

# Can Vibration Therapy Reduce Fall Risk in Elderly Population

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## INTRODUCTION

As we age, bone density and skeletal muscle strength decreases, increasing susceptibility to injury from falls, among others. The integrity of the musculoskeletal system is the main risk factor for falls in seniors (Bissonnette 2010). With life expectancy increasing considerably, the elderly population will continue to grow, and more work will need to be done to reduce risk factors for this population. Thus far, resistance training is the only proven drug-free treatment for Sarcopenia (Johnston 2008). However, for patients with mobility or neurological impairments, resistance training may not be practical. In recent years, research into the utility of vibration therapy treatments has increased. Vibration therapy may reduce the risk factors associated with falls. Consequently, seniors will be able to maintain their independence and quality of life.

## OBJECTIVES

- Evaluate the use of vibration therapy as a drug-free treatment for sarcopenia.
- Determine how vibration therapy compares to resistance training for elderly patients.

## WHAT IS VIBRATION THERAPY?

Vibration therapy (VT) is a method of muscle stimulation in which a device transmits vibrations to the body. This causes muscle fibers to contract and relax, mimicking motion and exercise. VT exists in two forms; whole body vibration devices and localized vibration devices that are applied to a particular muscle. The main focus of this research summary was on whole body vibration, since the vibrations are transmitted through the legs to the body (Roelants 2004), and better suits the lower body strength and balance needs of the elderly population (Bird 2009).



Whole body Vibration. Bird, 2009

## METHODS

- Ask a question: Drug-free methods of preventing falls in elderly patients
- Literature review on vibration therapy and whole body vibration
- Journals and articles were selected from the Michael Schwartz library and PubMed databases based on relevance to elderly patients.

## CLINICAL APPLICATIONS OF VT

Author	n. of Patients	Type of Vibration	Duration	Outcome
Rabini	25	100 Hz	24 weeks	Increased stability and balance
Bautmans	14	30-50 Hz	6 weeks	Increased lower body flexibility
Verchueren	25	30-40 Hz	24 weeks	Increased isometric and dynamic muscle strength
Wang	19	30 Hz	16 weeks	Improvement in functional movements

## RESULTS

- Whole body vibration therapy has shown improvement in balance and postural control.
- Improved muscular strength. It was shown to be as effective as resistance training, but is best used as a supplement to a resistance training regimen.
- Improved lower body flexibility.
- Increased functional movements. Patients were able to walk longer distances and could more easily enter and exit car.

## CONCLUSIONS

Vibration therapy mimics motion and exercise, and has shown to be an effective treatment for sarcopenia. It has also shown significant benefits to balance and postural control (Rabini 2015). All of these are components that impact the prevalence of falls in the elderly. VT works best in conjunction with resistance training, but can be just as effective, especially for those with time constraints or mobility impairments.



Wang, 2015

## FUTURE WORK

More research needs to be done in this relatively new field of study. Its effects on bone density are still being assessed. Other potential areas of research for vibration therapy are treatments for Parkinson's or multiple sclerosis.

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