

# Welcome!



## Veterans and Parkinson's: Exercise, Nutrition and Wellness

The program will begin shortly.

A few notes before we start:

- All attendees will be muted and off camera
- You can submit a question by using the **Q&A** function in the black banner on the bottom of your viewing page.
- For optimal viewing of our speaker, please choose speaker view at the top right-hand corner of your viewing page.
- We will begin promptly at 12:00 p.m. ET
- Duration: 2 hours

Better Lives. Together.



## VETERANS AND PARKINSON'S: Exercise, Nutrition and Wellness

Monday, October 17, 2022  
12:00 p.m. – 2:00 p.m. ET

## Webinar Watch Party



Barry and  
Florence  
Friedberg  
JCC  
Oceanside,  
NY



Better Lives. Together.

2

## Webinar Watch Party



Veteran's  
Outreach  
Center  
Utica, NY



Better Lives. Together.

3

## Webinar Watch Party



### WNY VA Healthcare Buffalo, NY



Better Lives. Together.

4

## Our Mission



**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.

**We have everything you need to live better with Parkinson's.**



Better Lives. Together.

## Parkinson's Foundation Resources



We provide free resources including: books, webinars, podcasts, a life-saving hospitalization kit and our toll-free Helpline, 1-800-473-4636, staffed by Parkinson's specialists who answer more than **20,000 calls annually**.



**Better Lives. Together.**

## PD Health @ Home



We invite you to participate in our **PD Health @ Home** events including:

- Mindfulness Mondays
- Wellness Wednesdays
- Fitness Fridays

Visit [Parkinson.org/PDHealth](https://www.parkinson.org/PDHealth) to learn more about upcoming programs and to register



**Better Lives. Together.**

# Care Partner Summit



**Saturday, October 29, 2022**

**IN PERSON** The Tarrytown Estate Hotel, Tarrytown, NY

**10:00 am - 12:30 pm ET** Check in & Program

**12:30 pm - 2:00 pm ET** Lunch

**ONLINE** via Zoom webinar

**10:30 am - 12:30 pm ET**

With a focus on managing evolving roles and understanding thinking changes in Parkinson's, the **2022 Care Partner Summit** will bring care partners together **in-person** and **online** to provide tools to make life better for themselves and their loved one with Parkinson's disease.

[Parkinson.org/NortheastCPS](https://parkinson.org/NortheastCPS)



**Better Lives. Together.**

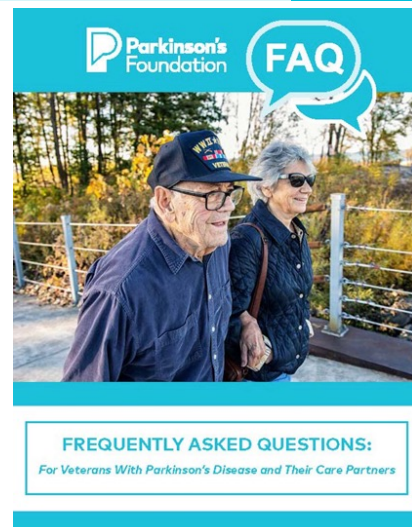
# Resources: Veterans and Parkinson's



The VA estimates there are 110,000 Veterans living with Parkinson's disease.

The Parkinson's Foundation has partnered with the VA to increase access to the information and resources Veterans need to better manage their health.

[Parkinson.org/Veterans](https://parkinson.org/Veterans)  
[Parkinsons.va.gov](https://parkinsons.va.gov)



**Better Lives. Together.**

## Thank You to Our Sponsor



The “Veterans and Parkinson’s” virtual programs are supported by a grant from Genentech, a member of the Roche Group.

**Genentech**  
*A Member of the Roche Group*

Better Lives. Together.

## Veteran’s and Parkinson’s: Exercise, Nutrition and Wellness



### James F. Morley, MD, PhD

Assistant Professor of  
Neurology at the Veteran's  
Administration Medical  
Center



Better Lives. Together.



## Veterans with Parkinson's: Exercise, Nutrition and Wellness Part 1

James F. Morley MD, PhD

Co- Director, Parkinson's Disease Research, Education and Clinical Center  
Crescenz (Philadelphia) VA Medical Center  
Assistant Professor of Neurology  
Perelman School of Medicine at the University of Pennsylvania

**Better Lives. Together.**

### Outline



Efficacy of exercise in PD

- Different exercises, different effects

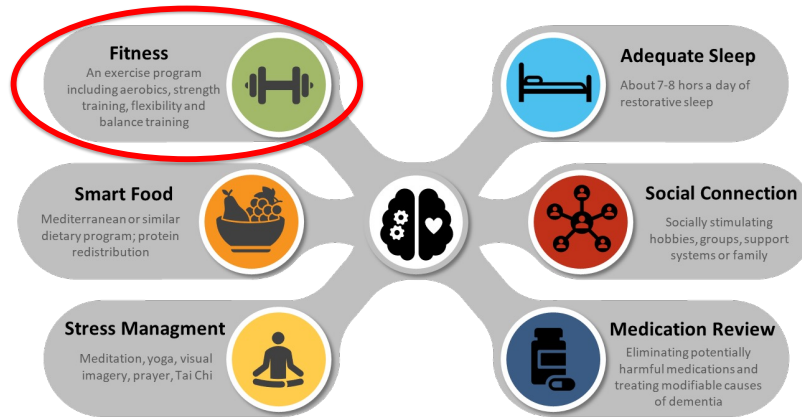
What do we know about activity/exercise levels in PD?

- What *drives* activity levels in PD?
- What can we do to increase them?

How to prescribe exercise like a medicine in PD?

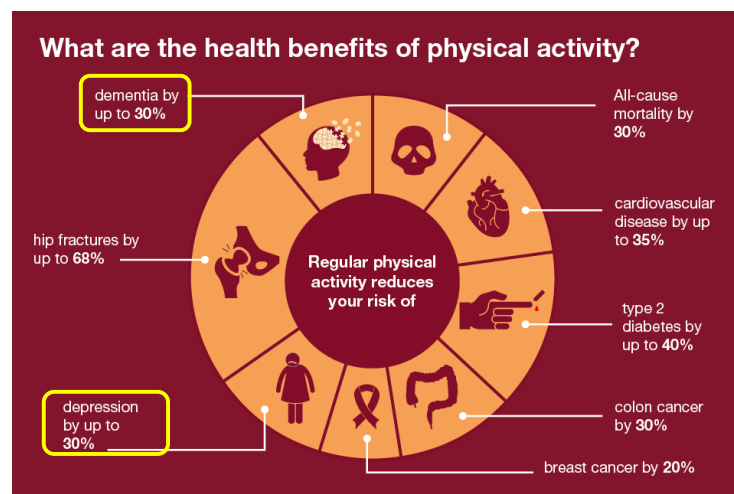
**Better Lives. Together.**

## Components of a Brain Wellness Program



**Better Lives. Together.**

## Exercise...it does a body (and brain!) good!



**Better Lives. Together.**

[www.service.gov.uk](http://www.service.gov.uk)

## Exercise as (brain) medicine

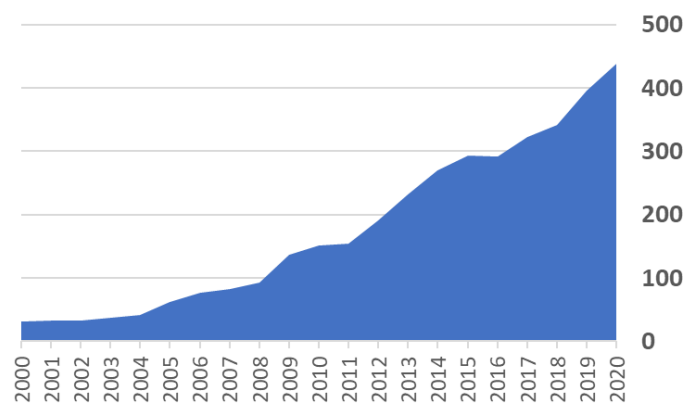


- Many general health benefits
- Epi and clinical trial evidence:
  - Fitness is related to cognitive scores in seniors
  - Mid-life exercise and the risk of MCI or dementia
  - Increases in functional connectivity (fMRI)
- Animal models link exercise with:
  - Growth factors (IGF-1, BDNF)
  - Markers of synaptic plasticity
  - neurogenesis



Better Lives. Together.

## Publications on “exercise and PD” 2000-20



Better Lives. Together.

# What do we mean by “exercise”

## Aerobic/Endurance

- Walking/running
  - Outdoor
  - Treadmill
    - Forced/unforced
    - Cued/uncued
- Elliptical
- Swimming
- “aerobics”
- HIIT
- Biking
  - Stationary
  - Outdoor

## Strength

- Freeweights
- Bodyweight
- Circuit
- Resistance bands
- Kettlebell
- Medicine ball
- Progressive resistance exercise (PRE)

## Flexibility

- Yoga
  - × Flow
  - × Stability
  - × Chair
- Static stretching
  - × Active
  - × Passive (PT)

## Balance

- Balanced based physiotherapy
- Stability ball/board
- Tai Chi
- Qi Gong

## Aerobic Exercise for Parkinson's Disease: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

Hai-Feng Shu, Tao Yang, Si-Xun Yu, Hai-Dong Huang, Ling-Li Jiang, Jian-Wen Gu, Yong-Qin Kuang\*

- 18 RCTs representing 919 patients, early/mid PD
- Multiple interventions (treadmill, HIIT, dance) 3-24 wks

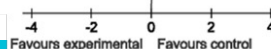
### UPDRS III

1.1.3 UPDRS III

Mean SD Total Mean SD Total Weight IV, Random, 95% CI Year

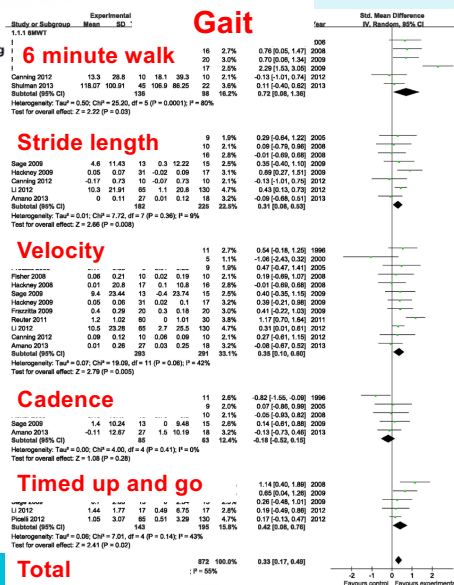
Experimental	Control	Std. Mean Difference	Std. Mean Difference
Mean SD Total Mean SD Total Weight IV, Random, 95% CI Year	Mean SD Total Mean SD Total Weight IV, Random, 95% CI Year	IV, Random, 95% CI Year	IV, Random, 95% CI Year
Miyai 2000	-3.2 1.48 5 -0.6 1.59 5 1.8%	-1.53 [-3.04, -0.02]	2000
Miyai 2002	-3 1.37 12 -1.3 1.53 12 3.6%	-1.13 [-2.00, -0.26]	2002
Fisher 2008	-2.8 10.83 10 -2.7 8.91 10 3.6%	-0.01 [-0.89, 0.87]	2008
Hackney 2008	-1.5 6.6 17 4.3 5.6 16 4.4%	-0.92 [-1.84, -0.20]	2008
Hackney 2009	-2.15 3.03 31 5 2.74 17 4.1%	-2.40 [-3.17, -1.62]	2009
Sage 2009	-1.8 7.96 13 1.2 8.54 15 4.2%	-0.35 [-1.10, 0.40]	2009
Frazzitta 2009	-7.1 5.34 20 -5.8 5.26 20 4.9%	-0.24 [-0.86, 0.38]	2009
Schenkman 2012	-2.5 8.54 41 -1.16 9.11 80 6.3%	-0.15 [-0.53, 0.23]	2012
Picelli 2012	-6.31 7.22 17 0.13 8.46 17 4.5%	-0.80 [-1.50, -0.10]	2012
Li 2012	-6.42 5.46 65 -3.23 6.92 130 6.7%	-0.49 [-0.79, -0.19]	2012
Canning 2012	2.4 5.1 10 2.3 4.9 10 3.6%	0.02 [-0.86, 0.90]	2012
Amano 2013	0.57 6.9 27 -2.25 6.26 18 5.0%	0.42 [-0.19, 1.02]	2013
Subtotal (95% CI)	268	350 52.7%	-0.57 [-0.94, -0.19]

