



PARKINSON'S DISEASE

SPOTLIGHT ON PARKINSON'S DISEASE: STAYING HEALTHY, KEEPING FIT

THURSDAY, MARCH 29, 2018

WELCOME AND INTRODUCTIONS



Stephanie Paul

Vice President Development and Marketing
American Parkinson Disease Association



PRESENTATION



Terry Ellis, PhD, PT, NCS

*Assistant Professor, Department of Physical Therapy & Athletic Training
Director, Center for Neurorehabilitation
Boston University
College of Health and Rehabilitation Sciences: Sargent College
Boston, MA*

FINANCIAL DISCLOSURES

Salary & Grant Support: National Institutes of Health;
American Parkinson Disease Association

Honoraria: None

Speaker's Bureau: American Physical Therapy
Association; Neurology Section

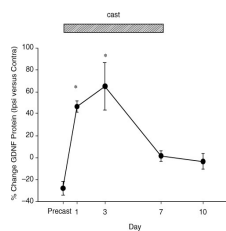
Equity & Consulting Agreements: None



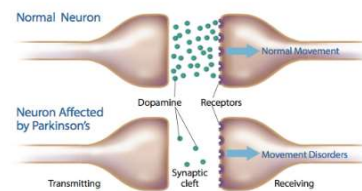
What Impact Does Exercise Have on Parkinson Disease?

5

COULD EXERCISE BE NEUROPROTECTIVE?



Increase in Neurotrophic Factor levels – promotes survival of neurons in the brain



Exercise increases dopamine secretion

6



ANIMALS TO HUMANS..... HOW DOES IT TRANSLATE?


Could exercise be the *medicine* we've been waiting for?



7

Contemporary Clinical Trials 36 (2013) 90–98

Contents lists available at ScienceDirect



ELSEVIER

journal homepage: www.elsevier.com/locate/conclintrial

Contemporary Clinical Trials

Study in Parkinson Disease of Exercise (SPARX): Translating high-intensity exercise from animals to humans

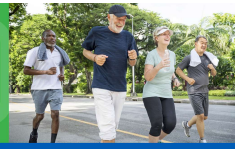
Charity G. Moore^{a,*}, Margaret Schenkman^b, Wendy M. Kohrt^c, Anthony Delitto^d, Deborah A. Hall^e, Daniel Corcos^f

N = 126

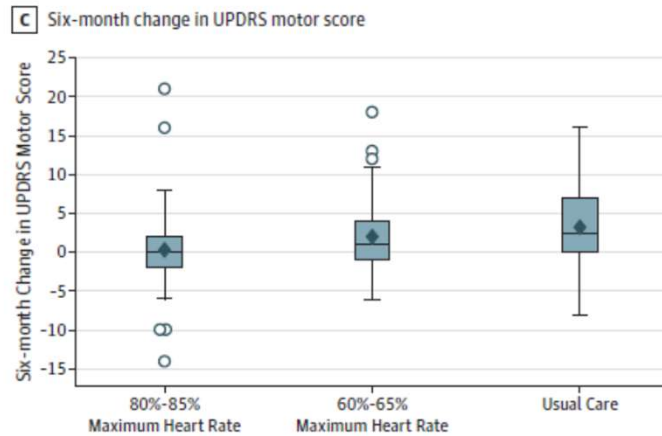
Mod Intensity = Exercise 4 days per week
60–65% HRmax

