

Osteoporosis

Definition

Osteoporosis is the thinning of bone tissue and loss of bone density over time.

Alternative Names

Thin bones

Causes

Osteoporosis is the most common type of bone disease. An estimated 10 million Americans have osteoporosis, as well as another 18 million who have low bone mass, or osteopenia, which may eventually lead to osteoporosis if not treated.

Researchers estimate that about 1 out of 5 American women over the age of 50 have osteoporosis. About half of all women over the age of 50 will suffer a fracture of the hip, wrist, or vertebra (bones of the spine).

Osteoporosis occurs when the body fails to form enough new bone, or when too much old bone is reabsorbed by the body, or both.

Calcium and phosphate are two minerals that are essential for normal bone formation. Throughout youth, your body uses these minerals to produce bones. If you do not get enough calcium, or if your body does not absorb enough calcium from the diet, bone production and bone tissues may suffer.

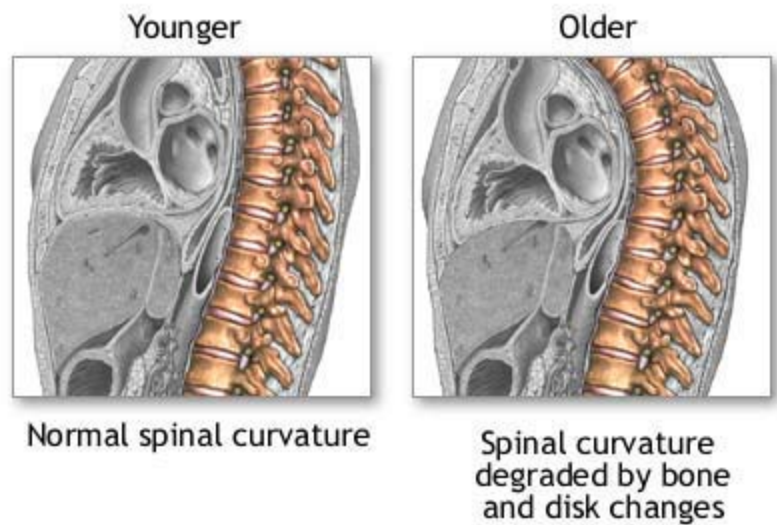
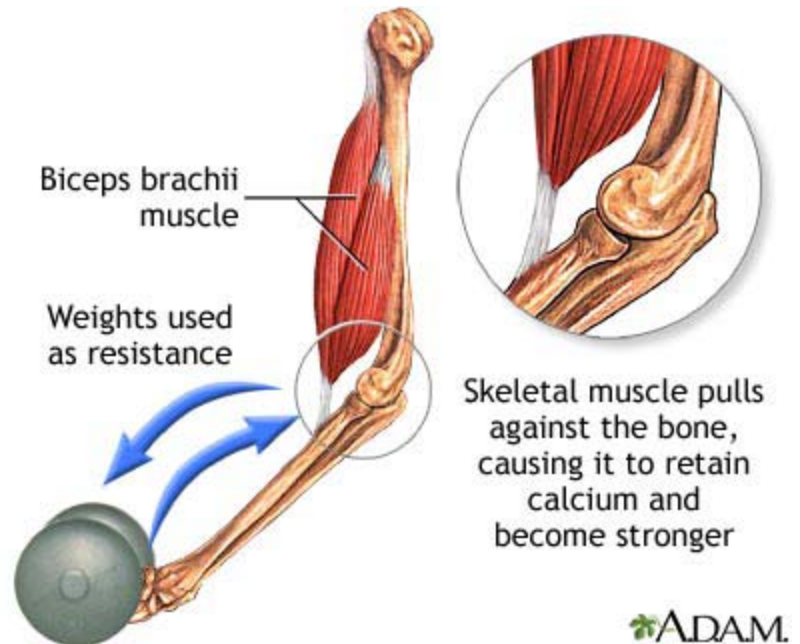
As you age, calcium and phosphate may be reabsorbed back into the body from the bones, which makes the bone tissue weaker. This can result in brittle, fragile bones that are more prone to fractures, even without injury.

