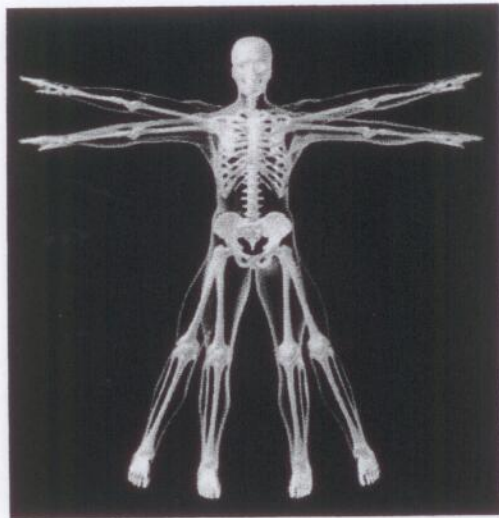


Osteoporosis



Osteoporosis

What is Osteoporosis?

Osteoporosis is a disease characterized by low bone mass and deterioration of bone tissue. This leads to increased bone fragility and risk of fracture (broken bones), particularly of the hip, spine and wrist. Osteoporosis is often known as "the silent thief" because bone loss occurs without symptoms. Osteoporosis is sometimes confused with osteoarthritis, because the names are similar. Osteoporosis is a bone disease; osteoarthritis is a disease of the joints and surrounding tissue.

Prevalence

1.4 million Canadians suffer from osteoporosis.

One in four women over the age of 50 has osteoporosis. At least one in eight men over 50 also has the disease. However, the disease can strike at any age.

Costs

Financial

The cost of treating osteoporosis and the fractures it causes is estimated to be \$1.3 billion each year in Canada alone. Long term, hospital and chronic care account for the majority of these costs. Given the increasing proportion of older people in the population, these costs will likely rise.

Human

The reduced quality of life for those with osteoporosis is enormous. Osteoporosis can result in disfigurement, lowered self-esteem, reduction or loss of mobility, and decreased independence.

The statistics related to hip fractures are particularly disturbing. There were approximately 25,000 hip fractures in Canada in 1993. Seventy percent of hip fractures are osteoporosis-related. Hip fractures result in death in up to 20 percent of cases, and disability in 50 percent of those who survive.

Diagnosis

:: How Strong Are Your Bones? ::

Assessing your risk and testing for bone loss are the keys to diagnosing osteoporosis.

Osteoporosis is a potentially crippling disease characterized by low bone mass (density) and deterioration of bone tissue. The condition leads to increased bone fragility and risk of fracture – most often at the spine, wrist or hip.

Osteoporosis does not develop overnight. You can lose bone mass steadily for many years without experiencing any symptoms or signs of the disease until a bone fractures. For this reason, osteoporosis is often called "the silent thief" - literally stealing our bone mass without giving us any indication whatsoever. If osteoporosis is first diagnosed at the time a fracture occurs, it is already fairly advanced.

Early detection of bone loss, therefore, is critical in preventing osteoporotic fractures. This section of the website is designed to help you assess your risk of osteoporosis so that you may take preventive action.

Assessing your risk factors: a first step

No single cause for osteoporosis has been identified. However, certain factors seem to play a role in the development of osteoporosis. We call these factors "risk factors" because each factor influences our risk of developing the disease. Several of these factors have been shown to be stronger predictors of bone loss than others and are therefore considered major risk factors. Other conditions that may also lead to bone loss are considered minor risk factors. OSTEOPOROSIS CANADA recommends that all postmenopausal women and men over 50, and all individuals over the age of 65 be assessed for the presence of risk factors for osteoporosis.

