OHSU PARKINSON CENTER

Physical Therapy and Exercise Guidelines for Parkinson's Disease

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OHSU Parkinson Center

Parkinson's Foundation
CENTER OF EXCELLENCE

Disclosures

- Nothing to disclose

Objectives

- Understand current exercise guidelines for Parkinson's Disease
- Describe when to utilize physical therapy throughout the course of Parkinson's Disease

History of PD and Exercise

"life should be quiet and regular, freed, as far as may be, from care and work"

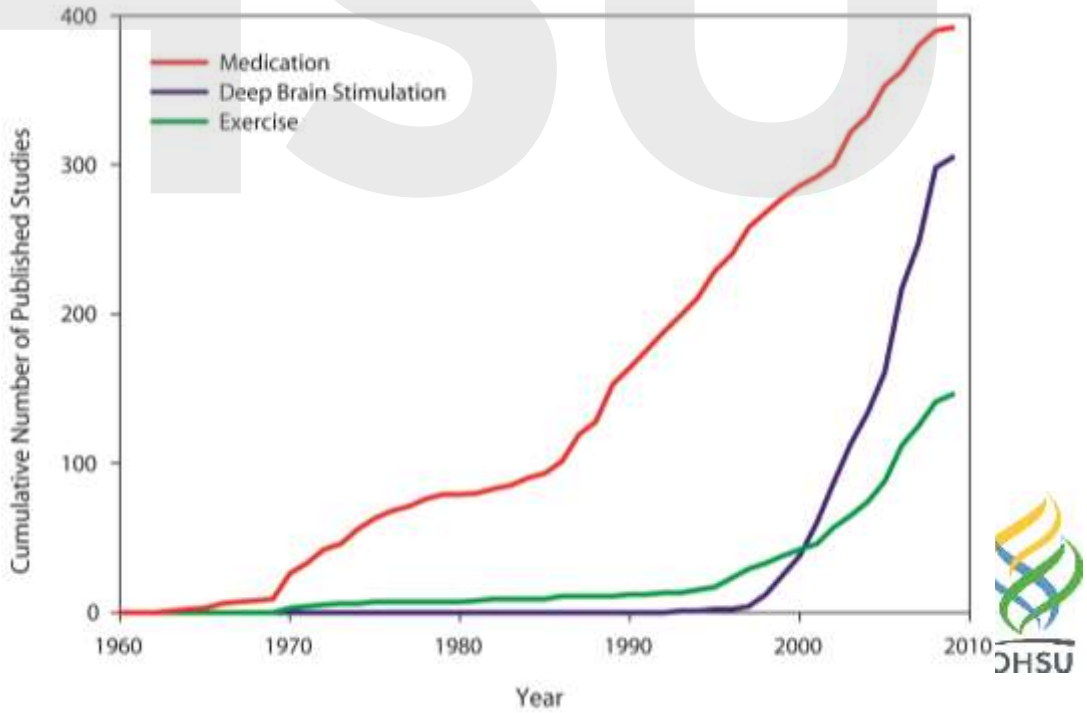
Carbidopa/levodopa commercially available

Animal studies show high intensity exercise is neuroprotective

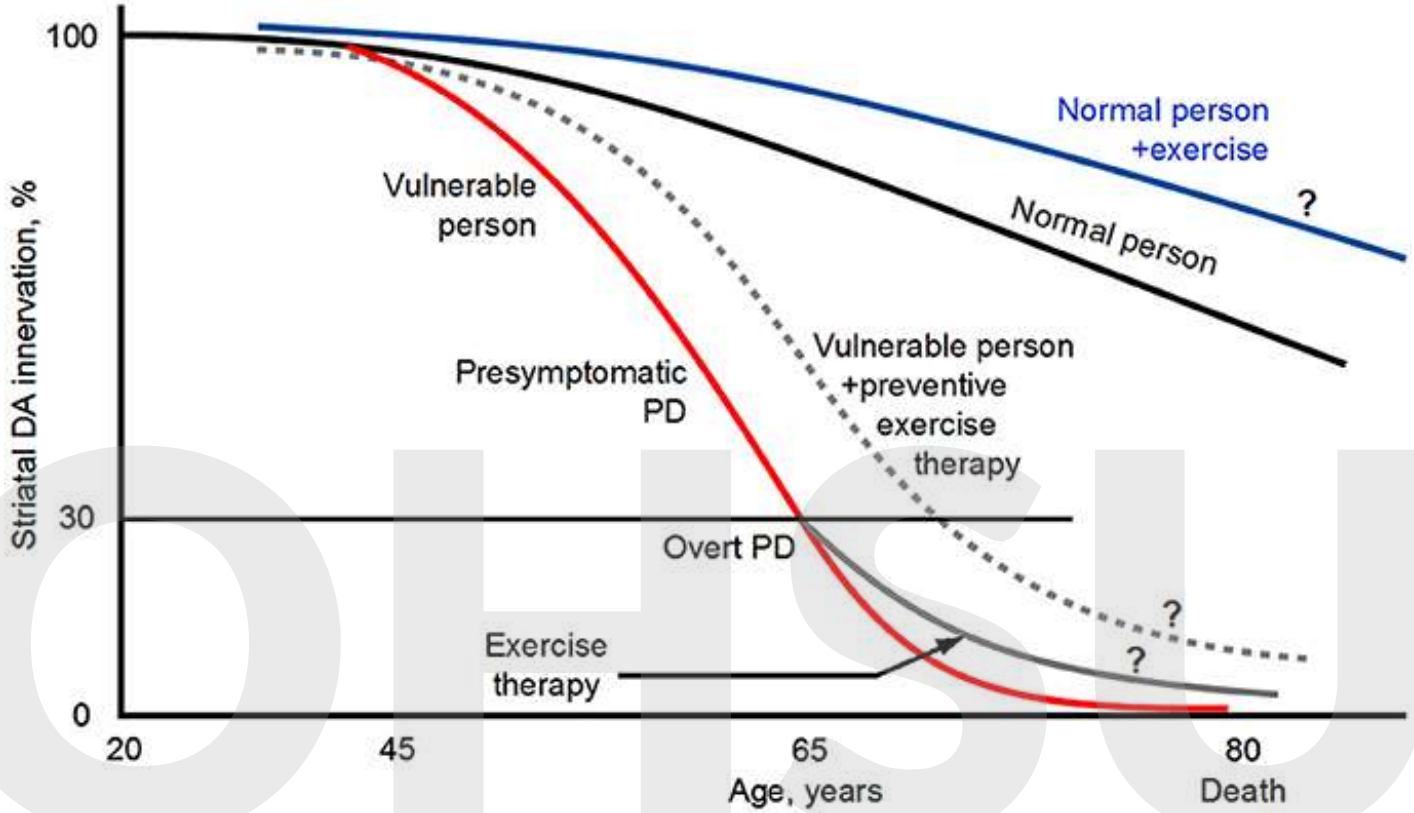
Numerous clinical trials looking at various modes of exercise on PD

1899 **1975** **2000s** **2010s**

Stretching, Chair exercises



Alberts JL and Rosenfeldt AN J of Parkinson's Disease 2020



- Disease modifying = slowing the course of the disease
- Symptom modifying = slowing progression of symptoms
- At this point good evidence for **symptom modification** but not for disease modification

Hou L et al; Motor Control 2017

What is the BEST exercise?

