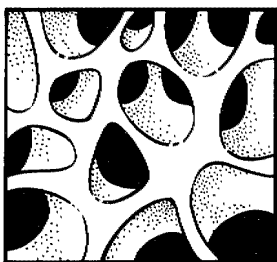


# Osteoporosis

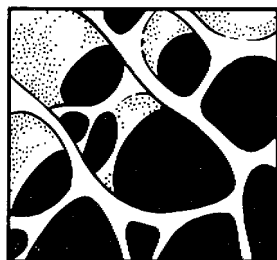
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## What is it?

In *osteoporosis*, the bones become porous and thin. Over time, this weakens the bones and makes them more likely to break or fracture, even after a minor injury



Close-up view



Close-up view

or fall.

**Normal bone**

**Osteoporosis**

## What causes it?

Exactly what causes the increased loss of bone due to osteoporosis is unknown. However, there appear to be many contributing factors, including hormonal imbalances, and alterations in the absorption of calcium and phosphorus. We do know that there are many things which put you at risk for osteoporosis. The more of these that apply to you, the higher your risk is.

### Risk factors

- Natural or surgical menopause before age 48
- Inadequate dietary calcium
- Lack of weight bearing exercise
- Poor diet or malnutrition
- Smoking or alcohol abuse
- Osteoporosis in close relatives
- Small, thin bone frame (BMI<20)
- Fair skin (Caucasian or Asian race)
- Hyperthyroidism (excess thyroid hormone)
- Long-term use of steroids

## Who gets it?

Osteoporosis is four times more common in women than in men. This is because women have less bone mass than men do, tend to live longer, take in less calcium, and need the female hormone *estrogen* to keep their bones strong. If men live long enough, they are also at risk for getting osteoporosis.

Once total bone mass has peaked (around age 35) all adults start to lose it. In women, the rate of bone loss speeds up during menopause or after surgical removal of ovaries when estrogen levels fall.

## What are the symptoms?

You may not know you have osteoporosis until you have serious signs. These include a broken wrist or hip, low back pain, or a hunched back. You may lose height over time because osteoporosis can cause the bones in your spine to collapse. These are called *compression fractures* and they often cause severe back pain.

Since early osteoporosis has no symptoms, the US Preventive Services Task Force recommends that women 65 and older (60 and older for high risk individuals) be screened routinely for osteoporosis. The most common bone densitometer for screening is the dual-energy x-ray absorptiometer (DEXA), which reports a bone mineral density "T" score with T=0 for a healthy young adult female. A normal low risk score is greater than T -1.0. Moderate risk is T score -1.0 to -2.5 and is called *osteopenia*. Fracture risk is 2-7 times greater than normal in this group. The highest risk group is osteoporosis with T score less than -2.5 and fracture risk 8-11 times normal.

## How do you prevent it?

To reduce the risk of developing post-menopausal osteoporosis, any woman over age 45 should increase calcium intake. Also, any kind of regular weight bearing physical activity (like walking) can help slow the rate of bone loss. Unusually high percentages of women who have osteoporosis are cigarette smokers. If you're a smoker, stop. Limiting alcohol intake to less than 1 per day for women and 2 per day for men also reduces risk.

## Can it be treated?

- **Exercise** is very important. Regular exercise, particularly if it stresses weight bearing (walking, jogging, racquet sports, dancing, weight-training) can be very effective since it keeps both bone and muscle healthy plus reduces risk of falls. Walking is good exercise for those who do not want to take part in active sports, or can not do so because of their general health.

