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All about osteoporosis

A guide to bone health, fragile bones and fractures



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What is osteoporosis?



- **Your bones**
- **Consequences of osteoporosis**
- **Less common types of osteoporosis and other related conditions**

Osteoporosis literally means ‘porous bones’. It occurs when the struts which make up the mesh-like structure within bones become thin, causing bones to become fragile and break easily following a minor bump or fall. These broken bones are often referred to as fragility fractures. The terms ‘fractures’ and ‘broken bones’ mean the same thing. Although fractures can occur in different parts of the body, the wrists, hips and spine are most commonly affected.

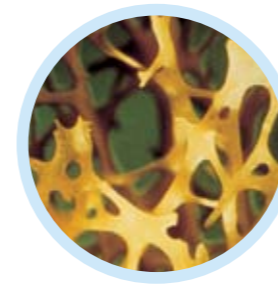
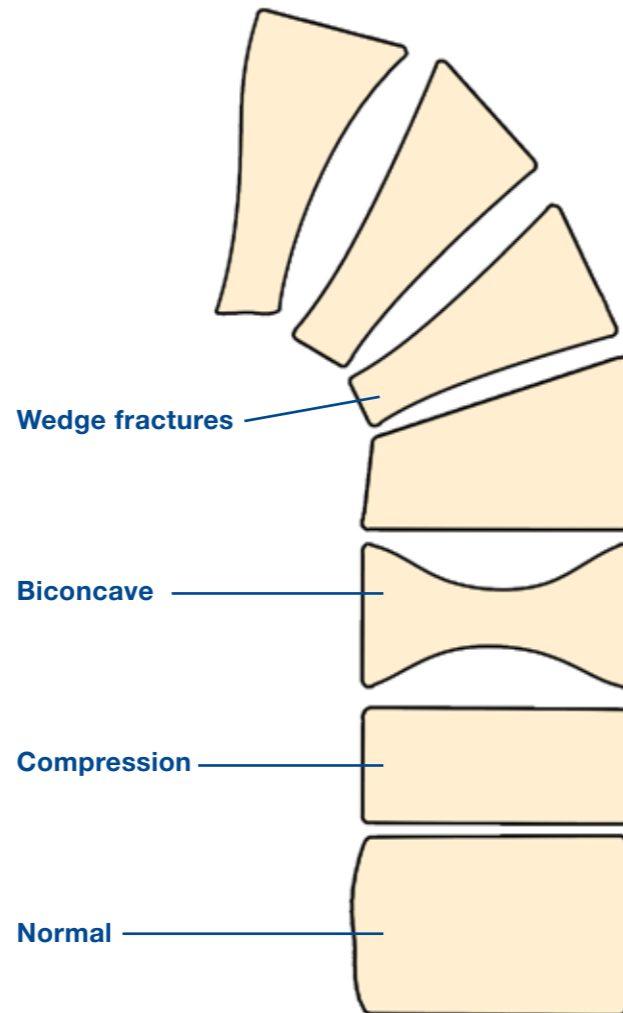
Your bones

Bones contain collagen (protein), calcium salts and other minerals. Each bone is made up of a thick outer shell known as cortical bone and a strong inner mesh of trabecular bone which looks like a honeycomb. Bone is alive and constantly changing throughout life. Old, worn out bone is broken down by cells called osteoclasts and replaced by bone building cells called osteoblasts, a process of renewal called bone turnover. In childhood, osteoblasts work faster, enabling the skeleton to increase in size, density and strength. During this period of rapid bone growth, it takes the skeleton just two years to completely renew itself. In adults this process takes seven to ten years.

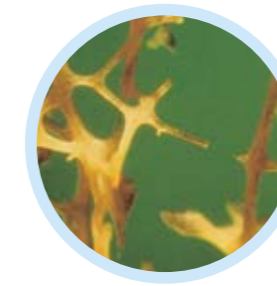
Osteoporosis

Bones stop growing in length between the ages of 16 and 18, but bone density continues to increase slowly until a person’s late 20s. At this point the balance between bone demolition and bone construction becomes stable. After the age of around 35, bone loss increases very gradually as part of the natural ageing process. This can lead to osteoporosis and an increased risk of broken bones, especially in later life. Women are particularly susceptible because bone loss becomes more rapid for several years following the menopause.

Types of vertebral (spinal) fracture



Strong dense bone



Fragile osteoporotic bone

Consequences of osteoporosis

Osteoporosis is only painful if fractures have occurred

Having osteoporosis does not automatically mean that your bones will break, it just means it is more likely and that you have a ‘greater risk of fracture’. Thin, fragile bones in themselves are not painful but the broken bones that can result can cause pain and other problems. Osteoporosis does not generally slow or stop the healing process. Bones that break because of osteoporosis will still heal in the same way as they do in people who do not have osteoporosis, usually in about six to eight weeks.

Fractures are the same as broken bones

The medical term for when bones break as a result of osteoporosis is ‘established’ or ‘severe’ osteoporosis.

Wrists

Broken wrists (known as Colles’ fractures) can be the first indication that you have osteoporosis. They often occur in middle aged women who have put out their arm to break a fall. Healthy bones should be able to withstand a fall from standing height, so a broken bone in these circumstances is known as a fragility fracture.

Hips

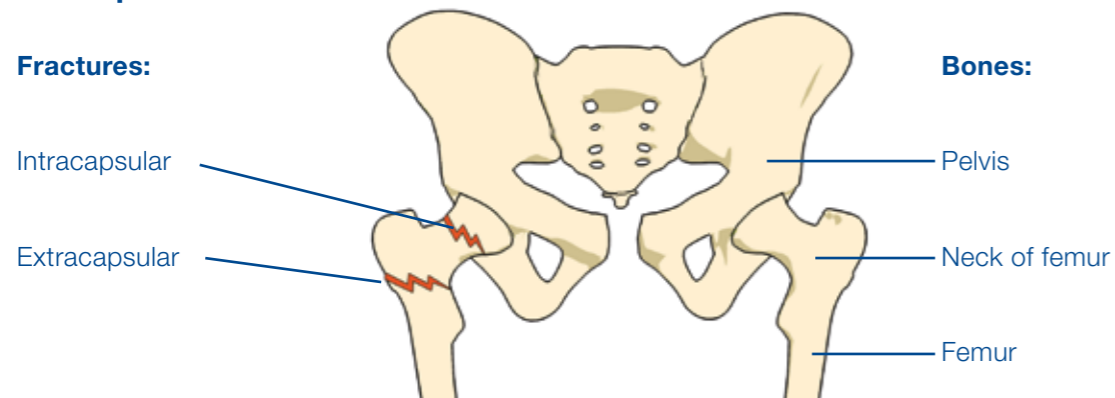
Hips broken as a result of osteoporosis occur most commonly in our late 70s or 80s (see diagram on page 8). They happen as a result of a fall and can affect all aspects of life. Full recovery is always possible but will often depend on how well someone is before the broken hip occurs. Getting back to being fully mobile and independent can be difficult and physiotherapy and social care services are often essential.

Breaking a hip when you are older can have a major impact on your independence. It can also create a real fear of falling among older people and can make them cautious of everyday activities.

Spinal bones

Fractures due to osteoporosis of the bones in the spine (vertebrae) usually occur in the lumbar (lower) or thoracic (middle) area of the spine. They are often referred to as spinal or vertebral fractures. Bones become squashed or compressed because of their reduced strength. Sometimes they are referred to as ‘crushed’, ‘collapsed’ or ‘wedged’ depending on how the bone is affected. A ‘compression fracture’ is a good way of describing what happens.

What is a hip fracture?



These fractures do not interfere with the spinal cord or result in paralysis or loss of sensation except in very unusual cases. Although bones heal they do not return to their previous shape which can cause height loss or spinal curvature.

If a number of wedge fractures occur together then the spine can tip forward causing an outward curve (kyphosis). If the bones are flattened, the trunk can be shortened in length causing loss of height. A fracture of one or more of the vertebrae can occur as the result of an awkward movement, like reaching up to get something from a kitchen cupboard or lifting heavy shopping bags. Sometimes, they may occur spontaneously, with very little cause, such as following an episode of coughing or sneezing.

If fractures are numerous and severe they can lead to significant height loss and curvature causing shortness of breath, protruding stomach, indigestion problems and stress incontinence. This is because of a reduction in the available space for the internal organs.

However, not everyone is affected severely and even if you or someone close to you is, many things can be done to help.

Other fractures

Other bones such as the humerus (upper arm), ribs or the pelvis may break if they are fragile but the wrist, spinal bones and hip are the most common places for fractures to happen.

There are a number of less common types of osteoporosis and related conditions you may want to know about.

Less common types of osteoporosis and other related conditions

Idiopathic juvenile osteoporosis

This is an unusual condition in young people where broken bones occur spontaneously without an apparent underlying problem. Sometimes, osteoporosis happens because of other factors such as corticosteroid use, brittle bone disease (osteogenesis imperfecta) or because a child is immobile.

i For more information see our leaflets *Osteoporosis in children, Osteogenesis imperfecta and osteoporosis*

Osteoporosis associated with pregnancy

This is a rare condition when bones, usually in the spine or hip, break easily during or after pregnancy.

i For more information see our leaflet *Pregnancy and osteoporosis*

Osteoarthritis

This is different to osteoporosis and is a disease that affects the joints in the body causing them to become damaged. Hips, knees and knuckles can be affected and so can joints in the spine. Both osteoarthritis and osteoporosis occur more commonly as people age. Sometimes back pain can be caused by compression fractures as well as osteoarthritis in the joints.

i For more information see our leaflet *Osteoarthritis and osteoporosis*

Transient migratory osteoporosis

A rare condition which can cause chronic pain and is associated with sudden loss of bone density, usually in a hip. This is unlike 'ordinary' osteoporosis which is only painful when broken bones have occurred. The pain goes away eventually but sometimes recurs in another part of the body. Referral to a pain clinic may be necessary to help with the difficult pain problems associated with this condition.

Complex regional pain syndrome CRPS (reflex sympathetic dystrophy)

CRPS affects a hand, foot, wrist, ankle or knee but can spread up a whole limb. Although often triggered by a minor injury or previous broken bone the reason for continuous pain is poorly understood. Sometimes pain is traced to a specific nerve injury but sometimes not. Often there is loss of bone density in the affected area. This is a localised problem and does not result in general osteoporosis.

i For more information see our leaflet *Complex regional pain syndrome and osteoporosis*

Prevention



- Preventing osteoporosis and fragility fractures
 - Healthy balanced eating
 - Exercise and strong bones
- What else can I do for my bones?
 - Your questions

Our genes are key to deciding the potential size and strength of our skeleton, but the way we live our life can also play a part in the amount of bone we invest in our bone 'bank' during our youth and how much we save in later life.

