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Constraint-induced movement therapy for hemiparesis following stroke

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Editor's note: This is a summary of a nursing care–related systematic review from the Cochrane Library.

Constraint-Induced Movement Therapy for Hemiparesis Following Stroke

REVIEW QUESTION

Is constraint-induced movement therapy (CIMT) effective in improving use of the upper extremities in people with hemiparesis following stroke?

TYPE OF REVIEW

This is an intervention review of 42 randomized controlled trials (RCTs).

RELEVANCE FOR NURSING

Stroke is one of the main causes of disability worldwide, commonly affecting balance, speech, and coordination. Most stroke survivors need long-term support with activities of daily living (ADLs), especially in cases of hemiparesis. Among the management approaches to improve function of the upper extremities in hemiparesis is CIMT, which is based on two principles: the forced use of the affected arm by restraining the unaffected arm (with a sling or hand splint) during exercise or while performing ADLs for 90% of the patient's waking hours; and exercise of the affected arm such that movement is accomplished in small steps of progressively increasing difficulty. Modified forms of CIMT exist, with reduced exercise time or no exercise during the period of restraint. The rationale for CIMT is based on the theory of "learned non-use," which predicts that following stroke people have greater movement ability than they realize.

CHARACTERISTICS OF THE EVIDENCE

This review included RCTs and quasi-RCTs comparing CIMT or its modified forms with other rehabilitative techniques or no treatment. The participants were adults (over 18 years) with a clinical diagnosis of stroke, either ischemic or hemorrhagic, and with paresis of an arm. The primary outcome was the impact of the intervention on disability as measured by functional independence. Secondary outcomes were arm motor function, perceived arm motor function, arm motor impairment, quality of life, and dexterity.

Forty-two studies (1,453 participants) were included in the review. Participants had little use of the affected limb, but some residual motor power, the potential for further motor recovery, and limited pain or spasticity. The majority of studies were underpowered (the median number of participants was 29) and small-trial bias is a consideration. Eleven trials (344 participants) assessed disability immediately after the intervention, and found a nonsignificant benefit of CIMT over conventional treatment. For the most frequently reported outcome of arm motor function (28 studies involving 858 participants), CIMT was significantly more effective than conventional treatment ($P = 0.004$). Three studies involving 125 participants explored disability at three and six months after treatment but reported no significant effect.

BEST PRACTICE RECOMMENDATIONS

The authors found that CIMT was associated with limited improvements in motor impairment and motor function, but that these benefits did not persuasively reduce disability. They suggest that the impact on arm impairment and motor function may be due to the type and amount of exercise and not solely to the constraint; however, the review could not identify which factor is more important. Clinicians aiming to develop a tailored CIMT program need to examine the individual characteristics of their patients carefully to identify factors likely to increase the chances of improved functioning through CIMT.

RESEARCH RECOMMENDATIONS

The findings of this review differ from those of a 2009 Cochrane review by Sirtori and colleagues, which suggested that CIMT may be superior to traditional rehabilitation. Information about the long-term effects of CIMT is limited. Further trials to explore the relationship between participant characteristics and improved outcomes are needed. ▼

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SOURCE DOCUMENT

Corbetta D, et al. Constraint-induced movement therapy for upper extremities in people with stroke. *Cochrane Database Syst Rev* 2015;10:CD004433.