Heterogeneity:  $\tau^2 = 0.29$ ;  $\chi^2 = 44.17$ ,  $df = 11$  ( $P < 0.00001$ );  $I^2 = 75\%$   
Test for overall effect:  $Z = 2.98$  ( $P = 0.003$ )



# Aerobic Exercise for Parkinson's Disease: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

Hai-Feng Shu, Tao Yang, Si-Xun Yu, Hai-Dong Huang, Ling



Better Lives. Together.

Article

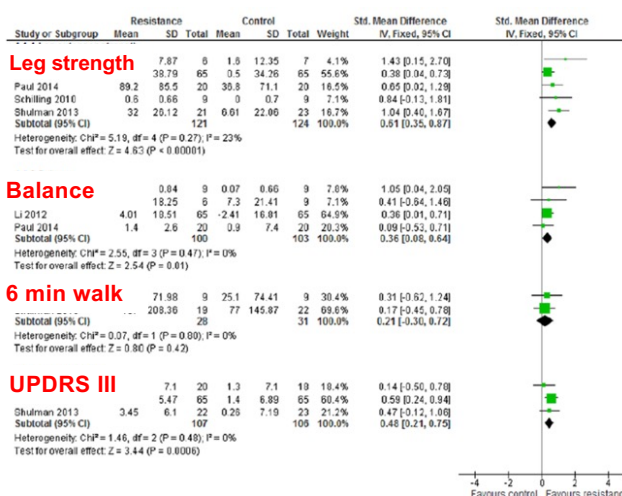
CLINICAL REHABILITATION

Parkinson's Foundation

## Effectiveness of resistance training on muscle strength and physical function in people with Parkinson's disease: a systematic review and meta-analysis

Clinical Rehabilitation  
2016, Vol. 30(1) 11–23  
© The Author(s) 2015  
Reprints and permissions:  
sagepub.co.uk/journalsPermissions.nav  
DOI: 10.1177/0269215515570381  
crs.sagepub.com

8 studies,  
N=401  
H/Y 1-4  
Primarily PRE



Better Lives. Together.

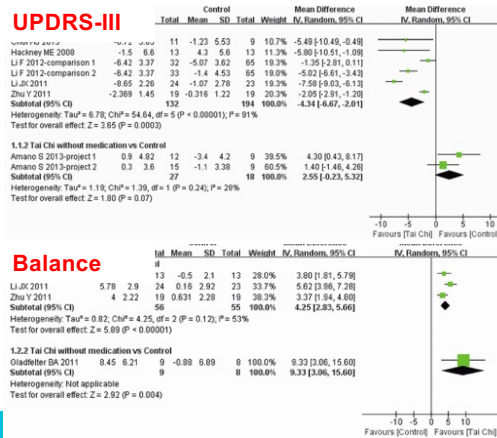
Chung, Clin Rehab 2016

# Efficacy and Safety of Tai Chi for Parkinson's Disease: A Systematic Review and Meta-Analysis of Randomized Controlled Trials



Xiaojia Ni<sup>1,2</sup>, Shaonan Liu<sup>3</sup>, Fuchang Lu<sup>2</sup>, Xiaogeng Shi<sup>4</sup>, Xinfeng Guo<sup>3\*</sup>

9 RCTs, 909 patients, early stage  
Various frequencies 4-24 weeks



Better Lives. Together.

Ni, PLoS One 2016

## PD-specific training: BIG and LOUD



- Underlying feature in PD is slowness and **smallness** of movement
- Speech→**hypophonia**, Motor→**bradykinesia**
- LSVT** initially developed for speech: intensive therapy based on increasing volume but also improves articulation (and swallowing)
- ”Training **BIG**” adapted principle for rehab focusing on increasing movement amplitude but also improves speed, coordination
  - clinically significant improvements in overall motor function
- LOTS of positive real-world experience

**NO reason to wait—PT/OT for “prehabilitation”**

Better Lives. Together.

## Alternative exercise therapies



Complementary physical therapies for movement disorders in Parkinson's disease: a systematic review. *Eur J PMR* 2015

[Alves Da Rocha P<sup>1</sup>](#), [McClelland J](#), [Morris ME](#).

- 1210 PD patients from 20 randomized controlled trials
- Dance, water therapy, virtual reality, Nordic walking, boxing, others
- Each has some benefit, **not clear that any is better than others**

Better Lives. Together.

## Exercise and motor symptoms in PD



Multiple exercise interventions improve motor sx

Different exercise types may target different motor domains

- **Aerobic may have the broadest effects**

Questions remain about *translating to “treatment”*

Better Lives. Together.

## Exercise for non-motor symptoms in PD



Exercise may improve mood, sleep, cognition in PD

- Usually secondary outcomes in studies
- Low baseline sx make effects more difficult to demonstrate

Good reason to think from general pop/MH lit

More study needed in PD with targeted intervention/outcomes

In practice, may be a happy side effect

Better Lives. Together.

## Exercise and cognition in PD



RESEARCH ARTICLE

Effects of physical exercise programs on cognitive function in Parkinson's disease patients: A systematic review of randomized controlled trials of the last 10 years

- 9 RCTs, N=256, moderate disease, mean ages 59-71, durations 4-11 weeks
  - Treadmill, dance, Tai Chi, WiiFit, cognitive motor training, PT.
    - ✦ 2-3x/week. 40-90 min sessions
  - Followup 2-3 months
- Significant effects overall, largest effect size with treadmill training
- Limited by heterogeneity of interventions and outcomes

Better Lives. Together.

Da Silva PLoS one 2018

# Exercise and sleep in PD

## Randomized, Controlled Trial of Exercise on Objective and Subjective Sleep in Parkinson's Disease

Amy W. Amara, MD, PhD,<sup>1,2\*</sup> Kimberly H. Wood, PhD,<sup>1,2,3</sup> Allen Joop, MS,<sup>1</sup> Raima A. Memon, MD,<sup>1,4</sup>

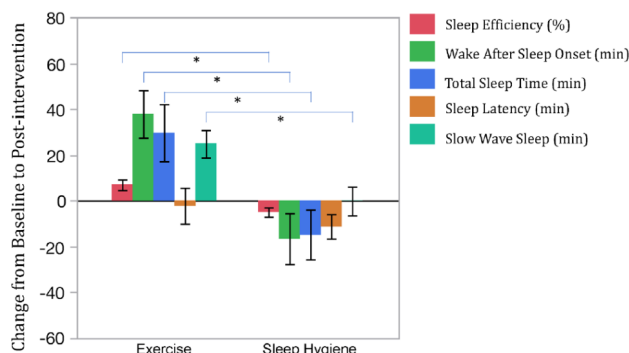
N=55 H/Y 1-2 PD

3x/wk supervised exercise vs. counseling control

16 week intervention

Objective measures improved w Ex

Subjective measures imp w SH-C



Better Lives. Together.

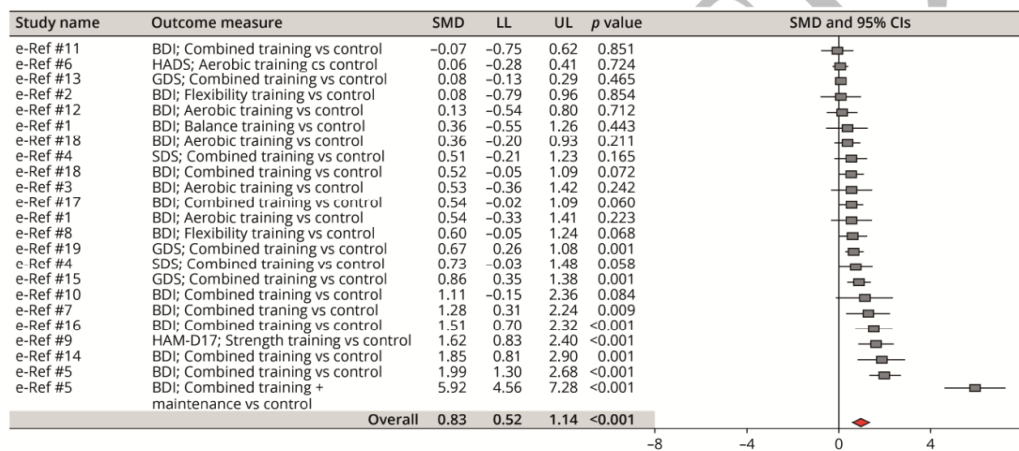
Amara MD/ 2020

16

# Exercise and depression in PD

## Effects of Exercise on Depressive Symptoms in Patients With Parkinson Disease: A Meta-analysis

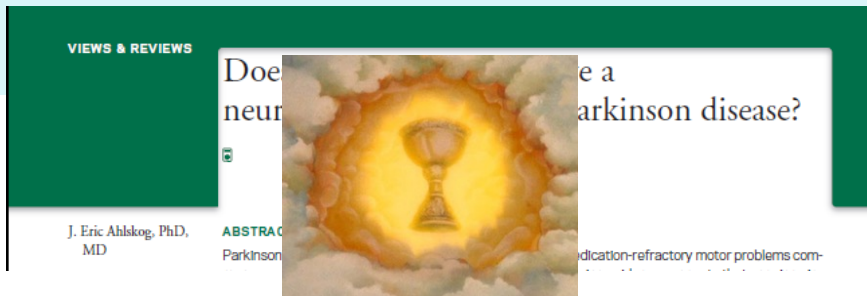
19 studies  
>1300 PwP



Better Lives. Together.

