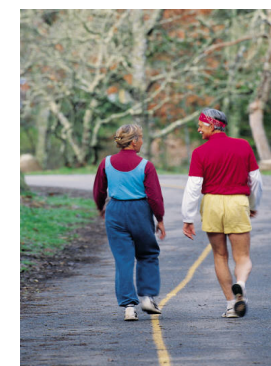




## **Osteoporosis**



This information is also available on request in other formats by phoning 01387 241053.

***Information leaflet***

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- ◆ [www.menopausematters.co.uk](http://www.menopausematters.co.uk)
- ◆ National Osteoporosis Society  
Camerton, Bath. BA2 0PJ  
Tel: 01761 471771 or Helpline 0845 450 0230  
[www.nos.org.uk](http://www.nos.org.uk)

housebound, where appetites may be poor and exposure to sunlight is limited. They may also be of benefit in those who do not like or cannot tolerate dairy products. The recommended intake of calcium for adults is 700mgs daily although more (1000 - 1200mg daily) is recommended for people with osteoporosis. Adequate Vitamin D is necessary for calcium to be absorbed properly.

### **In conclusion: -**

Osteoporosis is a disease which is becoming increasingly common as we now live much longer and have a growing elderly population. It is not however an inevitable consequence of old age or in women, the menopause. Many factors determine our own osteoporosis risk; genetics, how well peak bone mass is achieved in younger years, age of menopause, how active we are and what our diet and lifestyle is like.

It is however preventable and it is never too late to do something to protect our bones. Hopefully this leaflet has provided some useful information and advice in doing so.

### **Introduction**

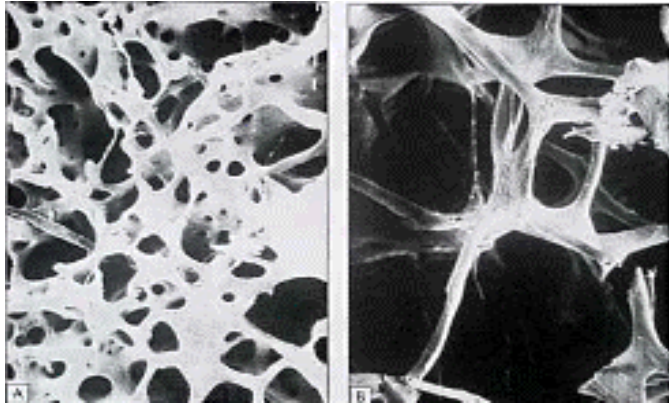
As osteoporosis is an increasingly common health problem with it now being estimated to affect 1 in 2 women and 1 in 5 men, this leaflet is designed to help you understand just what it is, what causes it and what can be done.

Osteoporosis can be a major cause of pain and disability with bones often breaking more easily as a consequence of osteoporosis, but it is preventable and treatable.

As well as explaining the treatments that are currently available for those who have osteoporosis, information will also be given on what can be done in the prevention of osteoporosis.

### **What is osteoporosis?**

Osteoporosis literally means “porous bones”, although is also defined as “a systemic, skeletal disease, characterised by low bone mass and micro-architectural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture”. Bones are made up of a thick outer shell and a strong inner mesh which looks like a honeycomb and consists of protein, calcium and other minerals. The honeycomb structure is made up of struts of bone, and osteoporosis means that these struts become thin and break which in turn makes bones more porous and fragile. When bones become more fragile, they can break more easily even after a simple type of fall, for example, falling from standing height. This is known as a **low trauma fracture** and often it is this type of fracture that is the warning sign that someone may have osteoporosis.



**Normal bone**

**Osteoporotic Bone**

### How is bone formed?

Bone is highly specialised, living tissue, which is constantly changing and being renewed by a process known as bone remodelling, or bone turnover. This process basically involves cells called **osteoclasts** which break down and remove old bone and then cells called **osteoblasts** forming new bone and filling the cavity created by removing the old bone. This bone remodelling process continues throughout life but slows down as we get older. In childhood and adolescence the bone building cells (osteoblasts) work faster than the bone removing cells (osteoclasts) causing bones to increase in density and strength. Bones continue to grow in strength until our mid-late twenties when maximum strength known as **peak bone mass** is reached. Bone density is then maintained up until our mid-late thirties and then starts to decrease as part of the natural ageing process. In women there is increasing bone loss at the time of the menopause.

Zoledronic Acid is also given intravenously as a 15 minute infusion and also takes place in a hospital clinic.

Calcium and Vitamin D supplements are often prescribed along with these drugs to enhance their affect, particularly in those whose dietary intake is poor. It is however advisable to either omit the calcium supplements on the day of taking the bisphosphonate or take, in separate doses(i.e. lunch time and tea time to aid absorption).

### Strontium Ranelate (Protelos)

Strontium Ranelate is the first osteoporosis treatment which has both anti-resorptive and bone forming properties. It is known as a dual action bone agent (DABA), as it slows down the action of cells which remove old bone as well as increasing the formation of new bone. It is available as a 2g sachet of powder, which is dissolved in a glass of water. It is taken daily at bedtime, at least 2 hours after eating. If on calcium supplements, then these should also be taken at least 2 hours before.