Preventing osteoporosis and fragility fractures

Healthy balanced eating

During childhood, adolescence and early adulthood, when the skeleton is growing, it is vitally important to maximise bone strength. By 'banking' plenty of bone in these years, it puts the skeleton in a better position to withstand the bone loss that occurs with advancing age. You can do this by taking plenty of weight bearing exercise and eating a well balanced, calcium-rich diet.

As we get older our bones start to lose strength and density as the work of the bone demolition cells starts to slowly overtake the work of the bone construction cells.

The older we get, the greater our risk of breaking a bone. Fragility fractures become more common as the density of bone decreases and bones become generally less strong and more fragile. Although there is a lot you can do to help keep bones strong, there are lots of other factors which can increase the risk of breaking a bone. For older people one of the most common causes of fracture is falling.

Falling is common in later life because of poor balance and co-ordination, leading to a higher risk of breaking a hip, something which could have a significant impact on quality of life. Reducing risks of falling may be a way of reducing risks of fracture.

Whatever your age or sex, it is vital to make sure that what you eat today will help to keep your skeleton strong for the future. Eating for your bones needn't be boring – there are lots of delicious meals and snacks packed full of the vitamins and minerals you need and they don't have to be fattening. Low fat or fat free dairy products usually have as much or more calcium as the full fat versions.

Aim to eat meals that incorporate a wide variety of foods from the four main groups. These are fruit and vegetables; carbohydrates like bread, potatoes, pasta and cereals; milk and dairy products; and protein such as meat, fish, eggs, pulses, nuts and seeds.

This will also help provide you with all the vitamins, minerals and energy you need to live life to the full and reduce the risk of other chronic diseases.



Getting a head-start: building bones during pregnancy

Building healthy bones actually starts in the womb. Pregnant women should avoid smoking and drinking alcohol, as well as making sure they have a good intake of calcium and vitamin D to ensure they are doing the very best they can for their baby's developing skeleton.

Healthy eating tips:

- Base your meals on starchy foods but try to make them the whole grain variety such as brown rice and pasta.
- Eat more fruit and vegetables, at least five portions a day.
- Eat more fish, try for two portions a week and remember oily fish, such as mackerel, are also a good source of vitamin D.
- Cut down on saturated fats and sugar, check out the food labels. 5g or more of saturated fat per 100g and 10g or more of sugars per 100g is a lot.
- Try to cut down on the amount of salt you eat, again, check out the food labels and remember that 0.5g or more of sodium per 100g is high.
- Get active and try to maintain a healthy weight.
- Don't skip breakfast, it kick-starts the day!



Find out more by visiting www.eatwell.gov.uk. There is more information available from The British Nutrition Foundation which produces leaflets on healthy eating in general. Ring **020 7404 6504** or log on to www.nutrition.org.uk. If you are concerned about your eating habits, you could also speak to the practice nurse at your local GP surgery.

For more information on healthy eating visit the Food Standards Agency website at www.food.gov.uk.



Calcium

Calcium is vital for strong teeth and bones because it gives them strength and rigidity. Our bodies contain about 1kg of this vital mineral and 99% of it is found in our bones. Most people should be able to get enough calcium through healthy eating. The following table lists recommended intake levels of calcium.

How much calcium is recommended?

Age	RNI reference intake nutrient
0–12 months (non breast-fed infants only)	525mg
1–3 years	350mg
4–6 years	450mg
7–10 years	550mg
11–18 years boys/girls	1,000/800mg
19+ years	700mg
Pregnant women	700mg
Breast feeding women	700mgs + 550mg

Reference Nutrient Intake

The Government’s advisors on nutrition have set levels of dietary calcium intake or reference nutrition intake (RNI) of which 700mg is sufficient to meet the daily requirements for 97.5% of the adult population. These advisors

also recommend that 400mg is the lower reference nutrient intake (LRNI) or the lowest amount of calcium required for maintaining a healthy adult skeleton. Do not worry if your calcium intake does not quite reach the RNI of 700mg a day, it is the average daily amount that is important. A low calcium intake on one day, when most days you achieve the right amount, will not have a detrimental effect on your bone strength.

Examples of calcium rich foods

Weight	Food	Calcium content (mg)
1/3 pint (190ml)	Whole milk	224
1/3 pint (190ml)	Semi-skimmed milk	231
1/3 pint (190ml)	Skimmed milk	235
150g (5oz)	Low-fat yoghurt	225
112g (4oz)	Ice cream	134
28g (1oz)	Cheddar cheese	202
112g (4oz)	Boiled spinach	179
112g (4oz)	Baked beans	59
100g (3½oz)	Tofu	480
56g (2oz)	Whitebait (fried)	482

i For more information, see our leaflet *Healthy bones – facts about food*



Vitamin D

You need vitamin D to help your body absorb calcium. The best source is sunlight, which your body uses during the summer months to manufacture the vital vitamin in your skin. About 15 to 20 minutes of sun exposure to the face and arms every day during the summer should provide you with enough vitamin D for the year. You can also find vitamin D in margarine, egg yolks, cod liver oil and oily fish such as herrings and sardines.

You should be able to get enough vitamin D through diet and by enjoying an active, outdoors lifestyle during the summer months. However, some people might be deficient in vitamin D and might benefit from a dietary supplement of vitamin D (see box on right).

For the groups listed here, an RNI of 10 micrograms is recommended per day (7 micrograms for infants under six months, 8.5 micrograms for children aged six months to three years). High levels of vitamin D for prolonged periods can be toxic so it is important that dietary supplements do not provide more than 25 micrograms of vitamin D daily.

Do you need more vitamin D?

If you fall into one or more of these categories you may want to think about taking a vitamin D dietary supplement:

- The housebound, especially frail, older people.
- Those with a poor diet.
- Asian women and children. This group may be deficient in vitamin D because of decreased skin production due to skin pigmentation, dress code and, sometimes, poor dietary vitamin D.
- Those who wear total sun block all the time when outdoors.
- Pregnant women. This is because a baby’s stores of vitamin D are laid down during pregnancy and are affected by the mother’s vitamin D levels.
- Breast feeding women.
- Infants and children under three.
- Those using long term anti-epileptic drugs because this alters the take-up of vitamin D by the body and can affect the absorption of calcium.
- People with severe liver, kidney disease or malabsorption problems.



Get the most from your food

- Breakfast cereals are an easy calcium rich start to the day. Add milk and it bumps up the calcium content even more.
- Instead of snacking on crisps or sweets, eat nuts or dried fruit like apricots and figs, both excellent sources of calcium.
- Don't bin the bones when you open tinned fish, like sardines. Mash them into the fish and you won't notice them but you will benefit from the calcium they contain. Whitebait is also rich in calcium.
- Tofu (a vegetable protein made from soya beans) can be high in calcium.
- Bring water to the boil before putting in the vegetables (including potatoes).
- Steam vegetables or use a microwave to help to maintain their vitamin content.
- Green leafy vegetables, like watercress, broccoli and curly kale, are good sources of calcium.
- Eat fresh or frozen fruit and vegetables because vitamin levels drop the longer they are kept.
- Do not leave cut vegetables in the air, heat or light. Instead keep them covered in a cool, dark place, eat them raw or cook them in small amounts of water.
- Use the cooking water in a soup or sauce to get back some of the lost vitamins and minerals.
- Fat soluble vitamins (vitamins A and K) are more readily absorbed if foods are stir fried in oil, for example, stir fried broccoli.
- Stir frying food is also a good way to conserve nutrients.



Other nutrients for bones

There are many other less well known vitamins and minerals which may play a part in bone health, but more research is needed in this area to fully understand their role. These nutrients are all readily available through a balanced diet and, as long as a wide range of foods from all the main food groups are obtained, it is likely that you will be getting enough.

There are also nutrients which may reduce or increase the amount of calcium the body absorbs or increase calcium lost in the urine. The way nutrients are absorbed by our body is far from straightforward and uptake can either be increased or decreased depending on the presence of other nutrients. More research is needed into this area to help us fully understand how significant all of these factors are. Vitamins such as B, C and K and minerals such as magnesium have been shown to have an effect on bone health.

If you have a well balanced diet you should not need to take a general vitamin or mineral supplement for your bones.

i For more information see our leaflet *Healthy bones – facts about food*



Exercise and strong bones

Exercise is important for everyone at all stages of their lives, but is especially important for people with osteoporosis and at risk of fracture. Finding out the right kind of exercise for you will help you to gain confidence and help to reduce your risk of breaking a bone.

Bone is a living tissue which reacts to increases in loads and forces by growing stronger. It does this all the time, so exercise will only increase bone strength if it increases the loading above normal levels. Weight-bearing exercise such as jogging can help maintain and increase bone density in the spine and hips, and arm loading exercises such as weight training can increase bone density in the wrist. Weight-bearing exercise means any exercise where you are supporting the weight of your own body.

Body weight is an advantage for maintaining bone density because the mass of the body itself is bone loading. In post-menopausal women, body fat makes a little oestrogen which helps to keep bones healthy. If it is necessary to lose weight for other health conditions, take advice from your doctor about a sensible diet containing enough calcium and protein. If you decide to take up a new bone boosting exercise, choose an enjoyable activity which fits in with your life. It is also important that you avoid excessive exercise and weight loss.



One of the most effective ways of loading your bones is by doing brief bouts of high impact exercise. High impact is created by a large force which rises rapidly. For example, the heel strike when your leading foot hits the ground during jogging provides a useful jolt to the skeleton, including the hip and spine. A few jolts are enough. Running up an average flight of stairs provides 10 jolts each time you go up and 10 jolts each time you come down. Five flights a day provides 100 jolts which is likely to produce a positive effect on bone density, whereas half an hour jogging provides about 2,000 jolts. Prolonged exercise is not necessary in order to stimulate bone. You should only attempt an exercise such as running up a flight of stairs if you feel fit enough to do so.

If you 'bank' enough bone when you are young, you will be in a better position to withstand the natural bone loss we all experience later in life.

Try to incorporate 20 minutes of some form of physical activity five times a week into your life. Not only will it be good for your bones but also for your general well being.

Exercise to build bones and prevent osteoporosis

- Team sports like football, as well as participation classes like dancing, are a great way of getting children involved in fitness from a young age. Key bone-building years are those up to about your mid 20s, so plenty of weight-bearing exercise and a healthy well balanced, calcium rich diet will build strength into young bones.
- Jumping on the spot or skipping is good for children and young people because it adds some impact to bones. Aim for 50 jumps a day or skipping for five minutes each day.
- A 20 minute jog three times a week is good for building bone in both the hip and spine in younger people. Intermittent jogging is also good, especially for people who find continuous jogging too strenuous. Walk then jog every 20 metres or so. Even a very brisk walk can be good for your bones.