Kim, Neurology 2022; accepted

17



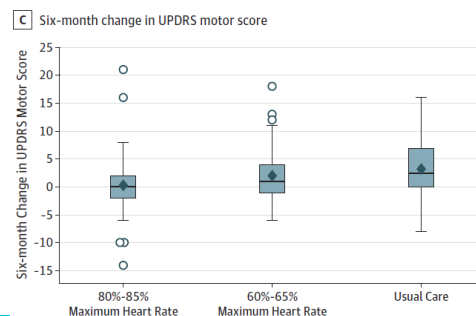
Mid-life exercise habits affect the risk of getting PD  
 Exercise in animals models increases growth factors that may protect against/slow down PD  
 Exercise in PD patients (very small trial) increases dopamine receptors (maybe cells?)

## Effect of High-Intensity Treadmill Exercise on Motor Symptoms in Patients With De Novo Parkinson Disease

A Phase 2 Randomized Clinical Trial

Margaret Schenkman, PhD, PT; Charity G. Moore, PhD; Wendy M. Kohrt, PhD; Deborah A. Hall, MD, PhD; Anthony Delitto, PhD, PT; Cynthia L. Comella, MD; Deborah A. Josbeno, PT, PhD; Cory L. Christiansen, PhD, PT; Brian D. Berman, MD, MS; Benzi M. Kluger, MD; Edward L. Melanson, PhD; Samay Jain, MD; Julie A. Robichaud, BS-PT, MHS, PhD; Cynthia Poon, PhD; Daniel M. Corcos, PhD

N=128 *de novo* un-medicated H/Y 1-2  
 Hi- vs Mid-Intensity treadmill 4x/wk, vs. con 6mos  
 4 point diff in UPDRS3Δ  
 – Hi vs con (not moderate)  
 – ?dose-finding  
 good adherence (3d/wk)  
 and retention (>90%)



## Aerobic Exercise Alters Brain Function and Structure in Parkinson's Disease: A Randomized Controlled Trial



Martin E. Johansson, MSc<sup>1,2†</sup> Ian G. M. Cameron, PhD<sup>3,4,5†</sup>  
Nicolien M. Van der Kolk, MD, PhD<sup>2</sup> Nienke M. de Vries, PhD<sup>2</sup> Eva Klimars, MSc<sup>1,2</sup>  
Ivan Toni, PhD<sup>1</sup> Bastiaan R. Bloem, MD, PhD<sup>2</sup> and Rick C. Helmich, MD, PhD<sup>1,2</sup>

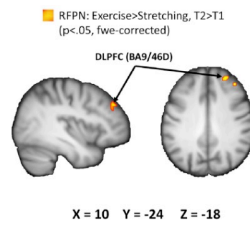
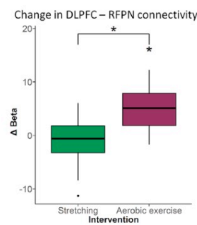
56 early H/Y $\leq$ 2 PD, duration 3.5-4y (Park In Shape)

Compared stretching (n=25) to biking (n=31)

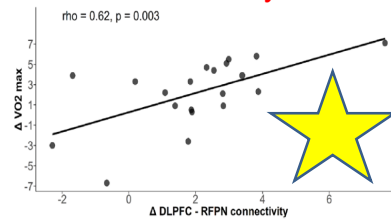
structural and fMRI & oculomotor cognitive task

– baseline and at 6-month follow-up.

connectivity



$\Delta$ connectivity  $\propto$   $\Delta$ fitness



Better Lives. Together.

Johansson et al. Ann Neurol 2022

## What's the right kind of exercise?



CLINICAL TRIALS

SECTION EDITOR: IRA SHOULSON, MD

### Randomized Clinical Trial of 3 Types of Physical Exercise for Patients With Parkinson Disease

Lisa M. Shulman, MD; Leslie I. Katzel, MD, PhD; Frederick M. Ivey, PhD; John D. Sorkin, MD, PhD;  
Knatchelle Favors, MPH; Karen E. Anderson, MD; Barbara A. Smith, RN, PhD;  
Stephen G. Reich, MD; William J. Weiner, MD; Richard F. Macko, MD

67 PD patients with gait impairment

Treadmill, high intensity vs. low vs. stretching & resistance

3x/week x 3 months

6MWT improved in all

S&R improved muscle strength and UPDRS motor

Better Lives. Together.

Shulman, JAMA Neurol 2013

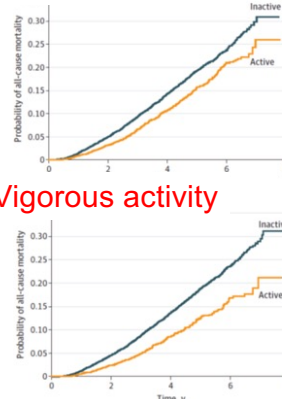
# Association of Physical Activity, Including Amount and Maintenance, With All-Cause Mortality in Parkinson Disease



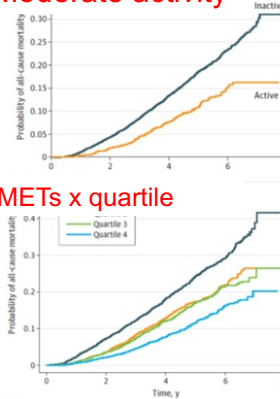
Seo Yeon Yoon, MD, PhD; Jee Hyun Suh, MD, PhD; Seung Nam Yang, MD, PhD; Kyungdo Han, PhD; Yong Wook Kim, MD, PhD

Korean population-based study  
10699 PD pts  
Activity questionnaire  
– Freq and intensity  
Primary: All-cause mortality

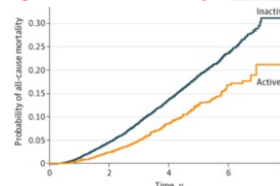
## Light activity



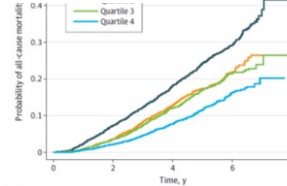
## Moderate activity



## Vigorous activity



## METs x quartile



Better Lives. Together.

Yoon JAMA Neurology 2021

## Exercise in the “real-world”: PF QI study



Regular Exercise, Quality of Life, and Mobility in Parkinson's Disease: A Longitudinal Analysis of National Parkinson Foundation Quality Improvement Initiative Data

Miriam R. Rafferty<sup>a,\*</sup>, Peter N. Schmidt<sup>b</sup>, Sheng T. Luo<sup>c</sup>, Kan Li<sup>d</sup>, Connie Marras<sup>e</sup>, Thomas

## Effect of Exercise and Rehabilitation Therapy on Risk of Hospitalization in Parkinson's Disease

George T. Kannarkat, MD, PhD,<sup>1,\*</sup> Miriam R. Rafferty, DPT, PhD,<sup>2,3</sup> Sheng Luo, PhD,<sup>4</sup> Hongliang Liu, PhD,<sup>5</sup> and

Better Lives. Together.

Rafferty JPD 2017, Kannarkat MDCP 2022

23

# The real problem...?

If we assume...

Exercise (in some form) is *EFFICACIOUS*

How can we make it an *EFFECTIVE* "medicine"

How to prescribe it?



Will patients take it?



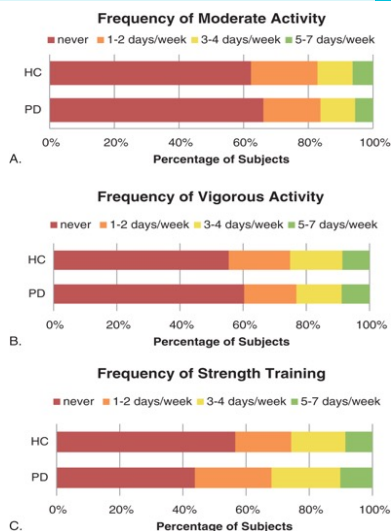
Better Lives. Together.

## PD and (non)compliance with activity recs

### ACSM exercise guidelines



Fewer than 40% of PD pts meet goals  
More than 50% report "NEVER" for exercise  
Probably worse in other populations



Sneha Mantri, MD

Better Lives. Together.

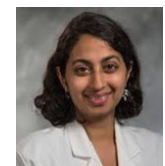
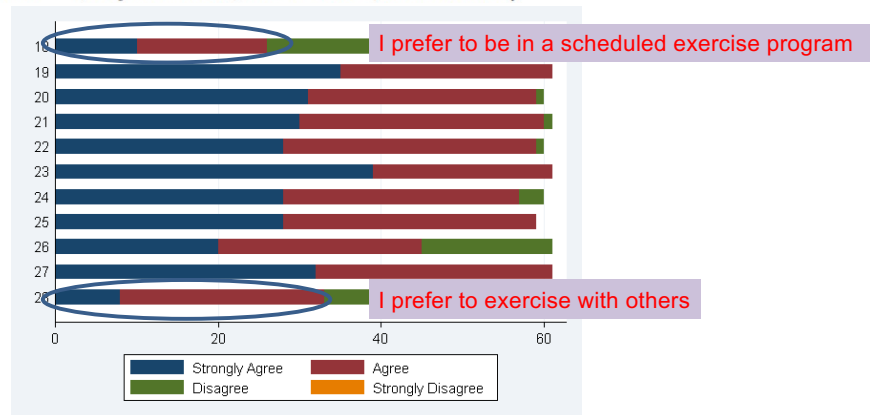
Mantri et al. J Park Dis 2018

# Motivators of exercise

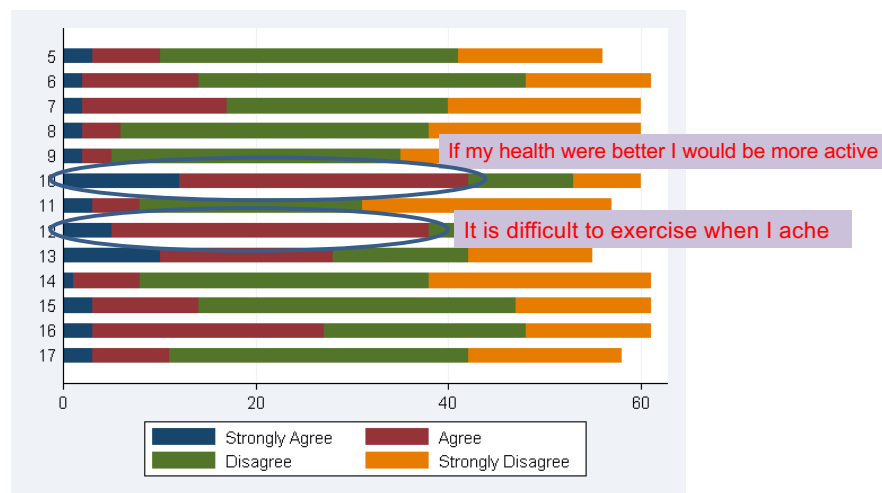
Understanding physical activity in Veterans with Parkinson disease: A mixed-methods approach



Sneha Mantri<sup>a,b,c,\*</sup>, Stephanie Wood<sup>a</sup>, John E. Duda<sup>a,b</sup>, James F. Morley<sup>a,b</sup>



# Barriers to exercise



# Patient-Reported Determinants of Exercise

Understanding physical activity in Veterans with Parkinson disease: A mixed-methods approach



Sneha Mantri<sup>a,b,c,\*</sup>, Stephanie Wood<sup>a</sup>, John E. Duda<sup>a,b</sup>, James F. Morley<sup>a,b</sup>

- Fear of falling
- Other medical co-morbidities
- Lack of motivation
- Desire to maintain independence

Health



- Exercise partners
- PD group programs (e.g. Rock Steady Boxing)
- Lack of time due to other commitments

Social



- Access to gym or exercise classes
- Safe neighborhood for walking
- Weather

Environment



Better Lives. Together.

