



An Algorithm for Optimizing the Effectiveness of the TheraTogs ULTRA Posture & Torso Alignment System

The acquisition of postural control – the foundation for functional use of the extremities - is paramount. When the innate drive to achieve and maintain verticality combines with deficits in core muscle balance, strength, and stability, the child usually serves the necessity for upright maintenance by using her extremities for stabilizing rather than function.

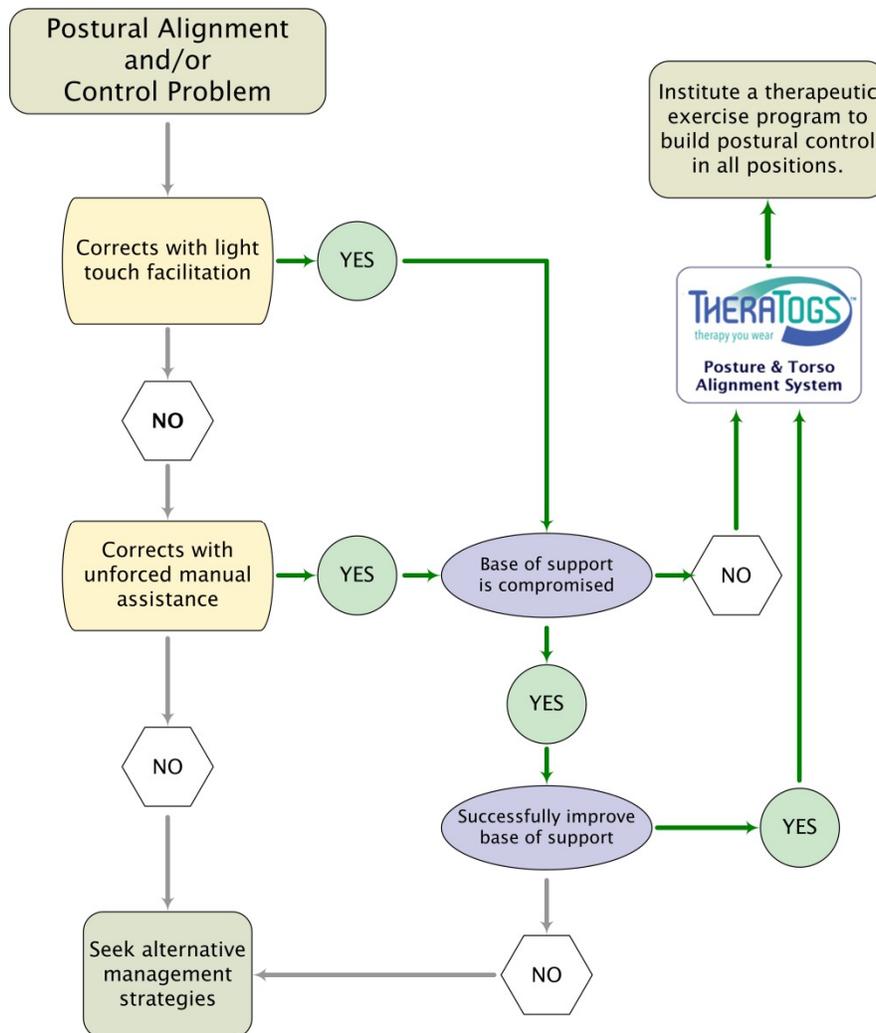
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Chronic limb muscle use for stabilization rather than function produces common soft tissue contractures in children with diplegic cerebral palsy.

I find that TheraTogs are most effective in providing live-in neuromotor training when used in early infancy to align, and at the same time, to deliver somatosensory input to the trunk and pelvis, particularly in the presence of hypotonia, ligament laxity, and postural features common in prematurity. Nervous system maturation joins antigravity muscle control in a proximal-to-distal sequence, and the garments and strapping options included in the TheraTogs PTA support that process. As usual, babies do the best!