- The slow, controlled lifting of weights, best done in a proper gym with advice from an instructor, will increase bone density and makes your muscles stronger if you train three times a week on non-consecutive days.
- Tennis is another high impact but enjoyable sport that builds bone density. Research has shown that professional tennis players have much higher bone density in their serving arm than their non serving arm!
- Exercise to music classes, like aerobics, circuit training and boxercise. Anything that involves high impact exercise will boost both your bones and your heart when you are young.

Exercise with osteoporosis – for the fitter person without fractures

If you have had a bone density scan and osteoporosis has been diagnosed, you will want to know which exercises are safe for you and how exercise can build up your bone density or at least reduce further bone loss. You may not be old and frail or have broken any bones, in fact, you could be fit and healthy except for the finding of low bone density. Recommending exercise for you is not straightforward and a referral to a physiotherapist may be helpful. It will be important to discuss how high your risk of fracture is at this point. If you are at risk for

other reasons and especially if you have already had a fragility fracture then you will need to be cautious and avoid high impact exercise.

If you are already jogging without pain or problems then your immediate risk of fracture may not be high and you may decide to continue. The dilemma here is that it is high impact exercise that builds strong bones most effectively but for some people, at high risk of fracture, these types of exercise might risk breaking bones.

Exercise to keep fit, keep bones strong and prevent falls – for people over 70 or after fragility fractures

Although you may not want to do all the things you did when you were younger and fitter or before you had fragility fractures, if you stop using your muscles they will lose strength which will affect your sense of mobility and balance, and this makes you more prone to falls and fracture. Leading an active lifestyle can halve your risk of breaking a bone, particularly in your hip. The term ‘active lifestyle’ means enjoying a variety of physical activities throughout the day that keep you on the move. These may include sport or leisure activities like bowls, ballroom dancing or gardening as well as necessary activities like housework and shopping. It can

be as simple as climbing the stairs regularly or taking short, brisk walks.

You can adopt a more active lifestyle at any age, provided you begin with familiar activities that you enjoy and progress at an appropriate pace – research has shown that you are never too old to start reaping the rewards of being more active!

As we get older, our risk of falling increases which puts us in greater danger of breaking a bone, particularly the hip. So we often need to improve our sense of balance and there are many exercises which can help. If you like to swim, try walking about in the water, sideways and backwards as well as forwards.

However, it is important that you exercise safely. Warm up, begin gradually and then increase intensity over time.

- Enjoying a brisk walk every day is great for older people. It’s an easy and free way to a fitter, healthier older age.
- Dancing of all varieties provides enjoyable exercise which is especially good for balance as well as your bones.
- Tai Chi is an ancient form of Chinese martial arts which is good for improving posture

>>

and balance in older people. Good balance, co-ordination and muscle strength are vital for lessening your risk of falling and therefore breaking a bone if you have osteoporosis. (Tai Chi and other balance improving activities, such as dance, require a fair sense of balance to begin with, so choose a class that is suitable for your age group or is aimed at beginners.)

- Golf, bowls and croquet are all sports that people can enjoy into older age. Golf provides a good walk and also develops flexibility for the shoulders and spine.
- Swimming provides excellent opportunities to improve the stamina and strength of all the major muscles. It can also help to improve the flexibility of many joints.

- Gardening can also be a useful activity. Long handled tools and raised flower beds will allow you to avoid bending if you have had compression fractures in your spine.
- Simple exercises can also strengthen your bones and can be done from the comfort of your own home. Gentle press ups against a wall or lifting tins of food while you watch your favourite soap on TV can help strengthen your wrists.

You need to be very careful with exercises that include any bending, lifting or are high impact because these are not suitable for people with very fragile bones or fractures. Forward bending exercises could increase the risk of spinal fractures.

i For more information see our booklet *Exercise and osteoporosis*



What else can I do for my bones?



Stop smoking

Smoking is well known to have an adverse effect on general health. It has been shown to slow down the work of the bone building cells, osteoblasts. Smoking may also result in an earlier menopause in women and can also increase your risk of a broken hip later in life. One study showed that fracture risks are higher for those who are current smokers than those who have given up. Quitline provides more information at www.quit.org.uk or **0800 002200**.

Reduce alcohol intake

Excessive alcohol consumption appears to be a significant risk factor for osteoporosis and fractures. Even minor alcohol intoxication is associated with an increase in falls, which can result in breaking a bone. You should try not to exceed the Government's recommended limit which says men should not drink more than three to four units of alcohol a day and women should drink no more than two to three units a day. Too much alcohol is bad for our general health and is associated with increased risks of cancer and high blood pressure.

How much is a unit of alcohol?

In the UK, one unit is equal to 8g of alcohol. As a rough guide, the following drinks contain one unit of alcohol:

- one small glass (125ml) of table wine
- a single pub measure (25ml) of whisky, gin or brandy
- half a pint of beer or cider
- quarter of a pint of super-strength beer or cider

Hip protectors

For older people who may be at risk of falling, hip protector pants are available which can help to cushion the force of a fall. These underwear garments have two protective hard shells built into cotton pants covering your hips to absorb the impact of the fall. However, research studies have not conclusively proved that they prevent broken bones.

i For more information see our leaflet *Hip protectors and osteoporosis*

Fall prevention

Many older people fall in the home, so it is important to try to reduce hazards that could cause you to trip and fall.

- Take your time using stairs and hold on to the rail.
- Loose rugs or carpets, trailing wires, slippery floor surfaces and poor heating and lighting can increase your risk of falling.
- Other health problems such as Parkinson's disease, arthritis or stroke are common causes of falls and some medications can increase your risk of falling by affecting your balance.
- Have your eyesight and hearing checked because poor eyesight can increase your risk of falling and some forms of deafness can affect your balance.
- Ask your doctor to review all the medications you take. Taking lots of different medications (known as polypharmacy) can sometimes heighten side effects such as dizziness or drowsiness. If your tablets are causing dizziness or drowsiness let your doctor know.

If you are concerned about falling and particularly if you tend to fall, you could talk to your local GP; ask for a referral to your local falls clinic. Help the Aged also offers useful information on preventing falls at www.helptheaged.org.uk.

Your questions:

Do I need to take a calcium supplement?

Most people should be able to get enough nutrients through their food without needing to take a calcium supplement. Eating a good, balanced diet will also ensure you get other vital bone building vitamins and minerals. Many people will be surprised to see it is not just dairy products that contain calcium. Green leafy vegetables, bony fish and dried fruit all contain useful quantities of the mineral. Dairy products are often recommended as they are a rich source of calcium that is easily absorbed and generally make up a significant proportion of most Western diets.

i For more information see our leaflet *Healthy bones – facts about food*

I have osteoporosis – should I eat more calcium?

If you have been diagnosed with osteoporosis and are taking a drug treatment, you may need to boost your calcium intake up to 1,200mg a day and consequently may be given a calcium supplement with your osteoporosis medicine. In the research trials that have shown bisphosphonates (one type of osteoporosis drug treatment) to reduce fracture risk, the calcium supplementation used was 500-1,000mg. Extra calcium may be taken as part of the diet or as a supplement.

i For more information see our leaflet *Drug treatments for osteoporosis*

Your questions (cont'd):

Is high calcium intake a guarantee against osteoporosis?

Although calcium is a vital mineral for bone health, eating lots of it does not automatically result in a high bone density or prevent broken bones. There are some groups of people who have a low calcium intake but also have few broken bones because of osteoporosis. However, it is not clear exactly why this is. It may be because of other lifestyle factors, such as being more physically active or getting more exposure to the sun and having good levels of vitamin D. Alternatively, there may be genetic reasons or body size differences.

I am a vegan, will this cause problems for my bones?

If you don't eat dairy products, you will need to include lots of other calcium rich foods such as green leafy vegetables, almonds, sesame seeds, dried fruit, pulses, fortified soya drinks and soya protein tofu in your diet. For further information about a healthy vegetarian or vegan diet, contact the Vegetarian Society or the Vegan Society (see contact details at the back of this booklet). A vegetarian diet is not a risk factor for osteoporosis and vegetarians do not appear to have poorer bone health than the rest of the population.

Can I have too much calcium?

Having more than the recommended 2,000 to 2,500mg of calcium a day on a regular basis could lead to medical problems including a high level of calcium in the blood, known as milk alkali syndrome. It may also interfere with the absorption of other minerals such as iron and magnesium.

I am lactose intolerant, how can I get more calcium into my diet?

Some people cannot tolerate lactose, the natural sugar found in milk, because they don't produce enough lactase, the enzyme needed to digest lactose. When undigested lactose passes through the system unabsorbed, it will ferment in the large intestine causing stomach cramps, bloating, flatulence and diarrhoea. Lactose intolerance affects 5-10% of North Europeans and North Americans of European origin. This figure may be as high as 90% in some Asian, African and Caribbean populations.

If you are lactose intolerant, make sure you enjoy plenty of non-dairy calcium rich foods like pilchards, sardines, spinach, watercress, sesame seeds and tahini (sesame seed spread). You could also choose fortified foods, such as soya milk which includes added calcium.

Can eating fortified foods help?

Supermarket shelves are increasingly filled with supplemented foods that claim to be good for you because they are fortified with vitamins and minerals. They may prove a convenient way of improving the nutritional value of your diet. But remember, it's a well balanced diet that provides a range of nutrients to keep bones strong, not just one added mineral or vitamin.

Will I still get enough vitamin D if I use sun block?

If sun blocks or high factor sunscreens are used on exposed skin all through the summer, this will lower the vitamin D production. Most people use sun blocks or sunscreens if they know they will be in strong sunshine for some time e.g. on the beach, gardening, or for outdoor sports and would not apply if going outside for short periods e.g. hanging out washing, shopping, school playtimes. These short periods of time in the sunlight, without sun block or sunscreen, should give adequate exposure to produce vitamin D. Children and those at risk of skin cancer may need to cover-up when the sun is strong. If someone uses sun block for medical reasons at all times, they need vitamin D supplements.

Are cycling and swimming good exercise for my bones?

Cycling and swimming are not weight-bearing exercises so will not increase bone density. However, they are both effective ways of keeping fit and healthy and leading an active lifestyle can prevent falls and fractures.

 For more information see our booklet *Exercise and osteoporosis*

Is vibration therapy good for bones?

Vibration therapy is a technology which was first found to have a positive impact on bone in studies on astronauts who lose bone rapidly when in a weightless environment. The technique involves standing on a vibrating plate which transmits high-frequency, low-intensity mechanical forces through the person's feet and up through the skeleton.

The principles of vibration therapy have been used in the production of exercise equipment which can be found in many gyms around the country and can be purchased for use at home. Such equipment aims primarily to improve muscle strength and flexibility and may therefore play a useful part in improving general fitness which is important to us all as we get older. Its impact on bone is less well established and more research is needed in this area.

Diagnosis and risk factors

- Factors that increase your risk of osteoporosis and fractures
- Diagnosing osteoporosis on a scan
 - Assessing fracture risk
 - Your questions



Osteoporosis plays an important part in determining how strong our bones are and can help us understand how likely it is we will fracture (break bones) in the future.