- Strength training
- Aerobic
- Balance exercises
- Task specificity and multifaceted
  - Tai Chi
  - Dance
  - Agility
- Individual vs Group





Small significant effect (≤0.2)

Moderate significant effect (0.2-0.5)

Moderately large significant effect (0.5-0.8)

Large significant effect (≥0.8)

Table 1. Results of the Outcome Measures Related to the Type of Intervention.[a]

	Motor symptoms	Balance				Gait			QOL
	(UPDRS)	TUG	Berg	6 min walk	10 m walk	Speed	Stride length	Cadence	(PDQ-39)
Conventional PT (n = 45)	0.48 [0.35, 0.60]** n = 26	0.11 [−0.07, 0.29] n = 14	0.03 [−0.25, 0.31] n = 3	0.13 [−0.01, 0.28] n = 6	0.30 [0.01, 0.59] n = 56**	0.24 [0.03, 0.45] n = 11	0.28 [−0.11, 0.67] n = 4	0.52 [0.11, 0.92] n = 4**	0.11 [0.01, 0.22] n = 17*
Resistance training (n = 17)	0.20 [−0.02, 0.42] n = 7	0.19 [−0.05, 0.43] n = 6	0.31 [−0.47, 1.09] n = 1	0.67 [0.09, 1.24] n = 2*		−0.07[−0.30, 0.16] n = 6	−0.63 [−1.20, −0.06] n = 2		0.23 [0.01, 0.43] n = 7
Treadmill training (n=22)	.09, 0.29] = 16	0.07 [−0.19, 0.34] n = 8	0.21 [−0.13, 0.55] n = 5	0.29 [0.04, 0.55]* n = 9	0.47 [0.08, 0.85] n = 4*	0.52 [0.34, 0.69] n = 23**	0.20 [− 0.04, 0.44] n = 12	0.12 [−0.15, 0.39] n = 9	−0.06 [−0.49, 0.36] n = 4
Strategy training (n = 14)	0.43 [−0.32, 1.18] n = 1	0.53 [0.23, 0.82] n = 6**	0.12 [−0.43, 0.68] n=1	−0.02 [−0.90, 0.85] n = 1	−0.04 [−0.60, 0.51] n = 1	0.45 [0.13, 0.76] n = 6**	0.52 [0.11, 0.93] n = 4	0.47 [−0.01, 0.95] n = 3	0.17 [−0.34, 0.67] n = 2
Dance (n=11)	0.72 [0.44, 1.01] n = 8**	0.49 [0.19, 0.80] n = 8**	0.59 [0.27, 0.91] n = 7**	0.51 [0.10, 0.91] n = 4*		0.32 [−0.02, 0.66] n = 6	0.11 [− 0.36, 0.58] n = 3	1.33 [0.31, 2.34] n = 1*	−0.13 [−0.63, 0.38] n = 3
Martial arts (n = 11)	0.26 [0.08, 0.43] n = 10*	0.56 [0.36, 0.77] n = 7**	0.24 [−0.02, 0.49] n = 4	0.20 [−0.15, 0.55] n = 3		0.29 [0.07, 0.52] n = 6*	0.32 [0.07, 0.56] n = 3*		−0.09 [−0.66, 0.47] n = 2
Nordic walking (n = 3)	0.74 [0.24, 1.24] n = 3**	0.55 [0.06, 1.04] n = 3*	0.99 [0.48, 1.50] n = 3**	0.94 [0.28, 1.60] n = 2*	0.37 [−0.15, 0.90] n = 2				0.46 [−0.18, 1.11] n = 1
Aerobic exercises (n = 5)	0.92 [0.61, 1.22] n = 4**	0.80 [0.44, 1.15] n = 1**	[−0.81, 0.83] n = 1	1.02 [0.69, 1.34] n = 3**					0.20 [−0.11, 0.52] n = 2
Balance and gait training (n = 28)	0.34 [0.11, 0.56] n = 12*	0.36 [0.15, 0.58] n = 11**	0.57 [0.35, 0.79] n = 12**	−0.12 [−0.48, 0.23] n = 4	0.15 [−0.56, 0.85] n = 2	0.28 [0.12, 0.44] n = 17**	0.36 [0.12, 0.59] n = 10*	0.24 [−0.01, 0.48] n = 8	0.28 [−0.04, 0.60] n = 6
Hydrotherapy (n = 8)	−0.11 [−0.41, 0.19] n = 5	0.50 [0.25, 0.75] n = 8**	0.31 [0.04, 0.59] n = 7						0.39 [−0.01, 0.79] n = 3
Dual task (n = 3)	−0.18 [−0.79, 0.42] n = 2	−0.36 [−1.39, 0.66] n = 1				−0.25 [−0.85, 0.34] n = 2	−0.08 [−0.46, 0.30] n = 1	−0.29 [−0.65, 0.07] n = 2	−0.04 [−0.78, 0.71] n = 1
Exergaming (n = 9)		0.58 [0.29, 0.87] n = 7**	0.47 [0.17, 0.77] n = 6*	0.23 [−0.20, 0.67] n = 3	−1.66 [−2.84, −0.48] n = 1*	0.30 [−0.02, 0.62] n = 4	0.77 [−0.07, 1.60] n = 1		0.45 [0.13, 0.77] n = 4*

Abbreviations: n, number of included studies; PT, physiotherapy; (MDS-)UPDRS-III, Movement Disorder Society–sponsored revision of the) Unified Parkinson's Disease Rating Scale part III; TUG, Timed Up and Go; BBS, Berg Balance Scale; 6MWT, 6-Minute Walking Test; 10MWT, 10-Minute Walking Test; PDQ-39, Parkinson's Disease Questionnaire–39; PDQL, Parkinson's Disease Quality of Life Questionnaire.

[a]Data are presented as standardized mean difference [95% CI]. Positive effect estimates mean positive results on each outcome measure. Red cells indicate small significant effect (≤0.2), orange cells indicate moderate significant effect (0.2-0.5), light green cells indicate moderately large significant effect (0.5-0.8), and dark green cells indicate large significant effect (≥0.8).

*Statistically significant effect, $P \leq .05$.

**Statistically significant effect, $P \leq .001$.

Radder DLM et al; Neurorehabilitation and Neural Repair. 2020

Physical Therapist Management of Parkinson Disease: A Clinical Practice Guideline from the American Physical Therapy Association