Usually, the loss occurs gradually over years. Many times, a person will have a fracture before becoming aware that the disease is present. By the time this occurs, the disease is in its advanced stages and damage is severe.

The leading causes of osteoporosis are a drop in estrogen in women at the time of menopause and a drop in testosterone in men. Women, especially those over the age of 50, get osteoporosis more often than men.

Other causes include:

- Being confined to a bed
- Bone cancer
- Cushing syndrome



- Excess corticosteroid levels due to on-going use of medicines for asthma, certain forms of arthritis or skin diseases, and COPD.
- Hyperthyroidism
- Hyperparathyroidism

White women, especially those with a family history of osteoporosis, have a greater-than-average risk of developing osteoporosis. Other risk factors include:

- Absence of menstrual periods (amenorrhea)
- Drinking large amount of alcohol
- Early menopause
- Eating disorders
- Low body weight
- Smoking
- Too little calcium in the diet
- Use of certain medications, including steroids and antiseizure drugs

Symptoms

There are no symptoms in the early stages of the disease.

Symptoms occurring late in the disease include:

- Bone pain or tenderness
- Fractures of the wrists or hips (usually the first sign)
- Loss of height over time
- Low back pain due to fractures of the spinal bones
- Neck pain due to fractures of the spinal bones
- Stooped posture

Exams and Tests

Bone mineral density testing (specifically a densitometry or DEXA scan) measures how much bone you have. This test has become the gold standard for osteoporosis evaluation. For specific information on such testing, see bone density test.

A spine CT can show loss of bone mineral density. Quantitative computed tomography (QCT) can evaluate bone density, but is not as available and is more expensive than a DEXA scan.

In severe cases, a spine or hip x-ray may show fracture or collapse of the spinal bones. However, Simple x-rays of bones are not very accurate in predicting who is more likely to have osteoporosis.

A urinary calcium test can provide some evidence of increased bone turnover, but is of limited value. A number of newer tests to evaluate bone turnover are becoming available. Ask your health care provider which test is best for you.

Treatment

The goals of osteoporosis treatment are to:

- Control pain associated with the disease
- Slow down or stop bone loss
- Prevent bone fractures by minimizing the risk of falls

There are several different treatments for osteoporosis, including a variety of medications.

BISPHOSPHONATES

Bisphosphonates are a type of drug used for both the prevention and treatment of osteoporosis in postmenopausal women. Several bisphosphonates are approved for the treatment of osteoporosis in the United States. Most are taken by mouth, usually once a day or less. For example, some may be taken once a week.

While side effects are generally mild, potential side effects include stomach upset and irritation of the esophagus. Because bisphosphonates are difficult to absorb, these medicines should be taken on an empty stomach. You should not lie down or consume food or beverages (other than water) for at least 30 minutes after taking the medicine. Your doctor may also recommend taking calcium and vitamin D supplements.

CALCITONIN

Calcitonin is a medicine that slows the rate of bone loss and relieves bone pain. It comes as a nasal spray or injection. The main side effects are nasal irritation from the spray form and nausea from the injectable form.

While calcitonin slows bone loss and reduces the risk of fractures, it appears to be less effective than bisphosphonates.

HORMONE REPLACEMENT THERAPY

Reduced estrogen levels during and after menopause may affect a woman's bone strength. Based on early studies, many physicians used to believe that hormone replacement therapy (HRT) might help reduce the risk for bone fractures caused by osteoporosis in addition to treating menopausal symptoms and reducing the risk for heart disease. However, the Women's Health Initiative (WHI) led health care providers to revise their recommendations regarding HRT.

The WHI study showed that women taking HRT had 34% fewer hip fractures and 24% fewer fractures than women not receiving hormones. However, women who took estrogen with or without the hormone progesterone for 5 or more years had an increased risk for stroke, heart disease, breast cancer, and blood clots.

