



To News Editor
For Immediate Release

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CUHK Invents Vibration Platform to Improve Human Musculoskeletal System

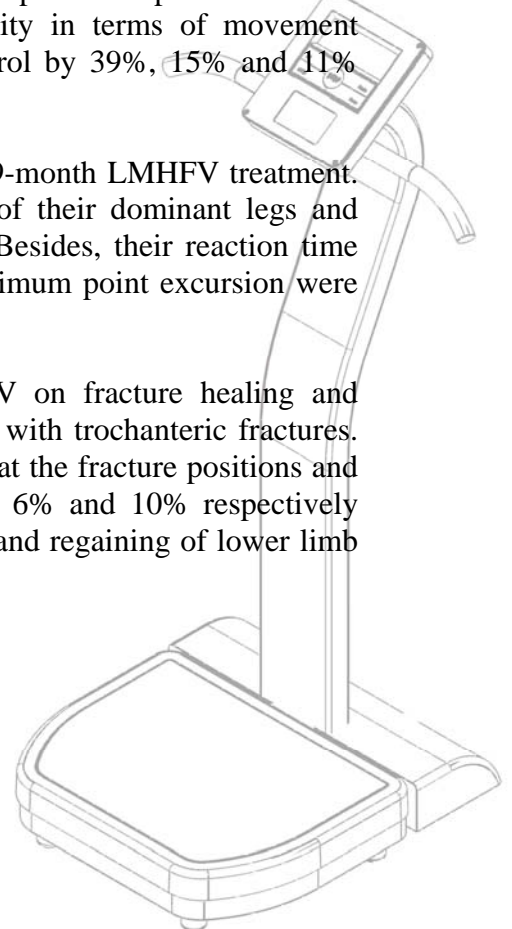
The Department of Orthopaedics and Traumatology at The Chinese University of Hong Kong (CUHK) has developed an innovative vibration platform that could prevent and improve osteoporosis and related diseases by employing low-magnitude and high-frequency whole-body vibration (LMHFV). The vibration platform also improves blood circulation, relieves pressure and other muscle and bone problems, such as low back pain and poor balance due to degeneration in muscles and neurological diseases. By matching the natural frequency of the human body, the platform provides mechanical stimulation to improve the musculoskeletal system.

Led by Prof. Leung Kwok-sui, Professor of Orthopaedics and Traumatology at CUHK, a research team has consistently proved the effects of LMHFV treatment by human studies and laboratory animal experiments since 2005. The first study was done on normal and induced osteoporotic animals with fracture. Research results showed that fracture healings have accelerated by over 30%. Fracture callus formation, mineralization and remodeling were also enhanced.

Subsequently, a three-month study was conducted on post-menopausal women. Results showed that the treatment has enhanced stability in terms of movement velocity, maximum point excursion and directional control by 39%, 15% and 11% respectively when compared with the control group.

In another study, 29 normal elderly were subjected to a 9-month LMHFV treatment. The results indicated that the muscle strength of both of their dominant legs and sub-dominant legs has shown significant improvement. Besides, their reaction time was reduced by 18%, while endpoint excursion and maximum point excursion were increased by 17% and 12% respectively.

Furthermore, a clinical study on the effect of LMHFV on fracture healing and postoperative rehabilitation was conducted on 40 elderly with trochanteric fractures. After a six-month treatment, their bone mineral densities at the fracture positions and directional control in balance ability have improved by 6% and 10% respectively when compared with the control group. Fracture healing and regaining of lower limb functions were notably enhanced.



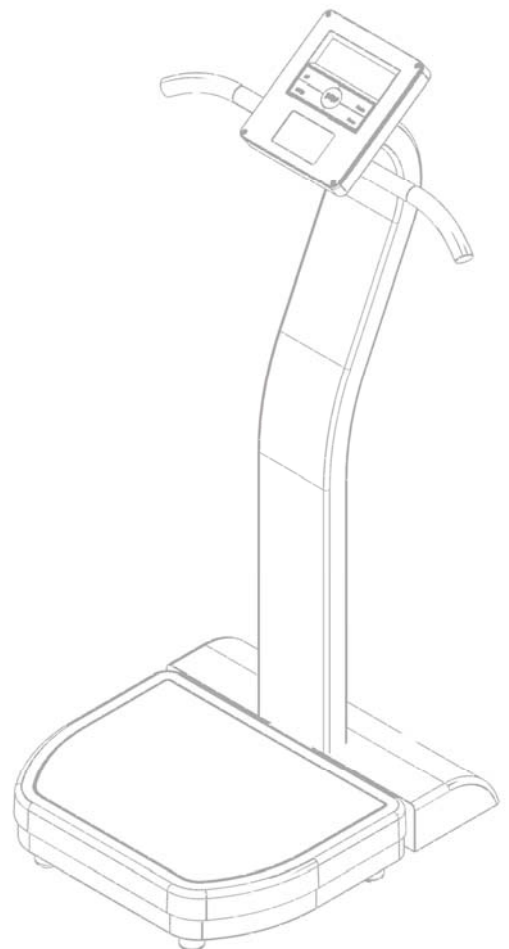
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In addition, Professor Leung collaborated with the China Astronaut Research and Training Centre to investigate the efficacy of LMHFV on healthy young men who were kept for 60 days of complete bed rest which mimics the space flight with no gravity. The outcome further reinforced the positive impacts of vibration treatment in maintaining muscle strength. For example, the chair-rising time is 17% faster than the control group. With reference to the results of animal experiments, clinical studies on post-fracture elderly and post-menopausal women, as well as studies on prolonged bed rest, LMHFV treatment is proved to be beneficial to the musculoskeletal system.

