

# **Vibration Therapy** and Osteoporosis

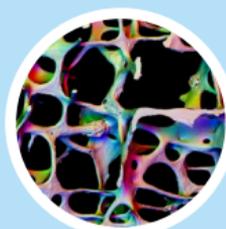


# What is osteoporosis?

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 any part of the skeleton, the wrists, hips and spine are most commonly affected following low-trauma injuries (e.g. a fall from standing height). These fractures lead to the pain associated with osteoporosis. Spinal fractures can also cause loss of height and curvature of the spine.



Strong  
dense  
bone



Fragile  
Osteoporotic  
bone

**This leaflet covers specific information on vibration therapy. If you would like more general information on osteoporosis, please ask us for a copy of our publication All About Osteoporosis.**

# Vibration Therapy

The aim of changes in life style and/or treatments for osteoporosis is to reduce the risk of breaking fragile bones. There is a range of drug treatments available on prescription that do this very effectively. However, there are people who cannot tolerate these drug treatments or simply would rather avoid using them. Other people using prescribed medication for osteoporosis wish to explore the use of therapies or techniques that may be used along side their treatment to benefit their bones. Because of this, there is always great interest in any “non drug therapies” for people with osteoporosis, though it must be recognised that these are not always supported by good research to prove that they reduce the risk of broken bones. Vibration therapy (including Whole

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Body Vibration [WBV] and Dynamic Motion Therapy [DMT]) has provoked a lot of interest recently, especially because of the claims that are made in terms of a possible positive impact on bone density. This leaflet will examine the principles of these techniques and the research that has been conducted into their impact on the skeleton.

Exercise is good for bone. Our bones are designed to respond to the stress placed upon them during normal physical activities and exercise. The best evidence that exercise is beneficial is that no exercise (or lack of strain) is really bad for the skeleton.



An extreme example of this arises during space flight where weightlessness places no strain on bone or muscle and leads to fairly rapid loss of bone and muscle mass and strength. Scientists have discovered that such bone loss may be prevented or recouped by standing on a vibrating plate for 10 to 20 minutes per day.

### **What techniques are available?**

Vibrating plates do not all work in the same way. The vibrations generated by the platform are transmitted to the person standing, sitting or lying on the machine and the intensity and the direction of these vibrations are essential for their effect. Different vibration platforms have different vibration characteristics. Not all platforms perform in the same manner, and this is why the results of using them are different.

There are two distinct types of machine on the market which will be examined separately.

# Whole Body Vibration Therapy (WBV)

e.g. PowerPlate, Galileo etc.

## How does it work?

This vibration technique induces fast but short stretches and contractions in muscles and tendon fibres causing increases in muscle power and strength. The vibrations are transmitted via a platform on which the person usually stands. The vibration is of reasonably high magnitude and frequency and when combined with a programme of exercises it has been found to improve muscle power. As this is its primary aim, these types of vibrating plates are often found in gyms and fitness centres. In the elderly, many broken bones are caused by falls and the risk of falling may be lowered by improving muscle strength. The increased muscle and ligament strength also places the skeleton under greater stress and bone responds to this by becoming stronger. In summary, WBV aims to increase muscle strength with an additional beneficial effect on bone.

## The evidence

There have only been a few small studies examining the impact of WBV on bone in people with osteoporosis. In one study, WBV and exercises increased muscle strength in a similar manner to other types of exercises but the addition of WBV also had a small additional impact on hip bone density. However, there are issues around the safety of this vigorous form of vibration therapy in elderly people with a fragile skeleton and especially those who have broken bones easily. Further work is going on in this area.



# Dynamic Motion Therapy (DMT)

e.g. Juvent 1000

## How does it work?

DMT is based on the premise that some of our muscle fibres twitch or operate at a very rapid rate, even when we're standing still. This rapid muscle action helps us to maintain our upright posture and assists in blood flow return to the heart.

These low-force muscle activities are also thought to encourage bone growth and strength. It is recognised that these particular muscle fibres can deteriorate with age and the hope is that these may be restored by use of DMT. The user usually stands on a plate which emits tiny up and down vibrations. They should adopt a relaxed upright stance (without footwear) and are usually advised to undertake the exercise for 20 minutes a day, five days a week.



## **The evidence**

As with WBV, there have only been a few small studies examining the impact of DMT on bone in people with osteoporosis. While some beneficial effects have been demonstrated in children with disabilities, the impact in adults has not been well evaluated with only relatively small benefits being observed in bone density.

## **Where do we go from here?**

All the problems that are associated with osteoporosis occur as a result of broken bones. When research is performed to assess whether or not a treatment for osteoporosis is effective, it is important that there is strong evidence that the treatment will reduce the risk of broken bones safely and effectively. While this evidence is available for many of the drugs that are used to treat osteoporosis, it is not yet available for vibration therapy. To summarise there is scant evidence yet of the effect of vibration therapy on bone density and fracture risk so it is not possible at present to recommend a specific machine or a regime for how frequently it should be used or for how long at each session.

It is also important that the studies performed into vibration therapy are of sufficient size and test the impact of the intervention on relevant people i.e. people with and at increased risk of broken bones. We await further research into these areas. Anyone with a diagnosis of osteoporosis who is considering using vibration therapy should discuss their plans with their doctor.



**Factors which can help to maintain healthy bones are a well-balanced diet with adequate calcium-rich foods; regular weight-bearing exercise; avoiding smoking and keeping alcohol consumption within the recommended limits.**

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Osteoporosis  
Society**

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