Major risk factors

- Age 65 or older
- Vertebral compression fracture
- Fracture with minimal trauma after age 40
- Family history of osteoporotic fracture (especially if your mother had a hip fracture)
- Long-term (more than 3 months continuously) use of glucocorticoid therapy such as prednisone
- Medical conditions (such as celiac disease, Crohn's disease) that inhibit absorption of nutrients
- Primary hyperparathyroidism
- Tendency to fall
- Osteopenia apparent on x-ray
- Hypogonadism (low testosterone in men, loss of menstrual periods in younger women)
- Early menopause (before age 45)

Minor risk factors

- Rheumatoid arthritis
- Hyperthyroidism
- Prolonged use of anticonvulsants
- Prolonged heparin use
- Body weight less than 57 kg (125 lbs.)
- If your present weight is more than 10% below your weight at age 25
- Low calcium intake
- Excess caffeine (consistently more than 4 cups a day of coffee, cola or some energy drinks)
- Excess alcohol (consistently more than 2 drinks a day)
- Smoker

Because the main health implication of osteoporosis is the increased possibility of fracture, **OSTEOPOROSIS CANADA** recommends that you also consider your risk factors for fracture.

Key risk factors for fracture

- Low bone mineral density (BMD)
- Prior fragility (low-trauma) fracture
- Long-term (more than 3 months continuously) use of glucocorticoid therapy such as prednisone
- Age – the risk of fracture increases with age
- Family history of osteoporotic fracture

Risk factors are additive, meaning that the more risk factors you have, the greater your risk of developing osteoporosis. If you are over 50 and have at least one of the major risk factors or two or more of the minor risk factors, OSTEOPOROSIS CANADA recommends that you talk to your physician about being tested for osteoporosis.

Furthermore, assessing your risk factors can help you identify those that you can change. Some of these factors are a result of heredity; others are lifestyle factors. By making changes in your lifestyle, you are doing something to improve your bone health and lower your risk of developing osteoporosis.

Testing for osteoporosis: a second step

A risk factor assessment is an important first step in alerting you to your risk for osteoporosis. However, it is not a scientific way to predict whether your bones will become porous. Many people who develop osteoporosis have few of the risk factors – a fact we are trying to understand through research into the causes of osteoporosis.

This is why medical testing is so important. The tests are known as Bone Mineral Density (BMD) tests and the technology that they use is known as bone densitometry. These tests are safe, painless and accurately measure the density of your bones. A BMD test can tell you whether or not you have osteoporosis and how likely you are to develop it in the future, and can help you to make decisions that may prevent fractures or further bone loss.

About BMD testing

Who should have a BMD test?

Bone densitometers (the machines that perform the test) are available on a limited basis across Canada, and thus, individuals who are suspected to be at high risk are generally given priority for this testing. Like any other diagnostic test, you must be referred to a diagnostic facility by a physician. OSTEOPOROSIS CANADA recommends that individuals who, in consultation with their physicians, discover that they are at high risk of developing osteoporosis have this test in order to plan a proper healthcare strategy.

Specifically, there are several situations where a bone density test is recommended:

- You are 65 or older.
- You and your physician have done a risk factor assessment and have determined that you are a high-risk individual.
- You have lost four or more cm in height overall or two or more cm in one year. You have kyphosis (excessive backward curvature of the spine resulting in either a hump or a more gradually rounded back).
- You are taking glucocorticoid medication, and want to determine if you are losing bone mass and whether treatment for osteoporosis is required.
- You have recently had a fracture in which osteoporosis is suspected and you want to make decisions about further diagnosis and treatment options.
- You already have osteoporosis and you and your physician are monitoring the effectiveness of the treatment.

If you and your doctor agree that your bones need to be monitored, make sure you are re-tested on the same BMD machine whenever possible.

What exactly happens during a bone densitometry test?

The most common bone density test in use today is called dual energy x-ray absorptiometry (DXA). This test involves lying on a table for several minutes while a small x-ray detector scans your spine, one hip, or both. You may be asked to lift your legs onto a support to straighten your back for the test. The test is safe and painless and does not require any injections or any other discomfort. You receive a very small amount of radiation from a DXA test, approximately the same amount you are exposed to if you fly from Toronto to Vancouver.

How does a bone densitometer measure bone density?

