MUSCULOSKELETAL AUSTRALIA

Osteoporosis

Your questions answered

Q. What is osteoporosis?
A. Osteoporosis is a condition that causes bones to become weak and lose their strength, making them break more easily than healthy bones.

Osteoporosis is more common in women, with about 1 in 3 women 75 and over affected, compared with 1 in 10 men.[i]

The good news is there are many things you can do to reduce your risk of developing osteoporosis. And if you have osteoporosis, it can be treated effectively with self-care and medicines.

Q. How do bones work?
A. To understand how osteoporosis affects your bones, it's helpful to know how your bones work.

Although we often think of them as dry and lifeless, bones are living tissue. They're made of the protein collagen and are strengthened with the minerals calcium and phosphate.

Bones are constantly changing throughout life. This is called 'remodelling'. Bone cells called osteoblasts build new bone, while other bone cells (osteoclasts) break down and remove old bone. This process is controlled by hormones such as calcitonin, parathyroid hormone, oestrogen (in women), testosterone (in men), and vitamin D.

Osteoporosis occurs when your body removes more bone than it builds.

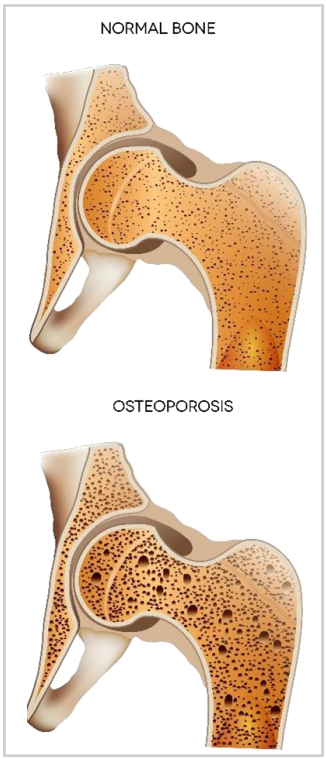
Q. How does bone remodelling change over time?
A. From birth to about 25 years of age, you build more bone than you lose. Your bones are not only getting bigger as you grow, but they're also developing their density. This determines how strong they are.

From about 25 to 50, your bones break down and rebuild at about the same rate. They're in a state of balance. This is when you've achieved your 'peak bone mass'. Your bones are at their strongest.

After about 50 years of age, you break down more bone than you rebuild. While this means everyone will experience some bone loss as they age, it doesn't mean everyone will develop osteoporosis.

Women commonly experience a period of rapid bone loss after menopause. This is due to a drop in oestrogen levels. It's estimated that the average woman loses up to 10% of her bone mass in the first five years after menopause.[ii]

Q. How does osteoporosis change bones?



A. If you could look inside your bones, you'd see that the inside is a honeycomb-like structure.

In normal bone, the spaces in the honeycomb are small and densely packed. This makes bones strong enough to provide your body with structure and to protect your insides while at the same time being light enough for you to move around.

When a person develops osteoporosis, the spaces in this honeycomb structure become larger, and bones aren't as dense. They become weaker and more fragile.

Osteoporotic bones break (or fracture) more easily than healthy bones. Even a minor bump or fall can cause a serious fracture.

Osteoporosis is a silent disease. There are usually no signs or symptoms that you have it until you break a bone.

Q. What causes osteoporosis?

A. Osteoporosis is caused by a loss of bone density. Many things can cause you to lose bone density; some you can change, others you can't.

Risk factors you can't change:

- Family history of osteoporosis
- Being female
- Getting older
- Early menopause (before 45) resulting in reduced levels of oestrogen
- Use of certain medicines, including long-term use of glucocorticoids (e.g. to treat rheumatoid arthritis or asthma), some chemotherapy drugs, epilepsy drugs, and proton pump inhibitors
- Other health conditions, including rheumatoid arthritis, coeliac disease, inflammatory bowel diseases, and diabetes.

Risk factors you can change:

- Low levels of calcium in your diet
- Not getting enough vitamin D
- Being inactive or sedentary
- Excessive alcohol intake
- Smoking
- Being underweight
- Poor nutrition
- Eating disorders.

The International Osteoporosis Foundation has an online risk test you can use to check your risk factors. This isn't a diagnostic tool, but it can help you understand your potential risks so you can discuss them with your doctor.

