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The Unique Role of Occupational Therapy in the Evaluation and Treatment of Individuals with Parkinson's Disease

Julia Wood MOT, OTR/L
Dan Aaron Parkinson's Rehabilitation Center

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Learning Outcomes

- Describe the impact of motor and non-motor symptoms on the daily function and participation of people with Parkinson's disease.
- Identify and list appropriate outcome measures to create a person-centered approach to the evaluation and treatment of people with Parkinson's disease.
- Identify and list occupation-based treatment strategies to address the participation challenges for people living with Parkinson's disease

2

PD Symptoms & Functional Impact

3

Cause & Prevalence

- Brains of people with PD demonstrate loss of dopaminergic neurons in the substantia nigra.
- Nearly one million will be living with Parkinson's disease (PD) in the U.S. by 2020
- More than 10 million people worldwide are living with PD
- Incidence of PD increases with age, but an estimated 4% of people with PD are diagnosed before age 50.

(National Parkinson's Foundation, 2018)

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Motor symptoms of PD

- ***Bradykinesia***
- ***Tremor***
- ***Rigidity***
- Hypokinesia
- Akinesia
- Micrographia
- Hypomimia
- Loss of automatic movement
- Gait changes—festination/freezing
- Decreased dexterity
- Deficits in force generation
- Dystonia
- Dyskinesia
- Postural instability occurs later—if early, can be a sign of an Atypical Parkinsonism

(Moustafa et al., 2016)

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Non-motor symptoms of PD

- Fatigue
- Depression/ Anxiety/Apathy
- Obsessive /compulsive symptoms
- Sleep disturbance
- Cognitive changes
- Olfaction
- Autonomic Abnormalities--OH
- Stomach and upper GI disturbance
- Sexual dysfunction

(Bonnet et al., 2012)

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Mid-stage Parkinson's disease

- Refers to expression of symptoms rather than time since onset
- Symptoms become less able to be suppressed with medications
- Motor fluctuations and off episodes occur

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Clinical presentation of late stage PD

- 40% live in aged care facilities
- 81% experience falls (23% sustained fractures)
- 84% demonstrate cognitive decline
- 48% fulfill criteria for dementia
- 50% experience hallucinations and depression
- 35% present with symptomatic postural hypotension
- 41% demonstrate urinary incontinence
- 50% experience choking

(Hely, et al., 2008)

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Vision changes in PD

- Contrast sensitivity
- Depth perception
- Visual processing speed
- Visual acuity
- Convergence insufficiency
- Impaired eye movements
- Impaired recognition motion/emotion/faces
- Peripheral vision impairments
- On/Off fluctuations

- Reduced contrast sensitivity
- Deficits in visual spatial, visual attention & motion perception
- Impaired visual processing speed
- Correlates with gait disturbances and postural instability

(Davidsdottir et al., 2005)(Uc et al., 2005) (Weil et al., 2016)

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Cognition in early PD

Impairments found in early, untreated PD

- Impaired processing speed
- Attention deficits
- Visuospatial impairments
- Executive dysfunction
- Memory impairments

Functional impact on process skills:

- Impaired problem solving
- Difficulty multi-tasking
- Decreased mental flexibility
- Decision making
- Difficulty planning and organizing

(Weintraub, et al. 2015)

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Impact of Symptoms on Function: Motor Skills

Loss of automatic movement

- Impaired motor planning
- Familiar, sequential patterns become impaired
- Decreased weight shift, loss of arm swing

Bradykinesia/Akinesia/Hypokinesia

- Reduced amplitude of movement
- Slow task performance
- Impaired transfers & bed mobility

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Impact of symptoms on function: Rigidity & Tremor

- Decreased dexterity
- Fine motor impairments
- Difficulty buttoning, handwriting, cutting food, retrieving items from wallet/pocket
- Impaired manipulation
- Impaired functional reach

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Social Interaction Skills

- Hypomimia—facial masking
- Vocal volume & speech changes
- Verbal fluency/bradyphrenia impact engagement in conversation
- Decreased gesturing
- Difficulty with written/email communication

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Causes of Falls in PD

- Longer disease duration
- Higher medication doses
- Dyskinesia with on-time
- Higher scores on MDS-UPDRS Motor & Non-motor and Motor Complications

(Schrag et al., 2015)

- Cognitive impairment (attention and executive dysfunction)
- Psychosis
- Sleep disorders (RBD)
- CV Dysfunction (autonomic impairment)
- More likely taking antidepressants

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Stress & PD

- Emotional stress can increase motor symptoms
- Studies indicate that stress can impinge on dopaminergic control of motor movements
- The timing and intensity of stressors may affect the efficiency of exercise being neuroprotective.
- PD patients with depression and/or chronic stress may experience a chronic neuroinflammatory environment perhaps linked to exacerbated PD pathology.