Mantri et al. 2019a

# “Nudging” activity levels in PD

JAMA Internal Medicine | Original Investigation

- N Effect of a Game-Based Intervention Designed to Enhance Social Incentives to Increase Physical Activity Among Families
  - The BE FIT Randomized Clinical Trial

licine

Mitesh S. Patel, MD, MBA, MS; Emelia J. Benjamin, MD, ScM; Kevin G. Volpp, MD, PhD; Caroline S. Fox, MD, MPH; Dylan S. Small, PhD;

JAMA Internal Medicine | Original Investigation

- G Effectiveness of Behaviorally Designed Gamification Interventions With Social Incentives for Increasing Physical Activity Among Overweight and Obese Adults Across the United States
  - The STEP UP Randomized Clinical Trial

Mitesh S. Patel, MD, MBA, MS; Dylan S. Small, PhD; Joseph D. Harrison, BS; Michael P. Fortunato, BA;

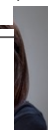
Original Investigation | Diabetes and Endocrinology

Effect of Behaviorally Designed Gamification With Social Incentives on Lifestyle Modification Among Adults With Uncontrolled Diabetes A Randomized Clinical Trial

Mitesh S. Patel, MD, MBA; Dylan S. Small, PhD; Joseph D. Harrison, MBOS; Victoria Hilbert, MPH, RD; Michael P. Fortunato, BA; Al Leen Oon, BA; Charles A. L. Rareside, MS; Kevin G. Volpp, MD, PhD



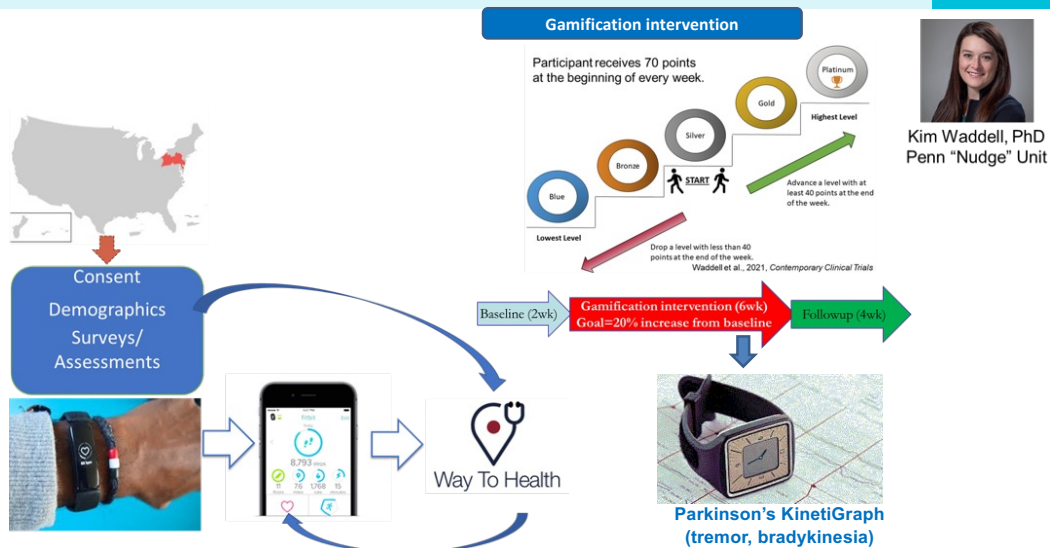
Patel, MD



Small, PhD

Better Lives. Together.

## “Touchless” trial to increase PA in PD using gamification



Kim Waddell, PhD  
Penn "Nudge" Unit

Better Lives. Together.

Funded by DoD CDMRP (Morley)

## HOW TO PRESCRIBE EXERCISE IN PD



Better Lives. Together.

FOR \_\_\_\_\_ DATE \_\_\_\_\_

ADDRESS \_\_\_\_\_

**R<sub>x</sub>**

REFILL \_\_\_\_\_ TIMES



PRODUCT SELECTION PERMITTED

DISPENSE AS WRITTEN

DEA NO. \_\_\_\_\_ ADDRESS \_\_\_\_\_

Reorder Item #6102

Total Pharmacy Supply, Inc.

1-800-878-2822

FOR \_\_\_\_\_ DATE \_\_\_\_\_

ADDRESS \_\_\_\_\_

**R<sub>x</sub>**

REFILL \_\_\_\_\_ TIMES

*Carbidopa/levodopa 25/100*  
**Type, amount, frequency, duration**  
*1 tab qd*  
*Dispense 30 days, 11 refills*

PRODUCT SELECTION PERMITTED

DISPENSE AS WRITTEN

DEA NO. \_\_\_\_\_ ADDRESS \_\_\_\_\_

Reorder Item #6102

Total Pharmacy Supply, Inc.

1-800-878-2822



FOR \_\_\_\_\_ DATE \_\_\_\_\_

ADDRESS \_\_\_\_\_

R<sub>x</sub>

REFILL \_\_\_\_\_ TIMES

*Carbidopa/levo dopa 25/100  
1 tab by mouth, 3 times daily  
Dispense 30 days, 11 refills*

PRODUCT SELECTION PERMITTED

DISPENSE AS WRITTEN

DEA NO. \_\_\_\_\_ ADDRESS \_\_\_\_\_

Reorder Item #6102

Total Pharmacy Supply, Inc.

1-800-878-2822

together.



FOR \_\_\_\_\_ DATE \_\_\_\_\_

ADDRESS \_\_\_\_\_

R<sub>x</sub>

REFILL \_\_\_\_\_ TIMES

*Power-walking 2 miles  
On foot, once daily  
Dispense 30 days, 11 refills*

PRODUCT SELECTION PERMITTED

DISPENSE AS WRITTEN

DEA NO. \_\_\_\_\_ ADDRESS \_\_\_\_\_




Reorder Item #6102

Total Pharmacy Supply, Inc.

1-800-878-2822

together.

# PF/ACSM Exercise Guidelines for PD

Aerobic Activity	Strength Training	Balance, Agility & Multitasking	Stretching
<p>3 days/week for at least 30 mins per session of continuous or intermittent at moderate to vigorous intensity</p> <p><b>TYPE:</b> Continuous, rhythmic activities such as brisk walking, running, cycling, swimming, aerobics class</p> <p><b>CONSIDERATIONS:</b> Safety concerns due to risks of freezing of gait, low blood pressure, blunted heart rate response. Supervision may be required.</p>	<p>2-3 non-consecutive days/week for at least 30 mins per session of 10-15 reps for major muscle groups; resistance, speed or power focus</p> <p><b>TYPE:</b> Major muscle groups of upper/lower extremities such as using weight machines, resistance bands, light/moderate handheld weights or body weight</p> <p><b>CONSIDERATIONS:</b> Muscle stiffness or postural instability may hinder full range of motion.</p>	<p>2-3 days/week with daily integration if possible</p> <p><b>TYPE:</b> Multi-directional stepping, weight shifting, dynamic balance activities, large movements, multitasking such as yoga, tai chi, dance, boxing</p> <p><b>CONSIDERATIONS:</b> Safety concerns with cognitive and balance problems. Hold on to something stable as needed. Supervision may be required.</p>	<p>&gt;2-3 days/week with daily being most effective</p> <p><b>TYPE:</b> Sustained stretching with deep breathing or dynamic stretching before exercise</p> <p><b>CONSIDERATIONS:</b> May require adaptations for flexed posture, osteoporosis and pain.</p>
 <p><b>See a physical therapist</b> specializing in Parkinson's for full functional evaluation and recommendations.</p>	 <p><b>Safety first:</b> Exercise during on periods, when taking medication. If not safe to exercise on your own, have someone with you.</p>	 <p>It's important to <b>modify and progress</b> your exercise routine over time.</p>	 <p>Participate in <b>150 minutes</b> of moderate-to-vigorous exercise per week.</p>
			

## A tailored approach to exercise Rx in PD



	H/Y 1	H/Y 2	H/Y 3	H/Y 4	H/Y 5
Aerobic/Endurance	+++ Whatever works	+++ Whatever works	+ UE (handbike) or aqua	+/- UE (handbike)	
Strength	+++ Whatever works	+++ Whatever works	++ Resistance bands	+ Resistance bands	+ Hand grips
Balance	+ Tai chi	++ Tai chi, PT	+++ Balance-based PT	++	
Flexibility	++ yoga	++ yoga	++ chair yoga	+ Chair/passive	+ Passive



FOR \_\_\_\_\_ DATE \_\_\_\_\_

ADDRESS \_\_\_\_\_

R<sub>x</sub>

REFILL \_\_\_\_\_ TIMES

*Hi-intensity Treadmill-walking 2 miles  
On foot, once daily  
Dispense 30 days, 11 refills*

PRODUCT SELECTION PERMITTED

DISPENSE AS WRITTEN

DEA NO. \_\_\_\_\_ ADDRESS \_\_\_\_\_

Reorder Item #6102

Total Pharmacy Supply, Inc.

1-800-878-2822

**together.**



FOR \_\_\_\_\_ DATE \_\_\_\_\_

ADDRESS \_\_\_\_\_

R<sub>x</sub>

REFILL \_\_\_\_\_ TIMES

*Stationary bike 2 miles  
once daily  
Dispense 30 days, 11 refills*

PRODUCT SELECTION PERMITTED

DISPENSE AS WRITTEN

DEA NO. \_\_\_\_\_ ADDRESS \_\_\_\_\_

Reorder Item #6102

Total Pharmacy Supply, Inc.

1-800-878-2822

**together.**



FOR \_\_\_\_\_ DATE \_\_\_\_\_

ADDRESS \_\_\_\_\_

R<sub>x</sub>

REFILL \_\_\_\_\_ TIMES

*Aqua-aerobics  
pool, 3 times/week  
Dispense 30 days, 11 refills*

PRODUCT SELECTION PERMITTED

DISPENSE AS WRITTEN

DEA NO. \_\_\_\_\_ ADDRESS \_\_\_\_\_

Reorder Item #6102

Total Pharmacy Supply, Inc.

1-800-878-2822

together.



FOR \_\_\_\_\_ DATE \_\_\_\_\_

ADDRESS \_\_\_\_\_

R<sub>x</sub>

REFILL \_\_\_\_\_ TIMES

*LSVT/BIG  
On foot, once daily  
Dispense 6 weeks, 6 refills*

PRODUCT SELECTION PERMITTED

DISPENSE AS WRITTEN


DEA NO. \_\_\_\_\_ ADDRESS \_\_\_\_\_

Reorder Item #6102

Total Pharmacy Supply, Inc.

1-800-878-2822

together.