Q. How can I prevent osteoporosis?

A. Being aware of the risk factors and living a bone-healthy lifestyle is key to reducing your risk of osteoporosis. That includes getting enough calcium, vitamin D, protein, and exercise, avoiding smoking and heavy drinking, and maintaining a healthy weight.

Q. What are the symptoms of osteoporosis?
A. For most people, there are no symptoms that you have osteoporosis. Bones becoming weaker has no visible signs until they become so weak that they break. This can cause pain from a fracture – for example, breaking the wrist or hip after a fall. If the bones in the spine (vertebra) have fractured or collapsed, it can cause back pain, loss of height and a stooped posture.

Q. How do I know if I have osteoporosis?
A. If you're concerned that you may have osteoporosis or may be at risk of developing it, you should see your doctor.

Your doctor will assess your risk factors for developing osteoporosis and look at your medical history – including your family history.

Family history is significant because having a parent or sibling with osteoporosis puts you at greater risk of developing osteoporosis.

After assessing your risk factors, your doctor will decide whether you need a bone scan. This scan will measure the density of your bones. The best scan for assessing your bone density is a dual-energy x-ray absorptiometry – often referred to as a DEXA or DXA scan.

A DEXA scan is short and painless. While you lie on your back on a padded table, a scanning arm passes over your body to take images of your hips, spine, and in some cases, the forearm. It takes about 15-30 minutes. A report is then sent to your doctor.

DEXA test results are reported using T-scores. T-scores show how much your bone density is above or below that of a healthy young adult. Differences between your bone density and that of a young adult are measured in units called standard deviations (SDs).

The World Health Organization has defined osteoporosis as a T-score lower than -2.5 standard deviations below normal, or 25% lower than the average young adult.

You have osteopenia if you have bone density 10% to 25% lower than an average young adult or a T-score between –1.0 and –2.5 standard deviations below normal. Being diagnosed with osteopenia increases your risk of developing osteoporosis, so this is a good opportunity to take action to prevent further bone loss and increase bone density.

A Z-score may also be used when explaining your DEXA scan results. This score compares your bone density to someone the same age and sex as you. A Z-score can also indicate any possible underlying cause of osteoporosis, such as other medical conditions or medicines.

Q. How is it treated?
A. Osteoporosis is treated using various treatments, including calcium, vitamin D, exercise, medicines and self-care.

Calcium
Most of your body's calcium is stored in your bones. That's why we associate calcium with healthy bones and teeth. But your heart, muscles and nerves also need calcium to function properly.

Because your body can't make calcium, you need to get it from the foods you eat each day. If you don't have enough calcium in your diet to keep your body functioning properly, your body will take it from your bones. Over time, this can lead to bones becoming weaker.

For adults, the amount of calcium required daily is between 1000-1300mg, depending on age. Children need between 500-1300mg daily, again, depending on age. Find out more about the recommended dietary intake of calcium.

Calcium is found in many foods, including dairy, oranges, sardines and salmon, almonds, tofu, baked beans, and green leafy vegetables.

Talk with your doctor if you don't think you're getting enough calcium through your diet. You may need to consider taking a supplement. You can also get advice from a dietitian about ways to add more calcium to your diet.

Vitamin D

Vitamin D is produced when your skin is exposed to the sun. It's essential for strong bones because it helps increase calcium absorption, regulates the amount of calcium in your blood, helps strengthen your skeleton, assists with muscle function and reduces your risk of falls.

The main source of vitamin D is sunlight. You should expose your hands, face and arms to the sun daily. The amount of time you need to do this depends on where you live, the time of the year and your skin's complexion. Healthy Bones Australia has developed a chart to help you work this out.

Vitamin D can also be found in small quantities in foods such as fatty fish (salmon, herring, mackerel), liver, eggs and fortified foods such as low-fat milk and margarine. However, it's unlikely that adequate quantities of vitamin D will be obtained through diet alone.

Exercise

Besides having a calcium-rich diet and ensuring you get enough vitamin D, regular exercise is essential for maintaining healthy bones.