High Intensity = Exercise 4 days per week
80–85% HRmax

8



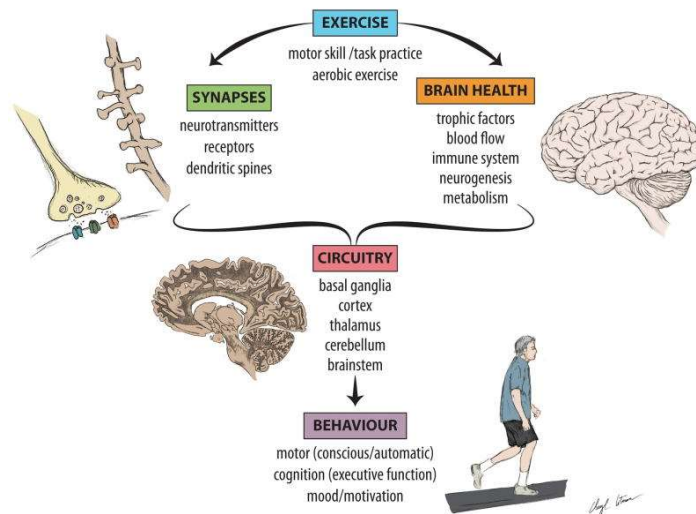
IS HIGH INTENSITY EXERCISE NEUROPROTECTIVE?



Schenkman 2018
JAMA Neurology

9

Experience-Dependent Neuroplasticity



10



What kind of exercise is best for people with Parkinson disease?

There are important components of an exercise program.....

.....that must be tailored to the individual's profile, preferences and goals

11

KEY ELEMENTS OF EXERCISE IN PD

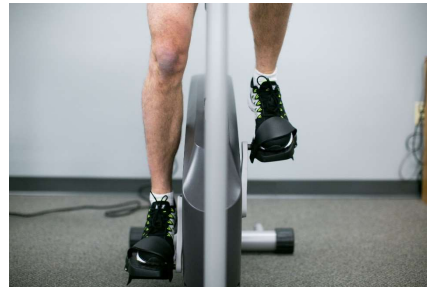
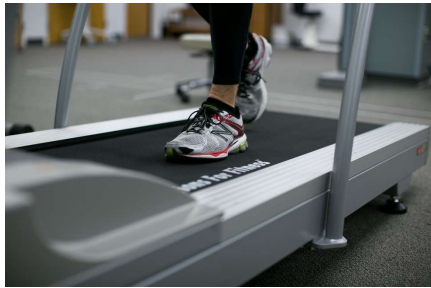
Exercise Category	Examples
Cardiovascular / Physical Activity	Treadmill Walking overground Biking Swimming Boxing
Strength Training	Weight training • machines, dumbbells, theraband, • weighted vests, body weight
Balance / Neuromotor Training	Balance Training Tai Chi class Dancing
Stretching	Flexibility / ROM exercises / Yoga

12



CARDIOVASCULAR TRAINING

Result in improvements in
Cardiorespiratory Fitness



13

AEROBIC WALKING EXERCISE IN PARKINSON DISEASE

- Walking 3x per week for 45 minutes
- Community Setting
- Mean HR = 70% HR max (HR = 107.8)

Outcome	Adjusted for levodopa equivalent
VO2 max (max O2 uptake; mL/min/kg)	1.66 ± 2.90 (<0.001)
7-m walk (seconds)	-0.62 ± 1.05 (<0.001)
UPDRS Motor	-2.75 ± 7.12 (0.002)
UPDRS Mental	-0.52 ± 1.58 (0.025)
Flanker task – (% increase score)	-3.70 ± 8.17 (0.005)
Fatigue Severity Scale	-0.52 ± 1.13 (0.002)
Geriatric Depression Scale	-0.77 ± 2.58 (0.043)
PDQUALIF, total (quality of life)	-1.14 ± 4.21 (0.064)

