Whole Body Vibration Therapy

Vibration therapy for circulation is something that is increasing in importance, especially for the elderly and diabetic population. Over the last few years, circulation seemed a distant thought in everyone's minds when they were looking to see how vibration therapy would be beneficial. There seemed to be more focus on bone density, fat loss, and sports performance. However, we're going to take a look at a new study that is beginning to show the positive benefits of vibration therapy for circulation. Over the last 40 years a tremendous body of research has been compiled as to the beneficial effect of vibrational exercise.

Vibration therapy increases circulation

In the past, various vibration therapy research studies have shown a substantial increase in circulation and blood flow. A recent research study decided to pursue similar research, but added various other modalities to the mix. We know that vibration therapy increases circulation, but can it be something that you can use with other forms of physical therapy to enhance the effects? In a study in the Medical Science Monitor journal, researchers evaluated not only vibration therapy, but also moist heat. The study evaluated the effects of various modalities, such as active vibration, passive vibration alone, moist heat alone, moist head combined with passive vibration, a commercial massaging heating pad, and no intervention. The study dealt with relatively healthy older men. The conclusion from the study showed that skin blow flow in the legs was the greatest in the group that consisted of moist heat combined with passive vibration. The skin blood flow increased by 450% after 10 minutes of the therapy and stayed at about 379% for 10 minutes after the vibration therapy treatment.

Vibration therapy combined with heat increases circulation

Previous research has shown that vibration therapy can increase circulation. There's been studies showing a doubling of the circulation. There's also been studies showing a positive effect of vibration therapy for healing of burns. This is one of the first studies that are showing a shift from vibration alone to including it in the treatment process. This is a great shift in research since it now takes vibration therapy seriously. Adding it to other forms of treatment will certainly enhance the results of the treatment. Moist heat and vibration therapy appears to enhance each other here. That's good news for those looking for an alternative solution to more aggressive forms of treatment for their circulation problems.

Vibration therapy and circulation treatment

These results correspond directly with our experiences on the effects of vibration therapy for circulation. We've seen the effects in a wide variety of cases, such as diabetic neuropathy, restless leg syndrome, venous insufficiency, chronic disc herniation with radiculopathy (sciatica), and healing of ulcers. These type of results were nothing short of amazing, considering that most of these patients were resistant to various other forms of therapy prior to seeking treatment with vibration therapy. Although the results are amazing, it doesn't take away from the fact that in its simplest form, vibration therapy is actually a simple treatment tool to use for physical therapists, chiropractors, and other health professionals. Vibration therapy is just another form of exercise. We know that exercise is highly effective in these health conditions. The only problem was getting these patients to engage in exercise that would be beneficial. The diabetic neuropathy patients were limited by pain and lack of mobility to engage in a sufficient amount of exercise to generate muscle contracts that would help increase circulation. The same could be said for most of the health conditions listed here. Passive vibration therapy, as demonstrated in this study, showed that it can be an effective form of exercise therapy for increasing circulation.

If you suffer from circulation issues, then vibration therapy is something you, or your health care provider, may want to consider. However, it's also highly recommended that you begin to develop lifestyle changes such as exercise and nutrition in addition to the treatments. For health professionals. you can see that vibration therapy does not need to be a stand alone form of treatment. It can be used with other modalities and treatment methods to enhance the results that you are going to achieve. **Vibration therapy for circulation** is just one form of positive effects that you can achieve to increase health and well being.

Over the last 40 years a tremendous body of research has been compiled as to the beneficial effect of exercise. It is now very well accepted that regular exercise, as part of a healthy lifestyle will keep you mobile, flexible and strong.

Working on the 3 components of mobility- flexibility, strength and balance, we can have very productive, enjoyable and long lives.
Whole Body Vibration keeping it has become significantly easier to stay in shape.

We have also poured over research on osteoporosis and have put together a work-out regimen using the WBV based on those findings!

Below you find a list of the physiologic reasons for maintaining the flexibility and pliability of tissues. It is by no means a complete list, but it demonstrates very well the importance of keeping tissues active.

