

ABSTRACT

THESIS: The Acute Effects of Supramalleolar Orthotics on Gait of Children with Down Syndrome

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COLLEGE: Health

DATE: July 2020

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Children with Down syndrome (DS) experience difficulty performing daily tasks, such as walking, due to specific musculoskeletal deficits. In attempt to improve function, supramalleolar orthotics (SMOs) are often used to improve lower extremity motor function and gait patterns for children with Down Syndrome (DS). The purpose of the current study was to identify differences in gait mechanics during walking using two different styles of SMOs in children with DS. The different styles of SMOs included one SMO that supported the first metatarsal and medial side of the foot and the other supporting the fifth metatarsal and lateral side of the foot. Both styles of SMOs resulted in changes of gait patterns for children with DS. Support to the first metatarsal head and medial side of the foot tended to inhibit ankle movement at heel strike and toe off leading to decreased spatiotemporal variables (e.g., walking velocity, step length, step width) and inability to effectively utilize the ground reaction force. Additional support to the fifth metatarsal head and lateral side of the foot resulted in improved spatiotemporal variables (e.g., walking velocity and step length), ankle kinematics at heel strike and toe off, and ankle kinetics. Information gained from this study can help identify the benefits of orthotics for children with Down syndrome with the goal of improving motor function and quality of life.