

About exercise for osteoporosis and bone health

Exercise or keeping moving is important for bone health and osteoporosis - whatever your age or wellness and whether you have broken bones in the past or not. Being physically active and exercising will help you in so many ways and is very unlikely to cause a broken bone. If you're just starting out, even small amounts are better than nothing - set achievable goals and take it step by step. Everyone can benefit from exercise, regardless of your condition, including those who aren't very mobile or have fractures because of osteoporosis.

Why is exercise important?

There are many benefits to exercise and keeping physically active:

- It helps to strengthen your muscle and bone, leading to fewer broken bones
- It improves your balance so that you are less likely to slip, trip or fall
- It helps to reduce your risk and symptoms of other medical conditions
- It helps you to continue to do everyday activities and live independently when you are older
- It improves your brain function, makes you happier and builds your confidence

Exercise and osteoporosis

If you've been diagnosed with osteoporosis, or have risk factors, you may want to know how exercise can help to promote bone strength and whether exercise or movements are safe to continue or start doing. Be confident - being active and doing the exercise you enjoy is important - and it's unlikely to cause a broken bone.

A positive approach

After a diagnosis of osteoporosis or if you have risk factors, you should do more exercise, rather than less. It's true that if you have spinal fractures or lots of other broken bones you may need to modify some exercises to be on the safe side, but generally exercise won't cause you to have a fracture.

Remember, it's never too late to start moving. Something is always better than nothing and even minimal exercise could slow down the loss of bone strength. The good news is, if you are well enough to do some more intense exercise, then your bone strength may even improve. You can adapt your exercise according to what you can manage - you'll find something that's right for you.

What is osteoporosis?

Osteoporosis is when bones lose their strength and break easily, often following a minor bump or fall. These broken bones are most common in the wrists, hips and spine and are often referred to as 'fragility fractures'. The word fracture and broken bone mean the same thing. Osteoporosis itself isn't painful, but the broken bones it causes can lead to the pain associated with the condition. Spinal fractures can also cause loss of height and curvature of the spine.



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About exercise for osteoporosis and bone health

Choosing exercise and movements that work for you There are three ways that exercise and safe movement help with bone health and osteoporosis.

- 1. Exercises to promote bone and muscle strength
- 2. Exercises to keep you steady
- 3. Exercises to care for your back

All of these are important; think about how they apply to you, and whether you feel you should prioritise any single one.

For example, if you're fit and well, you may want to look at how you can use exercise to strengthen your bones. Your priority is likely to be different if you have back pain with spinal fractures, meaning you may be looking for information on caring for your back right now. Alternatively, you may need to start with some balance exercises to make you more steady, before you increase your physical activity further. Whether you're looking to build your bone strength, improve your balance or discover ways to care for your back, find something you enjoy and integrate those exercises into your life - that way you will be much more likely to continue.

You can also use our related fact sheets and videos to practise exercise routines and movements within each section.

You can view our range of fact sheets and videos on Exercise for osteoporosis and bone health at theros.org.uk/exercise or request copies of the fact sheets by calling 01761 471771

If you're new to exercise, our Getting started with exercise fact sheet (2) and accompanying videos give you everything you need to feel confident about taking the next steps.





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1. Exercise to promote bone and muscle strength

Being physically active and doing exercise helps to keep bones strong and healthy throughout life. That's because your bones are living tissues that get stronger when you use them. As a child, exercise plays an important part in making our bones bigger and stronger; but as we get older, we start to lose bone strength. That's why keeping up with exercise as you age is important. It strengthens your muscles and keeps your bones strong - making them less likely to break by maintaining bone strength.

What types of exercise do I need to do for my bones?

Bones stay strong if you give them work to do. For exercise to be most effective at keeping bones strong you need to combine weight-bearing exercise with impact and muscle strengthening exercise. Variety is good for bones, which you can achieve with different movements, directions and speeds - in an activity like dancing for example. Short bursts of activity may be best, such as running followed by a jog, or jogging followed by a walk.

What is weight-bearing exercise with 'impact'?

You are weight bearing when you are standing, with the weight of your whole body pulling down on

"For exercise to be most effective at keeping bones strong you need to **combine** *weight-bearing exercise with* impact and muscle strengthening exercise."

