A Systematic Review of the Use of Accelerometers in Upper Extremity Stroke Rehabilitation

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Introduction

Stroke is the leading cause of long-term adult disability in the United States (National Stroke Association, 2017), and impaired upper extremity function is one of the most common yet difficult results of a stroke (Gillen & Nielsen, 2016). The necessity for rehabilitation focused on the upper extremity is emphasized by the multitude of possible localized impairments, including but not limited to the following: abnormal muscle tone, sensory changes, and paresis, with the latter being the primary determinant of upper extremity functional loss (Lang, Bland, Bailey, Schafer, & Birkenmeier, 2013).

Over the last decade, technological advancement has given researchers a cost-effective solution to objectively measure and monitor bodily movements, making technology an integral part of current and future stroke rehabilitation (Iosa, Hesse, Oliviero, & Paolucci, 2013). One mode of technology in particular has been used increasingly in upper extremity stroke rehabilitation studies – accelerometers. These are multi-axial movement detectors that measure acceleration and magnitude of vectors that account for bodily motion (Moore et al., 2016). The use has been found to be beneficial for various reasons including its objectivity as a measure of movement, the accuracy of the data, and the affordability of the tool (Salazar et al., 2014). Providing accelerometers as a valid outcome measure.

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Methodology

Study Aim

To conduct a systematic review on the use of accelerometers in stroke rehabilitation studies of the upper extremity.

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