

Surface Electromyography as an Assessment Tool to Guide Physiotherapy Protocols in Stroke Rehabilitation: A Narrative Review

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ABSTRACT

Stroke is a major cause of disability globally, upper extremity motor impairment being more prominent, affecting quality of life and functional independence. Physiotherapy plays a vital role in recovery, but the conventional assessments mostly rely on subjective observations. Surface Electromyography (sEMG), as a non-invasive technique, detects muscle activity and offers real-time insights that can guide and optimise physiotherapy protocols.

This review aimed to elaborate on the clinical applications of sEMG as an assessment tool in physiotherapy for improving motor recovery after stroke and to highlight the need for using sEMG at regular intervals during upper extremity motor recovery physiotherapy protocols, to modify the protocols based on sEMG findings.

The narrative review was carried out by searching major databases (Scopus, PubMed/MEDLINE, Google Scholar and Web of Science) by using keywords. Studies focusing primarily on sEMG as an assessment tool, biofeedback, and personalised rehabilitation was included.

Evidence suggests that sEMG helps in early detection of muscle activity, abnormal synergies and inappropriate co-contractions in

stroke survivors. Integrating sEMG into physiotherapy protocols facilitates tailored interventions, enhances patient engagement through biofeedback and provides quantifiable outcomes. It supports individualised physiotherapy planning and promotes precision rehabilitation. Despite its advantages, it is not being used as it should be in clinical practice. Various challenges such as high equipment cost, errors in electrode placement, limited accessibility and lack of standardised protocols, hinder widespread adoption of sEMG in clinical settings.

sEMG is a valuable adjunct for guiding physiotherapy protocols, enabling personalised rehabilitation and improving motor function after stroke. Its integration into routine clinical practice enables accurate evaluation, guides targeted therapy to enhance motor recovery, reduce disability and improve quality of life. Addressing barriers to its clinical adoption may be advantageous for motor recovery in stroke survivors.

Keywords: Biofeedback, Motor recovery, Personalised rehabilitation

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