

Clinical Effectiveness of Motor Imagery Post Stroke: An Evidence Based Review

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OBJECTIVES:

- Understand the current evidence for motor imagery, as presented in an evidence-based review of 15 articles.
- Identify three clinical implications of this evidence in treatment for individuals post-stroke.
- Distinguish the unique role of occupational therapy using motor imagery to enhance occupational participation.
- Analyze supports and barriers to implementing the evidence for motor imagery to current practice settings through group discussion.

What is the effectiveness of motor imagery to increase upper extremity function for daily activities for individuals post-stroke?

Acute versus Chronic Stroke: Strong evidence supports the use of motor imagery for individuals with acute and chronic stroke to improve upper extremity function.

- Total time post-stroke: 12 days - 4.6 years
- Average time post-stroke: acute = 7.7 weeks/ chronic = 2.4 years
- Statistically significant results for use of motor imagery for patients
 - 6 articles with chronic stroke (3 Level I, 2 Level II, 1 Level III)
 - 5 articles with acute stroke (3 Level I, 1 Level II, 1 Level III)

Protocol: Perspective: Strong evidence supports a first-person perspective to improve upper extremity function; there is preliminary evidence for a third-person perspective and a combined perspective.

- First-Person Perspective: 9 articles (4 Level I, 3 Level II, 2 Level III)
- First Compared to Third-Person Perspective: 1 article (Level I) (not statistically significant)
- Combined First and Third-Person Perspectives: 1 article (Level II)

Protocol: Motor Imagery with Relaxation: Strong evidence supports the use of relaxation as the first step within a motor imagery protocol to improve upper extremity function.

- 7 articles using this approach (3 Level I, 3 Level II, 1 Level III)
- Relaxation, ranging from 2-5 minutes, was used as the first step of motor imagery

Protocol: Motor Imagery with Graded Performance: Strong evidence supports the use of motor imagery with graded performance.

- This involves using motor imagery with gradually more complex tasks or environments (Timmermans et al., 2013)
- 7 articles (3 Level I, 2 Level II, 2 Level III) using this approach had statistically significant results

Delivery Method: Intervention: Strong evidence supports the use of audio delivered motor imagery to improve upper extremity function; moderate evidence supports the use of therapist delivered motor imagery; preliminary evidence supports the use of video & therapist delivered, video delivered & audio, video, therapist scripted delivery. Further research is needed to identify the most effective delivery method.

- Video Recording: 1 article (Level I)
- Audio Recording: 5 articles (3 Level I, 2 Level II)
- Therapist Delivered: 6 articles (2 Level II, 2 Level III, 2 Level III)
- Video, Audio, & Therapist Scripted: 1 article (Level I) (not statistically significant)
- Video & Therapist Delivered: 1 article (Level I) (not statistically significant)

Delivery Method: Duration, Frequency, Intensity: Preliminary evidence supports varied duration, frequency, and intensity of motor imagery intervention.

- Statistically significant outcomes were seen as early as 2 weeks with 5 sessions/week lasting 40 minutes each, and as late as 10 weeks with 3 sessions/week lasting 50 minutes each.
- Studies most frequently used 30 minute sessions (Ranged from 10-60 minutes)
- Studies used an average of 15.4 treatment sessions

Most Frequently Used Outcome Assessments:

- Fugl-Meyer Test of Sensorimotor Impairment: 7 articles (4 Level I, 2 Level II, 1 Level III)
- Action Research Arm Test: 6 articles (4 Level I, 2 Level II)
- Barthel Index of Activities of Daily Living: 2 articles (2 Level I) (not statistically significant)

Databases:

CINAHL
Cochrane
Ovid
PubMed

Two authors critiqued each article utilizing the PEDro Scale to minimize bias

Search Terms:

Population: Stroke, "poststroke", "post-stroke", "hemiparesis", "CVA", "cerebral vascular accident", "cerebrovascular accident", "upper extremity", "upper limb", hand

Intervention: "motor imagery", "mental practice", imagery, visualization

Outcome: "activities of daily living", function, motor N5

Themes	Preliminary	Moderate	Strong
Acute			✓
Chronic			✓
1st Perspective			✓
3rd Perspective	✓		
Combined Perspective	✓		
Relaxation			✓
Graded Performance			✓
Video Delivery	✓		
Audio Delivery			✓
Therapist Delivered		✓	
Audio, Video, & Therapist Scripted	✓		
Video & Therapist Delivered	✓		
Duration, Frequency, & Intensity	✓		

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- * References marked with an asterisk indicate studies included in the evidence-based review

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