(Hemmerle, Herman, & Seroogy, 2012)

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Evaluation & Outcomes

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CONTINUED

OT Approach to Assessment

Observe	Observe occupational performance
Assess	Assess body structure/function strengths and limitations
Consider	Consider the environment
Select	Select tools to obtain information and develop a client centered occupational profile
Incorporate	Incorporate care partner when appropriate

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CONTINUED

Facial Masking & Misperception

- Impact on perception of clinician high mask vs. low mask
- Depression
- Sociability
- Social support
- Cognitive competence

(Tickle-Degnen, Zebrowitz & Ma, 2011)

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Parkinson's Disease Questionnaire (PDQ-39)

- *Due to having Parkinson's disease, how often during the last month have you had difficulty/problems…..? (never, occasionally, sometimes, often, always)*
  - ✓ *Mobility*
  - ✓ *ADL*
  - ✓ *Quality of life*
  - ✓ *Social stigma & support*
  - ✓ *Cognition*
  - ✓ *Communication*
  - ✓ *Pain*
  - ✓ *Emotional well-being*

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Assessment of Activity & Participation

Canadian Occupational Performance Measure (COPM)
Patient Specific Functional Scale (PSFS)
Physical Performance Test (PPT)
Parkinson's Activity Scale (PAS)
Performance Assessment of Self-Care Skills (PASS)
Activity Card Sort
Nottingham Extended Activities of Daily Living

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Modified Parkinson's Activity Scale (PAS)

Performance based format of 14 test items in three domains

Chair transfers (2 items), gait akinesia(6 items), and bed mobility(6 items)

Observer scores the quality of movements as they are performed.

Ranked 0 (normal)-4 (physically dependent)

https://www.sralab.org/rehabilitation-measures/modified-parkinson-activity-scale

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Physical Performance Test (PPT)

- Assess multiple domains of physical function with observation of simulated ADLs in older adults
- Simulated and timed ADL's: writing, eating, dressing, reaching and functional mobility
- Can be adapted to 7 or 9 item format

- https://www.sralab.org/rehabilitation-measures/physical-performance-test

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CONTINUED

Assessment of Participation

Activity Card Sort, 2nd Edition (ACS)

- Promotes choosing client centered interventions, based on client interests
- Measures changes in participation
- Guides discussion about current and prior interests and perceived roles

(Baum & Edwards, 2008)

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CONTINUED

Assessment of balance and falls

- Five Time Sit to Stand
- Timed Up & Go (TUG) & Timed Up and Go-Cognition (TUG-COG)
- Mini best test
- Activities Specific Balance Confidence (ABC) Scale

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Timed Up and Go (TUG) & Timed Up and Go – Cognition (TUG-cog)

- Quick and simple to administer
- Strong reliability and validity
- Readily accessible equipment
- Involves transfer to stand, walk short distance, turn and return to sit

(Podsiadlo & Richardson, 1991)

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Hand Dexterity Assessments

- 9 Hole Peg Test
  - MDC: 2.6 sec dominant hand, 1.3 sec non-dominant hand
- MAM -36: (Manual Ability Measure)
- Coin Rotation Task
- Purdue Peg Board Test

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CONTINUED

Handwriting Assessment

(Nackaerts, et al., 2017)

Systematic Screening of Handwriting Difficulties (SOS-test)

- 87 patients with PD and 26 HC
- PD patients had smaller and slower HW with worse quality
- SOS outcomes significantly correlated with fine motor skill performance, disease duration, and severity.
- Demonstrated excellent intrarater, interrater and test-retest reliability

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Cognitive Screens

- Montreal Cognitive Assessment (MOCA)
- Mini Mental Status Examination (MMSE)—not sensitive to MCI
- Saint Louis University Mental Status (SLUMS)
- Mini Mental Parkinson's
- Trails A & B
- Scopa-Cog

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Pelli Robson Contrast Sensitivity Test

- PD patients may have normal visual acuity but impaired contrast detection.
- Contrast sensitivity may improve with dopaminergic therapy in early and mid stages, but eventually declines with disease progression