Uc, E et al. Neurology. 83(5):413-425; 2014

14



STRENGTHENING EXERCISES

Result in improvements in
Strength

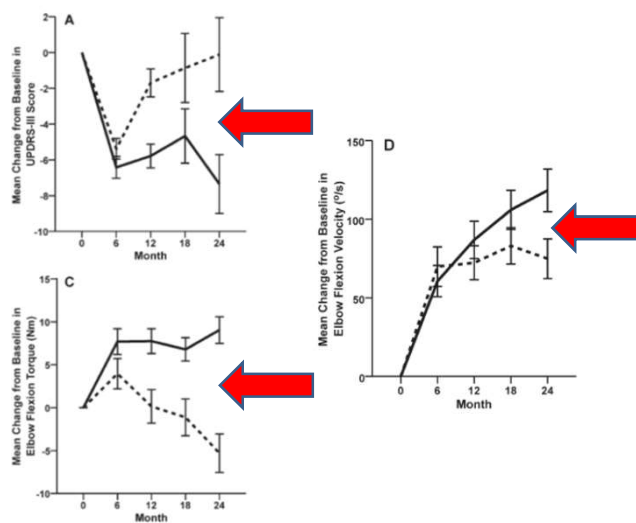


15

Corcos et al.
2013;
2-year (2x/wk)
RCT
Progressive
Resistance
Exercise in PD

Significant
improvements:

- Motor UPDRS (off meds)
- Strength
- Movement Speed



16



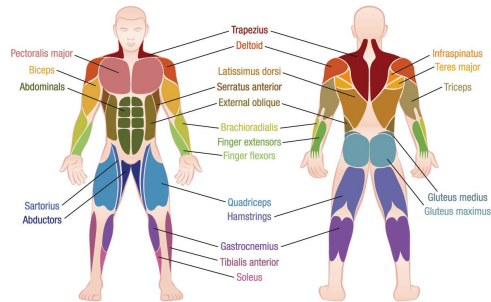
TARGETING STRENGTH

Enhance Upright Posture

- Hip Extensors
- Hip Abductors
- Knee Extensors
- Calf Muscles
- Back Extensors

Muscle Diagram

of the male body - anterior and posterior view



17

Level 1



Level 2



Level 3



18

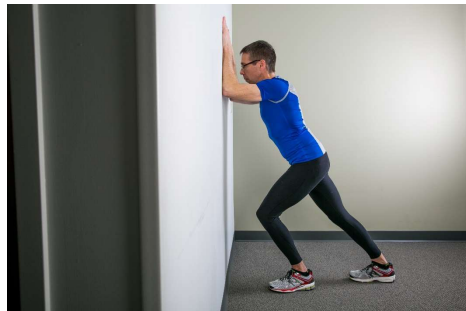


STRETCHING EXERCISES

Result in improvements in
Range of motion and flexibility



19



20



BALANCE EXERCISES

Result in improvements in
balance



21

TAI CHI

- 195 persons with Parkinson Disease participated
- Randomly assigned to a group:
 - Tai Chi
 - Resistance training
 - Stretching
- 2x/wk for 60 mins over 24 weeks



RESULTS

- Significantly improved balance in Tai Chi compared to other groups
- Significantly lower incidence rate of falls in the tai chi group compared to the stretching group but not the strengthening group

Fuzhong Li et al. N Engl J Med 2012;366:511-9

22



DANCING: TANGO

62 Persons with PD
12-month community-based tango (2 classes per week)

Improvements in motor symptoms (off meds)
balance, walking, freezing and quality of life



Hackney & Earhart 2009
Duncan & Earhart 2012

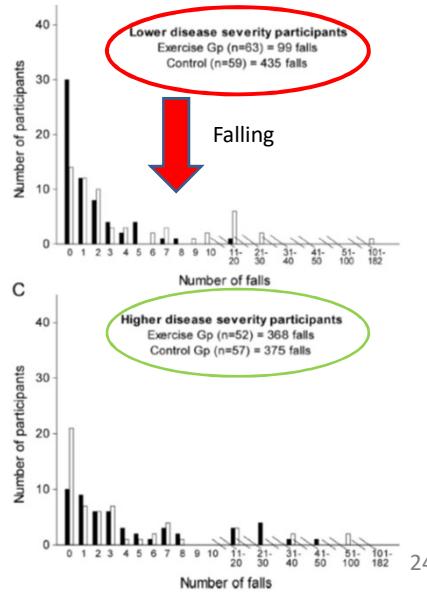
23

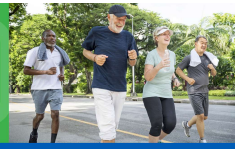
EXERCISE FOR FALL PREVENTION IN PD

- RCT (N=231)
- Exercise vs Usual Care
- Ex = 40-60 mins 3x/wk x 6 months
- Monthly exercise class led by PT remainder performed at home
- Exercise program targeted balance, strengthening and freezing



