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Use of a Caregiver Coaching Model for Implementation of Intensive Motor Training for Hemiplegic Cerebral Palsy: A Case Study

Abstract

Background: There is extensive literature to support the efficacy of both pediatric constraint-induced movement therapy (pCIMT) and hand-arm bimanual intensive therapy (HABIT) for children with hemiplegic cerebral palsy. In addition, there is increasing evidence to support the training of caregivers (parents and other care providers) to carry out therapy interventions in the home. The Family Activity Adaptation Model (FAAM) presents guidelines for parent and caregiver coaching for intensive therapies used in occupational therapy practice.

Method: In this descriptive case study the FAAM was used to frame caregiver training to answer the question: Is a coaching model, using a participant other than the primary caregiver, an effective intervention delivery method for intensive therapies for a 2-year-old with hemiplegic cerebral palsy? Outcome measures included the Canadian Occupational Performance Measure, Pediatric Motor Activity Log, Pediatric Evaluation of Disability Inventory, Goal Attainment Scaling, and grip strength and range of motion.

Results: The results demonstrated that gains were made on six of seven outcome measures, including both child performance outcomes and parent satisfaction measures.

Conclusion: Caregiver coaching using FAAM principles for intensive motor therapy intervention resulted in gains on a variety of outcome measures. Further research is needed.

Comments

The authors report no potential conflicts of interest.

Keywords

early intervention, Family Activity Adaptation Model, parent satisfaction, CIMT, HABIT

Cover Page Footnote

Special thanks to Dr. Sarah Schoen, Dr. George Tomlin, Dr. Renee Watling, and Dr. Lucretia Berg for guidance related to study design and analysis.

Credentials Display

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Children with cerebral palsy are commonly seen by occupational therapists, including those working in early intervention (EI) settings. Hemiplegia affecting either side of the body accounts for approximately 25% of all children diagnosed with cerebral palsy (Children's Hemiplegia and Stroke Association, 2020; Shevell et al., 2003). Given this prevalence, there is a wide range of evidence-based treatment approaches targeting hemiplegic cerebral palsy. Specifically, there is extensive peer-reviewed literature to support the efficacy of both traditional and modified constraint-induced movement therapy (CIMT; Chen et al., 2014; DeLuca et al., 2015; Novak et al., 2020; Ramey et al., 2013) and hand-arm bimanual intensive therapy (HABIT; Charles & Gordon, 2006; Gordon, 2013) for children with hemiplegic cerebral palsy.

Pediatric Intensive Therapies for Hemiplegia

CIMT is a technique often used by occupational and physical therapists to increase the client's awareness and use of an upper extremity that has been impacted by hemiplegia (Reiss et al., 2012). It involves the use of a splint, cast, or mitt (constraint) placed on the unaffected upper extremity, which encourages increased use of the affected extremity (Ramey et al., 2013). The constraint is then combined with intensive occupational and/or physical therapy to promote and encourage active functional reach, grasp, and release in the affected upper extremity, with the goal of increasing functional participation in daily activity. Pediatric CIMT, or pCIMT, is the application of CIMT principles specifically to the pediatric population (Ramey et al., 2013). Typical gains using this intensive treatment method include improvements in hand and upper extremity motor function resulting in increased participation in bimanual activities of daily living, instrumental activities of daily living, and play (Chamudot et al., 2018; Ramey et al., 2013).

Traditional pCIMT protocols include a constraint worn on the unaffected extremity (typically 24 hr per day for 21 consecutive days), combined with systematic and intensive therapy for the affected extremity (Ramey et al., 2013). Modified pCIMT involves wide variations to the traditional protocols. Variations of the traditional protocols are many and include the child's tolerance of the constraint, the needs of the individual child and/or their family, their ability to access therapy services, the high cost of frequent therapy services, and/or the lack of therapy providers with training in pCIMT methods (Ramey et al., 2013). Modified pCIMT is typically less intensive than traditional pCIMT (generally 3–6 hr of daily constraint wear over 5–15 days) and may involve some sessions provided by a parent or caregiver (Ramey et al., 2013).

