Paul S Sung, J Nov Physiother 2015, 5:4
http://dx.doi.org/10.4172/2165-7025.S1.002

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International Conference and Expo on

Novel Physiotherapies

August 17-19, 2015 Chicago, Illinois, USA

A kinematic and kinetic measurement of balance and coordination in subjects with recurrent low back pain

Paul S Sung
The University of Scranton, USA

This presentation is to understand comprehensive postural compensation patterns based on kinetic data on the ground as well as kinematic data from trunk motion to assess balance. Firstly, positional-dependent spinal loading with trunk motion is important to relate with center of pressure from the ground for effective rehabilitation intervention and strategies. The combined kinetic and kinematic measurements lead to a better understanding of spinal movement patterns to clarify the relationship between kinematic and kinetic changes in subjects with recurrent LBP. The first part of my presentation is to provide assessment tools for normalized kinematic and kinetic stability indices while considering visual input during one leg standing. Secondly, the shoulder and pelvis kinematics will be compared based on range of motion (ROM), angular velocity, and relative phase (RP) values during trunk axial rotation. The results of this study will be included the difference in should and pelvic girdle motion in the transverse plane during axial trunk rotation. This pattern of trunk movement could be due to possible pelvic stiffness with neuromuscular constraints. Since subjects with recurrent LBP demonstrated decreased pelvic rotation compared to the shoulder for postural control, increased pelvic flexibility could enhance coordinated movement patterns in order to integrate spinal motion.

Biography

Paul S Sung is Associate Professor in Department of Physical Therapy at the University of Scranton, Scranton Pennsylvania. He conducted his research fellowship at the Iowa Spine Research Center, Biomedical Engineering Department at the University of Iowa in Iowa City, Iowa. He is a member of the International Society for the Study of the Lumbar Spine as well as the American Physical Therapy Association. His research interests include the mechanisms of chronic low back pain, sports injury mechanism, spine biomechanics, and non-operative spine care and its clinical application to neuromuscular control.

drpsung@gmail.com

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