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Hemispheric Asymmetries in Movement Planning and Control in Adults with Stroke: Impact on Occupational Therapy Interventions

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Introduction: In the United States more than 69% of the 750,000 annually experiencing a stroke have mild to severe upper extremity dysfunction affecting their skilled performance of every day tasks. Research with the stroke population suggests that there are not only motor control deficits in the "affected" upper extremity but also subtle deficits in the "non affected limb". Understanding these deficits and their impact on occupational performance can influence the occupational therapist's choice of efficacious intervention strategies for patients with stroke. **Objective:** Using a well established motor control paradigm, this study examined vision and task complexity in movement control of the "unaffected arm" in patients with stroke to determine the extent of movement control dysfunction underlying skilled performance of the "unaffected Limb". **Design:** A between groups, multifactorial design. **Setting:** Occupational therapy motor control lab. **Participants:** Twelve right-hand dominant adults matched for age and gender with and without a CVA were recruited. Participants were screened for intact cognitive and perceptual functioning, as well as, normative hand function for their age. **Intervention:** Each participant performed six trials of simple and reciprocal tapping (similar to keyboarding) with and without vision using the unaffected limb. **Main Outcome Measures:** Spatial and temporal measures of limb movements across conditions were obtained. **Results:** Each group demonstrated an increase in movement time with increasing task complexity but there were no significant differences between the groups. However, in the control group, reaction time increased in the vision conditions with increasing task complexity but decreased in the patient groups suggesting less use of vision in the preplanning of movements. Patients with stroke demonstrated more kinematic movement abnormalities underlying simple task performance. **Conclusions:** Movement planning and the movement profiles of patients with stroke using their unaffected limb differ from the typical person using the same limb. Occupational therapy rehabilitation of movement control and function in stroke may be enhanced by teaching clients strategies focused on the planning and control of movement using different task conditions. Also, occupational therapists in treatment planning may need to take into account bilateral limitations patients with stroke may encounter in everyday task performance.