Caregiver-provided pCIMT may be necessary for a variety of reasons, including lack of time and/or finances or lack of access to outpatient therapy provided services, especially at the intensity required for traditional pCIMT. Caregiver-provided CIMT can be defined as CIMT services being provided in the home by someone other than the practicing therapist. There is a paucity of research related to caregiver-provided intensive therapy services, as these are not typically identified as something included in a home program because of the intensity, frequency, and duration of therapy services required. While the caregiver may often be the parent, another care provider in the home, such as a nanny, relative, or friend, could also implement the intervention with the proper training.

The HABIT, supported by Charles and Gordon (2006), involves the same intensive practice used in pCIMT but engages the child in activities requiring the use of both hands, without the use of a constraint. Activities are selected based on their specific use of bilateral hand use both symmetrically and asymmetrically, using age-appropriate toys and the child's level of play (Charles & Gordon, 2006). The intensity is quantified through the frequency and duration of the bimanual activities presented throughout

targeted treatment sessions. Recent studies suggest that both pCIMT and bimanual intensive therapy result in significant improvement and are similar in their efficacy (Aarts et al., 2010; Chamudot et al., 2018). The pCIMT and HABIT techniques are increasingly used together to promote the use of the weaker upper extremity while also promoting bilateral hand use to increase function (Hoare & Greaves, 2017).

Parent and Caregiver Coaching in EI

EI is the provision of services to infants and young children (0–3 years of age) with developmental delays and their families (Centers for Disease Control and Prevention, 2019). Parent and caregiver coaching models in EI have been used across disciplines, including occupational therapy, physical therapy, and speech and language pathology (Case-Smith et al., 2013). There is increasing evidence to support the training of care providers (parents and other primary caregivers) to carry out therapy interventions at home (Benfer et al., 2018). This supports a cohesive approach to intervention that supports families and their communities.

A new model presented by Osei and Dimitropoulou (2019, 2021), the Family Activity Adaptation Model (FAAM), is a service delivery model that aims to support families in developing daily activities and routines to facilitate bimanual hand use, support the interest needs and lifestyle of families, and maintain practice intensity. In this model, the occupational therapist acts as "facilitator" for the caregiver and the child. The FAAM encourages the use of goal-directed, occupation-based activities that are meaningful to the family. This iterative model uses a teach-coach-review process to train caregivers to implement an intense treatment protocol into daily life routines. As a newly presented model, Osei and Dimitropolou (2019, 2021) employed this newly presented model to build on other parent coaching models, such as the Occupational Performance Model (Graham et al., 2010) to support, develop, and apply the model specifically to young children requiring intensity, frequency, and duration of pediatric hemiplegia treatment protocols where access may be challenging. These parent coaching models emphasize the collaborative process of goal-setting with families, supporting the play patterns and preferences of the child, and developing routines that match family values through a consultative method. There is currently limited research combining the intensive treatment methods of pCIMT and HABIT with parent coaching models in occupational therapy for children with hemiplegia (Novak & Honan, 2019).

Applying Coaching Models and Intensive Training to Other Caregivers

Intensive treatments such as pCIMT and HABIT are typically delivered by a therapy therapist in an outpatient setting. This can significantly limit access to these evidence-based interventions for families, particularly those with long work hours, those experiencing socioeconomic barriers, those in rural communities, and/or those in situations where access is limited, such as with the current Covid-19 pandemic. When intensive treatments with a therapist are not feasible, interventions administered by a caregiver and facilitated by an occupational therapy therapist may be an option using a coaching model.

When using coaching models, it is often the parent (typically the mother) who is the primary person implementing interventions (Kemp & Turnbull, 2014; Novak & Honan, 2019). However, having a parent provide an intensive home-based intervention may not always be the best option given current lifestyles. Caregivers, in the form of relatives, nannies, or other community members, may have an opportunity to step in to provide the treatment required without disrupting the typical family routines. For the purposes of this study, we sought to answer the following intervention question: Is a coaching model, using a participant other than the primary caregiver, an effective intervention delivery method for intensive therapies for a 2- year-old with hemiplegic cerebral palsy?

