

# **Holland Bloorview**

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## HELPING HAND: A PAEDIATRIC CONSTRAINT INDUCED MOVEMENT THERAPY GROUP



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## Presentation Overview

- Overview of constraint induced movement therapy (CIMT)
- Helping Hand Program
  - Program Objectives
  - Program Content
  - Demographics
  - Outcomes & Case Study
  - Strengths & Limitations
  - Future Directions



## What is CIMT/Modified CIMT/Forced Use?

- **CIMT** refers to restraining the unaffected limb while training the affected limb for 3 or more hrs. per day for 2 or more weeks (Sterr et al 2002, Taub et al 2004)
- **Modified CIMT** is when the limb is restrained for less than 3 hrs. each day or the training is less than 3 hrs. per day (Taub et al 2006, Eliasson et al 2005, Naylor et al 2005)
- **Forced Use** refers to restraining the child's unaffected limb without training (Gordon et al 2005)

## Key Concepts

- CIMT works by constraining the preferred upper extremity to force the use of the hemiplegic arm
- This produces use in the affected arm through two mechanisms:
  - **Shaping**: successively builds complex motor skills through positive reinforcement
  - **Practice**: induces cortical reorganization



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## Literature

- CIMT: Studies in adult stroke & children with CP
- Range in duration of program, type & method of constraint
- All studies found an increase in scores on functional outcome measures after CIMT
- Immediate and sustained changes noted
- Studies that examined the neurophysiology behind
- CIMT found changes in cortical activation



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## Limitations of CIMT

- CI therapy **does not normalize** limb movement
- Limb power may modestly improve for some patients. However, limb power, tone, coordination, or somatic sensation are likely to remain affected following the conclusion of treatment
- The main goal of CI therapy is to improve the amount of **spontaneous limb use** in the “real-world”



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## Helping Hand Program Objectives

- Increase use of affected limb in daily occupations
- Increase participation in Self-Care and Play
- Promote parental understanding of CIMT as it relates to hemiplegia
- Address parent & participant psychosocial needs in context of CIMT



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## Helping Hand Program Overview

- 2 week CIMT group program offered during the summers of 2008, 2009 & 2010
- Interdisciplinary program comprised of Occupational Therapists, Physiotherapist, Social Workers, Music Therapists and Volunteers
- Daily program from 9:00 a.m. to 1:00 p.m. 5 days/week
- Consisted of concurrent child and parent groups
- Method of constraint included splinting and casting
- Program content emphasized participation in play and self care activities

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## Inclusion Criteria

- Client of Bloorview Kids Rehab- diagnosed with ABI or Stroke
- Stated functional goals for upper extremity
- Family commitment to participation in program
- Sensory awareness of affected limb
- Initiation of active movement at shoulder and elbow
- Safety with respect to mobility and balance
- Developmental/cognitive ability to participate in a group

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## Exclusion Criteria

- Behavioral concerns that would preclude participation
- No medical condition that would preclude the wearing of a splint or cast



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## Program Content

- Daily gross motor activities & stretching
- Fine motor activities (circuit & time trials)
- Snack
- Games/ special activities (includes crafts, music, cooking, magic, parent simulation)
- Lunch
- Fine motor activities
- Parent feedback & check in
- Parent Group
- Client Support Group


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## Psychosocial Components

- Social Workers met with Parents 6 times for 2 hrs
- Goals for parent component:
  - Provide information and strategies to help parents better cope & understand while supporting their children
  - Give parents the opportunity to meet with and support each other
- Social Workers met with participants 2-4 times
- Goals for client sessions:
  - Assess emotional coping
  - Encourage use of frustration management strategies

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## Topics for Client Sessions

1. Colour the Circle Pre & Post 10 Question Measure
  - It helps that there are other kids & teens doing Helping Hand with me
  - I know how to manage my frustration with using only my weaker hand and not both hands
2. Talking, Feeling, Doing Game
3. Hopes, expectations and coping strategies
4. Frustration management strategies
5. Clients experience of CIMT

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## Topics for Parent Sessions

1. Hopes, expectations and coping strategies
2. Insight and understanding into both motor and sensory impairments
3. Effective frustration management strategies
4. Parents experience of CIMT
5. Literature review
6. Long term strategies and physician's presentation on ABI, Neuroplasticity and Constraint Therapy

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## Summary of Parents' Group Evaluations- Quantitative Results

