

## 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 cortices 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

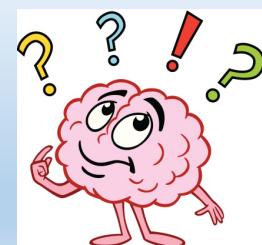
- CRPS
- Amputation
- Back pain
- Extremity pain
- Stroke
- Any condition that results in chronic pain

### 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 activate 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 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 stroke
  - 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 Stroke

- Inpatient Rehabilitation
- Visiting Nurse Association/Home Health Services
- Outpatient Rehabilitation

## References

- Dr. Lorimer Moseley, Dr. David S. Butler, Timothy B. Beames. The Graded Motor Imagery Handbook June 2019
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