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Feasibility and Effects of Accelerometer Based Feedback on Paretic Upper Extremity Amount of Use in the Home Setting in Subjects Chronic Post-Stroke

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Abstract

Purpose : to (1) evaluate the feasibility of using accelerometers in the home to quantify how much subjects chronic post-stroke (PS) use their upper extremities (UE), (2) measure differences between amount of UE movement in subjects PS and a healthy control group (HC), (3) determine the effects of accelerometer based feedback on paretic UE use in subjects PS, and (4) determine if those effects are retained over time.

Methods : Six subjects PS wore accelerometers for 3 weeks with two feedback sessions given during week two. Seven HC subjects wore accelerometers for one week. Accelerometer based outcome measures included relative paretic or nondominant UE time active (overall, 1 handed, 2 handed), and arm ratio (paretic/nonparetic or nondominant/dominant). Statistical analysis (SPSS v. 22.0) was performed to evaluate differences and relationships.

Results : 11 of 13 subjects (of varying severity of impairment post-stroke) completed the entire study confirming feasibility in the home. HC subjects had significantly higher amount of use than subjects PS ($p < 0.04$) for all outcome measures. There was no significant increase in amount of use for subjects PS after receiving feedback ($p > 0.56$), but some subjects had increased amount of use for some of the outcome measures.