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CHILD WITH TRAUMATIC BRAIN INJURY IMPROVED GAIT ABILITIES FOLLOWING INTERVENTION WITH PEDIATRIC MOTOR-ASSISTED ELLIPTICAL TRAINING: A CASE REPORT

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Introduction

Children with physical disabilities, including traumatic brain injury (TBI), sometimes have difficulty walking and engaging in physical/ play activities.

A motor-assisted elliptical (*ICARE*) is used in rehabilitation, medical fitness, and home settings to address walking and fitness in adults.^[1,2,3]

Recent pediatric modifications (*Pedi-ICARE*^[4]) listed below enabled mass repetition of the gait-like activity^[5] in children^[6].

- 7"-17" step length
- Adjustable height pedals
- Modified seat
- Modified handles
- Speeds up to 65 revolutions per minute (RPM)
- Integrated body weight support



ICARE



Child with TBI exercising on *Pedi-ICARE*

Objective

Evaluate impact of 24-session intervention with *Pedi-ICARE* on walking and fitness of child with TBI.

Methods

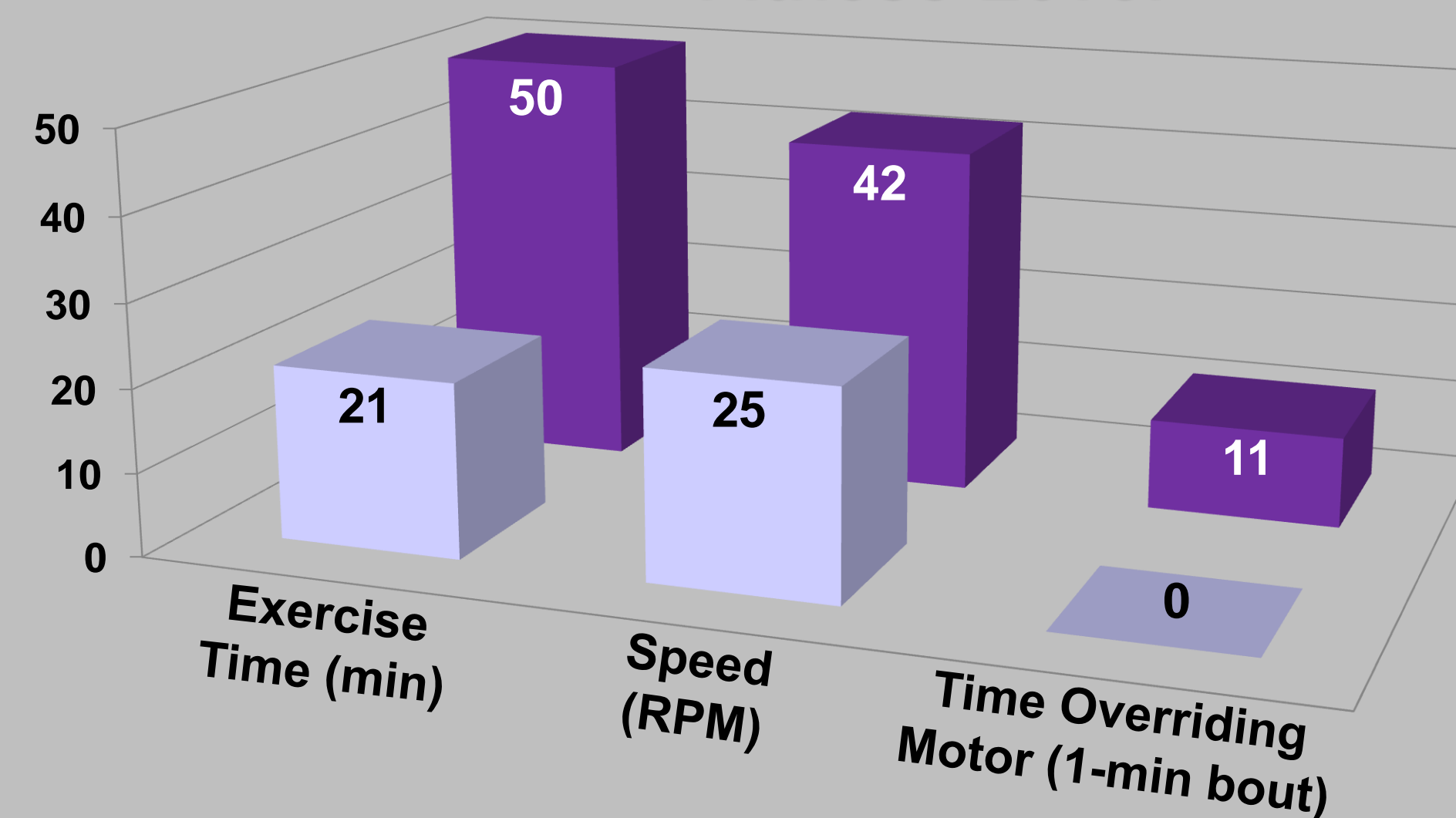
Participant: 9-year old child with TBI. Study approved by Institutional Review Board.

