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A Practical Approach to Evaluating Individuals with Parkinson's disease

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The Dan Aaron Parkinson’s Rehab Center at Pennsylvania Hospital
Philadelphia, PA
Penn Therapy & Fitness/Good Shepherd Penn Partners

Course Overview

- OT Research for PD – Where are we now?
- Pathophysiology
- Motor Symptoms
- Non-Motor Symptoms
- Medical & Surgical Treatments
  - Pharmacology and DBS
  - Performing an Intake History
  - Evaluation & Outcome Measures
Science catches up with Rehab

We finally have:

- evidence for the value of exercise in PD (not just meds & surgery)
- identified key principles of exercise that drive activity-dependent neural plasticity
- demonstrated that exercise can: improve brain functioning and may slow disease progression

OT Research in PD – 2010 review

- 1997–2008
- 8 studies
  - 3 on OT task-related training
  - 2 on functional training with external cues
  - 3 on OT as part of interdisciplinary treatment
- "it is difficult to determine conclusively the effect of OT…
- evidence to suggest that treatment produces improvements in motor and QOL for the duration of therapy."


OT Research in PD – 2013 Study

- 43 subjects, 10 weeks of home-based OT following the Dutch guidelines of OT in PD
- COPM used at outcome tool but only 60% of the priorities identified by the tool were addressed in tx
- "perceived 'more grip on the situation' and used 'practical advices that make life easier.'"
- "outcome measures need to be refined, treatment intensity should be increased, and aligning priorities with goals and interventions together with the patients and caregivers…"

OT Research in PD – 2014 Study

- 191 subjects, ~6 yrs. with PD (H&Y 1-2), ~70 y/o
- 16 home sessions over 10 weeks
- Canadian Occupational Performance Measure (COPM)
- QOL, Caregiver burden

Results:
- >50% improved in hygiene, dressing, stairs, QOL
- Decreased effects after 3 months


Pathophysiology of PD

Two Pathological Features:
1. Progressive death of Dopaminergic neurons in the Substantia Nigra (80% cell death prior to sx’s appearing)
   - Dopamine transmits signals for smooth, coordinated mov’ts
   - Leads to other mov’t control centers being unregulated
   - Basal Ganglia applies too much “brake”

Functional Imaging: Healthy Controls vs Parkinson’s Disease

SPECT- Dopamine transporter uptake scans (DAT scan)

Healthy subject
Parkinson’s disease patient – Hoehn-Yahr Stage 1

Courtesy of K. Monk.
2. **Presence of Lewy Bodies**
   - Abnormal intraneuronal protein
   - Develop within the remaining dopaminergic neurons & in cerebral cortex

**Motor Symptoms**

**Classic features**

- Resting Tremor (~70%)
- Rigidity (invol. ↑ in muscle tone to PROM)
- Bradykinesia – slowness of movement
- Postural Instability → Falls (last to occur)

**PD is a Motor & Sensory/Perceptual Disorder**

“*Motor-Sensory Disconnect*”
The person with PD is unable to use their own internal feedback to regulate the size or speed of their movement

**Bradykinesia** = Too Slow
**Hypokinesia** = Too Small
Sensory system

*Not enough feedback*

- Do not recognize mov’t is too small
- When told to make the mov’t bigger, feel as though the mov’t is now “too big”
- When told to speak louder, feel as though they are shouting
- Poor recognition of:
  - changes in posture – especially with activity
  - arm not swinging

Motor System

*Too much brake*

- ↓ ability to regulate muscle activation
- Do not generate enough force, quickly enough
- Do not generate the force needed to stop mov’t

**Difficulties with:**

- Preparation for Mov’t
- Selection/Initiation of Mov’t
- Completion of Mov’t
- Linking Mov’t Sequences
- Mov’t’s blend together

Eval Gait
Motor Symptoms

Gait and Balance

- Slowed or absent automatic movements:
  - ↓ Heel strike & Reciprocal UE Swing
  - Shortened Step/Stride Length
  - Slowed Velocity
  - Turning
    - Multi-step, Pivot & Cross-over
    - Festination & Retropulsion
  - Freezing of Gait (FOG)
  - Slowed or absent Righting reflexes
  - Narrow BOS
  - COG anterior to BOS
Falls

