

# Adherence to modified constraint-induced movement therapy: the case for meaningful occupation

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## ABSTRACT

**INTRODUCTION:** Modified constraint-induced movement therapy (mCIMT) has been shown to improve function of an affected upper limb post stroke. However, factors influencing adherence of individuals undertaking a mCIMT protocol require further investigation.

**AIM:** To explore the experience of two participants undergoing a mCIMT protocol and examine factors influencing adherence to the protocol.

**METHODS:** A qualitative case study design was used. Two participants with upper limb hemiparesis following a stroke were recruited and received mCIMT (two hours of therapy, three days per week for a total of two weeks). During the treatment period, participants were also encouraged to wear the restraint mitt for four hours per day at home.

**RESULTS:** Participants reported increased confidence and self-esteem following participation, as well as improvements in bi-lateral upper limb function. Participants reported the mCIMT protocol as being highly frustrating. However, motivation to adhere to the protocol was positively influenced by the meaningfulness of the occupations attempted.

**CONCLUSION:** Although mCIMT can prove frustrating, meaningful occupations may act as a powerful motivator towards adherence to a mCIMT protocol. Further research is required.

**KEYWORDS:** Stroke; meaningful occupation; motivation; upper extremity; motor skills; constraint-induced movement therapy

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## Introduction

Stroke is a leading cause of disability<sup>1</sup> and of particular interest to primary health care practitioners,<sup>1</sup> as it significantly affects everyday activities and quality of life.<sup>2</sup>

Constraint-induced movement therapy (CIMT) produces effective outcomes for individuals living with stroke.<sup>3</sup> CIMT facilitates the use of the affected arm, through constraint of the unaffected limb, by overcoming learned non-use and increasing cortical representation, leading to improved motor and functional capacity.<sup>3</sup> Although effective, CIMT is also arduous.<sup>4</sup>

Modified constraint-induced movement therapy (mCIMT), with variations in implementation and intensity of the protocol, is accepted as a feasible alternative, although adherence issues are still reported.<sup>5,6</sup> Varying the intensity of the protocol, through mCIMT, has traditionally been the tool for increasing adherence and participation.<sup>7</sup>

Although the literature regarding motivational factors in adults undergoing mCIMT is scant, a case study is reported in which an individual underwent mCIMT four years post ischaemic stroke.<sup>8</sup> Tasks and activities, associated with the meaningful role of a skilled violinist, were

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## WHAT GAP THIS FILLS

**What is already known:** The literature on the effectiveness of constraint-induced movement therapy (CIMT) and its modifications (mCIMT), to improve motor issues post stroke, is broad and conclusive. However, the demands and rigor of CIMT or mCIMT can influence compliance negatively.

**What this study adds:** This study offers an insight into the experience of undergoing mCIMT. In relation to client motivation and adherence to protocol, it highlights the importance of meaningful and psychologically rewarding occupations.

deliberately incorporated within the mCIMT protocol. The findings suggest that when valued activities associated with meaningful occupations are skilfully incorporated into mCIMT, individuals are assisted to improve upper limb motor capacity as well as occupational performance, due to a positive change in their motivation. Engel<sup>9</sup> agrees that interventions that incorporate meaningful occupation establish a connection between the components of function and actual occupational performance. Intriguingly, Ikiugu et al.<sup>10</sup> distinguish between meaningful occupation and psychologically rewarding occupation, whereby meaningful occupation is not necessarily rewarding in the first instance, but is in the long term, compared to psychologically rewarding occupation, which is always meaningful. They suggest that therapists should consider meaningful and valued occupations when devising long-term goals and should incorporate psychologically rewarding occupations or tasks, linked to meaningful occupations, within interventions such as mCIMT.

This paper presents the lived experience of two individuals undertaking mCIMT, an evidenced-based post-stroke motor remediation technique. It explores the relationship between valued and meaningful occupations and positive outcomes as a result of mCIMT.

## Methods

Deakin University's Human Research Ethics Committee provided approval for this study on 3 June 2013 (Ref. 2013-082).

Qualitative data related to two community-dwelling participants who undertook mCIMT (two hours supervised constraint for three days/week over two weeks) is reported. The protocol also required four h/day unsupervised home-based constraint over the period. The restraint was a mitt, and standard inclusion criteria for mCIMT were used.

Qualitative data were gained from the Canadian Occupational Performance Measure (COPM)<sup>11</sup> and semi-structured interviews, pre- and post-intervention and at 4 weeks.

One participant was male (55 years) and the other female (69 years). Time post stroke was one year and four years, respectively. The male had experienced a left hemisphere stroke and the female a right hemisphere stroke, both resulting in upper limb motor impairment on the opposing side. Both were right dominant. Prior to the intervention, occupations of interest were identified via the COPM, which explores and measures changes in subjective performance and satisfaction of occupational performance across the domains of self-care, productivity and leisure.<sup>11</sup>

Three flexible, semi-structured interviews<sup>12</sup> were conducted individually, providing data on the intervention experience and factors influencing adherence. Interviews targeted the following: intensity of protocol; perceived benefits and motivation patterns; and improvements made. Interviews were audio-recorded, transcribed, checked and themed.

## Results

Data from the COPM revealed that Participant 1 considered shed-work and mending fine objects related to agriculture as meaningful occupations, whereas Participant 2 identified doing artwork, holding a glass while standing when socializing and eating and using a fork in the affected hand, as valued and meaningful occupations.

