

Osteoporosis and you

Find out about the implications
of osteoporosis and what you can
do for your bone health



What is osteoporosis?

Osteoporosis, which literally means “porous bone”, is a disease in which the density and quality of bone are reduced. As the bones become more porous and fragile, the risk of fractures is greatly increased. The loss of bone occurs “silently” and progressively. Often there are no symptoms until the first fracture occurs.

Fractures associated with osteoporosis occur most commonly at the wrist, hip and spine. In the short term, spine fractures (vertebral compression fractures) can cause intense pain, and may eventually result in a gradual loss of movement and the inability to carry out daily chores. They can lead to loss of height, and in severe cases the spine may curve to form what is termed a “dowager’s hump”. Hip

fractures almost always require surgery and in about a third of patients, result in loss of independent living and the need to transfer to institutional care. Fractures caused by osteoporosis in women over 45 years are responsible for more days spent in hospital than most other diseases, including breast cancer or heart attack. The lifetime risk for a woman or man of dying from hip fracture complications is the same as for dying of breast or prostate cancer respectively.



normal bone



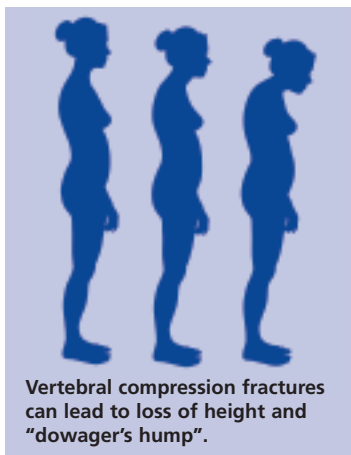
osteoporotic bone

The good news is that testing for osteoporosis is quick, easy and painless, and there are a number of different treatments available that can reduce the risk of vertebral fractures by up to 65% and nonvertebral fractures by up to 53%.

How osteoporosis develops

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Bones are made of living, dynamic tissue. All throughout life old bone tissue is removed and new bone tissue is formed. The critical years for building bone mass are during childhood and adolescence. This is when new bone is formed more quickly than old bone is removed, causing bones to become larger and denser. This pace continues until around the mid 20's when peak bone mass is normally reached. Although a person's peak bone mass is determined largely by genetic factors, other factors such as nutrition, physical activity and disease also influence bone development.



Bone tissue loss generally begins after the age of about 40 years, when we are no longer able to replace bone tissue as quickly as we lose it. In women, however, the rate of bone tissue loss increases after menopause, when estrogen production stops and bones no longer benefit from its protective effect. Men also suffer from loss of bone tissue, but the rate of loss is much slower than in women. At this stage in life, taking preventive measures will help to slow the rate of bone tissue thinning and reduce the risk of having osteoporosis-related fractures.

The best time in life to ensure bone health for the future is while we are still young. Exercise and good nutrition, with plenty of calcium-rich foods accompanied by enough regular sunshine to maintain vitamin D production in our bodies, makes for strong bones. This does not mean, however, that we cannot contribute positively to our bone health later on in life. The same things that make bones strong in youth will also help later on. For patients diagnosed with osteoporosis, there are also various treatments available that slow down the rate of bone loss.

How common is osteoporosis?

One in three women and one in five men over the age of 50 years will suffer an osteoporotic fracture. The hormonal changes that take place at menopause are one reason why women are at greater risk than men.

There are a number of other risk factors associated with osteoporosis:

- A close family member diagnosed with osteoporosis
- A family history of fractures resulting from minor bumps and falls
- Frequent falls
- A previous fracture
- Long-term enforced bed rest
- Little physical activity
- Low body weight
- Loss in height
- Periods stop for more than 12 months
- A diet low in calcium and vitamin D
- High alcohol intake
- Smoking
- Certain medications in long-term use such as corticosteroids
- Age 60+
- Chronic disorders such as anorexia nervosa, malabsorption syndromes including coeliac disease and Crohn's disease, chronic liver disease, primary hyperparathyroidism, post-transplantation, chronic renal failure, hyperthyroidism, Cushing's syndrome, arthritis

Osteoporosis is a global problem. Current estimates for the total number of sufferers set the figure at 75 million for Europe, the United States and Japan. This figure is projected to double within 50 years. It is also estimated that around 225 million people in Europe, the United States and Japan have low bone mass – termed 'osteopenia'. Due to demographic changes, the greatest increase in the number of people with osteoporosis will be in Asia and Latin America. It is projected that about 50% of all osteoporotic hip fractures will occur in Asia by the year 2050.

Are you at risk?

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If you are worried that you may be at risk, take a minute to fill in the questionnaire below.

If you answer 'yes' to more than one question it does not mean that you have osteoporosis, but it does indicate that you may be at risk and should talk to a physician. Your doctor will be able to advise whether you should take a bone density test – a simple, non-invasive procedure that takes about 15 minutes.

