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## Osteoporosis

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### Summary

- Diet, vitamin D and weight-bearing exercise can help to prevent osteoporosis.
  - If you have osteoporosis, medical treatment can prevent further bone loss and reduce your risk of bone fractures.
  - Treatment options for osteoporosis include dietary changes, exercise, lifestyle changes, falls prevention, supplements and medications.
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Osteoporosis literally means 'bones with holes'. It occurs when bones lose minerals such as calcium more quickly than the body can replace them. They become less dense, lose strength and break more easily.

Most people don't realise they have osteoporosis until a fracture happens, as there are usually no signs or symptoms. This is why osteoporosis is often called the 'silent disease'. Osteoporosis particularly affects women in their middle and later years, although some men are also affected.

If you have osteoporosis, lifestyle changes and medical treatment can prevent further bone loss and reduce your risk of bone fractures.

### Osteoporosis and bone growth

Bone is formed by specialised cells. Like the rest of the body, bone is constantly being broken down and renewed. It is living tissue that needs exercise to gain strength, just like muscle.

In the early years of life, more bone is made than is broken down, resulting in bone growth. By the end of your teens, bone growth has been completed and by about 25 to 30 years of age, peak bone mass is achieved.

Sex hormones, such as oestrogen and testosterone, have a fundamental role in maintaining bone strength in men and women. The fall in oestrogen that occurs during menopause results in accelerated bone loss. During the first five years after menopause, the average woman loses up to 10 per cent of her total body bone mass.

Fractures of the spine caused by osteoporosis can lead to pain, loss of height and changes in posture, such as the 'dowager's hump'. This hump is caused when spinal fractures are compressed due to the force of gravity, resulting in an abnormal bending forward of the spine called kyphosis.

### Symptoms of osteoporosis

Osteoporosis causes no specific pain or symptoms. However, it does increase the risk of serious or debilitating fractures. If you think you may be at risk of developing osteoporosis, see your doctor.

### Diagnosis of osteoporosis

Currently, the most reliable way to diagnose osteoporosis is to measure bone density with a dual-energy absorptiometry scan or DXA. A DXA scan is a short, painless scan that measures the density of your bones, usually at the hip and spine and, in some cases, the forearm.

You can qualify for a Medicare rebate for a DXA scan if you:

- have previously been diagnosed with osteoporosis
  - have had one or more fractures due to osteoporosis
  - are aged 70 years or over
  - have a chronic condition, including rheumatoid arthritis, coeliac disease or liver disease
  - have used corticosteroids for a long time.
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Your doctor will be able to tell you whether you fit the criteria to receive a Medicare rebate. It is possible to have a DXA scan performed if you do not fit the criteria for the Medicare rebate, however, there will usually be an out-of-pocket cost associated with the scan.

### **Risk factors for osteoporosis**

There are many risk factors for osteoporosis, some of which you cannot change, such as being female, and having a direct relative who has had an osteoporotic fracture.

Other risk factors include:

- inadequate amounts of dietary calcium
- low vitamin D levels
- cigarette smoking
- alcohol intake of more than two standard drinks per day
- caffeine intake of more than three cups of coffee or equivalent per day
- lack of **physical activity**
- **early menopause** (before the age of 45)
- loss of menstrual period if it is associated with reduced production of oestrogen, which is vital for healthy bones (the menstrual cycle can cease following excessive dieting and exercise)
- long-term use of medication such as corticosteroids for rheumatoid arthritis, asthma and other conditions.

Some conditions place people at a higher risk of osteoporosis. These conditions include:

- thyroid disease or an overactive thyroid gland
- rheumatoid arthritis
- chronic liver and kidney disease
- conditions that affect the body's ability to absorb nutrients, such as Crohn's disease, coeliac disease and other inflammatory bowel conditions.

### **Prevention of osteoporosis**

From a young age, both men and women can take steps to prevent osteoporosis by making sure that they:

- have a healthy and varied diet with plenty of fresh fruit, vegetables and whole grains
- eat calcium-rich foods
- absorb enough **vitamin D**
- avoid **smoking**
- limit **alcohol** consumption
- limit **caffeine**
- do regular weight-bearing and strength-training activities.