Our Exercises to promote bone and muscle strength fact sheet (3) and accompanying video show you how to exercise safely with osteoporosis



your skeleton. Weight bearing exercise with impact involves being on your feet and adding an additional force or jolt through your skeleton - anything from walking to star jumps.

You can get weight bearing exercise with impact by taking part in some physical activity, sports or by doing specific exercises. Depending on what activity you do, the level of impact will vary. The following will help you to understand the difference between low, moderate and high impact exercise:

Lower impact

Walks Brisk walking Marching Stair climbing Gentle heel drops Stamping

Moderate impact

Highland dancing Jogging or running Team & racket sports Skipping & hopping Low level jumping Vigorous heel drops & stamping

High impact

Basketball Volleyball Track events Star jumps Tuck jumps High level jumps



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1. Exercise to promote bone and muscle strength

What is muscle strengthening exercise?

When your muscles pull on your bones it gives your bones work to do. Your bones will respond by renewing themselves and maintaining or improving their strength. As your muscles get stronger, they will pull harder, meaning your bones are more likely to become stronger.

To strengthen your muscles, you'll need to move them against some resistance. Increasing muscle resistance can be done by adding a load for the muscles to work against, such as a weight in your hand, using an elastic muscle resistance band or using your body weight during a press up, for example.

As your muscles get stronger and you find the movements easier, you can gradually increase the intensity of the resistance - by increasing the weight of what you lift. This is known as progressive resistance training and research studies have shown that this is likely to be the best type of muscle strengthening exercise for bone strength.

What is high intensity progressive resistance training?

This is when you use weights in a slow, controlled manner and gradually increase the weight of what you lift, as your muscles get stronger and you find the movements easier. You should only be able to complete 8-12 repetitions with your weights or band before your muscle is too tired to do another. In practice your muscles will feel warm, shake or may not want to do the last repetition. Using weights is ideal but if that's too difficult for you then resistance bands are an alternative.

You may want to start high intensity progressive resistance training with an instructor in a gym, so you get the right advice about which weights and machines to use - and most importantly, learn the correct technique. Some instructors will give personal advice to you at home using free weights or bands. Building up gradually according to your fitness level and muscle strength is essential.

Here are some exercises to consider doing:

For your upper body and spine:

- wall press
- bicep curl
- tricep press
- chest press
- back extension
- overhead press
- dead lift

For your lower body and hips:

- squats
- sit to stand
- hip abduction
- extension and flexion
- lunges
- leg press



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1. Exercise to promote bone and muscle strength

	Most people with osteoporosis	If you have spinal fractures or are unable to do moderate impact	If you are not physically strong or able to do regular exercise
Weight bearing exercise with impact	About 50 moderate impacts on most days (jumps, skips, jogs, hops etc.)	20 minutes lower impact exercise on most days – make part of your regular exercise	At the very least avoid prolonged sitting or lying down. Stand up for a few minutes every hour
Muscle strengthening (resistance) exercise	 On 2-3 days of the week (non-consecutive days) Aim for 20-30 minutes of muscle resistance exercise working on exercises that target legs, arms and spine. Working gradually using bands and weights -the most you can lift 8-12 times Build up to 3 sets of each exercise 		

'Looking for more information?

You'll find some answers to questions about weight-bearing, impact or muscle strengthening exercise on page 9.'



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2. Exercise to keep you steady preventing slips, trips and falls

Being physically active, as well as specific exercises, can help keep you steady so you'll be much less likely to fall over and break a bone. This can make a real difference if you have other medical conditions that cause you to fall over or if you are getting older and your balance isn't so good.

If you have noticed that your balance isn't very good, or if you have had a recent slip, trip or fall you can do exercise to improve your balance and muscle strength. It's also important to work on your balance regularly if you are over the age of about 65 and you aren't taking part in physical sport or leisure activity. If you're thinking of starting a new activity like brisk walking it's especially important to have good balance and coordination before you start. We have the resources to help you.

What do I need to do to keep me steady, to prevent slips and trips?

Staying active through regular everyday activities is very important. Be conscious of the amount of time you sit down for and break up any long periods of time you are sitting by standing up for a few minutes every hour or so.