FOR \_\_\_\_\_ DATE \_\_\_\_\_

ADDRESS \_\_\_\_\_

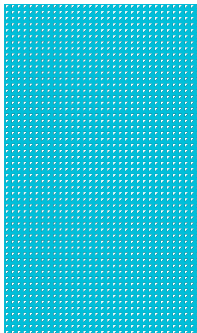
**Rx** REFILL \_\_\_\_\_ TIMES

*Tai Chi 30minutes  
Twice weekly  
Dispense 30 days, 11 refills*

PRODUCT SELECTION PERMITTED DISPENSE AS WRITTEN

DEA NO. \_\_\_\_\_ ADDRESS \_\_\_\_\_

Reorder Item #6102 Total Pharmacy Supply, Inc. 1-800-878-2822



**together.**

## Conclusions



Exercise/PA is good for PD symptoms

- Stay tuned for disease-modification

More studies needed to tell if there is a “best”

- Probably whatever you will do is “best”

In the meantime, work with your doc/PT to determine the right exercise prescription for you

Just like your medication prescription changes, so may your exercise prescription

## Questions?



### John Duda, MD

Director of the Parkinson's  
Disease Research,  
Education and Clinical  
Center



## We're Here For You



**Parkinson.org**  
**Parkinson.org/Veterans**



**1.800.4PD.INFO**



**VA** U.S. Department  
of Veterans Affairs

**Parkinsons.va.gov**



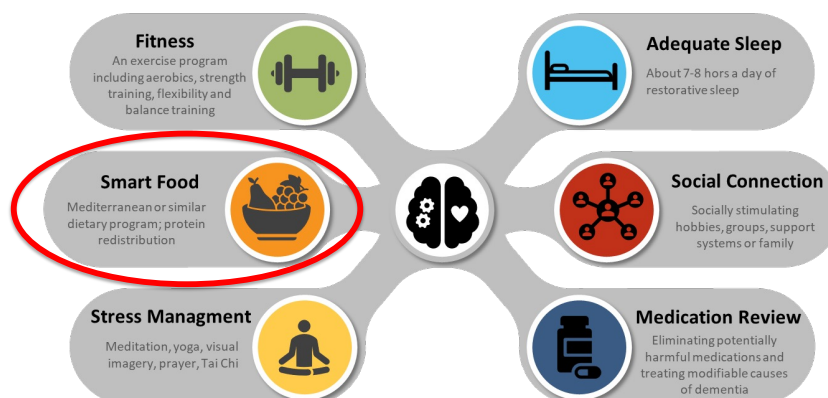
## Veterans with Parkinson's: Exercise, Nutrition and Wellness Part 2

John Duda, MD

Director, Parkinson's Disease Research, Education and Clinical Center and  
Co-Director, Center for Neurotrauma, Neurodegeneration and Restoration at the  
Michael J. Crescenz VA Medical Center in Philadelphia and  
Professor of Neurology, Perelman School of Medicine at the University of Pennsylvania

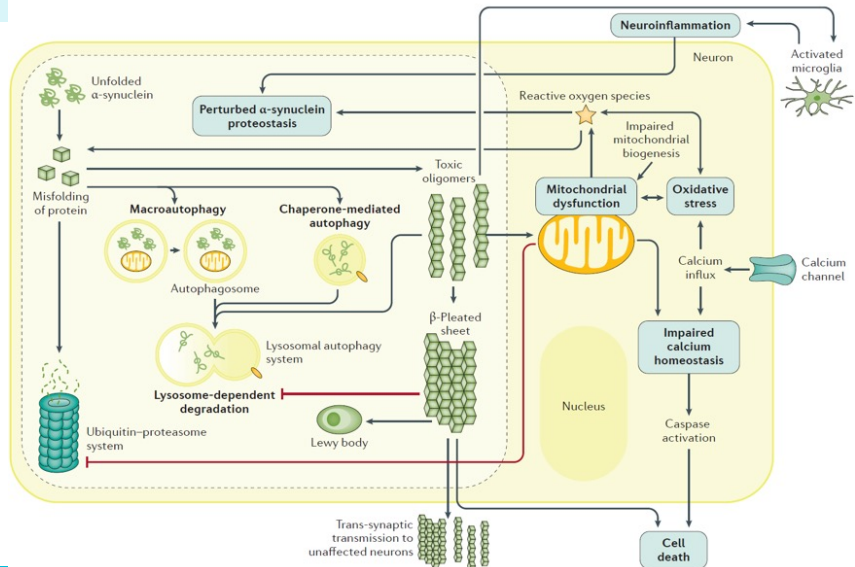
**Better Lives. Together.**

### Components of a Brain Wellness Program

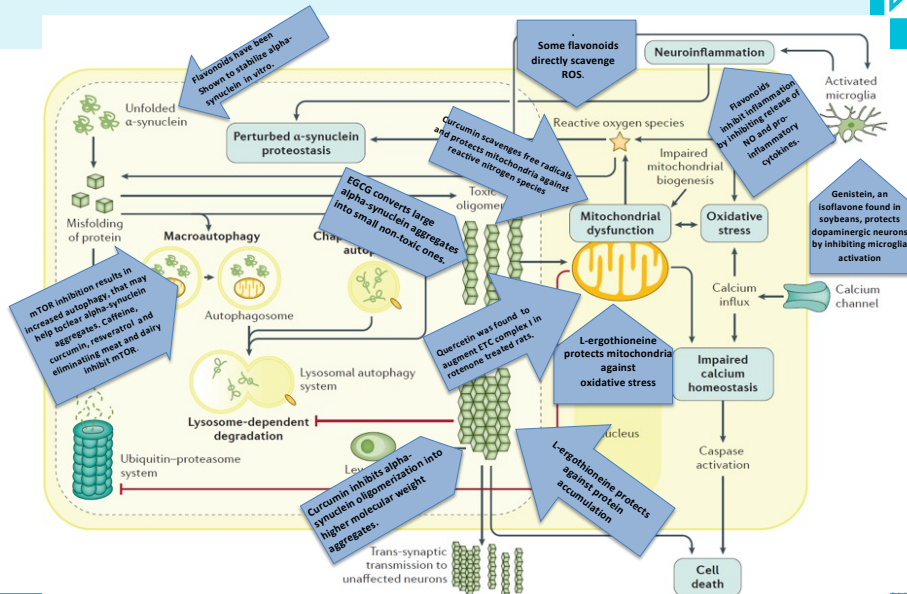


**Better Lives. Together.**

## Mechanisms involved in Parkinson's disease



Better Lives. Together.



Better Lives. Together.

Research Article

**Role of Diet and Nutritional Supplements in Parkinson's Disease Progression**



Laurie K. Mischley,<sup>1</sup> Richard C. Lau,<sup>2</sup> and Rachel D. Bennett<sup>1</sup>

<sup>1</sup>Bastyr University Research Institute, 14500 Juanita Dr. NE, Kenmore, WA 98028, USA

<sup>2</sup>Oregon State University, 101 Milam Hall, Corvallis, OR 97331, USA

- Data derived from the Complementary and alternative medicine in PD (CAM Care in PD) study - a pragmatic, prospective observational study that was designed to determine whether modifiable aspects of lifestyle are associated with PD symptom severity and progression
- Uses self-reported food frequency questionnaires and a novel patient-reported outcome measure of symptom severity

Better Lives. Together.

## PATIENT REPORTED OUTCOMES IN PD (PRO-PD)

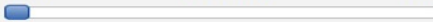
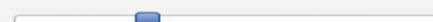
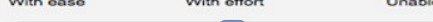
npj | Parkinson's Disease

[www.nature.com/npjparkd](http://www.nature.com/npjparkd)

ARTICLE OPEN

Use of a self-rating scale of the nature and severity of symptoms in Parkinson's Disease (PRO-PD): Correlation with quality of life and existing scales of disease severity

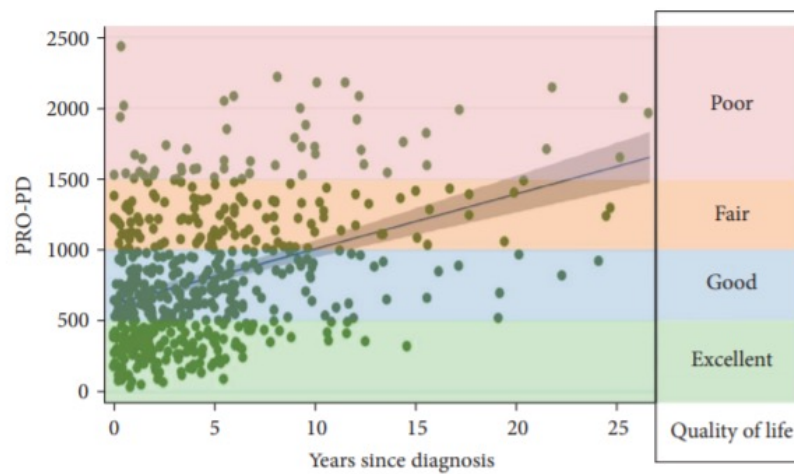
Laurie K. Mischley<sup>1</sup>, Richard C. Lau<sup>2</sup> and Noel S. Weiss<sup>3</sup>

<b>Falling</b> <small>* must provide value</small>	Never	Occasionally	Daily	
				0
				reset
<b>Rising from Seated Position</b> <small>* must provide value</small>	With ease	With effort	Unable to rise	
				31
				reset
<b>Dressing, Eating, &amp; Grooming</b> <small>* must provide value</small>	With ease	With effort	Unable	
				51
				reset

[www.propd.org](http://www.propd.org)

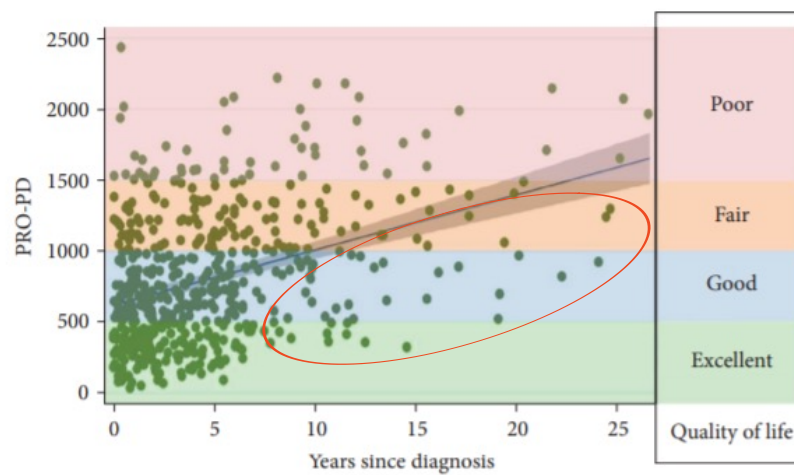
Better Lives. Together.

## Pro-PD and quality of life



Better Lives. Together.

## Pro-PD and quality of life



Better Lives. Together.

