An Analysis of Shoulder Loading Differences for Simulated Industrial Task Performance between Injured and Non-Injured Subject Populations

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Detailed characterization of differences in motions between injured and non-injured populations has not been widely studied. These motion differences may have an impact on physical loading of injured populations performing work tasks. This study included analysis of tasks performed by three populations: control, spinal cord injured, and low back pain. Shoulder loading was examined for goal-directed simulated sagittal and lateral plane work tasks through calculation of maximum external dynamic shoulder moments. The significant main effects in determining shoulder moments included: type of task performed (one or two-handed load movement), horizontal distance to target, vertical height of target, and population membership. There was also a significant interaction effect between population and task type. This study establishes that both task requirements and injury status quantitatively effect shoulder loading, particularly for lateral motions, and suggests that ergonomists should consider factors beyond task-defined characteristics when designing job interfaces for injured populations.

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