The IOF one-minute osteoporosis risk test

1. Have either of your parents been diagnosed with osteoporosis or broken a hip after a minor bump or fall?

Yes No

2. Have you broken a bone after a minor bump or fall?

Yes No

3. Have you taken corticosteroid tablets (e.g. cortisone, prednisone) for longer than 3 months?

Yes No

4. Have you lost more than 3 cm (just over 1 inch) in height?

Yes No

5. Do you regularly drink alcohol in excess of safe limits?

Yes No

6. Do you smoke more than 20 cigarettes a day?

Yes No

7. Do you suffer from diarrhea (caused by celiac disease or Crohn's disease)?

Yes No

For women

8. Did you go through menopause before the age of 45?

Yes No

9. Have your periods stopped for 12 months or more (other than because of pregnancy or menopause)?

Yes No

For men

10. Have you ever suffered from impotence, lack of libido or other symptoms related to low testosterone levels?

Yes No

The importance of early diagnosis

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Men and women over 60 years are at higher risk of osteoporosis than younger people. Nevertheless, it is possible to have osteopenia (low bone mass) or osteoporosis at a much earlier age. As osteoporosis has no obvious symptoms other than a fracture when the bone is already significantly weakened, it is important to go to the doctor if any of the risk factors apply to you.

The doctor will take a thorough medical history that includes information on any recent fractures and may determine that the next step is to have a bone mineral density (BMD) test.

A number of different types of BMD tests are available, but the most accurate is DXA (dual energy X-ray absorptiometry). DXA is a low radiation X-ray capable of detecting quite low percentages of bone loss. It is used to measure spine and hip bone density.



Bone mineral density testing is a simple and non-invasive procedure.



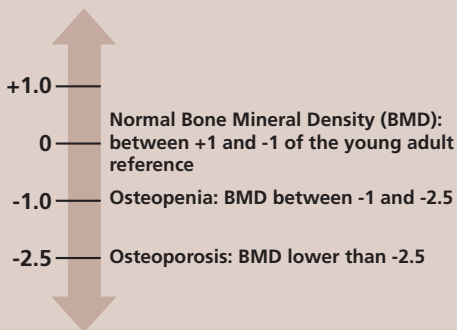
The World Health Organization has defined a number of threshold values for osteoporosis. The reference measurement is defined as healthy bone density in a young female of around 25 years.

Osteoporosis is diagnosed when a person's BMD is more than 2.5 times below this reference measurement. Osteopenia – decreased bone mass, but not as severe as osteoporosis – is diagnosed when the measurement lies between 1 and 2.5 times below the young adult reference measurement.

If the results of your BMD test show osteopenia or osteoporosis it does not automatically mean that you will have a fracture. There are a number of therapies available that your doctor might prescribe that slow down the rate at which bone loss occurs and help prevent

fractures. In addition, there are important nutritional and lifestyle changes that you can make to help reduce your risk of fracture.

Threshold values for osteoporosis



Making lifestyle changes

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Once osteoporosis or osteopenia has been diagnosed, it might not be possible to completely halt the process of bone loss, but it is possible to slow it down significantly and remove or reduce certain factors that contribute to its rapid progress.

Exercise is not just important to general health, it helps build bone mass in youth and slows down bone loss in adults. Exercise also strengthens muscles, increases flexibility, and improves coordination and balance. These factors are significant in helping to reduce the risk of falls.

Weight-bearing exercise in particular is good for bone health. This type of exercise includes walking, jogging, tennis and similar sports, aerobics and dancing. In terms of bone health, you will benefit more from “high-impact” activities like aerobics and jogging but they may not be suitable for you if you have any other medical conditions or problems with your joints, or if you have already had a fracture. **Resistance training**, also known as weight or strength training, is also good for muscles and helps maintain bone mass. Speak to your doctor to find out which sort of exercise is best for you according to your age and health condition.





Recommended daily calcium allowance

	Calcium (mg/day)
Infants and children:	
0-6 months	300-400
7-12 months	400
1-3 years	500
4-6 years	600
7-9 years	700
Adolescents:	
10 to 18 years	1300*
Women:	
19–menopause	1000
Postmenopause	1300
During pregnancy (last trimester)	1200
Lactation	1000
Men:	
19-65	1000
65 +	1300

* particularly during the growth spurt

Figures based on Western European, American and Canadian data. Source: FAO/WHO: Human Vitamin and Mineral Requirements, 2002

Both **calcium** and vitamin D are essential to maintain healthy bones. As we grow older we absorb calcium from food less efficiently. This means that over time we need higher amounts of calcium (see tables).

Calcium rich foods include dairy foods such as milk, cheese and yogurt; certain greens (e.g. broccoli, curly kale, bok choy); whole canned fish with bones, such as sardines or pilchards; nuts (almonds and brazil nuts in particular) and tofu set with calcium. In addition, calcium-fortified foods – most commonly orange juices and breakfast cereals – are increasingly available.

