



Pediatric Constraint Induced Movement THERAPY

| by Katherine Ryan-Bloomer |

Constraint Induced Movement Therapy (CIMT) is a form of therapy used for individuals who have experienced hemiparesis, or weakness, in one of their upper extremities (arms). CIMT emerged in the 1960s with adults who had experienced a stroke causing weakness and poor coordination in one side of their bodies.

The principles of CIMT include:

- constraint of the unaffected upper extremity,
- high dosages beyond typical therapy schedules,
- the use of shaping techniques and repetitive practice with task variation,
- sessions that take place in a naturalistic environment, and
- transition program following CIMT.

The unaffected arm may be constrained using a variety of materials including a removable cast, splint, sling, or mitt. As an alternative, the patient might consciously refrain from using the non-affected arm. In the past, CIMT required adults to wear a constraint for 90 percent of a 24 hour day for 10 to 14 days, which forced the affected arm to be the primary manipulator for most daily tasks. This intervention was found to be very effective to improve the use of the affected arm even after the constraint was removed.

CIMT for Children

Researchers began introducing CIMT to the pediatric population in the early 1990s, but found that the protocol needed to be adjusted to fit the needs of children. In the past two decades pediatric CIMT (P-CIMT) has become one of the best evidence-based therapeutic interventions for children with hemiparesis, in particular, cerebral palsy.

Several studies have illustrated that CIMT is beneficial for improving:

- coordination in the affected upper extremities,
- bilateral and bimanual coordination referring to the use of both arms and both hands, and
- performance in everyday tasks or occupations.

(Brady & Garcia, 2009; Charles & Gordon, 2005; DeLuca, et al., 2012; Stearns, Burtner, Keenan, Qualls, & Phillips, 2009)

Signature versus Modified P-CIMT

Many studies have evaluated the optimal frequency and duration for the constraint to be worn. Signature Pediatric CIMT involves children wearing a constraint for nearly 24 hours per day for 21 days while participating in

six hours of CIMT therapy per day. This is followed by one week of therapy activities that require the use of both hands (bimanual training).

Signature P-CIMT has been found to produce significant improvement in quality and quantity of movement in the affected arm, including upper extremity coordination, and hand function, as well as occupational performance. Some Signature P-CIMT studies have even found spillover effects in speech intelligibility.

A study by Case-Smith, DeLuca, Stevenson, & Ramey (2012) found that three hours of CIMT therapy was just as effective as six hours for improving upper extremity function in three- to six-year-old children if constraints were worn for nearly 24 hours per day. In addition, it was found that children using this protocol maintained the improvements even at three to six months following CIMT therapy.

Other studies have utilized a Modified P-CIMT protocol, which requires fewer than 24 hours of constraint time per day or less than two hours of therapy. In contrast to the Case-Smith, DeLuca, Stevenson, & Ramey study, these studies have not shown as statistically significant improvements, nor are the improvements as long-lasting as the Signature CIMT studies. ❄

Katherine Ryan-Bloomer, PhD, OTR/L, is Assistant Professor of Occupational Therapy at Rockhurst University and Staff Occupational Therapist for the Rehabilitation Institute of Kansas City. Since 1947, RIKC has helped individuals achieve greater independence at home, school or work, and in the community.

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3011 Baltimore Ave. | Kansas City, MO 64108