There are specific stability and balance exercises that have been shown to help keep you steady. They make your muscles work together in a way that helps to keep you more stable and less likely to fall. You can learn about these exercises in our Exercise to improve balance and muscle strength fact sheet (4) and video. Once you become familiar with them, you'll find that you can easily fit them into your daily life. Alternatively, you can do activities that promote good balance like tai chi, dance, yoga or Pilates. Exercise that increases your muscle strength will also help to prevent you from falling and if you have had

reduce your risk. You can find out about other ways to stop you falling that aren't related to exercise at fallsassistant.org.uk or on our website and in our All about osteoporosis booklet.

If you are prone to falls, it is best to find a groupbased programme led by a specialist falls instructor (such as the Otago or FAME(PSI) exercise programmes). Contact your local falls service or leisure service where they can suggest how to tailor exercises to suit your needs.

Our Exercises to improve balance and muscle strength fact sheet (4) and accompanying video show you how to exercise safely with osteoporosis



How much and how often should I exercise to improve my balance?

People who are unsteady or over 65 and not doing regular exercise

- Balance exercises
- 2-3 times a week (non-consecutive days). Up to 10 repetitions of each exercise

People who are particularly prone to slips, trips and falls

- Highly challenging balance and muscle strengthening exercise
- Building up to 3 hours a week or 25 minutes per day over at least 4 months



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spinal fractures which have affected your posture,

doing exercises to help with posture may also help



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Figure 1 - Chief Medical Officer's guidelines on physical activity for children, adults and older adults.

For your general health - the UK Chief Medical Officer guidelines recommend:

- Children 60 minutes of moderate intensity physical activity daily
- Adults moderate intensity aerobic activity for 150 minutes a week (could be 30 mins on 5 days of the week). This means enough to get warm, get your heart rate up, and make you slightly out of breath. In addition, muscle strengthening exercise on at least 2 days a week.
- Older adults (over 65 years) Same aerobic activity plus improve balance and coordination on at least 2 days a week. Avoid sitting for extended periods.

And remember:

For bone health - you need to also include some weight bearing exercise with impact, and ideally work your muscles quite hard if you are able

3. Exercise and movements to care for your back

Many people experience fear about simply moving, lifting and everyday living after a diagnosis of osteoporosis and particularly after painful spinal fractures. This is often based on a misunderstanding about what you can and can't do. A diagnosis doesn't mean you need to limit what you do. In fact, we want you to understand this is the moment you would benefit from keeping mobile and active. Remember that most people with osteoporosis are unlikely to experience a spinal fracture during exercise. Keeping your back straight - as part of moving and lifting - and learning safe moving and lifting techniques, minimises your risk of spinal fractures and may help to relieve pain. This applies equally to you whether you have a spinal fracture or not. With our range of information on exercises to care for your back, you can learn and continue to move with confidence.

What types of exercise can I do to care for my back? Specific exercises can strengthen back muscles and

improve pain, posture and other symptoms after spinal fractures related to height loss and spinal curvature. Following the gentle exercises in our Exercises for back pain after spinal fractures fact sheet (5) may help with pain by improving muscle tone, easing tension and reducing muscle spasm in your back. You can use our Exercises to help with posture fact sheet (6) to learn some exercises that promote the health of your spine and help to reduce the strain on your joints, tendons and muscles. Doing these exercises may make a positive difference to some of the symptoms that affect you.

Pilates, yoga and other exercise routines can also help. If you have questions about bending forward (flexion), you can look at our *Bending forward with* osteoporosis fact sheet (8) and our Pilates exercises - modifications with osteoporosis fact sheet (9) and accompanying videos, where you may find the answers to help.



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3. Exercise and movements to care for your back

How much and how often should I exercise to care for my back?

Exercises to strengthen back muscles to help with posture	on 2-3 days of the week (non-consecutive days)	These back executive exercise position them, rather them, rather them, with thicker residuely weights. Aim for 10, held
Exercises to relieve back pain	Daily exercises. Consider asking your doctor to be referred to a physiotherapist if you have painful fracture or mobility problems	

kercises focus on holding ons for longer or repeating han making them harder sistance bands or heavier or 3-5 repetitions or up to d for 3-5 seconds

Is there information about simple day to day movements, and lifting?