Method

Study Design and Enrollment

This research incorporates a descriptive case study design. The subject's mother approached the primary investigator (an occupational therapist, faculty member, and pediatric clinic coordinator) requesting assistance with developing a home-based intensive therapy program for her 2-year, 7-month old daughter diagnosed with right hemiplegic cerebral palsy. A study protocol was developed by the primary investigator. University institutional review board approval and informed consent were obtained. The parent sought out and hired a caregiver/nanny, who was also an occupational therapy student at the investigator's institution. The parent and the newly hired caregiver agreed to participate in the intervention protocol as detailed below.

Intervention

Application of the Family Activity Adaptation Model (FAAM) guided the intervention protocol using the FAAM theoretical structure: (a) goal identification, (b) occupation-based activity analysis, (c) family support, and (d) intensive training (Osei & Dimitropoulou, 2019). Pretest and posttest data was collected to specifically identify potential progress in identified areas. Intervention included:

1. *Goal Identification*: Included interviewing and establishing goals with the family using the Canadian Occupational Performance Measure (COPM) and Goal-Attainment Scaling (GAS).
2. *Occupation-based Activity Analysis*: Included PI analysis of family routines and sequences, environmental context, time expectations, cognitive demands relative to the child's developmental stage, and motor requirements specific to the physical demands. Identification of child-activity interaction played a critical role, including opportunities to upgrade and downgrade (scaffolding) based on the child's activity tolerance and interests. See Appendix for a sample of suggested daily occupational therapy interventions.
3. *Family Support*: Included weekly consultation of PI with the caregiver and/or parent using the teach-coach-review method.
    a) Ongoing weekly consultative support, including phone and email communication to support activity identification and modify and scaffold activities based on professional reasoning.
    b) Resources in the form of articles and books were provided to both caregiver and parents.
4. *Intensive Training*: In both pCIMT & HABIT principles occurred over multiple sessions. This included collaborative activity identification supporting the occupation-based activity analysis.
    a) Two, 2-hr sessions provided to the caregiver.
    b) One, 2-hr session provided to parents and caregiver.

Outcome Measures

Grip Strength and Joint Mobility

Bilateral grip strength was measured using a bulb dynamometer at pre and posttest. Active right upper extremity shoulder flexion and supination were measured using goniometry. These measurements were chosen based on functional outcomes required to meet parent goals.

The COPM

The COPM is a client-reported rating of problems, concerns, and issues in the occupational performance areas of self-care, productivity, and leisure (Law et al., 2005). The COPM has strong content, construct, and criterion validity, and recent studies have demonstrated the COPM to be sensitive to

changes occurring as a result of pCIMT (Aarts et al., 2010). The COPM was used to guide goal identification and intervention planning.

Pediatric Evaluation of Disability Inventory

The Pediatric Evaluation of Disability Inventory (PEDI) is an evaluation designed to measure functional capabilities in children ages 6 months to 7.5 years of age (Haley et al., 1992). The PEDI has strong content and construct validity, is sensitive to change, and is appropriate for use with children with cerebral palsy (Graham et al., 2010). The PEDI looks specifically at three domains of function, including self-care, mobility, and social function. For the purposes of this study only the self-care scale was used.

Pediatric Motor Activity Log Revised

The Pediatric Motor Activity Log Revised **(**PMAL) is an assessment designed to measure participation in functional activities and the use of an impaired upper extremity in children 2–8 years of age with cerebral palsy (Taub et al., 2007, 2011, 2012). The PMAL demonstrates high internal consistency and test-retest reliability (Taub et al., 2007, 2011). It is administered in a semi-structured interview format to the primary caregiver. Sample questions include: During the last week how often did your child eat finger foods, pick up small items, self-feed with fork or spoon, and so forth, and then asks how well their child does the same activities. Questions are rated on a scale from 0–5 with 0 meaning that the affected arm is not used in that activity and 5 meaning that the child uses the arm in a typical way or 90%–100% of the time. While the tool was designed to be used every other day, it was administered at pre and post testing for this study.

