The background features a stylized human figure in black and white on the left, and several interlocking gears in shades of blue on the right. The overall theme is mechanical and human movement.

PWR!Moves™

Make FUNction Exercise!™

As developed by Becky G. Farley, PhD, MS, PT

A PWR!Guide to
a Parkinson-Specific
Exercise Program

Work Harder/Do More
Move BIGGER and FASTER
EVERY Day!

This book is dedicated to Sally Michaels. No words can express my love and appreciation and respect.

With special thanks to my husband Dave Nelson, for his enduring love and support.

For Claire McLean and Valerie Carter for your expertise, support and thinking beyond BIG.

For John Dean and Gillian Porter, your insights are truly valued.

And, to my Mom, for her courage and invincible will. I Love you ALL!

Book Layout, Cover and Design: Lynn Roden

Photography: Merkedda Studios

The proceeds of this book will benefit the **PWR!Gym**[®]

A Community NeuroFitness Center of Excellence for People with Parkinson Disease

in Tucson, Arizona



The real world translation of neuroplasticity-principled approaches for people with PD is dependent upon overcoming many challenges. Environments for learning are needed that embrace an atmosphere of empowerment, motivation, social enrichment, and **FUN**ction! On February 2012, the doors to the first **PWR!Gym**[®] opened in Tucson, AZ. **PWR!Gym**[®] is one solution to truly implement Exercise AS Medicine for people with Parkinson disease.

We at **Parkinson Wellness Recovery | PWR!**, a nonprofit organization, have for over 3 years been focused on starting a global Parkinson Exercise Revolution! And we invite you to JOIN IN

PWR! 's mission and vision is that every individual with Parkinson Disease (PD), at diagnosis, receives information on how neuroplasticity-principled, research-based exercise programming can help them to GET BETTER and STAY BETTER! This **PWR!Guide** is our effort to educate, empower and enrich the lives of individuals with PD through giving you research-based TOOLS which will show you how to **Make Exercise FUNction™** on a daily basis, to improve your quality of life, and to be in control of your destiny. It is our GOAL to give you HOPE... to see that you DO have options and choiceand to help you take control of that which you can!

May our work help serve you in your life. Please Join the Parkinson Exercise Revolution by getting on our mailing list at www.pwr4life.org to find out about all the latest research-based information and exercise updates and how we integrate this information into everything we do. Better yet, come experience neuroplasticity-programming firsthand, by visiting us in Tucson, AZ at our **PWR!Gym®** – A Community Neurofitness Center of Excellence for people with PD, or by participating in a **PWR!Retreat** or other Exercise Event.



With our deepest intention of serving you,
Sally Michaels,
COO/Co-Founder

Parkinson Wellness Recovery | PWR

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Introduction

This section is about education and empowerment! It is what every person needs to know at diagnosis. It is what people that come to our **PWR!Gym**[®] or **PWR!Retreat** learn Day 1. It is what we teach at our **PWR!Academy** courses. And, just like our **PWR!** program, it is updated as new information is revealed.



Exercise IS Medicine for People with Parkinson Disease

Recent research indicates that exercise is more than strength, balance, coordination, flexibility or cardiovascular function. Instead, it is a physiological tool that protects at risk or compromised neurons, and guides brain health, protection, repair and adaptation after a neurodegenerative process occurs (plasticity). Once triggered by exercise, these physiological mechanisms have the potential to slow disease progression in people with Parkinson disease!

Examples of how exercise can slow disease progression.

Neuroprotection: Exercise may protect vulnerable dopamine (DA) neurons (at risk of dying); or rescue those DA neurons that are compromised (affected).

Bottom Line: The brain is healthier, more resilient, and makes more dopamine for longer.

Neurorepair: Exercise may repair damaged circuitry.

Bottom Line: The brain does more with less dopamine.

Adaptation: Exercise may recruit other undamaged parts of the brain to help.

Bottom Line: The brain CAN find a way to help you GET BETTER.

BOTTOM LINE: For people living with PD -

It is never too late to GET BETTER at what you practice, practice, practice! Even if the DA neurons are still dying, damaged areas can be repaired, or undamaged areas can be recruited to help.

Neuroplasticity-Principled Exercise Essentials

WHAT you do is important.