Association between dietary practices and Parkinson's disease progression

Food item (serving size)	Mean change in PRO-PD score (SE)*	P value (95% CI)*	Mean change in PRO-PD score (SE)**	P value (95% CI)**
Fresh vegetables (1/2 cup)	-53.2 (7.9)	<0.000 (-68.7 to -37.6)	-48.9 (8.3)	<0.000 (-64.7 to -33.1)
Fresh fruit (1/2 cup)	-44.1 (8.5)	<0.000 (-60.7 to -27.5)	-40.7 (8.6)	<0.000 (-57.5 to -23.9)
Nuts (1/4 cup or 2 tbsp spread)	-38.5 (7.5)	<0.000 (-53.2 to -23.7)	-33.2 (7.6)	<0.000 (-48.1 to -18.4)
Fish (4 oz)	-37.1 (8.9)	<0.000 (-54.6 to -19.5)	-29.5 (9.1)	0.001 (-47.3 to -11.6)
Olive oil (1 tsp)	-34.1 (6.8)	<0.000 (-47.4 to -20.8)	-31.4 (6.8)	<0.000 (-44.7 to -18.1)
Wine (6 oz)	-23.6 (5.3)	<0.000 (-34.1 to -13.1)	-14.6 (5.6)	0.009 (-25.5 to -3.7)
Turkey (4 oz)	-20.2 (18.7)	0.281 (-57.1 to 16.7)	-10.8 (19.2)	0.573 (-48.7 to 27)
Coconut oil (1 tsp)	-18.6 (5.5)	0.001 (-29.3 to -7.8)	-20.2 (5.5)	<0.000 (-31 to -9.4)
Fresh herbs (1 tsp)	-14.9 (6.4)	0.02 (-27.4 to -2.4)	-8.9 (6.5)	0.169 (-21.7 to 3.8)
Spices (1/4 tsp)	-14.2 (6.4)	0.027 (-26.7 to -1.6)	-13.4 (6.4)	0.037 (-26 to -0.8)
Eggs (1 egg)	-9.5 (8.2)	0.251 (-25.6 to 6.7)	-9.7 (8.3)	0.241 (-26 to 6.5)
Bread (1 slice)	-7.7 (6.8)	0.26 (-21.2 to 5.7)	-6.9 (6.9)	0.314 (-20.4 to 6.6)
Beans (1/2 cup)	-6.3 (8.6)	0.466 (-23.3 to 10.7)	-5.4 (8.8)	0.54 (-22.6 to 11.8)
Butter (1 tsp)	-4 (5.9)	0.494 (-15.6 to 7.5)	-3.8 (6)	0.522 (-15.5 to 7.9)
Oatmeal (1 cup)	-3.2 (6.5)	0.624 (-15.9 to 9.5)	-4.4 (6.6)	0.501 (-17.3 to 8.5)
Liquor (1 oz)	-2.8 (7.7)	0.717 (-17.8 to 12.3)	3.6 (7.7)	0.47 (-11.5 to 18.7)
Green tea (1 cup)	-2.3 (5.7)	0.68 (-13.5 to 8.8)	1.6 (5.7)	0.779 (-9.6 to 12.7)
Juice (8 oz)	-2.3 (5.8)	0.687 (-13.8 to 9.1)	-1.4 (5.9)	0.811 (-12.9 to 10.1)
Frozen fruit (1/2 cup)	-1.9 (6.1)	0.757 (-13.8 to 10)	-2.2 (6.1)	0.714 (-14.1 to 9.7)
Cream (1/4 cup)	-0.5 (7.4)	0.942 (-15.2 to 14.1)	-0.3 (7.4)	0.971 (-14.7 to 14.2)
Coffee (8 oz)	-0.1 (4.4)	0.983 (-8.8 to 8.6)	4.3 (4.5)	0.342 (-4.5 to 13.1)

Better Lives. Together.

Association between dietary practices and Parkinson's disease progression

Food item (serving size)	Mean change in PRO-PD score (SE)*	P value (95% CI)*	Mean change in PRO-PD score (SE)**	P value (95% CI)**
Soy (3 oz)	0.4 (7.9)	0.962 (-15.2 to 16)	2.3 (8)	0.77 (-13.4 to 18.1)
Safflower oil (1 tsp)	0.7 (6.9)	0.922 (-12.8 to 14.2)	6.8 (6.9)	0.325 (-6.8 to 20.5)
Beer (12 oz)	1.1 (7.6)	0.88 (-13.7 to 16)	2 (7.5)	0.789 (-12.8 to 16.8)
Chicken (4 oz)	3.3 (9.7)	0.34 (-15.6 to 22.3)	13.4 (9.8)	0.171 (-5.8 to 32.5)
Milk (1 cup) (mammalian, for example, cow)	5.8 (4.8)	0.226 (-3.6 to 15.2)	5.1 (4.8)	0.291 (-4.4 to 14.5)
Pork (4 oz)	6.1 (8.6)	0.482 (-10.8 to 22.9)	7 (8.7)	0.42 (-10 to 24)
Black tea (1 cup)	8.6 (5.6)	0.121 (-2.3 to 19.5)	8.4 (5.6)	0.131 (-2.5 to 19.3)
Eat food from a can	9.6 (8.1)	0.234 (-6.2 to 25.4)	6.1 (8.1)	0.449 (-9.7 to 22)
Pasta (1 cup)	10.1 (9.3)	0.28 (-8.2 to 28.4)	9.2 (9.4)	0.326 (-9.2 to 27.6)
Frozen vegetables (1/2 cup)	11 (6.9)	0.11 (-2.5 to 24.4)	10.3 (6.9)	0.137 (-3.3 to 23.9)
Cheese (1 slice, 1/2 oz, 1 tbsp)	11.7 (6.9)	0.091 (-1.9 to 25.3)	15.5 (6.9)	0.026 (1.9 to 29.1)
Yogurt (3/4 cup)	13.5 (7.5)	0.073 (-1.3 to 28.3)	15.2 (7.6)	0.046 (0.2 to 30.1)
Ice cream (1/2 cup)	13.8 (7.4)	0.064 (-0.8 to 28.3)	18.3 (7.5)	0.015 (3.6 to 32.9)
Soda (12 oz)	15.4 (7.8)	0.049 (0.03 to 30.7)	15.2 (7.9)	0.054 (-0.3 to 30.6)
Beef (4 oz)	16.2 (8.3)	0.051 (-0.1 to 32.4)	21.8 (8.3)	0.009 (5.5 to 38.1)
Fried food (4 oz)	19.5 (8.8)	0.027 (2.2 to 36.8)	23 (8.9)	0.009 (5.6 to 40.4)
Canned vegetables (1/2 cup)	19.9 (7)	0.005 (6.1 to 33.6)	18.3 (7)	0.009 (4.5 to 32.1)
Diet soda (12 oz)	20.7 (6.1)	0.001 (8.7 to 32.8)	23.6 (6.1)	<0.000 (11.6 to 35.6)
Canned fruit (1/2 cup)	36.1 (7.9)	<0.000 (20.5 to 51.6)	32 (7.9)	<0.000 (16.5 to 47.6)

Better Lives. Together.

## Interpreting the data

Most of the beneficial dietary components are prominent in diets like the Mediterranean diet



Better Lives. Together.

## Mediterranean diet likely reduces risk of dementia

### Mediterranean Diet, Cognitive Function, and Dementia A Systematic Review

Ilianna Lourida,<sup>a</sup> Maya Soni,<sup>b</sup> Joanna Thompson-Coon,<sup>a</sup> Nitin Purandare,<sup>a†</sup> Iain A. Lang,<sup>a,c</sup>  
Obioha C. Ukoumunne,<sup>a</sup> and David J. Llewellyn<sup>b</sup>

Epidemiology (2013)24:479

Adherence to a Mediterranean-Style Diet and Effects on Cognition in Adults: A Qualitative Evaluation and Systematic Review of Longitudinal and Prospective Trials

Front Nutr (2016)3:22

Roy J. Hardman<sup>a\*</sup>, Greg Kennedy<sup>a</sup>, Helen Macpherson<sup>a</sup>, Andrew B. Scholley<sup>a</sup>  
and Andrew Pipingas<sup>a</sup>

### Mediterranean Diet, Cognitive Function, and Dementia: A Systematic Review of the Evidence<sup>1-3</sup>

Sara Danuta Petersson<sup>4</sup> and Elena Philippou<sup>4,5\*</sup>

Adv Nutr (2016)7:889–904

Better Lives. Together.

## General rules about Nutrition

- Food gives us pleasure, so eat what you need to eat to be happy. Food also nourishes us, so the rest of the time, eat what you need to be healthy.
- Eat more whole, unprocessed plant foods, including fruits, vegetables, mushrooms, nuts, seeds, beans, legumes, whole grains, teas and spices.
- Avoid highly processed foods as much as possible.
- The more variety and color in your diet the better!
- Following a dietary pattern like the Mediterranean diet, the MIND diet or a whole foods plant based diet can be helpful

## The MIND diet: Ten foods to Eat

- **Green, leafy vegetables:** Aim for **six or more servings per week**. This includes kale, spinach, cooked greens, and salads.
- **All other vegetables:** Try to eat another vegetable in addition to the green leafy vegetables **at least once per day**. It's best to choose non-starchy vegetables because they provide a lot of nutrients for a low number of calories.
- **Berries:** Eat berries **at least twice per week**. Berries such as strawberries, blueberries, raspberries, and blackberries all have antioxidant benefits
- **Nuts:** Try to get **five or more servings of nuts each week**. The creators of the MIND diet don't specify what kind of nuts to consume, but it is probably best to vary the type of nuts you eat to obtain a variety of nutrients.
- **Olive oil:** Use olive oil as your main cooking oil.
- **Whole grains:** Aim for **at least three servings daily**. Choose whole grains like oatmeal, quinoa, brown rice, whole wheat pasta, and 100% whole wheat bread.
- **Fish:** Eat fish **at least once per week**. It is best to choose fatty fish such as salmon, sardines, trout, tuna, and mackerel for their high amounts of omega-3 fatty acids.
- **Beans:** Include beans in **at least four meals per week**. This category includes all beans, lentils, and soybeans.
- **Poultry:** Try to eat chicken or turkey **at least twice per week**.
- **Wine:** Aim for **no more than one glass daily**.

[The MIND Diet: A Detailed Guide for Beginners \(healthline.com\)](https://www.healthline.com/health/mind-diet)

# The MIND diet: Five foods NOT to Eat



- **Butter and margarine:** Try to eat **less than 1 tablespoon (about 14 grams) daily**. Instead, try using olive oil as your primary cooking fat and dipping your bread in olive oil with herbs.
- **Cheese:** The MIND diet recommends eating cheese **less than once per week**.
- **Red meat:** Aim for **no more than three servings per week**. This category includes all beef, pork, lamb, and products made from these meats.
- **Fried food:** The MIND diet highly discourages fried food, especially the kind from fast-food restaurants. Limit your consumption to **less than once per week**.
- **Pastries and sweets:** This includes most of the processed snack foods and desserts you may think of — ice cream, cookies, brownies, snack cakes, doughnuts, candy, and more. Try to limit these to **no more than four times per week**.