The GAS

The GAS has been used in the social sciences for many years as a means of measuring therapeutic outcomes, and it has become an increasingly popular means of evaluating functional client goals in rehabilitation settings (King et al., 1999). The GAS provides an individualized, criterion-referenced measure of change, "making it potentially responsive to small changes that are perceived by children, families, and teachers as important for daily function" (King et al., 1999, p. 37). At the start of the intervention, clients are assigned a baseline score. Following the intervention, these scoring criteria are used at the time of post testing: -2 indicating a decrease in function, -1 indicating no change in performance, 0 indicating the expected outcome was achieved, +1 indicating there was a greater than expected outcome, and +2 indicating there was a much greater than expected outcome. This method of scoring is consistent with the research presented by Harpster et al. (2019), placing -1 at baseline to be able to indicate both potential regression, as well as potential progress.

Parent Satisfaction Survey

An individualized, research-designed questionnaire was used to determine parent satisfaction within the coaching model. Questions targeted concepts around duration of treatment, focus of treatment options, and specific coaching methods.

Data Collection

Pretest data was collected during a 2.5 hr occupational therapy evaluation of client function at the primary investigator's university onsite clinic. Outcome measures were administered to the parent (questionnaires) and the child (physical assessments) accordingly. During the intervention phase, data regarding tolerance to constraint wear was recorded at each session. Posttest data was gathered in 2 weeks of the end of the intervention period, as well as 3 months post intervention by phone to determine whether gains had been maintained or whether additional changes had occurred.

Data Analysis

Quantitative data from the interviews and assessments was analyzed. Descriptive statistics were used to describe outcomes.

Results

Gains were made on six out of seven outcome measures.

Child Performance Outcomes

Positive changes were observed in grip strength and right upper extremity range of motion as identified pretest to posttest (see Tables 1 and 2).

Table 1

Grip Strength in Both Hands with Bulb Dynamometer

Grip Strength	**Left (pounds)**		**Right (pounds)**	
	Pretest	*Posttest*	*Pretest*	*Posttest*
Grip trials	15, 12, 10	20, 20, 28	1, 0, 2	5, 5, 0
Average	12.3	22.7	1	3.3
Change	10.4		2.3	

Table 2

Range of Motion in Right Upper Extremity

Joint measurement	**Pretest**	**Posttest**	**Change**
Shoulder flexion	75 degrees	85 degrees	10 degrees
Supination	85 degrees	115 degrees	30 degrees

Parent-Reported Outcome Measures

Parent report suggests high satisfaction and positive changes in their child's occupational performance in the home environment. Clinically significant changes were noted on the COPM. Perceived changes were noted by the parent in both performance of the selected activities and their satisfaction with the level of performance on the selected activities (see Table 3). Changes in the GAS suggest more than expected progress on goals set (see Table 4). Data collected in the PMAL suggests an improvement in the child's overall use of her affected limb in everyday tasks at post testing. Further gains were noted additionally at the 3-month follow-up (see Table 5). In addition, the results of the Parent Satisfaction Survey suggest that the parent was very satisfied with the overall process (see Table 6). Initial pretest information using the PEDI Self Care subtests (Functional Skills and Caregiver Assistance) suggests that the child fell in the range of typical development (scaled scores = 54.3 and 48.6). Scores were obtained at posttest but did not indicate any change, as the child remained in the range of typical development over the 5-week intervention.

