Discussion

Constraint-induced movement therapy (CIMT) and modified constraint-induced movement therapy (mCIMT) are multicomponent interventions designed to help patients overcome learned non-use of a paretic upper extremity and increase motor function. This intervention is appropriate only for those with some movement in their paretic limb (at least 10 degrees of active extension in two fingers, the thumb, and the wrist). The 2019 VA/DoD Stroke Rehabilitation CPG defined CIMT as a neurorehabilitation technique consisting of three components: 1) immobilization of the non-paretic upper extremity to prevent its use in daily activities, 2) task-specific practice of the paretic upper extremity with frequent repetitions for about six hours per day, and 3) instruction in transfer of skills from the clinical setting to the home environment in performance of ADLs and IADLs. The main difference between CIMT and mCIMT is the number of hours of therapy per day, with CIMT requiring more than three hours per day, and mCIMT requiring three hours or fewer of therapy per day.(85)

The current systematic evidence review included one meta-analysis along with one network meta-analysis (NMA).(86, 87) Zhang et al. (2023) identified 44 RCTs (n=2,083) with the Motor Activity Log (MAL) as the primary outcome.(86) The results showed that CIMT combined with conventional rehabilitation, compared with conventional rehabilitation alone, was statistically superior in improving both the amount (MAL-Amount of Use Measure [MAL-AOU], MD: 0.46; 95% CI: 0.25–0.67) and quality of movement (MAL-Quality of Movement Measure [MAL-QOM], MD: 0.51; 95% CI: 0.28–0.73). This difference was maintained at 3 months but not at 4–12 months follow-up. However, these results did not reach the threshold for clinical significance. The FMA was analyzed as a secondary outcome. For this metric, the MCID is 10.(88) Again, statistically but not clinically significant differences between the intervention and control groups were found (MD: 2.42; 95% CI: 1.05–3.79).

An NMA by Saikaley et al. (2022) (n=6,781) compared CIMT and mCIMT with conventional rehabilitation.(87) CIMT and mCIMT were found to be relatively more effective than conventional rehabilitation for improvement in upper limb function as measured by the FMA (MD: 6.7; 95% CI: 4.3–9). Again, this finding met statistical significance but did not achieve the MCID.

Some variation occurs in patient preferences regarding this treatment. CIMT and mCIMT intervention can be burdensome to patients because the duration of treatment might average from three to six hours per day for two weeks or more. High-intensity CIMT might cause anxiety for patients, and restricting the non-paretic side for a long duration might make the rehabilitation experience less satisfactory for the patient. On the other hand, patients with a paretic dominant upper extremity might have a strong internal motivation to comply with the intensity of this intervention. Also, for the motivated patient, there is the potential for transfer of learned motor functions to the home setting, though RCTs have not documented such improvement. Of note, CIMT and mCIMT are appropriate for only those with some movement in their paretic limb.