We understand you need to be able to bend forward and move around for everyday activities. This is generally safe and won't cause a spinal fracture but there are a number of safe techniques for day-to-day moving and lifting that you can learn to help reduce your risk of injury. Read our Moving and lifting safely fact sheet (7) or watch the accompanying video they'll help you to feel more positive and in control. You'll also see how we use the 'hip hinge' as a simple technique for safe bending that can be practised and integrated into all day-to-day movements. The rule of thumb is to 'think straight' - keeping a straight upper back (with the neck in line with the spine) for all movements that involve bending and lifting. Remember, safe lifting techniques are recommended rather than any notion of only lifting up to a specific weight or avoiding it altogether. Try to engage your abdominal muscles during movements and always move in a smooth, controlled way within a comfortable range. Any twisting or rotation movements should be safe if they are performed smoothly and comfortably. There are misunderstandings about bending forward with osteoporosis, and whether it will cause a spinal fracture - but remember, we're here to help you make sense of the information and can give you what you need to know, when you need it.





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Ouestions and Answers

Here are some answers to questions that we are often asked about exercise and physical activity:

Is it safe to do impact exercise, like running and jumping, with osteoporosis - or will it cause a fracture in my spine?

The higher the impact the better for bone strength, at least up to moderate impact (like low level jumps, jogging or hopping). Research shows that moderate impact exercise is generally safe for most people with osteoporosis and gives your bones sufficient impact to promote bone strength. If you have been doing high impact exercise (star jumps, track events, basketball) without pain or fractures, then you are probably safe to continue to do so. However, it's worth noting that there is insufficient research evidence to determine whether high impact exercise is more effective or safe for everyone with osteoporosis or an increased fracture risk. Impact exercise is unlikely to cause a spinal fracture but to be on the safe side, if you have had spinal fractures (or have broken lots of other bones because of osteoporosis) aim for lower impact exercise. If your spinal fracture didn't occur during exercise, then building up gradually to a moderate level of impact may be

appropriate.

If you are planning to increase your exercise levels and you are at all unsteady, start with some balance exercises first to help you maintain your steadiness and reduce your chance of injuries. If you have other medical

conditions that make impact exercise unsuitable, such as painful arthritis of the knees, you may need to concentrate on muscle strengthening exercises.

Is any exercise that strengthens muscles going to strengthen my bones?

Muscle strengthening exercise helps to maintain your bone strength, but you need to increase the work you want your muscles to do over time (progressive muscle resistance) to promote (do the very best for) your bone strength. If you are fit and well, try to increase the intensity of your muscle strengthening exercise using resistance bands or weights.

Is there a limit to how much weight I can lift with osteoporosis?

No, there isn't a specific weight that is safe or a limit beyond which you will cause a spinal fracture. If you have had spinal fractures, then it's natural to feel quite vulnerable however it is how you lift rather than how much you lift that matters. It is important to use a

good technique when you are lifting something. Look after yourself by thinking ahead and planning. If you lift something and you can feel the strain in your back, then stop. Think whether you need to reduce the weight or change how you are lifting. And you can always help yourself by following our exercises to help care for your back.

Can exercise make a difference to my bone strength?

Exercise is especially important when you are building bone strength in childhood and through your twenties as your bones grow in size and strength. The evidence in adulthood is less clear, but doing exercise and keeping active may improve bone strength or even bone density through into old age. Importantly, keeping physically active and doing exercise does help to stop you losing bone density and strength as you age. If you are able to do more intense impact and muscle strengthening exercise, then some small research studies show you may improve bone density and this could potentially reduce your risk of fractures.



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Ouestions and Answers

Will swimming or cycling help my bones?

Swimming and cycling will meet the broader Government guidelines on physical activity (see Fig 1), however, these activities are not weightbearing and don't provide impact. They may strengthen muscles to some extent but because the weight of your body is held by the water or your bike, there isn't much force going through to your bones. It's probably not enough to promote bone strength. But using water paddles when swimming might increase the resistance to some extent. You can be creative by incorporating some weight-bearing impact though - for example, jogging 25 paces on your way to the pool and 25 on your way out.

What activity, or leisure and sports activities, will strengthen my muscles and help my bones?

The following are examples of activities that may help to maintain bone strength, but you probably need to include more intense progressive muscle resistance exercise to be most effective for strengthening your bones:

- heavier gardening
- hill walking
- heavy housework or maintenance
- circuit training

- aerobics
- pilates and yoga

Am I too old for exercise to help my osteoporosis?