### Parathyroid hormone (PTH) available as Teriparatide or Preotact.

PTH stimulates the formation of new bone. It is given in an insulin type pen as a daily injection which you are taught to give yourself and is only prescribed by specialist osteoporosis clinics. It is usually used in post-menopausal women who have been diagnosed as having severe osteoporosis and fractures. Prescription of this drug depends on several factors including the severity of osteoporosis, fracture history and the response to and success of other treatments.

### Calcium & Vitamin D supplements: -

Adequate calcium and vitamin D is essential for strong bones and teeth. The best way of getting enough calcium is in the diet as it is more readily absorbed. However, supplements can be beneficial, particularly in older people, the frail and

These type of drugs have been shown to very effective in the treatment of osteoporosis by increasing bone strength and reducing the risk of fracture.

There are a number of bisphosphonates drugs available: -

- 1) **Etidronate (Didronel PMO)** - is a bisphosphonate drug which is taken in a 3 month cycle with a prescribed calcium supplement.
- 2) **Alendronate (Fosamax)**
- 3) **Risedronate (Actonel)**
- 4) **Ibandronate (Bon viva)**
- 5) **Zoledronic Acid (Aclasta)**

**Alendronate, Risedronate and Ibandronate** all have a similar mode of action.

The bisphosphonate drugs are poorly absorbed from the bowel and can sometimes cause stomach problems such as indigestion, heartburn, or nausea although are generally very well tolerated. To maximise absorption and minimise side effects, they have to be taken first thing in the morning on an empty stomach with a full glass of plain tap water, with nothing else to eat and drink (including any other medications) until at least ½ hour afterwards. It is also advisable to stay upright or wander about in this time and not to lie flat after taking the tablet. Alendronate and Risedronate are available as both daily and weekly preparations but most people now prefer to take the weekly tablet for convenience. Ibandronate is available as a monthly tablet, which some people prefer, or as an intravenous injection. The injection is usually given in a specialist clinic.

### **Osteoporosis in women.**

Osteoporosis is estimated to affect 1 in 2 women over the age of 50. It is more common in women than in men mainly because of the affects of the menopause. The hormone oestrogen is known to maintain bone density and help reduce the risk of fracture, therefore with decreasing oestrogen levels at the time of the menopause bone loss is accelerated. Osteoporosis is also more common in women because they tend to have smaller, less dense bones than men and do not achieve as high a peak bone mass.

### **Osteoporosis in men.**

Although osteoporosis is more common in women, it is still common in men with 1 in 5 being affected. In men it is often secondary to another health problem. Low levels of the male hormone testosterone (hypogonadism) can also cause osteoporosis, although in nearly half of all men who have osteoporosis the actual cause is unknown. This is known as idiopathic osteoporosis.

### **Risk factors: -**

In men and women, there are other factors which can increase the risk of osteoporosis. Our risk of osteoporosis is mainly hereditary with 70-80% of bone strength being genetically determined. A close family history (e.g. parents, grandparents, brothers/sisters) of diagnosed osteoporosis is therefore an important risk factor. A maternal history (mother) of hip fracture can also significantly increase your own risk of hip fracture.

**Other risk factors include: -**

- Breaking a bone after a minor fall (low trauma fracture)
- Early menopause (before 45 years of age)
- Long term or high dose use of steroids
- Family history of diagnosed osteoporosis including maternal history of hip fracture
- Medical conditions which may affect the absorption of food including; ulcerative colitis, crohns disease, coeliac disease, gastric surgery and liver disease.
- Other medical conditions such as hyperthyroidism, hyperparathyroidism (overactive thyroid, parathyroid glands)
- Certain medications e.g. long term anti-epileptic medications, aromatase inhibitor medications which are often used as part of breast cancer treatment.
- Amenorrhoea (absence of menstrual periods) for greater than 6 months for reasons other than pregnancy e.g. as a result of an eating disorder or over-exercising.
- Smoking
- Excessive alcohol intake - more than 14units per week for women and 21 units per week for men. (1 unit = 1 small glass of wine, 1 measure of spirit or ½ pint of beer or lager).
- A diet low in calcium (less than 700mg calcium daily).
- Lack of weight bearing exercise e.g. walking, jogging, dancing, aerobics
- Being underweight

**Hormone replacement therapy (HRT): -**

Hormone replacement therapy is particularly useful for the prevention and treatment of osteoporosis in women who require it for control of menopausal symptoms, and also have other risk factors for osteoporosis, and in those women who have had an early menopause. For those women who have had an early menopause, (before 45), HRT can be taken until the age of 50, which is the average age of menopause, when the risks and benefits of whether to continue should then be discussed. HRT has been shown to maintain bone density and reduce the risk of fracture whilst taken, and is licensed for bone protection. This bone protection wears off once HRT is stopped.

