



JUVENT'S MICRO-IMPACT PLATFORM FOR INCREASING BONE MINERAL DENSITY IN PEDIATRIC CANCER SURVIVORS

Bone Mineral Density is pivotal for whole body health:

- Skeletal system gives physical support to the human body as well as other major physiological functions such as hematopoiesis- the process of creating new blood cells in the body.
- Our skeletal system is a key component of our endocrine system.
- Proper of skeletal health is imperative for physical strength, immune and circulatory system.
- Bone mineral density (BMD) during childhood and adolescence is critical to establish sufficient bone mass to support and maintain skeletal health throughout life.

Bone Mineralization is severely compromised in pediatric cancer survivors:

- About 47% of pediatric cancer survivors are severely impaired for proper bone mineralization resulting in suboptimal BMD that persists into adulthood affecting their total body health.
- Primarily due to cumulative effects of the disease, chemotherapy, radiation, physical inactivity, and poor nutrition.
- In the U.S. itself, 300,000 pediatric cancer survivors suffer from post-chemotherapy bone and joint damage.
- Weight-bearing exercise or nutritional supplementation have not shown to improve BMD in these patients.

Low-magnitude mechanical stimulation (LMMS) in bone morphogenesis:

- Low-magnitude mechanical stimulation (LMMS) is a relatively new technology which has shown to improve bone mineralization significantly.
- LMMS is applied through the feet, by standing on a platform oscillating at relatively high frequency.
- The mechanical signals are anabolic to the skeletal system by stimulating mesenchymal stem cell populations toward osteoblastogenesis.
- LMMS is non- invasive and non-pharmacologic with minimal risk for adverse events.

Juvent's Micro-Impact Platform: A world leader in LMMS technology for healthcare and sports applications

- Juvent Micro-Impact Platform is the result of \$45 million of research and development, which has culminated in over 20 patents worldwide.
- Its unique LMMS reflects a novel combination of intelligent software, a high-resolution accelerometer, and a precision mechanism that optimizes a signal optimized for each user.
- Unlike whole body vibrational 'shakers' Juvent's Smart Technology provides precisely controlled micro-impacts by self-adjusting the user's unique resonant frequency, so it only needs 0.3 g's of force to be effective.

Juvent's Micro-Impact Platform: New clinical trial, published in JAMA Oncology, shows Micro-Impact Therapy improves bone density in pediatric cancer survivors

- The randomized placebo controlled clinical study was effective in improving total body and tibial BMD in children randomized to the device while children in the placebo group had decreases in BMD.
- Tibial trabecular BMD among participants completing 70% or more of the prescribed sessions increased by a mean of 11.2%.
- Circulating osteocalcin - a bone morphogenesis biomarker at 12 months correlated with change in total body BMD.
- Improved BMD means better bone health, hematopoiesis, and immune system.
- No adverse events with a year of twice daily 10-minute sessions.
- Pediatric cancer survivors with low BMD may benefit from Juvent's Micro-Impact Therapy as a novel and safe intervention to optimize peak bone mass during youth, alone or in conjunction with other therapies.

SAFE: Non-Invasive, non-pharmacologic without side effects

EFFECTIVE: Effective in increasing Bone Mineral Density

EASY: Easy to perform procedure

Literature Cited:

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2. Chow DH. *Low-magnitude high-frequency vibration (LMHFV) enhances bone remodeling in osteoporotic rat femoral fracture healing.* J Orthop Res. 2011 May;29(5):746-52. doi: 10.1002/jor.21303.
3. Nagaraja M.P and Hanjoong Jo .*The Role of Mechanical Stimulation in Recovery of Bone Loss—High versus Low Magnitude and Frequency of Force.* Life 2014, 4, 117-130; doi:10.3390/life4020117

Clinical Benefits of Juvent's Micro-Impact Platform® - 2019®, All Rights Reserved. JR300329-Rev.1
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