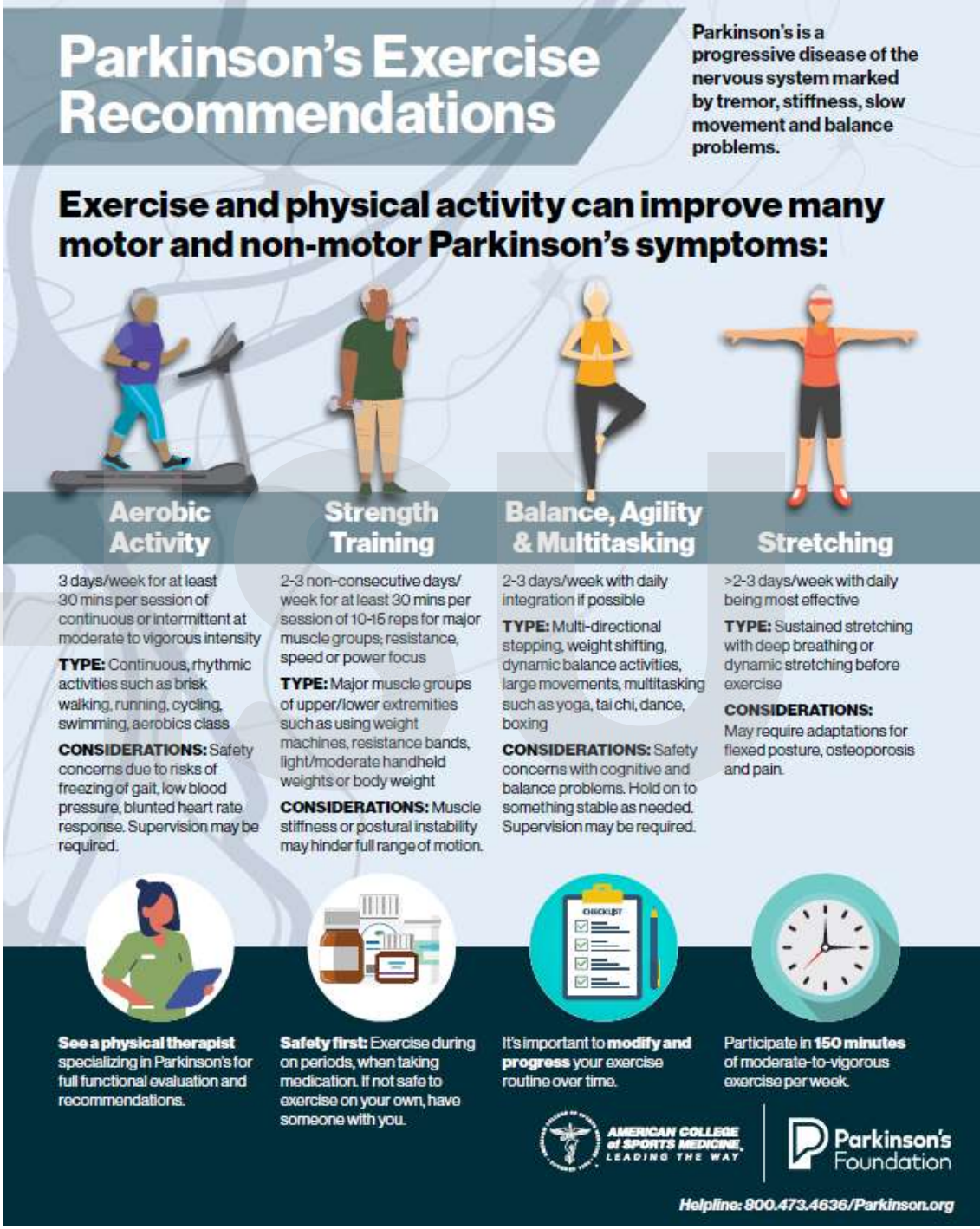
Intervention	Quality of Evidence	Strength of Recommendation
Aerobic exercise	High	◆◆◆◆
Resistance training	High	◆◆◆◆
Balance training	High	◆◆◆◆
Flexibility exercises	Low	◆◆◇◇
External cuing	High	◆◆◆◇
Community-based exercise	High	◆◆◆◆
Gait training	High	◆◆◆◆
Task specific training	High	◆◆◆◆
Behavior-change approach	High	◆◆◆◇
Integrated care	High	◆◆◆◆
Telerehabilitation	Moderate	◆◆◇◇

Strong ◆◆◆◆
Moderate ◆◆◆◇
Weak ◆◆◇◇

Osborne, JA. et al. *Physical therapy* (2021).

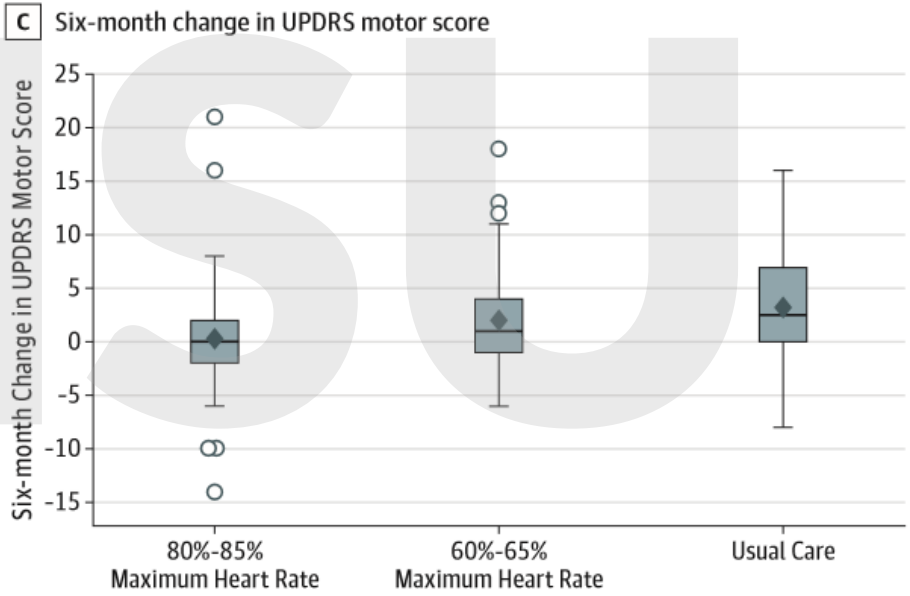
Recent recommendations

www.parkinson.org



High Intensity = Better

- Clear prior issues: cardiac, MSK
- Focus on **INTENSE** aerobic
  - Early referrals are **BEST**
- Motivational interviewing: what is the client **going to do** for exercise
- www.sparx3pd.com



Schenkman M et al; JAMA Neurol 2017

How hard should I push myself?

- If it's easy: it's probably not doing anything
- Balance between too easy and hurting yourself
- Slow increase in challenge or intervals

- Max HR: 220-age
  - Aerobic: 65-85% of Max HR
  - Example: 65 yo: Max HR = 220-65 = 155 bpm
    - 65% of max HR = 101 bpm
    - 85% of max HR = 132 bpm
- Consult with a PT or consider a exercise stress test

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Aerobic

Dosing

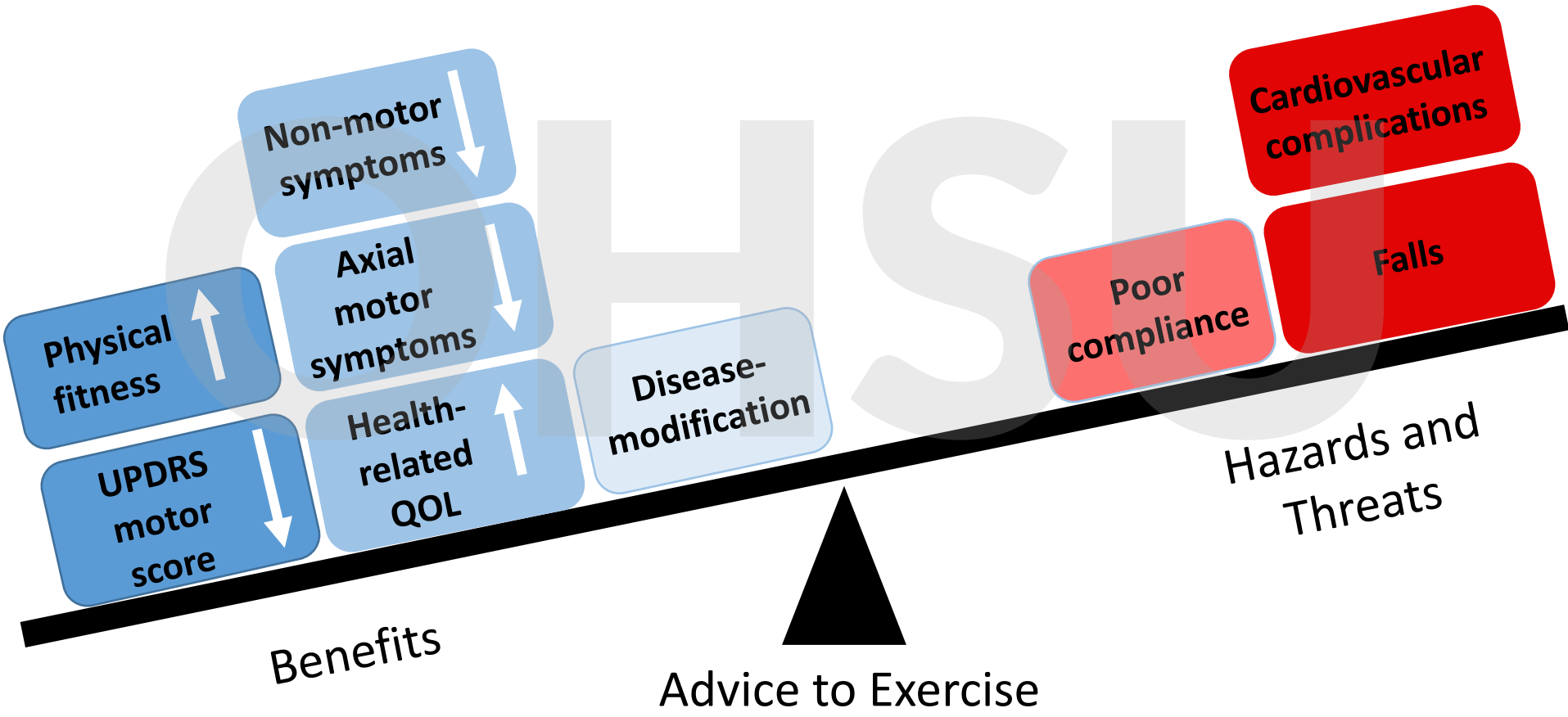
- Frequency: 3x/wk
- Duration:
  - 30 min at target intensity
  - 5-10 min warm up/cool down
  - 2-16 months (sustained)
- Intensity:
  - Moderate to High

