

# Fitness Counts

**A Body Guide to Parkinson's Disease**



## About this book

### **GLOSSARY**

Definitions for all words underlined in blue can be found in the glossary starting on page 51.

A comprehensive Parkinson's disease glossary can be found at [Parkinson.org/Glossary](https://www.parkinson.org/Glossary).

### **INDEX**

An index of key words and topics can be found on page 52.

### **PARKINSON'S FOUNDATION RESOURCES**

Several episodes of our podcast series, *Substantial Matters: Life and Science of Parkinson's*, focus on exercise and overall wellness. Check it out at [Parkinson.org/Podcast](https://www.parkinson.org/Podcast).



**While medication has long been the most promising treatment available for Parkinson's disease (PD), a regular exercise program should always be part of managing PD. In fact, most movement disorder neurologists say that exercise is as important as any one of your medications. Though exercise is not a cure, it may help slow the progression of symptoms.**

This book provides general exercise information and suggestions for all people living with PD. You may use it to help increase your fitness level and improve your ability to do everyday activities. In addition, this book includes resources for physical and occupational therapists who would like information regarding treatment options for people with PD.

Be creative with your fitness. Exercise indoors and out. Change your routine frequently. Dance. Use music. Try a new exercise. Exercise with a partner, child, friend or animal. Join an exercise program or group. Above all, challenge yourself and **have fun!**

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## CHAPTER ONE

# About Parkinson's Disease



To understand the role fitness plays in treating Parkinson's disease, we first need to understand the symptoms of the disease. If you are reading this book, you are probably already familiar with PD, but here are some basics: Parkinson's is a progressive, neurodegenerative disorder that affects about one million people in the United States and 10 million people worldwide. It is called a movement disorder because of the "motor features" it can cause – tremors, slow movements, stiffness and muscle cramping. Symptoms are diverse and usually develop slowly over time. Parkinson's not only disrupts brain networks that control movement, but also those linked to mood, behavior and thinking (cognition).

Parkinson's disease is not diagnosed with a test or a scan; instead it is diagnosed by a neurologist, who asks you questions about your health and medical history and observes your movement. Your doctor may want you to have some tests or imaging; some, like an MRI, can help rule out other conditions, while others, like DaTScan, may help confirm a Parkinson's diagnosis if there is uncertainty. The goal of treatment is to help you manage your symptoms.

## 6 FITNESS COUNTS

The symptoms of Parkinson's disease include more than just the motor features. Parkinson's impacts thinking: the disease can affect working memory, decision-making, staying attentive and concentration. Parkinson's is also linked to depression and anxiety, and it can affect behavior and disturb sleep.

From a biological perspective, Parkinson's results in low levels of the brain chemical dopamine, and this leads to the loss of effective communication between the higher brain structures on the surface of the brain (called the cortex) and the deep part of the brain that manages more basic functions (called the basal ganglia). The higher brain structures are where you think, and the deep structures are where those thoughts are translated into actions, particularly movement. Researchers continue to study how cells and brain networks are affected in Parkinson's to improve our understanding of the disease and potential for treatments. We do know that the dopamine system is not the only one affected by Parkinson's. The disease process also disrupts other brain networks, including those linked to mood, behavior, and cognition (thinking).

Although there is no way now to correct the brain changes that cause Parkinson's, we know that exercise can help you fight the disease and that staying healthy can help reduce setbacks that make living with PD more challenging. Great care is an important part of living your best life with Parkinson's.

### NOTE

**Before starting an exercise program, it is important to discuss your program with your doctor and/or physical or occupational therapist. They can address your fitness questions and concerns on a more personal level. These health professionals can also design a specific fitness routine for you and keep you updated on current Parkinson's research. (See Chapter 3, *Physical and Occupational Therapy*, on page 14 for information on how to find a therapist near you.)**



## Parkinson's Symptoms

While you may not experience all the symptoms below, Parkinson's will affect many systems of the body. Parkinson's symptoms vary from person to person and change over time. Three telltale symptoms help doctors make a diagnosis:

1. **Slowness of movement (bradykinesia)**
2. **Tremor**
3. **Rigidity**

Bradykinesia plus either tremor or rigidity must be present for a Parkinson's diagnosis to be considered.

Other symptoms of PD are related to these movement challenges:

- Changes in walking
  - Difficulty turning
  - Festination or shuffling (quick, small, involuntary steps forward)
  - Retropulsion (quick, small, involuntary steps backward)
- Freezing episodes (an inability to perform a movement, or a feeling that your feet are stuck to the ground)
- Micrographia (small, cramped handwriting)
- Speech and swallowing changes

Another movement symptom, postural instability (trouble with balance and falls), is often mentioned, but it does not occur until later in the disease progression.

The **non-movement symptoms** of PD can also indirectly affect mobility:

- Bowel and bladder changes (constipation, urinary urgency and frequency, incontinence)
- Cognitive changes (attention, memory problems)
- Mood changes (anxiety, depression)
- Orthostatic hypotension (a drop in blood pressure and a feeling of lightheadedness upon standing)
- Sensory changes (pain, tightness, tingling, burning)
- Sleep disorders
- Visuo-spatial problems (difficulty detecting changes in the amount of space surrounding objects; e.g., detecting the correct height of a step)

## PD is a Movement and Sensory Disorder

People with Parkinson's have difficulty regulating the size or speed of their movements. Movements are bradykinetic (too slow) and hypokinetic (too small).

Changes in the movement system (muscles) lead to challenges controlling movements, including the following:

- Starting and stopping movements
- Automatically controlling muscles
- Linking different movements to accomplish one task: for example, moving from sitting to standing
- Finishing one movement before beginning the next: for example, not completely turning around before sitting down

Changes in the sensory system also lead to challenges, particularly noticing and correcting movement and voice issues. Here are some other examples:

- Slowness or smallness of movements: for example, when told to make the movement bigger, a person with PD may feel the movement is now too big
- Lack of movement: for example, an arm that does not swing during walking
- Changes in posture
- Changes in voice volume: for example, when told to speak louder, a person with PD may feel they are shouting

### TIP

**Research from the Parkinson's Foundation *Parkinson's Outcomes Project*, the largest-ever clinical study of Parkinson's, suggests that people with PD do at least 2.5 hours of exercise a week for a better quality of life.**

## CHAPTER TWO

# Why Exercise?

Research from the Parkinson's Foundation *Parkinson's Outcomes Project* shows that starting an exercise routine and consistently exercising have positive effects on self-reported health-related quality of life and mobility. It is better to start earlier, but it is never too late.

