

Osteoporosis

Osteoporosis is a common bone disease that mostly affects women past the age of menopause, but men and younger females can also experience low bone density (Osteopenia). Fortunately, you can take simple steps to reduce your risk of developing osteoporosis and avoid the often debilitating bone fractures that can result from this disease. If you already have osteoporosis, new medications and therapies are available to slow or even stop its progression.

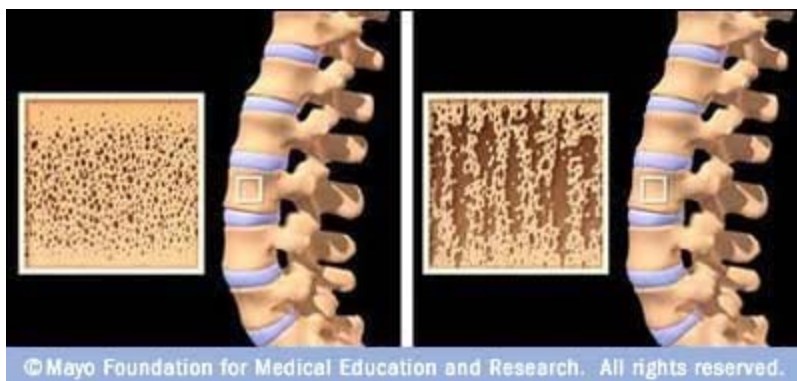
A Broader Health Impact

Osteoporosis (which means "porous bones") is a weakening of the bones. When your bones contain fewer minerals than normal, they weaken and become brittle. This condition commonly results in bone fractures — most of them in the spine, hip or wrist. Spine and hip fractures especially may lead to chronic pain, long-term disability and even death. A major goal of treating osteoporosis is to prevent fractures. Osteoporosis can cause the bone structure to become so weak that even mild stresses like bending over, lifting a vacuum cleaner or coughing can cause a fracture. In some cases, spinal fractures can occur without any fall or injury simply because the bones in your back (vertebrae) become so weakened that they begin to compress. Compression fractures can cause severe pain and require a long recovery. If you have many such fractures, you can lose several inches of height as your posture becomes stooped.

How does Osteoporosis Develop?

Your risk of developing osteoporosis depends on how much bone mass you attained between ages 25 and 35 (peak bone mass) and how rapidly you lose it later. Bone is continuously changing — new bone is made and old bone is broken down — a process called remodeling, or bone turnover. A full cycle of bone remodeling takes about 2-3 months. When you're young, your body makes new bone faster than it breaks down old bone, and your bone mass increases. You reach your peak bone mass in your mid-30s. The higher your peak bone mass, the more bone you have "in the bank" and the less likely you are to develop osteoporosis as you age. Not getting enough vitamin D and calcium in your diet may lead to a lower peak bone mass and accelerated bone loss later.

After reaching peak bone mass, bone remodeling continues, but you lose slightly more than you gain. At menopause, when estrogen levels drop, bone loss in women increases dramatically. Although many factors contribute to bone loss, the leading cause in women is decreased estrogen production.



Normal bone has the appearance of a honeycomb matrix (left). Under a microscope, osteoporotic bone (right) looks more porous.

What are the Risk factors?

A number of factors can increase the likelihood that you'll develop osteoporosis, including:

- **Age** - starting in the mid-30's and accelerating after 50 years of age for women, age 75 and older for men
- **Sex** - fractures are twice as common in women as they are in men
- **Race** – females of Caucasian and Southeast Asian ethnic background
- **Family history** - Osteoporosis or related fracture in a parent or sibling
- **Frame size** - thin or small body frames tend to have less bone mass to draw from
- **Low calcium and Vitamin D intake or absorption**- plays a major role
- **Medical conditions and procedures that decrease calcium absorption** - Stomach surgery (gastrectomy), Crohn's disease, celiac disease, vitamin D deficiency, and Cushing's disease
- **Estrogen Deficiency**- infrequent menstrual periods or menopause before age 45
- **Eating disorders** - Women and men with anorexia nervosa or bulimia
- **Thyroid hormone** - too much thyroid hormone
- **Corticosteroid medications** - Long-term use of prednisone, cortisone, prednisolone and dexamethasone. These medications are common treatments for chronic conditions, such as asthma, rheumatoid arthritis and psoriasis. If taken for long periods, your doctor should monitor your bone density and recommend other drugs to help prevent bone loss.
- **Other medications** - Long-term use of the blood-thinning medication heparin, the cancer treatment drug methotrexate, some anti-seizure medications, diuretics and aluminum-containing antacids
- **Sedentary lifestyle** – immobility or lack of exercise
- **Alcohol abuse** - reduces bone formation and interferes with the body's ability to absorb calcium
- **Excess soda consumption** - may interfere with calcium absorption which may increase mineral loss. The phosphoric acid in soda may contribute to bone loss by changing the acid balance in your blood.
- **Tobacco use** -contributes to weak bones
- **Previous Fracture** – following a low-level trauma, especially after age 50
- **Postmenopausal women who have had breast cancer** - especially if treated with chemotherapy or aromatase inhibitors such as anastrozole and letrozole, **which suppress estrogen**. This isn't true for women treated with tamoxifen, which may reduce the risk of fractures.

What are the Symptoms of Osteoporosis?

