Motor Intensive & Therasuit Therapy

Student Inservice: Spring 2019
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Objectives

By the end of this presentation the learner will be able to….

- Understand the logistics of a Motor Intensive Therapy program
- Review current evidence regarding effects of intensive therapy
- Explore current recommendations for use of the Therasuit in practice

Motor Intensive Program: St Croix Therapy

- Typically 3 hours of therapy a day, 5 days a week, for 3 weeks
- Program is carefully tailored to meet each client's needs
- Typical session:
  - "Setting up the body" for work- proprioception, stretching, massage, vestibular exercises
  - Therasuit is applied prior to exercise in Universal Exercise Unit
  - Aquatic Therapy
- Prescription required specifying the need for intensive therapy
- Billing: SCT fully discloses the cost of the program prior to scheduling
  - SCT contacts insurance to inquire on coverage, though informs family that insurance may not entirely cover intensive
  - Financial agreement signed prior to start
  - Deposit is due prior to start to reserve spot in program

Therasuit®

- Developed and patented by Richard and Izabela Koscielny in 2002
- Breathable, soft, dynamic orthosis
- Intended to improve/change proprioception, reduce pathological reflexes, restore physiological muscle synergies, and load the entire body with weight[1]
- Ultimately intended to normalize vestibulo-proprioceptive input to influence “correct” alignment by allowing increased repetitions for a particular movement



Table 2: Core principles of experience-dependent neuroplasticity

1. Use it or lose it	Neural networks not actively engaged in training can degrade
2. Use it & improve it	Training can induce dendritic growth and synaptogenesis within specific brain regions that enhance task performance
3. Specificity	The nature of training dictates the nature of the plasticity
4. Repetition matters	Repetition is required to induce lasting neural change (skill instantiation)
5. Intensity matters	A sufficient intensity if stimulation is required to induce plasticity
6. Time matters	Different forms of plasticity occur at different times during training
7. Salience matters	The training experience must be sufficiently rewarding to induce plasticity
8. Age matters	Training-induced plasticity occurs more readily in the younger brain
9. Transference	Plasticity induced by one training experience can enhance the acquisition of similar behaviours
10. Interference	Plasticity induced by one training experience can interfere with the acquisition of similar behaviours

Note. This table summarises key principles by Kleim & Jones (2008) and is not intended as an exhaustive list.

Christy J, Chapman C, Murphy P. The effect of intense physical therapy for children with cerebral palsy. *J Pediatr Rehab Med*. 2012;5:159-170.

- Purpose: Determine short and long term (3 months post) effect of an intensive physical therapy program (5 days/week, 4 hours/day, 3 weeks) on gross motor function, community walking, participation, and performance/satisfaction in children with CP
  - Use of suit in all participants, though amount of time was individualized
  - Therapists did feel the suit was beneficial in maintaining alignment of joints during exercises
- 17 subjects with CP between 4 and 12 years GMFCS levels I-III
- Results: 3 week session of intensive improved gross motor function (GMFM-66), perception of general heath (PODCI-gf), and performance and satisfaction of important activities (COPM)

Table 1
Description of the intervention

Duration (minutes)	Activity	Description/examples
10–15	Moist heat	Applied to tight musculature
15–20	Manual therapy	Massage, soft tissue/joint mobilization and stretching
15–20	Strengthening	Core musculature strengthening exercises (e.g. sit ups on a stability ball)
30–50	Activities in a TheraSuit™	Walking over ground and on treadmill, stair climbing, jumping, squatting, running (depended on abilities and goals)
20–30	Strengthening with weights*	The child was placed on a plinth in supine or prone and used weights ranging from 0.5–3.0 kg attached to a pulley system on a metal frame. Weights were placed on the lower or upper extremities with a soft strap. Exercises were done in straight and diagonal planes. Resistance was increased by 0.5 kg when the 15–25 repetitions were independently completed.
20–30	Upright exercises in a metal frame*	A belt was placed around the child's waist. The therapist attached bungee cords of varying resistance to the belt and then to a metal frame. The bungee cords assisted in keeping subjects upright and provided resistance as the child worked on balance and other activities.
20–30	Floor Activities	Examples: sitting and standing balance, transitions, walking, stair climbing, ball skills.
30–40	Endurance Activity	Examples: bike riding, timed treadmill or long distance over ground walking