People with advanced PD who exercise show greater positive effects on health-related quality of life, so it is particularly important to keep exercising and find new ways to facilitate exercise as the disease progresses.

## 10 FITNESS COUNTS

There are two main reasons that exercise is important when you have Parkinson's:

### **1. In addition to PD, your body is coping with the general effects of aging.**

As we age, certain changes occur in our bodies:

- Loss of tissue elasticity (skin wrinkles, muscles can tighten)
- Mineral loss in bones (fractures can occur more readily)
- Loss of muscle mass (muscles are not as toned):  
We lose 1% of muscle mass per year over the age of 60!

If you combine normal, age-related changes with a sedentary lifestyle, you increase your risk of developing cardiovascular disease, osteoporosis, diabetes and cognitive impairment. Without regular exercise, our bodies and minds become weaker, stiffer and more likely to suffer an injury.

### **2. Research proves that exercise benefits people with PD.**

Studies in both animals and humans have demonstrated the brain and body benefits of exercise for people with Parkinson's.

## Exercise as Medicine

Ongoing research is clearly showing us that in addition to directly benefiting symptoms, exercise helps the brain compensate for changes that occur because of Parkinson's. Studies have shown that exercise and physical therapy can improve many aspects of Parkinson's by incorporating feedback, repetition, challenge, problem-solving, engagement and motivation. Aside from taking medications on time, exercise is the single most important activity you can do to manage Parkinson's and lead the best possible life.

Reported benefits of exercise include improvements in the following areas:

- Gait and balance
- Flexibility and posture
- Endurance
- Working memory and decision making
- Attention and concentration
- Quality of sleep

And reductions in the following concerns:

- Falls
- Freezing of gait
- Depression and anxiety

## Exercise Effects on Cognition

About half of people with Parkinson's experience challenges with what doctors call *executive functioning*, which involves planning activities, keeping a schedule, staying organized and similar tasks. Executive dysfunction can appear as problems with working memory (measured by how many things you can keep track of at the same time) and problems keeping focused on a task and responding to changes.

The parts of the brain that perform executive function tasks are the same ones that help you adapt to changing environments. For example, you use your executive function centers when you go from walking inside the house to walking outside. You also use them when you learn a new skill or improve an old skill.

### Aerobic Exercise

It is well-known that aerobic exercise makes your heart healthier and improves how your body uses oxygen. Studies also show that aerobic exercise can improve age-related changes in executive function. Scientists are studying if and how aerobic exercise works to slow Parkinson's disease and what the right "dose" of exercise is to get the best benefits. (See page 26 for more information on aerobic exercise and examples of exercises you can try.)

### Skill-Based Exercise

Skill-based exercises focus on complex movements of the whole body, such as balance, hand-eye coordination and reaction time. Studies of skill-based exercise have been shown to improve motor function, but so far we don't know if aerobic or skilled-base exercise is better for PD. In fact, the answer may be doing both, especially for targeting cognition. Your physical therapist may incorporate skill-based and aerobic training by having you do exercises with specific goals. An example might be to walk a course through your neighborhood and finish in a pre-set time.

### TIP

For more information on Parkinson's effects on thinking and memory, order your free copy of the book *Cognition: A Mind Guide to Parkinson's* by calling our Helpline at 1-800-4PD-INFO (473-4636) or online at [Parkinson.org/Books](http://Parkinson.org/Books).

## Exercise and Neuroplasticity

You know that exercise improves muscle strength, flexibility, bone density and cardiovascular health. But did you know that this same exercise leads to changes in your brain? When you begin a new activity or exercise, your brain – not just your muscles – is *learning* the movements. This process of teaching your brain a new pattern (whether it is a movement, being comfortable in a new place or even learning a way to think) is called neuroplasticity.

Research has measured the following Parkinson's-fighting changes in the brains of animals that exercise:

- More effective use of dopamine by brain cells
- Growth of new blood vessels, which helps brain cells get the oxygen and nutrients they need to stay healthy and participate in the activities of thinking
- Improved use of energy by brain cells (better metabolism)
- Increased release of special proteins that strengthen connections (synapses) between brain cells, and growth of new connections
- Reduced potentially harmful effects of the immune system (less inflammation)
- Growth of new brain cells

All of this contributes to even better effects of the medicines you take to fight Parkinson's. So take advantage of the fact that by doing something enjoyable to make your body healthier, you are also making your brain healthier!

### Tips

- When you learn a new exercise skill (like tai chi, boxing, etc.) it helps both how you move and how you think.
- There is not one best exercise – you should do aerobic, strength and skill-based exercises to get the best benefits.
- Doing a variety of exercises, as well as pushing yourself to get better at the exercises you do, helps your brain cells grow new connections, resulting in learning.
- Exercise is a lifelong commitment.
- Exercise is medicine!

## Social and Emotional Benefits

It is important to challenge yourself with exercise, but not to the point that you feel discouraged. Exercise is a daily achievement. You need to believe you can do it and feel that you're accomplishing something for yourself. If you are struggling with motivation or with believing in your own ability, ask your care team, friends or family for help. You might join a group fitness class or ask a friend to go for a walk with you. In this way exercise can provide social and emotional benefits, as well as physical and mental ones. The key is finding exercises and activities that you enjoy that also help you feel and move better.

### TIP

**Choose an exercise program that you will actually do! Don't design a great, Parkinson's-specific exercise program and then skip it because it is too hard or not fun.**

### TIP

**Mixing exercises that are skill-based and/or aerobic increases the chance of getting both motor and cognitive benefits.**

## CHAPTER THREE

# Physical and Occupational Therapy

Licensed rehabilitation specialists, including physical and occupational therapists, work in a variety of healthcare settings and play a vital role in the fitness and well-being of people with PD.

**Physical therapists** address balance, strength and range of motion related to a person's functional mobility (e.g., walking, getting in and out of chairs and changing position in bed). They can also design a personalized exercise routine.

**Occupational therapists** address performance skills related to tasks that occupy a person's time, such as activities of daily living (e.g., dressing, bathing, cooking), work, school, social/communication and leisure activities.



