

# Effects of Pace and Work Stress on Upper-Extremity Kinematic Responses in Sign Language Interpreters

Matthew Marshall, Ph.D.  
Associate Professor  
Industrial and Systems Engineering  
Rochester Institute of Technology  
Rochester, NY

## **Abstract**

Sign language interpreting is an occupation that suffers from high levels of repetitive motion injuries (RMIs) and burnout due to the high physical and cognitive demands of the interpreting task. The objective of this research was to determine the effects of work pace and psychosocial stress on the wrist kinematics of sign language interpreting. It was found that neither pace nor stress affected mean wrist position, but increased pace resulted in significant increase of both mean velocity and acceleration, with increases ranging from 10.7-18.6%. Increased psychosocial stress resulted in significant increase of left-hand (non-dominant) mean velocity and acceleration, with increases ranging from 14.8-19.5%. No effect of stress was observed for the right hand. In addition, several wrist kinematic variables of interpreting exceeded previously established high risk industrial benchmarks. The results of this work support earlier research which found deleterious effects of work stress on the biomechanical responses of the lower back.

## **About the Speaker**

Matt Marshall has been a faculty member in the Department of Industrial and Systems Engineering at RIT since November 2001. Matt teaches courses in ergonomics/biomechanics as well as statistical quality control, and is actively involved in working with manufacturing and service industries in central and western New York to improve workplace ergonomics and safety. He received his Ph.D. in Industrial and Operations Engineering from the University of Michigan in 2002. His dissertation focused on the assessment of forceful exertion in occupational settings, with a particular emphasis on the use of electromyography and psychophysical methods to quantify the magnitude of forceful exertion. Most recently, Matt has completed research to evaluate the effects of psychosocial stress on the biomechanics of the upper extremities.

*Along with his research presentation, Matt will provide an overview of the Kate Gleason College of Engineering at RIT.*