Factors that increase your risk of osteoporosis and fractures

Osteoporosis, measured on a densitometry x-ray (see page 33), is a 'risk factor' for fracture, just as high cholesterol is a risk factor for having a heart attack. However, not everyone who has osteoporosis will break a bone easily and some people without osteoporosis will do so.

Many other factors also contribute to fracture risk. Some of these affect the strength of bones, while others affect risk in different ways such as increasing the risk of falling.

Genes: our genes determine our risk of osteoporosis to a large extent. Some families have a smaller, finer build and osteoporosis and fractures are more common. If one of your parents had a broken hip you are more likely to have a fracture yourself.

Age: bone loss increases in later life so by the age of 75 years, about half of the population will have osteoporosis as measured on a bone density scan. As you get older, bones become more fragile and more likely to break generally, whatever your bone density.

Race: people who are Afro-Caribbean are at a lower risk than those of Caucasian or Asian origin because their bones are bigger and stronger.

Gender: women have smaller bones than men and they also experience the menopause, which accelerates the process of bone turnover. The female hormone, oestrogen, has a protective effect on bones. At the menopause (normally around the age of 50), the ovaries almost stop producing this hormone thus reducing the protection it gives to bones.

Low body weight: low body weight is where the BMI (Body Mass Index) is below 19kg/m². Low body weight often means bones are finer and smaller so osteoporosis is more likely as bone loss increases in later life. There is also less padding when an older person falls which may increase fracture risk. Small amounts of oestrogen are produced in fatty tissue which may help to protect women's bones in later life.

Smoking: current smokers are more likely to break bones.

Alcohol: excessive alcohol consumption appears to be a significant risk factor for osteoporosis and fractures.

Falling: older people who are at risk of falling are more likely to have fractures, especially of the hip, after the age of 75 years.



How to calculate your BMI

Calculating your own BMI is very easy if you know your height and weight:

1. Measure your height in metres (h) and multiply the figure by itself
2. Measure your weight (w) in kilograms
3. Divide your weight by your height squared i.e BMI = w/(h x h)

So if, for example, you are 1.6m tall and weigh 60 kg, your body mass index would be 23.4:

1. Your height is 1.6m so multiply
 $1.6 \times 1.6 = 2.56$
2. Your weight is 60 kg
3. BMI = $60 / 2.56 = 23.4$

Previous fractures: if you have already broken bones easily, including in the spine, then you are much more likely to have fractures in the future.

Some medical conditions increase your risk:

- Rheumatoid arthritis.
- Low levels of the sex hormone oestrogen in women as a result of early menopause or having a hysterectomy with removal of ovaries (before 45), anorexia nervosa or Turner's syndrome. Excessive exercise can also reduce hormone levels.

- Low levels of the sex hormone testosterone in men can occur for a number of reasons including following surgery for some cancers. Some rare conditions that men are born with such as Klinefelter's disease or Kallman's syndrome also lower testosterone levels.
- Hyperthyroidism when levels of thyroid hormone are abnormally high.
- Parathyroid disease when levels of parathyroid hormone are abnormally high.
- Conditions that affect the absorption of food such as Crohn's or coeliac disease.
- Conditions that cause long periods of immobility such as stroke.

i For more information see our leaflets **Thyroid disease and osteoporosis, Parathyroid disease and osteoporosis, Anorexia nervosa and osteoporosis, Coeliac disease and osteoporosis**

Other conditions may be associated with osteoporosis such as diabetes and HIV (AIDS). Organ transplant recipients and people with some respiratory diseases may also be at more risk, although more research is needed to understand why.



Some medicines increase your risk:

- Taking corticosteroid tablets for other medical conditions for over three months.
- Anti-epileptic drugs.
- Breast cancer treatments such as aromatase inhibitors.
- Prostate cancer drugs that affect either the production of the male hormone testosterone or the way it works in the body.

Other medicines may increase risk but more research is needed:

- Injectable progestogen contraceptives – medroxyprogesterone acetate, known as Depo Provera.
- Some drugs used for mental health problems (particularly psychosis).

Some other drugs are associated with a greater risk of breaking bones but more research is needed to confirm this.

Others at risk include people who have undergone gender re-assignment especially if hormone replacement therapy is discontinued.

i For more information see our leaflets *The contraceptive injection (Depo Provera) and osteoporosis, Transsexualism and osteoporosis, Anti-epileptic drugs and osteoporosis, Glucocorticoids and osteoporosis*

Diagnosing osteoporosis on a scan

World Health Organisation (WHO) definition of osteoporosis

Osteoporosis is currently diagnosed on a bone density scanning machine when the amount of bone you have, as measured on the scan, is found to be significantly reduced. The lower your bone density the higher your risk of breaking bones.

Central DXA scanning (see page 33), which measures the spine and hip, is currently the most accurate and reliable method. It is a simple, painless procedure that uses very low doses of radiation. You will be asked to lie down for 10–15 minutes while an x-ray scanning arm passes over you to take an image of your spine and hip. These scanners are usually in hospitals although not all hospitals have one.

Deciding who needs a bone density scan

Bone density scans are generally recommended when the result is needed to help determine whether, and which, drug treatment is necessary. You will need a referral from your GP, who will decide whether to send you for one after discussing your risk factors. Sometimes your risk of fracture is so high anyway because of other risk factors that a scan is not necessary before a drug treatment is prescribed e.g. if you are over 75 years of age, because your chances of having low bone density are very high.

Your doctor will use the results to decide whether or not you need treatment, or in some cases you may be referred to a specialist consultant.

DXA scan results

The scan results will show how your bone density compares with the average bone density of both a young adult of the same sex and also someone of the same age (and sex) as yourself. The results can be given as a percentage of the normal value or, more commonly, as a standard deviation, which means the number of units above or below the average for the population. If your bone density is significantly lower than average, this is diagnosed as osteoporosis.

Bone density scanning can be useful but it is not a perfect measure of bone strength. Scans do not show the quality of your bones – whether the structure has broken down inside – which is why your doctor will need to use the result in combination with other risk factors to decide how high your risk of breaking bones currently is.

The diagnosis of osteoporosis using bone density scanning was developed for use with post-menopausal women, so men and younger women, with low bone density results may need referral to a specialist for scan interpretation and advice.

Assessing fracture risk

Until recently post-menopausal women with risk factors for osteoporosis were often referred for bone density scanning. Guidelines recommended that drug treatments should be prescribed for those with osteoporosis to reduce the risk of fractures occurring. Research has now proved that bone fragility can be assessed more accurately by including other risk factors for fracture.

Your bone density measurement on a scan is only part of the story. What is most important is how likely you are to break bones (including compression fractures in the spine). Although a diagnosis of osteoporosis will increase the risk of a fracture, many other factors will also contribute to your risk.

Some of these risk factors, such as the risk of falling, may be tackled by lifestyle changes. Other risk factors relate to bone strength and may be positively affected by taking drug treatments.

When doctors are deciding who needs a drug treatment to reduce their risk of a fracture, they are moving towards using 'fracture risk assessment' rather than simply diagnosing osteoporosis. Drug treatments are currently prescribed for those people most likely to have fragility fractures. These drugs have been proved to rapidly reduce the risk of fractures occurring. Measurement of bone density may form part of this 'fracture risk assessment' but it may not always be necessary.

A 'fracture risk assessment' tool called FRAX has been developed by the World Health Organisation, to identify who is most at risk of fractures in the next 10 years. Guidelines are now being developed across the world to help health professionals use this tool so that men and women can receive the drug treatments they need.

Dual energy x-ray absorptiometry (DXA) is the type of bone density scan usually recommended



Your questions:

How are fractures or broken bones diagnosed?

Normal x-rays are used to see if a hip, wrist or other bone has broken. Height loss and spinal curvature are not always caused by osteoporotic fractures so a normal x-ray can be useful for identifying other problems such as disc disease.

Are there other types of bone density scans?

DXA scans are currently considered the 'gold standard' and are the only type of scan generally recommended. However, other types of scans can be useful in some situations. There are a number of other techniques available including:

- peripheral DXA (pDXA) machines
- QCT (quantitative computed tomography)
- ultrasound

Can blood or urine tests diagnose osteoporosis?

Some specialist centres may carry out 'bone marker' tests.

When the cells that break down and build up bone are at work, they leave trace elements behind. These are called 'bone markers' and can be measured in urine or blood. Results of

the urine tests can be used to monitor the rate of bone loss in people with osteoporosis. They can tell if you are losing bone too fast and they may be used to monitor your response to drug treatments. These tests cannot be used alone to diagnose osteoporosis or to assess your risk of breaking bones.

i For more information see our leaflet *Scans and tests and osteoporosis*

Do I need to see a specialist?

Many people with osteoporosis or at high risk of fracture can be managed by doctors, nurses and other practitioners at your GP practice. If a referral is made for bone density scanning (which usually takes place in a hospital), then an interpretation of the scan should be sent to your doctor so that they know what it means and what possible treatments are recommended. If your medical situation is complicated, or the GP is uncertain about any aspect of your care, you may be referred to a hospital specialist and/or to see the clinical nurse specialist in osteoporosis. This is important with more unusual types of osteoporosis.

You cannot insist on a hospital referral because this is a clinical decision made by your GP but you can make a request and discuss your

reasons. In the same way, you cannot insist on a particular medical treatment although, in most practices, you can arrange to see another doctor to discuss your situation.

What shall I do if a number of the risk factors for osteoporosis and fractures apply to me?

If you are at high risk of breaking bones, especially as you move into later life, then drug treatments might be prescribed to help strengthen bones and make fractures less likely. You may be referred for a bone density scan to help decide if drug treatments are needed.

Some of the risk factors are part of your genetic make up and cannot be changed. Others, such as those caused by other medical conditions or medicines, may be reduced by a positive change in lifestyle or sorting out the underlying condition. If you are at high risk of falling then this may need investigating so that help and advice can be offered.

If you want to talk through your need for scanning or your risk of osteoporosis and fractures then you can talk to your doctor or ring the nurses at the National Osteoporosis Society Helpline on:

0845 450 0230 or **01761 472 721**



Drug treatments



- How drugs are developed and licensed
 - Drug treatments for osteoporosis
- Less commonly used drug treatments for osteoporosis
 - Treatments for men
 - Treatments for younger women
- Treatments for osteoporosis in children
 - Deciding on a drug treatment
 - Your questions

In this chapter, we look at the different drug treatments available for osteoporosis and new treatments currently under development.

How drugs are developed and licensed

Scientific research is the only way to prove if a drug works. Clinical trials on new drugs usually go through four stages after initial tests on animals. First, a small number of healthy volunteers try a new drug, then a few hundred people with the condition will test it to see if it works and what side effects occur. This information will be used to develop the dosage and method of taking the drug.