- Reduces tension in muscles and helps muscles relax: many studies have shown that increased flexibility can significantly reduce aches throughout the body, an issue that is significantly on the rise with today's sedentary lifestyles.
- Exercise improves flow of oxygen and intake of essential nutrients: it allows the muscles to work properly. muscles that are not pliable tend to cut off their own circulation, which can result in lack of oxygen and nutrients.
- Helps reduce and manage stress: with flexibility comes a significant reduction in the "tension" in your body. you will feel less stressed, which is essential because stress is a leading contributor to chronic diseases.
- Improves your posture: exercising your lower back, shoulders and chest properly helps to align your back and improve your posture - which helps to take the strain and excessive workload of the spine, particularly the neck.
- Improves circulation: exercising increases the blood supply to your muscles and joints, improving circulation throughout the entire body
- Reduces the degeneration of your joints: working out helps to increase your range of motion and may slow the degeneration of joints.
- Helps to eliminate or avoid low back pain: flexibility in the hips, hamstrings, and pelvic muscles helps to remove stress from your spine that causes lower back pain.
- Helps to eliminate pain from stress on muscles: exercise makes muscles flexible and loose, reducing the shortening and tightening effect from working your muscles and the associated aches and pains from it!
- Improves clarity and focus: for many of the reasons noted above, such as improved blood and oxygen circulation and reduced body tension, you will experience greater mental clarity and focus.
- May reduce your risk of injury: flexible muscles are not as likely to become injured from extended movements.

Whole Body Vibration or (WBV) is relatively new concept in training, exercise and sports rehab. WBV utilizes vibration stimulus to incite an involuntary response in the nerves, muscles and ligaments. Mechanoreceptors, that include muscle spindles, and Golgi Tendon Organs (GTOs for short) are the sensory organs of the muscle which are sensitive to mechanical stimulation. Muscle spindles send information to higher cortical centers in the brain with information on the tension of the muscle, causing the muscle to contract when excited. Conversely, when the GTO (which is located inside muscle tendons) is excited, it causes the muscle to relax.

Thus, when stimulated by vibration, the muscle spindles, tendons and GTOs send impulses to the brain and cause the muscles to contract and relax at the rate of vibration; a phenomenon called Tonic Vibration Reflex (TVR). This response recruits nearly 100% of the muscle fibers in contraction and enhances neuromuscular efficiency. Skeletal muscles contract and release at the same frequency of the vibration. So, for example, if standing in a squat position on the vibration platform set at 30 Hz, muscles will contract and release 900 times in a 30 second session. These numbers would be impossible to stimulate during a normal exercise regime.

The mechanical rationale behind using WBV is simple, yet powerful. Utilizing perhaps the most well known formula in all of physics, that of Issac Newton's Second Law of Motion: Force = Mass X Acceleration. In traditional strength training, force production is primarily affected by Mass or increasing load by adding weight to an exercise. In WBV therapy, the acceleration variant is manipulated. The acceleration variable is increased as the result of the platform rapidly moving up and down at a specific frequency. Amplitude and frequency can be adjusted to a degree on this machine.

Optimal frequency has been confirmed in numerous papers to be in the 20 Hz - 50Hz range. The acceleration forces resulting from the vibration cause the muscles to contract. Due to this involuntary contraction of the muscles, many more muscle fibers are recruited than a voluntary movement (see Issurin & Tenebaum, 1999). EMG results further confirm this (see Bosco, et. al. 1999, and Delecluse et. al. 2003). The rapid contraction and relaxation of muscles in the 25 - 50 times per second range also works a a pump on both the circulatory and lymphatic systems, increasing blood flow and lymphatic drainage throughout the body (see Kershan - Schindle et. al 2001 and Lohman et. al. 2007).

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Working on the 3 components of mobility- flexibility, strength and balance, we can help accelerate healing and recovery.

While performing stretching or exercise on the vibration plate, almost 100% of the target muscles fibres are recruited. This is achieved by creating an almost constant stretch/reflex in the muscles, known as a tonic stretch/reflex. This basically means that the muscles are contracting at a very high frequency and so force, producing faster increases in muscular strength. Adding to this frequency with the vibration plate allows muscle, tendons, ligament fibres to be stimulated more efficiently, while reducing pain & inflammation
Increased muscular strength and lean muscle mass
Increased muscle flexibility
Increased bone mineral density (especially useful in conditions such as osteoporosis)
Decreased muscular and joint pain
Faster recovery from musculoskeletal injuries
Faster post-workout recovery

Other research supporting WBV therapy:

1) Cheung WH, et. al., "*High-frequency whole-body vibration improves balancing ability in elderly women,*" Archives of Phys Med and Rehab, 88(7), 852-857.
2) Savelberg HH, et. al., "*Whole body vibration induced adaption in knee extensorsl consequences of initial strength, vibration frequency and joint angle*," J Strength and Conditioning Research, 2007, 21(2). 3
3) Rittweger J, et. al., "*Treatment of chronic Low Back pain with lumbar extension and whole-body vibration exercise,*" SPINE, Vol. 27, #17.
4) Luo J, et. al., "*The use of vibration training to enhance muscle strength and power*," Sports Med, 35(1).