

# Maximizing mobility in Parkinson's disease: Effects of an individualized training program on fall risk

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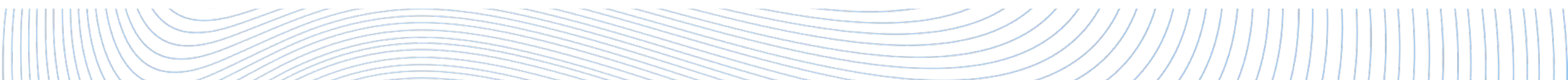
# Acknowledgements

- Collaborators

- Mary Biddle, Director of YMCA Healthy Living Center
- Trainers @ Caldwell & Meridian YMCA
- Students: Rachel Journ, Brook Conrad

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- Idaho Elks Rehab Society



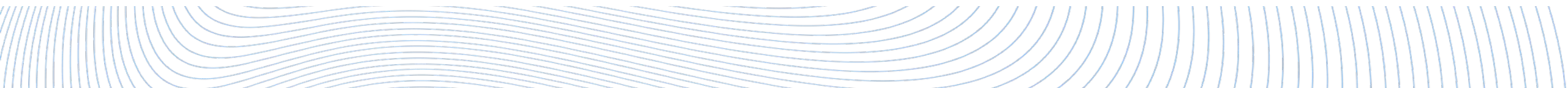
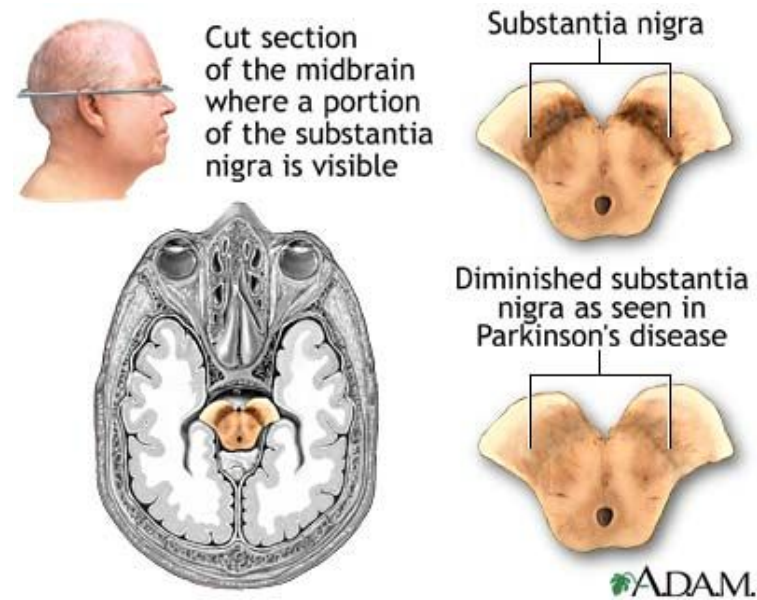
# What is Parkinson's disease?

- A progressive neurological condition that causes a reduction in the amount of dopamine produced by the brain



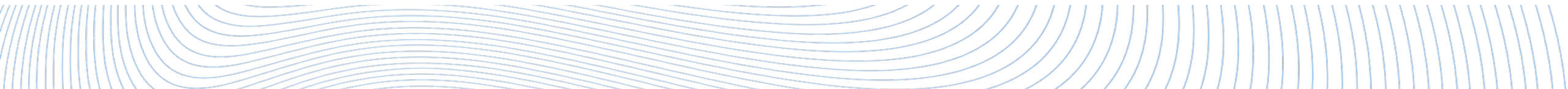
# What is Parkinson's disease?

- Dysfunction at the Basal Ganglia
  - Substantia nigra – where dopamine is produced



# What causes PD?

- Unknown etiology
- Genetics
  - Believed to cause 10-15% of PD cases
  - [PD GENERation](#)
- Environmental Factors
  - Head injury
  - Exposure to pesticides

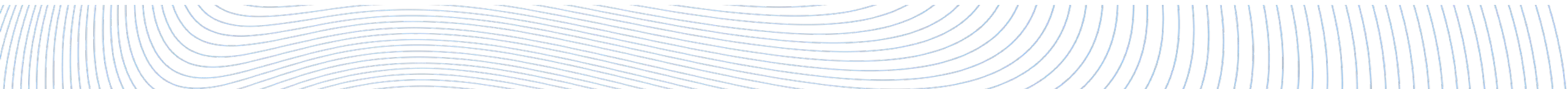


# Statistics

- PD affects approximately 1.5 million Americans
- Approximately 60,000 new cases annually
  - # of cases expected to double between 2005-2030
- Men are 1.5x more likely to have PD than women

Fahn S., *Ann N Y Acad Sci*, 2003

Dorsey ER, *Neurology*, 2007





# Motor Symptoms

- Cardinal signs
  - Bradykinesia
  - Tremor
  - Rigidity
  - Postural Instability



A blurred photograph of a crowd of people walking across a zebra crossing. The image is taken from a low angle, focusing on the lower legs and feet of the pedestrians. The zebra crossing stripes are prominent, running diagonally across the frame. The people are in motion, creating a sense of a busy, crowded environment. Overlaid on the lower half of the image is the text "The Problem of Falls" in a large, white, sans-serif font.