After this, a larger number of people take the drug over a longer period of time and if the drug is proven to work and is safe and tolerable, it will be licensed either by the Medicines and Healthcare products Regulatory Agency (MHRA) or the European Medicines Agency for doctors to use. In the final stage, further studies are carried out once the drug is available to prescribe to look at long-term side effects.


Drug trials are monitored by regulatory authorities and, if there are doubts over the safety of a drug, the trial is suspended or stopped.

How drug treatments work and what they do

Most drugs work by slowing down the activity of the osteoclast cells that break down old bone. These are known as anti-resorptive drugs. Some treatments stimulate the cells that build new bone; these are known as anabolic drugs. Some may perform in a combination of ways. The main aim of drug treatments is to decrease the risk of broken bones and they are licensed on the basis that they do this. Often treatments will show an increase in bone density as well.

As a result of these trials, doctors will have a range of licensed treatments which will always be their first choice. Sometimes, however, there is no suitable drug so the doctor will make a clinical decision to use an unlicensed drug. If this happens, doctors must be confident they have good reasons for choosing the drug prescribed and could argue their case in court should any problems occur.

Drug trials have shown that the drugs shown right are all effective at reducing broken bones.

 For more information see our leaflet *Drug treatments for osteoporosis*

Key to tables

F = Post-menopausal women M = Men

These symbols are a guide to whether men or women will be prescribed each drug. Sometimes, however, men will be prescribed drugs licensed for women

H = These treatments have been shown to reduce the risk of a broken hip

GIOP = These treatments have been shown to reduce the risk of broken bones in people who have osteoporosis caused by corticosteroid medication

V = These treatments have been shown to reduce vertebral fracture

Drug treatments for osteoporosis

Group name	Drug name	Brand name	Licensing details	Method of administration
Bisphosphonates	Alendronate	Fosamax	F M GIOP V H	Daily 10mg tablet
		Fosamax once weekly	V H F	Weekly 70mg tablet
	Alendronic acid		V H F	Weekly 70mg tablet
		Fosavance	V H F	Weekly tablet consisting of 70mg alendronate and 2800 iu vitamin D
	Risedronate	Actonel	F V H GIOP	5mg daily tablet
		Actonel once weekly	F M V H	35mg weekly tablet
Actonel combi		F V H	Weekly 35mg tablet and daily sachet containing calcium and vitamin D3	
Ibandronate	Bonviva	F V	Monthly 150mg tablet	
	Bonviva injection	F V	3 monthly 3mg intravenous infusion	
Zoledronic acid	Aclasta	F V H M	Annual 5mg intravenous infusion	
Cyclic etidronate	Didronel PMO	F GIOP	14 daily tablets of 200mg editronate followed by 76 days of calcium supplements in the form of a fizzy drink	
Selective oestrogen receptor modulator (SERM)	Raloxifene	Evista	F V	Daily 60mg tablet
N/A	Strontium ranelate	Protelos	F V H	2mg sachet mixed with water and taken daily
N/A	Parathyroid hormone	Teriparatide (Forsteo)	F M GIOP V	20mg daily self-administered injection
		Preotact	F V	100mg daily self-administered injection
Calcium and vitamin D	A range of calcium and vitamin D supplements can be prescribed by a doctor		M F	400-800 iu (10-20micrograms) vitamin D added to calcium available as chewable tablets or powders that are dissolved in water

Less commonly used drug treatments for osteoporosis

Group name	Drug name	Brand name	Licensing details	Method of administration
Hormone therapy or hormone replacement therapy (HRT) for women	Many products are available containing oestrogen only (for women who have had a hysterectomy), progestogen only, or a combination of both (for women who still have a womb)	Many products available	F	Various doses and routes of administration are available (tablets/patches/nasal sprays/implants/topical gels/vaginal creams)
Hormone therapy for men	Testosterone (for men)	Many products available	M	Various doses and routes of administration are available (tablets/patches/implants/injections)
	Calcitonin	Miacalcic nasal spray	F V	200 iu daily nasal spray
		Miacalcic injection	F V	100–200 iu daily injection
	Calcitriol	Rocaltrol	F V	Twice daily 0.25microgram tablet



Although the broken bones associated with osteoporosis are more common in women, and research and drug development has focused on post-menopausal women, osteoporosis and fractures also affect men.

Treatments for men

Men who are found to have a high risk of fracture or who have already broken a bone will normally be referred to specialist centres for assessment and discussion of potential treatments. This is because the diagnosis of osteoporosis is more complex in men and some treatments are only licensed to be used for post-menopausal women or men on corticosteroid therapy.

Three of the bisphosphonates, alendronate (Fosamax), risedronate (Actonel) and zoledronic acid (Aclasta), have a specific licence for men as does a form of parathyroid hormone treatment called teriparatide (Forsteo). Although not licensed for men, the bisphosphonate

ibandronate (Bonviva) or zoledronic acid (Aclasta) is sometimes prescribed, as are strontium ranelate (Protelos) and the other form of parathyroid hormone treatment Preotact. In practice it is likely that the generic form of alendronate – alendronic acid – will be the first choice treatment for men. Other treatments, such as calcitonin (Calsynar/Miacalcic), calcitriol (Rocaltrol), or occasionally sodium fluoride or anabolic steroids, may be used in specialist centres.



Hormone therapy or hormone replacement therapy?

As recently as two decades ago, HRT was the only treatment available for osteoporosis and was prescribed for post-menopausal women to raise the level of the hormone oestrogen after the menopause. However, over the last twenty years, the range of treatments for osteoporosis has greatly increased and we have a far better understanding of the effects of the long-term use of HRT. These can include a risk of breast cancer, strokes, other blood clots and an

increased risk of cardiovascular disease. Because of these factors, HRT is no longer a first choice treatment for either the prevention or treatment of osteoporosis in post-menopausal women. HRT is still prescribed to relieve menopausal symptoms, and women who are taking it for this reason can be assured they are also taking an effective treatment that will protect them against broken

bones. HRT also has a role to play in replacing hormones in women who have had an early menopause until they reach the age of 50. For men with osteoporosis caused by low testosterone levels (hypogonadism), testosterone replacement can be given by tablets, patches, injection or implants. There are side effects associated with this treatment so careful counselling and monitoring is essential.

Treatments for younger women

There are treatments available for younger women taking high dose corticosteroids or with specific hormonal disorders. For other younger women, advice should be sought from a specialist such as a rheumatologist (joints and bones), an endocrinologist (hormones) or a gynaecologist (women's health) or other appropriate specialist.

Women taking high dose corticosteroid tablets such as prednisolone and who have a low bone density may be offered one of the bisphosphonate drugs. However, women of child bearing age will want to discuss this with their doctor because bisphosphonates stay in the bones for a long time and could potentially affect the development of the baby in the womb. Pre-menopausal women who have broken bones easily may be offered other osteoporosis drugs from a specialist centre.

Low bone density in younger women may be caused by other contributing factors such as the eating disorder, anorexia nervosa, when low levels of the hormone oestrogen can be detrimental to bone. For these women, support and help to manage the underlying problem is important. An increase in body weight will help to restore normal menstrual periods and hormone levels which should, in turn, help to prevent further bone loss.

HRT or the contraceptive pill containing oestrogen may be given if a woman has no menstrual periods because of low body weight, but any potential benefits on bone density are unproven. Calcium and vitamin D may be prescribed to ensure an adequate intake.

Women and men with coeliac disease have an increased risk of osteoporosis and advice about gluten-free foods as part of healthy eating will help to increase the absorption of minerals and vitamins. As with other conditions that affect the absorption of food in the body, calcium and vitamin D may be prescribed.

Pre-menopausal women with low bone density are not very likely to break a bone in the near future. They will usually be given lifestyle advice and should also be advised to discuss their risk of osteoporosis with their doctor when they reach the menopause.

i For more information see our leaflets **Anorexia nervosa and osteoporosis, Coeliac disease and osteoporosis**

Treatments for osteoporosis in children

As with many medical conditions, drugs for osteoporosis have not been properly tested and licensed for children. Bisphosphonates are used for children, especially if they break bones a lot, however, there is some uncertainty about short or long-term effects of bisphosphonates on growing bone. Monitoring of this treatment should take place within a specialist centre. As juvenile osteoporosis can spontaneously improve, especially during puberty, many specialists decide to take a 'watch and wait' approach where possible. Calcium and vitamin D may also be prescribed.



Deciding on a drug treatment

Most of us do not want to take drugs unless we have to and decisions about treatments are especially difficult with conditions like osteoporosis because they are essentially about preventing fractures rather than making you feel better.

People considering treatments for osteoporosis may examine a wide range of factors before making a decision including the likelihood of breaking a bone. Some of the factors that may affect a decision include:

- Personal experience
- How well a treatment works
- The method of taking a treatment
- Short-term side effects
- Long-term risks

Few research trials have made a direct comparison between two or more treatments and trials that have been carried out have been contradictory and unable to prove that one treatment reduces the risk of fractures more than another. Most osteoporosis drug treatments reduce the risk of fractures by around 50%.

Some drugs seem to protect one site in the body but not others. This can affect choices of treatment. In practice, doctors will offer treatments depending on your individual situation. This may be because drugs have

been tested more specifically on one group or because treatments seem to be better tolerated.

Treatments for osteoporosis are taken to reduce the risk of broken bones. They are increasingly being prescribed for people with a high risk of fracture. Factors such as age can affect our risk of breaking bones, so it is likely that age and other factors, as well as bone density, will be used to help determine whether a treatment is necessary.

Side effects

Unfortunately, most of the drugs used to reduce the risk of broken bones in people with osteoporosis can cause side effects in some people, though these will depend on a lot of different factors.

Some of the bisphosphonate tablets can cause inflammation to the food pipe (oesophagus), sore throat and swallowing difficulties, musculoskeletal pain and chest pain. Injectable bisphosphonates sometimes cause flu-like symptoms for a few days and raloxifene (Evista) and strontium ranelate (Protelos) slightly increase the risk of blood clots.

To reduce the risk of side effects there are strict instructions regarding how the bisphosphonate tablets are taken. For example,

alendronic acid must be taken first thing in the morning, on an empty stomach, before the first food of the day.

New drug treatments under development

New treatments are being developed for osteoporosis all the time and many are currently undergoing testing. These include anti-RANK ligand antibodies such as denosumab. These have an effect on bone breakdown by inhibiting a local hormone called RANK ligand which affects the control of bone turnover.

Other work currently underway is looking at growth hormones and the role played by genes.

At the same time, existing drugs are also being manufactured in new forms. Ibandronate (Bonviva), for example, is available as an intravenous injection as well as a tablet.

There may also be government restrictions on which drug treatments your doctor can prescribe for you.

i For more information see our leaflet *Drug treatments for osteoporosis*

Your questions:

Where can I get more help?

