

Menopause and osteoporosis

Osteoporosis is a condition characterised by weakened bones that fracture easily. After menopause many women are at risk of developing osteoporosis.

Peak bone mass is usually reached in your 20s to 30s when the skeleton has stopped growing and bones are at their strongest.

The female sex hormone oestrogen plays an important role in maintaining bone strength. After menopause oestrogen levels drop and this may result in increased bone loss. The average woman loses up to 10 per cent of her bone mass in the first five years after menopause. Research suggests that about half of all women over the age of 60 years will have at least one fracture due to osteoporosis.

What is osteoporosis?

Bones are constantly changing through life – breaking down (resorption) and being renewed (formation). Osteoporosis is what happens when resorption occurs more quickly than formation, leading to loss of bone strength and density. The bones become fragile and fracture more easily.

Usually there is no sign that osteoporosis is developing until a fracture occurs. Fractures are most common in the spine, hip and wrist and can occur after only a minor fall (a minimal trauma fracture). Osteoporotic fractures of the spine cause loss of height, and gradual development of a rounded and stooped appearance. These fractures may or may not cause pain.

Diagnosing osteoporosis

Osteoporosis is commonly diagnosed using a specialised x-ray technique called DXA (DEXA). DXA test results are presented as a T-score and a Z-score. The T-score compares the bone density of the woman being scanned with that of a young woman (when peak bone mass is at its best). The Z-score compares the bone density of the woman being scanned with that of a woman of the same age as you. Z-scores, not T-scores, are used in premenopausal women.

- A T-score greater than -1 indicates **Normal bone density**.
- A T-score between -1 and -2.5 indicates **Low bone density**, sometimes called osteopaenia. (This means there is some loss of bone mineral density, but not it is not severe enough to be called osteoporosis)
- A T-score of -2.5 or less indicates **Osteoporosis**. When a person has a minimal impact fracture, regardless of the T scores, osteoporosis is also diagnosed

Minimising the risk of osteoporosis

To minimise the risk of osteoporosis, you should:

- Ensure adequate dietary calcium (equivalent to 3-4 serves of dairy food per day)
- Maintain adequate vitamin D levels – approximately 5-15 minutes of sunlight (before 10am and after 2pm) will provide the necessary daily requirement (although this varies depending on the season and where you live). Some people are unable to obtain adequate Vitamin D through sun exposure and Vitamin D supplements may be required.
- Do regular physical activity (Ask your doctor to advise what is appropriate)
- Stop smoking
- Use caffeine in moderation. Drinking tea does not have an adverse effect on bone health.

Physical activity

Exercising regularly throughout life may reduce the risk of osteoporosis. Doing some type of physical activity on most days of the week for 30-40 minutes is recommended. Physical activities that are beneficial in preventing fracture are weight bearing and resistance training exercises.



Weight bearing exercise refers to any exercises performed on your feet. Examples include walking, running, tennis, Tai Chi and dancing. Studies have shown that vigorous exercise (e.g. walking at a fast pace) gives the greatest benefits.

Resistance training exercises are also known as strength training exercises. Strength training uses weights of some kind – for example machines, dumbbells, ankle or wrist weights – to create resistance, which helps build muscle mass and places an extra load (on the involved limb bones). Recent studies have also shown that swimming is helpful, since it requires your body to move against the resistance of the water.

Physical activity improves muscle strength, balance and fitness, which reduces the risk of falls and fractures.

General recommendations for physical activity

- Avoid high impact activities or those that require sudden, forceful movements.
- Do weight bearing exercise such as Tai Chi, dancing and weight training
- Do aerobic activity (anything that increases your heart rate, such as walking, jogging, cycling etc) three times a week
- Undertake strength training twice weekly
- Include flexibility exercises or stretching

Be guided by your healthcare professional when deciding on your exercise program.

Treatments

A number of medical treatments are available for the management of osteoporosis. These include:

- Vitamin D derivatives and calcium supplements
- Bisphosphonates
- Selective oestrogen receptor modulators (SERMs)
- Hormone therapy (HT/HRT)
- Tibolone
- Strontium ranelate
- Teriparatide

Vitamin D and calcium supplements

Vitamin D deficiency is common in Australia and New Zealand. Studies indicate that 30 to 50 per cent of postmenopausal women are deficient in vitamin D. Up to 60 per cent of postmenopausal women are not meeting their required dietary calcium intake. Calcium is the main mineral within the human skeleton and vitamin D is important for helping the calcium get into bone. Five to fifteen minutes of exposure to sunlight every day can also boost vitamin D production and contribute to bone health.

Using combined calcium and vitamin D supplements can give a small reduction in fracture risk.

All research into the effect of specific osteoporosis therapies has used these treatments in combination with calcium and vitamin D supplements. Therefore it is likely that your doctor will prescribe vitamin D along with calcium supplements, if dietary calcium is insufficient. The need for supplementation will be determined by your doctor.

