Walk This Way

Pediatric WalkAide System... the preferred alternative to bracing

Submitted By: Nolan Hayday

Since its introduction, candidates for this Functional Electrical Stimulation System were mainly those living with multiple sclerosis, traumatic brain injury, stroke, incomplete spinal cord injury, and hereditary spastic paraplegia. Now, add children with CP to that list.

The use of the WalkAide System in treating children with cerebral palsy (CP) is becoming more common and more research is providing evidence that the WalkAide System is a viable option. The device is an advanced Functional Electrical Stimulation (FES) System for the treatment of foot drop caused by upper motor neuron injuries. This technology features specific programming for the Pediatric WalkAide making it suitable for children and embodies other kid-friendly features as well that include:

- **Pediatric Cuff:** designed to fit small children
- **Pediatric Programming Options:** amplitude, frequency, and pulse duration settings for well tolerated stimulus
- **Personalized Solution:** adaptive program and modular components through growth and maturity
- **Self-Contained System:** single unit system with no extra pieces, ideal for playful kids

- **Single Battery Operation:** operates up to 30 days on one AA battery, with no need for nightly recharges
- **Patented Accelerometer:** promotes natural, efficient, and safe multidirectional walking
- **Freedom in Footwear Option:** allows kids to have more freedom in footwear or no shoes at all
- **Silicone Cover:** provides additional protection from abrasions, environmental elements (such as rain, snow, dust or mud), accidental spilled liquids (drinks) and light impacts

Shown here with silicone protective cover

Pediatric WalkAide clinical evidence has highlighted acceptance, preference and kinematic improvements. At the 65th Annual Meeting of the American Academy of Cerebral Palsy Developmental Medicine in 2011, researchers from the National Institutes of Health (NIH) presented a study that demonstrated how the WalkAide System successfully improves mobility by significantly increasing ankle control during walking in children with foot drop due to CP. This is the first study to present the group results of a commercially-available foot drop stimulator in children with cerebral palsy.

Participants in this study experienced increased ability to dorsiflex their feet. Participants also continued to experience improvements after four months of use compared to one month, suggesting improved response to the WalkAide's functional electrical stimulation over time. This is a finding that would not be expected with conventional orthotic bracing such as the ankle foot orthosis (AFO).

Additionally, when given a choice between the WalkAide and their previous treatment protocol (an AFO or no device at all), 95 percent of the children in the study chose to continue with the WalkAide, which is encouraging given the challenge of compliance with AFOs in this population.

"While we are fortunate to see firsthand how the WalkAide improves the lives of our patients every day, it is very encouraging to see additional documented validation of the efficacy of our technology - especially when it comes out of the NIH, a world-renowned medical institution known for quality, integrity and clinical excellence," said Aaron Flores, Ph.D., general manager of Innovative Neurotronics, the firm that developed the system.

About the Study Design

Titled "Short-term effects of the WalkAide functional electrical stimulator on gait in individuals with cerebral palsy" by NIH's Laura Prosser, PT, Ph.D., Lindsey Bellini, MS, Katharine Alter, MD, and Diane Damiano, PT, Ph.D., the study collected lower extremity motion data for 19 youth with CP ranging in age from seven to 20 years with a 10-camera computerized motion-capture system. The participants' gait patterns were documented walking with, and without, the WalkAide at a speed they selected on their own and then at their fastest speed. At both speeds, dorsiflexion of the impaired ankle increased significantly during swing phase with the WalkAide.

Additionally, NIH's clinical results (Functional electrical stimulation in children and adolescents with

"...the [Pediatric] WalkAide System successfully improves mobility by significantly increasing ankle control during walking in children with foot drop due to CP."

cerebral palsy, Marietta Van Der Linden, article first published online: August 28th 2012) have shown that the use of the WalkAide System by children with CP offers significant rehabilitation benefits such as: 1) improved responses with FES, not expected with conventional bracing, 2) Improved kinematics and range of motion and 3) improved fatigue resistance.

Not unlike the "adult" version, the Pediatric WalkAide applies low-level electrical currents directly to the peroneal nerve (i.e. the motor nerve that controls the movement of the ankle and foot) prompting a muscle contraction which lifts the foot at the appropriate time during the gait cycle. The device uses an embedded accelerometer, which is similar sensor technology to that used in Wii video gaming systems, to determine the appropriate timing for stimulation with every step. The child version is equipped with a smaller cuff and smaller electrodes to allow for a secure fit on small legs for precise electrode placement. Lower pulse-width settings for gentle electrical stimulation options can be adapted as the child grows and matures into adulthood.

Encouraging Kids to be Kids

The Pediatric WalkAide is an advanced FES system specifically configured for children. It's uniquely programmed for each child and utilizes a patented accelerometer technology to stimulate the peroneal nerve to lift the foot, promoting a more natural, balanced and efficient gait. It is a lightweight, single-unit device worn below the knee, fully operable with one hand. Children have the freedom to choose to walk with or without footwear, up and down stairs and even sidestep.

Lifelong Clinical Outcomes

The device is adaptable to growth and rehabilitation needs of children. Early intervention can balance forces across joints and normalize stress on skeletally immature bones, reducing the abnormal physiological demands during growth.

Dynamic Alternative to Bracing

Many children may reject brace wear in their prescribed rehabilitation protocols. In the recent NIH study, when given the choice, 90 percent of the children chose to continue wearing the WalkAide over their current treatment. Benefits include improved walking speed, improved gait quality, reduced atrophy, improved circulation and muscle condition and may promote natural bone growth (with active muscle contraction) and may delay or prevent surgical intervention (with reciprocal inhibition of antagonist).

For more information on the WalkAide System, visit www.walkaide.com

Nolan Hayday is a WalkAide Advisor with The Knee Centre in addition to his role of business manager at Karl Hager Limb & Brace in Edmonton, Alberta. Nolan was first introduced to the WalkAide System in 2006 and has been involved in expanding the system throughout Canada since 2007. He initially provided training support but is now a WalkAide System instructor.

The Knee Centre
Canadian WalkAide Distributor

WalkAide® System