noi

Healthy notions of self through neuroscience knowledge

So... what is gmi?

Evidence base for the use of the Neuro Orthopaedic Institute's Graded Motor Imagery Handbook, Recognise™ online, Recognise™ Flash Cards and Mirror Box.

Neuro Orthopaedic Institute (NOI) holds the view that evidence based practice is the integration of clinical expertise acquired from clinical experience with the best external evidence from clinical trials and research from basic sciences (Sackett et al., 1996).

Graded Motor Imagery is a sequence of strategies including laterality restoration (being able to identify left and right limbs), motor imagery and use of a mirror box. The therapeutic target is the process in the central nervous system broadly referred to central sensitivity. Evidence for the use of the GMI process or its individual components comes from neuroscience and clinical trials.

Therapeutic tools suggested for laterality recognition are the Recognise™ Flash Cards and the Recognise™ online. A Mirror Box is required for mirror therapy.

Clinical trial evidence

In the most recent randomised controlled trial, the graded motor imagery package has demonstrated good evidence for outcome (reduced pain and disability) in Complex Regional Pain Syndrome1 (CRPS1) (Moseley, 2004a, 2005) and CRPS1 and phantom limb pain (Moseley, 2006). It works best if carried out in the sequence of laterality recognition, motor imagery and mirror therapy (Moseley, 2006).

A recent systematic literature review of graded motor imagery in CRPS 1 advocates its use to reduce pain (Daly AE, Bialocerkowski AE, 2008). There is good evidence for the use of mirror therapy alone for acute CRPS (McCabe et al., 2003; McCabe et al., 2004).

Mirror therapy alone for phantom limb pain has shown benefits in small trials (McLachlan et al., 2004; Ramachandran & Rogers- Ramachandran, 1996). There are case reports of successful mirror therapy management of CRPS (Karmarker & Lieberman, 2006) and post hand surgery pain (Rosen & Lundborg, 2005) in respected medical journals.

Vladimir Tichelar et al., (2007) demonstrated benefits of mirror box therapy with cognitive behavioural therapy in three patients with CRPS1.

CRPS and phantom limb pain are severe neuropathic pain states. It would seem that the GMI process would be beneficial for other pain states such as overuse syndromes (variously focal dystonia, repetition strain injury, cumulative trauma disorder) and various arthritic syndromes. Anecdotal evidence supports this contention, suggesting that trials are worthy.

Basic sciences evidence

The pathobiological target of graded motor imagery techniques is the process broadly known as central sensitisation. For a recent review see Campbell and Meyer (2006). This includes changes such as cortical reorganisation where brain parts dedicated to body parts and function anatomically change. The advent of brain mapping techniques such as functional magnetic resonance imaging have provided a solid science foundation to notions of cortical reorganisation. Systems of 'mirror neurones' exist in the brain (Gallese et al., 1996) and are activated by watching movement or imagined movement.

Loss of laterality recognition is known to occur in patients with CRPS and phantom limb pain. (Moseley, 2004b; Nico et al., 2004; Schwoebel et al., 2002).

Attempts at limb laterality recognition activates pre motor (association) cortices, not the primary motor cortex, allowing a selective and graded therapy (Moseley et al., 2003).

Production and perception of motor action activates common brain parts (Blakemore & Decety, 2001; Grezes & Decety, 2001) allowing imagery to be a way of 'exercising' neurones in a graded programme.

Cost (AUD)

> Graded Motor Imagery Handbook $50
> Recognise™ online $20 (two month subscription)
> Recognise™ Flash Cards $50
> NOI Mirror Box $50
> Graded Motor Imagery Pack $144.50
(pack includes: 1 x GMI Handbook, 1 x 2 month Recognise™ subscription, 1 x Mirror Box, 1 x Flash Card set)

Product prices incur GST in when ordering in Australia. Discounts available on bulk purchases. All the GMI resources are easy to use, require little training or supervision, and can be used on multiple occasions.

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