TheraTogs™ PTA System – Intervention Algorithm



You'll find that in the algorithm, as you travel down from the top box to "Corrects with unforced manual assistance", you are led to assess and, if needed, address the functioning base of support before introducing the TheraTogs PTA. As Dr. Shirley Sahrman suggests, I begin by optimizing the body-ground interface in prone, sitting, and standing positions.

For example, sitting independently with a vertical sacrum and lumbar spine might not be possible without adapting the base of support by a) assuring that the feet contact the floor securely; b) raising and/or tilting the seat surface forward; c) increasing the seat surface resistance to sliding, and so forth.

When the child is working in the standing position, I address pronated or supinated feet with orthotic devices or preliminary serial casts designed to improve weight-loading on the whole foot and to facilitate weight shifts onto the heels as much as possible. In my experience, TheraTogs systems used in standing rely on optimum foot and ankle alignment and stability to deliver optimum functioning postural alignment.

If you are unable to improve the body-ground interface using adaptive equipment, casts, or orthoses, then you might seek alternative management strategies, or, at least, reduce your expectations of TheraTogs PTA as a postural alignment aide (they're only fabric, after all), or consider trying them to increase the child's body awareness and attention.

In 2011, Pfeifer M and others presented the results of their second study of the effects of wearing 2 types of Spinomed® back orthosis – devices that resemble the Posture and Torso Alignment System in function.¹ The back orthosis was prescribed for problems related to osteoporosis in 62 women over 60 years of age with kyphotic curves $\geq 60^\circ$. Wearing the Spinomed orthosis for a minimum of 2 hours/day during a 6-month period showed these results vs. no change in the control group:

- 72% increase in back extensor muscle strength ($P < 0.01$), measured isometrically while the subjects were sitting on a DigiMax MechaTronic system.
- 44% increase in abdominal flexor muscle strength ($P < 0.01$)
- 11% decrease in the angle of kyphosis ($P < 0.01$) measured via 3-D stereophotomorphometry
- 23% decrease in body sway ($P = 0.03$) via digitized tableau recordings transferred to a computer.
- 19% increase in vital capacity ($P < 0.01$).

Those who wore the Spinomed® Active model – a more flexible design – showed similar results, with a greater gain of 56% in abdominal flexor muscle strength.

This data supports the view that a consistent program of living in improved functioning postural alignment fosters strength gains in the muscles that operate the affected body segments without adding a strengthening exercise regime. Children with muscle length imbalances related to hypotonia, ligament laxity, and various manifestations of cerebral palsy, have been shown by several researchers to lack normal muscle strength in all muscles tested.

I propose that the **TheraTogs Posture & Torso Alignment System**, worn daily, can be expected to induce fatigue in the wearer in the first few weeks as muscles are recruited for postural control at new lengths, even while the strapping affords assistance. During this early period, the key to relieving fatigue is to reset the straps to reduce the tension. It is not necessary to remove the PTA system.

Following the introductory period, trunk muscle strength and postural control (as indicated via body sway measures) should improve over several months of consistent wear, as they did after wearing the SpinoMed back orthosis.

I look forward to learning more from researchers who are adequately equipped to challenge this hypothesis.

Got Feedback? We'd appreciate any suggestions you have for improving the usefulness of the PTA System Intervention Algorithm, and any more tips you might like to share on optimizing caretaker compliance.

¹ Pfeifer M, Kohlwey L, Begerow B, Minne HW. 2011. [Effects of two newly developed spinal orthoses on trunk muscle strength, posture, and quality-of-life in women with postmenopausal osteoporosis: a randomized trial.](#) *Am J Phys Med Rehabil.* 90(10):805-15.

Pfeifer M, Begerow B, Minne HW. [Effects of a new spinal orthosis on posture, trunk strength, and quality of life in women with postmenopausal osteoporosis: a randomized trial.](#) *Am J Phys Med Rehabil.* 2004 Mar;83(3):177-86.