Think of the light shining through the curtains of your home on a sunny day. The amount of light that reaches your eye depends on the thickness of the curtains. If your curtains are very thick, very little sunlight passes through them. If, however, you replace them with a thinner fabric, the light coming through to you will increase substantially. Similarly, a bone densitometer uses a detector to measure the transmission of small amounts of x-rays (light) through your bones. The amount of light that passes through the bone is measured, thus providing a radiologist with a picture that indicates how dense (thick or thin) your bones are.

Drug Treatments

Their role in the prevention and treatment of osteoporosis

For individuals with osteoporosis, there is now a variety of drug treatments available. The primary aim of drug treatments is to reduce fractures. Several of these drugs are also used to prevent osteoporosis in individuals who are at high risk of developing the disease. The primary aim of medications used as preventive measures is to prevent further loss of bone density.

How our bones work

Bone is a living tissue that is constantly renewed through a process in which old bone is removed and replaced by new bone. Cells called osteoclasts erode the bone, creating small cavities; bone-forming cells called osteoblasts then fill in the cavities with new bone. This is nature's way of restoring bones and keeping them healthy.

In younger people with healthy bones, the osteoclasts and osteoblasts work together, maintaining healthy bones. However, after our mid-30s the process is not as efficient, and we begin to gradually lose bone. In someone with osteoporosis, bone loss occurs more rapidly, causing the bones to become thinner and weaker over time. If you have osteoporosis, you have already lost a significant amount of bone and may continue to do so unless you receive medication.

Finding the medication that's right for you

You and your physician need to review the drug treatment options, assessing the risks and benefits each offers and choosing the best treatment for you, based on current scientific evidence. You may also need to explore several treatment options, because each person is different. Some people respond better to one drug than another. Some people have side effects on one and not another. (Any side effects should be reported to your doctor immediately.)

Cost may also be a factor. Provincial drug plans may cover certain drugs only for certain patients. Remember, treatment plans can be changed. The important thing is to find a drug treatment that works for you.

Using therapies in combination

Drug therapies are sometimes combined (e.g. HRT and a bisphosphonate) to increase the benefit to bones, particularly if an individual continues to lose bone density or suffers fractures while on medication or receives steroids for three months or more. Because the different drugs work in bones differently, combining them can be beneficial in these rare cases. However, combinations of osteoporosis drugs have not been shown to reduce fracture risk any more than individual treatments, and two therapies always cost more than one.

How long should I stay on my medication?

Your doctor may monitor how well your drug treatment is working by giving you a bone density test. Usually you will have a test every two to three years. If you have been prescribed osteoporosis drug therapy because you are using steroids, you will usually have a follow-up bone density test in one year.

Calcium and vitamin D

No matter what drug therapy you choose, remember that a diet rich in calcium and vitamin D is required to maintain healthy bones.

You are not alone.

This section of the website is intended for those who have just learned that they have osteoporosis and those who may still have questions about how to manage this disease. It contains the collective wisdom of many individuals who have adjusted to their diagnosis and now live full and active lives.

Diagnosis has a significant impact.

Most individuals feel anxious when first diagnosed with osteoporosis. Their concerns are usually related to fear of breaking bones (or fracturing a second time if a broken bone was part of the initial diagnosis).

This fear reaction often includes negative thoughts. What if I keep losing height? I can't go outside; I might fall. I can't participate in many of my favourite recreational activities! I can't even do many of the routine chores around the house without asking for help.

If you allow yourself to dwell on the negative, such thoughts can lead to feelings of loneliness, depression and helplessness. Fear of loss of independence because of physical limitations contributes to depression. It is important to think about what you can do. Remember that many people with osteoporosis adjust and live full, active lives.

With the help of drug therapy and appropriate lifestyle changes, individuals are able to reduce their risk of fracture and, in some cases, improve bone mass. That is food for positive thought!

Calcium: An essential element for life

Calcium is crucial to maintain life. Just about every cell in the body, including those in the heart, nerves and muscles, relies on calcium to function properly. Bones require calcium to maintain their strength.

