

# Correcting Foot Drop without an Ankle Foot Orthosis

Renae Fisher, MD, Travis Bridges, DO, Olivier Rolin, MD, PhD

Virginia Commonwealth University PM&R



VCU Health™

## Introduction

-Elastomeric fiber garments are flexible, less restrictive garments believed to enhance proprioception and provide the central nervous system with additional information regarding limb and trunk position.<sup>1</sup>

-In our study, we present elastomeric fiber garments in conjunction with foot orthoses as potential proprioceptive augmenting alternatives to ankle foot orthoses.

-The Edinburgh Visual Gait Score (EVGS) was used to analyze gait patterns. The EVGS was developed as a more accessible, yet reliable way to measure gait in patients with cerebral palsy by videotaping walking trials<sup>2</sup>.

## Case Description

•4-year-old female with right hemiplegic spastic cerebral palsy GMFCS 1 after sustaining perinatal stroke in the M2 distribution.

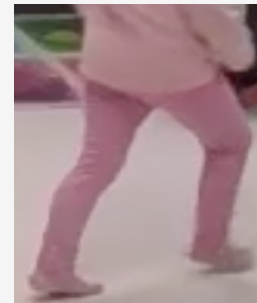
•-At age 2, she had frequent falls and right plantarflexion spasticity (Modified Ashworth 2) and was prescribed right supramalleolar orthosis (SMO) and physical therapy.

•At age 4, she had continued right foot drop and a steppage gait pattern and was prescribed a right stabilizing pressure input orthosis (SPIO) leg sleeve and a right Pattibob foot orthosis (FO).

•Her gait was then analyzed using the EVGS during three in-office videotaped walking trials.

## EVGS Results

Barefoot	Left	Right
Foot	2	8
Knee	1	3
Hip	0	1
Pelvis	0	1
Trunk	2	1
<b>Total</b>	<b>5</b>	<b>15</b>



Right foot orthotic only	Left	Right
Foot	1	5
Knee	3	4
Hip	0	1
Pelvis	1	1
Trunk	2	1
<b>Total</b>	<b>7</b>	<b>12</b>



Right foot orthotic + SPIO	Left	Right
Foot	1	0
Knee	2	1
Hip	0	0
Pelvis	0	1
Trunk	2	0
<b>Total</b>	<b>5</b>	<b>4</b>



Images display right foot initial contact per trial (barefoot, FO only, then SPIO + FO)

## Discussion

- In persons with cerebral palsy, disorders of posture and movement may be secondary to impairments with integrating multiple senses. This includes pressure from the ground, limb proprioception and vestibular inputs. This leads to movement patterns that are spastic and inefficient.
- Our walking trials demonstrated no significant improvement in gait when barefoot walking was compared to using a right Pattibob foot orthotic only.
- However, there was significant improvement in gait when a right SPIO leg sleeve was used concurrently with a right Pattibob foot orthotic. We postulate that her improvement in gait was attained due to enhancing right leg proprioception. In particular, significant improvement was noted in swing phase dorsiflexion and a change from toe strike to heel strike was noted.
- These findings encourage future research into using elastomeric fiber garments with foot orthoses as alternative treatments for foot drop in children with cerebral palsy.

## References

- (1) Hylton N, Allen C. The development and use of SPIO Lycra compression bracing in children with neuromotor deficits. *Pediatr Rehabil.* 1997 Apr-Jun;1(2):109-16. doi: 10.3109/17518429709025853. PMID: 9689245.
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