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## Outcome measurement based on kinematic characteristics in patients with low back pain

This presentation is to introduce evidence based kinematic changes in the lumbar spine in subjects with and without recurrent low back pain (LBP) while standing on one leg with visual feedback. The lumbar stability index includes relative holding time (RHT) and relative standstill time (RST). Even though a number of studies have evaluated postural adjustments based on kinematic changes in subjects with LBP, lumbar spine stability has not been examined for abnormal patterns of postural responses with visual feedback. The stability index of the core spine significantly decreased in both RHT and RST, especially when visual feedback was blocked for subjects with LBP. The interaction between visual feedback and trunk rotation indicated that core spine stability is critical in coordinating balance control. A trunk muscle imbalance may contribute to unbalanced postural activity, which could prompt a decreased, uncoordinated bracing effect in subjects with LBP. As a result, kinematic rehabilitation training could be used in the prevention of postural instability. The effect of visual feedback on kinematic changes, such as RHT and RST, has not been carefully considered in subjects with LBP. Statistically significant and clinically relevant differences in postural stability and visual feedback were observed between subjects with and without LBP during the one leg standing test. Subjects with LBP have decreased RHT and RST when visual feedback is blocked. As a result, the early detection of kinematic imbalance might be required to understand compensatory mechanisms and postural adjustments in subjects with LBP.

## 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.

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