In the body, calcium is found in three places:

- in the skeleton and teeth
- in the cells
- in the blood.

Because calcium is so important, the body has a carefully regulated system to ensure that a good supply is always - and immediately - available. The body does this in three ways:

- It absorbs calcium directly from the food we eat.
- It takes calcium from our bones if there is not enough available. When this happens, the bones become less dense and more fragile.
- It slows down the amount of calcium that leaves the body in the urine by returning some to the blood stream where it remains available to organs and cells.

The main goal of good calcium nutrition is to maintain an adequate supply so that our bodies do not have to dip into our only calcium reservoir - our bones.

The role of calcium in building stronger bones

In childhood, calcium is necessary to grow a healthy skeleton to support a growing body. By age 20 in men and age 16 in women, bones typically stop growing in length and we are almost at our peak bone mass. The density of our bones at this point depends a lot upon our calcium intake as children and teenagers. The greater this peak bone mass, the less likely our bones are to become porous and fragile later in life.

Bone is living tissue, constantly renewing itself. Although bone is strong and relatively flexible, everyday wear and tear causes tiny structural defects, much like those that occur in the foundations of a building over time. In our bodies,

Listen to your body

Pain usually means something is wrong. It may be only a minor muscle or tendon strain but ignoring this early warning sign may cause more serious injury. Listen to your body. Consult a physiotherapist to address the cause of the pain and to help you keep active safely.

Precautions

If you have osteoporosis, consult a physiotherapist or occupational therapist to teach you how to perform your everyday activities. In general, be careful of performing activities that require twisting or bouncing or jerky movements. Avoid exercises or activities that require forward or side bending of the spine from any position (sitting, standing or lying) as this puts a lot of stress on the spine. When exercising, always hold weights close to your body.

Be **back smart**. Don't store heavy objects on very high or low shelves. When exercising or performing everyday activities, think before you lift and always practice good lifting technique:

- Bend your hips and knees, not your back.
- Keep your tummy muscles pulled in tight.
- Keep the load close to your body.
- Move your feet, don't twist your back.

Get help from experts

Your health status and age will determine whether you need to seek the advice of experts when beginning an exercise program. For those who are beginning physical activity, seeking advice from a physiotherapist or fitness instructor can be useful. If you are planning to attend an exercise class, make sure you ask whether the instructor has training in leading exercise for people with osteoporosis, and knows what is safe. For people who have recently fractured, a physiotherapist can help by developing and supervising a rehabilitation exercise plan.

Physical activity for people with physical challenges

Individuals with physical challenges may find themselves limited in the type of activity that they can do. However, physical activity is a vital part of a healthy lifestyle for people with activity limitations, not only to promote healthy bones but also to reduce the number of secondary conditions that can result from a disability. By adapting activities, changing one's environment or using assistive devices and equipment that allows for greater participation, everyone can lead an active life. A physiotherapist or occupational therapist can suggest suitable activities.

Enjoy

Get pleasure from your chosen activity. If you don't like it, you won't do it... so find an activity that suits you and have fun! ¹

¹ "Osteoporosis." Osteoporosis Canada. <http://www.osteoporosis.ca>. Copied directly.

there are two groups of specialized cells that perform the work of a "maintenance crew." Osteoclasts excavate any areas of crumbling or weakened bone and then osteoblasts fill in the crevices with material that calcifies to form new bone. This two-part process is called bone remodeling, and is completed every three to four months in a healthy young adult.

As we age, the two groups of cells that form the maintenance crew become less efficient in working together - the osteoclasts remove old bone faster than the osteoblasts are able to rebuild it. In addition, calcium, like many nutrients, is absorbed less effectively as we age. In people who have relatively healthy bones, adequate calcium intake can help the remodeling process stay balanced. Studies of older adults show that adequate calcium intake can slow bone loss and lower the risk of fracture.

