Torso Movements of People with Spinal Cord Injury and Low Back Pain

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Functional limitation in seated manual transport tasks was quantified in spinal cord injury, low back pain, and control participants. Seated participant performed either two-handed or one-handed transport movements to target shelves at 0 (forward), 45, and 90° (right) azimuths. Torso movements were measured and modeled by combinations of cubic B-splines. The statistical comparisons of each group's movement patterns indicate that the SCI and LBP participants exhibit smaller torso flexion and axial rotation than control participants, and the SCI participants tend to move the torso away from the target by lateral bending and extension. These differences are minimized in the one-handed transport condition and/or transports to the close targets. The movement patterns suggest that persons with SCI may have adapted strategies to compensate for the limited control of upper body balance, while persons with LBP may limit torso motion to avoid pain. Furthermore group differences reduced in a specific transport posture and target positions indicate that special care should be taken for the design of workspace and task for workers affected by SCI and LBP.

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