Considerations

- No one form is better than another
- Task specificity in training
- Should be initiated in early PD

APTA CSM 2021 PD CPG Guidelines, not published

The argument for exercise



Adapted from Schootemeijer S et al; Neurotherapeutics 2020

Exercise options

Stanford MEDICINE | Stanford Parkinson's Community Outreach

PD Exercise Classes Live Online

Amy Says Dance

By Amy Herman Carlson (Los Angeles, CA)

Cost: Free

Classes: free form dance

Class Time (PT):

- Daily: 8:15am

Use this link to join the class at the scheduled time

APDA Northwest Chapter At-Home Exercise Options

By American Parkinson Disease Association (APDA) Northwest Chapter (Seattle, WA)

apda AMERICAN PARKINSON DISEASE ASSOCIATION

Cost: Free

Classes: body moves, chair yoga, dance, laughter yoga, movement studio, music therapy, Rock Steady Boxing, Sing Loud, yoga for PD

Class Times (PT):

- Monday: 10am (music therapy)
- Tuesday: 8am (dance moves), 1pm (chair yoga), 2:30pm (yoga for PD)
- Wednesday: 10:30am (body moves), 12:30pm (Sing Loud)
- Thursday: 7am (laughter yoga), 2:30pm (yoga for PD)

PF Fitness Fridays

Parkinson's Disease Exercises: Sit 'n' Fit

Parkinson's Foundation

13K views • 1 year ago

Parkinson's Disease Exercises: Head, Shoulders, Knees and...

Parkinson's Foundation

8.3K views • 1 year ago

Parkinson's Disease Exercises: Flexibility

Parkinson's Foundation

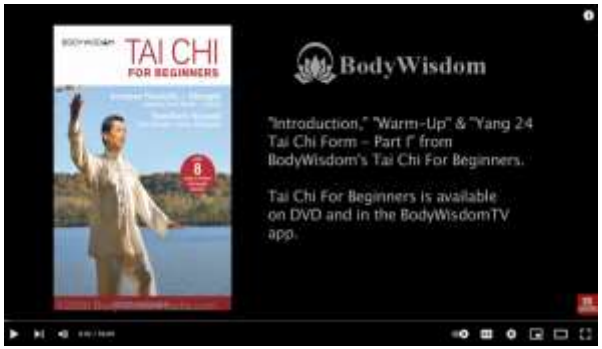
5K views • 1 year ago

Parkinson's Resources

Find an Exercise Class

WHAT'S YOUR MOTIVATION TO KEEP MOVING?

YouTube



Brian Grant exercise class finder

Psychology of Exercise and Parkinson's

We know exercise is beneficial for Parkinson's patients
Parkinson's patients are often less active than age-matched controls

BARRIERS

- Low outcome expectation
- Time
- Fear of falling

MOTIVATORS

- Enjoyable
- Less travel/cost less
- Include both social engagement and support
- Supervised by qualified professionals with Parkinson's Disease expertise
- Safe and adaptable

Ellis T et al; Phys Ther 2013; Paul SS et al; J Physiother 2021
Zaman A et al Disability and Rehab 2021

Contributors to **poor outcomes**

Cognitive difficulties

- Problem solving
- Dual tasking
- Visuo-spatial

Non-motor symptoms

- Orthostatic hypotension
- Fatigue
- Apathy

Medication side effects

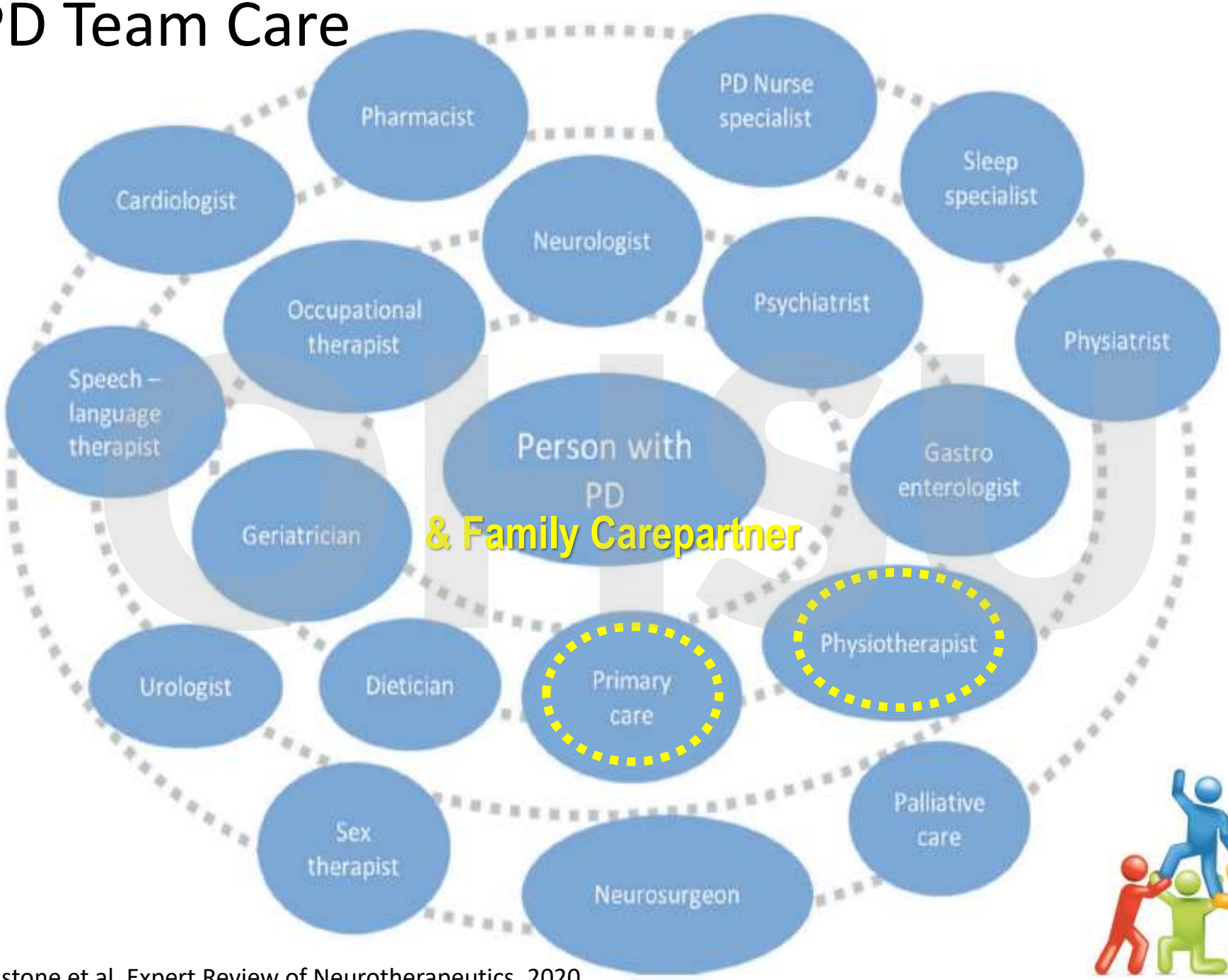
- Dyskinesia
- Impulsivity
- Motor fluctuations