There are many sources of help and information you can use. Your GP, practice nurse, hospital doctor, nurse or a pharmacist will be able to discuss your concerns and questions. Think about what you want to ask before you go for your appointment and perhaps make a list because there will be limited time. Do not rush to make a decision. If you have a hospital appointment in a few weeks' time, the decision can wait until then.

How do I know if drug treatments are working?

It is difficult to know whether a treatment has been effective or not because it may not make you feel any different. However, all of these treatments have been clinically tested and will generally reduce the risk of broken bones. Bone density scanning may sometimes be used to check the effectiveness of a drug treatment. This is not completely clear-cut because changes in bone density do not necessarily predict changes in your risk of breaking a bone and you may still benefit from therapy even if your scan results have not improved.

If a second scan is performed it is important that the same scanner is used to allow an accurate comparison. It is also important that,

in general, at least two years should elapse between scans, as the anticipated rate of change in bone density is relatively small and scans performed more frequently may generate misleading results. If you continue to break bones while taking one treatment, then a change of treatment may be suggested.

i For more information see our leaflet *Scans and tests and osteoporosis*

I've broken a bone even though I've taken a treatment – why is this?

There are many reasons why bones break easily. If the force is great enough, anyone can break a bone. Some people for example, are at increased risk of a broken hip. This may be because the length of their femoral neck (see diagram on page 8) is longer than usual or because they are slim and have no natural padding of fat to protect the hip area if they fall. Drugs may be effective in reducing your risk of breaking a bone but they cannot solve all these problems. Although the struts within bone can be thickened, leading to an overall improvement in bone density, the overall strength of bone can sometimes remain very poor and broken bones may still occur. Treatments can reduce your risk of breaking a bone by about half but they do not remove it completely.

Your questions (cont'd):

What if I decide not to take a treatment?

Some people with osteoporosis have decided not to take a treatment. This may be because they have personal health beliefs about taking conventional drugs.

Others do not take a treatment because the side effects or risks associated with treatments seem to them to outweigh the personal benefits. They or their doctor may decide there is no medical treatment appropriate for them. If this happens to you, there may be other practical steps you can take to help protect against broken bones.

How long do I need to take a drug treatment? What happens when I stop?

Drug treatments reduce the risk of breaking a bone while you are taking them but once you stop, the benefit will start to wear off. So, taking a drug between the ages of 50 and 60 will make no difference to your risk of breaking a bone when you reach 75.

There was a concern (especially with HRT) that stopping a treatment would increase the speed of bone loss. Research has failed to prove this either way. What is not known with the other drugs is whether there is a limit to the time they will work for you while you take them and if

long-term treatment continues to be effective or causes an adverse effect after a number of years. The lack of experience around the long-term use of treatments is one reason why many doctors are now reserving them for people who really need them e.g. those people at the highest risk of broken bones.

Some doctors feel that bisphosphonates should be used for five to ten years followed by a break in treatment or use of another type of treatment. Others feel confident to continue with treatments on a long-term basis.

I am going on holiday and it is difficult to fit in my medicine. Will it matter if I miss the occasional dose?

The drugs work over a period of time and missing out the drug for a week or so probably does not matter. However, the positive benefits of the drugs were achieved in drug trials based on continual dosage.

It is known that taking less than 80% of the drug dose is associated with poorer bone density improvements and less benefit on fracture rates so you should try to take all your tablets if you can. If you are worried about tap water while abroad, use bottled water when taking your tablets. (Choose water with the

lowest mineral content so that the minerals do not interfere with the absorption of the drug.)

I have terrible back pain and an x-ray has found a bone in my spine has crushed down and fractured. My doctor has put me on alendronic acid but the pain is no better. Why is that?

Osteoporosis drug treatments do not generally help with the pain (except for calcitonin which can sometimes help with the pain of a spinal fracture and maybe parathyroid hormone treatment (PTH)). The drugs are working to reduce the chance of getting another broken bone but can do nothing about fractures that have occurred already. However, there are many ways of helping you to manage pain effectively and it is important to remember that as bones heal, pain will gradually lessen, although progress can be slow and variable.

Your doctor may be able to refer you to a physiotherapist or a pain clinic for further advice and treatment for pain if necessary.



I have been changed from Fosamax (alendronate) to alendronic acid by my doctor. Why?

Alendronic acid is the generic (non-brand) version of alendronate (Fosamax). It is essentially similar to the branded products and is considered to be as effective in reducing fracture risk and as safe. If you find you are experiencing any new adverse effects then it may possibly be that you are sensitive to an added ingredient. Your doctor will have made the change because the drug is substantially cheaper than branded products without being less effective.

Is there a natural way of treating osteoporosis? Can I prevent broken bones by changing my diet and exercising more?

Those who took osteoporosis drugs in the trials were less likely to break a bone than those who did not take a treatment. Exercise patterns and diet have been shown to have some effect, although the effects of exercise routines have not always been sustained. Unfortunately, there have been few research trials for osteoporosis comparing drug and non-drug approaches. As yet, complementary therapies have not been shown to reduce the risk of breaking a bone.

Lifestyle changes are important anyway but you will then have to decide whether to take a treatment by balancing the risks and benefits.



Living with broken bones

- Living with broken bones – coping with pain and problems
 - Types of pain
- Drug treatments to relieve pain
 - Other drug treatments
 - Drug-free treatments
- Surgery to help with pain
 - Your questions
 - Useful contacts

Living with broken bones – coping with pain and problems

The pain associated with osteoporosis is due to the fractures (broken bones) it causes. Most broken bones are very painful at the time of fracture, although compression fractures in the spine can be painless.

Everyone responds to pain differently so pain relief that works for one person might not be effective for another. Pain is also affected by other factors such as the other pressures you are facing in your life. Experiencing pain can also lead to low mood and tension which can make the pain more difficult to manage. However, there are many ways pain can be relieved and practical help is available so that you can manage pain better. Most people with fractures recover well and return to full and active lives.

Some of the long-term problems associated with fractures mean that other help and support is necessary. When older people break their hips, other services such as physiotherapy and occupational therapy may be needed to help them to regain their independence.

Compression and wedge fractures in the spine can cause loss of height and curvature of the spine and can also cause shortness of breath and the stomach to be squashed and distended. This can make activities of daily living difficult.

Wrist (Colles') fractures

These breaks take six to eight weeks to heal and a plaster cast will usually be applied in a hospital Accident and Emergency Department to stabilise the break and aid healing. Unless you are unwell, a hospital stay will not be necessary.



Occasionally, if the bones are not in a good enough position to heal, an operation may be needed to stabilise the bone. Usually wires are inserted through the skin and around the fracture and a partial cast will be applied in the operating theatre. Your arm will be elevated after surgery to reduce swelling and a full cast applied when the swelling has gone down. An uncommon complication of Colles' fracture is a condition known as complex regional pain syndrome (CRPS).

i For more information see our leaflet **Complex regional pain syndrome and osteoporosis**

Hip fractures

Broken hips most commonly occur in people who are over 75 years of age who fall directly onto the hip. If you have broken your hip, you may find that, even after your hip has healed, you are less independent than before. This type of break may have a bigger effect on your life. You may well find that you can't walk as far and that you need more practical support than before. An operation is normally required to fix or replace the part of the upper end of the thigh bone that has broken (see diagram right). Your surgeon will want to repair the break as soon as possible, but occasionally surgery may be delayed if you have an additional problem such as a urine or chest infection, low levels of red blood cells (anaemia) or heart problems.

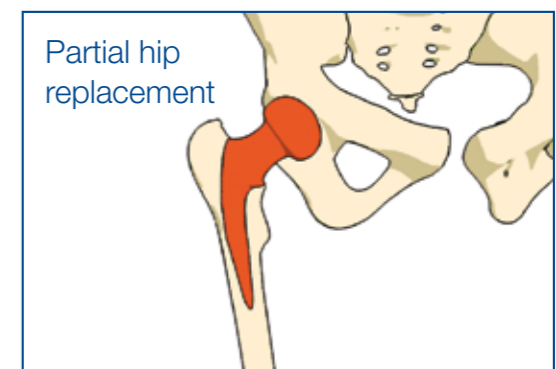
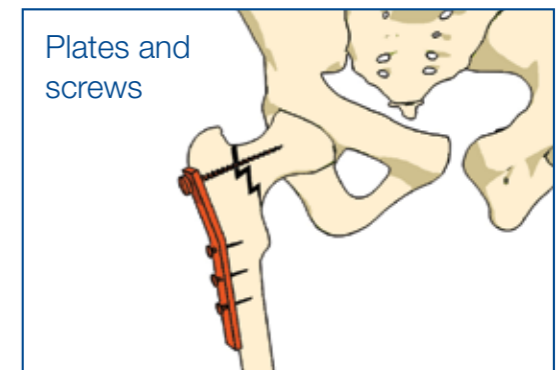
The quicker you start to get up after surgery, the more successful your recovery is likely to be. Getting moving earlier reduces your risk of problems after your operation such as chest infection and clotting problems. You will hopefully be up and out of bed the next day with the help of a physiotherapist and a walking frame, and gradually become more mobile as the days progress. After the operation you will have regular strong pain relieving injections or a patient controlled analgesia pump, providing a pain relieving drug straight into your vein. This

i There are a number of hints and tips on how to overcome various problems associated with living with osteoporosis at the end of this chapter and also see our leaflet *Living with broken bones – making life easier after fracture*

will make sure you are able to control your pain by giving yourself safe amounts of medicine without waiting for a nurse.

If you are already quite frail before breaking your hip, you may need a period of rehabilitation after your operation so that you can go home safely. The length of stay in hospital can be as short as five days or as long as three weeks.

Operations to mend a hip fracture



Spinal compression fractures

For some people these fractures occur suddenly with severe and disabling pain but for many the compression of the bone is 'silent' and may only be noticeable if height loss or curvature of the spine occurs.

In between each of the bones in the spine (vertebrae) there are many nerves travelling from the spinal cord to all areas of the body. These are the brain's messengers. The pain experienced following a spinal fracture may stem from irritation of the nerve root and be made worse by muscle spasm, when the muscle contracts over the site of the injury as a protective mechanism, but the spasm itself can also cause pain.

The experience of compression fractures is varied. Some people have acute pain at the time which resolves as healing takes place. Others, up to 70% of people, have 'silent' spinal fractures that cause no pain but may eventually lead to height loss and curvature. Unfortunately, some people will suffer from chronic long-term back pain. Many people recover well from painful compression fractures and cope with any long-term pain problems. For others, these fractures unfortunately lead to being less mobile, sleep problems, mood changes and reduced general health.

Following an injury there are generally two distinct phases of pain. An understanding of this is particularly relevant for people who have had a vertebral fracture as a result of osteoporosis. This is because pain may continue after bones heal.

Types of pain

Acute pain: This happens immediately when a bone breaks and will usually lessen over several weeks as injured tissue and bone heals.

