

Parkinson Disease Resistance Training

Produced by: Parkinson Disease Knowledge Translation Task Force

Fact Sheet

Physical therapists should implement resistance training to reduce motor disease severity, and improve strength, power, nonmotor symptoms, functional outcomes, and quality of life in people with Parkinson disease.

Types of people with PD (PwP) who would most/least benefit from resistance training as part of a multimodal program.

1. Resistance training is appropriate for people with mild-moderate PD (H&Y 1-3), based on published studies
2. For those with balance deficits (moderate to severe PD; H&Y 3-4), resistance training may need to be adapted or supervised by an exercise professional or a trained care partner

How to perform the intervention

1. Frequency: 2 nonconsecutive days per week
2. Time: 30-60 minutes per session (Volume: 4-12 hours/month)
3. Intensity: progress as tolerated with good form
 - a. Strength: Progress to 80% of the repetition maximum (RM) to achieve strength gains
 - i. Beginner: 40-60% of 1RM, or 1 set of 20-30 reps, progress to 2 sets of 15
 - ii. Experienced: 80% of 1RM, or 3 sets of 10-12 reps, working to muscle fatigue
 - b. Power: Working at higher speeds to improve power
 - i. Beginner: 20-30% of 1RM
 - ii. Experienced: 40% of 1RM
 - c. There are several ways to estimate the 1-Repetition-Maximum (1RM) such as the Oddvar-Holten Curve,¹ Brzycki Formula² and Epley Formula³
4. Type: all major muscle groups, but particularly target extensor muscles (trunk, gluteal muscles, etc)
 - a. Can use weight machines or body-weight-based exercises with free-weights and dumbbells or resistance bands.
 - b. Incorporate in a comprehensive care plan that includes balance training, and other forms of exercise as appropriate.

What does it improve and how to measure change?

What does it improve?	How to measure change?
Motor Disease Severity	MDS-UPDRS III (motor symptoms)
Strength and Power	Handheld dynamometer
Functional Mobility Outcomes	Five Time Sit to Stand
Quality of life	PDQ-39

- Strength training may also improve nonmotor symptoms including cognition, depression, and anxiety. Please work with your interdisciplinary care team to address these concerns.
- See PD EDGE and ANPT Core Measures CPG for other outcome measure suggestions.



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Considerations related to safety (precautions, contraindications; when should you NOT choose the intervention)

1. Falls are a potential risk with balance exercises but did not increase number of adverse events. Take appropriate precautions to prevent falls.
2. Type of exercise and level of supervision should be chosen based on the individual's safety profile, including falls, orthostatic hypotension, osteoporosis/osteopenia, spinal stenosis, musculoskeletal problems, cognitive abilities, and ability to maintain a good biomechanical form.
3. Resistance training should be performed "ON" medication.

Considerations for practice setting

1. Outpatient, inpatient, and home settings will likely have different equipment available and different medical risks due to different levels of participants.

Considerations for implementation (cost and space)

1. Access to a local fitness facility with resistance training equipment and the cost of a membership (Individuals will need to drive, arrange a ride, or take local transportation):
 - a. Senior Center
 - b. Local fitness center (YMCA's often have senior programs and discounts)
 - c. Local outpatient clinics that have a gym attached for individuals to continue their home programs
 - d. Hospital based fitness center
 - e. Non-profit based neurological fitness centers
2. Availability of supervision if needed. The physical therapist should work with a local personal trainer or train the care partner to help the PwP safely learn and progress strengthening exercises.
3. Adapting resistance training for a community-based exercise group may be difficult to personalize appropriate dose
4. Resistance training can be adapted to be performed at home, which a skilled PT can help identify and progress. For example:
 - a. Think creatively for home items (milk jugs filled with different amounts of water) or theraband that could be used instead of gym weights.
 - b. Progression can be built in through a variety of mechanisms, such as changing the relationship with gravity, adding resistance, or adding repetitions

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References:

1. Holten O, Grimsby O. Medical Exercise Therapy: A Course Workbook. The Holten Institute for Medisinsk Treningsterapi, 1986
2. Brzycki, Matt (1998). *A Practical Approach To Strength Training*. McGraw-Hill. ISBN 978-1-57028-018-4
3. Epley, Boyd (1985). "Poundage Chart". *Boyd Epley Workout*. Lincoln, NE: Body Enterprises. p. 86.