



Exercise and Parkinson's Disease

Potential Benefits on Motor and Non-Motor Symptoms

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Keith Cochran MD
Movement Disorder Fellow
Department of Neurology
University of California, Irvine



Disclosures

- None to report





Outline

- Definitions
- Overview of types of exercise
- Barriers to exercise in PD Patients
- Challenges in studying exercise in PD
- Effects of exercise on motor symptoms of PD
- Effects of exercise on non-motor symptoms of PD



Definitions

- Parkinson's disease (PD) is a chronic, progressive and disabling disease with both motor and non-motor symptoms.
 - Motor symptoms: those affecting body movement
 - Non-motor symptoms: those affecting things besides body movement



Definitions

- Physical activity – Any body movement that involves expenditure of energy
 - Examples: Going for a walk, household chores
- Exercise – Type of physical activity that involves planned, structured, and repetitive body movements with the goal of improving fitness or function



Types of Exercise

- Aerobic/endurance exercise –
 - Performed with the goal of improving cardiovascular fitness
 - Usually for longer periods of time
 - Examples: treadmill walking or jogging, cycling
- Resistance training –
 - Moving a limb or part of the body against a weight or resistance
 - Performed with the goal of improving muscular strength
 - Examples: weight training, resistance bands



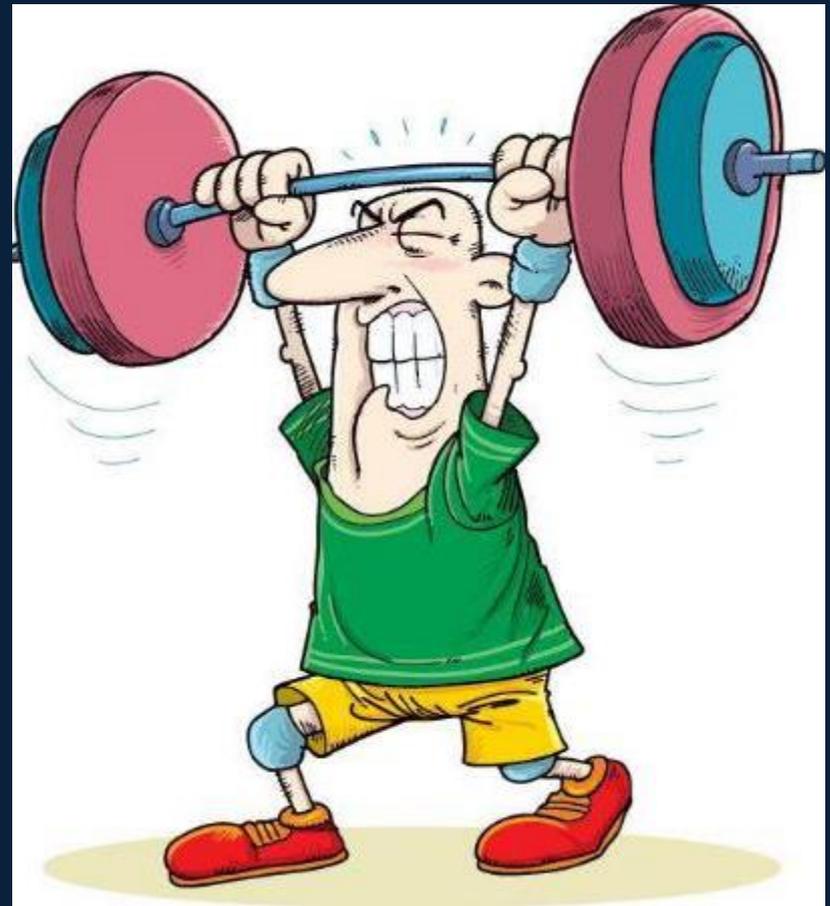
Types of Exercise

- Physical therapy –
 - Physical activity or exercise
 - Done under the supervision of a trained physical therapist
 - Goal is to improve function or independence
 - Can be targeted for specific symptoms or functions



Overall Benefits of Exercise

- Improves cardiovascular health and reduces risk of obesity and high cholesterol
- Can improve anxiety, depression, and sleep problems
- Associated with improved cognition
- Associated with healthy aging





Why is Exercise Relevant to PD?