- 1/3 of people over 65 report falls
- 70% of PWP fall 1x/year
- 50% fall 2x or more/year
- Hip fracture & head trauma are the most common injuries
- Also increased FOF and reduced QOL
- Meta-analysis of prospective fall studies:
  - 57% of PWP with a h/o falls fell during a 3-month surveillance period…but so did 21% who had no history of falls


Freezing of Gait (FOG)

“Motor Block”
- Akinesia or
- Trembling in place due to fighting the freeze
- least responsive to meds & surgery
- commonly occurs while performing complex motor sequences - in areas where patients:
  - make multiple small steps and turns
  - try to perform a new task in a relatively quick amount of time
- Commonly occur: with direction changes, small spaces, crowds, distraction, doorways & especially turns (360° with dual task is one of the worst)


FOG

The FOG occurs in part:
- because the PD brain cannot adjust speed or size of steps quickly enough to changing environment

AND

- if the patient does not allow enough time for each movement in the sequence, then the movements all blend together and are performed simultaneously
  “Too many plugs in the outlet cause a short-circuit”
FOG

- Occurs at all disease stages
  - 2011 study - 27% of patients in the very early stages showed FOG

- 86% of FOG - start hesitation, 71% - turn hesitation

- FOG severity & frequency are associated with reduced activity levels

- Those with FOG show more cognitive deficits

Micrographia

Visual Changes
- Slowed scanning & anticipatory eye movements
- Less ability to determine changes in walking surface
- Difficulty with contrast sensitivity & visuospatial perception

Speech and Swallowing
- ↑ or ↓ speed
- Softer volume & monotone
- ↓ facial movement
- Poor self awareness
- Occurs early in disease

Tx: Lee Silverman Voice Tx (LSVT® Loud)
- Dysphagia in later stages
- ↓ habitual swallowing + slowness + ↓ posture = drooling

Dysphagia in later stages
Dystonia
Abnormal tone

- Shoulder ext & IR, with wrist & finger flex
- Toe curling, ankle PF & Inversion
- Writer’s cramp
- “Charlie horse”
- Blepharospasm (essentially “blind”)
- Generally occur when levodopa levels are low, but can occur at peak levels

Non-Motor Manifestations

Autonomic Dysfunction
- Urinary Frequency/Incontinence
  - ↓ detrusor muscle inhibition
  - Bladder hyperreflexia with ↓ bladder volumes
- Constipation
  - ↓ activity, ↓ H2O intake, ↓ peristalsis
  - Medication side effects
- Orthostatic hypotension
- Thermoregulatory abnormalities
- Excessive sweating

Non-Motor Manifestations

Sleep Disturbances
- Fragmentation
- REM Behavioral D/O – act out dreams due to loss of normal voluntary muscle atonia
  - prevalence 15-47%
- Excessive Daytime Sleepiness/“Sleep Attacks”
- Restless Leg Syndrome

Tx: Meds, good sleep hygiene, aerobic exercise, recommendations on “good napping” times and places
Cognitive Changes

- Executive functioning
  - Identify problem
  - Planning course of action
  - Initiate action
  - Evaluate self
  - MCI present early on
  - Bradyphrenia
  - Attention (shifting or selecting)
  - Distractibility & Concentration
  - STM
  - Multitasking ability
  - Organizational ability

Dementia in PD

- 24 to 31% of patients with PD have dementia
  Longitudinal study of 233 patients (followed for 12 yrs): 60% prevalence of dementia

Psychosis

- Hallucinations
- Delusional
- Paranoid thoughts

Depression & Anxiety

**Depression** – Prevalence of up to 50%
  - most common neuropsychiatric symptom
  - major factor impacting QOL

**Anxiety:** 40-50% (co-morbid with depression)

- Both can precede onset of motor symptoms
- Worse during "off" times – leading to panic attacks