As you get older - over 70 - you might not be able to manage the intensity of impact and muscle resistance exercise that is most likely to improve bone strength. However, there is good research evidence that keeping active makes you less likely to have a broken hip and is likely to maintain bone strength. Exercise will at the very least, make you less likely to fall over (see section 2. Exercise to keep you steady) and it may help with pain after spinal fractures too (see section 3. Exercise and movements to care for your back).

What about sports such as horse riding and skiing?

Falls and fractures are more likely for anyone engaging in this type of activity, regardless of your fracture risk. If you have osteoporosis, the risk of a broken bone is going to be higher, but it is still not very likely you will break a bone. If you have enjoyed these activities previously then there is good reason to continue. Activities such as horse riding also help with balance and muscle strength. If you haven't had any fractures already, then the benefits, especially your enjoyment, are likely to outweigh

the risks. There are very few reports of horse riding causing spinal fractures.

If you are someone who has had bones that have broken very easily, including spinal bones, then you are obviously more at risk and will have to make a decision depending on your own priorities and any pain you have from the fractures, your muscle tone etc. Try not to let fear of fractures keep you from having fun and being active. Remember most people with low bone density or risk factors aren't about to break a bone.

Can I exercise instead of taking medicines (osteoporosis drug treatments) for my bones?

There is no conclusive research comparing the benefits of taking medicines for osteoporosis with the benefits of exercise. Your doctor will help you to understand whether your risk of fracture is high enough to need a drug treatment and if you are prescribed medications it will be important to keep taking them to get the benefits you need. Lifestyle approaches, such as exercise and keeping active, are considered a very useful 'add on' but exercise is not a replacement for medications.



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Ouestions and Answers

Is it safe to exercise with anorexia nervosa and low bone density?

Yes, in that moderate impact (or lower impact after a spinal fracture) and muscle strengthening exercise may help to maintain your bone strength. However excessive amounts of exercise with a lowcalorie intake could potentially add to bone strength problems and interfere with recovery from the anorexia. It will be important that you get a treatment plan drawn up, that includes exercise advice, by all the healthcare professionals involved in your care.

Can you do too much exercise?

Surprisingly, there are situations in which too much exercise can be bad for the skeleton and actually increase the risk of broken bones (known as 'fit but fragile'). Exercising to the extreme (exercising daily for multiple hours) can cause fragile bones - elite athletes and dancers are sometimes at risk. There are several factors that combine to cause fragile bones especially in women. These include not eating enough (a low-calorie intake) for the amount of exercise you are doing; low body weight leading to low oestrogen levels (no menstrual periods can be a sign); and not eating the correct nutrients. If this has happened to you, you will need to seek advice from medical advisers within your sports specialty.

Do I need to see a physiotherapist or other healthcare professional before starting to exercise with osteoporosis?

If you have low bone density, have risk factors, or have been told vou have an increased fracture risk, then you should be able to exercise safely and effectively based on the principles explained in our information. However, you should ask your doctor for a referral to a

you are having problems with exercise because of other medical conditions

physiotherapist if:

- you have had a number of falls
- you have spinal fractures causing pain and other symptoms
- you are struggling to exercise.

If you need help and advice about how to exercise, especially to ensure you are using the correct technique, then an exercise professional or instructor at a gym or class will be able to advise you. The important thing to remember, whatever your health and fitness status and exercise programme, is that little and often, progressing slowly, steadily, comfortably and enjoying your exercise is key. It's never too late to begin to work on your fitness and bone strength. No exercise or movement is 100% safe or effective but, fully informed you can exercise wisely and be

confident you are doing the very best for the future.

Remember - you can ask for information, advice and help whenever you need it. And our Getting started with exercise fact sheet (2) and video has excellent information to support you.

Our publications are available free of charge, but as a charity, we would appreciate any donation you are able to give to support our work. Or why not join us as a member to receive our quarterly magazine, packed with useful information, tips and the latest medical news?



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'Thank you to Professor Dawn Skelton, Professor in Ageing and Health, Glasgow Caledonian University, and all other advisers and volunteers who helped to develop our fact sheets and videos about exercise.'



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