Intervention: Motor-assisted elliptical training parameters (i.e., total exercise time, speed, motor assistance) manipulated across 24 sessions (3 days/week) to progressively challenge participants' walking and fitness.

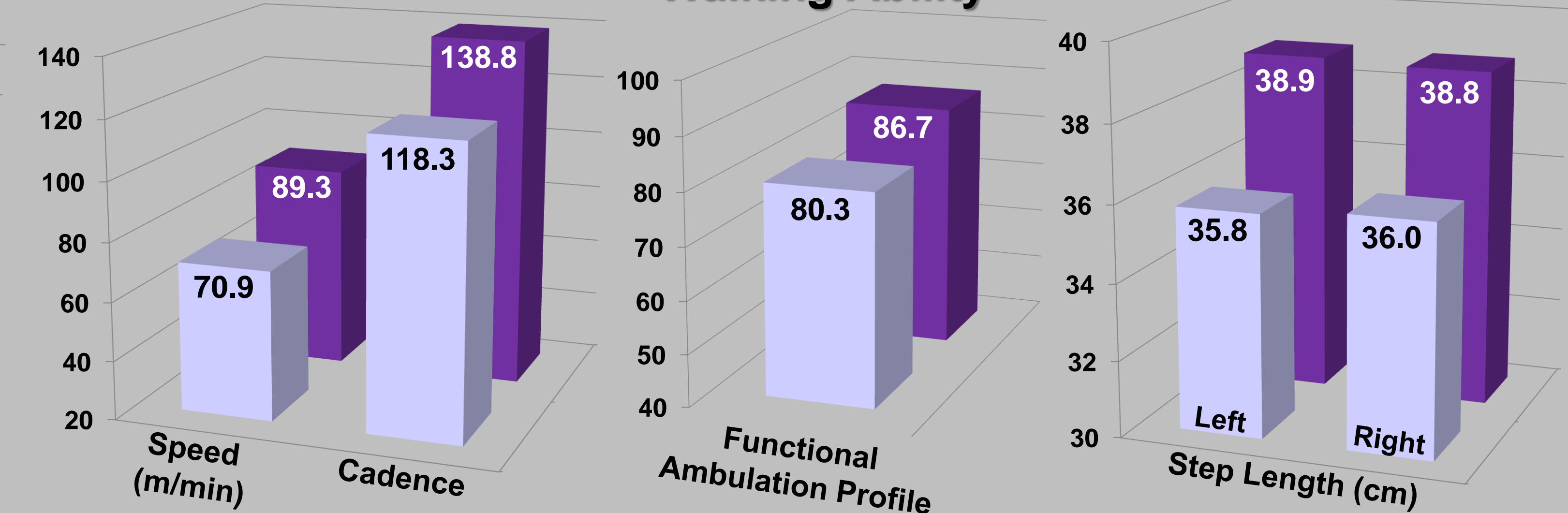
Main Outcome Measures: Fitness level measured by changes in training capacity (exercise time, speed, time overriding motor). Walking ability measured by GAITrite (speed, cadence, functional ambulation profile, and bilateral step length).

Results

Fitness Level



Walking Ability



Conclusion

Post-intervention improvements in walking and fitness for one child with TBI are encouraging. Future clinical studies are required to elucidate impact of *Pedi-ICARE* training on function, fitness and community participation for children with neurologic disorders including TBI.

References

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- [3] Irons, Brusola, *et al.* Cardiopulm Phys Ther J 2015;26(2):36-41.
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- [5] Burnfield, Shu *et al.* Phys Ther 2010;90(2):289-305.
- [6] Burnfield, Cesar, *et al.* Gait Posture 2017;51:194-200.

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