Table 3

Summary of COPM

	Pretest		Posttest		Follow-up	
	Performance Score[a]	Satisfaction Score	Performance Score	Satisfaction Score	Performance Score	Satisfaction Score
Goal #1: Improve ability to supinate[b]	3	3.5	5	10	8.5	10
Goal #2: Improve ability to support dish w/ R hand while eating	3	4	5	10	7	9
Goal #3: Use R pincer grasp to eat or play	4	7	5	9	6	7
Total Score	10	14.5	15	29	21.5	26
Avg. Score	3.3	4.8	5	9.7	7.2	8.7
Change Scores	n/a	n/a	1.7	4.9[c]	3.9[d]	3.9[d]

[a] Scores in the COPM are presented on a scale from 1–10; [b] e.g., when putting on lotion, collecting small toys, washing hands. [c] A change score of two or greater indicates clinically significant changes (Law et al., 2005). [d] Change since initial evaluation.

Table 4

Summary of Goal Attainment Scaling

OT Goals	**Pre-Test**	**Post-Test**
1. Child will use her right hand to assist in daily activities.	-1	2
2. Child will turn her hand (supinate) to allow her to collect/carry toys, coins, lotion, etc.	-1	1
3. Child will use pincer grasp to feed self or manipulate toys.	-1	2
Sum of Scaled Scores	*n/a*	5
T-score	73*	
Standard Deviation	2.3	
Descriptive Change	Much greater than expected*	

Note. King et al. (1999).

Table 5

Summary of Pediatric Motor Activity Log

Functional use of right arm	**Pretest**	**Posttest**	**3-month follow up**
How often[a] avg. response	2.59	3.20	3.68
How well[b] avg. response	2.68	3.14	3.64

[a] How often child participates in daily activities using affected arm. [b] How well child participates in daily activities using affected arm.

Table 6

Research Participation Parent Satisfaction Survey Results

Parent Satisfaction Survey	1 Strongly Disagree	2	3 Neutral	4	5 Strongly Agree
I am satisfied with my child's experience with the care provider-provided activities.					**X**
I felt that 5 weeks was a sufficient period of participation to see progress.					**X**
My child generally tolerated wearing the required splint for the daily 3-hr intervention period.				**X**	
The care provider was knowledgeable and carried out the program consistently.					**X**
I felt the caregiver model was an effective way of increasing function without having to attend daily services.					**X**
I would recommend this model (caregiver provided activities) to others.					**X**
My child enjoyed participating in the activities.					**X**
My child made improvements in their ability to participate in their daily activities.					**X**
My child made improvements in the functional use of their right arm.					**X**
I was provided instruction to support my child's goals during the intervention period.					**X**
I would have liked more individualized instruction.			**X**		

Open Ended Responses:

- The activities that were most helpful for my child were: "Painting with both hands, drawing while splinted, reaching up for objects, eating while splinted, and using pincer movement. (My child) loved making cookies."
- The activities that were least helpful to my child: n/a.
- Additional comments: "(The caregiver) was fantastic! (My child) bonded with her and that was huge. We are both extremely happy with this experience and surprised that we can see so much improvement in (our child's) overall use of her right hand. We would recommend it to other families, too."

