

# Efficacy of Multiple Treatments of Pediatric Constraint-Induced Movement Therapy to Improve Upper Limb Function in a Child with Hemiplegia Secondary to an Unconventional Etiology:

## A Case Report

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### Introduction

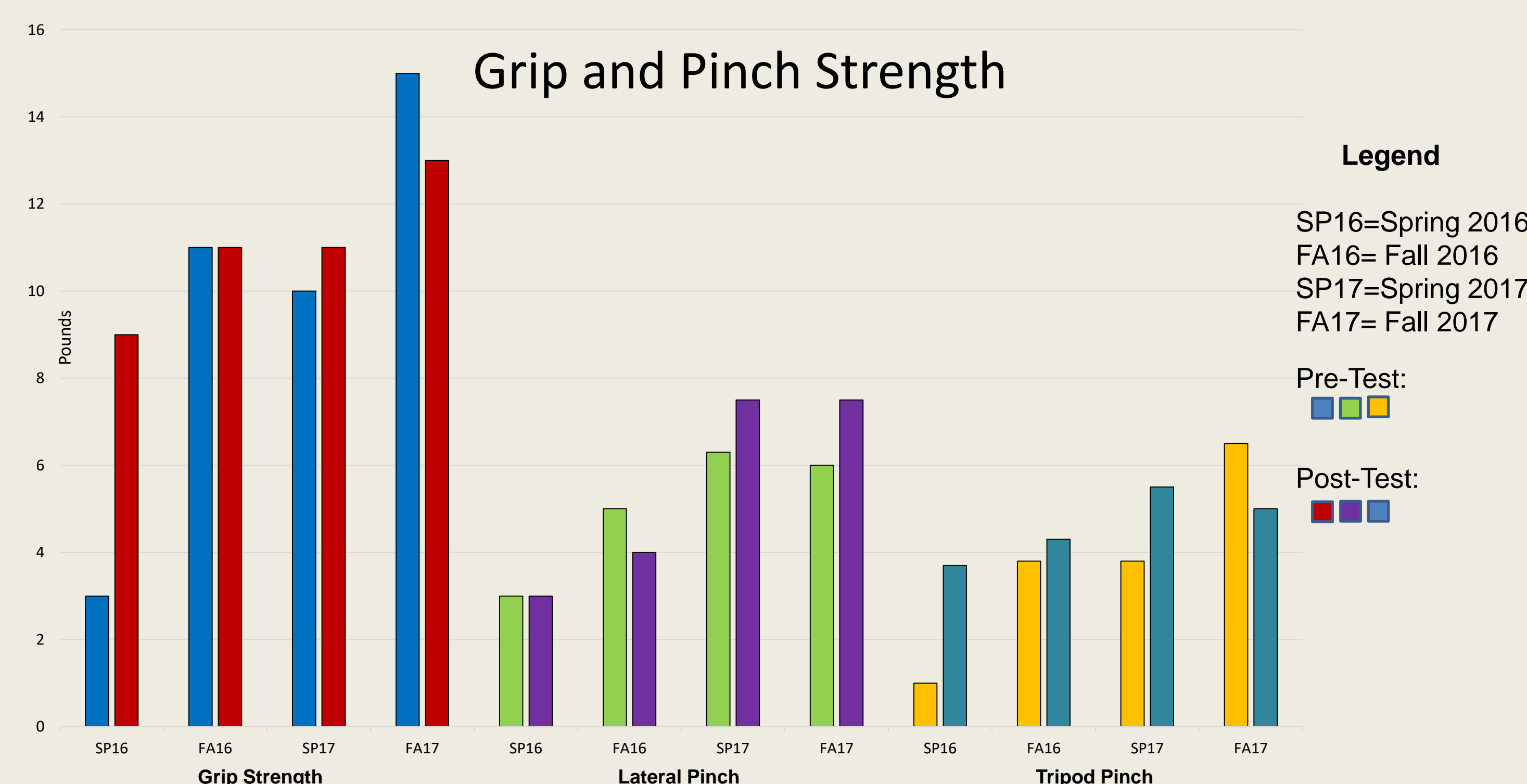
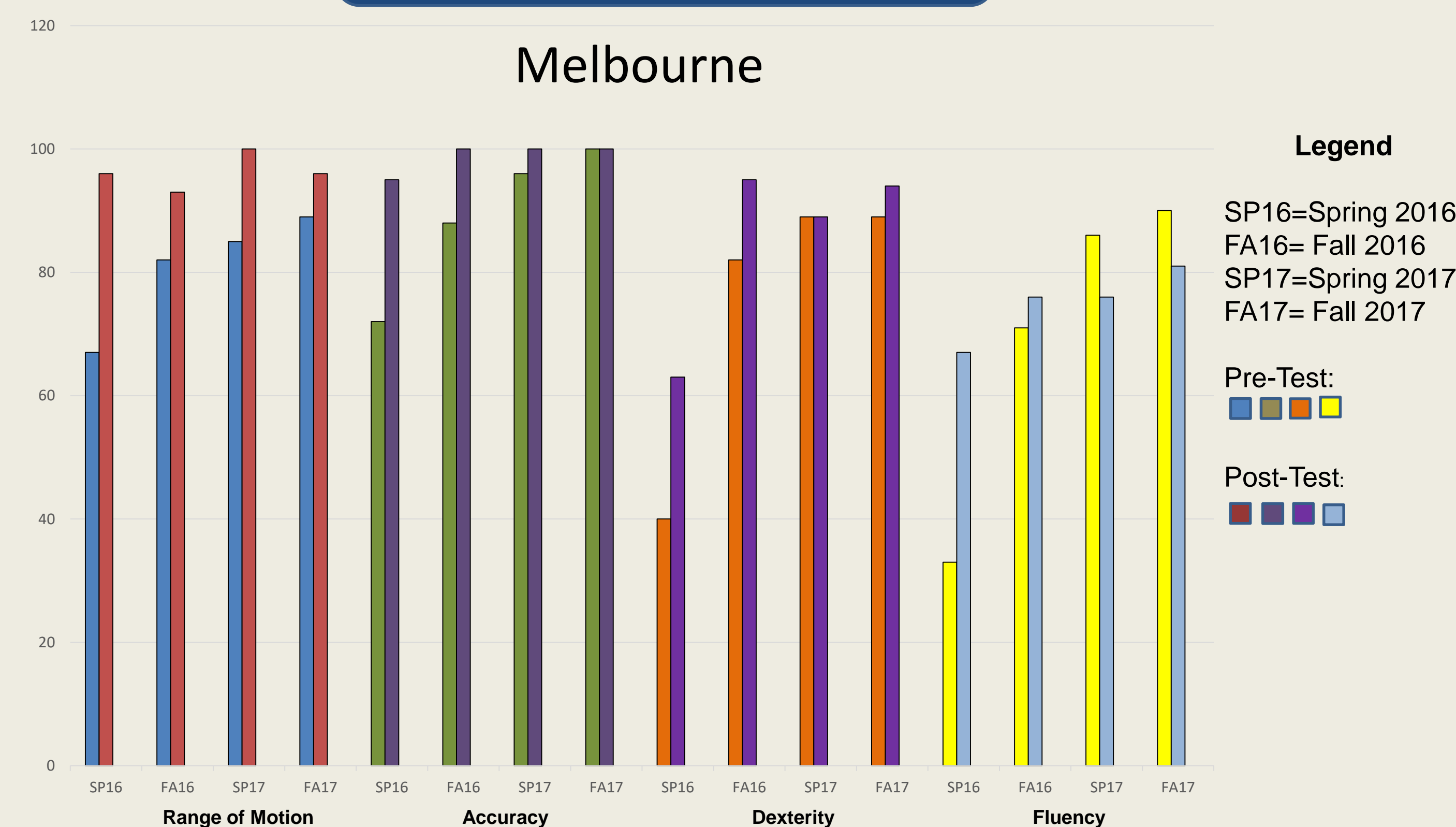
Pediatric Constraint-Induced Movement Therapy (pCIMT) is an evidenced-based and specialized treatment approach that involves constraint of the non-affected extremity in combination with mass practice and shaping of movement patterns with the affected extremity. pCIMT has been widely researched for children with Cerebral Palsy and Brachial Plexus Injury, however it's effects are still unclear for children with hemiplegia due to differing etiologies. This case report explores the efficacy of multiple treatments of pCIMT for a child with hemiplegia secondary to spinal tumor resection.