PTs and OTs who work with people with PD can do all of the following:

- Design or modify exercise programs
- Evaluate and treat mobility and walking problems
- Evaluate and treat joint or muscle pain that interferes with activities of daily living (ADLs)
- Help with poor balance or frequent falls
- Teach care partners proper body mechanics and techniques for assisting someone with PD
- Make referrals to movement and exercise programs in the community
- Recommend and teach the use of appropriate adaptive equipment and walking devices

## Four Stages of Intervention

Physical and occupational therapy can be helpful throughout your journey with Parkinson's. Interventions generally occur in four stages:

### **Stage 1: Pre-habilitation**

This stage is like prevention. You start working on a problem before you even experience symptoms. Begin an exercise program even if there are no noticeable difficulties with balance, stiffness or movement. You can ask for a referral to a physical therapist as soon as you receive a Parkinson's diagnosis.

### **Stage 2: Rehabilitation**

At this point, you notice symptoms, but you can take steps to fix the problem. Continue your exercise program. Learn how to walk better, get up from bed or a chair, get out of a freezing episode and improve posture.

### **Stage 3: Preservation**

Do your best to make sure you do not lose what you have. Stay active. Join a group, get physical and social and have fun!

### **Stage 4: Prevention**

The stages come full circle. You do not want any new problems on top of existing challenges. Continue your exercise program. Learn about home modifications, care partner training and ways to stay strong.

## How to Find a Physical or Occupational Therapist

Many states allow you to go directly to a physical or occupational therapist without a referral from a healthcare professional. However, depending on your health insurance plan, there may be limitations on where you can receive treatment or the number of visits that are covered.

For help finding a physical or occupational\* therapist near you, particularly one with experience working with people with Parkinson's, try the options below. Recent research from ParkinsonNet, a collaborative network of medical and allied health professionals in the Netherlands, led by the medical director of a Parkinson's Foundation Center of Excellence, shows that people with Parkinson's who receive physical therapy from a specialized provider – someone with training and experience in PD – receive better benefits and achieve better health outcomes.

### **1. Call the Parkinson's Foundation Helpline.**

Call our toll-free Helpline at 1-800-4PD-INFO (473-4636) or email [helpline@parkinson.org](mailto:helpline@parkinson.org) to speak with a PD information specialist. When you call our Helpline, you can ask about exercise classes in your area. You can also find out if there is a physical or occupational therapist in your area who has completed our Allied Team Training for Parkinson's (ATTP®) program. This is a special training program for allied health professionals, including physical and occupational therapists, that helps them develop a deeper understanding and appreciation of the skills needed to help people living with PD.

### **2. Search the American Physical Therapy Association (APTA).**

Visit [www.apta.org](http://www.apta.org). Click on "For the Public," then "For Patients" and finally "Choosing your PT." The search will note physical therapists who have specialized certifications; choose geriatric or neurological rehabilitation. You can also call 1-800-999-2782.

### **TIP**

**Ask for a referral to a physical or occupational therapist with geriatric or neurological experience. Explain that you are looking for someone who has experience working with people with Parkinson's.**

**3. Search the LSVT Global Directory.**

Visit [www.lsvtglobal.com](http://www.lsvtglobal.com) to find LSVT BIG-certified physical and occupational therapists. Click on "Find a Clinician," choose "LSVT BIG" and follow the instructions. You can also call 1-888-438-5788. See page 50 for information on LSVT.

**4. Call your local movement disorders center.**

Movement disorders centers in the Parkinson's Foundation Centers of Excellence network are models of the team care approach to Parkinson's treatment. They have physical and occupational therapists on staff or allied health professionals in the community to whom they frequently refer their patients. If the referral is coming from the movement disorders center, it is likely that the provider has experience working with people with Parkinson's.

**5. Call the department of physical therapy at the closest university.****6. Call your local hospital.**

For a list of questions to ask your therapist to get the best possible care, visit the National Board for Certification in Occupational Therapy (NBCOT) at [www.nbcot.com](http://www.nbcot.com). Click on "Public," then "Why Certification Is Important," and scroll down to "Questions to Ask Your Therapist." These questions are useful as you find the right occupational or physical therapist for you.

\* *The American Occupational Therapy Association (AOTA) does not have a general search function for occupational therapists near you on their website.*

**TIP**

**It is ideal for every person diagnosed with PD to begin a fitness routine in the pre-rehabilitation stage. Data from the Parkinson's Foundation Parkinson's Outcomes Project, the largest-ever clinical study of Parkinson's, show that people with PD who start exercising earlier experience a significant slower decline in quality of life than those who start later. If you have Parkinson's and are not yet exercising, speak with your healthcare provider about beginning therapy. Establishing early exercise habits is an essential part of overall disease management. It's never too late to start!**



## CHAPTER FOUR

# What Exercises Should I Do?

The general goals of exercise and physical and occupational therapy are to improve your symptoms and help you do activities you enjoy. Your therapist should design a program in which you practice skills to improve and maintain your mobility. These skills might include walking, balance and maintaining good posture.

Your program needs to push your brain as well as your muscles. Your therapist will help you challenge yourself by trying different exercises, setting goals for improvement and working harder (for example, by increasing repetitions). Scientists believe that learning this way will lead to better brain changes.

## Working with Your Therapist

To improve your performance on a routine skill, like walking, your therapist might have you focus on a complex task, like walking while bouncing a ball or counting backwards. This is called dual-task practice, and it can help you target specific mobility impairments. Do you have difficulty getting up from a chair? Your therapist will likely work with you on muscle strength and ask you to practice sitting and standing with seats at different heights. But he or she may also have you perform this task while standing on a balance pad and answering questions.

Here are just a few of the many types of exercise that have been found to help people with PD:

YOGA

TAI CHI

BOXING

TREADMILL TRAINING

DANCE

AEROBIC EXERCISE

BALANCE

STRENGTH TRAINING

AMPLITUDE TRAINING (MAKING MOVEMENTS BIGGER)

### TIP

Research has shown that everyone benefits from exercise. It is never too late to get started, but talk to your doctor before you begin and before changing the intensity of your exercise program. Also ask for help if you are struggling to stay motivated. Your PT or OT can help you find exercises that are challenging and enjoyable AND lead to improvements in mobility.

### TIP

Try something new and different. Don't do the same exercise at the same intensity in the same way all the time.

## Deep Breathing

Breathing deeply will help you relax, and relaxing will help you stretch. Do not hold your breath, strain or take shallow breaths while exercising. Shallow breaths overwork the upper chest muscles and upper parts of the lungs, leading to tension and fatigue. Full, deep breaths allow the diaphragm to lower and the lungs to expand deeply. This helps you take in more oxygen with each breath.



### Proper Diaphragmatic Breathing

Lying comfortably on your back, place one hand on your chest and one hand on your abdomen.

Take in a slow, full breath (inhale) through your nose, and feel the hand on your abdomen rise as the lungs fill with air.

