

## **Functional Utility of Wearing a Myoelectric Upper Extremity Orthosis in Chronic Stroke Survivors with Moderate Hemiparesis**

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Stroke remains a leading cause of long-term disability worldwide, often leading to motor impairment and consequent decline in functional independence. Upper extremity (UE) hemiparesis is especially common post-stroke and often leads to decreased independence with self-care activities of daily living (ADLs). The purpose of this study was to determine if wearing a portable, myoelectric elbow-wrist-hand orthosis (MEWHO) immediately reduces motor impairment and increases functional ability in chronic stroke survivors ( $\geq 12$  months) with moderate UE hemiparesis ( $n=18$ ). Participants first underwent a battery of measures testing UE motor impairment and functional ability without the MEWHO, then were re-tested on the same battery of measures while wearing the MEWHO. The primary outcome measure was the UE section of the Fugl-Meyer Assessment (FM); secondary measures included a battery of functional tasks and the Box and Block Test (BB). While wearing the MEWHO, subjects exhibited significantly reduced UE impairment (FM:  $t=8.56$ ,  $P<.001$ ) and significantly increased quality of movement during select functional tasks (feeding [grasp]:  $z=2.251$ ,  $P=.024$ ; feeding [elbow]:  $z=2.966$ ,  $P=.003$ ; drinking [grasp]:  $z=3.187$ ,  $P=.001$ ). Additionally, subjects showed significant decreases in time required to grasp a cup ( $z=1.286$ ,  $P=.016$ ) and increased gross manual dexterity while wearing a MEWHO (BB test:  $z=3.42$ ,  $P<.001$ ). This was the first study, to our knowledge, to compare the effects of a myoelectric UE orthosis versus no orthosis in UE hemiparesis. Results suggest that wearing a MEWHO significantly decreases UE motor impairment, increases gross manual dexterity, and increases functional ability for individuals with UE hemiparesis post-stroke.