Recently, a study in older women suggested one gram of a calcium supplement may increase the risk of heart disease, however further research is needed. If you are over the age of 70 years or have heart problems, you should discuss the use of calcium with your doctor.

Bisphosphonates

Bisphosphonates are medications that reduce the resorption of bone. They reduce both spinal and hip fractures in women at risk of fracture by about 35%-50%. Possible side effects of treatment include gastrointestinal upset and in particular, gastroesophageal reflux (heartburn), and a rare, but important side effect of osteonecrosis (death of bone) of the jaw.

Bisphosphonates may be taken daily or weekly, but are only available on the Pharmaceutical Benefits Scheme (PBS) with restrictions (either any age with a low impact fracture OR people over 70 years with a T score less than -3.0). In New Zealand, access is not restricted by age but by bone density or a history of previous fractures. The most commonly used bisphosphonates in Australia are alendronate (Fosamax) and risedronate (Actonel). A yearly intravenous form of bisphosphonate will be available in Australia on the PBS from the first of December 2008

Selective oestrogen receptor modulators

The female body contains oestrogen receptors located on many body tissues including bone. These receptors respond to oestrogen. Selective oestrogen receptor modulators (SERMs) are medications that work by blocking the oestrogen effect at some receptor sites, while prompting an oestrogen effect at others. In bone, these medications work like oestrogen and lead to an increase in bone mass (density) and reduce spinal fractures in women with low bone density by about 34%. The main SERM medication in Australia is raloxifene (Evista). Potential side effects of SERMs include hot flushes and a slight increased risk of deep vein thrombosis (DVT), but SERMs do not increase the risk of breast cancer.

Hormone therapy

Hormone therapy (HT/HRT) relieves menopausal symptoms such as vaginal dryness, hot flushes and night sweats. When taken at the beginning of menopause, HRT can also prevent bone loss and should be started soon after menopause for maximum benefit. Some studies have shown that HRT can increase bone density by around five per cent in two years. On average, HRT reduces the risk of spinal and hip fractures by 40% in women not specifically selected for risk of fracture. Bone loss will resume once HRT is stopped. The rate of bone loss is more rapid than normal for the first 4-5 years after stopping HRT. If your bone density is already low before you stop HRT, alternative treatments to preserve bone density will be needed.

The use of hormone therapy for prevention of diseases, such as heart disease or stroke, is not recommended. However, some women may elect to use hormone therapy to protect against osteoporosis—this needs to be done in consultation with the woman's doctor and the woman needs to understand the risks and benefits of this therapy. (Please refer to AMS fact sheet on HRT/Oestrogen only HRT)

HT/HRT should ideally be commenced before the age of 60. After 60, there is a higher risk of cardiovascular disease (stroke and heart attack) and DVT, than if used around the age of menopause.

Tibolone (Livial)

This therapy is a different form of hormone therapy for treating menopausal symptoms. There is evidence that tibolone has beneficial effects on bone and leads to an increased bone density and fracture prevention. It may have the same risks as conventional HT/HRT

Strontium ranelate (Protos)

Strontium is a trace element that is naturally found within soft tissues, blood, teeth and bone. It is not entirely clear how it works but when used as a medication, it leads to decreased bone loss and may enhance bone formation. Studies show the effect of strontium ranelate (a strontium compound) in postmenopausal women is a 35% reduction in spinal, hip and other fractures.



This medication has recently become available in Australia for the treatment of postmenopausal osteoporosis under the PBS. It is available, but not funded, in New Zealand. It appears to be well tolerated, but may be associated with side effects of diarrhoea, nausea and headache. There is also a slight risk of DVT. There is a rare but important side effect of a hypersensitivity rash and abnormal liver function tests.

Teriparatide (Forteo)

Teriparatide (parathyroid hormone) is administered daily via an injection just below the skin. It increases bone formation and absorption of calcium from the gut and kidney. Calcium and vitamin D supplements may be necessary with this medication and must be monitored under the care of a specialist doctor. It reduces fractures in postmenopausal women.

This therapy became available in Australia in November 2008 and is not currently listed for use by the PBS. Treatment is limited to one 18 month course per lifetime. Due to the expense and limited access of this therapy, it is not readily available to all Australians. Its prescription for use is confined to specialists in osteoporosis.

Prevention of falls

Prevention of falls can assist in decreasing the risk of an osteoporotic fracture, particularly of the hip and wrist. Factors to consider include:

- Exercise and balance training as described above
- Adequate Vitamin D. Vitamin D deficiency is associated with decreased muscle strength and increased risk of falls.
- Review of medications that may contribute to unsteadiness and increase the risk of falling
- Check your environment- eg fix that loose step or loose rug,

Where can I get more information?

www.jeanhailes.org.au

www.bonehealthforlife.org.au

www.menopause.org.au

www.osteoporosis.org.au – Osteoporosis Australia (02) 9518 8140

www.bones.org.nz

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