As you breathe out (exhale) through your mouth, feel the hand on your abdomen lower as your lungs empty.

### Massage

Massage therapy has been shown to increase circulation, reduce muscle tension and promote relaxation. It can be particularly helpful if you have problems with rigidity, anxiety and/or stress.

Massage is not a substitute for regular movement and exercise, but it can be a wonderful addition to your overall exercise program. Self-massage and care partner-assisted massage can be helpful. Most drug or department stores sell items such as wooden rollers and hand-held electric massagers that you or your care partner can use.

If you want a professional massage, select a massage therapist who is certified by the American Massage Therapy Association (AMTA). To find one near you, visit [www.findamassagetherapist.org](http://www.findamassagetherapist.org) or call 1-877-905-0577.

It is important to note that massage services are often not covered by health insurance.

## Flexibility Exercises

Regular stretching is the first step in your exercise program, and it can be one of the most enjoyable. Stretching helps you fight the muscle rigidity that comes with PD. It also helps your muscles and joints stay flexible. People who are more flexible tend to have an easier time with everyday movements.

While there are no standard stretching exercises for people with PD, the American College of Sports Medicine and the American Heart Association recommend the following guidelines for everyone:

- Perform at least 10 minutes of stretching at a time.
- Perform stretches at least 3-4 times per week; daily is better.
- Hold stretches for 10-30 seconds.
- Perform 3-4 repetitions of each stretch.

The muscles that tend to become tight in PD are those that bend and rotate the joints. At a minimum, a flexibility program should focus on the following body areas:

1. Chest wall
2. Shoulders and elbows
3. Back of the thighs (hamstrings) and knees
4. Calves
5. Front of wrists and palms
6. Low back and neck

### Stretching Tips

- **Your stretch should feel like a gentle pull. Do not stretch to the point of pain.**
- **Remain motionless while holding your stretch. Do not bounce while stretching. Bouncing can cause small tears in muscle fibers, and this can actually lead to less flexibility.**
- **Breathe evenly in and out during each stretch. Do not hold your breath.**

## STANDING STRETCHES

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### Chest Stretch

1. Stand facing a corner, placing forearms and hands on each wall.
2. Lean forward into the corner.
3. Keep head up and feet flat on the floor



### Back Stretch

1. Stand with feet hip-width apart.
2. Place palms on low back.
3. Gently lean trunk and neck back.



### Shoulder Stretch

1. Stand tall with feet hip-width apart.
  2. Clasp hands behind back.
  3. Gently lift arms up and away from the back, keeping head up.
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## LYING STRETCHES

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### Shoulder Stretch

1. Lie flat on your back.
2. If you are using a pillow, place it only under your head, not under your shoulders.
3. Slowly lift your arms straight up and allow them to fall back overhead.



### Rotation Stretch

1. Lie on your back with knees bent and feet flat. Arms should be outstretched at your side.
2. Rotate both knees to one side, keeping arms and upper torso flat. Turn head in opposite direction.
3. Repeat, rotating knees in the opposite direction.



## SEATED STRETCHES

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### Neck and Chest Stretch

1. Sit tall in a chair with hands clasped behind back of chair.
2. Allow neck to gently fall back.



### Hamstring Stretch

1. Sit tall in chair and place one leg straight out on another chair.
2. Keep toes pointed up, knees flat and back straight.
3. Gently reach for toes.
4. Only reach as far forward as you can without your knee bending.



### Rotation Stretch

1. Sit tall with your right arm behind the chair.
  2. Reach your left arm in front of you to grab the back of chair or the right armrest.
  3. Turn your neck and look over your right shoulder.
  4. Repeat on the other side.
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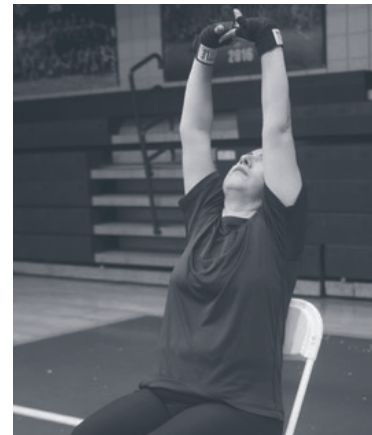
## Ankle Circles

1. Kick foot in front of you.
2. Move foot in slow, complete circles.
3. Repeat in both directions.



## Overhead Stretch

1. Sit tall in a chair and lace fingers together.
2. Turn palms facing out and slowly lift arms overhead.
3. Gently allow neck to fall back.
4. Look up at hands.



## Seated Side Stretch

1. Sit to one side of a chair that has armrests.
2. Keep your feet flat on the floor.
3. Reach your right arm down toward the floor.
4. Reach the left arm up and over toward the right.
5. Repeat on the other side.



## Aerobic Exercises

Aerobic exercise is any activity that works the heart, lungs and muscles and helps the body burn calories. A range of national and international health organizations, including the Department of Health and Human Services, the American Heart Association, the World Health Organization and others, recommend that most adults get at least 150 minutes per week of moderate intensity exercise, or 75 minutes per week of vigorous exercise.

Data from the *Parkinson's Outcomes Project* confirms that 2.5 hours of weekly exercise is the target amount for people with Parkinson's to lead a better quality of life. This means 30 minutes of exercise five times a week. You can be creative and work around any physical limitations. For example, walk for 10 minutes three times a day instead of one 30-minute walk.

### EXAMPLES OF AEROBIC EXERCISE

- Walking, jogging, running
- Swimming
- Dancing
- Water aerobics
- Chair aerobics
- Biking: indoor (stationary), outdoor, tandem or motor-powered (bikes that force movement at higher speeds than one would normally go)

### TIP

For maximum benefit in people with PD, research suggests that aerobic activity should be at a moderately-high to high intensity or pace.

### Target Heart Rate

Your target heart rate is the range in which your heart should be beating to give you the most benefit during exercise. Your target heart rate is important because it helps determine your fitness level when you start your exercise program and shows you how you are progressing.

#### CALCULATING YOUR HEART RATE

Calculate your maximum heart rate by subtracting your age from the number 220.

Your target heart rate should stay within 50-85% of your maximum heart rate. Take your pulse every so often while you exercise to make sure you stay within your range.

