

The Application of Graded Motor Imagery: Role in stroke recovery

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Objectives:

- Define stages of Graded Motor Imagery
- Understand purpose and application of GMI
- Provide treatment options
- Application of GMI to stroke recovery
- Evidence based practice

Training your brain away from pain

- Graded Motor Imagery
 - Retraining your brain to more accurately interpret pain.
- Purpose:
 - The process of graded motor imagery serves to guide the sensory and motor cortexes through activities without activating the pain neurotag associated with movement.
 - To provide treatment aimed at giving flexibility and creativity back to the brain in order to promote health and wellbeing.

Indications to GMI

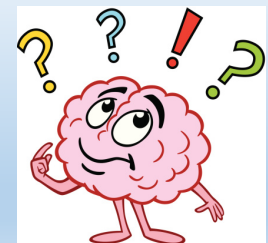
- CRPS
- Amputation
- Back pain
- Extremity pain
- Stroke
- Any condition that results in chronic pain

Barriers to GMI

- Cognition
- Vision
- Language
- Environment
- Clinician

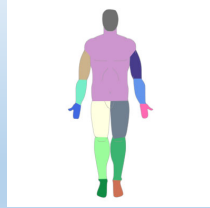
Stages of GMI

- Stage 1: Left/Right Discrimination
- Stage 2: Explicit Motor Imagery
- Stage 3: Mirror Therapy



Stage 1: Left/Right Discrimination

- Define: the process of defining one part of the body as different from the other, or if a body part is rotating right or left
- Purpose: to improve accuracy and speed of brain to body communication



Left/Right Discrimination

Treatment strategies

- L/R Cards
- Recognise App
- Youtube
- TV
- Magazines
- People watching

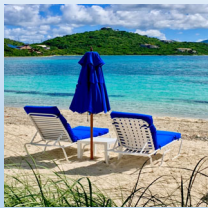
Left/Right Discrimination

- Treatment dosage
 - Establish baseline
 - Multiple short duration sessions per day for 2 weeks
 - Grade appropriately

Stage 2: Explicit Motor Imagery

- Define: the process of moving without actually moving
- Purpose: to active neural pathways in a non-threatening way as a preparation for movement (Mosley, 2005)

Explicit Motor Imagery



- Barriers
 - Impaired laterality
 - Pain with previous stage
- Imagery treatment suggestions
 - Static imagery
 - Whole body dynamic movement
 - ROM
 - Activity specific movement

Explicit Motor Imagery

- Treatment Dosage
 - Imagine static posture
 - Self, body parts, another person
 - Moving postures
 - Performing activities
 - 6-10 times daily for 10-15 minutes

Stage 3: Mirror Therapy

- Define:
 - movement of an unaffected side of the body to trick your brain into believing it is the affected side of the body
- Purpose:
 - To activate the motor cortex in the brain that controls the affected side of the body in a non-threatening way to promote movement, regulation of sensation, and body image



Mirror Therapy

- Barriers
 - Pain with previous stages
- Treatment
 - Static
 - ROM
 - Activity

Mirror Therapy

- Treatment Dosage
 - Remove all jewelry
 - Cover tattoos
 - Make both extremities look the same if possible
 - Do not move involved body part
 - 6-10 x per day < 10-15 minute session

Graded Motor Imagery

- Outcome Measures
 - Patient report
 - Pain scales/questionnaires
 - Functional index measure
 - DASH
 - Two point discrimination
 - Tampa Scale for Kinesiophobia

Stroke and GMI

- L/R discrimination
- Explicit motor imagery
- Mirror therapy

Stroke and Graded Motor Imagery

- GMI can be used without moving an affected limb
 - Pain
 - Motor
- Polli et al. (2017) Graded Motor Imagery for patients with stroke

Stroke facts

- Thalamic strokes
 - Type of lacunar stroke
- Function
 - Relay center
 - How we experience pain
- Common Impairments
 - Loss of sensation
 - Difficulty with movement
 - Maintaining balance
 - Speech
 - Vision impairment
 - Sleep disturbance
 - Lack of volition
 - Change of attention
 - Memory loss
 - Thalamic pain – central pain syndrome

Central Post-Stroke Pain

- Define
 - Central neuropathic pain syndrome after thalamic stroke
- Presentation
 - Presents on the side of the body contralateral to the thalamic stroke
 - Immediate or delayed onset
- Prognosis
 - May be persistent and life long

Stroke and Graded Motor Imagery

- Outcome measures
 - Wolf Motor function test
 - Fugl-Meyer Assessment
 - Tardieu Rating Scale for Spasticity
 - Visual Analogic Scale for Pain intensity
 - Functional Index Measure
 - Satisfaction Questionnaire

Treatment example for GMI and Stoke

- Inpatient rehab
- VNA
- Outpatient

References

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- Osuagwu B, Vuckovic A, Similarities between explicit and implicit motor imagery in mental rotation of hands: An EEG study Neuropsychologia Oct 21, 2014; 65(2014) 197-210
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