### **Calcium-rich diet and osteoporosis**

Enjoying a healthy, balanced diet with a variety of foods and an adequate intake of calcium is a vital step to building and maintaining strong, healthy bones. If there is not enough calcium in the blood, your body will take calcium from your bones. Making sure you have enough calcium in your diet is an important way to preserve your bone density.

It is recommended that the average Australian adult consumes 1,000 mg of calcium per day. Postmenopausal women and men aged over 70 years are recommended to have 1,300 mg of calcium per day. Children, depending on their age, will need up to 1,300 mg of calcium per day.

Dairy foods have the highest levels of calcium, but there are many other sources of calcium, including sardines, spinach and almonds. If you are unable to get enough calcium from your diet alone, you may need to talk to a health professional about calcium supplements.

## Vitamin D and osteoporosis

Vitamin D and calcium promote bone density. Vitamin D is important because it helps your body absorb the calcium in your diet. We obtain most of our vitamin D from the sun, and there are **recommendations for the amount of safe sun exposure for sufficient vitamin D production**, depending on your skin type, geographical location in Australia and the season.

Vitamin D can also be found in small quantities in foods such as:

- fatty fish (salmon, herring, mackerel)
- liver
- eggs
- fortified foods such as low-fat milks and margarine.

For most people, it is unlikely that adequate quantities of vitamin D will be obtained through diet alone. Talk with your health professional about vitamin D supplements if you are concerned that you are not getting enough vitamin D.

## Exercise to prevent osteoporosis

Weight-bearing exercise encourages bone density and improves balance so falls are reduced. It does not treat established osteoporosis. Consult your doctor **before starting a new exercise program**, especially if you have been sedentary, are over 75 years of age or have a medical condition.

General recommendations include:

- Choose weight-bearing activities such as brisk walking, jogging, tennis, netball or dance. While non-weight-bearing exercises, such as swimming and cycling, are excellent for other health benefits, they do not promote bone growth.
- Include some high-impact exercise into your routine, such as jumping and rope skipping. Consult your health professional – high-impact exercise may not be suitable if you have joint problems, another medical condition or are unfit.
- Strength training (or **resistance training**) is also an important exercise for bone health. It involves resistance being applied to a muscle to develop and maintain muscular strength, muscular endurance and muscle mass. Importantly for osteoporosis prevention and management, strength training can maintain, or even improve, bone mineral density. Be guided by a health or fitness professional (such as an **exercise physiologist**) who can recommend specific exercises and techniques.
- Activities that promote muscle strength, balance and coordination – such as **tai chi, Pilates and gentle yoga** – are also important, as they can help to prevent falls by improving your balance, muscle strength and posture.
- A mixture of weight-bearing and strength-training sessions throughout the week is ideal. Aim for 30 to 40 minutes, four to six times a week. Exercise for bone growth needs to be regular and have variety.

## Lifestyle changes to protect against osteoporosis

Be guided by your doctor, but general recommendations for lifestyle changes may include:

- **stop smoking** – smokers have lower bone density than non-smokers
- get some sun – exposure of some skin to the sun needs to occur on most days of the week to allow enough vitamin D production (but keep in mind the recommendations for sun exposure and skin cancer prevention)
- drink alcohol in moderation, if at all – excessive alcohol consumption increases the risk of osteoporosis. Drink no more than two standard drinks per day and have at least two alcohol-free days per week
- limit caffeinated drinks – excessive caffeine can affect the amount of calcium that our body absorbs. Drink no more than two to three cups per day of cola, tea or coffee.

## Management of osteoporosis

If you have osteoporosis, the strategies listed to prevent osteoporosis will help to manage the condition, but you may also need to consider:

- safer exercise options
- falls prevention
- medication.

### **Safer exercise options with osteoporosis**

If you have osteoporosis, the risk of a fracture (break) with high-intensity exercise and poorly performed strength training can outweigh the bone-building benefits of these exercises. The best approach is to have an exercise program put together specifically for you by a physiotherapist or exercise physiologist.

The program may include:

- modified strength-training exercises
- weight-bearing exercise such as brisk walking
- gentle exercises that focus on posture and balance.