Comorbidities that impact success of HEP

- Depression
- Mild cognitive impairment
- Medical co-morbidities
- # of meds
- Disease severity

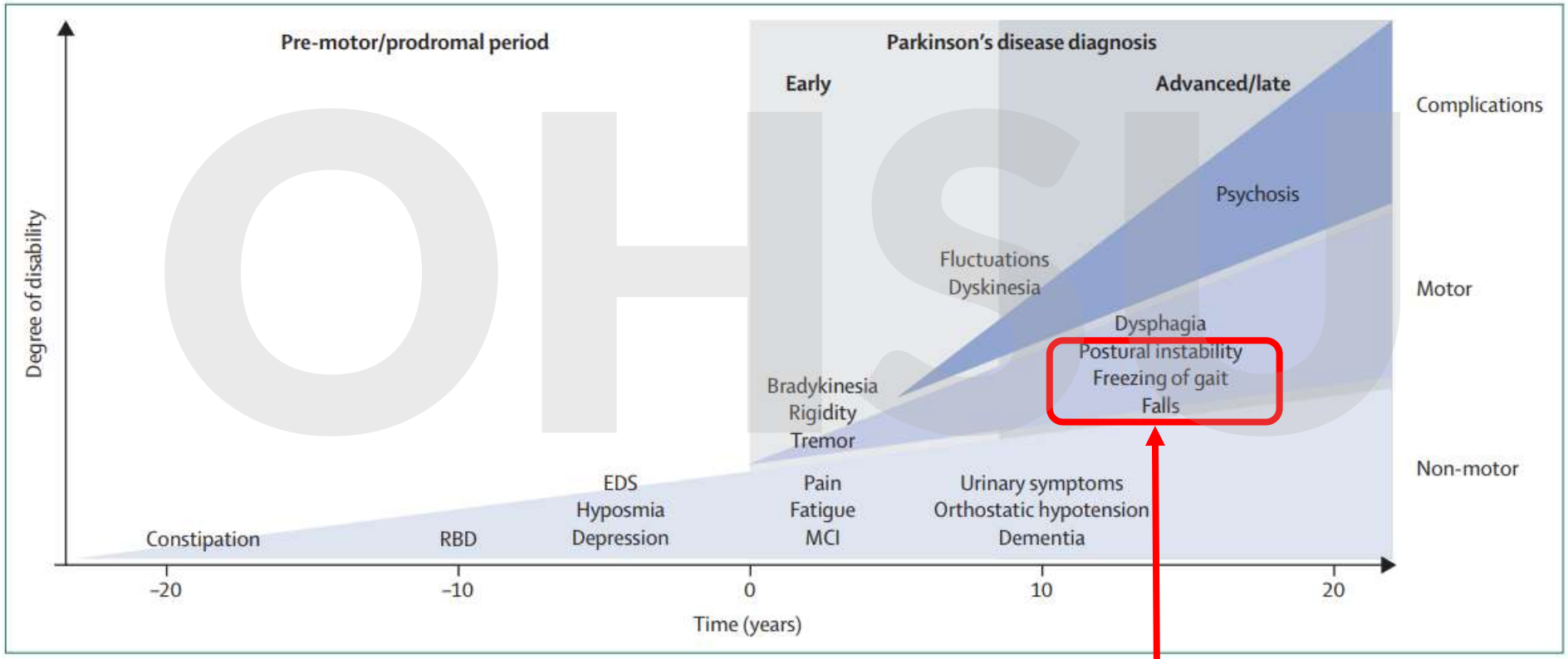
Borchers EE et al; Neurodegener Dis Manag 2019; King LA et al, JNPT 2015

PD Team Care



Lidstone et al, Expert Review of Neurotherapeutics, 2020.

Clinical symptoms and time course of Parkinson's disease progression



Physical Therapy

Kalia LV and Lang AE. Lancet. 2015

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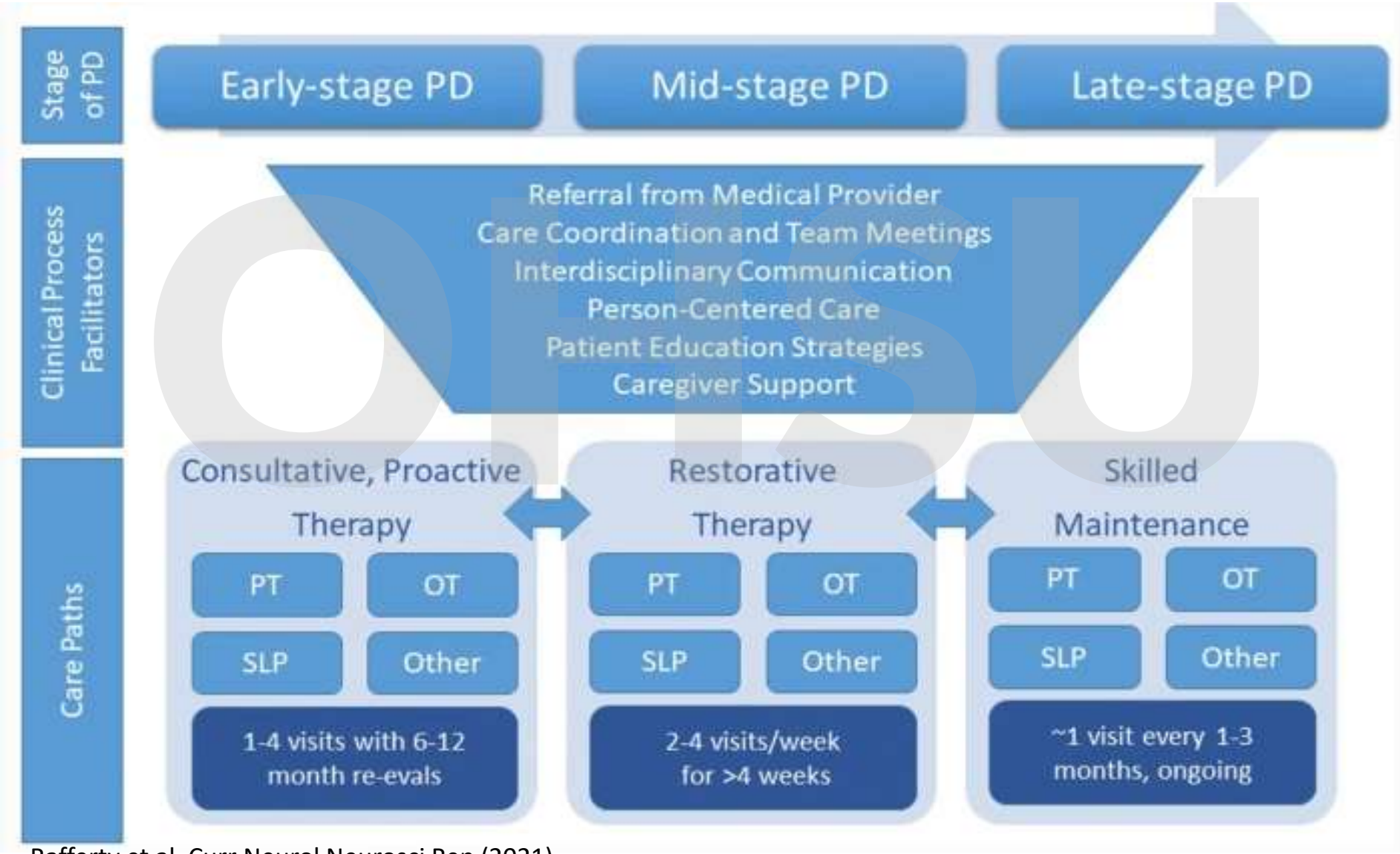
Role of Physical Therapy across the stages of Parkinson's Disease



