

## The Potential *Positive* Effects of Whole-Body Vibration on the Human Body:

Various [research articles](#) have demonstrated that WBV therapy has the potential to achieve many benefits, such as:

- [Bone remodeling](#)
- [Muscle strength](#)
- [Balance & posture](#)
- [Joint flexibility](#)
- [Hormone production](#)
- [Blood circulation](#)
- [Fat reduction](#)

However, it is important to recognize that each of the studies that demonstrated these benefits was conducted under specific parameters of wave type, treatment protocol & duration, vibration intensity, & vibration frequency, and on a specific group of people. It is well-known that individual body types, tissues, & ages can respond differently to an identical vibrational waveform.

As an example, consider two studies<sup>1,2</sup> on very similar platforms (sinusoidal waves at a frequency of 30 Hz, one at 0.3 G, the other at 0.2 G). In the first study, WBV was applied for 10 minutes, twice daily, and the subjects showed no change in bone mineral density; the other group of participants showed improvements of 2.1% to 5% in bone & muscle mass, and only stood on the platform for half the time. What could be responsible for the different results? The first study tested older women (post-menopausal); the other looked at young females.

Scientists have pointed out that aging alters the responsiveness of bone tissue to mechanical forces such as vibration, and a stronger signal may be necessary to provoke a response. This hypothesis makes sense when one considers that another difference between the two studies mentioned above is the amplitude (intensity) of the vibration that was used – the

study on post-menopausal women used the lesser frequency of 0.2 G. Obviously, WBV therapy cannot be considered a “one-size-fits-all” approach to any condition.

## Bone Remodeling

If you want to rebuild bone density on a vibrating platform, you need to understand which combination of waveform, frequency, & amplitude produces the same results as were achieved in the studies below:

- Decrease bone loss, increase bone density<sup>3</sup> (Flieger et al. 1998)
- Increase bone formation<sup>4</sup> (Rubin et al. 2001)
- Increase bone volume, increase bone formation rate<sup>5</sup> (Judex et al. 2002)
- Increase bone formation, decrease bone resorption<sup>6</sup> (Oxlund et al. 2003)
- Increase bone volume<sup>7</sup> (Christiansen & Silva 2006)
- Increase bone formation, decrease breakdown of bone tissue<sup>8</sup> (Xie et al. 2006)

Vibration at the wrong frequency, amplitude, or waveform has been shown to have no effect whatsoever on bone formation in the following studies:

- Vibration had no effect on bone formation<sup>9</sup> (Castillo et al. 2006)
- Vibration produced no change in bone mineral density<sup>10</sup> (Rubinacci et al. 2008)
- Bone mineral density in the hip did not change after WBV therapy<sup>1</sup> (Rubin et al. 2004)
- Both bone mineral density & bone remodeling factors were unaffected by WBV therapy<sup>11</sup> (Iwamoto et al. 2005)
- No change in bone mineral density was observed in the lumbar spine<sup>12</sup> (Gusi et al. 2006)

People of all ages & backgrounds using the Vibe have reported increases in their bone mineral density; read more about their experiences [here](#). Vibe For Health also actively recruits volunteers to have bone density measurements taken before & after using the Vibe, and records this information for future research publication.

It is important to realize that individuals who are currently taking, or have taken osteoporosis medication (such as Fosamax, Actonel, Boniva, etc.) in the last year, will not experience as dramatic improvements in their bone density with WBV therapy as individuals who are not currently taking these drugs. This is primarily due to the formaldehyde-like activity of these drugs upon the bones; while breakdown of old bone tissue is inhibited by these drugs, similarly, the creation of new bone tissue is also impaired. Research articles conducted on subjects who were currently taking an osteoporosis medication did not demonstrate improvement.<sup>11</sup> For additional information on this topic, please click [here](#).

## Muscle strength

If you are interested in using a vibrating platform to build or maintain muscle mass, you'll need a product that can duplicate these results:

- Increased knee extensor strength, speed, & jump height<sup>13</sup> (Roelants et al. 2004)
- Slowed muscle atrophy & increased recovery time after bed rest<sup>14</sup> (Belayv et al. 2008)
- Improved muscle strength & motor capacity in nursing home residents<sup>15</sup> (Bruyere et al. 2005)
- One year of WBV therapy increased muscle strength & mass as much as undergoing a fitness program<sup>16</sup> (Bogaerts et al. 2007)
- Improvements occurred in the isometric & dynamic strength of post-menopausal women<sup>17</sup> (Verschueren et al. 2004)

Avoid wasting your time & money on WBV platforms that show no benefit whatsoever, or even decreased muscle performance, as evidenced by these studies:

- WBV produced no difference in hip or knee muscle strength<sup>18</sup> (Rees et al. 2008)
- Long durations of low-frequency vibration decreased neuromuscular performance time<sup>19</sup> (Floyd et al. 1973)

Just as the effect of WBV on bone formation can be helpful, harmful, or ineffective depending upon the type of vibration used, muscle tissue can similarly be affected in a positive or negative manner by different forms of WBV. As stated by Prisby et al.,<sup>20</sup> in perhaps the most comprehensive review of research on WBV therapy: “*Therefore, dependent upon the frequency and duration of the vibratory stimulus, WBV may be beneficial or detrimental to neuromuscular performance.*”

Vibe For Health uses a computerized algometer to measure the exact force produced by the muscles before and after an individual exercises on the Vibe. Using this objective outcome tool, we have seen dramatic increases in the muscle strength of patients of all ages.

