

Topic 2

Precision: Why Medical and Sports-Performance Professionals Prefer Power Plate®

Coordination and Skill Development

When a child learns to throw a ball, motor neurons fire in a synchronous manner to perform the physical action. The process of motor learning is dependent upon repetition and interpretation by the movement control center of the brain (the motor cortex). Over time, the synchronization of motor neurons firing becomes more efficient and effective (Hebb, 1949). **For synchronization of motor neuron firing to occur, repetition of the action must be precise (Kottke, 1980).** From an athlete training for speed and accuracy to a deconditioned elderly individual improving balance, this process is the same.

Destabilization - Accelerating Coordination and Skill Development

Whole Body Vibration (WBV) platforms provide a means to accelerate coordination and skill development by destabilizing the body, forcing reflexive subconscious neuromuscular action in muscular and connective tissue to rebalance the body. The vibrations are enough to cause reflexes to engage, however not enough to cause a user to fall. Individuals on a vibration platform are put through a repetitive pattern of destabilization, and the repetition and precision of this movement is the essence of motor skill development.

Clinical Research

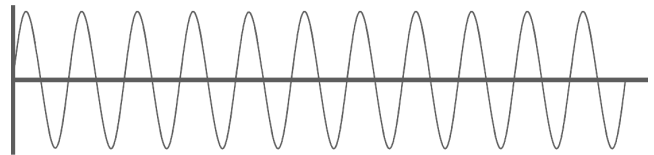
Clinical research with elderly and aging populations has shown improved balance, circulation, and locomotion with use of WBV. Researchers found that after a 2-month program with elderly subjects, mean age of 72, using strength exercise and once per week WBV, the walking speed, step length, and the maximum standing time on one leg were significantly improved over the control group that just performed strength exercise (Kawanabe, et al. 2007). Similarly, another study found in women age 60 and above who engaged in WBV three times per week, statistically significant increases were seen in stability (Cheung, et al. 2007). These findings were also replicated with high-level ballet students showing how all populations can respond to the motor learning process with WBV (Annino, et al. 2007).

Precision of Repetitive Action, the Power Plate Harmonic Vibration

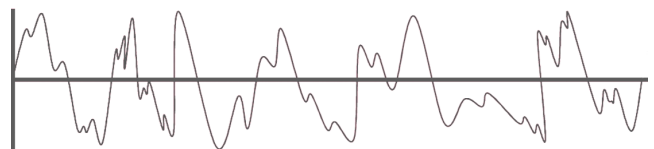
When the body makes a neurological change in motor learning/skill development, precise repetition is required and with WBV, vibration precision is key to effectiveness. Power Plate®, because of its higher standard of precision, has

long stood out among WBV products as the preferred brand of medical professionals, celebrities, and high-performance athletes. Power Plate® moves in a precisely controlled triplanar formation, causing vibratory stimulus that is exacting from one vibration/movement to the next.

A graphic example provided by an Oros® vibration analyzer of the Power Plate® sine wave shows the precision of repetition in each vibration:



Other WBV platforms exhibit a wide range of sine wave inconsistencies, some varying so much as to reduce the value to motor neuron learning to be virtually useless. The following is an example sine wave provided by an Oros® vibration analyzer of another WBV platform:



Power Plate® provides the most precise repetition in the WBV platform category regardless of loading, thereby providing a superior stimulation to the nervous system developing balance, and motor skills, in a shorter time frame than with other interventions, as well as increasing circulation, flexibility, muscular recruitment, and anti-aging hormone release.

Annino, G. Padua, E. Castagna, C. Di Salvo, V. Minichella, S. Tsarpela, O. Manzi, V. & D'Ottavio, S. (2007). Effect of Whole Body Vibration Training on Lower Limb Performance in Selected High-Level Ballet Students. *Journal of Strength and Conditioning Research*. 21(4), 1072-1076.

Cheung, W. Mok, H. Qin, L. Sze, P. Lee, K. Leung, K. (2007). High-frequency whole-body vibration improves balancing ability in elderly women. *Archives of Physical and Medical Rehabilitation*. 88:852-7.

Hebb, D. (1949). *The Organization of Behavior. A Neuropsychological Theory*. New York, NY: Wiley.

Kawanabe K, Kawashima A, Sashimoto I, Takeda T, Sato Y, Iwamoto J. (2007). Effect of wholebody vibration exercise and muscle strengthening, balance, and walking exercises on walking ability in the elderly. *The Keio Journal of Medicine*. 56(1):28-33.

Kottke, F. (1980). From reflex to skill: the training of coordination. *Archives of Physical Medicine and Rehabilitation*. Dec;61(12):551-61.

