



# **OSTEO VIBE PROGRAM**

## **MODULE 2**

### **EXERCISE AND OSTEOPOROSIS**

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## MODULE 2 EXERCISE AND OSTEOPOROSIS

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### ROLE OF EXERCISE IN OSTEOPOROSIS

Before we get into vibration specific exercise concepts, we are going to take a bit of time introducing you to the role of exercise in osteoporosis management. There's been a lot of confusion about which exercises are the best, or when to start exercising. I've found that a lot of my osteoporosis patients have put in time with exercise, but they didn't know why their bone density was still getting worse. It turns out that most didn't understand what type of exercise actually helps. The following are some key points to know about exercise and osteoporosis. This summary is not designed to be a comprehensive explanation. We prefer that you spend more time actually doing your vibration exercise sessions rather than reading. However, this should give you a good summary of what helps.

- Overloading forces must be placed on bone to stimulate bone formation. This means that you must gradually keep increasing your exercise intensity for it to be effective for bone growth in the long term.
- The two accepted strategies to make your bones resistant to fracture are 1) maximize the gain in bone mineral density in the first three decades of life, and 2) minimize the reduction in bone mineral density after the age of 40 due to endocrine changes, aging, decline in physical activity, and various other factors.
- Physical activity plays many different roles during a person's lifetime. It helps maximize bone mass during childhood and early adult years, maintains bone mass through the fifth decade, helps prevent bone loss with aging, and reduces falls and fractures in the elderly. As you can see, physical activity is a lifelong commitment.

- Bone mass decreases by about 0.5% per year or more after the age of 40, regardless of sex or ethnicity. That's why it's important to address the ability of exercise to slow down or prevent bone loss in this age group, and not necessarily to increase bone density.
- Walking programs of up to 1 yr have provided only modest effects, if any, on maintaining bone mass. Higher intensity activities such as stair climbing and jogging were generally found to be more positive.
- The incidence of hip fracture has been found to be 20 to 40% lower in individuals that exercise
- Women who walked 4 hours per week had a 41% lower risk of hip fracture compared to women that walked less than 1 hour per week. This suggests that even low intensity exercises such as walking can be beneficial, even if you are not going to see much bone density changes.
- Recommended exercises, apart from vibration training, include weight-bearing endurance activities (tennis; stair climbing; jogging, etc.) activities that involve jumping (volleyball, basketball, etc.) and resistance exercise (weight lifting).
- Intensity of exercise should be moderate to high
- Frequency of resistance training should be 2 to 3 times per week
- Duration of exercise should be 30 to 60 minutes, which is a combination of vibration training and other forms of endurance and resistance exercises. The exercise programs should aim to target all the major muscle groups.

## ROLE OF VIBRATION EXERCISE IN OSTEOPOROSIS

Vibration exercise is one of the most effective forms of training that you can do for osteoporosis. I've had over 10 years of experience with vibration and osteoporosis for my patients. What I found was that most of my older patients weren't able to begin any high intensity exercise programs, either due to limitations in mobility, lack of time, or inability to perform high intensity exercises due to fear of injury or lack of knowledge. Vibration exercise allows one to generate a relatively high intensity amount of muscle contractions and bone stimulus in a short period of time. Once you begin vibration training, it's a lot easier to increase the intensity than it is with conventional exercises. Let's face it. I've provided a lot of exercise programs over the years, and I've found that the type of intensity required to achieve positive bone density results was not attainable by some of my patients. That's why we've developed this program. We'll provide you with research references on the effects of vibration on bone density. We'll also go through the different vibration exercise concepts to help you achieve your goals. Finally, we'll also give you recommendations on other exercise programs that you can do.

### First goal of your vibration program is to increase endurance

Vibration exercise is based on following proper exercise principles that have shown to be beneficial for osteoporosis. Module 1 primarily focuses on building up your knowledge of your vibration exercise program. If you feel that the exercise times that we've given you are too difficult, just lessen the time of each exercise. Remember that the first thing we want to build up is endurance. That is done through repetition and not by forcing yourself to endure pain or discomfort. Be patient. You'll be able to build up to about 10 minutes of vibration exercise over the next few weeks. That's why the exercises in this Module are based on increasing your endurance. The exercises are simple, yet highly effective. They provide the foundation for all your future osteoporosis exercises.

## Most common areas to target

The most common areas affected by osteoporosis are the wrist, spine and hips. Therefore, we are going to break these body parts down and focus on one body part per week. This week, the focus is on the hips. The squat exercise is one of the best for the hip. However, make sure you also concentrate on the right part of your foot that will be making contact with the vibration platform - your heels! As you learned in the Vibration Training Sessions, heel contact increases the intensity of the vibration. This simple technique is even more important for the osteoporosis program, because heel contact increases the amount of positive stresses being passed on up the legs to the spine. This also takes time for some people to get used to, so start off slowly and gradually progress to applying more pressure to the heel area.

## VIBRATION RESEARCH STUDIES

The following are some research studies that we've referenced for you. We've also added some of our comments after the findings. If you have any questions about vibration research, simply contact us at [support@vibrationexercise.com](mailto:support@vibrationexercise.com)

J Bone Miner Res. 2004 Mar;19(3):352-9. Epub 2003 Dec 22.

