



## Ride-on Car Intervention for Young Children with Down Syndrome

*Summarized by Scottie Taylor | Fall 2022*

Christina M. Hospodar, Andrina Sabet, Samuel W. Logan, Michele A. Catena & James C. Galloway (2021). **Exploratory analysis of a developmentally progressive modified ride on car intervention for young children with Down syndrome.** *Disability and Rehabilitation: Assistive Technology*, 16:7, 749-757. DOI: 10.1080/17483107.2019.1710773.

### Abstract

**Background and Aims:** Children with Down syndrome (DS) may have limited opportunities to engage in self-directed mobility and play due to motor delays. A recent modified ride-on car innovation is the sit-to-stand (STS) model, which incorporates functional standing and walking training with the experience of powered mobility. This study aimed to (1) describe total dosage and daily usage of three modified ride-on car modes (seated, standing, and power-push) by young children with DS; (2) examine the ability of young children with DS to independently activate the modified ride-on car in seated and standing modes; (3) describe the age of onset of selected motor milestones of the sample in comparison to DS norms.

**Methods and Results:** Eight young children with DS (8.6+/- 2.0 months) used three modes of the modified ride-on car over a 9-month intervention. All eight children independently activated the modified ride-on car in seated and standing modes. Most motor milestones were achieved earlier in this sample than expected for DS norms, including the onset of independent walking.

**Conclusions and implications:** The developmentally progressive nature of the intervention and high dosage may have been instrumental in encouraging the onset of independent activation and earlier motor milestones.

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## Findings

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- All children in the study were able to turn on the switch in both modes (seated and standing positions) by 7 months of age.
- The days and amount of time of use to independent activation were similar in both modes. Children took approximately 3.5 weeks to achieve independent use in both modes.
- More research is needed to understand the developmental benefits of this therapeutic intervention.

## Summary

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Eight young children with Down Syndrome (DS) and their families were invited to the study. Each child could sit at the onset of the study. The children continued receiving their early intervention / current team services throughout the study.

Each child used two modified ride-on cars. One was a seated model, the other a sit-to-stand (STS) model. The STS model had two modes: standing and power-push. As soon as the child was deemed capable of maintaining weight on their legs they were progressed from the seated model to the STS model.

The prescribed intervention period was 9 months, though families were able to discontinue use of the cars at any time. Use of the car ranged from 7-15 months across families. They were encouraged to use the car daily, and the researcher and family collaborated to come up with new and engaging activities in the car. Logs were kept of the days and minutes of driving time, location, and activities.

The Bayley Scales of Infant Development was used to measure six specific items from the gross motor subscale. Once walking was reported, one final Bayley Scale assessment was performed, if possible, to confirm the ability to walk – defined as three consecutive independent steps.

## Real-World Implications

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This research article indicates that children with Down Syndrome have the ability to learn the mechanisms of use for a powered mobility option, in developmentally appropriate positions. This, in turn, allows them to explore and access their homes and communities with more efficient movement options. It also indicates that

these children learned these developmentally appropriate positions (sitting, standing with support, walking) sooner than the averages of gross motor milestones in the DS community.

## Limitations

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- The study had a small sample size (only 8 children).
- That makes it difficult to know if the results would apply to others.
- Only 5 of 8 children / families used the modified car as a power-push device (which was a developmentally appropriate option).
- It is possible that a greater effect would have been found if all children / families had used the power-push option.

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### FOR MORE INFORMATION, CONTACT:

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