#### TARGET HEART RATE AND MAXIMUM HEART RATE AVERAGES

AGE	TARGET HEART RATE (50-85%)	MAX HEART RATE (100%)
30 years	95-162 beats per minute	190
35	93-157	185
40	90-153	180
45	88-149	175
50	85-145	170
55	83-140	165
60	80-136	160
65	78-132	155
70	75-128	150
75	73-123	145
80	70-119	140
85	68-115	135

*Caution! If you take high blood pressure medications, be sure to check with your physician before calculating your target heart rate. Certain medications lower your heart rate and will affect your target rate. Also check with your physician if you have a pacemaker or atrial fibrillation.*

## Strengthening Exercises

Strong muscles are vital to maintaining and improving functional ability. While there are no specific guidelines for strength training in people with PD, muscles can be strengthened at any stage.

Strength training can take the form of lifting weights, using machines at the gym, using your own body weight for resistance or even using common household items like a milk jug filled with sand.

The American College of Sports Medicine and the American Heart Association recommend the following guidelines for everyone:

- Perform at least one set of each exercise, 10–15 times.
- Do strengthening exercises 2–3 days per week (but do not work out the same muscles on consecutive days; muscles need a day to rest before training again).

At a minimum, a strengthening program should include the following muscles, which help to combat posture and strength changes common in PD:

1. Core muscles (abdominals)
2. Thigh muscles (quadriceps)
3. Buttocks (gluteals)
4. Back muscles
5. Back of the arm muscles (triceps)

### Strengthening Tips

- Stop any exercise that causes pain.
- Concentrate on standing (or sitting) straight while doing the exercises.
- Keep movements smooth and even.
- Do not grip hand weights too tightly.
- Do not hold your breath. Breathe evenly throughout each exercise. As a rule, you should breathe out on the hardest part of the movement, and breathe in on the easiest part.

## STANDING STRENGTHENING EXERCISES

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### Wall Slides

1. Stand with feet 6-8 inches from the wall.
2. Rest your back and hands on the wall.
3. Slowly bend your knees and slide down the wall.
4. Do not let your knees move past your feet.
5. Hold this pose for a count of 5.
6. Slide back up the wall.



### Quad Strengthening

1. Sit tall on the edge of a chair with your arms crossed on your chest.
2. Slowly lean forward and use your legs to push up to stand.
3. Stand for a moment.
4. Slowly lean forward again and lower yourself to sit.



## SEATED STRENGTHENING EXERCISES

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### Shoulder Blade Squeeze

1. Sit tall on the edge of a chair.
2. Open arms out to the sides, fingers spread.
3. Pull arms back and squeeze shoulder blades together.





## ON-THE-GROUND STRENGTHENING EXERCISES

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### Bridge

1. Lie on your back with knees bent and feet flat.
2. Raise hips and squeeze buttocks.
3. Hold this pose for a count of 5, then lower.



### Quadruped

1. Begin on hands and knees. Keep your back flat.
2. Reach one arm straight forward.
3. Extend opposite leg straight back.
4. Hold for a count of 3-5.
5. Repeat on other side.



### Back Extension

1. Lie on stomach.
2. Lift upper body off surface, supporting body weight on forearms.
3. Hold position for a count of 5-10.

*NOTE: Remember, this is not a push-up. Your back muscles should be doing the work, not your arms.*



## Other Exercises

### Yoga

Yoga increases flexibility, breathing and posture awareness and helps with relaxation and stress reduction. Yoga is a self-paced activity, which means that not everyone has to perform a pose in the same way or hold it for the same amount of time. Most poses can be modified depending on your needs. You can even practice yoga in a chair.

Yoga classes and private sessions are held at many fitness centers, senior centers and community recreation centers. Since there are many types of yoga, it is important to contact the instructor or the facility prior to starting a class. Search for an instructor in the Yoga Journal online directory at [www.yogajournal.com/directory](http://www.yogajournal.com/directory) or the Yoga Alliance, [www.yogaalliance.org](http://www.yogaalliance.org) 1-888-921-YOGA (9642). Finally, there are many books and videos on yoga for people with Parkinson's that you can order or view online.

### Tai Chi

Tai chi is an ancient Chinese form of exercise that involves slow, gentle movements, each flowing into the next. Tai chi incorporates posture, mental focus and deep breathing as the body is in constant motion. Research has shown that tai chi can improve balance in people with PD. Many people with Parkinson's also report improvements in flexibility, strength and relaxation after doing tai chi. Fitness centers, senior centers and community recreation centers might offer tai chi classes. It is important to speak with the tai chi instructor to learn if the class will be beneficial for you.

You can learn more about tai chi and other therapies discussed in this chapter from the National Center for Complementary and Alternative Medicine at the National Institutes of Health: [www.nccam.nih.gov](http://www.nccam.nih.gov).

### Pilates

The Pilates method focuses on developing strong core muscles to help build strength and teach body awareness, good posture and graceful movement. The exercises can be performed using a floor mat and a variety of equipment. Pilates can help improve flexibility and agility and may also help with back pain.

Classes are often offered at fitness centers, senior centers and community recreation centers. It is important to first speak with the Pilates instructor to learn which exercises are best for you.

To learn more about Pilates or for help locating an instructor, visit the Pilates Method Alliance website at [www.pilatesmethodalliance.org](http://www.pilatesmethodalliance.org) or call 1-866-573-4945.

## Dance

Dance classes engage participants' minds and bodies in a social environment. Many people with PD who cannot walk well report they can still dance, and dance well! Studies show that dance can help with:

- Balance
- Walking ability
- Balance and walking confidence
- Movement initiation
- Quality of life and sense of well-being

There are many dance options for people with PD, including general dance therapy as well as specific types of dance, such as tango. Dance/movement therapists work with individuals and groups in a variety of settings. To locate a dance therapist, visit the American Dance Therapy Association at [www.adta.org](http://www.adta.org) or call 410-997-4040.

Two programs that are popular across the country are Dance for PD® and Let Your Yoga Dance®. Learn more and find classes at [www.danceforparkinsons.org](http://www.danceforparkinsons.org) and [www.letyouryogadance.com](http://www.letyouryogadance.com), respectively.

## Boxing

Non-contact boxing, when performed safely and in the proper setting, can be a fun and beneficial type of exercise. Programs like Rock Steady Boxing (which works exclusively with people with PD) provide training to instructors and links to classes in your area. Rock Steady Boxing classes combine many aspects of exercise that are important for people with PD – aerobic, strengthening, balance/agility, and dual-task practice. It challenges both the body and the brain. For more information go to [www.rocksteadyboxing.org](http://www.rocksteadyboxing.org) or call 1-888-217-0577.



\*Some centers offer classes for different stages of PD – be sure to ask about which class is best for you.