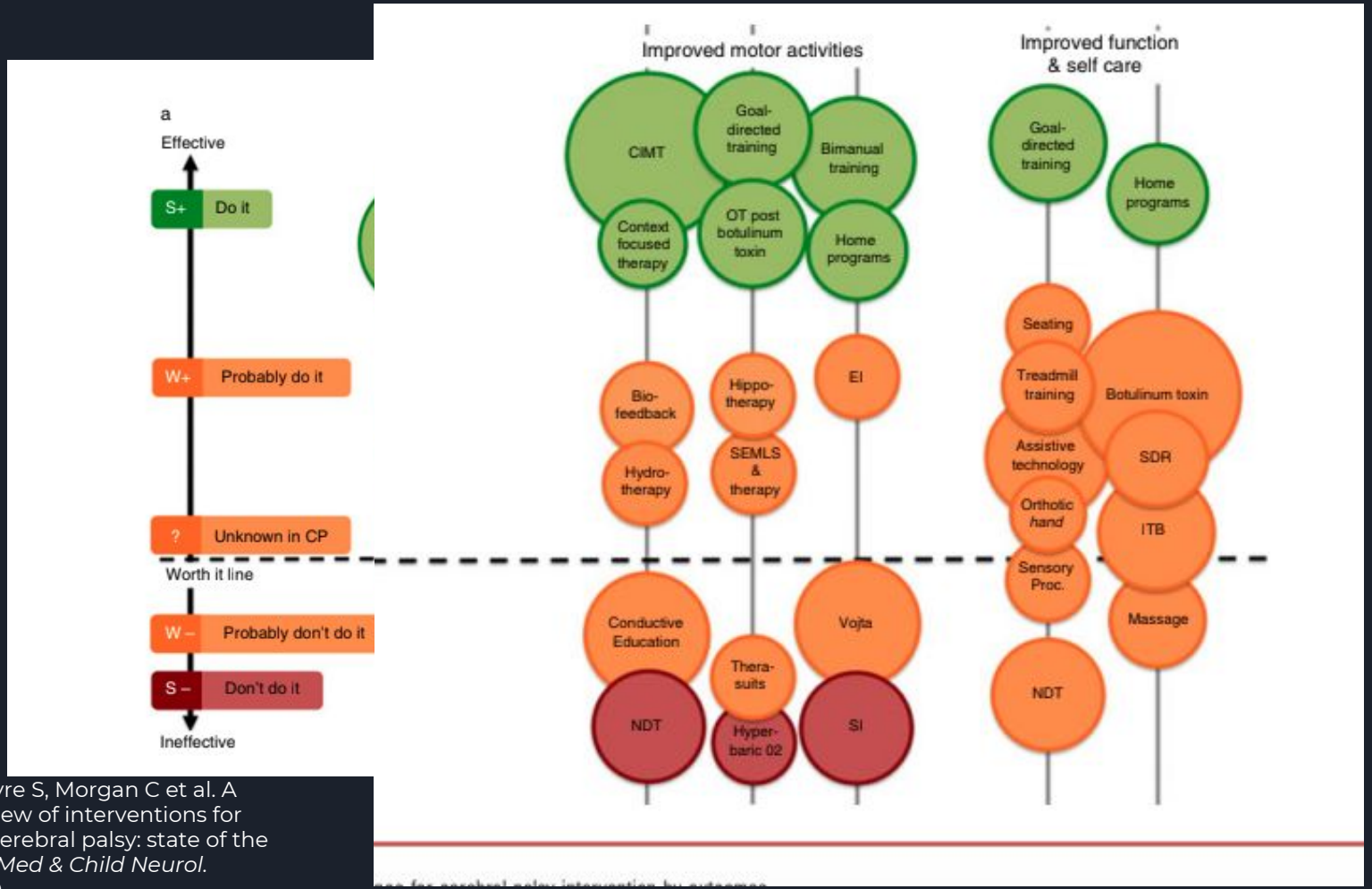
*For pictures of the apparatus and TheraSuit™, refer to Bailes et al. 2010 Figs 1 and 2 [2].

Bailes A, Greve K, Burch C et al. The effect of suit wear during an intensive therapy program in children with cerebral palsy. *Pediatr Phys Ther.* 2011;23:136-142.

- Twenty children with CP, GMFCS level III, ages 3-8 years were randomized to an experimental (TheraSuit) and control group
- Both groups participated in intensive program (4 hours/day, 5 days/week over 3 week period)
- Outcomes: PEDI, GMFM-66 completed at baseline, 4 weeks, and 9 weeks
- Results: Both groups were found to improve over the 9 week period in GMFM-66 and PEDI domains
- Conclusion: Use of the therasuit was not found to impact outcomes

Alagesan J, Shetty A. Effect of modified suit therapy in spastic diplegic cerebral palsy - a single blinded randomized controlled trial. *Online J Health Allied Scs.* 2010;9(4):14.

- 30 children with spastic diplegic CP ages 4-12 were randomized into two groups: conventional therapy only (control) and conventional therapy + suit therapy (experimental)
- Intervention took place 2 hours/day x 3 weeks
- Outcome used: GMFM-88 pre and post intervention
- Results: Statistically significant difference was found between the control and experimental groups.
- Conclusion: Suit therapy + physiotherapy is effective in improving gross motor function of children with spastic diplegic CP



Novak I, McIntyre S, Morgan C et al. A systematic review of interventions for children with cerebral palsy: state of the evidence. *Dev Med & Child Neurol*. 2013;55:885-910.


QUESTIONS?

References

1. Therasuit Method. *Therasuit LLC*. 2002-2019. http://www.suittherapy.com/
2. Kleim J and Jones T. Principles of experience-dependent neural plasticity: implications for rehabilitation after brain damage. *J Speech, Lang, Hearing Res.* 2008; 51: S225-S239.
3. Christy J, Chapman C, Murphy P. The effect of intense physical therapy for children with cerebral palsy. *J Pediatr Rehab Med*. 2012;5:159-170.
4. Bailes A, Greve K, Burch C et al. The effect of suit wear during an intensive therapy program in children with cerebral palsy. *Pediatr Phys Ther*. 2011;23:136-142.
5. Alagesan J, Shetty A. Effect of modified suit therapy in spastic diplegic cerebral palsy - a single blinded randomized controlled trial. *Online J Health Allied Scs*. 2010;9(4):14.
6. Novak I, McIntyre S, Morgan C et al. A systematic review of interventions for children with cerebral palsy: state of the evidence. *Dev Med & Child Neurol*. 2013;55:885-910.