**Apathy:** up 40%
Non-motor Symptoms Effect on Therapy - Cognitive

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Effect on Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety &amp; Depression</td>
<td>Low energy, fear, poor motivation, fatigue, poor compliance</td>
</tr>
<tr>
<td>Bradyphrenia &amp; Mild Cognitive Impairment (MCI)</td>
<td>Require ↑ time to learn new info., or answer questions</td>
</tr>
<tr>
<td>↓ Attention (shifting or selecting)</td>
<td>May need quiet enviro., more redirection, simple commands and repetition</td>
</tr>
<tr>
<td>↑ Distractibility &amp; ↓ Concentration</td>
<td>Cognitive therapy with SLP</td>
</tr>
<tr>
<td>↓ Executive functioning – identify, problem, planning course of action, initiate action, evaluate self</td>
<td>↓ Problem solving, may repeat same incorrect tech several times, poor self analysis &amp; self correction</td>
</tr>
<tr>
<td>↓ Multi or dual tasking ability</td>
<td>May need to begin with 1 task at a time before adding ↑ cognitive &amp; motor loads</td>
</tr>
<tr>
<td>↓ Organizational ability</td>
<td>Lists, reminders, timers, simplify, delegate</td>
</tr>
</tbody>
</table>

Non-motor Symptoms Effect on Therapy

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Effect on Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep Disturbances (REM behavioral d/o, excessive daytime sleepiness)</td>
<td>Fatigue, low energy</td>
</tr>
<tr>
<td>Bladder Urgency &amp; Frequency</td>
<td>Shifts focus from task at hand, to “I need to go now”. Commonly freeze-provoking</td>
</tr>
<tr>
<td>Orthostatic Hypotension</td>
<td>Dizziness, unsteadiness, falls, fear</td>
</tr>
<tr>
<td>Hyposmia</td>
<td>Low energy, hypoglycemia due to not eating, “I can’t taste anything.”</td>
</tr>
<tr>
<td>Pain/Paraesthesia</td>
<td>Less active, self-limiting activity, fear</td>
</tr>
</tbody>
</table>

Young Onset PD

- 5-10% of PWP dx before 40 y/o (YOPD)
- Often misdiagnosed & mismanaged – shoulder/foot/back injury
- More challenges due work & child responsibilities
- Generally progresses slower than older onset
- More difficulties with:
  - fatigue
  - anxiety & depression
  - cramping & dystonia
- NEED to begin tx ASAP – it is the therapist’s job to “unmask the symptoms”
Medical Management

**Dopaminergic**
- **Sinemet** (Carbidopa/Levodopa)
  - Immediate Release, CR, Liquid
- **Parcopa** (orally disintegrating tablets)
  - Orthostatic hypotension, “on/off” times, dyskinesia, hallucinations
  - High protein can interfere with absorption
  - Less effective over time
  - Less likely to be started in those with YOPD

**Medical Management**

**Dopamine Agonists**
- **Mirapex, Requip & XL, Parlodel**
  - Brain thinks there is more dopamine & sandpapers the receptors
  - Delays need for Sinemet, ↑ use for YOPD
  - Drowsiness, edema, obsessive problems
- **Neupro (Rotigotine Transdermal System)**
  - 24 hr. patch
  - Contains sulfites – those with asthma are more sensitive to
  - Skin irritation, drowsiness, can worsen psychotic-like behavior

**Medical Management**

- **Apokyn**
  - Injection pen
  - Immediate release (10 min.) – last up to 45-60 min.
  - Used for severe “off” times
  - Need an anti-nausea medication with this

**Anticholinergics**
- **Artane,Cogentin**
  - ↓ the ↑ amt. of acetylcholine
  - Control tremor early on
  - Dry mouth, sedation, confusion, urinary retention
Medical Management

MAO-B Inhibitors

- **Selegiline (Eldepryl)**
  - Blocks this enzyme that breaks down dopamine
  - Orthostatic hypotension, insomnia

- **Azilect (Rasagiline)**
  - Delaying need for Sinemet in early dx pt’s
  - Less "off" time for pt’s who fluctuate
  - May be neuro-protective
  - Once daily dose

Medical Management

COMT Inhibitors

- **Comtan**
  - Blocks this enzyme that inactivates dopamine, prolongs Sinemet time
  - Side effects similar to Sinemet