# The Problem of Falls



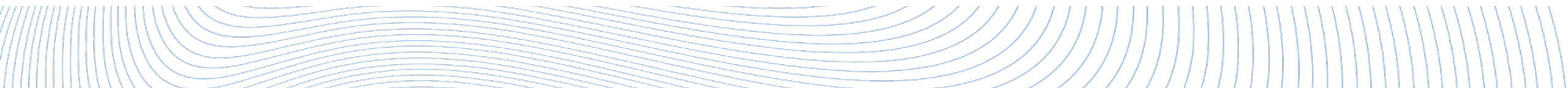
# Incidence of Falls in PD

- 45-68% of people with PD fall annually
- Approximately 66% of those who fall do so recurrently
- Falls expected to become “major health problem” with anticipated increase in number of individuals with PD

Latt MD, *Mov Disord*, 2009

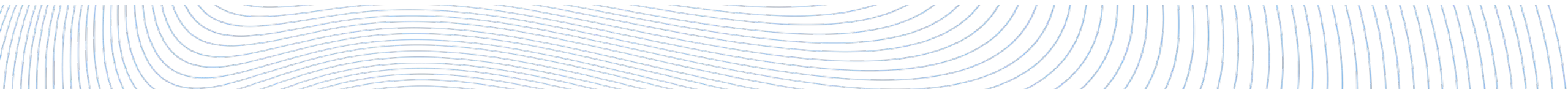
Paul SS, *Mov Disord*, 2013

Wood BH, *J Neurol Neurosurg Psychiatry*, 2002



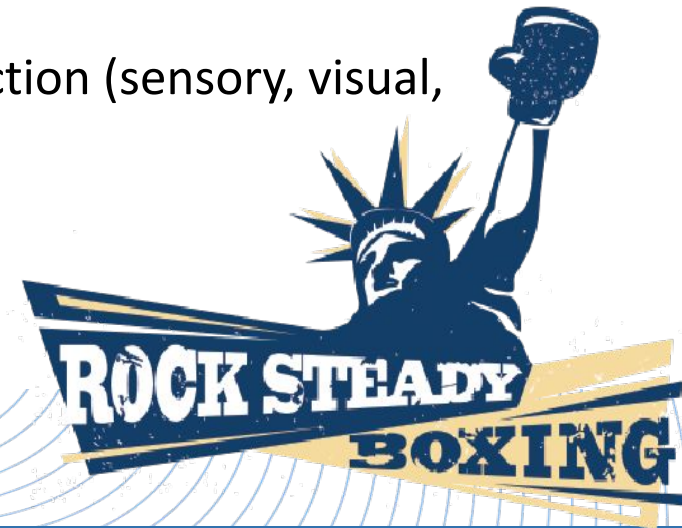
# Purpose

- The purpose of this investigation was to determine if a community-based boxing training program could improve functional mobility and reduce falls in persons with mild-to-moderate PD.

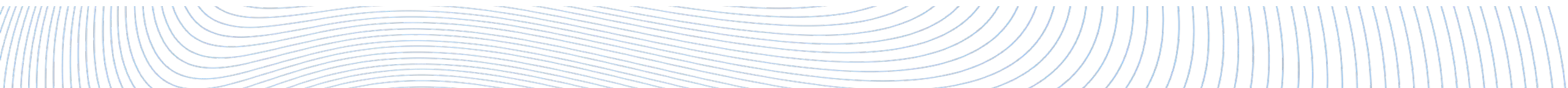
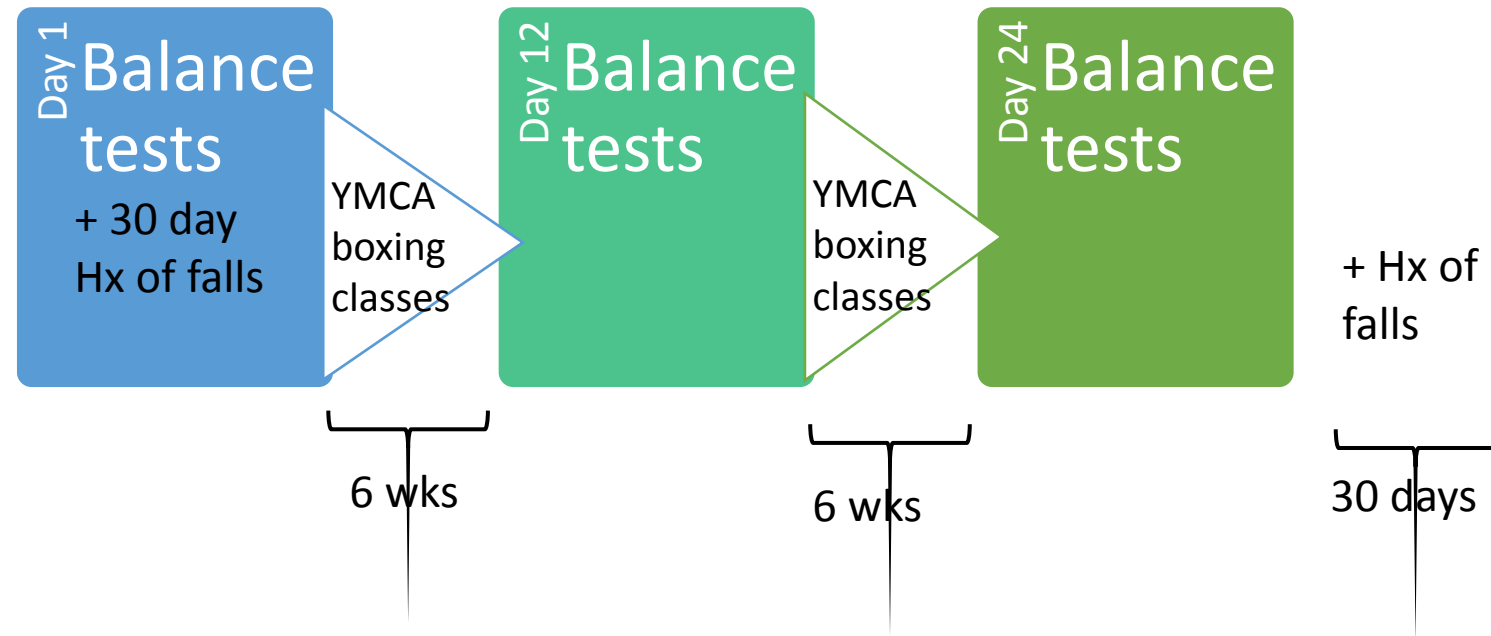