## Balance & Posture

WBV therapy has been suggested as the ideal non-drug treatment to reduce fractures, because not only have certain studies suggested improvements in bone density, there has also been published research showing enhancements in balance after WBV therapy. Obviously, having good balance helps to lessen the risk of fractures by reducing the chance of falling.

Individuals living with Parkinson's disease are particularly vulnerable to the risk of falls & fractures; they have approximately twice the risk of falling when compared to people of the same age who do not have Parkinson's. In some studies<sup>21,22</sup>, postural control & gait steadiness were improved when Parkinson's patients were exposed to WBV. In another study, however, WBV & standard balance training did not improve balance or gait stability in individuals with Parkinson's disease any more than balance training alone<sup>23</sup>.

Vibe For Health uses a computerized force platform (the AccuSway™ from AMTI) that measures sway patterns and center of gravity. When someone stands on this scale, it analyzes how much postural sway is present, and how far away from center their center of gravity is. After five minutes on the Vibe, the postural sway disappears and center of gravity returns to normal.

## Joint Flexibility

People using WBV therapy have reported improved ranges of motion. Scientists are attempting to determine how WBV affects the joints & cartilage. There is a great deal of promise in this regard to determine if WBV could be an effective treatment suffering from osteoarthritis or degenerative joint disease. However, it is also known that excessive mechanical stress upon the joints can contribute to the development of osteoarthritis and increase the rate of degeneration in the joints. It is important to recognize that vibration has the potential to damage joints as well as to help repair them.

## Hormone Production

It is not currently known whether WBV therapy aids in building bone density due to pure mechanical stimulation, hormonal stimulation, or a combination of the two factors. Human Growth Hormone is essential to build strong bones & muscles. Testosterone also plays a vital role in this regard, for both males & females, and cortisol (the stress hormone) has been shown to break down bone & muscle mass. Therefore, it makes sense to assume that vibration which raises levels of HGH & testosterone and decreases levels of cortisol would be more effective in building bone & muscle mass than WBV which did not produce this hormonal effect.

A great deal of attention has been devoted to an article, published in 2000 by Bosco et al, which demonstrated increases in testosterone & Growth Hormone levels, and a decrease in levels of cortisol<sup>24</sup>. However, research has since proven that not every type of vibration causes a hormonal response in the body. Consider the following information from scientific articles:

- No change in salivary testosterone or cortisol was noted<sup>25</sup> (Erskine et al. 2007)
- No effect on Growth Hormone & free or total testosterone<sup>26</sup> (Di Loreto et al. 2004)
- No change in testosterone; Growth Hormone & cortisol increased, then decreased during the first training session; no change in GH & cortisol levels noted during the last training session<sup>27</sup> (Kvorning et al. 2006)

Vibe For Health enlists the services of an independent lab to perform salivary testing & blood work upon volunteers before & after using the Vibe. With our specific product, we have seen increases in Human Growth Hormone & testosterone, and decreased levels of cortisol, in the majority of users.

## Blood Circulation

Researchers are devoting a great deal of effort to determine the effect of WBV therapy upon the circulation of blood & other fluids through the body. This information could be of great benefit to people suffering from diseases which affect the cardiovascular system, such as diabetes.

WBV therapy can also promote rehabilitation of the discs between the bones of the spine. Research has shown an increase in nutrient transport & waste removal in the intervertebral discs after exposure to WBV, which suggests that people suffering from disc degeneration or disc herniations could benefit from WBV therapy<sup>28</sup>. However, numerous studies have found an increase in disc & spinal problems amongst people who are exposed to certain frequencies of vibration for extended periods of time.

## Fat Reduction

As stated by Prisby et al,<sup>20</sup> *“One of the main advertising arguments for use of vibrating devices available on the market is that they promote weight loss or decrease fat mass; however, there is a lack of data in the literature to support these claims.”*

- In one study, 24 weeks of WBV did not alter body weight or total body fat in females<sup>29</sup> (Roelants et al. 2004)
- One of the foremost experts in the field of Whole-Body Vibration therapy, Clinton Rubin, was quoted as saying that once fat cells form, they tend to stick around,

and vibrating won't get rid of them: "If you have a fat mouse, in order to get rid of the fat, you need to metabolize it, just as we've all learned." <sup>30</sup>

The truth to WBV's application toward body composition & weight loss is that respiration, oxygen consumption & energy expenditure have all been shown to increase on a vibrating platform<sup>31,32</sup>, which does suggest that WBV can help to promote weight loss through increasing metabolism. Rubin's work, as reported in the *Proceedings of the National Academy of Sciences*, has shown that mice exposed to WBV for 15 minutes a day had 27-30% less fat 15 weeks later<sup>30</sup>. Bone marrow stem cells have the potential to turn into either bone or fat depending upon their environment, and Rubin theorizes that the increased mechanical stress upon the bones from WBV causes more of these precursor cells to develop into bone rather than fat.

Vibe For Health has not currently done research on the Vibe to determine if weight loss results from regular usage of the Vibe. In accordance with the research referenced above, **Vibe For Health does not claim that using the Vibe will help with weight loss**, simply because there is not enough published data to support such a claim. Be very wary of any WBV platform manufacturer who makes claims that their platform will help you to lose weight, as this claim is currently not supported by research. While the research that demonstrates an increase in oxygen consumption & energy expenditure utilizes a vibrating platform that is very similar to the Vibe (in terms of frequency & amplitude), and therefore it is reasonable to assume that the Vibe would achieve similar benefits, Vibe For Health is also currently planning a research study to determine if metabolism, respiratory rate, & oxygen consumption increase while standing on the Vibe.