(Weil et al., 2017)

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Mood & Depression

Beck Depression Inventory (BDI)
- 21 item questionnaire, provides severity rating

Hospital Anxiety & Depression Scale (HADS)
- self report inventory

Geriatric Depression Scale (GDS)
- Long form (30 questions)
- Short form (15 questions)
- Publicly accessible, takes <10 mins. to administer

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MDS review of fatigue rating scales (Friedman et al., 2010)

Functional Assessment of Chronic Illness Therapy-Fatigue Scale (FACIT-F)	Patient reported rating scale consisting of 13 items
Parkinson's Fatigue Scale (PFS-16), (Brown et al., 2005)	Self report to questions regarding last 2 weeks
Fatigue Severity Scale	9 item questionnaire with Likert scale 1-7

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Sleep

- ***The Parkinson's Disease Sleep Scale (PDSS)*** -- self-rate and quantify the level of sleep disruption being experienced

https://www.parkinsons.org.uk/professionals/resources/parkinsons-disease-sleep-scale-pdss

- ***The Sleep Hygiene Index (SHI) –*** 13-item self-report measure designed to assess the practice of sleep hygiene behaviors. Each item is rated on a five-point scale ranging from 0 (never) to 4(always).

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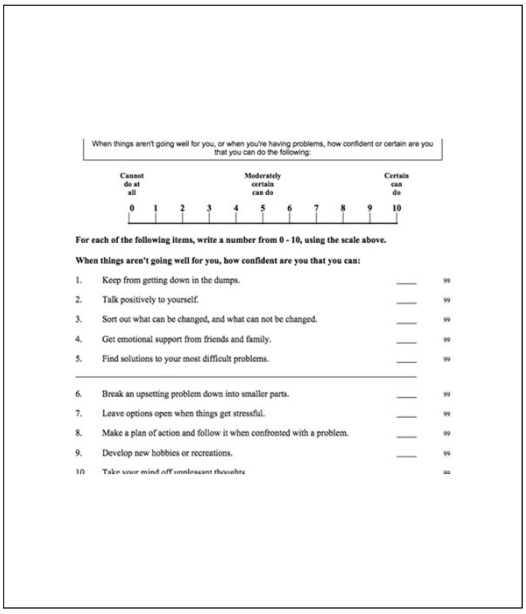
Coping Self-Efficacy Scale

- Provides a measure of a person's perceived ability to cope effectively with life challenges, as well as a way to assess changes in CSE over time



When things aren't going well for you, or when you're having problems, how confident or certain are you that you can do the following:

Cannot do at all — Moderately certain can do — Certain can do

0 1 2 3 4 5 6 7 8 9 10

For each of the following items, write a number from 0 - 10, using the scale above.

When things aren't going well for you, how confident are you that you can:

1. Keep from getting down in the dumps. ___ 99
2. Talk positively to yourself. ___ 99
3. Sort out what can be changed, and what can not be changed. ___ 99
4. Get emotional support from friends and family. ___ 99
5. Find solutions to your most difficult problems. ___ 99

6. Break an upsetting problem down into smaller parts. ___ 99
7. Leave options open when things get stressful. ___ 99
8. Make a plan of action and follow it when confronted with a problem. ___ 99
9. Develop new hobbies or recreations. ___ 99
10. Take your mind off unpleasant thoughts ___ 99

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OT Approach to Driving

- Educate client in the risk of driving with known impairment
- Test Perception/cognition—Trails B, UFOV
- ***Hartford We Need to Talk*** program materials to support family discussion
- Mandatory Reporter considerations
- Refer to CDRS for behind the wheel driving evaluation when appropriate
- Report concerns to M.D.

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Resources

- American Physical Therapy Association (APTA) PD EDGE Taskforce

http://www.neuropt.org/professional-resources/neurology-section-outcome-measures-recommendations/parkinson-disease

- Shirley Ryan Ability Lab (formerly rehab measures)

https://www.sralab.org/rehabilitationmeasures/database

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Case Study

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Meet Linda

70-year-old female with recent history of Parkinson's disease

Strengths:

- Supportive partner, family & friends.
- Motivated to participate in exercise to improve symptom management and forestall use of medications for PD
- Retired social worker with excellent insight into strengths and impairments

Participation Challenges:

- Difficulty using left hand/arm in manipulation of jewelry and clothing
- Daily fatigue that decreases activity tolerance and impacts participation in meal preparation activities
- Increased time for completion of dressing tasks

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Nine Hole Peg Test

- A timed, objective test of finger dexterity/fine motor coordination
- Quick and easy to administer
- Researched in Parkinson's disease
- Selected in this case as a proximal outcome to demonstrate improved functional use of affected left hand following intervention

"I want my left hand to work again….I have trouble hooking zippers and fastening necklace clasps".