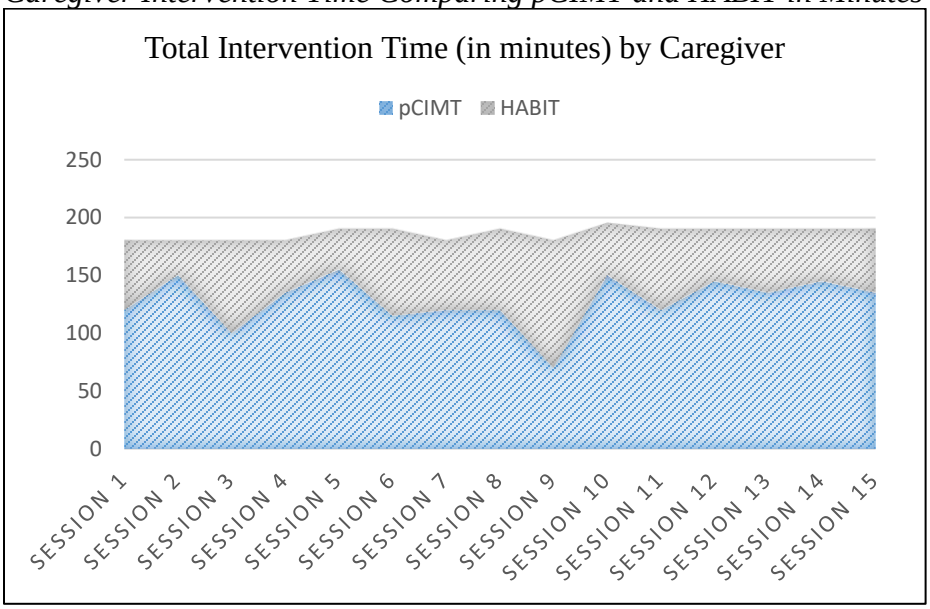
Discussion

Positive changes were noted on six of seven outcome measures used in this study, suggesting that the FAAM was a successful intervention approach for improving outcomes for this 2-year-old child with hemiplegic cerebral palsy. Positive outcomes included improved right upper extremity range of motion; improved right upper extremity grip strength; improved functional participation in daily activities as evidenced by the PMAL, COPM, and GAS; and a high level of parental satisfaction with outcomes. In addition, the child's parents gained strategies to use at home to support their child's motor skill and occupational development.

The caregiver was encouraged to adapt intervention activities to the child's needs, incorporating both pCIMT and HABIT in the treatment. While the intervention for this case study was initially designed to incorporate primarily pCIMT intervention, the caregiver was coached to incorporate HABIT principles and activities whenever the child did not tolerate the constraint. This was based on the knowledge that sometimes young children participating in pCIMT do not tolerate consistent use of a constraint, and current research supports the use of both interventions to address pediatric hemiplegia (Chamudot et al., 2018; Hoare & Greaves, 2017). One unexpected outcome that was noted on review was the ratio of pCIMT to HABIT incorporated into the intervention (see Figure 1). While 69% of the intervention was pCIMT-based, 31% of the intervention incorporated bimanual activities (HABIT).

Figure 1

Caregiver Intervention Time Comparing pCIMT and HABIT in Minutes



As suggested in the results of the PMAL, another unexpected, but welcomed, outcome was that gains continued after the primary intervention ended. The 3-month follow-up found that functional gains were not only maintained, but continued over the next several months. The parents reported being highly motivated by observed gains during the formal intervention period, which motivated them to continue therapeutic activities for an additional 3 months.

Lam-Damji et al. (2015) found that families suggest there are many barriers to accessing time-intensive programs such as pCIMT, including child frustration, safety considerations, and the timelines and commitment required of intensive therapy. The intensity and time commitment required for effective pCIMT can lead to poor adherence to therapy schedules in outpatient treatment, challenges for therapists to schedule and coordinate services, as well as inaccessibility to families with sociocultural risk factors (i.e., low socioeconomic status). While this is a single case study and cannot be generalized, it is important to consider that a caregiver coaching model, such as FAAM, implemented by someone other than the parent or primary caregiver, may be an opportunity for effective EI therapy services.

In this case study, it is important to consider how the family's education level and socioeconomic status may have impacted outcomes. The parents in this study were both highly educated professionals who spent considerable time researching interventions for hemiplegic cerebral palsy, which led to them seeking pCIMT intervention for their child. They had the funds to hire an additional caregiver to provide the interventions during the day while working their full-time jobs.

Limitations and Future Research

There are a variety of factors that limit the strength of this study. A case study cannot be generalized to a greater population but is useful to provide information regarding current practices and to generate new hypotheses for further research. It is important to note that the caregiver was an occupational therapy student with a basic background in child development and hemiplegic cerebral palsy. In addition, the parents' socioeconomic status allowed them to seek and hire an additional caregiver to carry out the prescribed home program. Finally, it is important to note that the child in this study was receiving weekly outpatient occupational therapy and monthly outpatient physical therapy services, which may have further

impacted outcomes. Further research is needed to examine the application of pCIMT and HABIT in the FAAM in EI settings and with larger sample sizes.

