



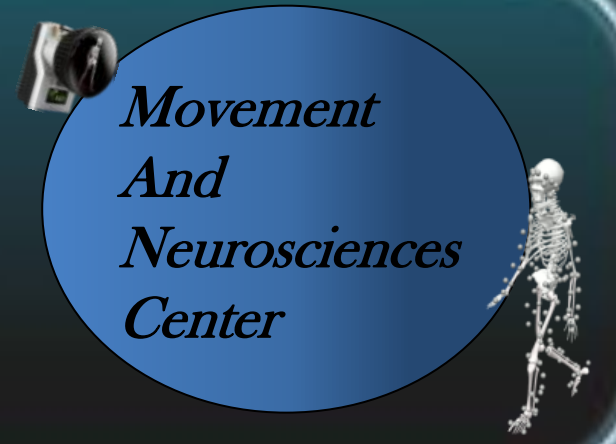
**Madonna**

# Individuals with Physical Limitations Can Benefit From Training On Motorized Elliptical For Community-Based Exercise

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## Introduction

A motorized elliptical was developed to address barriers to physical activity that individuals with motor control, strength, and endurance limitations face.<sup>1,2,3</sup> This trainer was adapted with a body weight support (BWS) system, ramp, steps, safety rails, footplate straps, and an adjustable seat to enhance access. A sensor controlled motor was integrated to initiate and sustain pedal motion for continuous training up to 65+ revolutions per minute (rpm).

## Purpose

Assess use of motorized elliptical trainer in a community-based medical fitness facility for individuals with physical limitations or chronic medical conditions.

## Methods

### Participants

Diagnosis	Age (y)	Height (m)	Weight (kg)
Cerebral Palsy	43	1.58	75.0
Stroke	74	1.50	72.7
Peripheral Arterial Disease	75	1.75	118.6
Stroke	59	1.85	78.6
Cardiovascular Disease	80	1.78	96.4
Rheumatoid Arthritis	42	1.63	52.3
Stroke	54	1.73	70.5
Osteoarthritis	73	1.63	92.3
Spinal Cord Injury	52	1.65	86.4
Multiple Sclerosis	47	1.63	63.6

### Instrumentation

- Motorized SportsArt E870 Elliptical Trainer

### Procedures

- Participants trained for 12 sessions.
- Velocity (VEL), stride length (SL), and BWS increases determined by participant performance, with session duration (DUR) determined by perceived exertion (RPE), heart rate (HR) and blood pressure (BP).

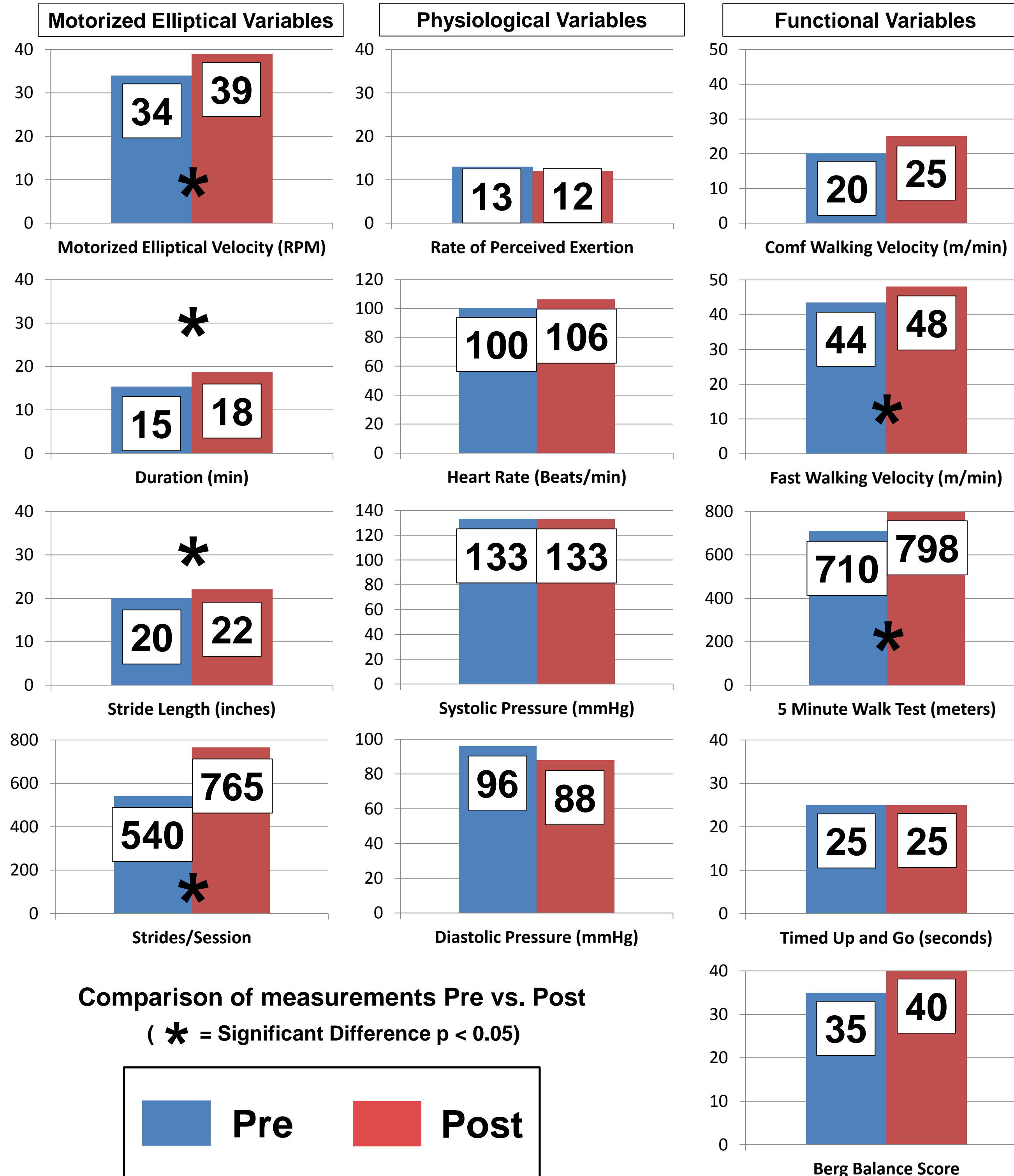
### Data Analysis

- Average of variables from 1<sup>st</sup> & 2<sup>nd</sup> (Pre) sessions were compared with average of variables from 11<sup>th</sup> & 12<sup>th</sup> (Post) sessions.

### Statistical Analysis

- Paired t-tests evaluated changes across pre to post.

## Results



## Discussion



Figure 1. Participant training on motorized elliptical

## Conclusion

The motorized elliptical is a promising fitness modality for individuals in the community with activity limitations, as evidenced by increases in exercise tolerance and corresponding improvements in fast walking speed and endurance with training.

## References

1. Burnfield et al (2011). *Physical Therapy*, 91(11):1604-1617.
2. Nelson et al (2011). *Journal of Medical Devices*, 5:021001.1-021001.7.
3. Burnfield et al (2010). *Physical Therapy*, 90(2):289-305.

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