When a fracture of the spine occurs, the bone may trap or irritate one or more nerves and relay messages of pain to the brain. Pain can be felt at the point of injury and in other areas e.g. down the arms, legs or around the ribs. This is because the message of pain is following the injured nerve's pathway.

Your doctor may prescribe pain relieving drugs which you should take as directed.

Chronic pain: This lasts beyond the expected healing time, sometimes defined as longer than three months, and remains even though the bone and surrounding tissue has healed. It is possible the pain is now due to a change in posture and the extra strain that this puts on muscles and ligaments and pressure on nerves.

The experience of pain can become a vicious circle as the strain creates muscle tension which increases the duration and intensity of pain. This creates a fear of future pain which leads to more muscle tension, followed by a hunched position as you try to reduce the pain. Long-term pain can be a difficult and depressing situation to cope with and may also affect relationships with those closest to you.

Pain and pain relief

There is no easy solution that will stop all pain but a good working partnership between you, your family and your GP is a helpful starting point on the road to a happier, more pain-free life. Here is a range of options to try out to find the right one for you.



Drug treatments to relieve pain

There are many different types of drug treatment. Some are available over the counter, while others are only available on prescription. A thorough assessment of your pain may be necessary before your doctor can decide which pain relieving drug may be the most appropriate for you. Be sure to tell the doctor how severe your pain is, where it is, how often you feel it, what makes it better or worse and how long it lasts. Your doctor will also need to know if you are taking any other medicines, including pain relievers. You may find it helpful to track the course of your pain and the effectiveness of treatment by imagining on a scale of 0 – 10 the severity of pain (0 equal to no pain, 10 equal to the most severe pain ever experienced). Recording scores in a diary between visits to the doctor with comments may help to remind you of any worsening or improvement to your symptoms.

Pain relieving medications can be given in a variety of ways but are mainly given as tablets to swallow. Other ways to take pain relievers include tablets dissolved under the tongue, suppositories, gels rubbed onto the skin, patches and various injections.

Mild pain

Pain relievers such as paracetamol or the non-steroidal, anti-inflammatory drug (NSAID) ibuprofen, are sometimes given for mild pain. NSAIDs are available over the counter in a number of different forms and can cause inflammation to the lining of the stomach. Ibuprofen should only be used for the short term (a few days) unless your doctor advises otherwise. These types of drugs can also sometimes make asthma symptoms worse and cause problems such as fluid retention and effects on the kidney or heart. Check with your GP first.

NSAIDs have both pain relieving and anti-inflammatory effects and may be helpful in the initial stages following a broken bone. There is a belief amongst some doctors that NSAIDs should be avoided in the initial days post-fracture as they may dampen the inflammatory process and delay bone healing although opinion differs on this. Again, this group of drugs should only be taken as prescribed and not on an empty stomach as ulceration of the stomach lining may occur.

Paracetamol is a commonly used pain reliever. One to two tablets should be taken every four to six hours to a maximum of eight in 24 hours.

General advice to avoid constipation

- Include plenty of fibre in your diet through eating lots of fresh fruit and vegetables. Linseed may be a useful, natural alternative to laxatives and may be sprinkled onto your cereal or mixed into food. Porridge is another good source of fibre.
- Do not ignore the feeling of needing to go to the toilet, as this can make constipation worse.
- Establish a regular routine for using the toilet.
- Remain as mobile as possible, e.g. go for walks because not moving about can reduce the way the bowels work.
- Consider the use of a regular laxative treatment such as senna. Seek advice from a pharmacist or your doctor for the most suitable preparation for you.



Paracetamol has a pain relieving effect but no anti-inflammatory properties. It does not cause as much gastric irritation as NSAIDs.

Paracetamol should not be used by anyone with known liver problems, due to its toxic effect on the liver in high doses. Your local pharmacist or your doctor will be able to advise you further.

Remember to take your pain relievers regularly, as prescribed. This helps to keep on top of the pain and prevents it escalating out of control. Taking only one tablet instead of two and only when the pain is unbearable is not going to control the pain. It will also mean that you end up feeling worn out and irritable with yourself and those around you.

Moderate (stronger) pain

The group of drugs commonly used to help control moderate pain includes co-dydramol, co-codamol and co-codaprin. These drugs contain either paracetamol or aspirin plus codeine or dihydrocodeine. The codeine products available over the counter contain lower doses of codeine than products prescribed by your doctor. If a stronger pain relieving effect is required, then codeine, dihydrocodeine and tramadol may be used

sometimes in conjunction with paracetamol or NSAIDs such as diclofenac. Your doctor will help you find the most effective medicine.

NSAIDs, such as ibuprofen, can be used alongside paracetamol. However always check your medications to make sure you are not taking two products that both contain paracetamol, or both contain NSAIDs, as there will be a maximum number of each you can take daily.

Codeine is very useful to help with pain but it can cause constipation or nausea (see box above).

Severe pain

For a minority of people, particularly following a newly broken bone or following an operation to repair a broken hip, strong drugs such as morphine may be necessary for a short while. The side effects associated with these drugs include drowsiness and confusion which can increase the risk of a fall and further fractures occurring, especially for frail, older people. Morphine and other similar drugs may cause nausea in the first week or two, therefore an anti-sickness drug may be useful initially until the nausea settles. Your doctor will have to balance the effects of any treatment of pain against your medical history and safety.

Other drug treatments

Some people worry that they will become addicted to these types of drug. Often these drugs may be given initially for two to three days following a spinal fracture before moving to a codeine/paracetamol combination if appropriate. However if pain is severe and long-standing it may sometimes be necessary to continue with strong pain relievers. In reality it is not usually a problem coming off long-term opiates, if it is done gradually with the supervision of your doctor. Sometimes, admission to hospital after spinal fracture for assessment and pain management can help to break the cycle of acute pain.

Sometimes, low doses of anti-depressants such as amitriptyline may be prescribed. Your doctor is not suggesting you are depressed but is using this type of drug because it can help to control associated nerve pain. The drowsiness these cause can, however, aid sleep at night. The dose for pain is a fifth to a quarter of that for depression. Diazepam (a muscle relaxant) may also be considered because it is useful in relieving any persistent muscle spasms you may have experienced during the acute period of pain.

Anti-epileptic drugs such as gabapentin are sometimes used as they can have a pain relieving effect.

Calcitonin is a drug which inhibits the action of the cells which break down bone (osteoclasts). Given for the first week or two following a painful spinal fracture, it may also help to reduce pain. Calcitonin is given by injection following advice from a specialist doctor. It is also available as a nasal spray. This too seems to relieve pain in some patients.

It is important to take any medicines prescribed for you correctly and report any adverse side effects to your doctor. If you feel your pain is not being effectively controlled, do tell your doctor.

Drug-free treatments

It may sometimes be helpful to use other therapies or treatments. You may find some of the following useful to reduce your pain.



Transcutaneous electrical nerve stimulation (TENS) machines

A TENS machine works on the same principle as rubbing an area after it has been hurt. The body relays this touch message to the brain which in turn lessens or blocks the feeling of pain by stopping the pain message from reaching the brain. TENS also encourages the body to produce endorphins, a group of chemicals that occur naturally in the brain and have pain relieving properties similar to opiate drugs such as morphine.

TENS machines are quite small and portable. Some can be clipped to the waistband of a skirt or trousers so mobility is not restricted. The machine itself has wires with small adhesive pads attached to them which are placed on

either side of the spine, just above the area of pain, or following a painful nerve pathway e.g. around the ribs. When in use, a tingling sensation is felt but this should not be painful or unpleasant. The depth and frequency of the tingling pulse can be easily adjusted to suit your individual needs.

You can borrow a TENS machine on a trial basis for around 28 days from a physiotherapist or doctor's surgery. They are also sold in most high street pharmacist shops.

Hydrotherapy

This is exercise therapy in water. Exercises in water seem to be particularly helpful in relieving pain. Warm water and the support it provides to the body encourages relaxation of tight muscles and joints which, in turn, reduces pain and increases mobility.

If you are very disabled, have not enjoyed swimming in the past or cannot swim, you will need a specialised physiotherapist to help with this. Hydrotherapy is not widely available. Pools are often located within physiotherapy departments and a doctor's referral is required. Some local swimming baths run specific classes for people who wish to do some active exercises in water, but do let the instructor know about any existing medical conditions.



Relaxation

It is easy to fall into a vicious circle of pain, tight muscles, stiffness and more pain. You may find it useful to learn how to relax, particularly if you are in a lot of pain.

Try these simple steps:

- Make sure you will not be disturbed. Put on some gentle music and burn aromatherapy oils or candles containing lavender, which is known for its relaxing properties. There are commercially prepared relaxation tapes available from organisations such as Arthritis Care or from high street stationers.
- Make sure you will be warm and comfortable enough. Lie down on the bed in a comfortable position or recline in a comfortable armchair, perhaps covering yourself with a rug. Use plenty of cushions for support and put one between your thighs.
- Close your eyes and let your whole body feel so heavy that it is sinking into the bed/chair. Let your mind float away. Remain like this for 20 minutes or however long suits you then gently stretch out your body as you might when waking in the morning and ease yourself into an upright sitting position.

- Stay sitting for a minute before getting up. After you have practised your relaxation, always get up slowly so that you do not feel dizzy. Remember to blow out the candles!

Self-management courses

As health information is now easier to obtain, the relationship between patients and doctors is changing. Informed patients are more interested in options and explanations and often want to take more control of their own health. This positive attitude is particularly relevant in the management of long-term conditions such as osteoporosis following fractures.

Self-management courses aim to give people the skills and knowledge to help manage pain, symptoms and emotional problems and also to communicate effectively, set goals and make decisions about their health. Ask your doctor if there is a self-management course in your area.

Physiotherapy and exercise

Following a broken bone, particularly in the spine or hip, your doctor may refer you to a physiotherapist. The physiotherapist will assess you prior to starting any treatment in order to meet your needs and monitor progress. The aims of physiotherapy include:

- Reducing the risk of a fall
- Improving balance and co-ordination
- Improving muscle strength, flexibility, breathing and posture
- Improving mobility
- Increasing confidence and well being
- Reducing/controlling pain
- Helping with changing shape after spinal fractures

If you find it hard to relax, this approach may work for you:

1. First learn to feel when your muscles are working and when they are relaxed. Do this first by tensing them, holding for a second and then letting go completely.
2. Work through your body bit by bit, tensing and then relaxing each big group of muscles.
3. Start with your feet. Tense your toes and legs, hold for a second and then let go completely.
4. Let your knees roll gently out, hold and let go.
5. Tighten your buttocks, then relax.
6. Don't forget your arms.
7. Screw up your face muscles in a frown, make an O with your mouth and then change your mouth shape as if saying E, then stop, relax and feel the difference.
8. Finally, do a whole body stretch from head to toe. Repeat steps 1 to 8 three times.