Estrogens are still used to prevent osteoporosis but are not approved to treat a woman who has already been diagnosed with the condition. If you are considering taking HRT to prevent osteoporosis, discuss the risks with your doctor.

PARATHYROID HORMONE

Teriparatide (Forteo) is approved in the United States for the treatment of postmenopausal women who have severe osteoporosis and are considered at high risk for fractures. The medicine is given through daily shots underneath the skin. You can give yourself the shots at home.

RALOXIFENE

Raloxifene (Evista) is used for the prevention and treatment of osteoporosis. Raloxifene is similar to the breast cancer drug tamoxifen. Raloxifene can reduce the risk of spinal fractures by almost 50%. However, it does not appear to prevent other fractures, including those in the hip. It may have protective effects against heart disease and breast cancer, though more studies are needed.

The most serious side effect of raloxifene is a very small risk of blood clots in the leg veins (deep venous thrombosis) or in the lungs (pulmonary embolus).

EXERCISE

Regular exercise can reduce the likelihood of bone fractures associated with osteoporosis. Some of the recommended exercises include:

- Weight-bearing exercises -- walking, jogging, playing tennis, dancing

- Resistance exercises -- free weights, weight machines, stretch bands
- Balancing exercises -- tai chi, yoga
- Riding stationary bicycles
- Using rowing machines
- Walking
- Jogging

Any exercise that presents a risk of falling should be avoided!

DIET

You should follow a diet that provides the proper amount of calcium, vitamin D, and protein. While this will not completely stop bone loss, it will guarantee that a supply of the materials the body uses to form and maintain bones is available.

High-calcium foods include low-fat milk, yogurt, ice cream, cheese, tofu, salmon, sardines (with the bones), and leafy green vegetables, such as spinach and collard greens.

Your doctor may recommend calcium and vitamin D supplements. Vitamin D helps your body absorb calcium. Ask your doctor what dose is best for you.

STOP UNHEALTHY HABITS

Quit smoking, if you smoke. Also limit alcohol intake. Too much alcohol can damage your bones, as well as put you at risk for falling and breaking a bone.

PREVENT FALLS

It is critical to prevent falls. Avoid sedating medications and remove household hazards to reduce the risk of fractures. Make sure your vision is good. Other ways to prevent falling include wearing well-fitting shoes, avoiding walking alone on icy days, and using bars in the bathtub, when needed.

MONITORING

Your response to treatment can be monitored with a series of bone mineral density measurements taken every 1-2 years. However, such monitoring is controversial and expensive.

Women taking estrogen should have routine mammograms, pelvic exams, and Pap smears.

RELATED SURGERIES

There are no surgeries for treating osteoporosis itself. However, a procedure called vertebroplasty can be used to treat any small fractures in your spinal column due to osteoporosis. It can also help prevent weak vertebra from becoming fractured by strengthening the bones in your spinal column.

The procedure involves injecting a fast-hardening glue into the areas that are fractured or weak. A similar procedure, called kyphoplasty, uses balloons to widen the spaces that need the glue. (The balloons are removed during the procedure.)

Outlook (Prognosis)

Some persons with osteoporosis become severely disabled as a result of weakened bones. Hip fractures leave about half of patients unable to walk independently. This is one of the major reasons people are admitted to nursing homes.

Although osteoporosis is debilitating, it does not affect life expectancy.

Possible Complications

- Compression fractures of the spine
- Hip and wrist fractures
- Disability caused by severely weakened bones
- Loss of ability to walk due to hip fractures

When to Contact a Medical Professional

Call your health care provider if you have symptoms of osteoporosis or if you wish to be screened for the condition.

Prevention

Calcium is essential for building and maintaining healthy bone. Vitamin D is also needed because it helps your body absorb calcium. Following a healthy, well-balanced diet can help you get these and other important nutrients throughout life.

Other tips for prevention:

- Don't smoke
- Avoid drinking excess alcohol
- Get regular exercise

A number of medications are approved for the prevention of osteoporosis.

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