### **Certified Personal Trainers**

Certified personal trainers generally work at fitness centers, senior centers, private gyms and in the home. Certification is available through a number of national organizations. Make sure your trainer is certified and ask about their knowledge and experience working with people with PD. Working with a trainer is a good way to continue with your exercise routine once you are no longer receiving physical or occupational therapy. Encourage your therapist to review and explain your program to your trainer to ensure a smooth transition.

### **Music**

Many people with PD are aware of the positive effect that music has on them. Now researchers are taking notice of these benefits. Studies show that music can reduce stress, improve breathing and voice quality and promote self-expression. In addition, music therapy can help with many aspects of PD:

- Improving bradykinesia
- Improving movement quality
- Acts as a rhythm for movement
- Improving quality of life

Music therapists work in a variety of settings, and some insurance companies will pay for their services. Music therapists work with individuals or groups through the use of some of the following:

- Singing
- Interpreting music through movement
- Using music for relaxation
- Using music to help initiate movement
- Song writing
- Lyric discussion
- Imagery
- Performing music
- Therapeutic drumming

For more information on music therapy, visit the American Music Therapy Association at [www.musictherapy.org](http://www.musictherapy.org) or call 301-589-3300.

## CHAPTER FIVE

# Walking, Turning and Falls Prevention

Problems with walking and balance are common in people with Parkinson's. However, the right combination of exercises and new ways of moving can improve balance, limit or prevent falls and put confidence back into your stride. Most people do not think about their walking. They can walk and talk and carry bags, purses and plates of food without difficulty. Arms swing naturally, and feet land on the heels with each step. Individuals with PD, on the other hand, lose their automatic movements. Feet begin to shuffle, and performing two tasks at once becomes more difficult. Turning becomes challenging, often leading to a freezing episode and sometimes a fall.

NOTE: Freezing of gait is the sudden inability to move the feet. You might feel stuck in place, completely unable to move, or legs may tremble in place.

There are many PD-related walking changes:

- Smaller steps
- Slower speed
- Less trunk movement (especially rotation)
- A narrow base of support (feet too close together)
- Less or absent arm swing (on one side of the body or both)
- Feet that land flat on the floor with each step instead of on the heel (this leads to shuffling, which can cause tripping and/or falling)

### **Managing Changes in Your Walking**

Along with exercise, focusing on each movement helps improve the quality of walking.

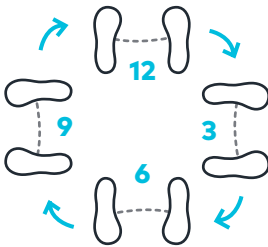
### **Walking Tips**

- Tell yourself to land heel first. You can do this by thinking of each step as a big kick.
- Focus on the size of your steps rather the speed of your steps.
- Avoid carrying things while walking. People with PD have difficulty performing more than one task at a time.
- The moment you begin to shuffle or freeze, try to come to a complete stop. Take a breath, stand tall and start again, focusing on making that first step a big step.
- Stand tall and look out in front of you; do not look directly down at your feet.
- Use a cane or walker/rollator if recommended by your therapist or doctor.

NOTE: The golden rule of using a walking device is this: if you need to reach out and touch furniture, walls or people when you are walking, then you most likely need a device.

## Turning Tips

- When beginning a turn from a stopped position, lead with your foot, not your upper body. Planting your feet and turning your upper body frequently leads to a freezing episode.
- If you want to turn right, shift your weight to the left foot and step out with the right foot. To turn left, shift your weight to the right and step out with the left foot.
- Try not to pivot when you turn. Instead, focus on how you lift your feet.



To turn in a small area, or when you are stopped and must turn, try the "clock turn" technique: start at 12:00, take two slow steps to 3:00, etc.

To turn in an open area, use large steps and make a U-turn.

### TIP

Individuals with PD must "tell" their feet how to move. By thinking about what you are doing, you use a different part of your brain than the part affected by PD. You re-route the message from the brain to the feet.

## Freezing Tips

FREEZE "TRIGGER"	FREEZE REDUCTION STRATEGY
<b>Answering the phone</b>	<p>Never rush to answer the phone.</p> <p>Keep a cordless phone within easy reach.</p> <p>Keep pathways open; rearrange furniture to keep floors free of clutter.</p> <p>Use an answering machine.</p>
<b>Walking onto/off of an elevator, train or bus</b>	<p>Allow everyone else to get on or off first.</p> <p>Announce that you have PD and ask people to be patient.</p> <p>Walk up to the threshold, stop, then focus on stepping over it.</p>
<b>Walking through a doorway</b>	<p>Tell yourself not to focus on the doorway; instead focus on how your feet hit the ground.</p> <p>Guess how many steps it will take to walk from where you are through the doorway, then count your steps as you move through to see how close you were to your guess.</p> <p>Look through the doorway at an object inside, and focus on approaching the object.</p> <p>Walk up to the threshold, stop, then focus on stepping over it.</p> <p>Place colored tape in horizontal stripes in front of and through the doorway, and focus on stepping over the tape. You can also place colored tape on the threshold itself, so you focus on stepping over it.</p> <p>Keep areas around doorways well lit and free of clutter.</p>
<b>Walking in crowds</b>	<p>Try to walk near walls.</p> <p>Take slow, deep breaths and focus only on how your feet are moving, not on the people around you.</p> <p>Alternate between walking a few feet and stopping.</p>
<b>Starting to walk</b>	<p>Stop all movement and take a deep breath.</p> <p>Make sure weight is even on both feet.</p> <p>Visualize stepping over or kicking an object.</p> <p>Shift weight to the side and step with the unweighted foot.</p> <p>March in place before stepping.</p> <p>Have your care partner place their foot ahead of your foot and step to it.</p>

*Note: For all strategies in the table above, focusing on the task is important. Rushing, carrying objects, talking with others or even looking away for a moment may limit how well the strategy works.*



## Falls and Balance

People with Parkinson's are two times as likely to fall compared to the general older population. Once falls begin, they are likely to continue. Falls lead to injuries, fractures, pain and fear of falling. Ultimately, falls can cause a decline in mobility, strength and cardiovascular health – all things to be avoided.

### Causes of Falls

- Slowed reaction time
- Freezing of gait
- Leg weakness
- Dizziness
- Shuffling steps that lead to tripping
- Poor safety awareness
- Difficulty doing two things at once
- Balance difficulties

### Preventing Falls

A physical or occupational therapist can recommend specific exercises, equipment and techniques to improve balance and mobility inside and outside the home.