# Research Study

- 12-week exercise program for individuals with Parkinson's Disease
  - Rock Steady Boxing
    - Each session involves a 45-60 minute circuit
    - Function, balance and non-contact boxing activities
    - 3-minute training bouts + 1-minute rest breaks
  - Balance program
    - Tailored to each individual's areas of balance dysfunction (sensory, visual, vestibular)
    - Working with personal trainer

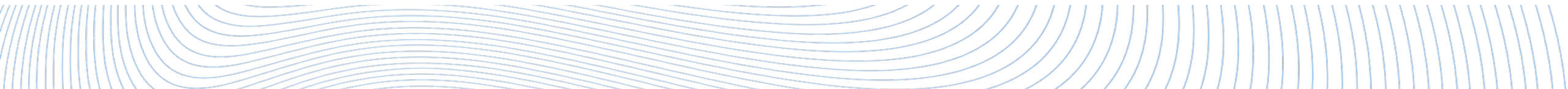


# Methods

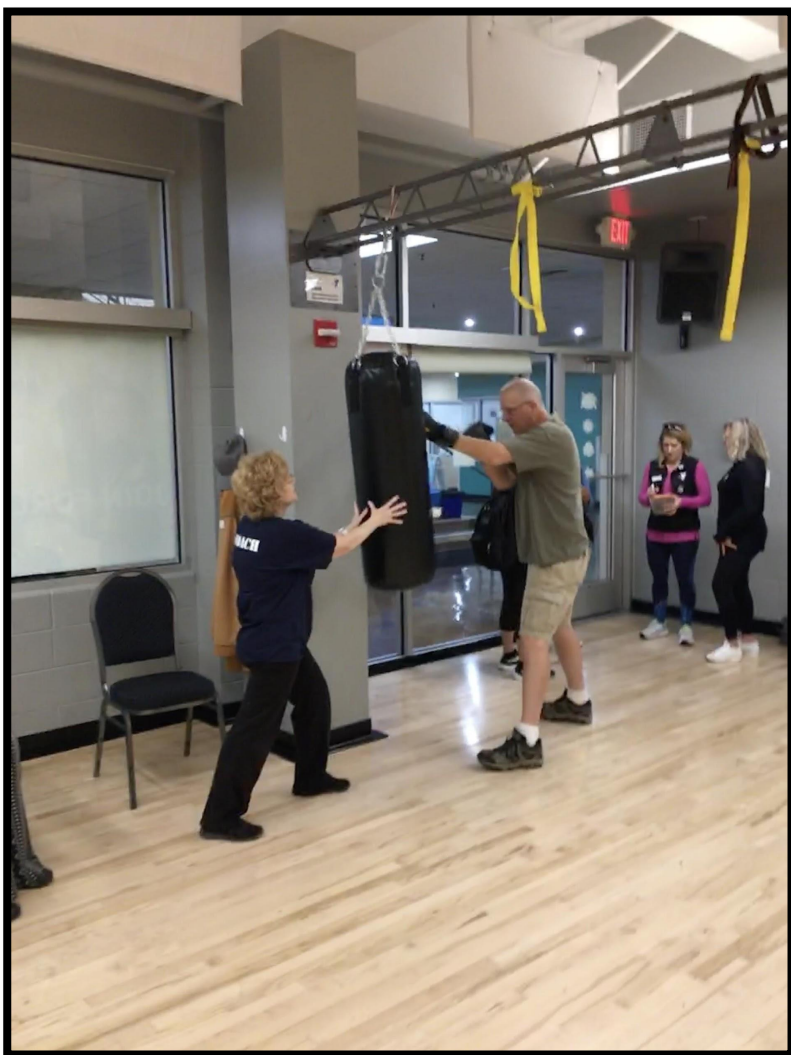


# Statistical Methods

- Paired  $t$  tests on *pre* and *post* effects
- *A priori* level of significance set at 0.05
- Effect sizes calculated with Cohen's  $d$