- Exercise has significant health benefits for everyone
- Exercise may be particularly challenging for PD Patients
- Medications for PD have specific purposes but do not treat all of the symptoms of Parkinson's disease
- Are there things besides medications that can be done to help preserve function or even slow the disease



Barriers to Exercise in PD Patients

- Patients with PD reported the following reasons for not exercising:
 - Low expectations
 - Bad weather
 - Lack of time
 - Pain
 - Depression
 - Fear of falling





Challenges of Studying Exercise and PD

- Studies involving exercise require significant amounts of time and staff
- It can be difficult to recruit large numbers of participants
- Multiple ways of exercising and multiple ways of measuring results lead to difficulty in making generalizations



Challenges of Studying Exercise and PD

Possible Exercise Modalities

- Endurance exercise
- Resistance training
- Physical therapy
- Balance training
- Tai Chi
- Dance
- Boxing

Possible Outcomes to Study

- Motor Symptoms
- Walking Speed
- Falling frequency
- Cardiovascular fitness
- Quality of life measures
- Mood
- Cognition



Benefits of Exercise in PD





Knowledge from Animal Studies

- Researchers have studied the effects of exercise on rats with symptoms of Parkinson's disease
- There is some evidence that exercise may change how the disease progresses in rats
- These findings have not been confirmed in humans





Effects on Motor Symptoms – Resistance Training

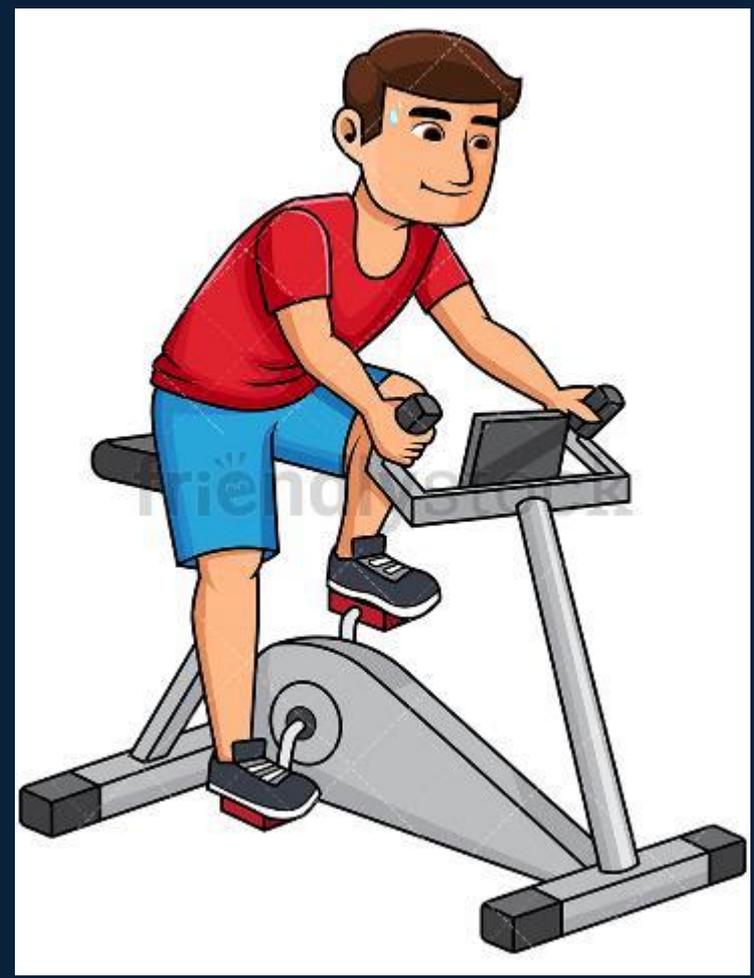


- Benefits include
 - Improved muscle strength and size
 - Improved speed in walking
 - Possible improved scores on quality of life surveys
- Progressive resistance training seems best
- Benefits are seen for as long as 2 years



