

## REPORT ON WHOLE-BODY VIBRATION AND OLDER ADULTS FOR 2011

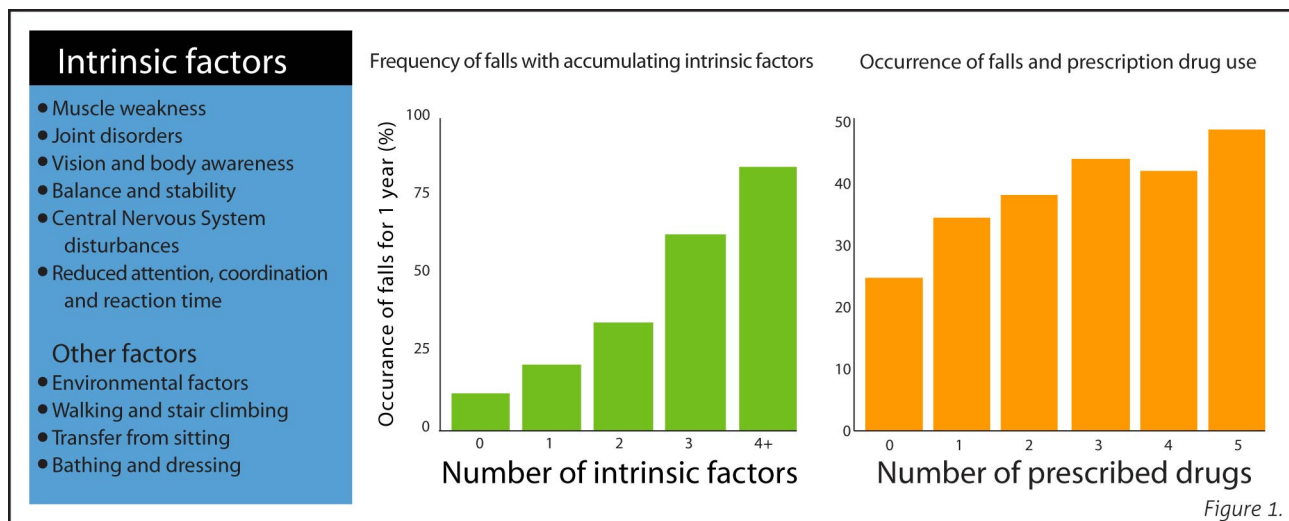
### Whole-body Vibration Exercise Prevents Falls for Older Adults

With a growing older adult population, balance, stability and the prevalence of falls leading to serious injury are becoming a real concern that needs a universal solution. 33% of people ages 65 and over fall at least once each year causing injury. These falls are the leading cause of death for this age group and have become a serious issue. Forty percent of these falls that cause serious injury, involve broken or fractured hips and 50% of these cause permanent damage in which the patient never regains full functional ability.



As we get older muscles become weaker, bones lose density and become brittle and balance and coordination is greatly diminished. As these problems get worse there is a compounding effect. The weaker one becomes the less active they become, the less active they become the faster these problems accelerate causing more inactivity. This compounding effect leads to a drastic increase in falls and the injuries resulting from them.

Physical condition such as weak muscles, low stamina, reflex & coordination reduction and bone strength has a great impact on the likelihood of a falling incident. Unfortunately, it more common today that adults suffering from these effects are given prescription drugs than put on a fitness program. Research shows that prescription drugs have a direct connection with increased falls in these adults. (see Figure 1 below)



Studies show that 20% of men and women 65 years and over did not even know the cause of their falls, inhibiting them from seeking preventative treatment. Osteoporosis affects over 43 million Americans, most of which are female (68%). Preventative treatment is critical to this age group to maintain an active, safe and healthy lifestyle.

## A Better Way – Treatment Without Drugs

Since the studies show that prescription drugs are not the best answer to this problem, what is the alternative?

**Whole-body Vibration Training** has been around for decades but only recently has it entered North America and been used by Doctors, Therapists and trainers. In the past 15 years hundreds of research studies have been done on the technology in regards to bone loss prevention, muscle building, balance and agility improvement, increase of beneficial hormones and metabolism and weight-loss just to name a few. Many Doctors have embraced the technology as a very effective healthy alternative to prescription drugs, which they believe are not the best answer.