- **Stalevo (Combo of Sinemet & Comtan)**
  - ↓ end-of-dose "wearing off"
  - ↑ control of body movements
  - Side effects similar to Sinemet

Medical Management

- **Antiviral**
  - **Amantadine**
    - Helps rigidity & bradykinesia
    - Low doses smooth fluctuations
    - High does suppress dyskinesias
    - Edema & purple blotches, insomnia

- **Dementia**
  - **Exelon**
    - treatment of dementia in PD
    - Nausea, vomiting, loss of appetite, weight loss
  - **Aricept**
    - possible improvements in attention
    - nausea, sleepiness, and slowing heart rate
Medication side effects:  

<table>
<thead>
<tr>
<th>Side Effect</th>
<th>Effect on Therapy Session</th>
</tr>
</thead>
</table>
| Dyskinesia                   | - Instability  
  - Teach safety & compensation tech. |
| Orthostatic Hypotension      | Worsening of dizziness, unsteadiness, falls, fear  
  - Pause after movement, hydration, compression stockings |
| “Off” Times                  | Focus of treatment completely changes if it appears during session  
  - Need to deal with mobility issues for on & off times (↑ caregiver training) |
| Bradykinesia/Akinesia, Dystonia, Anxiety, Sweating, Hot Flashes, Pain | - Attentional Cues, Care-partner training  
  - Deep breathing, relaxation, distraction  
  - Cool room temperature, cold packs, cool towel  
  - Massage |

Deep Brain Stimulation (DBS)

- Electrodes in Subthalamic Nucleus (STN) or Globus Pallidus Interna (GPi)
- Connected to neurostimulator (~pacemaker) under the clavicle area
  - Can reduce +/- control rigidity, bradykinesia/akinesia, tremor & dyskinesia
  - Pt. can only return to their best “on time”  
  - Can reduce amount of meds needed (~30%)  
  - STN can lead to depression, apathy, impulsivity, worsened verbal fluency, & executive dysfunction  
  - Not as effective on gait & balance

Falls & FOF with DBS

2013 survey by the Parkinson Alliance
- 334 with DBS (STN), 819 without
- 50 states were represented
- Younger group - 50-69; Older group – 70+
- DBS (controlling for age & disease duration):
  - Increased FOF  
  - 2.52 times the risk of falling  
  - Greater frequency of falls with inc. time of PD  
  - Self reports of more difficulty with mobility, speech, & stigma
Implications of study

“individuals with DBS therapy may have extra ability to move without functional impairment, but lack the feedback and control to do so safely”

“individuals may be more confident or capable to increase engagement in activities due to the reduced motor symptoms, but may neglect to attend to or take into account the continued difficulties related to PD (such as poor balance). Moreover, even though DBS therapy benefits some motor functions, the body/functional capability may still be constrained by other factors that may result in increased falls.”

Unmet Rehabilitation & Fitness Needs

Those with PD are ~1/3 less active as compared to healthy controls

Nimwegen, MV. J Neuro, 2011;258(12)

• Only ~15% of early diagnosed pts. are referred to therapy or fitness programs
• Referral generally not made until pts. experience disability (usually loss of balance) - years after the diagnosis.
• By this time there is already a decrease in their overall level of physical activity and withdraw from recreational and leisure activities

How Can We Change This?

• Need to encourage referrals to therapy immediately after dx
• Need readily available early intervention programs
• Need opportunities for continuous access to fitness
• Need programs that are neuroplasticity-principled:
  ◦ Try to limit compensatory training & encourage learning
  ◦ Challenge the brain to adapt/reorganize

How Care Model Should Look

- Diagnosed with PD and immediately sent for therapy
- Begin program for prevention and restoration
- Tailor tx to patient's needs
- Increase focus on new ways to support exercise adherence
  - Group classes
  - Phone and web visits/chats
  - Schedule regular follow-up reassessments

*People with PD NEED continuous monitoring and intervention over the course of their disease.*

Barriers to Exercise

Perceived barriers by community-dwelling adults with PD:
1. Low outcome expectation from exercise
2. Lack of time
3. Fear of falling