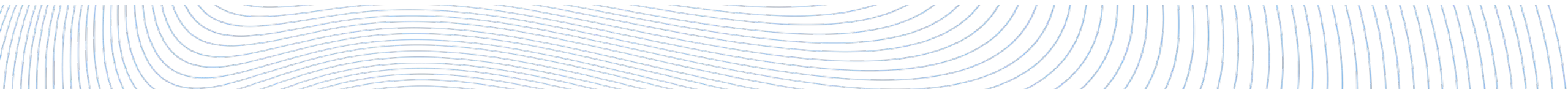






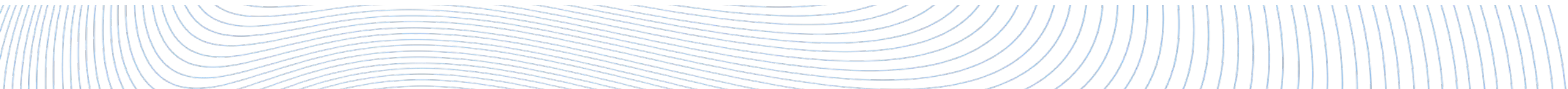
# Outcome Measures

- BERG Balance Scale
- Modified Clinical Test of Sensory Integration in Balance (MCTSIB)
- Timed Up and Go test (TUG)
- Five-times Sit-to-Stand (5-STs)
- Activities-Specific Balance Confidence scale (ABC)
- History of Falls

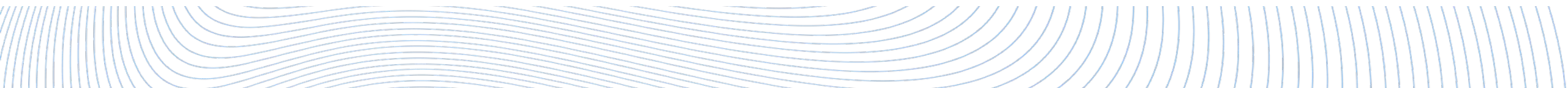
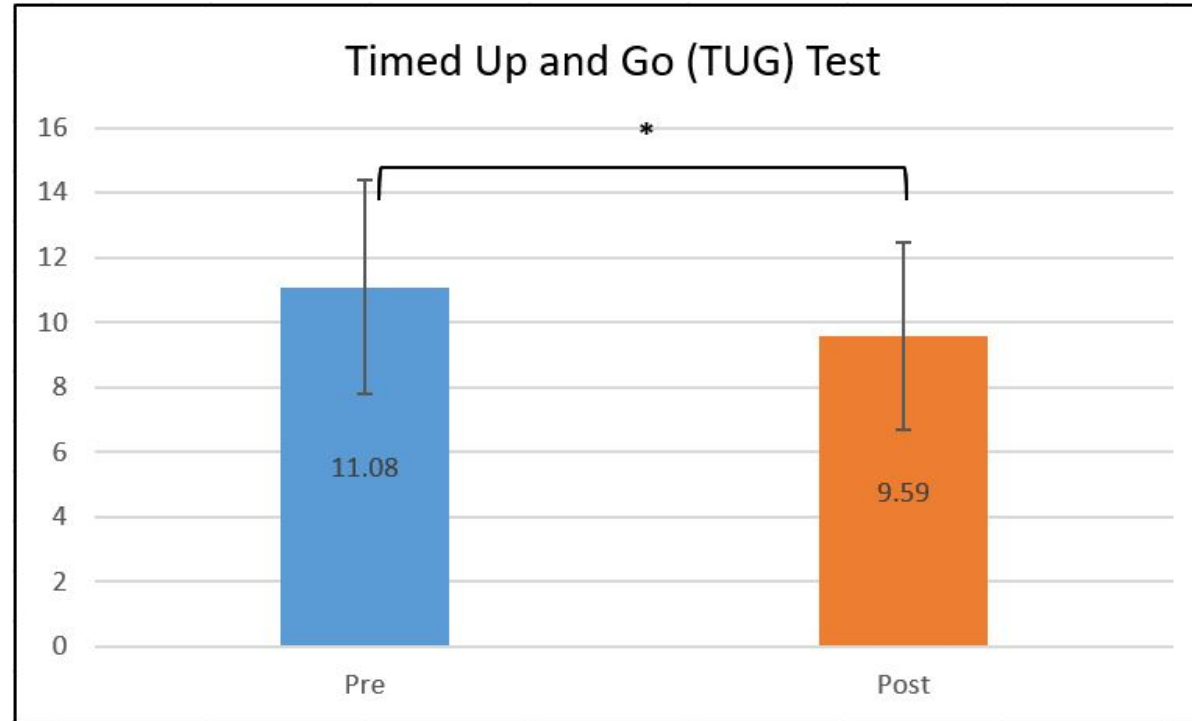
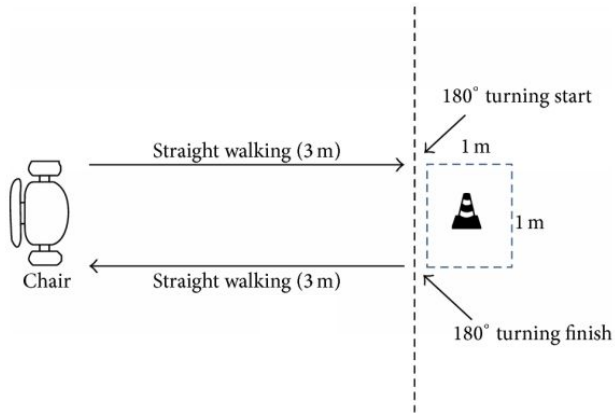