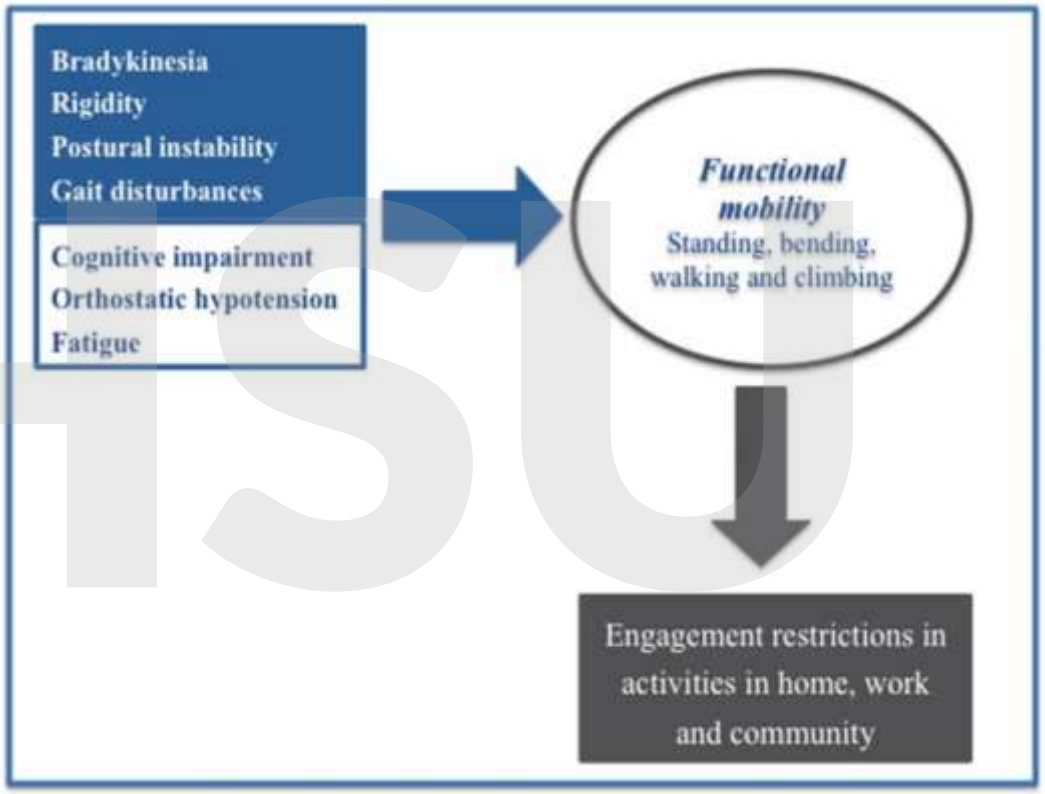
Rafferty et al, Curr Neurol Neurosci Rep (2021)

Early Stage PD: Proactive approach

- Shortly after diagnosis
- Establish baselines
- Provide education
- Initiate exercise program
- Patient Message:
  - "You can make a difference in the course of your disease by what you choose to do"
    - Exercise
    - Cognitive fitness and creativity
    - Emotional resilience

Mid Stage PD: Restorative therapy to promote functional improvements

- Falls: 35-90% of PWP have at least 1 fall
- Functional mobility: difficulty with sequencing
  - Standing up from a chair or toilet
  - Getting in/out of bed
  - Floor transfers
- Modifications of exercise program



Bouça-Machado R. et al Journal of Parkinson's disease 2018

Balance/Falls

Remediation

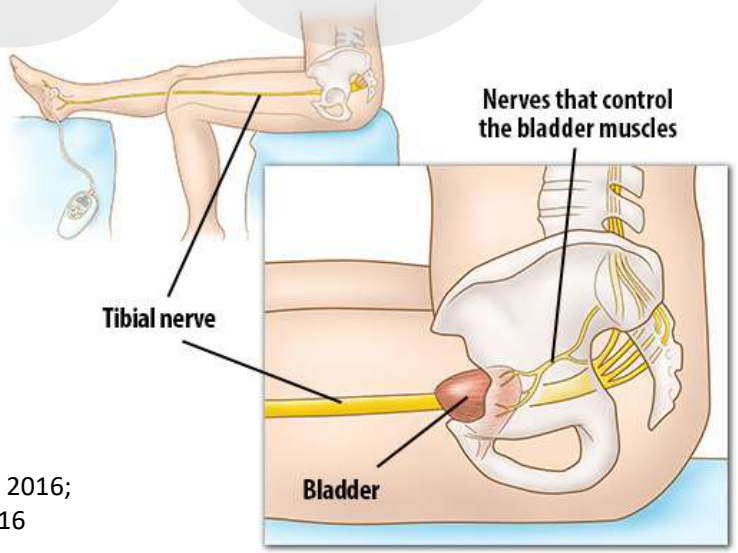
- Assessment of WHY
  - Meds/Dyskinesia
  - Orthostatic hypotension
  - Neuropathy
  - Environment
  - Posture
  - Postural instability
- Exercises to address deficits:
  - Compensatory stepping
  - Dual task training
  - Sensory Orientation training

Compensation

- Single point cane
- Bilateral trekking poles
- Walker
  - FWW: increases falls with PI
  - 4WW
  - U-step walker: with laser or metronome
- Protective equipment: knee pads, Safe hips, helmet

Pelvic floor PT

- **Urinary changes**
  - Pelvic floor PT: Frequency
  - TTNS: Transcutaneous-tibial nerve stimulation and PTNS: Percutaneous tibial nerve stimulation
    - Inhibit detrusor over-activity through afferent fibers to sacral cord
    - Potential use for both bladder and bowel issues
    - As effective as extended release oxybutynin in overactive bladder
  - OT: Mechanics of toileting
- **Constipation**
  - Potential for PT: abdominal mobilization/ positioning/IFC



Vaughen CP et al; Neurology. 2011; Manríquez VS et al; Eur J Obstet Gynecol Reprod Biol. 2016; Perissinotto MC et al; J Wound Ostomy Continence Nurs. 2015; Kabay S et al; Urology. 2016

Functional Mobility

	Sit to stand	Bed mobility	Floor transfer
Exercise	Strengthening quads/gluts	Stretching	• Strengthening: lunges • Stretching: hips
Sequencing	"Nose over toes"	Segmental rotation	Back chaining: crawling on bed or down onto knees
Environmental changes	• Higher chair • Lift chair	• Silk sheets/bottoms • Bed cane/transfer pole • Adjustable bed	Developing plan for falls if unable to get up