How can we change this?
- Education
- Realistic goal setting
- Time-management, organization
- Setting exercise schedule

“*You wouldn't want to skip your Sinemet – why do you skip your exercise?*”

Self-efficacy

- Self-efficacy - a person’s belief their capabilities to overcome barriers to exercising
- In community-dwelling PWP: self-efficacy & education level determined exercise behavior...not disease severity, or self-rated mobility problems in the home or community
- Therapy interventions often focus on the tech of the exercise and dose, but not on self-efficacy to keep the patient exercising
- Self-management approaches should be incorporated into the tx program

Exercise Adherence in Older Adults

The belief one has in one's capabilities to successfully carry out a course of action

Adherence

Self-efficacy

•Managing time*
•Self-monitoring*
•Eliciting support*

Self-regulation

Executive Function*

•Dual Task*
•Reaction Time*

Self-efficacy

Reduced in PD

Self-efficacy

Self-management approaches:
1. Weekly action plans and feedback
2. Modeling of behaviors
3. Problem-solving
4. Guided decision making
5. Link exercise to functional goal
6. Identify perceived barriers and develop strategies to overcome
7. Improve participation in self-identified roles in their home/work environment or society
8. Develop plan for ways to continue exercise and how to deal with a lapse

When you work with someone with PD, you're not just their therapist

Your role may be to assess the patient’s function, BUT...you are also a little bit of a:
- Psychologist
- Marriage & Family Counselor
- Building Inspector/General Contractor
- Medical Equipment Specialist
- Spiritual Advisor
- Coach
- Cheerleader
- Nutritionist
- Medical Manager
History Taking: The first step to a successful evaluation

Look

- Non-verbal communication
- How patient fills out paperwork
- Taking off coat, reaching into purse, etc.
- Home set-up
- Hygiene
- Self-correcting posture?
- Hiding symptoms?
- Does patient look to care partner to answer questions

Listen

- PMHx
  - how do co-morbidities affect PD & vice versa?
- Social Hx
  - Include home, leisure, work
  - Description of their support system
  - Description of home/work environment
  - Withdraw from recreational and leisure activities

Listen

- Overall level of physical activity
- Involvement in exercise
- Daily routine
- ADLs and IADLs
- The patient’s goals
- Interactions with partner/child/friend/staff
- Denial
- Discrepancies among answers
- Do they self-correct voice?
Feel

- Social interactions
- Motivation/Self-efficacy
- Emotional status
- Coping strategies
- Beliefs
- Anxiety
- Depression
- Fear
- Quality of Life

“What do you do for fun???”
“What brings you joy?”

Important Questions to Remember

- Side of onset of symptoms
- Hand dominance
- Initial presentation
- Time to diagnosis
- Who is primary PD-care practitioner?
  - PCP, Neurologist, Movement D/O Specialist, CRNP, PA
- Prior therapy

Questions…

- Knowledge of PD
  - Where do they find their information?
- Support Group involvement
- Medications/schedule
- Sleep
- Non-motor symptom involvement
- “What activities are you having difficulty with?”
- “What activities have you given up that you would like to return to doing again?”
PD Rating Scales

**Hoehn & Yahr**
- 1 – Unilateral
- 2 – Bilateral, \( \varnothing \) balance prob.
- 3 – Bilateral, balance prob., mild to mod disability
- 4 – Severe disability, but can walk unassisted
- 5 – W/C or bedridden

**UPDRS**
- Unified PD Rating Scale
  - Monitors the progression of sx’s
  - Commonly used in research

**MDS-UPRDS**
- The Movt D/O Society – sponsored revision of the UPDRS
  - New section on non-motor sx’s
  - 20 questions pt. (or partner) completes
  - Valid in PD

**PROFILE PD**
- A rating scale designed to quantify deficits in body systems and activities in those with PD
- 3 subscales: body systems, activities, and cognitive/psychological domains

As compared to the UPDRS:
- The scale is reliable and valid scale in early and mid stage PD
- Not intended as a substitute for a full eval (i.e., balance and gait tests)


