

Shaping-Induced Movement Therapy (SIMT): A Better Alternate Term for Modified Constraint-Induced Movement Therapy (mCIMT) for Lower Limbs

Jebaraj Fletcher¹, Tittu Thomas James²

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Abstract

Constraint-Induced Movement Therapy (CIMT), a therapy regime proposed by Taub and colleagues for rehabilitation of the upper extremities are being utilised for lower limb rehabilitation as modified-CIMT (mCIMT).

The recent literatures on mCIMT for lower limbs did not use the concept 'constraint' in their methodology. Restraining of the less affected lower limb as similar to that of upper limbs are not possible when providing CIMT because of the bipedal nature of lower limb tasks.

Shaping-Induced Movement Therapy (SIMT) which focuses on shaping the behaviour through internal constraints such as feedback and reassurance can be considered as the better alternative to mCIMT in the rehabilitation of lower limbs in patients with stroke.

Keywords: Constraint Induced Movement Therapy; modified ConstraintInduced Movement Therapy; Shaping Induced Movement Therapy; Stroke Rehabilitation.

INTRODUCTION

Constraint-Induced Movement Therapy (CIMT) was first described by Taub and colleagues¹, by constraining the unaffected upper limb to

induce intensive motor training on the affected side, thus preventing learned non-use. The same technique cannot be applied to the lower limbs, as constraining the unaffected lower limb will prevent bipedal ambulation, and introduces safety concerns during training. Dr. Taub himself has expressed his concerns in using the word 'constraint' in the name of therapy.² Hamzei *et al.*, in their article suggested the term 'Shaping-Induced Movement Therapy (SIMT)' for the treatment of lower limbs by adopting the concept of CIMT for the upper limbs.³ SIMT was introduced instead of modified-CIMT, by implementing positive reinforcement through feedback, shaping of daily activities by gradually increasing the complexity, thus the affected lower limb is being used more.³

The Constraint-Induced Movement Therapy (CI Therapy) Research Group at the University of Alabama at Birmingham (UAB), a leader in CI therapy research and development, points out that the key components of successful CIMT protocol are the positive reinforcement and one-to-one

Author Affiliation: ¹Physiotherapist, Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry 605006, ²Physiotherapist, National Institute of Mental Health & Neuro Sciences, Bengaluru 560030, Karnataka, India.

Corresponding Author: Tittu Thomas James, Physiotherapist, National Institute of Mental Health & Neuro Sciences, Bengaluru 560030, Karnataka, India.

E-mail: tittutalks@gmail.com

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interaction with patients.⁴ They also suggest that the unaffected lower limb is not restrained during therapy for the legs, and patients are advised to rely on affected side to perform variety of exercises.^{4,5} Training can also be enhanced by using force feedback (limb load monitor), or limb displacement feedback devices.⁵ Recent literatures have omitted the term 'constraint' even in the treatment protocols, having still using the term modified-CIMT for lower limb rehabilitation.^{6,7}

The initial studies on the limitations of using restraints were published by Sterr *et al.*, by demonstrating that substantial clinical benefits were achieved without constraint, but with effective shaping strategies.⁸ The constraints used in the CIMT studies for lower limb training such as shoe raises, splints, weights, or whole leg orthoses have reported to considerably alter the biomechanics and hinder the recovery of function in patients with hemiparesis.⁹ The same is supported by Duarte Pereira *et al.*, in their case study,¹⁰ suggesting that the restraint devices are not applicable in lower limb training with CIMT protocols considering that majority of the lower limb activities are bilateral in nature. However, the intensive task-oriented training, application of shaping, and transfer packages of CIMT must be incorporated in lower limb training. Hence, SIMT focus on internal restraints in the form of positive feedback and reassurance in increasing the use of affected lower limb instead of external constraints.¹¹

While the term 'constraint' is being misinterpreted by the professionals and lay-men as restraining patient movement, and when the restrains are not feasible in training of lower limb tasks, we suggest the term SIMT to be most appropriate term for lower limb training using CIMT principles. The same was suggested by Dr. Taub in his shared article with Hamzei *et al.*³

REFERENCES

1. Taub E, Pidikiti RD, Chatterjee A, Uswatte G, King DK, Bryson C, *et al.* CI Therapy extended from upper to lower extremity in stroke patients. Society for Neuroscience Abstracts. 1999;25:320-320.
2. Wilson H. YouTube. 2011 [cited 2024 Jul 24]. Parent Information - CIMT for Children at Ranken Jordan. Available from: <https://www.youtube.com/watch?v=IQTEPoVMIVk>.
3. Hamzei F, Kruger H, Peters M, Ketels G, Blessin J, Ringer T, *et al.* Shaping-Induced Movement Therapy for lower extremity (SIMT) - a pilot study. *Neurologie und Rehabilitation*. 2012;18(4):236-41.
4. CI Therapy Research Group. Constraint-Induced Movement Therapy [Internet]. 2024 [cited 2024 Jul 24]. Available from: <https://www.uab.edu/citherapy/training-manuals-publications-nav>.
5. Uswatte G, Taub E. Constraint-Induced Movement Therapy: A Method for Harnessing Neuroplasticity to Treat Motor Disorders. *Prog Brain Res*. 2013;207:379-401.
6. Bonnyaud C, Pradon D, Zory R, Bussel B, Bensmail D, Vuillerme N, *et al.* Effects of a gait training session combined with a mass on the non-paretic lower limb on locomotion of hemiparetic patients: A randomized controlled clinical trial. *Gait Posture*. 2013;37(4):627-30.
7. Menezes-Oliveira E, da Silva Matuti G, de Oliveira CB, de Freitas SF, Kawamura CM, Lopes JAF, *et al.* Effects of lower extremity constraint-induced movement therapy on gait and balance of chronic hemiparetic patients after stroke: description of a study protocol for a randomized controlled clinical trial. *Trials*. 2021;22(1):463.
8. Sterr A, Freivogel S. Motor-improvement following intensive training in low-functioning chronic hemiparesis. *Neurology*. 2003;61(6):842-4.
9. Abdullahi A, Truijen S, Umar NA, Useh U, Egwuonwu VA, Van Crielinge T, *et al.* Effects of Lower Limb Constraint Induced Movement Therapy in People With Stroke: A Systematic Review and Meta-Analysis. *Front Neurol*. 2021;12:1-15.
10. Duarte Pereira N, Ilha J, dos Anjos SM, Morris D. Constraint-induced movement therapy for lower extremity use in activities of daily living in people with chronic hemiparesis: multiple case study. *International Journal of Rehabilitation Research*. 2022;45(3):215-22.
11. Kawano M, Takamura Y, Tachihara M, Kawano A. Effects of Self-Determination, SoA, and Self-Efficacy on Degree of Independence in Activities of Daily Living in Stroke Survivors. *International Journal of Affective Engineering*. 2024;1:1-11.

