

Topic 2

The Increase of Force Production with bioDensity™

Force production is the metric that bioDensity uses to quantify and analyze changes in the body.

When the use of bioDensity results in an increase in the force an individual is able to produce, the body will have made adaptations. All exercise, has some irritation to the body, and the body's response to the irritation is to engage protective mechanisms IE: adaptation. Three specific adaptations occur and can be measured by the increases in force production with repeated use of the bioDensity device.

Bone Tissue Comfort with Greater Density

When children first begin to walk, then run, they strike the ground with their heels. This loading event during heel-strike impact delivers multiples of body weight in loading/force to their musculoskeletal systems inducing a response in growth of bone mass density. The U.S. Surgeon General states that activities that "involve impact are most useful for increasing or maintaining bone mass" (2004). One of the limiting factors to this type of impact loading is user comfort in response to the loading of bone mass. With bioDensity compressive force/loading stimulates the internal architectural bone matrix to become more dense in the same manner that impact does. As individuals use bioDensity, increases in force production are shown, and can indicate growth in bone density.

Neurological Amplification

By generating force in only optimal biomechanical positions, users are able to recruit the greatest amount of muscular tissue. These positions have been identified through analysis of force production and motor neuron engagement (Mookerjee and Ratamess, 1999). When an individual engages large amounts muscular cells in action, the cells work together more effectively over time (Hebb, 1949). Motor learning, begins this way, and as the individual repeats and speeds the action, greater neural adaptive responses takes place. Use of bioDensity™ engages the greatest amount of cells possible in action as the force in impact position is far beyond what can be used in conventional exercise. This directly stimulates greater neural activity.

Force production increases with bioDensity use indicates greater neural recruitment, which will enhance balance, speed, reflexes and posture.

More Powerful Muscle, Optimized Metabolism

One of the limitations to exercise for weight management, is that the functional capacity of an individual may be insufficient to engage in effective exercise intensity and duration. With bioDensity use, the forces that be tolerated dramatically increase dramatically, therefore normal caloric expenditure with activities of daily living, as well as exercise can increase resulting in more efficient weight management.

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

Kraemer, William J.; Zatsiorsky, Vladimir M. (2006). *Science and practice of strength training.* Champaign, IL: Human Kinetics. p.50.

Mookerjee, S. Ratamess, N. (1999). "Comparison of Strength Differences and Joint Action Durations Between Full and Partial Range-of-Motion Bench Press Exercise. *Journal of Strength and Conditioning Research*, 1999, 13(1), 76-81 National Strength & Conditioning Association.

U.S. Surgeon General (2004). *Bone health and osteoporosis: a report of the Surgeon General.* Rockville, Md. : U.S. Dept. of Health and Human Services, Public Health Service, Office of the Surgeon General; Washington, D.C.: U.S. G.P.O., 2004. p.223.

The logo for bioDensity, featuring the word "bioDensity" in a bold, sans-serif font. The "i" in "bio" has a dot, and the "y" has a tail. The "D" is significantly larger than the other letters. A trademark symbol (TM) is located at the top right of the "y".