Research suggests that two types of exercise are essential to optimal brain change – and they may work in synergy!

Vigorous Aerobic Training & Skill Acquisition (re-acquisition)

This **PWR!Guide** will focus on PD-specific skill acquisition through the repetitive practice of the **Basic 4 | PWR!Moves™** (UP/ROCK/TWIST/STEP) - as the foundation for what you do!

For optimal benefit, find a **PWR!Therapist** to help you integrate **PWR!Moves™** into a vigorous aerobic exercise program (and to any therapy or community or home exercise program you do).

HOW you do it is important.

No matter what type exercise you are doing, research has identified essential guidelines about “HOW to practice” to help you get the most out of your practice for your BODY and your BRAIN!

Neuroplasticity Guidelines

High Physical Effort | Forced Use

Push beyond self selected effort!

High Cognitive Engagement

Progressively challenge complexity.

High Attentional Focus

Train awareness of movement/actions.

High Emotional Engagement

Novel/reward-based/meaningful practice.

Basic 4 | PWR!Moves™

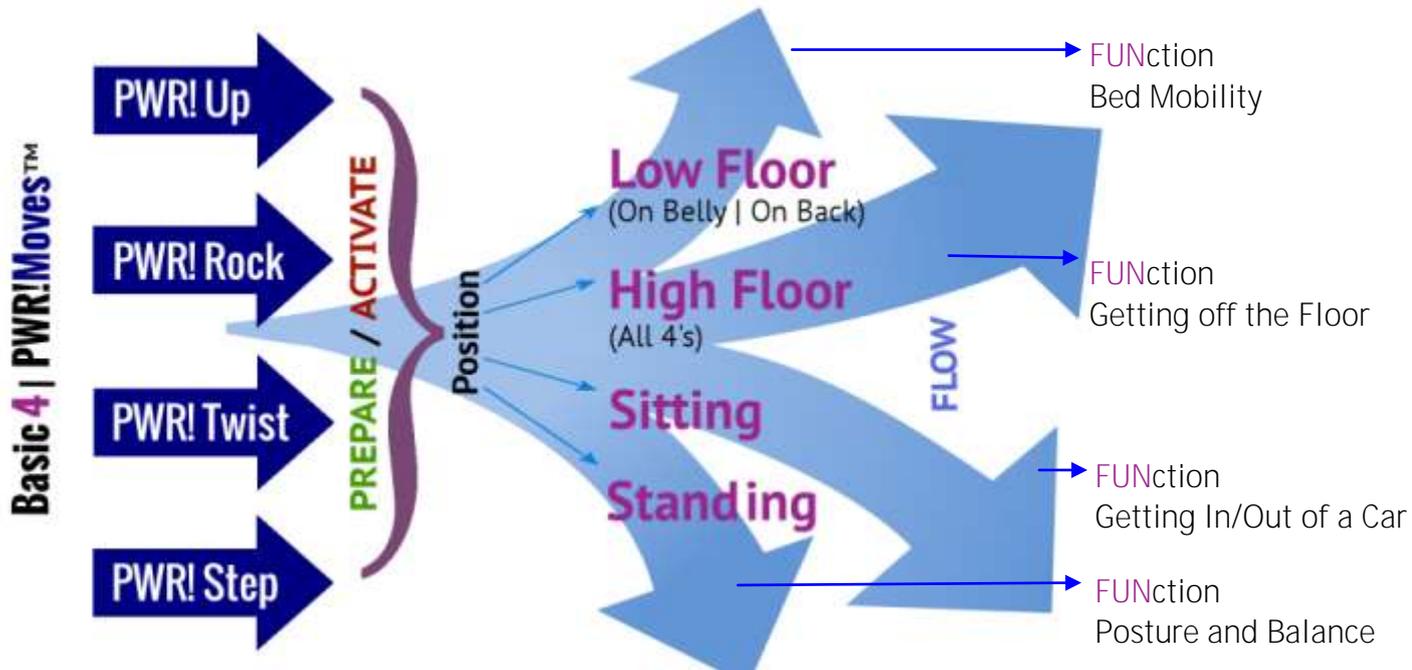
PWR!Moves™ are the building blocks of FUNction that underlie all meaningful activities and target the symptoms of PD that lead to the loss of skilled movements.