- In both years 70% felt meeting 6 times over 2 weeks was adequate to accomplish the goals
- 70- 80% strongly agreed that the Social Workers who lead the group supported theirs & their child's participation in the program
- 100% interested in 2009 versus 70% interested in 2010 in their children participating again
- 90-100% felt it was helpful to have separate parent group session
- Connecting with others and learning different ideas to help their children were the most reported benefits of the parent group

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## Summary of Parents' Group Evaluations- Qualitative Results

- Ways Helping Hand Parent Group benefitted:
  - "Connect with other Parents with same situation"
  - "Learning different ideas to help my child"
- What was liked best about parent group:
  - "Discussions with other parents, bringing everyone together, especially ones with more experience on ABI and recovery"
  - "What I liked best is that there is one (parent group). Also that all of us had a place to share ideas together"
- What parents liked least about the Parents' Group:
  - "The commute to HB. However being held in July does help due to less traffic"
  - "Repeating" (having participated last year)

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## Client's Perspective:

- "It was called Helping Hand and was fashioned as a camp; I call it Hand Camp (break off from boot camp)."
- "Snack time was a trial of patience for me and I am sure many of the other children- more ended up on the floor than in my mouth."
- "Lunch was again an "ordeal" with a capital O. Sandwiches broke, messes were made, juice was spilled."
- "As soon I got home, I dove for my bed. This happened every single day!"



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## Client Demographics

	#	Age	Diagnosis	Time Post Onset
<b>2008</b>	7	4-18 years	3 Stroke,3 TBI & 1 Dual Dx. of PDD & AVM	1-4 years
<b>2009</b>	10	3-17 years	1 Anoxic brain injury & DMD 3 stroke,3 AVM(1 child with PDD)	8 months- 3 years
<b>2010</b>	10	4-15 years	6 stroke,3 AVM & 1 Encephalitis	4 months -5 years

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## Outcomes: Assisting Hand Assessment (AHA)

- AHA measures & describes how effectively children use their affected (assisting) hand in bimanual activity performance
- Based on observations of actions performed in relevant & motivating activity (play)
- 4-point scale of 22 items rating the quality of movement
- Developed using Rasch measurement model  
(Sunholm, Homefur, Eliasson, 2007)

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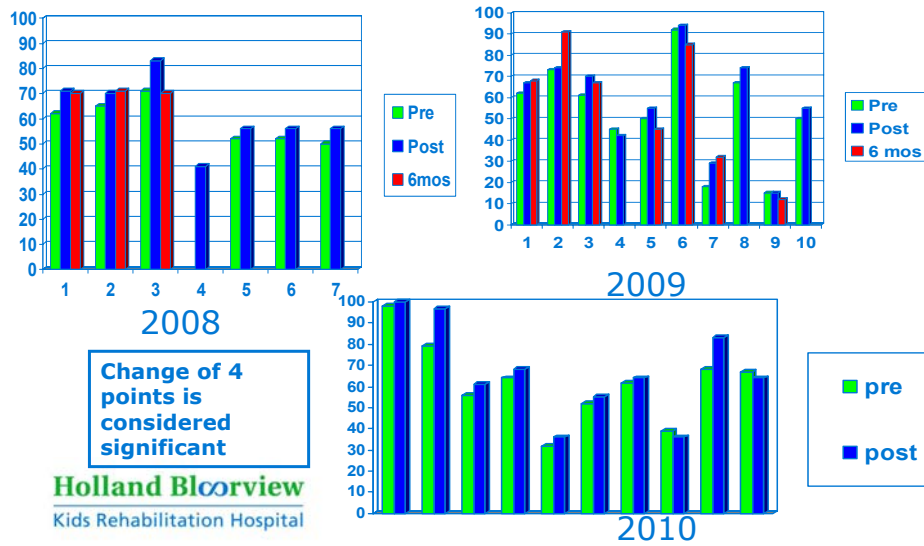
## Case 1

- 6 year old who sustained an ABI in 2007 in an MVA
- Presents with right hemiparesis and dystonia
- Multiple CIMT programs
- Supportive & engaged family
- Family Goals include:
  - Dressing, fastening buttons
  - Bathing, showering by himself
  - Putting on his Right shoe while wearing an AFO
  - Feeding with right hand
  - Throwing a ball