## Frustration

Both participants experienced feelings of frustration during the mCIMT programme. They reported feeling frustrated and disheartened

when unsuccessfully attempting an activity with one hand and found task performance significantly slower when using the affected hand. This contributed to instances when both participants reported it was easier not to use the affected hand for certain activities and found it diminished their self-esteem regarding their independence and stage of recovery.

*I've been feeling terribly temperamental with it and feeling like cheating and thinking I could do this so much quicker with the other hand. It's terribly frustrating and slow and it's just very hard when your hand doesn't do what you want it to do.* [Participant 2]

### New way of thinking

During therapy, Participant 1 noted an increased awareness of using the affected hand in daily tasks, with a subsequent adjustment in the way he perceived task performance. This inspired him to try previously unattempted activities, with a resultant increase in confidence in using the affected hand. Both participants mentioned how skills, learnt during mCIMT, were directly transferable to daily living and led to problem solving.

*It gives people a certain amount of knowledge and sort of makes you think of trying to do different things, problem solving.* [Participant 1]

### Support availability

Participant 2 reported changes in motivation and compliance when in the different therapy environments. With therapist support, she was significantly more engaged and able to persevere in using the affected hand. In contrast, during the home-based programme, she reported reverting to using both hands.

*It's certainly easier to do when I come to you. I mean, because you are kind of there to hold the thing and be the other arm and so often, even if I use my affected hand more, I find my unaffected hand wanting to help.* [Participant 2]

### Meaningful occupations

Both participants indicated that meaningful occupations during therapy increased their

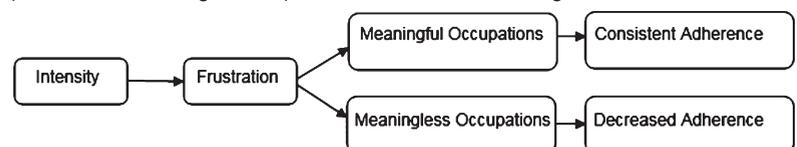
motivation and adherence to the mCIMT protocol, where valued tasks facilitated fine and gross motor skills and provided opportunities for practise in using the affected hand. Both participants acknowledged that meaningful and intrinsically rewarding occupations related to agricultural equipment (Participant 1) or doing artwork (Participant 2) greatly motivated their efforts to persevere in using the affected hand.

*I was doing my teeth and I had a lot more movement in the control of my hand. It would have been doing that sort of stuff [valued tasks] that got my hand a bit more dexterous.* [Participant 1]

### Discussion

For both the participants, mCIMT had a positive influence on self-perceived performance of tasks, self-satisfaction and confidence. However, similar to previous studies,<sup>5,6</sup> our participants found the mCIMT protocol frustrating, particularly for Participant 2 when at home and unsupported by a therapist. Both participants reported feeling the need to use their unaffected hand, to relieve the frustration caused by only having the affected hand available during therapy and when at home. Although frustration from the intensity of the protocol is universally accepted as an intrinsic barrier to adherence and participation in mCIMT,<sup>4</sup> a strong emerging theme from our report suggests that the meaningfulness of occupations associated with valued and meaningful roles was a crucial mediating factor between motivation and adherence to protocol. We suggest that adherence is mediated by participant priorities (see Figure 1) and that frustration with the intensity of the protocol only challenges adherence when it does not fit within the participants' occupational choices. This suggests that the choice of occupations within mCIMT, not just the intensity of the programme, can mitigate poor adherence.

Figure 1. Suggested relationship between intensity and adherence, with the presence of meaningful occupations as a crucial mediating factor



Participant 1's goal targeted a return to the valued occupation of farm-related maintenance tasks. Although mitt wearing frustrated him and, in the short-term, further restricted his ability to carry out the meaningful tasks associated with this occupation, he strategically integrated the home-based mCIMT programme into his daily routine. As a result, his frustration had little effect on adherence to the mCIMT protocol, with a positive change being reported and verified via the COPM.

Similarly, during the supervised sessions when the therapist was available to encourage her, Participant 2 performed meaningful and valued occupations. During these times, Participant 2's motor difficulties and accompanying frustration did not compromise her participation in mCIMT. However, when Participant 2's overlooked but valued lifestyle choice of socialising with friends had not been skilfully integrated into the mCIMT home-based protocol, conflict arose for her between completing the agreed home-based programme in preference to social commitments. One possible reason for this conflict may have been that Participant 2 perceived the home-based programme as a separate entity to the supervised therapy sessions and, as such, was less committed to the home-based programme compared to the supervised sessions. In hindsight, it would have been informative to discover whether a more satisfactory adherence to the home-based programme occurred if social commitments had been explicitly and skilfully included within the valued and rewarding occupations of the home-based programme.

If meaningful occupations are incorporated into a mCIMT protocol, our study suggests that frustration resulting from mCIMT may not necessarily lead to diminished adherence to the protocol. Furthermore, participants may feel empowered and experience increased motivation, satisfaction and adherence to the protocol, when self-selected valued tasks and activities, related to meaningful occupations, have been skilfully included within the protocol. In this regard, we endorse the findings of earlier research,<sup>8-10</sup> and recommend that future research seek a more nuanced understanding of how the frustrations related to protocol intensity actually interact with adherence to

mCIMT. We also suggest that motivational strategies, particularly related to meaningful occupations, are developed to encourage maximal adherence to mCIMT.

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#### COMPETING INTERESTS

None declared.

#### CONFLICTS OF INTEREST

None exist.