Canning et al; Neurology 84; 2015





KEY CHARACTERISTICS OF EXERCISE

TABLE 1. Practice variables important for evoking activity-dependent neuroplasticity- examples in brain injury (PD, stroke, spinal cord injury)

Practice variable	Animal study	Human study
Intensity	Petzinger et al., 2007 ²⁰ ; Tillerson et al., 2001 ²¹	Liepert, 2006 ¹³ ; Liepert et al., 2000 ¹⁴
Specificity	Fisher et al., 2004 ¹⁹ ; De Leon et al., 1999 ¹⁸ ; Tillakaratne, 2002 ¹⁷	Forrester et al., 2006 ¹² ; Dobkin et al., 2004 ¹¹
Difficulty	Friel and Nudo, 1998 ¹⁶	Wittenberg et al., 2003 ¹⁰ ; Johansen-Berg et al., 2002 ⁹
Complexity	Jones et al., 1999 ¹⁵	Winstein et al., 1997 ⁸

Petzinger et al., Movement Disorders Vol. 25, Suppl. 1, 2010, pp. S141–S145

25

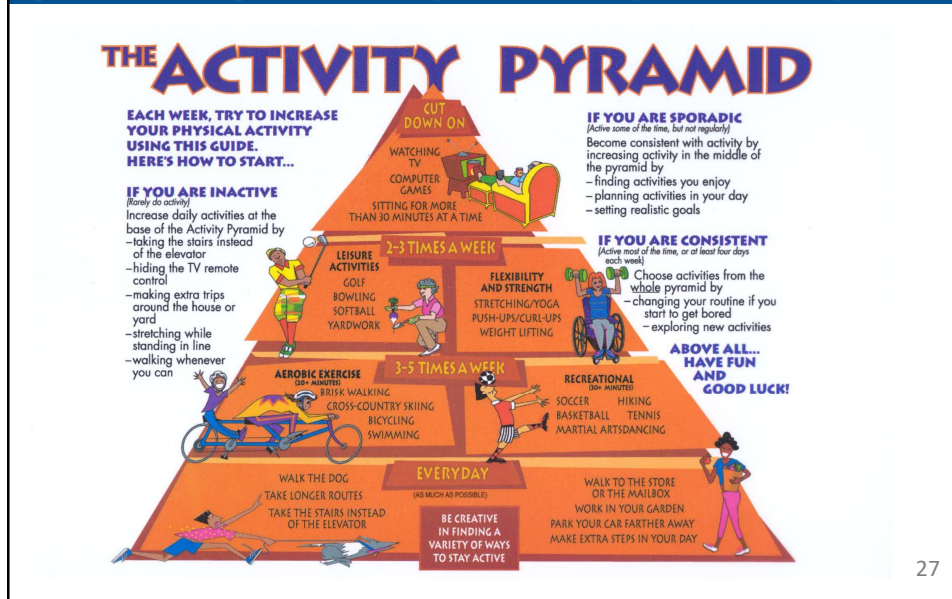
HOW MUCH EXERCISE SHOULD YOU DO? NATIONAL RECOMMENDATIONS:

Endurance	<ul style="list-style-type: none"> • 2 hours and 30 minutes of moderate-intensity exercise each week (30 mins, 5 times per week). • Start slow and gradually add more time. • People unable to meet these minimums can still benefit from some activity.
Strength	<ul style="list-style-type: none"> • Train each major muscle group on 2 to 3 non-consecutive days per week. • Two sets of each exercise, 8-12 repetitions. • Use machines, bands, weights or your own body weight to provide resistance.
Flexibility	<ul style="list-style-type: none"> • Perform at least 2-3 days each week. • Hold each stretch for 30-60 seconds to the point of tightness or <i>slight</i> discomfort, repeating 3-4 times. • Flexibility exercises are most effective when the muscle is warm (after exercising).
Balance	<ul style="list-style-type: none"> • Perform 2-3 days per week for 20-30 minutes. • Exercises should challenge balance, agility, and coordination. • Dance and Tai Chi are examples of activities that may improve balance in people with PD.

26



HOW MUCH EXERCISE IS RECOMMENDED EACH WEEK?



27

HOW LONG DO I NEED TO KEEP UP THE EXERCISE?

American College of Sports Medicine guidelines.....

If training is discontinued, gains in fitness regress by approximately 50% within 4-12 weeks!

28



Life Long Exercise.....Embrace it! It's Worth it!

29

REGULAR EXERCISE MATTERS IN PARKINSON'S DISEASE

- Analysis of registry data including 2252 persons with Parkinson disease
- Regular exercise (> 150 mins/week) at baseline were associated with better
 - Quality of life
 - Mobility
 - Physical function
 - Cognition

And less

- Disease progression

One year later.....



Oguh O et al. Parkinsonism and Related Disorders (2014) 1-5.

30



BARRIERS TO EXERCISE

Physical Therapy

Journal of the American Physical Therapy Association



Barriers to Exercise in People With Parkinson Disease
Terry Ellis, Jennifer K. Boudreau, Tamara R. DeAngelis, Lisa E. Brown, James T. Cavanaugh, Gammon M. Earhart, Matthew P. Ford, K. Bo Foreman and Leland E. Dibble
PHYS THER. Published online January 3, 2013
doi: 10.2522/ptj.20120279

Physical Therapy

Journal of the American Physical Therapy Association



Factors Associated With Exercise Behavior in People With Parkinson Disease
Terry Ellis, James T. Cavanaugh, Gammon M. Earhart, Matthew P. Ford, K. Bo Foreman, Lisa Friedman, Jennifer K. Boudreau and Leland E. Dibble
PHYS THER. 2011; 91:1638-1645
Originally published online October 14, 2011
doi: 10.2522/ptj.201100390

Most Common Barriers to Exercise in Persons with PD:

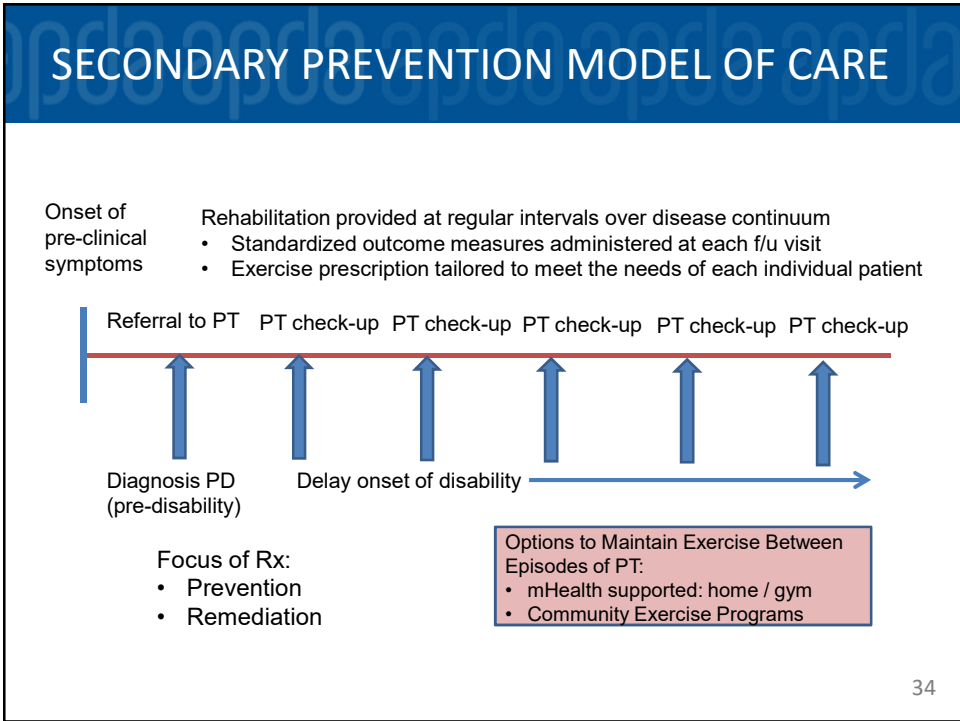
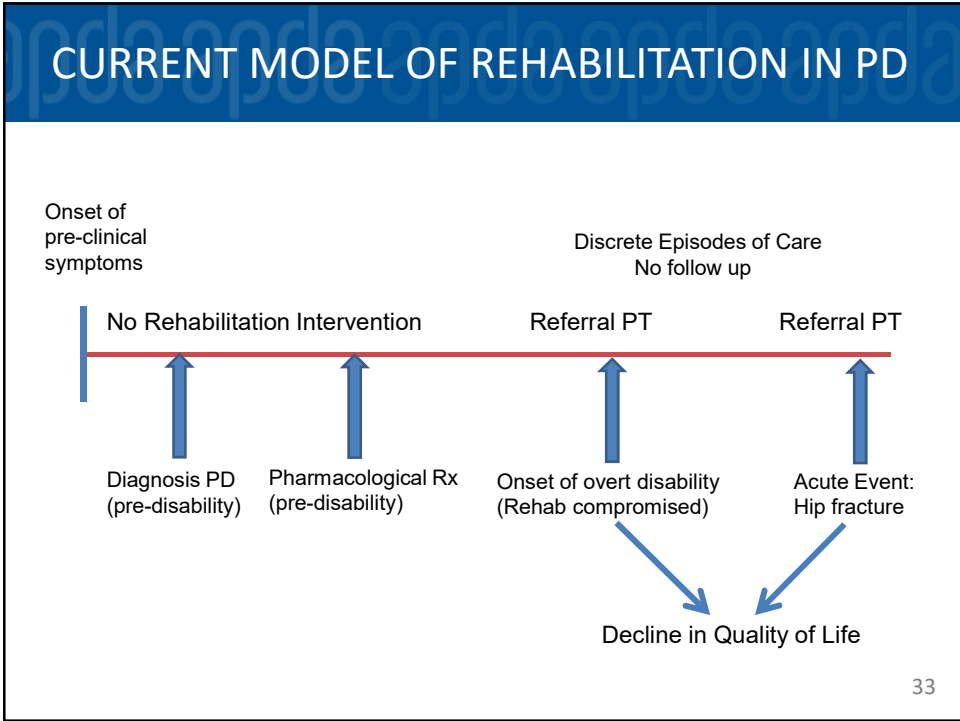
- **Low Self-Efficacy**
- **Low Outcome Expectation**

31

HOW TO GET STARTED AND GET THE MOST OUT OF EXERCISE...