PD Evaluation Template
- PMHx
- Home/work enviro
- Medications/Schedule
- Cognition
- Quality of Life
- Motivation/Self-efficacy
- Sleep
- Non-motor symptoms
- Pain
- Knowledge of PD
- Cardiovascular
- Skin/Sensation
- ROM/Strength
- RAMs
- Bed Mobility/Transfers
- Balance/Gait/Falls
- ADLs/IADLs
- Need for additional services
  - PT
  - SLP
  - Psych
  - Support Group
  - OT-Specific Measures

**CONTINUED**
### PD-related Outcome Measurement Tools...so many to choose from, so little time

- 5TSTS
- Lindop
- TUG, with motor & cog
- Berg
- BESTest (Mini & Brief)
- DGI
- FGA
- 6MWT
- 10 Meter WT
- Functional Reach
- Self-Reported Disability Scale in Patients with PD
- Schwab & England ADL Scale
- MAS – Motor assessment scale
- Purdue Pegboard Test
- MoCA
- PDQ-39
- ABC
- 9-hole Peg Test
- **Timing functional activities**

### Upper-Limb Assessment in PWP

**UL difficulties:**
- dec speed & amp of movements
- difficulty perf sequential tasks
- dec FMC

122 PTs and 68 OTs surveyed – they used:
- observational analysis
- timed functional activities
- MAS (motor assessment scale)

1. **UL disabilities given less priority than gait/balance**
2. **Low research in testing and treating UL in PD**
3. **Unfamiliar with available measurement tools**

### OT Outcome Tools - Patient

- Canadian Occupational Performance Measure: performance & satisfaction (COPM)
- Perceive Recall Plan Perform system (PRPP)
- Activity Card Sort (ACS)
- Utrecht Scale for Evaluation of Rehabilitation Participation (USER-P; satisfaction part)
- Parkinson’s Disease Questionnaire (PDQ-39)
- Fatigue Severity Scale (FSS)
- Beck Depression Inventory (BDI)
OT Outcome Tools – Carepartner

- Zarit Burden Interview (ZBI)
- Hospital Anxiety and Depression Scale (HADS)
- Utrecht Proactive Coping Competence scale (UPCC)


PD Eval - Musculoskeletal

ROM/Flexibility

Typically see tightness at flexors and rotators

Common Positions:
- Hand – closed (fist or just flexion at MCPs)
- Elbow – flexed
- Shoulder – IR
    - Loss of ROM on affected side due to ↓ use from overuse of other UE and ↓ reciprocal swing
- Neck – flexed (down-gaze)
- Trunk – flexed
- Knees - flexed
- Increased sedentary lifestyle and too much sitting add to the problem

Strength

Pt.'s often mistake bradykinesia & ↓ fine motor coordination as weakness

Muscle strength = \text{FORCE} \text{ generated by muscle contraction}

Bradykinesia = \text{SLOWNESS} \text{ of movement speed}

\text{POWER} = \text{FORCE} \times \text{SPEED} \text{}\text{(velocity)}

Allen NE, et al Parkinsonism Relat Disord. 2010 May;16(4):261-4

- Weakness typically found at trunk extension, abdominals, knee/hip/elbow extensors – even early on


- Inability to generate adequate power; poor STS, reduced toe-off, slowed gait, inc. falls
Coordination

RAMs - what are we testing with this in the UE?

• Finger tap, hand flips (UPDRS)
• Heel: Toe to Knee
• Foot tapping

Coordination

Fine Motor Dexterity: 9 Hole Peg Test

• May detect UE function deficits in the early stages
• Study shows average values, considers test-retest reliability, calculates preliminary MDC values, and identifies factors that contribute to PD-specific performance