# Participants

- 20 enrolled
- 19 completed all outcomes
  - 1 lost to follow-up (moved)
- 13 M, 6 F
  - Age:  $71.11 \pm 6.43$
  - BMI:  $27.86 \pm 4.75$
  - Hoehn & Yahr: 2.0
  - UPDRS motor score:  $16.79 \pm 4.96$

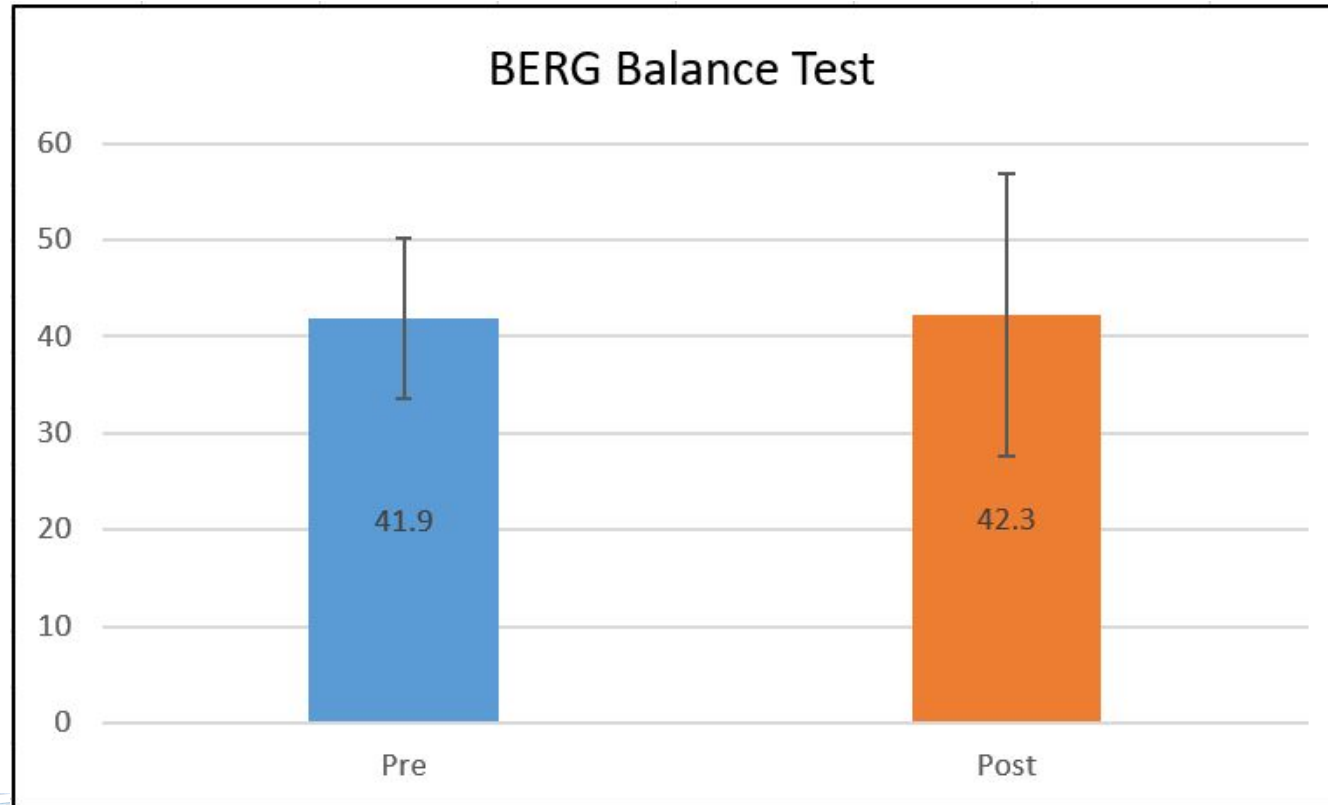