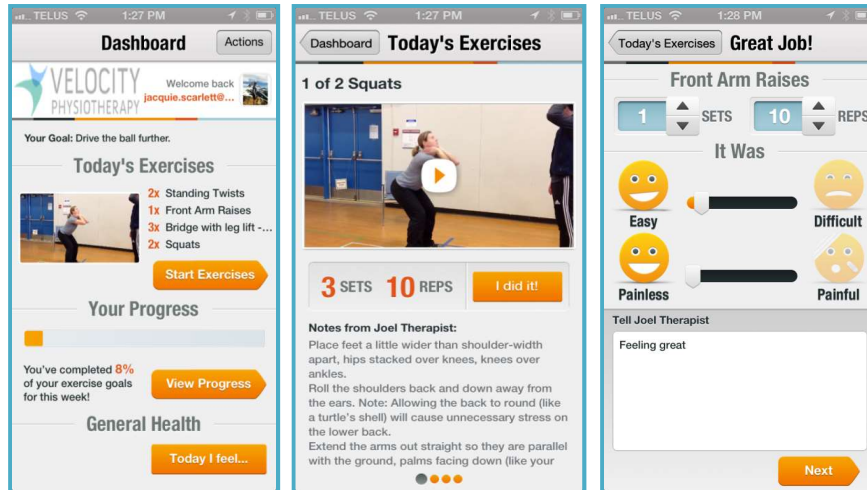
- Make an appointment with a Physical Therapist (PT) who is knowledgeable about Parkinson Disease (board certified in Neurologic or Geriatric Physical Therapy).
- Get “expert” advice about the exercises that are best for you.
- The PT can individualize the exercise program to target those areas that are most important to you.
- Be proactive and follow-up with a PT regularly (every 6 months or annually). These “check-up” visits can help you stay on top of your game.

32





MOBILE HEALTH TECHNOLOGY

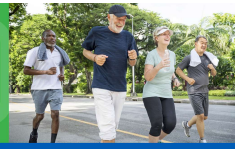


35

TIPS TO EXERCISE SUCCESSFULLY...

- Expect improvement – raise your expectations. Exercise will help you!
- Choose something you enjoy – you'll be more likely to stick with it!
- Partner up – an exercise buddy can make exercise more enjoyable and may make you more accountable.
- Mix it up – variety is good and reduces boredom
- Plan ahead and schedule your exercise – if you treat it like a meeting, you'll be more likely to fit it in.
- Join an exercise class – tai chi, yoga, boxing or dance – socialization can increase enjoyment and the class schedule can help foster regular participation.

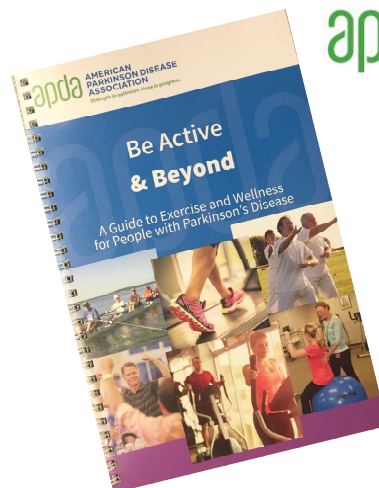
36



PRACTICAL TIPS TO BE MORE ACTIVE...

- Walking - one of the best forms of exercise
 - Use technology: Try an activity tracker – add steps everyday
 - Walk to Music or a Metronome – this increases your speed and improves the quality of your walking
 - Keep the pace of your spouse / friend
 - For every hour of sitting – walk for 5-10 mins
 - Bouts of walking that are at least 10 minutes long – count!

37



<https://www.apdaparkinson.org/resources-support/download-publications/>

38



APDA NATIONAL REHABILITATION RESOURCE CENTER AT BOSTON UNIVERSITY

Questions about exercise....call:

National Exercise Helpline
1-888-606-1688 or rehab@bu.edu

Funded by the National APDA and MA Chapter

39

QUESTION & ANSWER



Terry Ellis, PhD, PT, NCS

*Assistant Professor, Department of Physical Therapy & Athletic Training
Director, Center for Neurorehabilitation
Boston University
College of Health and Rehabilitation Sciences: Sargent College
Boston, MA*



CLOSING REMARKS



Stephanie Paul

Vice President Development and Marketing
American Parkinson Disease Association

FOR ADDITIONAL INFORMATION, ANSWERS TO YOUR QUESTIONS, OR FOR ADDITIONAL RESOURCES

Please visit our website
apdaparkinson.org

Or call us
1-800-223-2732