### Case Report

- Pre and post-testing with the following outcome measures was completed for each subsequent trial: Melbourne Assessment 2: A Test of Unilateral Upper Limb Function, Pediatric Motor Activity Log (PMAL), Pediatric Evaluation of Disability Inventory (PEDI), and Grip and Pinch Strength
- Custom removable uni-valved long arm thumb spica cast used for constraint of less affected upper extremity.
- pCIMT therapeutic package including direct, intensive occupational therapy sessions provided 2 hours per day, 5 days per week, for 3 weeks.
- Individualized sessions included shaping and mass practice targeting child's current skill level and developmental needs.
- Shaping consists of gradually increasing the difficulty of the activities while allowing the child to continue to be successful in the tasks.

- Mass practice consists of increasing number of repetitions of specific movement patterns.
- Home practice activities were completed a minimum of 2 hours during weekdays and recommended a minimum of 4 hours on weekend days.
- Multiple treatments were completed Spring 2016, Fall 2016, Spring 2017, and Fall 2017.

### Results



DeLuca, S.C., Ramey S.L., Trucks M.R., & Wallace D.A. (2015). Multiple treatments of pediatric constraint-induced movement therapy (PCIMT): A clinical cohort study. *American Journal of Occupational Therapy*, 69(6):1-9.

### Discussion

This patient demonstrates hemiplegia secondary to an unconventional etiology for which pCIMT is not highly researched. However, repeated pCIMT treatments produced large and significant benefits for this patient and the largest gains occurred after the first treatment. In addition, subsequent pCIMT treatments produced gains over and above the first pCIMT treatment. Future research needs to include more sensitive outcome measures for children with hemiplegia from a variety of diagnoses. Use of pCIMT should be explored to realize maximum benefits for all children with hemiplegia, especially those from unconventional etiologies.

The outcome measures utilized are normed for children with Cerebral Palsy or Brachial Plexus Injury, which may have influenced the outcomes. There is no clear research on time interval between each repeated treatment. In this study it was determined by family schedule and clinic availability. This parent was highly invested in the child's neuromotor progress which may have contributed in part the treatment benefits observed. Ongoing outpatient occupational therapy services was also continued between treatments of pCIMT.

### Conclusion

Repeated treatments of pCIMT demonstrated significant improvements in upper limb function for this child with hemiplegia secondary to a spinal tumor resection. The largest gains occurred after the first treatment with further smaller gains noted after each subsequent trial. Use of pCIMT should be explored to realize maximum benefits for all children with hemiplegia, especially those from unconventional etiologies.