# Clinical Balance Outcomes

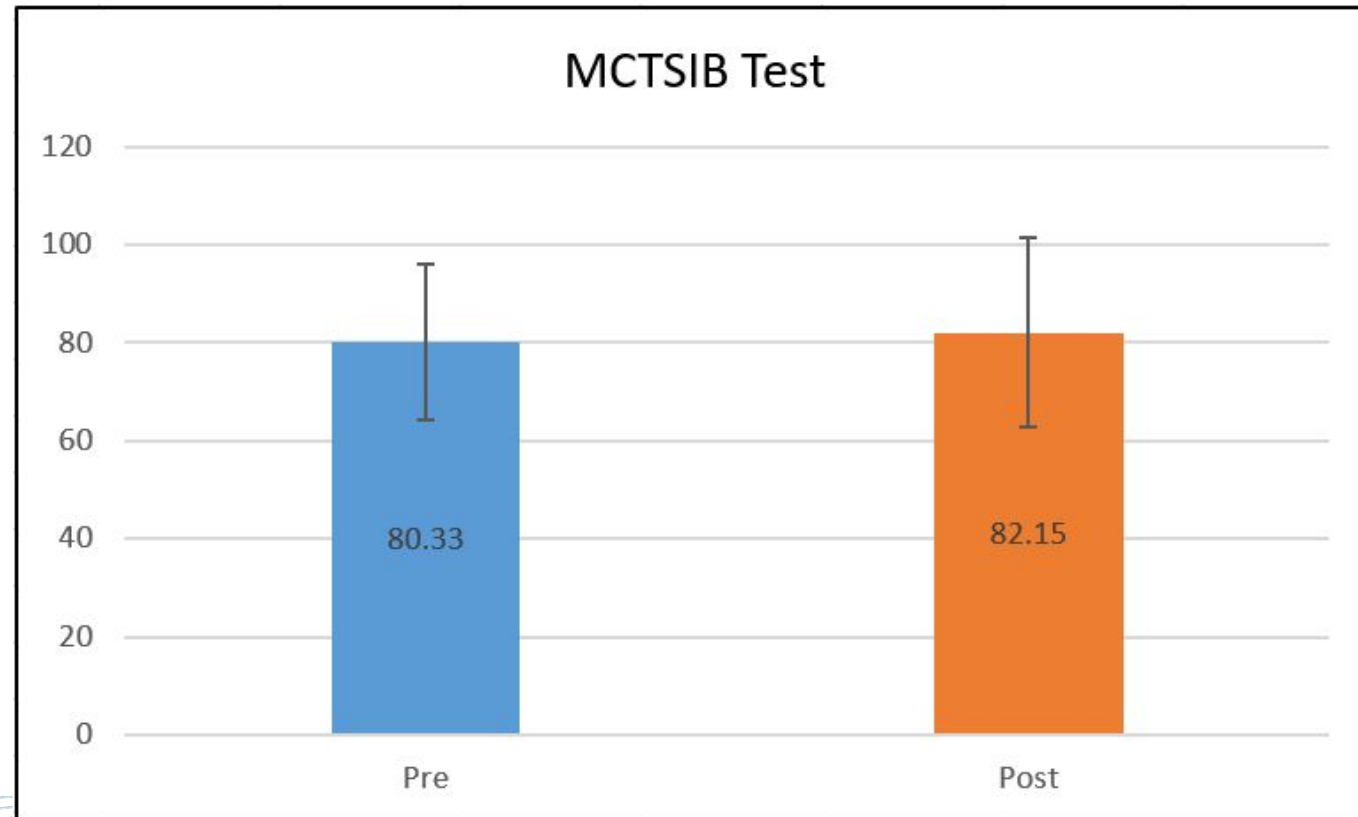




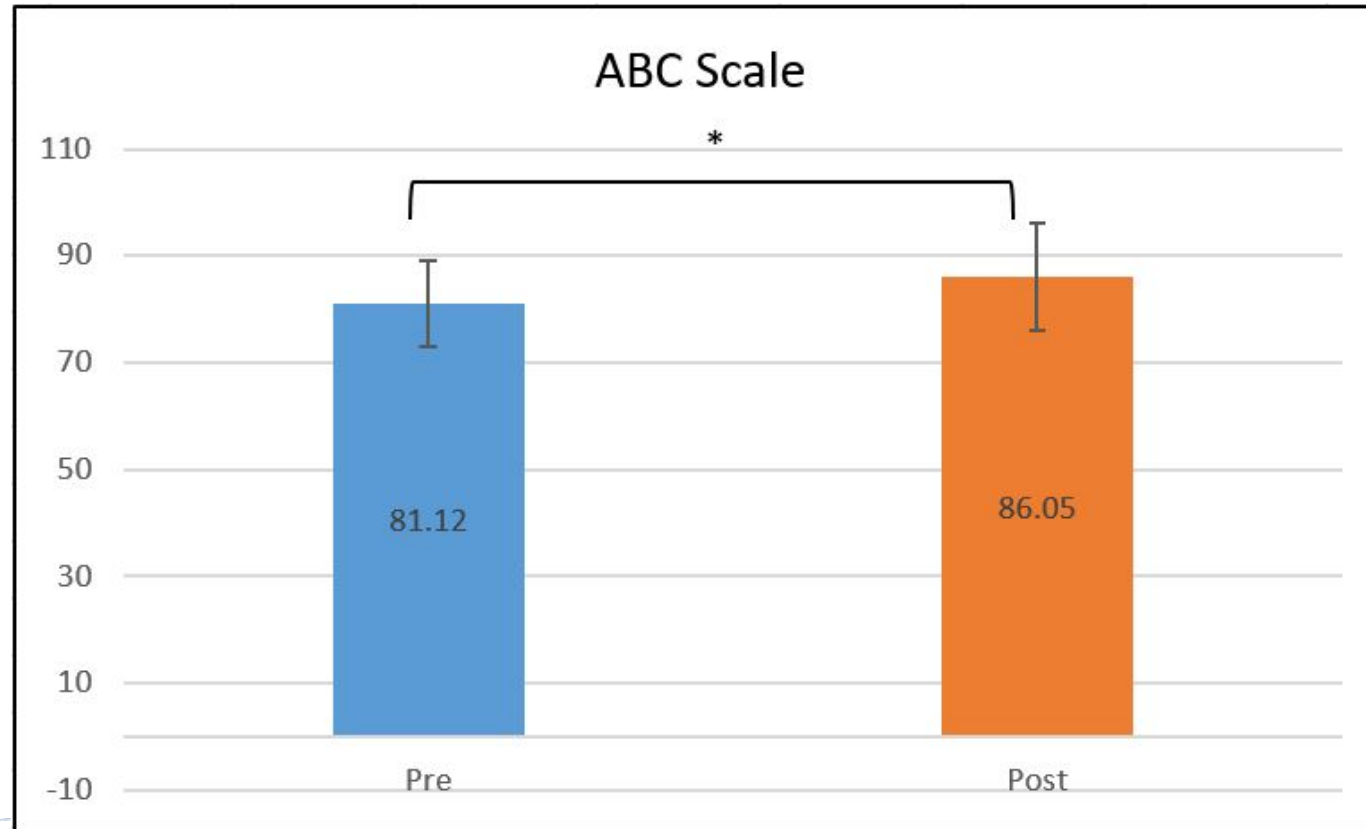
# Clinical Balance Outcomes



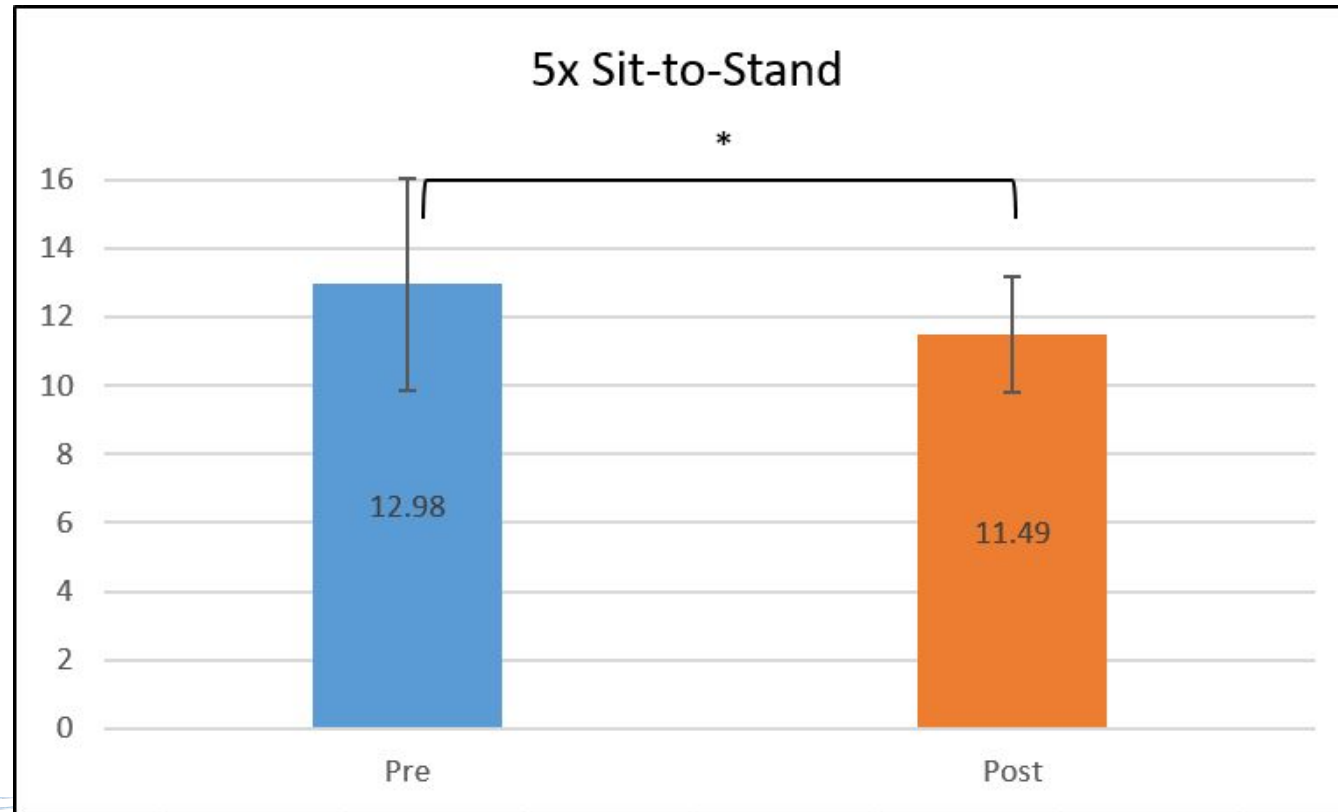
# Clinical Balance Outcomes



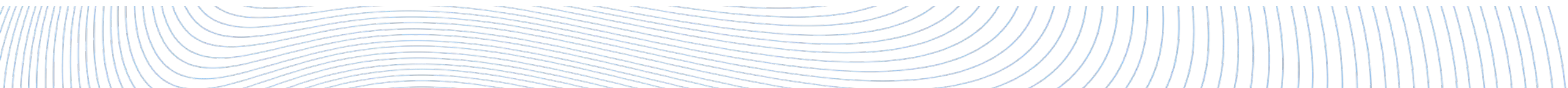
