CLINICAL BENEFITS OF JUVENT’S MICRO-IMPACT PLATFORM®

**CLINICALLY PROVEN**  **100% NATURAL**  **NON-INVASIVE**  **NO ADVERSE EFFECTS**

**BIOMECHANICAL SIGNALS AND BONE MORPHOGENESIS:**
Beyond physical support, the skeletal system serves many physiological functions such as endocrine, stem cell production hematopoetic and mesenchymal (osteo-, chondra-, adipo-, angio, neuro, and myogenic). Proper skeletal health is vital for physical strength and proper maintenance of the endocrine and circulatory systems. Developing optimal bone mineral density (BMD) during childhood and adolescence is vital to establishing sufficient bone mass to support and maintain skeletal health throughout life.

To date, prevention of bone loss has been approached principally through nutrition, vitamin supplements and pharmacologic intervention. Additionally, the developing skeleton is able to modify its structure and strength in response to biomechanical loading induced by functional activity\(^1\). As a supplement to traditional exercise, brief daily exposure to low-magnitude mechanical stimuli (LMMS) has demonstrated a potential as an adjunct bone therapy with anabolic and anti-resorptive properties\(^3\). LMMS involves standing on a pure linear displacement platform that transmits vertical accelerations well below 1g to weight-bearing bones\(^4\). These mechanical signals are anabolic to the skeletal system by stimulating mesenchymal stem cell populations toward osteoblastogenesis and improved bone mineralization\(^5\). Animal studies and several human clinical studies and trials have demonstrated LMMS efficacy in growing bones, resulting in gains in trabecular bone volume fraction and cortical area\(^6\).\(^14\).

**JUVENT’S MICRO-IMPACT PLATFORM: THE LEADING LMMS TECHNOLOGY FOR HEALTHCARE AND SPORTS APPLICATIONS**
This clinically proven fitness device is the result of $45-million of R&D and 20+ worldwide patents. It’s unique LMMS is a patented combination of intelligent software, sensors, and a precision mechanism that optimizes a signal personalized for each user’s resonant frequency. Its’ signal stays within a safe range of frequencies (32Hz-37Hz) and force (0.2-0.4g’s). Unlike whole body vibration (WBV) ‘shakers’, Juvent provides safe, sub-millimeter micro-impacts. These generate the desired physiological response without risk of injury at energy levels far below OSHA and ISOs safety guidelines allowing use with even children and frail adults.

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Table 1: Completed clinical studies using Juvent’s Micro-Impact Platform®

<table>
<thead>
<tr>
<th>CLINICAL STUDY, YEAR (LIT. CITED)</th>
<th>CLINICAL RESULTS</th>
</tr>
</thead>
</table>
| **POSTURAL INSTABILITY CAUSED BY EXTENDED BED REST IS ALLEVIATED BY BRIEF DAILY EXPOSURE TO LOW MAGNITUDE MECHANICAL SIGNALS, 2011 (1)** | - 29 healthy adults  
- 10 min daily for 90 days  
- Clinical Trial  
  
- Ankle, knee and back strength  
- Knee endurance decreased between 10.2% and 20.0% in the control group  
- Knee endurance decreased between 2.4% and 14.2% in the LMMS group |
| **PLANTAR VIBRATION IMPROVES LEG FLUID FLOW IN PERIMENOPAUSAL WOMEN, 2005 (2)**                   | - 18 Women aged 46-63yr. free of acute illness  
- 12 months  
- Clinical Trial  
  
- Plantar vibration serves to significantly enhance peripheral and systemic blood flow, peripheral lymphatic flow, and venous drainage, which may account for the apparent ability of such stimuli to influence bone mass. |
| **PREVENTION OF POST-MENOPAUSAL BONE LOSS (3)**                                                  | - 31 patients  
- Randomized double placebo controlled  
- 20 min/daily for 6 months  
  
- Treatment group with high compliance had significant relative BMD increase in femoral and spine outcomes |
| **MUSCULO-SKELETAL HEALTH IN YOUNG WOMEN WITH LOW BMD, 2006 (4)**                               | - 48 patients  
- 10 min/daily for 12 months  
  
- Cancellous and cortical bone density increased by 2.1% and 3.4% respectively in the treatment group  
- No adverse effects |
| **BMD IN PEDIATRIC CANCER SURVIVORS, 2016 (5)**                                                  | - 10 min/twice daily for 12 months  
- Clinical Trial  
  
- Effective in improving whole body and tibial BMD  
- Tibial BMD increased by a mean of 11.2% in highly compliant group  
- No adverse effects with twice daily 10 min use |
| **BMD IN PEDIATRIC CROHN’S PATIENTS, 2016 (6)**                                                 | - 10 min/daily for 6 months  
- Clinical Trial  
  
- Trabecular BMD and cortical area outcome measures improved significantly  
- No adverse effects |
| **BMD IN THALASSEMIA PATIENTS, 2012 (7)**                                                       | - 18 patients  
- 20 min/daily for 6 months  
- Pilot Study  
  
- Whole body BMD and serum markers of bone formation increased significantly  
- No reported adverse effects |
| **BMD IN PEDIATRIC CEREBRAL PALSY PATIENTS, 2010 (8)**                                           | - 31 patients  
- 10 min/daily for 6 months  
  
- Greater increase in the cortical bone outcome measurements during the vibrational treatment period  
- No adverse effects |
| **LOW MAGNITUDE MECHANICAL LOADING OSTEOGENIC IN CHILDREN WITH DISABLING CONDITIONS, 2004 (9)** | - 11% increase in trabecular bone density in the tibia following six months of treatment, in contrast to the 6% loss of bone mineral density in children standing on placebo devices |

*Bone Mineral Density

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Tab.2 Specific differentiating features of Juvent’s Micro-Impact technology

<table>
<thead>
<tr>
<th>FEATURES</th>
<th>Whole-body vibrators</th>
<th>Juvent Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivered stimulation type</td>
<td>High to Low Magnitude</td>
<td>Low Magnitude</td>
</tr>
<tr>
<td></td>
<td>High Frequency</td>
<td>High Frequency</td>
</tr>
<tr>
<td></td>
<td>High Displacement</td>
<td>Micro Displacement</td>
</tr>
<tr>
<td>Amplitude type</td>
<td>Variable (1g-12g)</td>
<td>Micro-impacts (0.3 g)</td>
</tr>
<tr>
<td>Machine software-induced stable posture</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>User’s body composition-calibrated amplitude/frequency adjusting</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Induce uncontrolled &amp; variable frequency</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Induce key bone morphogenic and stem cell genes (e.g. BMP, osteocalcin)</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Stable and uniform resonance with active feedback</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Induces unnecessary pain signaling</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Stable positive dose-response on bone-neuromuscular anabolic signaling</td>
<td>✗</td>
<td>✓</td>
</tr>
</tbody>
</table>

Lit. cited:

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