Late Stage PD: Skilled Maintenance

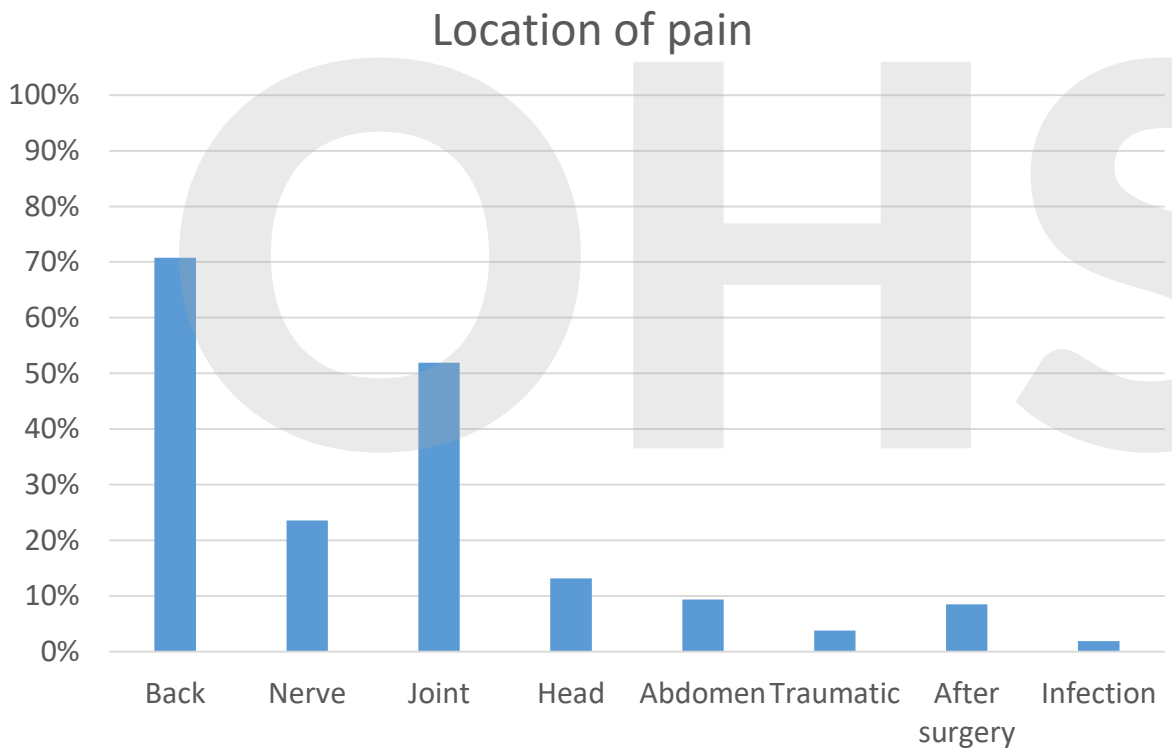
- Equipment needs
  - Wheelchairs
  - Bathroom equipment
  - Hospital bed
  - Hoyer lift

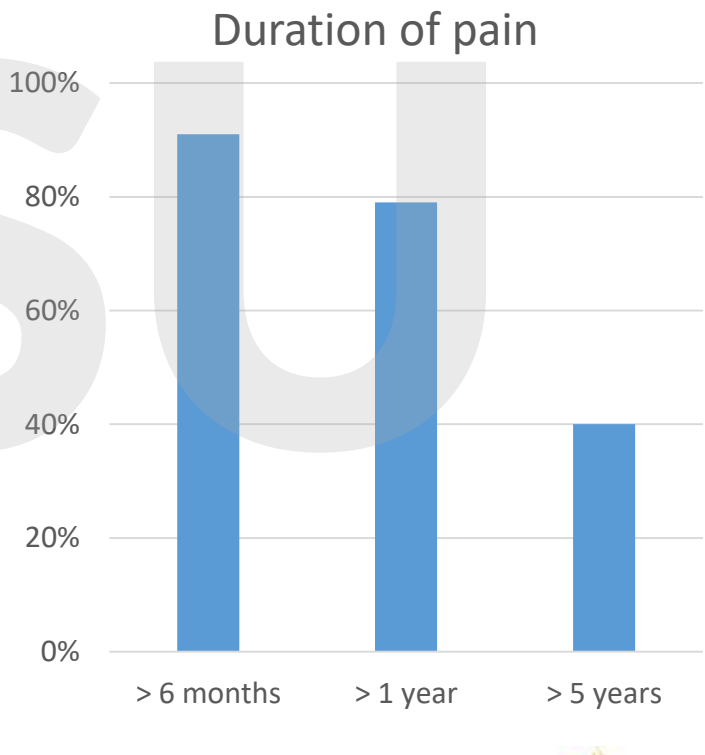
- Transfers
  - Caregiver training
  - Pressure sore prevention
- Stretching
  - Prevent contractures
- Pain management
  - Manual therapy
  - Modalities
  - Tape/bracing
  - Caregiver training

Pain

Musculoskeletal	Related to rigidity, postural changes and co-morbidities
Dystonia	Occurs during “off” or peak dose
Neuropathic	Radicular pain from compressive root lesions, focal or peripheral neuropathy
Central	Unusual burning, unrelated to motor phenomena
Akathisia:	Inner restlessness; Restless leg syndrome

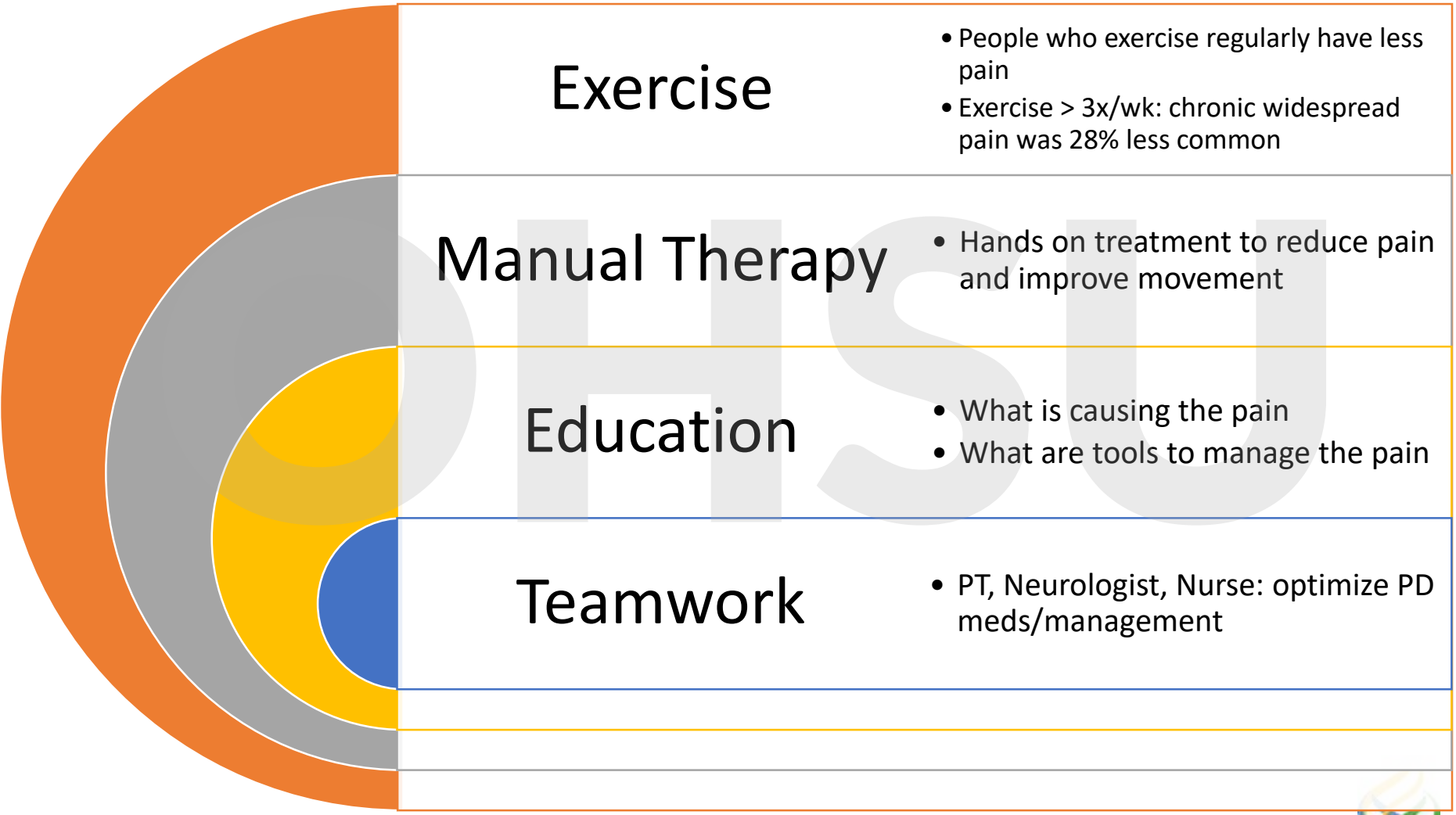
Pain and PD: Cross-sectional survey (n =181; Germany; H&Y 1-5)