[The MIND Diet: A Detailed Guide for Beginners \(healthline.com\)](https://www.healthline.com/health/mind-diet)

## More Information



### Parkinson's Foundation

Parkinson's Foundation

Expert Briefing:

### Nutrition and Parkinson's Disease

**John E. Duda, M.D.**

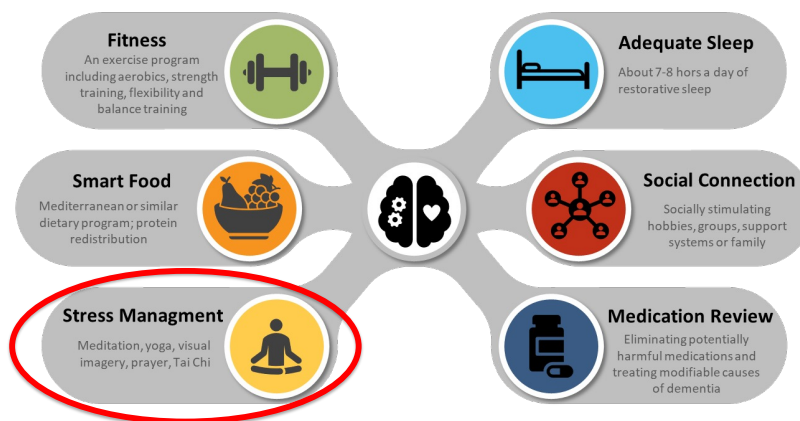
Director, Parkinson's Disease Research, Education and Clinical Center and  
Co-Director, Center for Neurotrauma, Neurodegeneration and Restoration  
Michael J. Crescenz VA Medical Center and  
Associate Professor of Neurology, Perelman School  
of Medicine at the University of Pennsylvania

Recorded on:  
Tuesday, September 12, 2017

<https://www.youtube.com/watch?v=uZVzKsEOuF4&t=650s>

Youtube search - Parkinson's Foundation Expert Briefings - Nutrition, Parkinson's Disease and the Gut Microbiome

## Components of a Brain Wellness Program

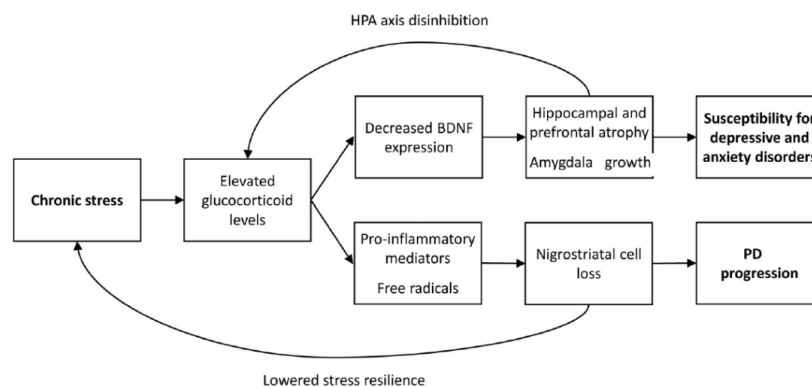


**Better Lives. Together.**

## VIEWPOINT

### Stress and Mindfulness in Parkinson's Disease: Clinical Effects and Potential Underlying Mechanisms

Anouk van der Heide, MSc,<sup>1,2\*</sup> Marjan J. Meinders, PhD,<sup>3</sup> Anne E.M. Speckens, MD, PhD,<sup>4</sup> Tessa F. Peerbolte, BSc,<sup>2</sup> Bastiaan R. Bloem, MD, PhD,<sup>1</sup> and Rick C. Helmich, MD, PhD<sup>1,2</sup>



**Better Lives. Together.**

Movement Disorders, Vol 36, No 1, 2021

**TABLE 1.** Reported change in reviewed articles after mindfulness-based intervention

Study	Sample Size		Motor Symptoms Instrument (Maximum Score) Absolute Change (SD)		Depression Instrument (Maximum Score) Absolute Change (SD)		Anxiety Instrument (Maximum Score) Absolute Change (SD)		Quality-of-Life Instrument (Maximum Score) Absolute Change (SD)	
	Intervention	Control	Intervention	Control	Intervention	Control	Intervention	Control	Intervention	Control
Advocat (2016) [22]	n = 24	n = 33			DASS-D (42) +1.9 <sup>a</sup>	+1.1	DASS-A (42) +0.3	-0.6	PDQ-39 (156) -0.5	-1.5
Birtwell (2017) [23]	n = 6 (uncontrolled)				DASS-D (42) -9.0 <sup>a</sup>		DASS-A (42) -7.5 <sup>a</sup>		PDQ-39 (156) N.I.	
Cash (2016) [24]	n = 39 (combined: 29 patients with PD with 10 caregivers)				PHQ-9 (27) -1.6 <sup>a</sup>		GAD-7 (21) -0.9		PDQ-39 (156) -2.4	
Dissanayaka (2016) [12]	n = 14 (uncontrolled)		MDS UPDRS-III (76) -0.8		HAM-D (52) -0.8 <sup>a</sup>		GAI (20) -1.9 <sup>a</sup>		PDQ-39 (156) -2.8	
Kwok (2019) [23]	n = 71	n = 67	MDS UPDRS-III (76) <sup>c</sup> -13.8 <sup>a</sup>	-9.1 <sup>a</sup>	HADS-D (21) <sup>c</sup> -2.6	-0.3	HADS-A (21) <sup>c</sup> -2.4	-0.4	PDQ-8 (32) <sup>c</sup> -2.2	+0.5
Pickut (2015) [25]	n = 14	n = 13	MDS UPDRS-III (76) <sup>c</sup> -5.5 <sup>a</sup>	+1.1	BDI N.I.	N.I.			PDQ-pain (12) +0.8 <sup>a</sup>	-0.7
Rodgers (2019) [26]	n = 15	n = 12			DASS-D (42) <sup>c</sup> -0.8 <sup>a</sup>	+0.4	DASS-A (42) <sup>a</sup> -0.7	-1.3	PDQ-39 (156) <sup>a</sup> -1.8	-3.0
Son (2018) [24]	n = 33	n = 30			GDS (30) <sup>b</sup> -3.4	-1.0	STAI (160) <sup>b</sup> -6.5	+9.4	PDQL (185) <sup>b</sup> +17.4	-8.6

- 6/8 trials reported a reduced depression score after mindfulness-based interventions, and 4/7 studies reported reduced anxiety scores
- Motor symptoms were assessed in 3 studies, of which two reported significant improvement after a mindfulness based intervention.

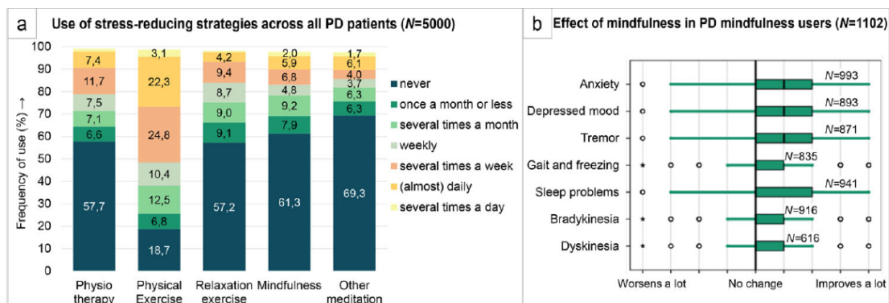
**ARTICLE**   **OPEN**


## Stress and mindfulness in Parkinson's disease – a survey in 5000 patients

Anouk van der Heide<sup>1,2</sup>, Anne E. M. Speckens<sup>3</sup>, Marjan J. Meinders<sup>4</sup>, Liana S. Rosenthal<sup>5</sup>, Bastiaan R. Bloem<sup>1</sup> and Rick C. Helmich<sup>1,2,6</sup>

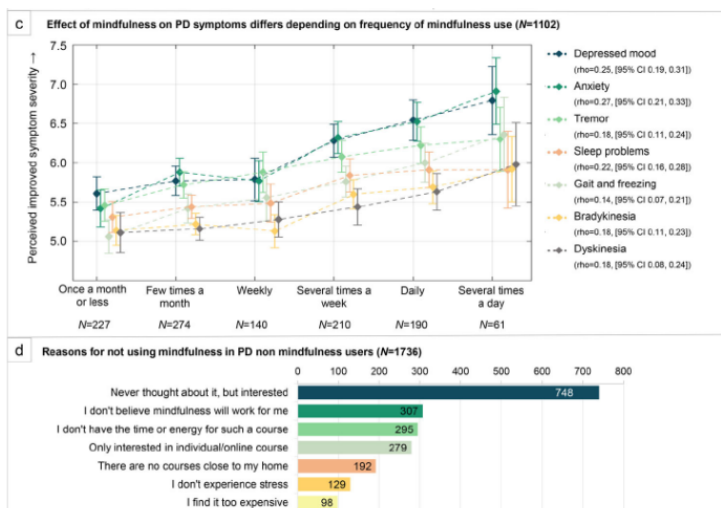
- Questionnaire sent to PD patients and controls to determine if PD patients experience more stress than controls, which personality and disease characteristics are associated with stress, which PD symptoms are especially sensitive to stress, and what patients do themselves to reduce stress
- 5000 patients, 1292 controls
- PD patients scored higher than controls on anxiety, perceived stress, and depressed mood, and lower on dispositional mindfulness.
- All PD symptoms worsened during stress

## People with PD use a lot of stress reduction techniques, and mindfulness helps many symptoms



**Better Lives. Together.**

## Dose Response Curve for Mindfulness Practice in PD



**Better Lives. Together.**

## Research

JAMA Neurology | Original Investigation

# Effects of Mindfulness Yoga vs Stretching and Resistance Training Exercises on Anxiety and Depression for People With Parkinson Disease A Randomized Clinical Trial

Jojo Y. Y. Kwok, PhD, MPH, BN, RN; Jackie C. Y. Kwan, MSocSc, PDMH, BSW, RSW; M. Auyeung, MBChB; Vincent C. T. Mok, MD, MBBS; Claire K. Y. Lau, MSC, BN, APN; K. C. Choi, BSc, PhD; Helen Y. L. Chan, PhD, BSN, RN

JAMA Neurology July 2019 Volume 76, Number 7

- Largest study to date of Mindfulness intervention in PD
- 138 patients randomly assigned to either 8 week of Mindfulness Yoga or Stretching and resistance training exercises, with a weekly session and request to do two 20 minutes sessions in addition each week

Better Lives. Together.

