**Power Plate® & Pelvic Floor Dysfunction**

**Prevalence:**
It has been estimated that 12–25 million Americans have some form of pelvic floor dysfunction, this translates into 1 in 3 women suffering from urinary and/or fecal incontinence, pelvic floor pain, and pelvic organ prolapse. 60-80% of women develop nerve injuries during childbirth, natural, cesarean section, forceps or vacuum assisted delivery. 36% of women over the age of 45 have some form or a combination of pelvic floor dysfunctions. 60% of all people in nursing homes have one or multiple forms of pelvic floor dysfunction, with incontinence, fecal or urinary, as the primary basis for placement into the assisted living facility. Pelvic floor disorders can be devastating to quality of life, often leading to social embarrassment, depression, lack of self-esteem and isolation. Fewer than half of all women with incontinence seek medical help. (Colosi & Christie et. al., 2008)

**Rapid Reflex Response and Motor Learning:**
Common findings in women with pelvic floor disorders are weakened abdominals with or without rectus diastasis, loss of hip range of motion, postural deviations, pelvic asymmetries, and decreased balance reactions (Kotarinos et. al. 2012). The pelvic floor is often found in a state of disuse atrophy from an imbalanced neuromusculoskeletal system, or in a state of hypertonicity where it is in a chronic contracted state, and cannot handle loading and unloading with basic to high level activities involving shock absorption. In essence, the reflexive nature of loading and unloading, subconscious, activation of the pelvic floor neuromuscular system is diminished. (Bo et. al. 2004)

Power Plate’s harmonic vibration quickly triggers the body’s natural Rapid-Reflex-Response (R³) to adapt to any alteration within the natural environment. With each vibration, your reflexes trigger muscle contractions hundreds of times per second. These rapid and cyclic contractions prepare our body against dynamic gravity and ground reaction forces, challenging our body’s center of gravity to maintain our Base of Support (BOS). With each vibration, Power Plate stimulates rapid reflexive muscle response (Tonic Vibration Reflex or TVR) through our proprioceptors up to 50x per second, improving functional performance, gait and locomotion, balance, range of motion, circulation and stability. This provides submaximal, subconscious feedback throughout the pelvis and pelvic floor, stimulating authentic, three-dimensional tissue stimulation. Thus the pelvic floor receives enhanced neuromuscular stimulation at a more rapid rate from the bottom up to reduce tone, or activate muscles inhibited by altered
neuromuscular patterning or atrophied by disuse. Power Plate enhances motor learning safely and at an advanced rate for immediate and lasting results.

**Therapeutic Effect:**

The “core” is a combination of the abdominal muscles, the low back muscles, hip rotators such as the adductor group and the muscles of hip external rotation, as well as the respiratory diaphragm, and pelvic floor. All of these muscles are layered and interconnected, working in synergy to enhance strength, coordination and balance reactions. Because the pelvic floor works as a unit, pelvic floor disorders will often lead to dysfunction of other organ systems. Patients will often present with weak abdominals, core dysfunction, and loss of hip range of motion, postural deviations, pelvic asymmetries, and decreased balance. Because the foot and ankle are the closest link to Power Plate’s base, movement enhanced proprioceptive excitation enhanced by vibration, transmits forces through neuromusculoskeletal and fascial interconnections to balance your center of gravity functionally feeding subconscious mobility and stability into the pelvic floor.

For tissue that is in a weakened state, or muscle tissue that has abnormally high levels of tension, Power Plate harmonic vibrations provide orderly oscillations, stable in form, shape and speed, for predictable and comfortable facilitation or inhibition of the pelvic core musculature. This feedback is authentic and reproducible, and delivers the benefit of increased efficacy of exercise, greater safety and comfort for enhanced subconscious motor learning.

**Neurophysiology: Tonic Vibration Reflex (TVR)**

The central nervous system (CNS) receives sensory information from the neuromuscular spindle sending a rapid subconscious message through the spinal cord eliciting a motor response. Harmonic vibration facilitates proprioceptive excitation and enhances subconscious muscle memory through increased neuromusculoskeletal feedback. For the advanced patient, condition dependent, it may not be authentic to perform activities of daily living consciously activating (Kegel exercises) the pelvic floor.

With each harmonic vibration of Power Plate, the pelvic core neuromuscular system is encouraged to perform reflexive muscle actions (also known as Tonic Vibration Reflex). Power Plate’s vibration stimulates 25–50 reflexive muscle contractions per second, so performing a rehabilitative exercise at 30Hz for 30 seconds will provoke 900 muscle actions. During an average 30-min. session on Power Plate, you will have as many as 43,000 neuromuscular adaptations depending on your selected functional activity.

**Clinical Research:**

The aim of this study was to determine if two different whole body vibration, sinusoidal vibration (SV) and stochastic resonance vibration (SRV), using various intensities lead to a reactive activation of pelvic floor muscles.
Results:
Both whole body vibration systems were able to activate pelvic floor muscles significantly depending on vibration intensity. Generally, the SRV achieved a significantly higher activation than maximum voluntary contraction, especially in women post partum and using a frequency of 6-12 Hz.

Conclusion:
SRV, compared to SV, leads to higher pelvic floor muscle activation in subjects with weakened pelvic floor muscles and achieves higher pelvic floor activation than maximum voluntary contraction alone. (Neurourol Urodyn. 2009;28(5):405-10.)

Summary:
Power Plate provides the most precise repetition in the WBV platform category, thereby providing a superior stimulation to the nervous system and pelvic core neuromuscular system. It is a vital functional tool for facilitating synergistic neuromuscular re-education and activation, balance, stability, circulation, strength and motor control, in a shorter time frame compared with traditional interventions. It is an authentic and comfortable functional tool to enhance subconscious neuromuscular activation throughout the pelvic floor, safely, comfortably, as it is non-invasive, activating the entire pelvic core neuromuscular system and kinetic chain.

References:
1. Christie, C.M., & Colosi, R.; The Female Chain Reaction: Continuing Education Seminar; Gray Institute; 2008