In the early stages of bone loss, you usually have no pain or other symptoms, so it is important to ask your doctor about a bone density test. Once bones have been weakened by osteoporosis, you may have symptoms that include:

- Back pain, which can be severe if you have a fractured or collapsed vertebra
- Loss of height over time, with an accompanying stooped posture
- Fracture of the vertebrae, wrists, hips or other bones

When should I seek medical advice?

Early detection is important in osteoporosis. Consider your risk factors, then discuss your prevention strategy with your doctor. If you're a woman, it's best to do this well before menopause.

How is Osteoporosis Diagnosed?

A simple, quick and painless test, a bone density test, measures your bone mineral density. It is similar to having an x-ray, but uses much less radiation. If the results show you have a T-score of 2.5 or less, you are considered to have osteoporosis and therefore at high risk for a fracture. T-scores between -1.0 and -2.5 are generally considered to show osteopenia, which means if bone loss continues the risk for fracture increases.

How is Osteoporosis Treated?

Diet, exercise, vitamins and minerals, lifestyle changes, medications and physical therapy all play a role in treating bone loss. Your doctor will determine what treatment regime is best for you.

➤ Physical Therapy

BHOSC offers a Physical Therapy Osteoporosis Program that addresses:

- Balance, posture, range of motion and limitations in your daily activities.
- A safe exercise program for you.
- Education in the prevention of injuries associated with osteoporosis.
- A custom back support/brace may be recommended

➤ Diet

Calcium and vitamin D supplements are most effective taken together in divided doses with food.

The amount you need to stay healthy changes over your lifetime. Your body's demand for calcium is greatest during childhood and adolescence, when your skeleton is growing rapidly, and during pregnancy and breast-feeding. Postmenopausal women and older men also need to consume more calcium.

- Calcium – make sure you are getting enough calcium in your diet (1000 mg per day for women before menopause and 1500 mg per day for postmenopausal women) Food containing calcium include dairy products, almonds, broccoli, cooked kale, canned salmon with the bones, oats and soy products such as tofu. Calcium supplements are inexpensive and generally well tolerated. Calcium phosphate and calcium citrate tend to be less constipating.
- Vitamin D – important for calcium absorption and to maintain muscle strength (400 IU per day until age 60, 600-800 UI per day after age 60). Vitamin D is absorbed through sunlight, is present in oily fish such as tuna and sardines, and is present in egg yolks. Calcium supplements with added vitamin D are usually needed to get the proper amount.

➤ **Exercise**

- Exercise – regular exercise is imperative, especially weight bearing exercise

➤ **Medications for Osteoporosis**

A number of medications help slow bone loss, decrease the risk of fractures, and help in controlling pain. Your doctor will recommend which medication is best for you based on several determining factors.

- Bisphosphonates: Available in pill and IV form.
- Calcitonin
- Estrogen or Hormone Replacement Therapy
- Selective Estrogen Receptor Modules (SERMs)
- Teriparatide (Forteo)
- Strontium Ranelate (Protelos)

Living with Osteoporosis

In addition to preventing further bone loss, it is important **to prevent a fracture.**

- Eliminate hazards in the house that increase your risk of falling. (remove loose wires or throw rugs, install grab bars in the bathroom and non-skid mats near skins and near the bath, etc.)
- Be careful when you are carrying or lifting items, as this could cause a spine fracture.

- Wear sturdy shoes, especially in winter.
- Use a cane or walker if you have balance problems or other difficulties walking.

Also:

- Discuss pain management strategies with your doctor. Don't ignore chronic pain. Left untreated, it can limit your mobility and cause even more pain.

PREVENTION of Osteoporosis

- **Eliminate lifestyle choices that increase your risk of osteoporosis-** see risk factors above
- **Add soy to your diet** - The plant estrogens found in soy help maintain bone density
- **Maintain good posture** - which involves keeping your head held high, chin in, shoulders back, upper back flat and lower spine arched — helps you avoid stress on your spine. When you sit or drive, place a rolled towel in the small of your back. Don't lean over while reading or doing handwork. When lifting, bend at your knees, not your waist, and lift with your legs, keeping your upper back straight.
- **Prevent falls** - Wear low-heeled shoes with nonslip soles and check your house for electrical cords, area rugs and slippery surfaces that might cause you to trip or fall. Keep rooms brightly lit, install grab bars just inside and outside your shower door, and make sure you can get in and out of your bed easily.
- **Consider hormone therapy.** Hormone therapy can reduce a woman's risk of osteoporosis during and after menopause. But because of the risk of side effects, discuss the options with your doctor and decide what's best for you. Testosterone replacement therapy works only for men with osteoporosis caused by low testosterone levels. Taking it when you have normal testosterone levels won't increase bone mass.
- **Healthy Bones start in Childhood** - Children who are physically active and consume adequate amounts of calcium-containing foods have the greatest bone density. Any weight-bearing exercise is beneficial, but jumping and hopping seem particularly helpful for creating healthy bones.

The Rheumatologist's Role in the treatment of Osteoporosis

As specialists in musculoskeletal diseases, rheumatologists can help to determine the cause of osteoporosis. They can provide and monitor the best treatments for this condition.

Additional Resources

National Osteoporosis Foundation www.nof.org

National Institute of Health Osteoporosis and Related Bone Diseases Resource Center www.osteoporosis.nih.gov

Mayo Clinic www.mayoclinic.com