Physical Activity

Physical activity is an important factor in the risk reduction and treatment of osteoporosis. Physical activity assists in building and maintaining healthy bones, improving muscle strength, posture, balance and coordination, and reducing the risk of falls and broken bones (fractures). Physical activity also contributes to a sense of well-being and an overall improvement in quality of life.

How Bone is Formed

Bone is living tissue. It is constantly renewed through a process in which old bone is removed and replaced by new bone.

When we are children and teenagers, we build the bone that lasts us through our lifetime. After our mid 30s, the cells that build bone are not as efficient, and we begin to gradually lose bone. Significant bone loss can lead to osteoporosis, a condition that causes bones to become thin and brittle. The result can be fractures, most often of the hip, spine and wrist. At menopause, a woman's estrogen level falls dramatically, and she usually loses bone more quickly. That's why women are especially at risk of osteoporosis.

Physical Activity and Bone

For healthy bones we need to achieve an ample peak bone mass when we are young, and maintain it as we age. Physical activity, combined with adequate calcium and Vitamin D, plays an important role in this process.

Physical activity places an increased "load" or force on our bones. Our bones respond by forming new bone and remodelling the bone to be stronger. Key bones, like the bones in our legs, back and wrist, need to be stimulated by physical activity -- so we need to be active in different ways in order to "load" or stimulate these bones and maintain their structural competence and strength.

Physical activity doesn't only affect bone mass. It improves our balance and coordination which, in turn, reduces our risk of falling -- falls that can result in fractures. In addition, improved strength, flexibility and posture can reduce pain and enable people with osteoporosis to do daily tasks more easily.

General Guidelines for Physical Activity

Frequency

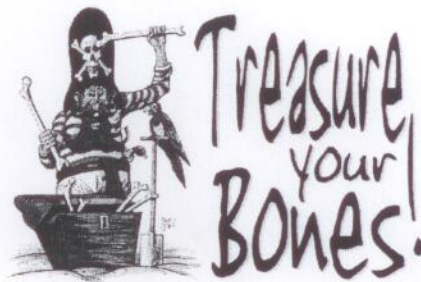
If your activities are of a relatively moderate intensity, such as walking, you will probably be able to exercise daily. However, if this is too tiring initially, try the activity every other day. If you are doing more intense activities (such as weight training) an every other day routine is more appropriate to give your muscles and joints sufficient time to recover. Progression of exercises and activities is important. Start with what you can do and then increase in frequency. Always include periods of rest and recovery.

Time

The amount of time that you exercise each day depends upon the intensity and the type of activity. In general, try to do your activity for 30 - 60 minutes each day. You can break your weight-bearing and resistance exercise sessions into as little as 5 - 10 minute segments and still derive benefit from the activity. Incorporate physical activity into your daily life: Walk to the store, take the stairs more often, etc.

Osteoporosis Quiz:

- Osteoporosis is often known as what?
 - "The Silent Thief"
 - "The Loud Killer"
 - "The Lofty Blacksmith"
 - "The Swarthy Knight"
- How many hip fracture cases, in Canada, in 1993, were 70% related to Osteoporosis?
 - 70%
 - 25 000
 - 10 000
 - 700
- Which of the following is NOT a MAJOR risk factor?
 - age 65 or older
 - family history of Osteoporosis
 - tendency to fall
 - smoking
- What does BMD stand for?
 - Bone Mass Deliverance
 - Bone Mass Density
 - Bone Mineral Density
 - Brass Mill Diggy
- Where in the body is calcium NOT found?
 - cartilage
 - skeleton and teeth
 - the cells
 - the blood
- Osteoclasts excavate any areas of crumbling or weakened bone and then osteoblast's fill in the crevices with material to form new bone. This is called what?
 - bone remodeling
 - bone retainment
 - bone filling
 - Osteoporosis
- Bone is..
 - non-living
 - living
 - dead tissue
 - animal tissue



Osteoporosis Quiz Answers:

1. A

2. B

3. D - smoking is a minor factor

4. C

5. A

6. A

7. B

