**Background and purpose:** The mid-shaft tibia has compromised bone strength index on the paretic side, which is associated with poor cardiovascular health. The results point to the potential importance of promoting cardiovascular health in enhancing tibial bone strength in chronic stroke patients but will need further investigations.

doi:10.1016/j.hkpj.2010.11.012

**Effectiveness of Using Nintendo Wii in Rehabilitation of Chronic Stroke Patients with Upper Limb Hemiparesis**

D. G. Manlapaz, L. A. Silverio, J. A. Navarro, M. F. Ang, M. Regacho, K. A. Canabalder, R. B. Dela Cruz

**Background and purpose:** The runaway success of virtual reality is a novel approach in rehabilitation of chronic stroke patients by improving function through provision of multi-sensory feedback as it becomes part of rehabilitation. The use of Nintendo Wii seems to be evolving into a therapeutic tool as widespread reports claim that it is now being used benefiting patients in rehabilitation centers. However, lack of evidences and standard parameters as to its effectiveness. The objective of the study is to determine the effectiveness of Nintendo Wii in upper extremity recovery of patients with chronic stroke.

**Methods:** There were 16 participants in the study (x = 55.69 ± 9.88 years; months post-stroke x = 38.56 ± 14.51), 11 males and 5 females were recruited in different rehabilitation centers in Metro Manila using random allocation. Eight out of 16 participants underwent Wii Therapy twice a week for 6 weeks Fugl Meyer (FM), Motor Assessment Scale (MAS) and Fast Fourier Transform (FFT) analysis of Wii moter aceleration data were used as an outcome measure. Results: FMS scores showed significant difference between the control & experimental groups with the latter yielding higher scores particularly in the flexor synergy component of FMS. MAS scores of UE function (pre-tests of both groups = p-value of 0.4295; post-tests of both groups = p-value of 0.1031; s = 0.05) of both groups did not reach the significant level, however, the experimental group showed relative improvement as compared to the control group. Preliminary results of FFT analysis showed pronounced magnitude of the dominant frequency and lesser number of residual frequencies in the experimental group compared to control group. Conclusion: The use of Nintendo Wii as a novel approach provided marked improvement in the UE function of chronic stroke patients demonstrated within a short timeframe (6 weeks). The gain in the motor function is highly attributed to the notion that repetitive used of affected limb along thereby enhancing cortical reorganization. Further studies should be conducted to attain a significant level.

doi:10.1016/j.hkpj.2010.11.013

**Association of Cardiovascular Health with Tibial Bone Density and Geometry in Chronic Stroke Survivors**

F. Z. H. Yang, A. Y. M. Jones, S. P. Yip, L. S. W. Li, M. Y. C. Pang

**Background and purpose:** Post-stroke changes in bone density and geometry are common, leading to increased risk of fractures. However, the mechanisms underlying these bone alterations are poorly understood. One potentially important factor which has been overlooked is cardiovascular health, as increasing evidence shows a strong link between cardiovascular disease and bone loss in other populations. This study aimed to investigate the association of cardiovascular parameters with tibial bone density and geometry in chronic stroke survivors.

**Methods:** Thirty-seven chronic stroke patients and nineteen healthy older adults participated in the study. Peripheral quantitative computed tomography (pQCT) was used to measure bone density, geometry and polar stress-strain index (p-SSI) of the mid-shaft tibia (66% site). Each subject was also evaluated for large artery (C1) and small artery (C2) elasticity indices, cardiac output (CO), stroke volume (SV) using pulse wave analysis and impedance cardiography. Results: The paretic side had significantly lower cortical bone mineral density (BMD), cortical bone area and p-SSI than the non-paretic side among stroke subjects (p = 0.05), whereas the control group showed no significant side-to-side difference in all pQCT parameters (p = 0.05). The tibial PSSI on the paretic side was significantly associated with C1, C2, SV, and CO (p < 0.05). Conclusion: The mid-shaft tibia has compromised bone strength index on the paretic side, which is associated with poor cardiovascular health. The results point to the potential importance of promoting cardiovascular health.

doi:10.1016/j.hkpj.2010.11.014

**Review the Efficiency and Effectiveness of the Lower Limb Amputation Rehabilitation Program in a Community Hospital in Singapore Using the Modified Barthel Index (MBI)**

T. Xu, C. Teh

**Background and purpose:** Some studies on lower-limb-amputation rehabilitation were conducted at the acute hospitals in Singapore. However, there are no similar studies on lower-limb-amputation rehabilitation in a community setting locally. The objective of this study was to review the efficiency and effectiveness of the lower-limb-amputation rehabilitation program in a community hospital in Singapore using the MBI. The role of the community hospital in Singapore is to provide convalescent and rehabilitative inpatient care to patients in the sub-acute phase of their recovery prior to returning to home or community.

**Methods:** This is a retrospective study on the lower-limb-amputation rehabilitation program from January 2009 to March 2010. Only 36 (14 females and 22 males) were discharged home and were selected for this study. Rehabilitation Efficiency (REy) and Rehabilitation Effectiveness (REs) were used to calculate the efficiency and effectiveness of the lower limb amputation rehabilitation program using Shah’s MBI score. REy is defined as the amount of improvement divided by the duration of rehabilitation. REs is defined as the percentage reflecting the proportion of potential improvement actually achieved during rehabilitation.

**Results:** The average length of stay for this group was 50 days. The average REy was 0.51 indicating that the patients made functional improvement on average 0.51 MBI score per day of stay. The average REs was 42.2% indicating that each patient achieved on average 43.2% of their total rehabilitation potential upon discharge home.

doi:10.1016/j.hkpj.2010.11.012