4

Building Blocks of FUNction

PWR!Moves™ are the building blocks of FUNction that underlie all meaningful activities including sports and recreation. We have identified 4 MOVES that are especially important for people with Parkinson disease. We call them the **Basic 4 | PWR!Moves™**. These are performed in 4 positions: Floor, All 4's, Sitting and Standing. This means you get LOTS of repetition of these same MOVES in different real world contexts.



No matter what exercise program you choose – ALWAYS reinforce these **Basic 4** building blocks of FUNction.

 PWR! Up Posture

Any movements that require lifting the whole body (trunk and limbs) against gravity. These movements counteract the stooped posture of PD. They actively stretch the flexor muscles on the front of the body and strengthen the extensor muscles on the back of the body. BETTER alignment improves your ability to be READY to get movement started on the first attempt and to recover your balance. Returning to this position (RESET) between actions improves the speed and accuracy of your everyday movements. Adding PWR!d ARMS and PWR!Hands (PWR!Reach) further enhances posture of head and shoulders, interacts with trunk motion for dynamic balance, and improves ability to manipulate tools or objects while doing chores or hobbies. The body follows the arms, so PWR!Reach to go and PWR!Reach to hold yourself up!



PWR! Rock

Weight Shift

Start Position
INHALE



- ◆ From **PWR!Up** position, **ROCK RIGHT & REACH** with **LEFT HAND FORWARD** as far as you can.
- ◆ Keep legs strong, and **WIDE** apart, pushing **HIPS** into the floor to help you **REACH** further.
- ◆ Return to **PWR!Up** position. **RESET**.
- ◆ Repeat opposite side.



- ◆ Slide **HAND** forward for support as needed to **REACH** further.
- ◆ **RESET** between **ROCKS**.

Repeat: 10x
each side

PWR!Boosts

To increase difficulty:

H Flick

V Sequence



“What Dr. Farley has done with PWR!Moves™ is to develop a set of exercises, that when done correctly, target all of the key aspects of exercise known to be important for people with Parkinson disease; cardio, strength, flexibility and large amplitude movements. The best thing about them is that they can be done with minimal equipment, scaled up or down, and performed in all positions to relate directly to FUNctional mobility and the activities of daily living”.

Claire McLean, PT, DPT, NCS
PWR! Therapist

PWR!Moves™ in Motion

Welcome to the **FLOW** section of the book. These **PWR!Moves™** will increase the complexity of your practice. If you are visiting this page, it means you are familiar with each of the **Basic 4** exercises and can do at least 10 repetitions of each exercise in at least one position (Floor, All 4's, Sitting, or Standing).

Pick your favorite **ACTIVATE PWR!Moves™** and find the **FLOW** pictures that correspond with that position. Take your time and look at the pictures and begin to combine them into a SEQUENCE - one **PWR!Move** at a time. Practice the entire sequence and build your endurance until you can complete 5 or more of each exercise. The difficulty depends upon how fast you can connect each exercise together! This is the challenge! It requires a specific type of cognitive skill called set-switching.

For an additional challenge:

- ◆ Work toward completing the **FLAWS** 10 times.
- ◆ Then work on the pacing, see if you can get through them a little bit faster.
- ◆ Or, try pacing to the corresponding exercise in the Animated **PWR!Moves™** Book.



Do NOT compromise QUALITY! Deliberate, complete movement is your 1st GOAL.

START



READY



PWR! Rock → FORWARD



PWR! Up →



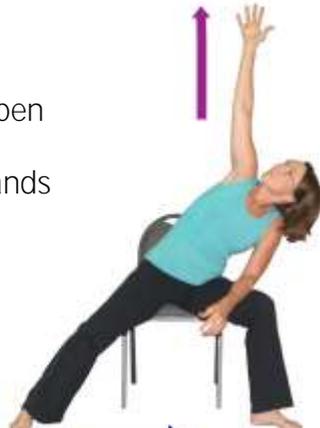
READY

Row 2



PWR! Rock → RIGHT

H Open
E Hands



PWR! Rock → LEFT



PWR! Rock → RIGHT

PWR!Boosts
To increase difficulty:

H Twist
E Hands



PWR! Rock → LEFT

Weekly Exercise Worksheet

Designed to help you get the most from this **PWR!Moves™** Guidebook, the following Weekly Exercise Worksheets can be used as your home exercise program *OR* as a supplement to your current fitness routine. Use this calendar to track your weekly **PWR!Goal** progress, targeting your PD symptoms through the **PREPARE**, **ACTIVATE**, and **FLOW** routines. If you have any questions, or need to seek a **PWR!Trained** Therapist of Fitness Instructor in your area to help you further, feel free to contact us at 520.591.5346 or www.pwr4life.org.