The LMHFV technology is widely applicable. Besides the elderly, bone fractured patients and post-menopausal women, it can also benefit patients with Osteoarthritis and Parkinsonism, athletes who need to train up their muscles and people who want to maintain their bones and muscles healthy.

Developed with a unique technology, the innovative and low cost vibration platform is designed to achieve high energy efficiency, with low noise in operation and low maintenance needs.





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致編輯先生
請予發放

中大研發強化人體骨骼及肌肉的全新振動平台

香港中文大學（中大）矯形外科及創傷學系研發了嶄新的高頻率、低幅度全身振動治療平台，透過人體全身的振動刺激原理，強化骨骼、提昇肌肉功能、改善血液循環、減輕背痛及紓緩情緒等，對預防及治療骨質疏鬆及相關疾病具一定療效。高頻低幅的振動治療技術配合人體骨骼肌肉的自然頻率，可應用於多種骨骼肌肉系統疾病。目前已有多項研究肯定其成效。

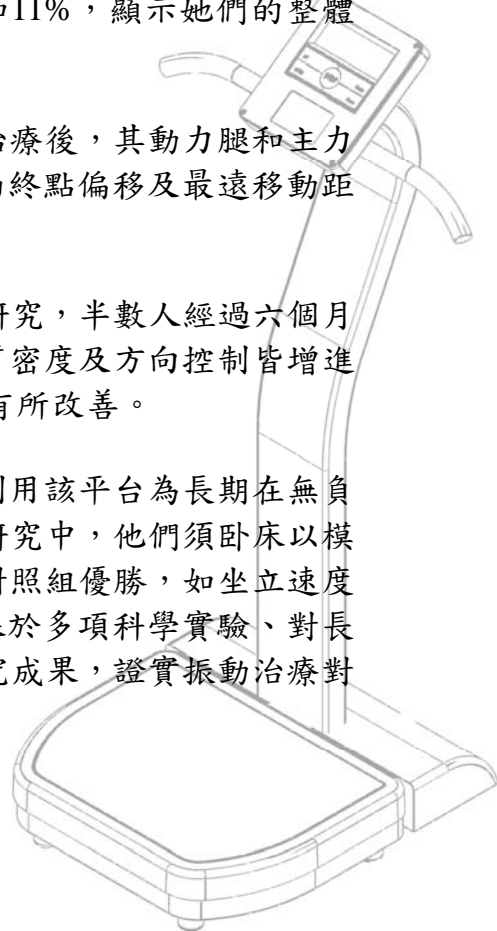
中大矯形外科及創傷學系講座教授梁國穗教授率領的科研團隊，在2005年開始進行有關研究。研究人員首先在動物上進行測試。結果顯示，高頻低幅的振動治療可加速正常骨折和骨質疏鬆性骨折後的癒合，速度較對照組快30%以上，而且更有效改善骨癒的生長、骨礦物質化及恢復骨骼形狀。

研究人員其後在人體上進行測試，首批為剛停經的婦女。結果發現，剛停經的婦女在三個月的振動治療後，在平衡能力測試中的移動速度、最遠移動距離及方向控制分別較對照組優勝39%、15%和11%，顯示她們的整體平衡力有明顯改善。

另外，29位健全的長者經過了為期九個月的振動治療後，其動力腿和主力腿肌肉的力量均有進步，反應時間縮短了18%，而終點偏移及最遠移動距離亦分別增加17%和12%。

研究團隊再邀請了40位髖關節骨折長者進行臨床研究，半數人經過六個月的振動治療後，與對照組比較，其手術位置的骨質密度及方向控制皆增進了6%及10%，顯示他們的骨折癒合和下肢肌力均有所改善。

梁教授更與北京中國航天員科研訓練中心合作，利用該平台為長期在無負重狀況下的年青人提供振動治療。在為期60天的研究中，他們須卧床以模擬在太空的無重狀態。結果顯示，他們的肌力較對照組優勝，如坐立速度加快了17%，再次證明振動治療有效強化肌力。基於多項科學實驗、對長者進行的臨床研究和模擬太空無負重情況下的研究成果，證實振動治療對骨骼及肌肉系統具顯著療效。



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由於振動幅度溫和，振動治療技術除適用於長者、骨折病人及停經後的婦女外，亦適用於骨關節炎患者、帕金森症病人、因傷患而缺乏運動的病人、需要加強肌肉鍛練的運動員，以及注重健康的人士。

中大矯形外科及創傷學系在研發振動平台時，採用嶄新的設計，結構以簡單為主，有效減輕操作時系統的機械摩擦，既節省能源，又可減低機械磨損，達致高效能、低噪音及低成本等多項效益。

二零零九年十一月二日