The types of exercise that benefit bone health include:

- Weight-bearing: such as brisk walking, climbing stairs, tennis, and netball. Your body is carrying its own weight, and gravity is exerting a force. Bones become stronger because they're coping with the force placed on them.
- High-impact: such as tennis, dancing, jumping or skipping. These exercises place high stresses on the bones of the spine and legs as your feet hit the ground.
- Resistance training: also known as strength training. This involves using machines (e.g. leg press) or free weights (e.g. dumbbells). The strong muscle contractions required to move a heavy weight place stress on the bone where the muscle attaches. When bone feels this strain repeatedly, it responds by becoming stronger.
- Balance training: exercises such as tai chi and yoga improve balance and mobility and reduce your risk of falling. This is essential for preventing fractures.

Before beginning an exercise program, speak with your health professional. Not every type of exercise will be suitable for all people.

If you've been diagnosed with osteoporosis, it's especially important that you discuss any kind of exercise with your health professional before you begin. Some high/moderately high intensity exercises may be unsafe for certain levels of osteoporosis.

Medicines

If you have osteoporosis, your doctor will consider factors such as your age, general health, and fracture risk before deciding on the most appropriate medicine.

Most osteoporosis medicines slow down bone loss by reducing the ability of osteoclasts to remove bone and allowing osteoblasts to continue to build bone.

In Australia, the following medicines may be prescribed for osteoporosis:

- oral bisphosphonates - e.g. alendronate and risedronate - weekly or monthly tablets
- zoledronic acid - once a year infusion given through a needle into the vein
- denosumab - twice a year injection into the fat just under the skin
- teriparatide - daily injection for people with severe osteoporosis.

Other medicines

- Menopausal hormone therapy (MHT) - also known as hormone replacement therapy or HRT - may be an option for some women around menopause. It's a synthetic version of the hormones oestrogen and progesterone. It's most commonly prescribed as a combination of oestrogen and progestogen; however, some women may take oestrogen on its own. MHT is associated with some health risks and is only considered for osteoporosis treatment when all other drug options have been ruled out.
- Selective Oestrogen Receptor Modulators (SERMS)
  SERMS acts on bones in a similar way to oestrogen. Because oestrogen levels drop at menopause, they may be prescribed for postmenopausal women who are at increased risk for osteoporosis or already have it.
- Supplements – calcium and vitamin D are important for bone health. Your doctor may prescribe a supplement if you're not getting enough through diet or exposure to sunlight.

Q. What else can I do to manage my condition?
A. You can do many other things to reduce the impact of osteoporosis.

Learn about your condition. Understanding osteoporosis and how it affects you means you can make informed decisions about your healthcare and actively manage it.

Prevent slips, trips and falls, which can lead to broken bones. Falls are most commonly caused by: poor muscle strength, poor vision, problems with balance, and home hazards that can lead to tripping – e.g. rugs, pets, and extension cords. Talk with your doctor for information and advice about falls prevention.

Quit smoking. As well as the many other health issues related to smoking, it's also linked to reduced bone density.

Consume in moderation (if at all) – alcohol, caffeine and salt, as they can all affect your bone density. Alcohol also increases the risk of falling and the chance of fractures.

Get support – this may be from your family, friends or a peer support group. They can all help you deal with the physical and emotional challenges of living with osteoporosis.

Q. Where can I get more help?

A. Many people and support organisations can help you manage your fibromyalgia. They include:

- your doctor
- physiotherapist
- exercise physiologist
- dietitian
- Musculoskeletal Australia | msk.org.au | National Arthritis and Back Pain+ Help Line: 1800 263 265

Q. How can Musculoskeletal Australia help?

A. Our nurses are available for you to speak with about osteoporosis, pain or any other musculoskeletal issues you have. You can contact them on weekdays between 9am-5pm. Phone 1800 263 265 or email helpline@msk.org.au. We also have a range of services – including free webinars – you can access on our website.

More to explore

- Healthy Bones Australia
- International Osteoporosis Foundation
- Osteoporosis
  American Academy of Orthopaedic Surgeons
- Osteoporosis
  Versus Arthritis
- Osteoporosis Canada
- Patient education: Bone density testing (Beyond the Basics)
  UpToDate
- Patient education: Calcium and vitamin D for bone health (Beyond the Basics)
  UpToDate
- Patient education: Osteoporosis prevention and treatment (Beyond the Basics)
  UpToDate
- Royal Osteoporosis Society

If you found this information useful, help us help others by donating today.

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References

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[ii] Osteoporosis, Australasian Menopause Society
https://www.menopause.org.au/hp/information-sheets/osteoporosis