

# The Physiological Impact of bioDensity™

**bioDensity™ makes possible a safe, self-induced, neuro-musculoskeletal stimulus that provides loading up to multiples of body weight. Such loads are normally associated with impact loading (Marcus, 2006). The U.S Surgeon General states that activities that “involve impact are most useful for increasing or maintaining bone mass”(2003).**

## **Bone Mass Density**

User volunteered unsolicited patient DXA Scans have shown an average 4.5% bone mass gain for individuals in the program for 3 years (n=8). (users/patients from initial Napa Valley, CA test facility). In 1993 The Center for Sports Medicine, at Pennsylvania State University, published a study examining the relationship of bone mineral density to muscular strength in elite junior Olympic weightlifters. The purpose was to better understand the influences of the heaviest types of bone loading on bone mass density. The results of the DXA scans compared the weightlifters to a control group, and showed that the weightlifters had a 133% greater bone mass density in the lumbar vertebrae (L2-4), standard vertebrae BMD testing (Conroy et al. 1993). This reaction involves the habitual nature of imposing load on musculoskeletal structure, and illustrates the loading and adaptive response process that bioDensity™ allows.

## **Impact Level Loading - Sports Performance**

The bioDensity™ Device normative data (bD server, 2011) shows the 75th percentile Leg Press Load Exposure for males between the ages of 20 to 29 (n=104) is 1,974 pounds. This output represents a load many times the typical athlete's body weight.

## **Impact Level Loading - Aging Population**

The bioDensity™ Device normative data (bD server, 2011) shows the 75th percentile Leg Press Load Exposure for females between the ages of 80 to 99 (n=33) is 612 pounds. This output represents a load many times the typical body weight of a female in this age group.

## **Neuromuscular Recruitment and Rapid Health Changes**

Bone density and neuromuscular recruitment work together. As bone mass becomes less porous, with bioDensity™, nerves within the bone are more protected thereby enhancing comfort. As comfort increases, individuals can engage the larger amounts of motor neuron activation, which is further enhanced by the nature of bioDensity™ movement positions. The neurological change of motor learning begins this way, and as the individual repeats and speeds the action, greater neural adaptive response takes place (Hebb, 1949). Use of bioDensity™ engages the greatest amount of muscle cells possible and directly stimulates greater motor neuron activity. Seeing reported force production increases with bioDensity™ use indicates greater neuromuscular recruitment, which will enhance balance, posture, breathing, reflexes and speed.

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