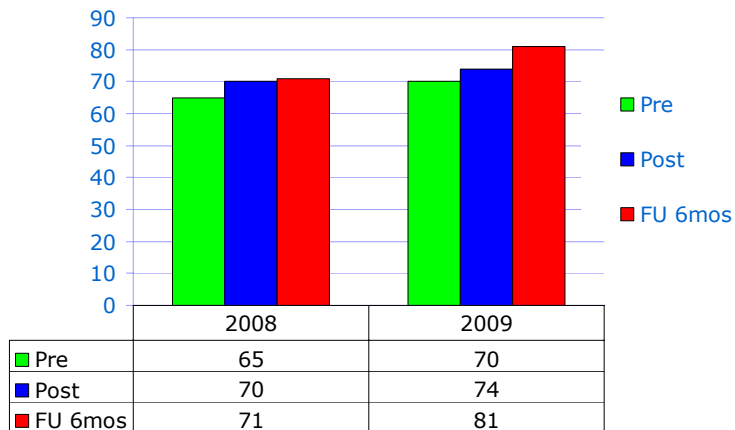


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## Outcomes: Assisting Hand Assessment (AHA)



## Client 1: Assisting Hand Assessment Outcomes



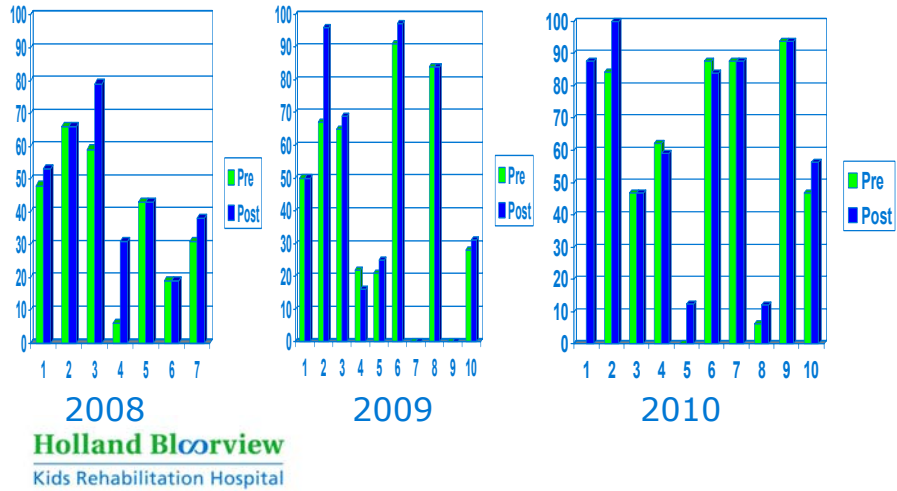
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## QUEST: Quality of Upper Extremity Skills Test

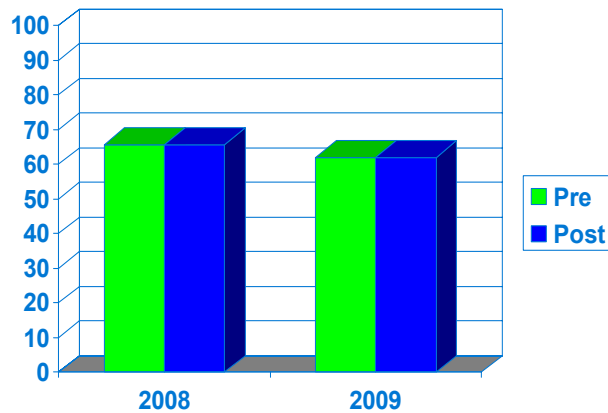
- This measure evaluates the quality of arm/hand movements in 4 areas:
  - Dissociated Movements
  - Grasp
  - Weight Bearing
  - Protective Extension
- Criterion referenced measure designed for children 18 months to 8 years with neuromotor dysfunction  
(Damateo, Law, Russell, Pollock, Rosenbaum, Walter, 1992)