Effects on Motor Symptoms – Aerobic Exercise

- Improves cardiorespiratory health
- May improve motor function
- May improve walking performance and speed
- May improve balance





Effects on Motor Symptoms – Physical Therapy

- Implementation varies and is often tailored to individuals
- Likely has benefit for walking speed, freezing, and balance
- LSVT-BIG focuses on large amplitude movements in high intensity designed to improve movement
 - May have improved motor symptoms and walking performance compared to Nordic walking and unsupervised exercise



Other Types of Exercise – Tai Chi

- Form of martial arts that focuses on slow control of movement, strength, and multidirectional movement
- May help with control of posture
- One study showed benefit on balance and decreased falls





Other Types of Exercise – Dance



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- Combines musical cues, spatial awareness, balance and strength
- Promotes social engagement and peer support
- Studies on waltz, tango, and fox trot showed benefit for walking and balance
- Participants in a tango program had improved motor function and less freezing



What About Falls?

- Many studies have shown no effect of exercise on fall risk in PD
- One analysis of many studies on exercise and falling in PD showed:
 - Decrease in fall rate
 - No change on number of fallers
 - The specific types of exercise were not specified





What can we do about falls?

- There are other ways to reduce risk of falls
 - Assistive devices, assistance from caregivers, etc
- In one study, PD patients who had lower confidence in their own balance were more likely to fall
- Exercises that improve confidence and reduce fear of falling may reduce risk of falling



Effects on Non-motor symptoms

- Non-motor symptoms of PD can be some of the most troubling for patients
- There are few medications approved for non-motor symptoms
- There is relatively little evidence for effects of exercise on non-motor symptoms
- Knowledge of effects of exercise on similar symptoms in healthy people may be helpful



Effects on Non-motor symptoms - Cognition

- In healthy individuals, attention and processing speed improve more when aerobic and resistance exercise is combined
- Aerobic exercise, resistance training, and dance have shown improvements on tests of cognition, memory, and attention in PD
- There is more evidence for aerobic exercise than for resistance training



Effects on Non-motor symptoms - Sleep

- In healthy adults, exercise can improve daytime sleepiness, quality of sleep, and need for medication
- In PD, some patients who exercise report improved sleep quality, though results are inconsistent





Effects on Non-motor symptoms - Mood

- In the general population and older adults, there is some evidence that exercise can
 - Improve mood
 - Help to treat symptoms of depression
 - Help to treat symptoms of anxiety
- There are few studies looking at the effect of exercise on mood in PD
- PD patients report improved mood with exercise in some but not all studies



Are there risks with exercise?

- Injuries can occur with exercise
- Studies do not support worsened outcomes from exercise in PD patients
- Studies on exercise in PD patients do not clearly show higher rates of injuries or falls





Concluding Points

- There are clear benefits to exercise in the general population
- There are distinct challenges in studying the effects of exercise in PD patients
- There is some evidence that exercise may affect Parkinson's disease progression
- Exercise likely has benefit for motor function and walking ability and may be helpful for non-motor symptoms



Concluding Points

- A combination of multiple types of exercise is likely beneficial
- Exercise should be done in “on” state (when medications are in effect)
- Exercise programs should be tailored to individual goals and preference
- More work is needed to determine if specific types of exercise are superior



Barriers to Exercise in PD Patients

- Patients with PD reported the following reasons for not exercising:
 - ~~Low expectations~~
 - ~~Bad weather~~
 - ~~Lack of time~~
 - ~~Pain~~
 - ~~Depression~~
 - ~~Fear of falling~~





Thank you and Questions?