### **Falls prevention and osteoporosis**

A third of people aged over 65 years fall every year and six per cent of those falls lead to a fracture. Reducing the risk of falls is important.

Be guided by your doctor, but general recommendations include:

- Perform exercises to improve your balance as prescribed by a physiotherapist or exercise physiologist.
- If you have prescription glasses, wear them as directed by your optician.
- ‘Trip proof’ your home – for example, remove loose rugs, install handrails in the shower and toilet, and make sure all rooms are well lit. An occupational therapist can help with this.
- Wear sturdy flat-heeled shoes that fit properly.
- Consider wearing a hip protector. This is a shield worn over the hip that is designed to spread the impact of a fall away from the hipbone and into the surrounding fat and muscle. Worn correctly, a hip protector can reduce the risk of hip fracture.

### **Treatment for osteoporosis**

There is no standard treatment for osteoporosis. Your treatment will depend on your specific needs. Generally, your overall risk of fracture will help your doctor to decide on the best course of treatment for you.

### **Osteoporosis medication**

As well as diet and lifestyle changes, your doctor may recommend medication. The options may include:

- **bisphosphonates** – bone cells are created and broken down in a constant cycle. Bisphosphonates encourage bone density by slowing the breakdown process and are commonly used in Australia to treat osteoporosis in men and women. These medications are incorporated into bone and the effects can be long-lasting, but studies suggest that there may be no further benefit for bones after five to seven years of treatment
- **selective oestrogen receptor modulators (SERMs)** – sites in the female body called oestrogen receptors respond to the hormone oestrogen. SERMs mimic the action of oestrogen and therefore reduce bone loss. SERMs have been shown to reduce the risk of spinal fractures
- **denosumab** – this is a twice-yearly injection given under the skin. Denosumab slows the breakdown of bone and is effective when treatment is given twice yearly, but bone density can fall once treatment is stopped
- **testosterone therapy** – men with symptoms of testosterone deficiency and low testosterone levels can improve their bone density with testosterone replacement. Doses of testosterone are given by injections, implants, skin patches, oral capsules, gels or creams to bring the blood levels back up to normal
- **parathyroid hormone (PTH)** – the parathyroid glands make PTH. This chemical regulates the amounts of calcium, phosphorus and magnesium in the bones and blood. Parathyroid hormone therapy stimulates new bone formation and can increase bone density and strength. This medication is a course of 18 months of daily injections used for people with severe osteoporosis when other types of medication are considered either

unsuitable or ineffective

- **menopausal hormone therapy (MHT, previously known as HRT)** – in women, the female sex hormone oestrogen plays an important role in maintaining the strength of bone tissue. Menopause causes a marked drop in oestrogen levels, and increases the risk of osteoporosis and osteoporotic fractures. While MHT boosts oestrogen levels and prevents osteoporosis after menopause, it has also been associated with increased risks of a number of conditions, such as venous thrombosis (blood clots in the veins) and breast cancer. However, MHT is very useful for treating symptoms such as flushes, sweats and sleep disturbance occurring around the time of menopause. Its long-term use is no longer recommended for osteoporosis management, but it is considered a first line treatment for women less than 60 years of age who are at risk of bone density decline and osteoporosis.

It is important to note that all medications have potential side effects. If you are prescribed medication for osteoporosis, discuss the benefits and risks of treatment with your doctor.

### **When to treat osteoporosis**

If you have osteoporosis, it is never too late to seek treatment, as age is one of the main risk factors for osteoporosis and breaks. Treatment can halt bone loss and significantly reduce the risk of fractures.

It is important that your doctor excludes other medical conditions that can cause osteoporosis, including vitamin D deficiency.

### **Where to get help**

- Your **GP (doctor)**
- **Musculoskeletal Australia National Help Line** Tel. **1800 263 265**
- **Osteoporosis Australia** Tel. **(02) 9518 8140** or **1800 242 141** (toll free)
- **Jean Hailes for Women's Health** Tel. **1800 JEAN HAILES (532 642)**
- **Australasian Menopause Society** Tel. **(03) 9428 8738**

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