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Pediatric Constraint Induced Movement Therapy Protocols for Hemiplegia

Christina Fisher, OTS and Brittany Newton, OTS

Case

In a variety of settings, the OT works with children with hemiplegic cerebral palsy (CP). Hemiplegic CP often affects sensation, perception, cognition, communication, and motor movements. These skills impact participation in home, school, community life, and activities of daily living (ADLs) such as grooming, dressing, and feeding. The OT has the responsibility to decide the most effective way to allocate treatment. Constraint induced movement therapy has been shown to improve developmental disuse in the the effected upper extremity. As there are many variations of this intervention, the OT wants to know what is the most effective type, frequency, duration, and intensity of constraint induced treatment.



Table 1

Article	Age	Setting	Daily Dosage	Frequency	Duration	Type
Chen et al., 2014	Average 2.4 - 10.7 years	Clinic Home Camp	0.5 - 6 hrs/day	2-7 days/week Avg. 5 days/week	2-10 weeks Avg. 2-3 weeks	Sling, glove, mitten, and cast
El-Kafy et al., 2014	4-8 years	Clinic and home	6 hrs/day (4hrs in clinic followed by 2 hrs at home)	5 days/week	4 weeks	Sling
Gelkop et al., 2015	1.5-7 years	School	2 hrs/day	6 days/week	8 weeks	Custom made gloves
Zafer et al., 2016	1.5 - 12 years	Clinic and Home	Treatment: 2 hrs/day Constraint: 6hrs/day	6 days/week	2 weeks	Mitt: Hand Sling: Elbow

1 Ask: Research Question

What is the most effective pediatric constraint induced movement therapy (CIMT) or modified constraint movement therapy (mCIMT) protocol for children with hemiplegia (type, frequency, duration, intensity)?

2a Acquire: Search Terms

Patient/Client group: Pediatric hemiplegic cerebral palsy

Intervention: Constraint Induced Movement Therapy (CIMT), Modified Constraint Induced Movement Therapy (mCIMT)

Comparison: None

Outcome: Increased function in upper extremity

2b Acquire: Selected Articles

Chen et al. (2014): A systematic review and meta-analysis of forty-one RCTs, sixteen reviews, and two clinical guidelines that assessed the effectiveness of constraint induced movement therapy on upper extremity function in children with cerebral palsy.

El-Kafy et al. (2014): A RCT that examined the effectiveness of a mCIMT protocol in improving upper extremity function in children with congenital hemiplegic cerebral palsy.

Gelkop et al. (2015): A matched-pair randomized trial that examined the effectiveness of mCIMT and Hand-Arm Bimanual Intensive Training (HABIT) protocols when provided in the school setting.

Zafer et al. (2016): A RCT that examined the effectiveness of constraint induced movement therapy compared to bimanual therapy in upper motor function in children with hemiplegic cerebral palsy.

3a Appraise: Study Quality

Chen et al. (2014): Preponderant: Large number (n = 27) of RCT studies used with good methodological quality. Limitations in varied outcomes measures, intervention protocols, and children's characteristics made the analysis and conclusions complicated.

El-Kafy et al. (2014): Preponderant: Extensive training given to interventionists and caregivers. Reliable and valid outcome measures. Small n-size (n = 30).

Gelkop et al. (2015): Preponderant: Only applicable special education school setting, not generalizable to other settings. Reliable and valid outcome measures. Small n-size (n = 12). No comparison to non-intervention group.

Zafer et al. (2016): Preponderant: Outcome tool was used for baseline and post treatment assessment in both treatment and control group. Small n-size (n = 20).

3b Appraise: Study Results The findings of these studies showed the effectiveness of different protocols for CIMT/mCIMT in improving upper extremity functioning in children with hemiplegic cerebral palsy. The studies support child-friendly mCIMT in natural environments, including home and school to ensure transfer of therapy from the clinic to every day life activities (ADLs). See Table 1 for specific study protocols.

4 Apply: Conclusions for Practice Based on the findings, the occupational therapist would find it most beneficial to administer CIMT/mCIMT in a child's natural environment. Transfer training during intervention is important for continued use of affected upper extremity after intervention. It is important to choose a protocol that is feasible for the family, considering duration, type, intensity and available resources.

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There are many effective protocols for constraint induced movement therapy and modified constraint induced movement therapy.

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