Conclusion

Clients and families have difficulty accessing occupational therapy services, especially where there are wait lists, in rural communities, in lower socioeconomic areas, and during times of crisis, such as the current Covid-19 pandemic. The ability of the occupational therapist to act as coach and facilitator allows for family members and caregivers to carry out consistent intervention in the home environment guided by skilled therapists. The current environment opens up opportunities for coaching and facilitation using a telehealth service delivery format model. This study supports current research demonstrating positive outcomes for parent or caregiver provided interventions at home. In this case study the FAAM, implemented by a caregiver other than the parent, was an effective intervention delivery method for intensive therapies for a 2-year-old with hemiplegic cerebral palsy. In addition, the combination of pCIMT and HABIT principles resulted in improved child outcomes, reinforcing the literature that supports the effectiveness of both interventions, specifically for children under 3 years of age.

Sheryl Eckberg Zylstra, DOT, MS, OTR/L, BCP*, has over 30 years of experience in occupational therapy. She currently works as a clinical associate professor at the University of Puget Sound teaching various intervention courses and managing the pediatric onsite student teaching clinic. She specializes in pediatric occupational therapy and has interests in applied clinical research.*

Aimee Sidhu, OTD, MA, OTR/L*, has over 20 years of professional experience as an occupational therapist, with most of her clinical practice in both rural and urban school-based settings in Washington and California. She has worked in occupational therapy education, having taught at both the occupational therapy and occupational therapy assistant levels, including post professional education in occupational therapy, and is currently at the University of Puget Sound. Her teaching experience includes a wide array of topics in occupational therapy, and she was honored with a National Excellence in Teaching award in 2017.*

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Appendix
Sample Daily Occupational Therapy-Designed Intervention Schedule

This demonstrates a typical intervention session for a 3-hr caregiver-provided intervention, and was given to the caregiver as a sample to help shape the day. Interventions varied daily at the discretion of the caregiver with regular guidance by the occupational therapist. The constraint was worn on the left hand, with use of HABIT-based interventions when no longer tolerated. Examples of HABIT activities include eating a sandwich, stabilizing paper while coloring/painting, playing a toy piano, holding a toy while manipulating pieces, pulling toys that require two hands (hula hoop), shaving cream play, water play, stacking large blocks, catching and throwing a ball, and riding a tricycle.

9:00 – 9:10 **Developing Rapport with Child/Application of pCIMT Splint**

9:10 – 9:25 **Story Time**
Encouraged turning pages of a book to promote supination and fine motor dexterity. Encouraged pointing at pictures to promote right hand and finger use.

9:25 – 9:50 **Individual Activity Time**
Caregiver led play time. Interventions included coloring, play with cause and effect toys, playing house, playing with dolls, baking, water play, and water flowers. All activities were selected to promote right upper extremity fine motor skills and functional arm use.

9:50 – 10:15 **Game Time**
These activities were specifically designed to promote right hand use and social participation while addressing the specific parent reported goals. Activities include obstacle courses, outdoor play, scooter board games, parachute activities, gross motor games such as relay races, and board games.

10:15 – 10:40 **Free Sensory Play**
Free sensory play time was used to promote right hand use and self-driven play in a supportive environment. Sensory play included playdough, play with shaving cream, water play, play with pudding, etc. Preferred activities were also incorporated, such as having a tea party, playing with stuffed animals, and exploring her environment.

10:40 – 11:00 **Craft Time**
Craft time was designed to promote continued use of right hand while simultaneously working on developmentally appropriate social and cognitive skills including requesting, turn taking, initiating conversation, attention, and decision-making skills.

11:00 – 11:30 **Snack Time**
Snack time was used to promote fine motor skills of the affected hand, especially including pincer grasp and supination.

11:30 – 11:50 **Closing Story Time and Clean Up activities**
Themes from the day will be reviewed and reinforced via reading of a children's book followed by age-appropriate discussion. Child was encouraged to turn pages and point to pictures. Clean-up activities were completed with splint worn.

11:50 – 12:00 **Data collection**
Child participated in bimanual activities with splint off to collect data regarding play.