Table 2. 9-Hole Peg Test Scores by Hoehn & Yahr Stage

<table>
<thead>
<tr>
<th>Modified Hoehn &amp; Yahr Stage</th>
<th>Dominant Hand, Mean ± SD</th>
<th>Non-dominant Hand, Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (a = 1D)</td>
<td>23.5 ± 5.6</td>
<td>23.5 ± 5.2</td>
</tr>
<tr>
<td>1.5 (a = 4D)</td>
<td>23.4 ± 5.2</td>
<td>23.2 ± 10.1</td>
</tr>
<tr>
<td>2 (a = 1ID)</td>
<td>24.6 ± 4.6</td>
<td>27.1 ± 4.8</td>
</tr>
<tr>
<td>2.5 (a = 4ID)</td>
<td>24.9 ± 22.5</td>
<td>34.4 ± 12.9</td>
</tr>
<tr>
<td>3 (a = 5D)</td>
<td>36.7 ± 16.4</td>
<td>36.0 ± 14.4</td>
</tr>
<tr>
<td>4 (a = 5ID)</td>
<td>43.5 ± 15.8</td>
<td>47.9 ± 15.9</td>
</tr>
</tbody>
</table>


Transfers

• Chair, toilet, tub, car
  • Not just STS: eccentric control of stand to sit, various surfaces & heights, walk to chair & then sit, & get in to
    a chair at a desk or table (commonly see FOG here)
  • Many PWP are independent, but use poor or unsafe tech

Describe technique:
• “Pt reaches for chair before turning to sit, + freeze, & lands on edge of chair”
• “Blocks LE against furniture to stand”
• “3/5 Indep., on 4 & 5 pt. failed to lean anterior and fell back into chair”
Time the technique:

5 Times Sit to Stand (FTSTS)

- Distinguish balance dysfunction older adults:
  - 16.9 inch chair
  - 13.4 sec. on average
  - 10 sec. for those < 60 y/o
  - 14.2 sec. for those > 60 y/o

- Distinguish who falls with PD:
  - ~17 inch chair
  - 16 sec.

- Easy to reassess change and make a progressively challenging exercise


Bed Mobility

Assess each sub-task:
- How do they approach the bed?
  - Crawl in or back up to sit?
  - If they sit, is it too high or low?
- How do they actually get in to position in the bed?
  - Scooting up & down
  - Rolling
  - Managing sheets/blankets
  - OOB

Describe the technique – why is it not safe or energy efficient?
Measure the technique: time the task
Pts. often test well in clinic but report poor performance at home due to difference in environment and med schedule
Remember to ask for:
- height of bed
- side they sleep on
- bed/sleep routine
- "map" of bed to bathroom
- video of bed mob at home if able

Lindop Parkinson's Assessment Scale (LPAS)
- Bed Mobility sections
  - "Sit to lie (56 cm bed)"
    - Unaided with ease (≤ 5 sec)
    - Unaided with effort (6+ sec)
    - Help of 1
    - Help of 2/unable

Gait
- Skilled Observation - Description
  - Reciprocal UE Swing → Trunk Rotation
  - Stride/Step Length
  - Heel Strike
  - Head Position & Eye Direction
  - Posture
  - BOS
  - Any freezing?
    - Note triggers — initiation, doorways, turns, small spaces, etc.
  - Various Surfaces & Areas & Activities (not just ‏ ↑↓ hall)
  - Use of device
  - Catch patient unaware

YOPD Gait – L side

Gait Outcome Measures

Timed Up & Go (TUG)
- Can trigger FOG with the pressure of being timed, at initiation of gait, and with turns
  - Good for reassessment – is the patient using appropriate techniques for freeze-prevention/break and turns?
- In YOPO especially - perform TUG with a simultaneous task
  - Cognitive: naming items in a group (animals, cars, desserts, etc.), serial subtraction
  - Motor: carrying a glass of water, moving change from hand to hand, buttoning a coat, etc.
  - Cognitive/Motor: dialing a mobile phone
  
  These are ALL FUNCTIONAL TASKS
  
  > 13.5 sec. = higher fall risk; Reliable in PD
  
  
  MDC = 3.5 secs
  

FOG questionnaire (FOG-Q)
- Assesses FOG severity
- Reliable and valid for PD
  

Functional Gait Assessment
- FGA includes tasks that require sensory integration during dynamic mobility (turning the head, walking with EC, and walking backwards.) These tasks can help to unmask deficits common to PD.
- 22/30 predict falls in community-dwelling older adults
- Valid & Reliable in PD
  
  
**Turning**

Even mildly impaired pts. who do not show balance deficits, show difficulties with turning. Present outcome measures do not capture this (Berg, Tinetti, ABC….)