Buhmann C et al; J Neurol 2017

4 ways that PTs manage pain



Holth HS et al; BMC Musculoskelet Disord. 2008

Physical Therapy: Insurance

Commercial insurance

- Many states have direct access x 30 days: do not need physician referral
- Each plan is individual for benefits

Medicare: Outpatient Therapy

- Need a referral
- Therapy cap: ~19 visits for PT and SLP OR ~19 visits for OT… then you need to show "medical necessity"

Medicare: Home Health

- Need a referral
- Covered 100% by Medicare A
- "Homebound"
  - You need the help of someone or a device (cane/walker) to get out of the house
  - It's hard to leave home (you don't leave often and if you do it's not for long and something important)

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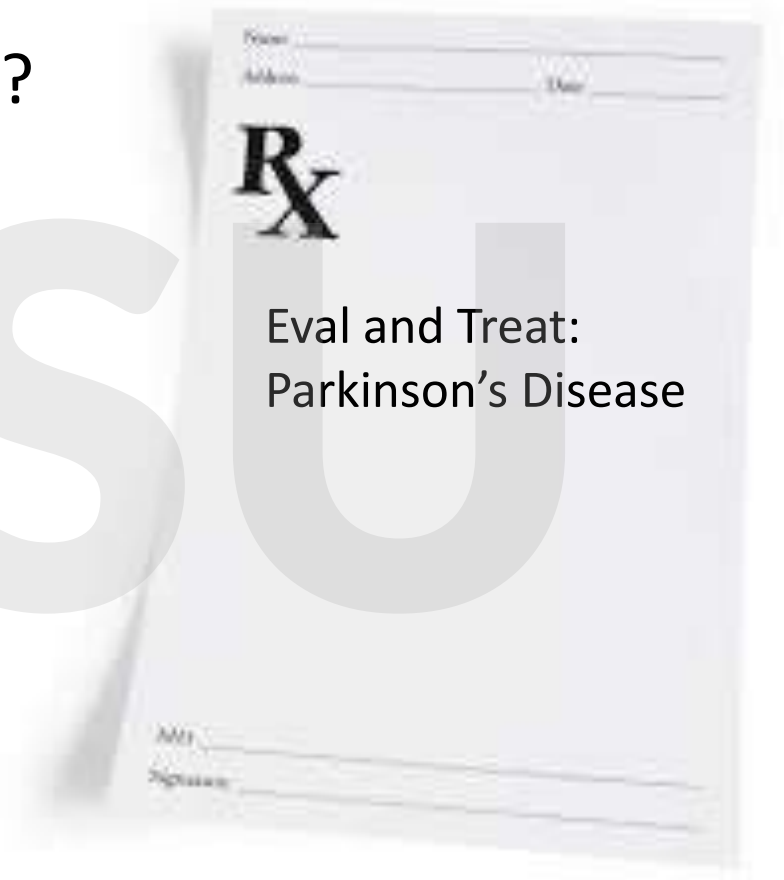
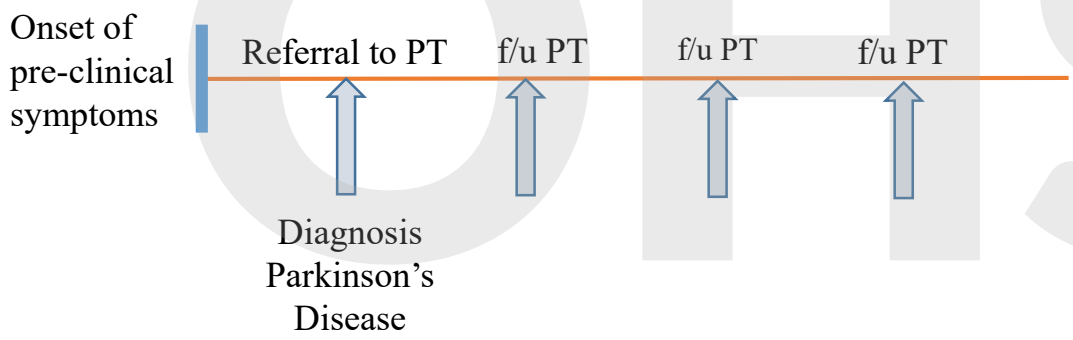
What could trigger a PT referral?

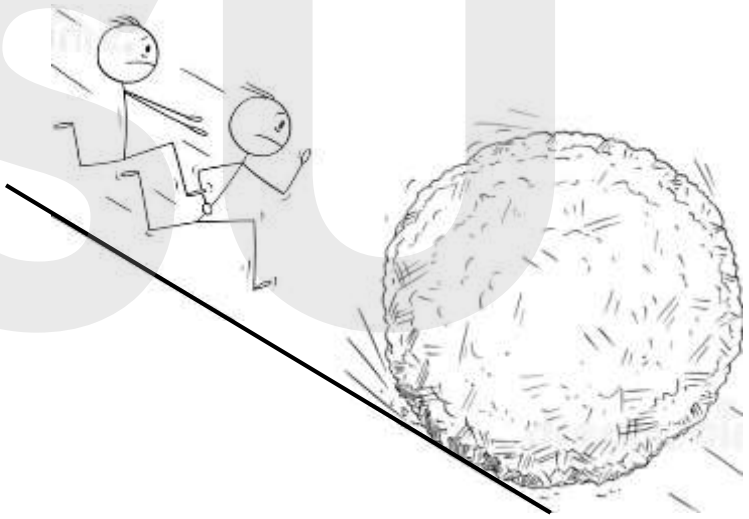
- What exercise is the **best** exercise?
- Is there a way to improve balance/decrease falls?
- How can I help my partner with transfers without getting hurt?
- What can I do about my pain?
- What type of mobility equipment should I have?



When should I come to Physical Therapy? Proactive vs Reactive

"Dentist model": Check in's every 6 months





Summary

- Exercise is a vital treatment component in PD
- Early referrals benefit patient but PT is useful throughout progression of PD

Prevention
- Early in the disease
- Neuro-plasticity
- Exercises targeted for future problems

Reaction
- Identify limitations
- Problem solve
- Exercises to address deficits

Compensation
- Assistive equipment
- QOL goals: safety vs independence
- Caregiver training

Thank You

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