## BALANCE EXERCISE

### Single Leg Stand

1. Stand with a bed or couch behind you and a sturdy chair next to you.
2. Shift your weight onto one leg, lifting the other leg up for a few counts.
3. Switch to the other leg and repeat.

NOTE: You can hold the chair to steady yourself as needed. To make the exercise more challenging, place two large soup cans or heavy containers on the floor in front of you and try to tap the can/container one or more times with your lifted foot before you put your foot down.



## Safe Movement Techniques

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### Sitting Down in a Chair

When sitting, turn all the way around so that the backs of both legs touch the chair.

Reach back with both arms to slowly lower yourself down.



**NEVER** reach forward for the chair first and then turn to sit. This can lead to landing sideways on the end of the chair, landing too hard in the chair or missing the chair and falling to the floor.



### Standing Up from a Chair

When moving from sitting to standing, do not push yourself straight up out of the chair. This frequently leads to falling back on to the chair. Instead, do the following:

1. Move to the front of the chair.
2. Place legs wide apart.
3. Bend knees so feet are under you.
4. Place hands on chair rail.
5. Lean forward so your weight is on the balls of your feet and your bottom begins to lift off the chair ("nose over toes").
6. Push to stand.



## Reaching Tips

There are many strategies you can use to make reaching safer.

- Stand in the “power stance” with feet wide apart and staggered. This allows you to shift your weight side to side and front to back.
- Stand directly in front of the object you are reaching for.
- Place one hand on the counter, wall or other stable object while you reach with your other hand.
- Avoid reaching for an object that is farther than arm’s length.
- Never lean your center of gravity (near the belly-button area) too far forward. If you reach for an object and your weight moves up onto the balls of your feet or your toes, you are too far from the object.



## Tips for Preventing Backward Falls

- Avoid stepping backward. Instead, step sideways. Make a safe turn, then walk forward.
- Do not stand directly in front of the oven door, refrigerator door, microwave or other appliance you are trying to open. Instead, stand slightly to the side and use a “power stance,” with one hand on a stable surface.



This stance can lead to repulsion or falls.



This technique is safer.

Note the “power stance” position of the feet.



## Getting up from a Fall



Begin to bend your knees.



Once your knees are bent and your feet are flat on the floor, reach one arm out to the side.



Reach the arm that was out to the side across your body while allowing your knees to fall over so that you can roll onto your side.



Push yourself up to a side sit.



Push yourself up onto your hands and knees.



Crawl to a sturdy piece of furniture, like a chair.

- Hold onto the chair with both hands.
- Bring your strongest leg up in front of you so that your foot is flat on the floor under your knee.
- Be sure your legs are wide apart.



Push up with your strong leg. Bring your other leg up so that the foot is flat on the floor. Pause here for a moment to be sure you are not lightheaded.



Slowly push your trunk up to stand tall.

## General Tips for Preventing Falls

For a complete safety review of your home, contact a physical therapist, occupational therapist or certified aging-in-place specialist (CAPS).

You can locate a CAPS by contacting the National Association of Home Builders at 1-800-368-5242.

### Recommendations

- Remove throw rugs.
- Keep areas well lit.
- Install grab bars in the bathroom.
- Install handrails on all stairs.
- Avoid clutter.
- Avoid rolling chairs.
- Use nightlights.
- Do not be afraid of change.

### When a Fall Occurs

1. Remain calm. Feel and look for any pain or possible injuries before you try to get up. Plan your strategy carefully.
2. Use a heavy piece of furniture to assist you in getting up. If you doubt your ability to safely get up alone, crawl or scoot to a phone and call for help.
3. If you are someone who frequently falls, it is recommended that you enroll in a home emergency response system.

## CHAPTER SIX

# Posture

**Your mother was right. You do need to sit up straight! Even without Parkinson's, it is easy to fall into the habit of bad posture. Many of our daily activities contribute to bad posture:**

- **Sitting and watching TV for too long**
- **Leaning over to work on the computer**
- **Sitting for too long while driving or riding in the car**
- **Looking down while reading or texting**
- **Propping your head against the headboard while lying down in bed**

**The following tips are helpful for maintaining good posture in all positions.**



## Sitting

- Sit so that your back is fully in contact with the chair back.
- Use a back support or pillow along your low back, especially for long car and plane rides and in the theater – it will help you to sit tall.
- Keep the computer screen and TV at eye level to minimize neck & eye strain.
- While reading, use a bookstand or rest your elbows on a pillow or a table. This allows you to look directly ahead at the pages.
- When reading in bed, sit with your entire back resting on the headboard, not just your head and neck.
- Maintain eye contact during conversation. This holds the head erect.
- Avoid sitting in chairs without back support or armrests.
- Avoid recliners. They promote rounding of the neck, shoulders and head, as well as tightness in the hips.
- Avoid low, soft couches and chairs. The height of your chair should allow for your hips and knees to be level with one another.

## In Bed

- Act like Goldilocks. Avoid using too many pillows or a pillow that is too thin under the head.
- The best position for sleeping is lying on your side with a pillow between the knees.
- Avoid sleeping in a chair. Lie down on a bed to nap.

## More Tips

- Perform frequent neck and shoulder stretches to relieve muscle tension.
- Place written reminders on commonly used items like the bathroom mirror, computer screen and television: "STAND TALL."



## CHAPTER SEVEN

# Young-Onset Parkinson's Disease

Everyone with PD will experience their disease in different ways. However, individuals with young-onset Parkinson's disease (YOPD) face unique issues relating to employment, body image, children, and long-term planning for finances and health care.

Fortunately, individuals with YOPD generally have fewer functional difficulties early in the disease. This is in part because they tend to have fewer medical issues to deal with as compared to older adults with PD.

If you have YOPD, empower yourself through knowledge, support and exercise. It is important that you begin a fitness routine as soon as possible to potentially slow the course of your disease and limit functional disabilities.

Research shows that:

- younger brains have greater potential for neuroplasticity (brain change)
- when an exercise program is challenging, intense, and works toward specific goals - greater gains are made for those with PD
- seeing a physical therapist seems to be more effective than just performing a generic exercise program
- high intensity biking and treadmill training are safe (once cleared by your doctor), can be easily performed, and can improve gait and balance

Take control of your disease and start a fitness plan now. Do not wait until you start to have pain or problems with your movements to begin taking care of yourself. Your fitness program should also address nutrition, stress management, leisure activities, and time management.

