Spatial and Temporal Variability of Gait Parameters in Down syndrome

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Background/Purpose Individuals with Down syndrome usually exhibit deviations in independent walking, caused by delays in motor or sensory functioning, as well as slowness in movements that are often awkward and uncoordinated. The purpose of this study is to **compare spatial and temporal gait movement parameters** of individuals with Down syndrome and control subjects without disabilities.

Method Twelve young adults with Down syndrome (18-28 years) and a control group of 12 participants without disabilities were matched according to age and sex. All participants were evaluated on responses to a preferred pace and fast walk with the GAITRite Electronic Walkway. Specific testing protocol was approved by the Institutional Review Board at the University of Georgia.

Analysis/Results Spatial outcomes included step and stride length, step and stride width, toe-in/toe-out, and base of support. Temporal outcomes included step time, velocity, single and double leg support time, stance, and swing time. There were significant group differences for **step length**, **step width**, **stride length**, and **velocity** in the preferred walk condition. Significant group differences for **step length**, **step width**, and **stride length** were observed in the fast walk condition. Percentage differences also indicated lower scores for all spatial and temporal variables in relation to the control group.

Conclusions The ability to control gait movements appears to reflect earlier movement experiences, so it may be possible to use variable sensory feedback and specific training to modify and adjust movement responses and improve gait performance in Down syndrome.