Approximate calcium levels in foods

Food	Serving size	Calcium (mg)
Milk, semi-skimmed	236 ml / 8 fl oz	272
Yoghurt (low-fat, plain)	150 gm / 5 oz	243
Cheese, hard	28 gm / 1 oz	205
Cheese, cottage	112 gm / 4 oz	142
Cheese, mozzarella	28 gm / 1 oz	101
Ice cream, dairy, vanilla	112 gm / 4 oz	112
Broccoli, cooked	112 gm / 4 oz	45
Curly kale, cooked	112 gm / 4 oz	168
Sardines, canned in oil, drained, whole	100 gm / 4 sardines	500
Pilchards, canned in tomato sauce, whole	110 gm / 2 pilchards	275
Almonds	26 gm / 12 almonds	62
Tofu, steamed	100 gm / 3.5 oz	510

Reference: Food Standards Agency (2002) McCance and Widdowson's The Composition of Foods, Sixth summary edition. Cambridge: Royal Society of Chemistry.



Adequate intake of **vitamin D**, which helps calcium absorption, is also essential. For the majority of people around the world, the amount of vitamin D synthesized in the skin through regular daily exposure to sunlight is sufficient. However dietary sources of vitamin D become relatively more important for people living in high latitude countries, in winter, for elderly people and those living in care homes and for people who rarely go outdoors. Recommended daily vitamin D intake ranges from 5 to 15 micrograms per day, with higher amounts recommended for elderly people. Good dietary sources of vitamin D include oily fish such as salmon and mackerel, fortified dairy foods or margarine, fortified breakfast cereals and egg yolks.

In order to maintain muscle function and bone mass, sufficient **protein** should also form part of a healthy diet. Good sources of protein include white meat, fish, milk, beans and tofu.

A number of other factors will also make a difference to your bone health:

Stop smoking – smokers lose bone density more rapidly than non-smokers;

Drink alcohol in moderation – excess alcohol is a risk factor for osteoporosis;

Ensure healthy body weight – excessive weight loss should be avoided.

Take an additional measure to reduce the risk of fractures by **fall-proofing your home**. Reduce clutter at floor level, wear well-fitting shoes or slippers and make sure surfaces are slip-proof: rugs should have a skid-proof backing. Have grab rails installed in the bathroom and toilet and make sure that lighting is bright enough. It is also a good idea to have regular eye check-ups – your vision is crucial in judging distances and detail.

Treating osteoporosis

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In addition to recommending lifestyle changes, doctors may prescribe **drug therapy** if osteoporosis is diagnosed. Today there are a number of effective treatment options available that have been shown to act quickly (within one year), to maintain bone density and to reduce the risk of having fractures. It is important that the choice of treatment be tailored to a patient's specific medical needs and lifestyle.

Common treatments that are currently available (although not in all countries) are: bisphosphonates (alendronate, ibandronate, risedronate), calcitonin, raloxifene, strontium ranelate, teriparatide and tibolone. Hormone replacement therapy (HRT), although not specifically for the treatment of osteoporosis, has also been shown to have a beneficial effect on bone.

Calcium and vitamin D supplements are also usually prescribed, to ensure adequate intake, and to ensure maximum effectiveness of the drug therapy. Sufficient calcium, vitamin D and protein intake not only helps to prevent osteoporosis, it is also important in helping to maintain bone density and muscle function in patients

diagnosed with osteoporosis. Calcium and vitamin D supplements are especially important for individuals at high risk of fracture.

Nutrition and lifestyle factors as well as exercise play an important role in osteoporosis prevention and management. By improving balance, muscle strength and agility, **individually tailored exercise programs** can also help to prevent falls. Special exercise programs, under professional supervision, can help with rehabilitation and pain relief after a fracture.

Other major aspects of treatment are **psychological and emotional support**, which can be provided by health professionals and osteoporosis patient support groups. Such support can be of great help in lessening the feelings of isolation and depression experienced by many patients with severe osteoporosis. **Practical help** such as advice on how to reduce the risk of falling, assistive devices such as walkers and hip protectors, and techniques for 'safe movement' in everyday activities such as walking, reaching/lifting, housework and gardening, is also very important.

What you can do

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Despite the fact that osteoporosis is widespread and also on the increase, few people are aware of the risk factors involved, how the disease progresses and what can be done to slow its progress. Greater awareness and preventive measures could lower the human, social and economic costs of the disease. There are osteoporosis societies in most countries and you can help spread knowledge of the disease by joining your local society and supporting it actively.

- Join an osteoporosis society;
- Donate your skills or funds;
- Lobby for change in health care policy to ensure that diagnosis and treatment are available to all – before the first fracture.

If you suspect you are at risk

- Take the IOF One-Minute Risk Test
- Talk to your doctor about having a bone mineral density measurement
- If you have osteoporosis, find out from your doctor which is the best treatment for you.

The International Osteoporosis Foundation (IOF) is an independent non-profit, non-governmental organization dedicated to the worldwide fight against osteoporosis.



Carmen Sanchez, osteoporosis patient from Spain

“An accurate diagnosis, which is relatively simple, can save people from pain, fractures and emotional damage.”

Visit the IOF website for further information, references and contact details for national osteoporosis societies worldwide: **www.iofbonehealth.org**

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