Instructions

Sample Worksheet

- ◆ Choose a minimum of 2 to 3 **PREPARE** exercises to do daily, so you stay flexible. Use as a warm-up and/or cool down. If you have specific problem areas, be sure to do those DAILY.
- ◆ Choose at least one **ACTIVATE** exercise for the day, making sure you cover all of the positions at least once during the week. For the other two days, choose your favorite position one day and the other day the position that is giving you the most trouble so you can work on overcoming those deficiencies!
- ◆ The same applies to your **FLOW** exercises, cover all of the positions at least once during the week. For the other two days, choose your favorite position one day and the other day the position that is giving you the most trouble.
- ◆ Mark off the exercises you do for each day to help you keep track!

Activity	Sun	Mon	Tue	Wed	Thurs	Fri	Sat
PREPARE							
Prone Reach	✓			✓			
Supine Lower Twist		✓		✓			
AB-4's Child Pose			✓		✓		
Open Hip Stretch	✓				✓		
Seated Upper Twist		✓				✓	
Humming Stretch			✓			✓	
PWR! Squat		✓					✓
Standing Sky Reach			✓				✓

Activity	Sun	Mon	Tue	Wed	Thurs	Fri	Sat
ACTIVATE							
Prone	✓					✓	
Supine		✓					
AB-4's			✓				
Sitting				✓			✓
Standing					✓		
FLOW							
Prone	✓					✓	
Supine				✓			
AB-4's		✓					
Sitting					✓		
Standing			✓				✓

Dr. Farley is dedicated to implementing the latest cutting edge research as it relates to Parkinson disease and developing new, innovative programs specifically for the PD community, their care partners and the therapists and fitness professionals that work with them. Below are references that Dr. Farley has reviewed and cited throughout this book.

- ◆ Abbruzzese G, Berardelli A. Sensorimotor integration in movement disorders. *Mov Disord* 2003;18(3):231-240
- ◆ Ahlskog JE. Does vigorous exercise have a neuroprotective effect in Parkinson disease? *Neurology* 2011;77:288-295.
- ◆ Ahlskog JE. Does vigorous exercise have a neuroprotective effect in Parkinson disease? *Neurology* 2011;77:288-295.
- ◆ Al-Jarrah MD, Jamous M. Effect of endurance exercise training on the expression of GFAP, S100B, and NSE in the striatum of chronic/progressive mouse model of Parkinson's disease. *NeuroRehabilitation* 2011 Jan 1;28(4):359-63.
- ◆ Al-Jarrah M, Jamous M, Al Zailaey K, Bweir SO. Endurance exercise training promotes angiogenesis in the brain of chronic/progressive mouse model of Parkinson's disease. *NeuroRehabilitation*. 2010;26(4):369-73.
- ◆ Al-Jarrah M, Pothakos K, Novikova L, Smirnova IV, Kurz MJ, Stehno-Bittel L, Lau YS. Endurance exercise promotes cardiorespiratory rehabilitation without neurorestoration in the chronic mouse model of parkinsonism with severe neurodegeneration. *Neuroscience* 2007 Oct 12;149(1):28-37.
- ◆ Cohen AD, Tillerson JL, Smith AD, Schallert T, Zigmond MJ. Neuroprotective effects of prior limb use in 6-hydroxydopamine-treated rats: possible role of GDNF. *J Neurochem*. 2003 Apr;85(2):299-305.
- ◆ Cruise KE, Bucks RS, Loftus AM, Newton RU, Pegoraro R, Thomas MG. Exercise and Parkinson's: benefits for cognition and quality of life. *Acta Neurol Scand* 2011;123:13-19.
- ◆ Dibble LE, Hale TF, Marcus RL, Droge J, Gerber JP, LaStayo PC. High-intensity resistance training amplifies muscle hypertrophy and functional gains in persons with Parkinson's disease. *Mov Disord* 2006 Sep;21(9):1444-52.
- ◆ Ebersbach G, Ebersbach A, Edler D, Kaufhold O, Husch M, Kupsch A, Wissel J. Comparing exercise in Parkinson's disease—The Berlin BIG study. *Mov Disord* 2010 July 28. [Epub ahead of print] Doi 10.1002/mds.23212.
- ◆ Ellis T, Cavanaugh JT, Earhart GM, Ford MP, Foreman KB, Fredman L, Boudreau JK, Dibble LE. Factors associated with exercise behavior in people with Parkinson disease. *Phys Ther* 2011 Dec;91(12):1838-48.
- ◆ Farley BG, Koshland GF. Training BIG to move faster: The application of the speed-amplitude relation as a rehabilitation strategy for people with Parkinson's disease. *Exp Brain Res* 2005;167(3):462-467.