**Raloxifene: -**

Raloxifene is a drug known as a Selective Estrogen Receptor Modulator (SERM). It mimics the action of oestrogen on bone, although is non-hormonal, and selectively binds to oestrogen receptors in the body. By being selective in its action it acts like oestrogen on bones but not so in tissues such as the breast where it has an anti-oestrogen effect. It therefore has a protective effect on bones without increasing the risk of breast cancer which can be associated with the long term use of HRT in women over the age of 50. It is used for the prevention and treatment of osteoporosis in post-menopausal women and has been shown to reduce the risk of fractures of the spine (vertebral fractures). It is most suitable for women not having menopausal symptoms such as flushes as it can cause or worsen these.

**Bisphosphonates: -**

The bisphosphonates are a group of drugs which are non- hormonal. They work by affecting bone resorption which means that they slow down the action of the cells which break down old bone (osteoclasts), allowing the bone building cells to work more effectively in laying down new bone, thereby increasing bone density.

### **Smoking: -**

Smoking is bad for bones! It has a toxic effect and can hasten bone loss by affecting how well the bone building cells work. In women it can also cause an earlier menopause which in turn can increase the risk of osteoporosis and breaking a bone. Try to give up smoking if you can and not only will this be of benefit to your bones but also to your heart, lungs and overall fitness and well being.

### **Alcohol: -**

Alcohol in excessive amounts is also detrimental to bones. The maximum limit for women is 14 units per week and 21 units for men. One unit is the equivalent of a small glass of wine, one measure of spirit or ½ pint of normal strength beer, lager or cider.

“Binge” drinking every so often can be just as harmful to bones as drinking on a regular basis. Alcohol taken in moderation however, is fine.

### **What treatments are available for osteoporosis?**

Not all people with osteoporosis will require treatment. The treatment of osteoporosis depends on a number of factors including age, sex, medical history, and if you have ever broken any bones. Considering these factors helps to decide if treatment is necessary and what the most appropriate treatment is. There are many good treatments available for osteoporosis with advances in research being made all the time offering a wider choice of options. Most of these treatments are aimed at maintaining bone density by slowing down the rate that old bone is removed and thus maximising bone strength.

### **How is osteoporosis diagnosed?**

Currently, the most accurate test available for diagnosing osteoporosis is a Dual Energy X-ray Absorptiometry (DEXA) scan. This is a simple type of x-ray which involves using low doses of radiation to measure bone density. It involves you lying on a firm couch whilst an x-ray arm passes over you and does not involve you going into a “tunnel” and the x-ray arm does not touch you.

It is a painless procedure which takes about 10 minutes and it measures bone density in the lower spine and hips. These measurements give an overall prediction of your bone density and strength. Dexa scans are usually only done in those people at highest risk of osteoporosis and you have to be referred by a doctor.



*Example of a dexa scanner*

## What can be done to help prevent osteoporosis?

Although most of our bone strength is built up in the early years, it is never too late to look after your bones. Although genetics play a big part in determining our risk of osteoporosis, dietary and lifestyle factors also play an important part.

### Diet: -

Not only is having a healthy diet essential for general health and well being but is also very important in building and maintaining healthy bones. Often people ask what kind of diet they should be following and basically a diet which is generally healthy and varied with foods from all the main food groups is all that is required. Calcium is the main nutrient that bones require, so incorporating foods which are rich in calcium is essential. Here are some helpful dietary hints: -

- Aim for around 700mg calcium / daily, which is the equivalent of a pint of semi-skimmed milk. Low fat dairy products have slightly more calcium than full fat varieties. Although dairy products are the easiest and richest sources of calcium other non-dairy foods such as oily fish, green leafy vegetables, bread, cereals, dried fruits, pulses, beans and seeds are also good sources, but greater quantities may need to be eaten to ensure an adequate calcium intake. An adequate Vitamin D intake is also required to ensure calcium is absorbed properly. Good dietary sources of Vitamin D include, oily fish, dairy products, fortified margarine and eggs, but about 90% of our Vitamin D supply comes from the action of sunlight on skin.
- Aim for 5 portions of fruit and vegetables per day to ensure adequate vitamins and minerals.
- Avoid excess caffeine by limiting tea, coffee and fizzy drinks such as cola.

### Exercise: -

Bones need to be used to keep their strength and the best form of exercise for this is what is known as **weight bearing exercise**. Basically this is the type of exercise which involves putting force through your bones and includes activities such as walking, dancing, jogging, running, tennis, skipping, and aerobics. Weight bearing exercise also helps to keep muscles as well as bones strong, which in turn helps to maintain balance and reduces the risk of falls.

Any exercise is better than none, but it is important to choose an activity which suits you, and you find enjoyable. Walking is a good form of exercise but walking at a brisk pace and over a distance has a more beneficial effect. Short bursts of exercise such as going up and down stairs are also beneficial, with simple changes such as walking rather than taking the car and taking the stairs rather than the lift also making a difference. As well as being beneficial to bones, regular exercise is also of benefit to the heart and cardiovascular system, can improve mood and contribute to overall well being.

Other forms of exercise such as swimming and cycling are good forms of exercise for overall health and fitness and can help keep joints flexible. Swimming and hydrotherapy can also be relaxing and can help relieve pain in people with osteoporosis or fractures. These types of exercise are however, not weight bearing exercises and are less beneficial on bone density and strength.