Physiotherapists can use a combination of pain relieving techniques including TENs machines, hydrotherapy and relaxation, as described above. They may also use the effect of heat. This can work to reduce muscle spasm by improving blood supply to the painful area. This simple treatment can be easily used at home with either a heat pad/wheat bag or a covered hot water bottle.

Sometimes, if there is a degree of inflammation present (soreness, stiffness), a cold pack can be equally helpful e.g. a bag of peas from the freezer, wrapped in a tea towel. Commercial cold packs are available from most major chemists. Use these cold compresses for no longer than ten minutes to avoid ice burns to the skin. Care should always be taken not to use too hot a heat pad or water bottle and not to use them on bare skin. The same applies to cold packs.

Spinal fractures due to osteoporosis can sometimes cause severe back pain. It may seem unbelievable when you are in pain but exercising regularly can actually help to reduce pain. Spinal fractures may cause pain with the slightest movement, so gentle controlled moves can help. You may want to rest in bed or a comfortable chair but try not to do this for long periods unless told to do so by your doctor.

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Remaining immobile for too long can create its own set of problems, such as blood clots, pressure sores, poor circulation, chest infections and you may lose bone density. Most therapists agree that in the early stages after breaking a bone, while the injury is healing, rest with gentle movement is best. However, it is just as important to regain mobility and prevent deterioration of the muscles which hold the spine in place. Even if you suffer from severe curvature of the spine, it is possible that suitable exercise may bring relief and improvement. You may need advice from a physiotherapist.

Exercises that help with posture and build muscle strength may also help reduce pain and increase your sense of well being. Gentle exercises, such as lying on your front and gently raising the head and shoulders by pushing up with your arms, can help to build up the back muscles which can be beneficial to pain. Care needs to be taken when carrying out this type of exercise and it should be undertaken with guidance from a physiotherapist. For more exercises that may help reduce pain, ask your doctor to refer you to a physiotherapist.

i For more information see our booklet *Exercise and osteoporosis*

Complementary therapies and pain

Most complementary therapies have not undergone the rigorous testing and clinical trials expected of conventional medicine so you are unlikely to find proof that they work to reduce pain. However, having gathered sufficient information, you may wish to try complementary therapy as part of your pain management plan.

Some of the most commonly used therapies are acupuncture, osteopathy, herbal medicine, the Alexander Technique, aromatherapy, chiropractic and reflexology.

i For more information see our leaflet *Complementary and alternative therapies and osteoporosis*

Pain management clinics

Most people will find something to help live with the ups and downs of their pain. For those who do not, a referral to a pain management clinic may be considered.

This type of clinic is usually situated within a hospital. The aim of the clinic, which you will probably attend for several weeks, is to enable you to understand the reasons for your pain. It will also help you to understand the effect it >>

has on your life and the lives of those around you, how to use various methods to manage or reduce your pain and perhaps divert your mind from it. Goal setting is often used as a way to help you to return to your usual activities.

In the course of your time at the clinic you will probably see a consultant, a physiotherapist, a nurse specialising in pain management and an occupational therapist who will see how you are managing at home. Sometimes you may also see a psychologist who can help you to cope with the emotional and psychological effects of chronic pain. Many who attend this type of clinic also enjoy meeting others who are experiencing similar problems and pain. In some cases, good friendships are formed. You may also be able to join a patient support group.

Not all pain clinics work in this way. Some do not offer lifestyle advice and complementary therapies and may solely focus on the control of pain by various types of drug treatments. Be prepared that in some areas there is quite a long waiting list to be seen in these clinics.

Managing your pain means that the prevention, lifestyle changes and safety measures learned need to be continued on a long-term basis to maintain good control of your pain.

Surgery to help with pain

There are surgical techniques called percutaneous vertebroplasty and balloon kyphoplasty which may help with the pain of spinal fractures. However, these are not widely available in the UK.

i For more information see our leaflets *Percutaneous vertebroplasty and balloon kyphoplasty and osteoporosis*

Living with fractures:

Pain isn't the only consequence of a fracture, there are lots of other knock-on effects including loss of height and changing body shape due to spinal fractures, loss of independence and fear of falling associated with hip fracture. However, there are other things you can do to feel positive about the future. Our Helpline responds to many queries relating to pain and problems caused by fractures. You will find a few of them on the next page.

Your questions:

What kind of effect will osteoporosis have on my sexual relationship?

Relationships, particularly physical relationships, can become strained especially if someone with osteoporosis becomes fearful of pain because of previous fractures – or fearful of further fractures. The most important thing is to talk with your partner about fears and concerns and, if appropriate, to discuss which positions might be most comfortable for sexual intercourse. Often partners will be worried themselves about causing more problems so sharing your feelings will be essential. Experimenting (and keeping a sense of humour!) often helps.

I'm finding it difficult to find clothing which is both attractive and comfortable, do you have any suggestions?

Finding both comfortable and stylish clothes can be a problem because of the height loss, curvature of the spine and bulging tummy that sometimes accompanies spinal fractures, but there are a number of things you can do:

- Vests and slips with thicker shoulder straps are less likely to slip off your shoulders.
- To avoid the discomfort of a tight waistband, unpick the waistband and sew the skirt onto a full-length slip. This also ensures the skirt hangs evenly.

- Let the waist out on skirts so that they sit comfortably on the hips. They do not ride up at the front easily when worn this way.
- For men, braces can be more comfortable than a tight waistband on trousers and a belt.
- If your bra straps keep slipping off your shoulders, fix a piece of elastic approximately one inch wide between the straps about five to six inches above the back of the bra.
- If you have difficulty in obtaining a comfortable fit with your bra, you can hook on a bra extender which are usually available from sewing departments. This will give you an extra two or three inches at the back of the bra.
- Maternity tights do not tend to dig into the waist the same way as ordinary tights can if you have a distended stomach.
- Loose dresses that fall from the shoulders can be helpful in disguising a larger waistline, as can loose jumpers over a skirt or trousers.
- An elasticated waist on trousers can be more comfortable than a fitted one and can be cleverly hidden by a smart, loose blouse.
- Pinafore dresses are an effective way to hide bulges and are very comfortable.

I've broken my hip after falling on a visit to the shops and am now terrified of leaving the house in case it happens again. What can I do?

Fear of falling is a huge issue for many people and can mean they do not want to get involved with even the most simple everyday activity and are too scared to leave their homes leading to isolation and a poor quality of life. However, it is important to overcome fears and regain your confidence as becoming more independent and mobile will increase your independence, boost your self-esteem and help you to build stronger bones.

Talk to your doctor about a possible referral to a falls clinic.

I'm worried that osteoporosis will mean I will lose independence and have to move into a home. Is there anything I can do to stop this happening?

Losing independence and having to move out of your own home is a natural and very common fear for you to have, but there are lots of things you can do to make sure your own home is safe and easy for you to live in:

- Make sure items used regularly are within easy reach to avoid stretching, bending

- down or having to stand on a chair.
- Wire baskets attached to the underside of shelves provide extra storage space within easy reach.
- Use a long handled dustpan, brush and mop.
- Consider a top loader washing machine to avoid bending down with heavy, wet washing.
- Use a perching stool for working at the sink.
- Various aids for opening jars, cans and bottles are available in department stores and chemists.
- A built-in oven at the correct height, instead of a free-standing one, prevents unnecessary bending.
- Have power points located at waist height to avoid bending.
- Use a lightweight vacuum cleaner.
- A 'grab', also known as an extending arm, can be useful to pick things up.

Useful contacts

Action on Pain

Tel: 0845 6031593
www.action-on-pain.co.uk

Age Concern England

Tel: 0800 0099 66
www.ageconcern.org.uk

Age Concern Cymru

Tel: 029 2043 1555
www.accymru.org.uk

Age Concern Scotland

Tel: 0845 833 0200
www.ageconcernscotland.org.uk

Age Concern Northern Ireland

Tel: 028 9024 5729
www.ageconcernni.org

Arthritis Care

Tel: 020 7380 6500
www.arthritiscare.org.uk

Arthritis Research Campaign

Tel: 0870 850 5000 (UK only) or
+44 (0)1246 558033
www.arc.org.uk

Back Care

Tel: 0845 130 2704
www.backcare.org.uk

beat (beating eating disorders)

Tel: 01603 619090
www.b-eat.co.uk

Breast Cancer Care

Tel: 0808 800 6000
www.breastcancercare.org.uk

British Thyroid Foundation

Tel: 01423 709707
or 01423 709448
www.btf-thyroid.org

Coeliac UK

Tel: 0870 444 8804
www.coeliac.co.uk

Counsel and Care

Tel: 020 7241 8555
www.counselandcare.org.uk

Expert Patients Programme

Tel: 020 7922 7860
www.expertpatients.co.uk

Extend (movement to music for the over
60s and less-able people)

Tel: 01582 832760
www.extend.org.uk

Food Standards Agency

Tel: 020 7276 8829
www.eatwell.gov.uk

Help the Aged

Tel: 020 7278 1114
www.helptheaged.org.uk

Klinefelter's Syndrome Association UK

Tel: 0845 230 0047
www.ksa-uk.co.uk

The National Association for Colitis and Crohn's Disease (UK)

Tel: 0845 130 2233 (or 01727 844296)
www.nacc.org.uk

National Institute for Health and Clinical Excellence

Tel: 0845 003 7780
www.nice.org.uk

NHS Direct

Tel: 0845 4647
www.nhsdirect.nhs.uk

NHS Direct Wales (Galw Iechyd Cymru)

Tel: 0845 4647
www.nhsdirect.wales.nhs.uk

Scotland NHS 24

Tel: 08454 242424
www.nhs24.com

Pain Concern

Tel: 01620 822572
www.painconcern.org.uk

QUIT

Tel: 020 7251 1551
www.quit.org.uk

Scottish Inter-Collegiate Guidelines Network

Tel: 0131 623 4720
www.sign.ac.uk

The British Nutrition Foundation

Tel: 020 7404 6504
www.nutrition.org.uk

The British Pain Society

Tel: 020 7269 7840
www.britishpainsociety.org

The National Society for Epilepsy

Tel: 01494 601300
www.epilepsyuk.org

The Patients Association

Tel: 0845 608 4455
www.patients-association.org.uk

The Pituitary Foundation

Tel: 0845 450 0376
Support and information Help Line
Tel: 0845 450 0377
Endocrine Nurse Help Line
www.pituitary.org.uk

The Prostate Cancer Charity

Tel: 020 8222 7622
www.prostate-cancer.org.uk

The Vegan Society

Tel: 0845 4588244
Tel: 0121 523 1730 General Enquiries
www.vegansociety.com

The Vegetarian Society

Tel: 0161 925 2000
www.vegsoc.org

Turner Syndrome Support Society

Tel: 0141 952 8006
www.tss.org.uk

Women's Health Concern

Tel: 01628 478 473
www.womens-health-concern.org