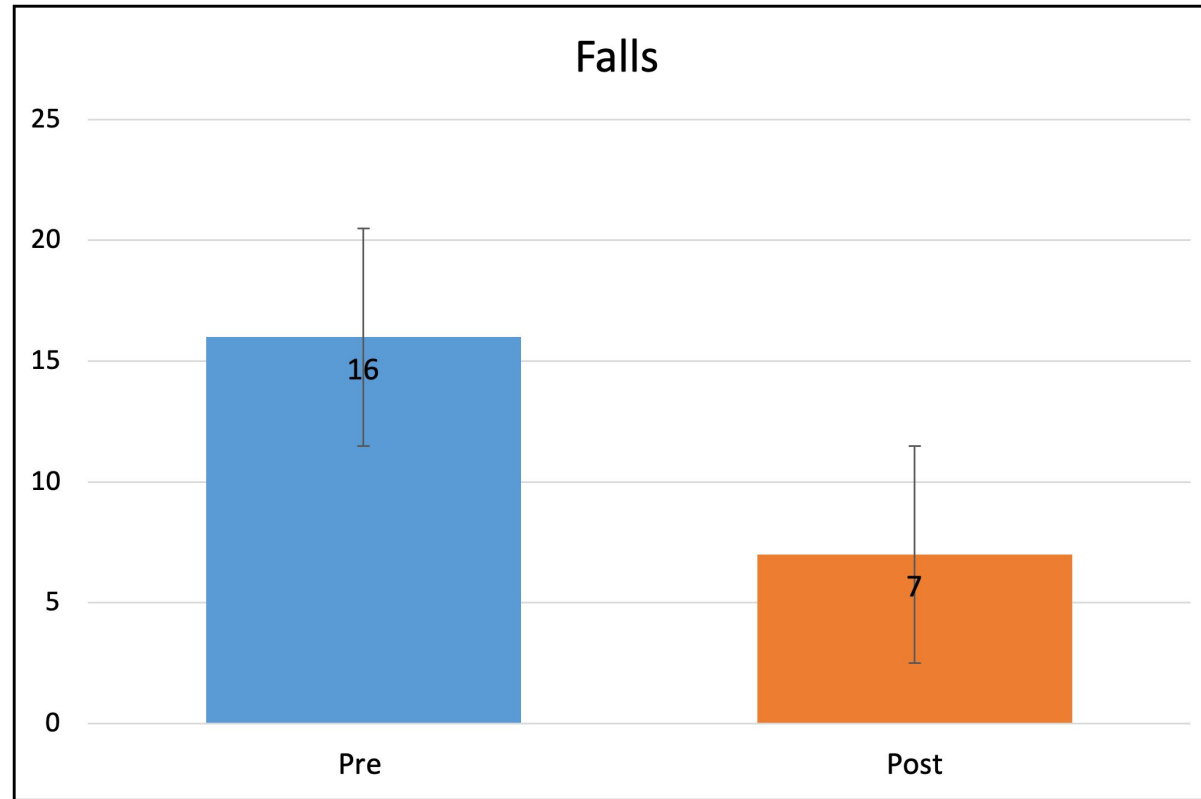
# Clinical Balance Outcomes



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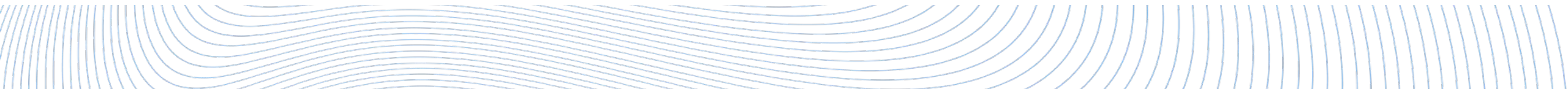
# Clinical Balance Outcomes





# Discussion / Conclusion

- Our data suggest that participation in a community-based non-contact boxing program may decrease the risk of falling for participants with mild to moderate PD.
- Participants move with greater power and fluidity, which may decrease their overall fall risk.



# Woo-Ha! Gooo Rock Steady!



# Questions