Becky G. Farley, PhD, MS, PT

Dr. Farley received a PhD in Neuroscience from the University of Arizona, a Master of Science in Physical Therapy from the University of North Carolina and a Bachelor of Physical Therapy from the University of Oklahoma. Dr. Farley has over 30 years of experience in neurorehabilitation and is currently a Physiology Associate, University of Arizona and the CEO/Founder of the nonprofit **Parkinson Wellness Recovery | PWR!** During post-doctoral projects, Dr. Farley investigated bradykinesia, developed the LSVT® BIG exercise program for people with Parkinson disease and completed an NIH funded randomized clinical trial **documenting it's short term efficacy.**



Dr. Farley has a passion for cycling, having qualified for the US team at the world cross-country mountain bike championship for 2 years in a row. Most recently, she rides for **FUN** (uphill) and likes to bound uphill (with poles) for a vigorous workout! She is married to a massage therapist and cyclist, has two dogs and lives in the beautiful Sonoran desert in Tucson, AZ – one of the best year-around cycling and outdoor **recreational communities in the US, where the state tree is the Saguaro cactus and the “rivers” are dry washes, except during the monsoons!** Dr. Farley founded the nonprofit **PWR!** in 2010, after piloting her **PWR!Gym®** model in a local fitness center. She now travels across the US and Canada to train therapists and fitness professionals, to advocate for new rehabilitation paradigms, and to empower people with PD in what they **CAN** do. When Becky joined forces with Sally Michaels, COO! - they launched the Parkinson Exercise Revolution at the 2010 World Parkinson Congress in Glasgow, Scotland. She has never been satisfied with status quo. Parkinson disease has given her a focus, the research has given her the ammo!

People with Parkinson's can GET BETTER and STAY BETTER with EXERCISE!

Many people receiving a diagnosis of PD are relegated to few options to help control the symptoms of their disease; the two most common are medications and DBS (deep brain stimulation). If they are lucky, their doctor will tell them they should include an exercise program into their weekly routine, but that's as far as it goes.

However, research studies have identified that WHAT you do and HOW you do it is important to promote brain health and repair. The training of large amplitude FUNctional movement, the practice of high effort, and sensory awareness are essential components of any exercise program for people with PD, along with other neuroplasticity-principled components needed to fully address all the motor, cognitive, and emotional symptoms of Parkinson disease.

Dr. Farley, with over 30 years of experience in neurorehabilitation, has integrated ALL of these essential exercise components into one comprehensive program to ensure the foundations of PD-specific exercise can be implemented throughout the Parkinson's community. Her PWR! program, through PWR!Moves™, directly addresses these motor and cognitive issues through 4 foundational movements established as the building blocks of FUNction. These MOVES can be used as a standalone exercise program but more importantly, these principles can be implemented into ANY exercise program.

Praise for PWR! and Dr. Farley's Revolutionary Exercise Protocol

*"I always thought I had to wait for a cure but I now realize the cure is inside me—**Parkinson's does not have to live in me even if I have it. I thought my life was over when I got Parkinson's and I planned everything with that in mind (with Parkinson's as the limiting factor) but now I know I don't have to do that at all. Ever**".*

Laurie N.
PWR! client

"PWR! has helped me to truly understand how important specific types of exercise are to slowing the progression of my disease".

Bruce M.
PWR! client