Table 2. Generalized Estimating Equation Analysis for the Comparison of Outcomes\*

Outcome	Mean (SD)		Group Effect <sup>b</sup>		Time Effect <sup>c</sup>		Group × Time Effect <sup>d</sup>	
	Experimental	Control	β (95% CI)	P Value	β (95% CI)	P Value	β (95% CI)	P Value
<b>HADS-anxiety</b>								
T0	6.32 (3.57)	5.66 (3.96)			NA	NA	NA	NA
T1	3.97 (3.57)	5.32 (3.84)	0.67 (-0.58 to 1.92)	.30	-0.46 (-1.22 to 0.30)	.23	-1.79 (-2.85 to -0.69)	.001*
T2	3.04 (3.06)	4.95 (3.49)			-0.72 (-1.43 to -0.01)	.05	-2.05 (-3.02 to -1.08)	<.001
<b>HADS-depression</b>								
T0	6.69 (3.36)	6.16 (3.64)			NA	NA	NA	NA
T1	4.10 (3.18)	5.90 (3.65)	0.53 (-0.64 to 1.69)	.38	-0.32 (-1.00 to 0.37)	.36	-2.75 (-3.17 to -1.35)	<.001
T2	3.53 (2.84)	6.00 (3.71)			-0.20 (-0.94 to 0.54)	.60	-2.75 (-3.71 to -1.79)	<.001
<b>MDS-UPDRS III</b>								
T0	34.90 (14.88)	31.64 (15.59)			NA	NA	NA	NA
T1	21.10 (13.61)	22.53 (14.66)	3.23 (-1.4 to 8.27)	.21	-8.71 (-10.94 to -6.48)	<.001	-5.19 (-8.15 to -2.24)	.001*
T2	22.41 (11.31)	23.75 (12.84)			-6.88 (-9.08 to -4.68)	<.001	-4.71 (-7.70 to -1.72)	.002*
<b>TUG*</b>								
T0	17.54 (15.95)	14.05 (6.04)			NA	NA	NA	NA
T1	14.72 (14.77)	12.41 (5.04)	0.06 (-0.05 to 0.18)	.28	-0.11 (-0.17 to -0.06)	<.001	-0.01 (-0.08 to 0.05)	.72
T2	12.36 (6.42)	13.47 (16.43)			-0.16 (-0.21 to -0.11)	<.001	0.00 (-0.08 to 0.08)	.99
<b>HWS-perceived hardship†</b>								
T0	4.04 (1.54)	3.88 (1.70)			NA	NA	NA	NA
T1	3.22 (1.39)	4.02 (1.53)	0.17 (-0.37 to 0.70)	.55	0.14 (-0.08 to 0.36)	.22	-0.92 (-1.25 to -0.61)	<.001
T2	3.12 (1.55)	3.89 (1.73)			0.01 (-0.27 to 0.29)	.94	-0.76 (-1.12 to -0.40)	<.001
<b>HWS-perceived equanimity†</b>								
T0	6.47 (1.38)	6.82 (1.21)			NA	NA	NA	NA
T1	7.58 (1.19)	6.78 (1.19)	-0.34 (-0.77 to 0.09)	.12	-0.03 (-0.27 to 0.21)	.83	1.11 (0.79 to 1.42)	<.001
T2	7.60 (1.41)	6.57 (1.61)			-0.20 (-0.48 to 0.09)	.18	1.19 (0.82 to 1.56)	<.001
<b>PDQ-8 summary index</b>								
T0	9.79 (5.02)	9.21 (5.26)			NA	NA	NA	NA
T1	7.57 (4.68)	9.66 (5.05)	1.81 (-3.51 to 7.14)	.51	0.38 (-2.60 to 3.35)	.80	-7.77 (-11.61 to -4.38)	<.001
T2	6.04 (4.76)	8.78 (5.51)			-1.63 (-4.32 to 1.06)	.24	-7.99 (-11.61 to -4.38)	<.001

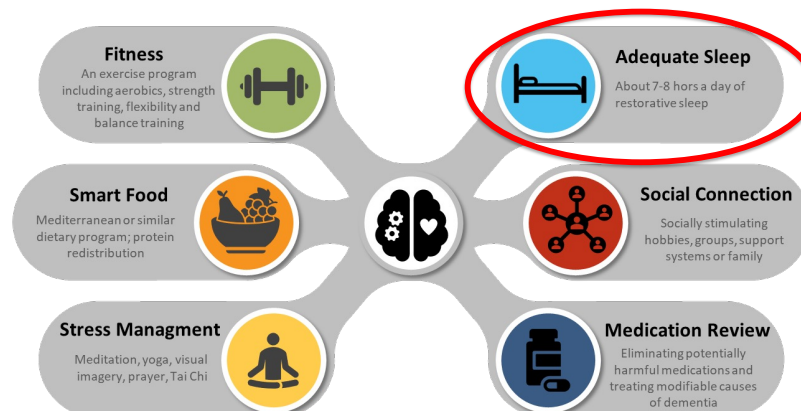
- The mindfulness yoga intervention significantly improved depression, anxiety, motor scores, and quality of life scores, compared with stretching and resistance exercise
- The data also show a remarkable improvement in the MDS-UPDRS III, the way we measure PD motor symptoms
- Questions remain, including why such a large improvement in motor function did not lead to clinically important improvements in quality of life

Better Lives. Together.

# What is Mindfulness?

- Mindfulness is the basic human ability to be fully present, aware of where we are and what we're doing, and not overly reactive or overwhelmed by what's going on around us (Mindful.org)
- It is something you already have, but may not use a lot
- It can be strengthened with training – mindfulness meditation
  - Focusing on your breath, walking, eating, anything that is happening right now
  - Includes other practices including gratitude practice, loving-kindness meditation, etc.
- Mindfulness practice has innumerable evidence-based benefits

## Components of a Brain Wellness Program



## Sleep Problems in PD

Sleep problems affect the majority of people with PD

Problems include:

- Insomnia – having difficulty falling asleep
- Having medications wear off at night
- Sleep fragmentation – waking up when asleep and having trouble getting back to sleep
- REM sleep behavior disorder – acting out your dreams
- Restless Legs syndrome
- Sleep apnea
- Excessive daytime sleepiness

## What to do about Sleep Problems in PD

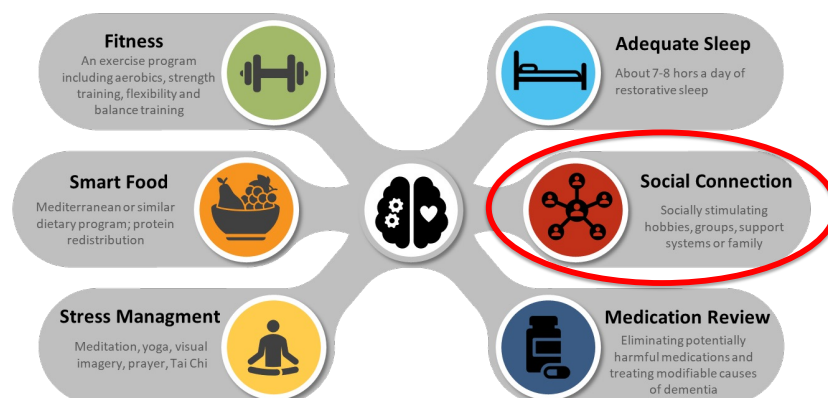
- Talk to your physician about them and consider referral to a sleep specialist
- Many of them have good treatments
- Rule out sleep apnea when sleep is non-restorative
- If you have insomnia consider training in CBTi (Cognitive Behavioral Therapy for Insomnia)
- Learn about and practice sleep hygiene tips

## Sleep hygiene tips

- Maintain a regular sleep schedule.
- Avoid napping in the late afternoon.
- Create a bedtime routine.
- A soak in the bath, relaxing music, or a book before bedtime can set the scene for sleep.
- Avoid phones, tablets, and TV immediately before bed.
- Find the right temperature.
- Lower the light.
- Reduce the lighting as you prepare for bed.
- Avoid late-night exercise.
- Do not exercise in the three hours before going to sleep.
- Avoid big meals late in the evening.
- Time your caffeine.
- Reduce alcohol consumption.

<https://positivepsychology.com/sleep-hygiene-tips/#strategies>  
<https://www.nia.nih.gov/health/good-nights-sleep>

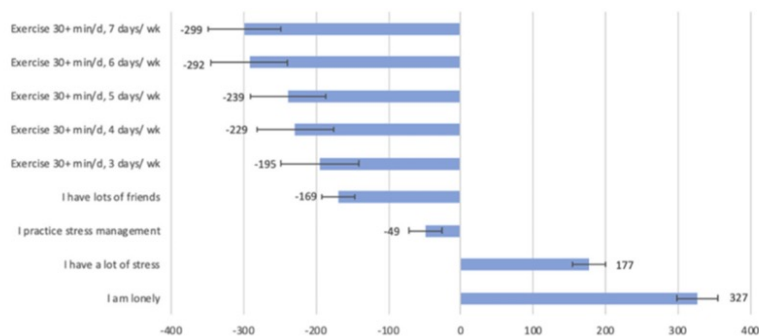
## Components of a Brain Wellness Program



## ARTICLE OPEN

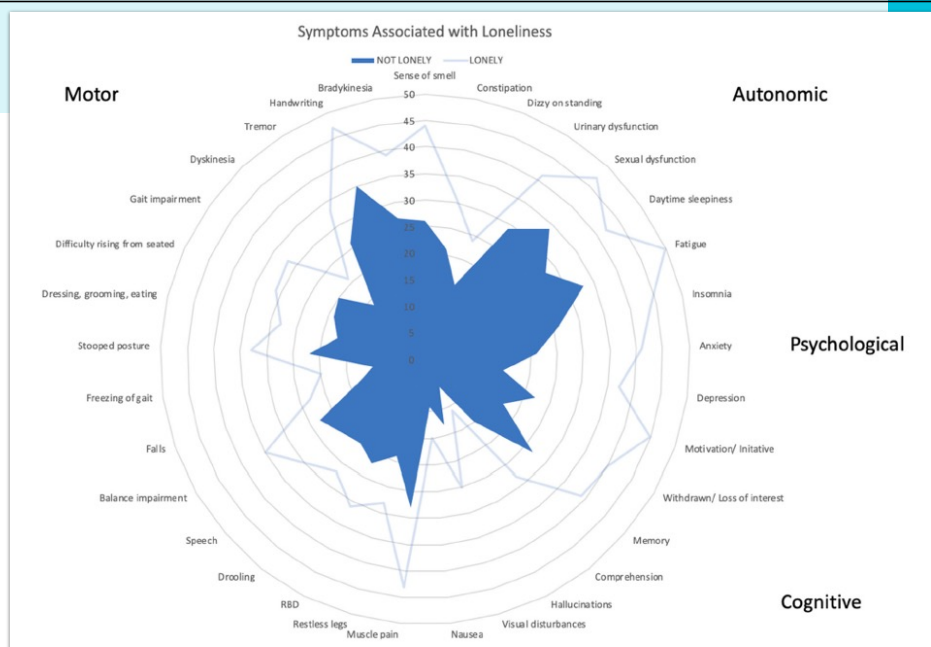


# Synergy of pandemics-social isolation is associated with worsened Parkinson severity and quality of life

Indu Subramanian<sup>1,2,5</sup>, Joshua Farahnik<sup>3</sup> and Laurie K. Mischley<sup>3,4</sup>

Better Lives. Together.

npj Parkinson's Disease (2020)



Better Lives. Together.

npj Parkinson's Disease (2020) 6:28

## What should I do?

- Stay connected in groups like the Parkinson's foundation
- Join a support group
- Stay connected to family and friends
- Consider doing some volunteering in your community
- Consider joining a regular exercise group for people with PD

Questions?



# Thank You!



**THANK YOU** to our speakers, Genentech,  
and to all of **YOU** for joining us!

We appreciate your feedback:  
**Complete survey right after this program**

Stay tuned for a follow up email today's recorded  
presentation, slides and other resources on our topics.



**Better Lives. Together.**