Test turns:
- Open & small spaces
- Walking to a chair
- From a static position
- On command
- With dual tasking

Mean 180 turns:
- Mild PD = 2.5 sec., # of steps = 4.5
- Severe PD = 3.2 sec., # of steps = 5.6

**Other Focus Areas**

- Stairs
- Curbs
- Ramps
- Type of Footwear

- Falls
  - Where - When - What activity?
  - “On or off”
  - Look for patterns – can you reproduce?
  - Fall Journal
Balance Measures

BESTest (36 items)
Differentiate[s] balance into 6 underlying systems (36 items):

Mini BESTest (14 items)
• Identifies subtle balance deficits – even in mild PD

Brief BESTest (8 items)
• As reliable as BEST and comparable to Mini

Balance & Other Measures

• Berg
  Ceiling effect in PD – in early stages of PD it isn’t sensitive enough to assess postural instability
  • Activities-Specific Balance Confidence Scale (ABC)
    < 67% = fall risk; Min detectable change in PD = 13
  • PD Questionnaire-39 (PDQ-39) – Quality of Life
  • Self-Reported Disability Scale in Patients with PD
  • Schwab & England ADL Scale
  • Patient Specific Functional Scale

Other Measures

Parkinson Fatigue Scale (PFS-16)

Sleep
• PD Sleep Scale
  1. The overall quality of your night’s sleep is:
  2. Do you have difficulty falling asleep each night?
  3. Do you have difficulty staying asleep?
  Awful to Excellent (0 to 10)

Non-motor symptoms
• NMSS
• http://www.pdnmg.com/tools/nms-scale08.pdf
Cognitive Measurements

MoCA – Montreal Cognitive Assessment
- Better at discriminating subtle cognitive changes in PD than the MMSE
- Visuospatial, executive, naming, memory, language, abstraction, delayed recall, orientation
- Add 1 point for an individual who has 12 yrs or < of formal education, for a possible maximum of 30 points. ≥26 is considered normal.


<table>
<thead>
<tr>
<th>Controls</th>
<th>MCI</th>
<th>Alzheimer's</th>
</tr>
</thead>
<tbody>
<tr>
<td>MoCa</td>
<td>27.4</td>
<td>22.1</td>
</tr>
<tr>
<td>Average</td>
<td>16.2</td>
<td>16.2</td>
</tr>
</tbody>
</table>

MCI = mild cog impairment

Self-Efficacy for Exercise Scale

How confident are you right now that you could exercise 3x/per for 20 minutes if:
1. The weather was bothering you
2. You were bored by the program or activity
3. You felt pain when exercising
4. You had to exercise alone
5. You did not enjoy it
6. You were too busy with other activities
7. You felt tired
8. You felt stressed
9. You felt depressed

Note confident Very confident
0 1 2 3 4 5 6 7 8 9 10

People with high self-efficacy were twice as likely to exercise vs. those with low self-efficacy


Outcome Tools

Rehabilitation Measures Database
"The Rehabilitation Clinician’s Place to Find the Best Instruments to Screen Patients and Monitor Their Progress"

www.rehabmeasures.org

Gives information on description, use, norms, min detectable change, bibliography, etc.
Resources

• National Parkinson Foundation
  www.parkinson.org (Allied Team Training for PD)
• Parkinson’s Disease Foundation
  www.pd.org (webinars)
• American PD Association
  www.apdapparkinson.org (Rehab resource link)
• European Parkinson’s Disease Association
  www.epda.eu.com/copingStrategies
• Occupational Therapy for People with Parkinson’s
  Best practice guidelines - Ana Aragon and Jill Kings
  http://www.bgsmdslive.org/OTPeopleParkinsons.pdf
• Guidelines for Occupational Therapy in Parkinson’s Disease Rehabilitation
  http://www.parkinson.org/NationalParkinsonFoundation/files/a5/a5-c7w90-a101-445c-96b2-7d81b31a42c9.pdf
• CurePSP (Atypical Parkinsonisms) www.curepsp.org
• LSVT BIG www.lsvtglobal.com
• