

Toe Walking: Intervention for Children with ASD

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What is the problem?

- ❑ Toe walking (TW) is defined as the absence of heel strike and the inability to obtain full foot contact while walking¹
- ❑ TW is common in children with autism spectrum disorder (ASD)²
- ❑ Persistent TW is found in 20% of children with ASD³
- ❑ TW can lead to skeletal changes, balance problems and compromised gross motor abilities
- ❑ Treatments are available for TW, but there is no consensus regarding the most effective treatment for children with ASD who TW
- ❑ Traditional physical therapy is often challenging due to restrictive patterns of behavior including sensory processing differences

Study Purpose

- ❑ Determine the effectiveness of a two-step intervention, serial casting (SC) and ankle foot orthotics (AFOs), on gait kinematics and functional outcomes for children with ASD who TW
- ❑ Hypothesis: Serial Casting and AFOs would reduce TW and improve parent reported functional outcomes

Study Participants

- ❑ Sample of convenience
- ❑ Five participants ranging in age from 4-15 years old; one female and 4 males.

Methods

- ❑ Study approved by UNM IRB for Human Research
- ❑ Social stories with pictures and words created to explain gait analysis and SC procedures
- ❑ Participants walked at self-selected speed for the gait capture at lab. 3-D gait and motional analysis utilized to assess gait parameters
- ❑ Parents completed Patient Specific Function Scale⁴
- ❑ Serial casting with primary investigator lasting 1-6 weeks
- ❑ When neutral ankle dorsiflexion achieved, gait capture occurred, AFOs fit and applied to be worn during day
- ❑ AFOs worn for 6 months followed by final gait capture

Results

- ❑ Passive dorsiflexion (DF) improved with serial casting across all participants
- ❑ DF kinematic gait patterns for 4 out of 5 participants approached normal kinematic patterns following both interventions
- ❑ After both interventions, all participants still had tendency to TW without AFOs
- ❑ Patient Specific Function Scale goals scores increased

Conclusions

- ❑ Serial casting and AFO interventions were jointly effective in reducing toe walking, increasing dorsiflexion range of motion and improving functional outcomes for participants

Study limitations: Small sample size of convenience, variation in AFO use, and variation in clinical presentations, ages, and associated factors such as anxiety, sensory processing differences and/ or behavioral concerns make group comparisons difficult.

References:

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