the field with improvements in physical therapy education, research, and practice.

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