### EFFECT OF 6 – MONTH WHOLE BODY VIBRATION TRAINING ON HIP DENSITY, MUSCLE STRENGTH, AND POSTURAL CONTROL IN POSTMENOPAUSAL WOMEN: A RANDOMIZED CONTROLLED PILOT STUDY.

Verschueren SM, Roelants M, Delecluse C, Swinnen S, Vanderschueren D, Boonen S.

#### SOURCE:

Laboratory of Motor Control, Department of Kinesiology, Faculteit Lichamelijke Opvoeding en Kinesitherapie, Katholieke Universiteit, Leuven, Belgium.

#### RESULTS:

**No vibration-related side effects were observed.** Vibration training improved isometric and dynamic muscle strength (+15% and + 16%, respectively;  $p < 0.01$ ) and also significantly **increased BMD of the hip (+0.93%**,  $p < 0.05$ ). No changes in hip BMD were observed in women participating in resistance training or age-matched controls (-0.60% and -0.62%, respectively; not significant). Serum markers of bone turnover did not change in any of the groups.

#### CONCLUSION:

These findings suggest that WBV (Whole Body Vibration) training may be a feasible and effective way to modify well-recognized risk factors for falls and fractures in older women and support the need for further human studies.

#### OUR COMMENTS:

This was one of the first landmark studies for vibration and bone density

This study not only demonstrated increase in bone density in the hip, but also that there were no vibration - related side effects

The fact this study did not show any increase in spine bone density confirms one of our key recommendations. This study asked the women to do their exercises with weight slightly shifted to the toes and mid foot. We firmly believe that this recommendation led to less impact on the body through the heel. Therefore, make sure you get used to putting more weight towards the heel!

Bone. 2010 Sep;47(3):650-6. Epub 2010 Jun 25.

## EFFECTS OF COMBINED WHOLE-BODY VIBRATION AND RESISTANCE TRAINING ON MUSCULAR STRENGTH AND BONE METABOLISM IN POSTMENOPAUSAL WOMEN.

Bemben DA, Palmer IJ, Bemben MG, Knehans AW.

### SOURCE:

Bone Density Research Laboratory, Department of Health and Exercise Science, University of Oklahoma, Norman, OK 73019, USA. [dbemben@ou.edu](mailto:dbemben@ou.edu)

### SUMMARY:

Whole-body vibration (WBV) has been shown to be osteogenic in animal models; however, its application in humans is not clear. The purpose of this study was to examine the effects of an 8-month program involving WBV plus resistance training on bone mineral density (BMD) and bone metabolism in older postmenopausal women.

Bone metabolism in postmenopausal women was not affected by resistance training either with or without WBV. In contrast, the addition of WBV augmented the positive effects of resistance training on muscular strength in these older women.

### OUR COMMENTS:

This study did not show any increase in bone density after vibration exercise. However, this study also showed no increase in bone density after resistance training, although the consensus among experts is that resistance training is highly recommended for those with osteoporosis.

This study is limited by the amount of exercise and the type of exercise performed with a vibration platform. Too many studies are limited by their need to stick to a 'formula' for exercise. As you will see with your Osteo Vibe program, each of us is unique in the type of exercises we will do, the amount we will do, and the progressions we will go through.

The study also reinforces our position of offering you realistic expectations with your program. Notice that although there was no increase in bone density, the women that added vibration to their resistance training program actually got stronger. Being strong is an important factor in preventing falls and staying mobile and active.

[J Aging Res.](#) 2011 Jan 3;2011:379674.

## **AEROBIC EXERCISE AND WHOLE-BODY VIBRATION IN OFFSETTING BONE LOSS IN OLDER ADULTS.**

[Liu PY](#), [Brummel-Smith K](#), [Ilich JZ](#).

### **SOURCE:**

Department of Nutrition, Food and Exercise Sciences, The Florida State University, 120 Convocation Way, 418 Sandels Building, Tallahassee, FL 32306-1493, USA.

### **ABSTRACT:**

Osteoporosis and its associated fractures are common complications of aging and most strategies to prevent and/or treat bone loss focused on antiresorptive medications. However, aerobic exercise (AEX) and/or whole-body vibration (WBV) might have beneficial effect on bone mass and provide an alternative approach to increase or maintain bone mineral density (BMD) and reduce the risk of fractures. The purpose of this paper was to investigate the potential benefits of AEX and WBV on BMD in older population and discuss the possible mechanisms of action. **Several online databases were utilized and based on the available literature the consensus is that both AEX (Aerobic Exercise) and WBV (Whole Body Vibration) may increase spine and femoral BMD in older adults.** Therefore, AEX and WBV could serve as nonpharmacological and complementary approaches to increasing/maintaining BMD. However, it is uncertain if noted effects could be permanent and further studies are needed to investigate sustainability of either type of the exercise.

### **OUR COMMENTS:**

The article confirms our position that as you get stronger and feel better with your vibration program, you can gradually increase your other activities, thereby providing you with a more rounded strategy.

Our Osteo Vibe program helps you in combining vibration with other activities. The goal of your program is to not only make small changes with your vibration program, but also with your daily life activities.

The study notes that they are uncertain if the effects are permanent. Obviously the right answer is that your program needs to be a part of your life. Any exercise program will help maintain your gains as long as you continue. That's why you need to make sure you understand that your goals are long term and a 'way of life', not just a quick fix.