Upper Limb Assessment & Treatment Guides

# 6. Mirror Box Therapy (MBT)

## Introduction / Background / Purpose

Mirror Box Therapy (MBT) was originally developed to assist people with pain as a result of amputation. It was designed by neurologist, Dr Ramachandran and has been applied to several conditions including stroke. Ramachandran and Eric Altschuler were pioneers in its use in people with stroke. MBT is based on graded motor imagery which guides the brain to use the effected side by increasing cortical and spinal excitability.

MBT is essentially used to ‘trick the brain’ into using the part affected by the stroke and enable a recovery of function in the affected limb.

## Competencies required

Physiotherapists and Occupational Therapists

## Equipment required

Mirror boxes may be home-made or can be purchased from local vendors including fishpond suppliers. The following youtube.com site has instructions for making a mirror box - see [www.nvigroup.com](http://www.nvigroup.com) or google search other sites. Construction of the box from corrugated plastic and acrylic mirror tile available at hardware stores are a low cost option.

* Mirror Box
* Table (adjustable table or chair preferable)
* Exercise materials (e.g. familiar objects – cup, pen, ball, materials such as sand / peas, temperature stimuli (warm / cold), textured objects – brushes, sandpaper.

## Procedure

* Choose an environment free of distraction / other stimuli if possible
* The client should remove all jewellery (rings, watches)
* Prepare the patient with an explanation of what MBT is – provide patient information
* Establish realistic expectations with understanding of the importance of training frequency and self-management
* Patient is positioned comfortably seated at the table with both arms resting on the table
* Place the mirror at 90 degrees to the patient (mid-sagittal plane) so mirror surface is facing the non-affected arm
* Place the hemiplegic/hemiparetic arm inside the mirror box
* Position the unaffected limb to match its mirror image of the affected limb

For a detailed guideline and treatment suggestions refer to the Waitemata DHB document below:



## Inclusion / Exclusion Criteria

Inclusion:

Patients with unilateral upper limb hemiparesis / hemiplegia following stroke.

Exclusion:

* Patients with visual field deficits or hemianopia
* Patients who are cognitively unable to tolerate sessions, or follow instructions
* Patients with severe visuospatial neglect and who are unable to turn their heads towards the mirror image or keep their attention on the mirror image for at least 5 -10 mins
* Patients who are unable to maintain sitting balance (with a table) for duration of session
* Patients with severe constraints of the non-affected limb (e.g. range of motion, pain).
* No consent granted

## Precautions

Be aware of:

* Fatigue
* Low motivation
* Cognitive impairments

## Evidence

Mirror box therapy has been investigated by many researchers. Studies are sometimes based on small sample sizes or single cases so caution should be used when extrapolating findings.

The time post-stroke would appear to be a factor in the success of MBT. In the acute phase MBT in conjunction with traditional therapy can enhance outcomes (Thieme et.al 2012).

In the sub-acute rehab phase MBT should be included as part of the rehabilitation programme (Thieme et al 2012).

In the chronic phase modest evidence of benefit from MBT exists. Often access to therapy is limited following the rehab phase so augmentation with MBT is one way to progress rehabilitation.

## Information for Patients / Families / Whanau

See Waitemata DHB information:

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## References

Nice Guidelines: [www.evidence.nhs.uk](http://www.evidence.nhs.uk)

Stroke Engine: <https://www.strokengine.ca/patient-info/mirror-therapy-info/>

Rothgangel,A.S., Braun,S.M., Beurskens,A.J., Seitz,R.J.,Wade,D.T.,(2011) The clinical aspects of mirror therapy in rehabilitation, a systemic review of the literature. *International Journal of Rehabilitation Research, 34(1), -13, 1-13*

Chopra,C., Tamaria,S.,(2013) Mirror Therapy in Stroke Rehabilitation. *International Journal of Science and Research 6-14, 660-663*

Doidge, N.,(2007) The brain that changes itself- Stories of personal triumph from the frontiers of brain science. *USA Viking Penguin p 177-196*

<http://www.physio-pedia.com/Mirror_Therapy>