Your ideal fitness routine should:

- be something you enjoy doing
- not add extra stress to your life
- fit in to your daily routine
- challenge you physically and mentally
- include moderate to high aerobic activity, core strengthening, flexibility and balance exercises
- be directed toward a goal or goals

**KEY POINT** .....

**Remember that simply exercising may not be enough for everyone with PD. Issues related to diminished or lost arm swing will not improve by biking. This is why physical and occupational therapists are so important. Therapists will advise you on what exercise and functional training are best for you to regain or prevent loss of movements.**

.....

# Appendix

## **TRAINING THE THERAPISTS AND TRAINERS**

*This section provides resources for physical & occupational therapists and other fitness professionals. Show this to or copy these pages for your fitness teams.*

### **Parkinson's Foundation Trainings**

#### **Allied Team Training for Parkinson's (ATTP®)**

ATTP is a unique curriculum in which healthcare professionals from diverse disciplines learn the best techniques in Parkinson's disease care through a dynamic, team-based approach. The interactive training program includes care strategies for all stages of Parkinson's, interdisciplinary training to foster stronger care teams and continuing education credits.

Through online modules and a three- to four-day in-person training, participants receive in-depth knowledge of how to assess and treat persons with Parkinson's disease in an interdisciplinary setting. Trainees practice integrated care planning in teams, using case study vignettes and videos of actual persons with Parkinson's. Trainees practice integrated care planning in teams and meet persons with Parkinson's disease to hear first-hand the impact of PD on people's lives.

#### **Physical Therapy Faculty Program**

The Parkinson's Foundation Physical Therapy Faculty Program is an accredited "train the trainer" program improving Parkinson's physical therapy care by training faculty leaders across the U.S. so they can, in turn, educate physical therapy students. This intensive course allows physical therapy educators to immerse themselves in learning the latest evidence-based findings in Parkinson's research and care.

For more information about these programs, call the Parkinson's Foundation Helpline at 1-800-4PD-INFO (473-4636) or visit [Parkinson.org/ProfessionalEducation](http://Parkinson.org/ProfessionalEducation).

#### **Online Courses for Allied Health Professionals**

The Parkinson's Foundation offers multi-module online courses for physical and occupational therapists, nurses, and speech-language pathologists and provides continuing education units (CEUs) for course completion.

## Boot Camp for Parkinson's Training

### **The Brian Grant Foundation**

Boot Camp training teaches physical and occupational therapists, group exercise instructors and personal trainers how to develop an evidence-based group exercise program. Visit [www.briangrant.org](http://www.briangrant.org) for more information.

## Other Trainings for Health Professionals

There are many certification programs available for allied health professionals to enhance their ability to care for people with Parkinson's disease, including the following:

### **LSVT Global: LSVT LOUD® and LSVT BIG®**

LSVT Global, Inc. provides specialized training and certification to speech-language clinicians (LSVT LOUD), and physical and occupational therapy clinicians (LSVT BIG) in clinically-proven methods to help improve communication and movement in individuals with Parkinson disease and other neurological conditions. Visit [www.lsvtglobal.com](http://www.lsvtglobal.com) or call 888-438-5788 for more information.

### **PWR!® (Parkinson Wellness Recovery)**

PWR! provides training and certification opportunities for physical and occupational therapists and fitness professionals in Parkinson's-specific, learning-principled exercise programs. Visit [www.pwr4life.org](http://www.pwr4life.org) or call 520-591-5346 for more information.

## Information Resources

### **Association of Physiotherapists in Parkinson's Disease Europe**

APPDE initiates and supports knowledge transfer between physiotherapy clinicians, researchers, educators, members of the multidisciplinary team, people with Parkinson's, families, policymakers and healthcare providers to promote best practice physiotherapy for people with Parkinson's across Europe. Visit [www.appde.eu](http://www.appde.eu) for more information.

### **EUROPEAN PHYSIOTHERAPY GUIDELINE FOR PARKINSON'S DISEASE**

[www.appde.eu/european-physiotherapy-guidelines.asp](http://www.appde.eu/european-physiotherapy-guidelines.asp)

This link from their site is particularly helpful for PTs.

### **TIPS AND TRICKS FOR PEOPLE WITH PARKINSON'S**

[www.appde.eu/coping-strategies.asp](http://www.appde.eu/coping-strategies.asp)

# Glossary

Glossary terms are identified with a blue underline the first time they appear in this book.

**A** **ADL** Activities of Daily Living

**B** **Bradykinesia** Slowness of movement

**D** **DatScan** Ioflupane I 123 injection, also known as phenyltropane, is a radiopharmaceutical agent which is injected into a patient's veins in a procedure referred to as SPECT imaging.

**F** **Festination** Quick, short steps

**Freezing** Temporary, involuntary inability to take a step or initiate movement; when it refers to walking, it is called "freezing of gait"

**M** **Micrographia** Small, cramped handwriting

**N** **Neuroplasticity** The brain's ability to reorganize itself by forming new connections; this allows the brain to compensate for injury and disease and to respond to new situations and changes in the environment

**O** **Orthostatic hypotension** A drop in blood pressure upon changing position from lying down or sitting to standing; also called "postural hypotension" and can cause fainting; when related to a neurological disorder like Parkinson's disease, called "neurogenic orthostatic hypotension," or nOH

**R** **Retropulsion** The tendency to walk and fall backwards

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#### **ABOUT THE PARKINSON'S FOUNDATION**

The Parkinson's Foundation makes life better for people with Parkinson's disease by improving care and advancing research toward a cure. In everything we do, we build on the energy, experience and passion of our global Parkinson's community. A wealth of information about Parkinson's and about our activities and resources is available on our website, [Parkinson.org](http://Parkinson.org).

#### **YOUR FEEDBACK MATTERS!**

We'd like to know what you think of our publications and programs. Please take a few moments to fill out our online feedback form. Your answers will be used to improve our resources and will benefit people with Parkinson's, caregivers, families and others in the Parkinson's community. Thank you for your help.

**ONLINE FORM:**     [Parkinson.org/Feedback](http://Parkinson.org/Feedback)

#### **YOUR GENEROSITY MAKES THIS PUBLICATION POSSIBLE.**

The Parkinson's Foundation is proud to provide this booklet and other educational materials at no cost to people around the globe. If you found this book helpful, please consider a gift so that we may continue to fight Parkinson's on all fronts: funding innovative research, providing support services and offering educational materials such as this publication. Thank you for your support.

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**DONATE BY MAIL:**     Parkinson's Foundation  
200 SE 1st St, Suite 800  
Miami, FL 33131

**DONATE BY PHONE:**     1-800-4PD-INFO (473-4636)

**TAX ID:**     13-1866796

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