

Vibration therapy and osteoporosis

What is osteoporosis?

Osteoporosis occurs when the struts which make up the mesh-like structure within bones become thin causing them to become fragile and break easily, often following a minor bump or fall. These broken bones are often referred to as 'fragility fractures'. The terms 'fracture' and 'broken bone' mean the same thing. Although fractures can occur in different parts of the body, the wrists, hips and spine are most commonly affected. It is these broken bones or fractures which can lead to the pain associated with osteoporosis. Spinal fractures can also cause loss of height and curvature of the spine.

What is vibration therapy?

Vibration therapy is when a mechanical vibration is delivered to the body whilst you are standing on an oscillating (vibrating) platform. As the machine vibrates, it transmits energy to your body, which causes your muscles to contract and relax dozens of times each second with the aim of increasing circulation, muscle strength and flexibility.

Recently there has been increasing amounts of research looking into the benefits of vibration therapy especially for those who are unable to engage with physical activity and its use is becoming much more common in gyms, physiotherapy departments and even at home.

Vibration therapy should be distinguished from vibration slimming machines that involve thick rubber bands or belts placed around your middle which shake you up, sometimes quite violently and are designed for the purpose of weight loss and muscle toning.

The history of vibration therapy and bone health

Vibration therapy was initially developed by scientists involved in space travel. The studies revealed that astronauts who spent months in space stations lost 1 to 2% of bone each month. It was found that they can regain such bone loss by standing on a lightly vibrating plate for 10 to 20 minutes each day.

This discovery has led others to wonder whether vibration therapy could help to prevent bone loss especially for those who already have a diagnosis of osteoporosis and also for those who are unable to do physical exercise because of other health problems. It has long been known that weight-bearing exercise has a positive influence on bone. Some of this benefit is caused by the stresses and strains that muscles and ligaments place on the skeleton so vibration therapy aims to simulate these forces thereby increasing muscle strength with a knock-on benefit on bone.

What types of vibration therapy are there?

There are two main types of vibration therapy available in the UK - Whole Body Vibration (WBV) and Low Intensity Vibration (LIV).

Whole Body Vibration (WBV)

This is where the vibration is transmitted through the use of a large vibrating platform and it usually has a hand rail to hold for safety. These machines are more commonly seen in gyms and fitness studios. Manufacturers of these machines (eg PowerPlate, Galileo, Reviber) usually have a range of machines and programmes that enable the intensity of the vibration to be varied. As with any form of exercise it is important to start new exercises gradually so starting on a low intensity would be sensible. Intensity relates to the amplitude (height) of the vibration as well as the speed (frequency) of the vibration.

This type of vibration therapy is not suitable if you have any of the following conditions:

- Any current or recent blood clots (acute thrombosis conditions)
- If you have a pacemaker
- If you are pregnant
- If you suffer with dizziness or inner ear problems

Also if you have advanced osteoporosis with several spinal fractures, have had joint replacements such as hip or knee or if you have significant cardiovascular disease (such as heart attacks, angina or stroke) vibration therapy may not be suitable so do discuss this with your doctor.

Low Intensity Vibration (LIV)

LivMD devices generally look like a set of large bathroom scales and emit tiny up and down vibrations, 30 times every second, which travel through feet, up the legs and into the hip and lower spine. The LIV signal replicates that made by muscles in the legs and lower back which are necessary for us to be able to stand up straight and have mobility.

Unlike the WBV there are no medical restrictions on LIV therapy. LIV and the devices that offer this treatment have been specifically designed to ensure there are no contra-indications or side effects from use.

I am fit and very active and don't have osteoporosis. Will vibration therapy strengthen my bones?

It is not really clear. It certainly appears that vibration therapy could be helpful in developing muscle tone and improving posture as part of an exercise regime and this in turn could lead to a positive effect on your bones. Some studies have even seen an increase in bone mineral density for some people although there have been other studies that have not found any benefit. Many vibration plates can be found in fitness centres and gyms and could be an addition to an exercise programme. Vibration therapy is also increasingly being used by physiotherapists to assist in some rehabilitation programmes especially for muscle and joint pain. However it is still unclear whether vibration therapy is better at improving bone strength than other types of exercise.

I have osteoporosis. Will vibration therapy help my bones?

It is still unclear whether vibration therapy improves bone strength but there is increasing evidence that it helps to reduce falls. Recent research has certainly identified that WBV therapy may be beneficial as part of a falls prevention programme if you are at risk of falling. Any reduction in falls will reduce the risk of broken bones. There is conflicting research, however, into whether WBV therapy actually increases bone strength. Some studies have identified an increase in bone density, especially in the hips, whereas other studies have shown that there is no benefit. Currently there is no evidence of a reduction in the overall risk of fractures, even if there has been an increase in bone density, other than by reducing your risk of falling.

There is always concern with any type of exercise programme as to whether it will be putting you at an increased risk of breaking bones. Any vibration may be detrimental to the spinal bones if they are very fragile. Also care must be taken when getting on and off the machines. It is important to discuss using any vibration device with your doctor or physiotherapist prior to starting using or purchasing a vibration plate and ensure that you begin on the lowest setting recommended and gradually build up how often you use the machine.

What does the future hold for vibration therapy?

Vibration therapy appears to have the potential to be used for some conditions although a lot more research still needs to be done. Particular areas of interest are whether vibration therapy could be a useful form of exercise for people with other chronic medical conditions that prevent them from taking part in other types of exercise.

Until there is more conclusive evidence, if you have osteoporosis always ensure you discuss with your doctor or healthcare professional about using a vibration plate.

What else can I do to prevent osteoporosis and fractures?

Factors which can help to maintain healthy bones include a well-balanced diet with adequate calcium rich foods; safe sunlight exposure to get adequate vitamin D; regular weight bearing exercise; avoiding smoking and keeping alcohol consumption within the recommended limits (For more information about healthy living for strong bones see our booklets '*All about osteoporosis*' and '*Exercise and osteoporosis*').

Examples of Vibration Plates

Whole Body Vibration (WBV)

Power Plate
www.powerplate.com

Low Intensity Vibration (LIV)

LivMD UK
www.livmd.co.uk

This information reflects current evidence and best practice but is not intended to replace the medical advice provided by your own doctor or other healthcare professional.

This is one of many information resources available about osteoporosis and bone health. View the range at theros.org.uk and order more by calling us on **01761 471 771** or emailing info@theros.org.uk

President: HRH The Duchess of Cornwall. Formerly known as the National Osteoporosis Society.
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 **0808 800 0035**

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