

## International Conference and Exhibition on Physical Medicine & Rehabilitation

August 19-21, 2013 Embassy Suites Las Vegas, NV, USA

## Balance perturbation system to improve balance compensatory responses during walking in old persons

Amir Shapiro Ben-Gurion University, Israel

A geing commonly disrupts the balance control and compensatory postural responses that contribute to maintaining balance and preventing falls during perturbation of posture. This can lead to increased risk of falling in old adults (65 years old and over). It is well known that if the person cannot regain balance a compensatory step will be initiated indicating that the other strategies have failed to recover equilibrium. The compensatory postural responses during walking is one of the goals in fall prevention programs. Most fall prevention programs are usually directed towards improving voluntary postural control. Since compensatory postural responses triggered by a slip or a trip are not under direct volitional control these exercises are less expected to improve compensatory postural responses due to lack of training specificity. Thus, there is a need to investigate the use balance perturbations during walking to train more effectively compensatory postural reactions during walking. Balance Measure & Perturbation System (BaMPer System) provides small, controlled and unpredictable perturbations during treadmill walking. This allows training compensatory postural responses during walking. Preliminary results from one site of a larger randomized controlled study conducted in two different houses for retirement older adults showed a significant improvement in voluntary stepping and in postural stability of older adults that participated in a 3 month training program twice a week, 20 minutes of walking plus unexpected external perturbations of balance during walking.

## Biography

Amir Shapiro received his B.Sc., M.Sc., and Ph.D. degrees in Mechanical Engineering from the Technion, Israel Institute of Technology, Haifa, in 1997, 2000, and 2004 respectively. Currently he is the director of the Robotics Laboratory and a Senior-Lecturer in the Department of Mechanical Engineering at Ben-Gurion University of the Negev, Beer-Sheva, Israel. On 2005-2006 he was a post-doctoral fellow at the Robotics Institute of Carnegie Mellon University, Pittsburgh, PA. His interests include locomotion of multi-limbed mechanisms in unstructured complex environments, navigation algorithms for multi-limbed robots, robots grasping design, control, and stability analysis, climbing robots, snake like robots, multi-robot on-line motion planning, bio-robotics and rehabilitation devices, and agriculture robotics.

ashapiro@bgu.ac.il