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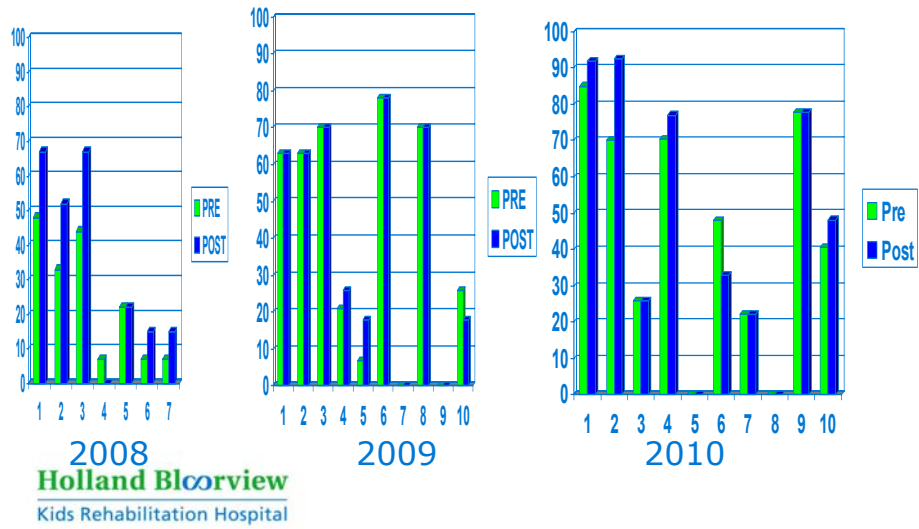
## QUEST: DISSOCIATED MOVEMENTS



## QUEST Dissociated Movements Client 1



## QUEST: GRASP



## QUEST: Grasp Scores Client 1



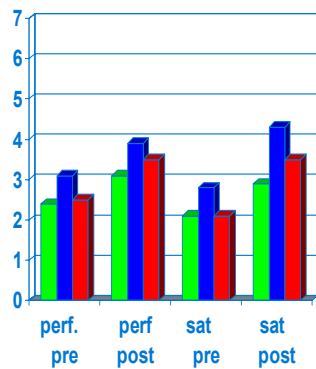
## Outcome: Canadian Occupational Performance Measure (COPM)

- Performance issues identified in the areas of self-care, productivity and leisure included:
  - Holding a spoon, cutting
  - Fastenings
  - Turning Pages in a book
  - Playing Nintendo & Wii
  - Playing Piano
  - Cutting with scissors
  - Making a bed
  - Transferring to a tub

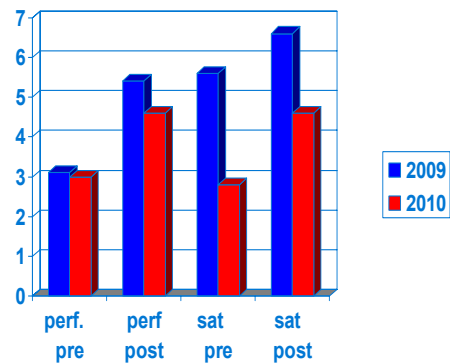


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## COPM Parents



## Clients



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## Other Outcomes

- Pediatric Motor Activity Log
- Acquire Motor Activity Log
- Modified Sphygmomanometer
- Client Program evaluation
- Time Trials and daily self report



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## Client Perspective

- "At one point I felt like walking out; I felt, "What do I need all this sadness for?" I looked at all the amazing kids doing the therapy with me; most were too young to understand why they had to go through so much hardship, yet no one complained and I thought, If they could do it I can too."
- "In retrospect when I look at where I started and where I now am, I am amazed. I can now scoop beans, stack cones, eat finger food, and even some chips. The flow of blood to my right arm has increased and I would not be surprised if my chance for having seizures has dropped drastically. It has taught me some lessons, which I now walk away with, lots of self-control and that true effort no matter how improbable brings results. In my present state of mind I would definitely continue CI therapy if given the chance."

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## Summary of Children's Group Evaluations

- 92% reported that the program helped in using their involved hand (very helpful & helpful)
- 75% reported that the program should be longer than 2 weeks
- 75% reported that the morning program was long enough
- 92% reported that they would consider attending a subsequent program

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## Client's Perspective for Carry-Over

- I will:
  - remember to use my right hand more often
  - play video with my fingers on my weak hand
  - practice magic
  - think of my friends and use my hand more
  - play bingo
  - try to eat my lunch with my left hand
  - brush my teeth

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## Summary



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- Paucity of literature
- Program model combines child friendly approach with parent support & education
- Group format promotes social interaction, modeling & encouragement
- Implications for work-load & resources
- Motivated client group
- Positive outcomes in strength, upper extremity function, & occupational performance
- Casting & Splinting both revealed positive changes

## Ongoing Questions

- Duration
- Intensity/methods
- Retention
- Need for subsequent course
- Group therapy
- Growth, development & recovery
- Bimanual vs. and/or in combination with CIMT
- Family & Client readiness



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## Questions?



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