

## Menopause and osteoporosis

Menopause can increase a woman's risk of developing osteoporosis, a condition in which bones are weakened and may fracture easily. The drop in oestrogen levels that occurs around the time of menopause results in increased bone loss. It is estimated that the average woman loses up to 10 per cent of her bone mass in the first five years after menopause.

**To reduce your risk of osteoporosis, eat a diet rich in calcium and exercise regularly. These lifestyle habits are best started in childhood to get the most benefits.**

While prevention is best, there are a number of medical treatments available for management of osteoporosis, including bisphosphonates, selective oestrogen receptor modulators (SERMs), hormone replacement therapy (HRT) or tibolone, vitamin D derivatives and calcium supplements, strontium ranelate and denosumab. Potential therapies include parathyroid hormone.

### The link between menopause and bone strength

The female sex hormone oestrogen plays an important role in maintaining bone strength. Oestrogen levels drop during menopause and this results in increased bone loss. Peak bone mass is reached when the skeleton has stopped growing and bones are at their strongest.

If a woman's peak bone mass before menopause is less than ideal, any bone loss that occurs during menopause may result in osteoporosis. Research suggests that about half of all women over the age of 60 years will have at least one fracture due to osteoporosis.

### Diagnosis of osteoporosis

Osteoporosis is best diagnosed using a specialised x-ray technique (DXA). A DXA measures bone density, and is used to assess the severity of bone mineral loss or loss of bone mineral density and presents the result as a 'T-score'. The T-score compares the bone density of the woman with that of a young woman (when peak bone mass is at its best).

The various T-scores used in diagnosis are:

- **Normal bone density** – the T-score measures between 0 and -1.
- **Osteopaenia** – the T-scores are between -1 and -2.5. This means there is some bone density loss, but it's not severe enough to be called osteoporosis.
- **Osteoporosis** – the T-score measures -2.5 or less. This is where the loss of bone density has reached a level where there is a much higher risk of having a fracture with minimal trauma.

### Lifestyle changes during menopause

During menopause a woman can reduce her risk of developing osteoporosis by making a few lifestyle changes:

- Take about 1,200 mg of calcium every day, which equals about three to four serves of dairy food.
- Do regular and appropriate physical activity, including resistance training exercise with weights (always do this type of exercise under supervision).
- Maintain adequate vitamin D levels – approximately five to 15 minutes of sunlight before 11 am and after 3 pm will provide the necessary daily requirement (this varies depending on the season and where you live – you will need longer if you live in Tasmania and it is winter).

- Avoid alcohol excess (current guidelines recommend a maximum of two standard drinks per day with two alcohol-free days per week for women)
- Cease smoking (smoking cigarettes is associated with a higher risk for developing osteoporosis)
- Avoid too much caffeine.

Ideally, a woman will follow these lifestyle habits from childhood to maximise bone mass before menopause.

## Physical activity is crucial

Exercising regularly throughout life can reduce the risk of osteoporosis. Doing some type of physical activity on most days of the week for between 30 and 40 minutes is recommended. Two types of physical activities that are most beneficial to bones are weight-bearing and resistance-training exercises.

In addition to reducing bone loss, physical activity will improve muscle strength, balance and fitness, and also reduce the incidence of falls and fractures.

Always consult with your doctor, physiotherapist or healthcare professional when you start an exercise program.

## Weight-bearing exercise

Weight-bearing exercise refers to any exercises performed on your feet. Examples include walking, running, tennis and dancing. Studies to evaluate the effects of exercises such as walking have not shown a drastic improvement in bone mass unless this activity is performed as a high-intensity activity (for example, walking at a fast pace or jogging).

## Resistance-training exercises

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. This helps build muscle mass and places a load (force) on the involved limb bones. It also includes exercises that use your own body weight as the load, such as push-ups where the load is placed through the arms and shoulders.

To avoid unnecessary injury, only perform these exercises under the supervision of an accredited trainer, exercise physiologist or physiotherapist.

## General recommendations for exercise

Be guided by your healthcare professional when deciding on your exercise program. General recommendations include:

- Avoid high-impact activities or those that require sudden, forceful movements.
- Do weight-bearing exercise such as walking, Tai Chi, dancing and weight training.
- Do aerobic activity two or three times a week.
- Undertake strength training once or twice weekly.
- Include flexibility exercises or stretching in your routine.

## Treatment for osteoporosis

Medical treatments available include:

- Bisphosphonates
- Selective oestrogen receptor modulators (SERMs)
- Hormone replacement therapy (HRT) or tibolone
- Vitamin D and calcium supplements
- Strontium ranelate
- Denosumab
- Potential therapies and parathyroid hormone.

Each type of medical treatment for osteoporosis has benefits and risks associated with it. These need to be fully discussed with your doctor prior to commencing treatment. Some osteoporosis treatments have been associated with extremely rare side effects, which are not discussed in detail here.

Your choice of treatment needs to be made after carefully considering your age, other health issues and your risk factors for fracture.

## **Bisphosphonates**

Bone cells are constantly being broken down and renewed. Bisphosphonates prevent bone loss by hampering the 'breaking down' process and preventing absorption of bone cells. Bisphosphonates may be taken daily, weekly (or yearly, which is by intravenous infusion), but are only available in Australia on the Pharmaceutical Benefits Scheme (PBS) for use to treat established osteoporosis with fracture or in women over 75 years with osteoporosis.

Possible side effects of treatment with bisphosphonates include gastrointestinal upsets.

## **Selective oestrogen receptor modulators**

The female body contains oestrogen receptors, which are located on many body tissues, including bone. These receptors respond to the hormone 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, they work like oestrogen and lead to an increase in bone mass (density), mainly in the spine (less in the hips).

Potential side effects of SERMs include hot flushes and a slightly increased risk of deep vein thrombosis (DVT).

## **Hormone replacement therapy**

Hormone replacement therapy (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. This treatment is sometimes called hormone therapy (HT).

HRT should be considered 'first line' treatment for osteoporosis in young women and those in their 50s for up to five years. 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 fractures by 40 per cent. Bone loss will resume once HRT is stopped.

The use of HRT for preventing diseases, such as heart disease or stroke, is not recommended. However, some women may elect to use hormone therapy – this needs to be done in consultation with your treating doctor and you need to understand the risks and benefits of this therapy.

## **Tibolone**

This therapy is a different form of hormone therapy for treating menopausal symptoms. Tibolone may not have the same stimulatory effects on the breast as standard forms of hormone therapy – studies have shown no increase in breast cancer for up to five years of use. However, tibolone should not be used in women with breast cancer.

There is evidence that tibolone has beneficial effects on bone and leads to an increase in bone mineral density and reduction in fracture and risk.

## **Vitamin D and calcium supplements**

A woman experiencing menopause may be prescribed a vitamin D derivative by a doctor and calcium supplements. These supplements may reduce the incidence of bone fractures by 30 per cent. Five to 15 minutes of sunlight exposure every day can also boost vitamin D production and contribute to bone health. Vitamin D levels are easily checked by a blood test.

## **Strontium ranelate**

Strontium is a trace element that is naturally found within soft tissues, blood, teeth and bone. How it works is unclear, but it seems to reduce bone loss and may enhance bone formation. Studies with this medication in postmenopausal women have shown a reduction in both vertebral (spinal), hip and other fractures.

This medication is available through the PBS in Australia for the treatment of postmenopausal osteoporosis. It is taken in the form of granules in water and should be taken at bedtime at least two hours after eating. It appears to be well tolerated, but may be associated with side effects of diarrhoea.

Like other osteoporosis therapies, you may also require additional vitamin D and calcium supplements if your vitamin D levels are low or dietary calcium intake is insufficient.

### **Denosumab**

Denosumab is a human monoclonal antibody designed to target RANKL, a protein that acts as the primary signal to promote bone removal. This medication is available through the PBS in Australia for the treatment of postmenopausal osteoporosis. It is an injection under the skin that is given twice a year.

Studies with this medication in postmenopausal women have shown a reduction in vertebral, non-vertebral and hip fractures..

It appears to be well tolerated, but may be associated with side effects of infections, rashes and joint pain.

### **Potential therapies – parathyroid hormone**

Parathyroid hormone is administered daily through an injection just below the skin (subcutaneous injection). 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 physician or endocrinologist. Most of the studies with this medication have only been for up to two years.

In Australia, parathyroid hormone treatment is limited to one 18-month course per lifetime, and there are particular restrictions for its use in osteoporosis. This treatment appears to have a clear benefit in reducing all types of fractures in postmenopausal women, except for hip fractures. However, the lack of benefit in preventing hip fracture may have been due to the way the studies were designed. More research is needed in this area.

This therapy became available in Australia in November 2003 and is not currently listed for use through the PBS. 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.

### **Where to get help**

- Your doctor
- Jean Hailes for Women's Health Tel. 1800 JEAN HAILES (532 642)
- Australasian Menopause Society Tel. (07) 4642 1603
- Council on the Ageing Tel. (03) 9654 4443
- Arthritis Victoria incorporating Osteoporosis Victoria Tel. (03) 8531 8000 or 1800 011 041
- Osteoporosis Australia Tel. (02) 9518 8140

### **Things to remember**

- It is estimated that the average woman loses up to 10 per cent of her bone mass in the first five years of menopause.
- Osteoporosis is when bones are weakened, causing them to fracture more easily.
- A woman can reduce her risk of osteoporosis by eating a diet rich in calcium and exercising regularly, starting in childhood.
- Medical treatments are available.

**This page has been produced in consultation with, and approved by:**

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