

# Motor Imagery: An Adjunct to Conventional Neuro Rehabilitation after Stroke

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## Introduction

Stroke occurs due to obstructed blood flow in the brain that eventually induces cell death. An estimated 13.7 million strokes occur globally each year. The three main types of stroke are transient ischemic attack (TIA), ischemic stroke, and hemorrhagic stroke. In TIA the interruption is temporary and there are no permanent neurological deficits. Ischemic stroke is the commonest of the strokes (about 87%) and occurs due to obstructed blood supply of the brain. Hemorrhagic stroke is caused by ruptured blood vessel. Stroke is divided into total anterior circulation stroke (TACS), partial anterior circulation stroke (PACS), lacunar stroke (LACS) and posterior circulation stroke (POCS) with symptoms including hemiparesis, sensory changes, visuospatial problems and cognitive impairments. The types and severity of the deficits depend upon the specific brain affected. Motor impairment after stroke affects about 80% of patients.<sup>1</sup> Recovery from stroke requires physical therapy and other rehabilitation interventions.<sup>2</sup>

MI (Motor Imagery) is the mental rehearsal of a task without physically performing it. While the experience of kinesthetic sensations may or may not be present. MI engages complex cognitive functions like attention and motor planning. This mental rehearsal stimulates the motor regions of the brain in a similar way to actual movement, regardless of the patient's residual motor abilities. This suggests that MI aids in developing alternative neural pathway for movement execution. According to the mental simulation theory, the patient is able to foresee the outcome of an action through previous experience. Neural motor network is stimulated by imagination of motor actions. Evidence suggested that combination of motor imagery techniques with the conventional therapy is more beneficial than compared to the use of conventional therapy alone. Evaluating a patient's MI may include administering the Kinaesthetic and Visual Imagery Questionnaire to gauge their visual and physical imagery experiences. Motor Imagery can be utilized in physical therapy rehabilitation through external visualization (where the patient imagines the movement as an external observer) and internal or

kinesthetic visualization (where the patient mentally simulate their own body movements).<sup>3</sup> A systematic review by Noelia et al (2019) concluded that MI can improve upper and lower limb functionality as an adjunct to other techniques after stroke.<sup>4</sup> A systematic review and meta-analysis conducted by Kruse et al (2020) showed that MI can improve brain function recovery and upper extremity functioning after stroke.<sup>3</sup>

It is the need of the hour that conventional neuro rehabilitation is imperative in order to prevent stagnation and ensure that evidence based techniques are incorporated, thereby offering stroke patients standardized and contemporary rehabilitation approaches.

## References

1. Whitehead S, Baalbergen E. Post-stroke rehabilitation. South African Medical Journal. 2019;109(2):81-3.
2. Boukhenoufa I, Zhai X, Utti V, Jackson J, McDonald-Maier KD. Wearable sensors and machine learning in post-stroke rehabilitation assessment: A systematic review. Biomedical Signal Processing and Control. 2022;71:103197.
3. Kruse A, Suica Z, Taeymans J, Schuster-Amft C. Effect of brain-computer interface training based on non-invasive electroencephalography using motor imagery on functional recovery after stroke-a systematic review and meta-analysis. BMC neurology. 2020;20(1):1-14.
4. López ND, Monge Pereira E, Centeno EJ, Miangolarra Page JC. Motor imagery as a complementary technique for functional recovery after stroke: a systematic review. Topics in stroke rehabilitation. 2019;26(8):576-87.

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