Some of the research was done at University of Miami, Miami VA Medical Center Geriatrics Research Center, State University of New York, University of Texas, NASA, McMaster University, and published in the Journal of the American Geriatrics Society, Archives of Physical Medicine and Rehabilitation, Journal of Musculoskeletal Interactions. In fact over 800 medical research reports have now been published by researchers from all over the USA, Canada and Europe.

To begin let's first examine what whole body vibration is and how it works.

### How Whole Body Vibration Training and Vibration Exercise Works

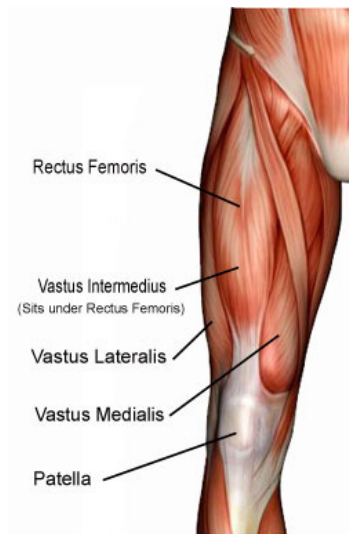
There are two prominent types of WBV platforms on the market, each operating by a different means and having unique characteristics:

- **Tri-angular Oscillating** vibration platforms move vertically and horizontally in an see-saw type motion, moving from 1 to 10 mm. *Most common type*
- **Tri-planar** platforms vibrate vertically and horizontally only about 1 to 4mm. *More for sports training*

Vibration exercise machines create involuntary muscle contractions known as the “stretch reflex”. As the platform moves down the tendon is stretched and then is involuntarily contracted. As the platform moves up to the original position the movement is repeated. This happens very rapidly and up to 30 times a second or 30Hz meaning that 35 muscle contractions are elicited every second. Vibration levels vary between 5 and 30Hz and the workout lasts up to 20 minutes long.

Vibration Exercise Training is a type of resistance training but done without the use of weights and does not stress the joints as in traditional exercise training. Force is applied via “acceleration” instead of “heavy weights” and the stress associated with them.

### The Impact of Strength and Balance



It is clear that there is a direct relationship between strength and balance which is why older people who are weaker, are more prone to falls. Research shows that knee strength alone is responsible for 40% of a person's balance and agility. This is an important factor among the older population with osteoarthritis. A study done on this group concluded that as strength increased, the odds for falls decreased significantly indicating a strong relationship existed between lower-body strength and balance and agility. Even small increases in muscle strength had a major impact on balance and falls.

Vibration Exercise is very effective at working these muscles and is effective for the prevention of falls in older adults. Vibration Fitness is even effective on very frail individuals who have difficulty exercising.

### Strength and Power in Older Adults

Strength gains with Vibration Exercise have been fantastic and studies show an impressive gain of 18% in the chair rising test in adults over 60, which is standing from a sitting position only using your legs.

Common injuries such as hip fractures are often caused by falls and although regular exercise is the most effective preventative measure many older people are unable to exercise effectively to build muscle strength. Vibration exercise machines have been shown to effectively build muscle strength, preventing falls and injury in older adults.

In many cases people have problems sticking to a fitness program due to fatigue or simply losing interest. Research shows that people are much more attracted to whole-body vibration and actually stick with it than traditional exercise. The main attractions were:

- Fast and effective
- Can do it at home (many disliked going to a gym)
- Invigorating workout, more energetic
- Like the way they feel after
- More enjoyable than traditional exercise
- Therapeutic, helped joint pain, etc.
- Very safe, didn't worry about injury

Whole-body vibration exercise has been shown to increase strength equivalent to that observed with traditional resistance training, especially in older adults, without the risk of injury that resistance training can have.

## **Summarizing Vibration Exercise Machine Research**

**This review of the research on Vibration Exercise Machines concludes the following:**

1. Vibration Exercise is effective at increasing strength, power and fitness.
2. Vibration Exercise improves balance and agility.
3. Vibration Fitness is effective at building bone mass.
4. Whole-body Vibration Exercise can decrease the risk of falls and injury in older adults.
5. Vibration Exercise has a positive effect on balance and postural control, especially among those with low fitness levels.
6. Vibration training appears to be safe, with very few side effects.
7. The usage rates over time for Vibration Exercise are very high.

### **Conclusion**

More now than ever, vibration exercise and WBV platforms are being integrated into facilities for fitness, wellness and medical rehabilitation. Individuals and organizations involved with an older adult population should seriously consider this training in their homes or communities as an alternative fitness and falls prevention strategy.

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