- **Calcium and Vitamin D** are also important in preventing and treating osteoporosis. Teenagers and pregnant women need 1200-1500 mg of elemental calcium per day (equivalent to 4 cups of milk). Adults should have 1000 mg per day. Menopausal women and men over age 65 should get 1500 mg per day. Dairy products made from skim milk have as much calcium as those made from whole milk with none of the fat. For example, milk has 300 mg of calcium per cup, yogurt 315 mg per cup, cheddar cheese 210 mg per oz, and cottage cheese 125 mg per cup. Non-dairy sources of calcium include figs 270 mg per 10 figs, broccoli 36 mg per 1/2 cup, tofu 258 mg per 1/2 cup, calcium fortified orange juice 200 mg per 6 oz and canned salmon 180 mg per 3 oz. Dried beans and spinach are also good.

You should take calcium supplements if you don't get enough calcium from the foods you eat. It is usually best to take the form of calcium called *calcium carbonate* because it seems to be easier for the body to use. Generic forms or antacids like regular TUMS (300 mg) are generally the best values. Take them at meal time or with a sip of milk to increase absorption and decrease side effects like bloating and constipation.

Vitamin D helps your body absorb calcium and is found in most fortified milk. The daily recommended amount is 800 IU or your body can make Vitamin D in the skin with at least 15 minutes of sun exposure daily.

- **Hormone replacement therapy** after menopause is one way for women to prevent osteoporosis from happening or keep it from getting worse once it has started. In replacement therapy you take the hormone *estrogen*, alone or in combination with *progesterone*, which is lost at natural menopause or after surgical removal of the ovaries.

Hormone replacement can decrease spine, hip and forearm fractures by 50%. It is most effective when started in the first few years after menopause. The benefits continue for as long as you keep taking the hormones. Side effects of estrogen may include sore breasts, return of menstrual periods, slight bleeding between periods, weight gain, and gall stones. Recent evidence has shown there is increased risk of breast cancer, heart attack, stroke and blood clots when estrogen and progesterone are used together.

- **Selective estrogen receptor modulators (SERM's)** are like estrogen yet subtly and importantly different. At some areas in the body they interfere with estrogen; at others they mimic estrogen. SERM's include the fertility hormone clomiphene, and the cancer

drug tamoxifen. Raloxifene (Evista) appears to prevent osteoporosis without increasing the chance of breast cancer or bringing on monthly bleeding. It costs four times more than estrogen. Unfortunately, raloxifene may worsen hot flashes and night sweats.

- **Bisphosphonates** (Fosamax, Actonel, Boniva) decrease bone breakdown and increase bone formation. Bisphosphonates can cut the risk of spinal and hip fractures by 50%, but they must be taken on an empty stomach and may burn the esophagus. They have been approved for prevention and treatment of osteoporosis in menopausal women who are not receiving hormone replacement therapy.

- **Calcitonin** (Miacalcin) works primarily by slowing bone breakdown. It is well tolerated, easy to take once a day nasal spray, but only half as effective as the bisphosphonates in preventing spinal fracture. Calcitonin can be helpful in patients who are experiencing bone pain due to osteoporosis.

- **Parathyroid hormone** (Forteo) is the first osteoporosis treatment that stimulates new bone formation by increasing the number and action of bone forming cells. It is approved to treat osteoporosis in postmenopausal women and men with high fracture risk. It is given as an injection similar to insulin. Side effects are mild and include nausea, dizziness and leg cramps. There were also increased bone cancers in study lab animals although none reported in humans.

## Are there complications?

Osteoporosis is responsible for many of the hip, wrist, and spinal fractures that occur in the elderly. Occasionally these fractures require hospitalization, and the death rate from such hospitalizations is surprisingly high. Elderly people with osteoporosis should take every precaution to avoid accidental falls. A walking stick or frame should be used if you do not feel steady on your feet. Shoes and slippers should have skid resistant soles. In addition, hand rails in bathrooms and sturdy banister rails against all stairs both inside and out should be installed for safety.

## In summary

- Osteoporosis affects 1/3 of women by age 65.
- The best prevention is regular exercise, proper diet, and avoidance of cigarettes and alcohol.
- For more information, contact the National Osteoporosis Foundation at [www.nof.org](http://www.nof.org) or (800) 223-9994.