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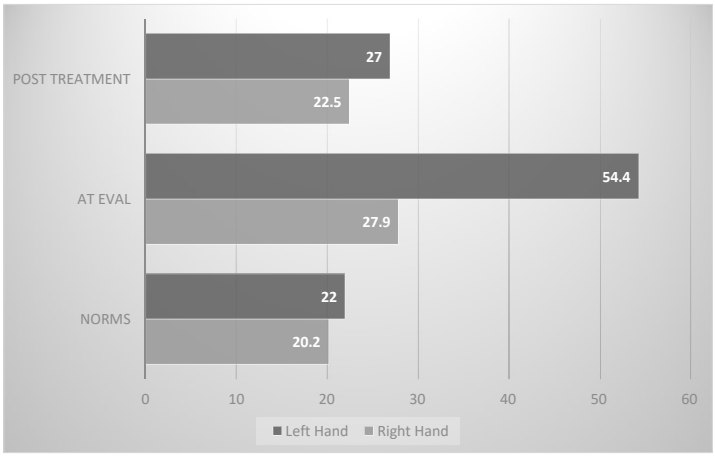

Nine Hole Peg Test

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Fatigue Severity Scale (FSS)

- A 9-item self report questionnaire
- Measures the severity of fatigue and its impact on an individual's activities and lifestyle
- The items are scored on a 7 point scale with 1 = strongly disagree and 7= strongly agree.
- The minimum score = 9 and maximum score possible = 63. Higher the score suggests greater fatigue severity.
- Selected in this case as a proximal outcome to measure if intervention reduces fatigue for Linda.

"*I want to be a able to cook dinner without taking rest breaks—I'm just so tired all the time*"

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Fatigue at Onset= 46/63

Fatigue after intervention= 27/63

Fatigue Severity Scale (FSS)

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Patient Specific Functional Scale (PSFS)

- Individuals rate their perceived ability to complete a self-selected activity on an 11-point scale
  - "0" represents “unable to perform”
  - "10" represents “able to perform at prior level”
- Individuals select a rating 0 to 10 that best describes their current level of ability on each activity selected
- Selected as a distal outcome measure of improved participation and task completion

Linda selected the following activities:

- zipper manipulation a 4/10, fastening jewelry 3/10, meal prep 5/10, and pace for dressing tasks 4/10.

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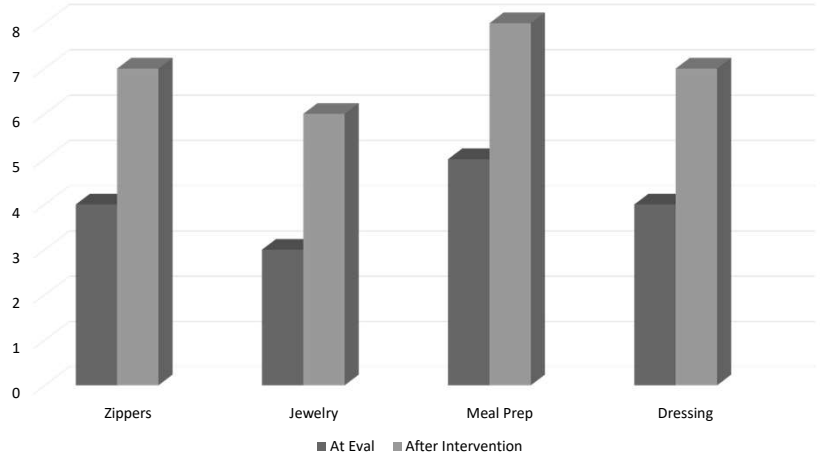
Patient Specific Functional Scale (PSFS)



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Summary

- Parkinson's disease is a complex neurodegenerative disorder involving an array of motor and non-motor symptoms
- These symptoms can impact all areas of ADL, IADL, rest and leisure activities, and ultimately QOL.
- Occupational therapists can play a unique role in providing a client centered approach to assessment of strengths and challenges to support participation.

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Questions?

Please email questions to:

Julia Wood, OTR/L
jmwood525@gmail.com

Thank you for your attention!

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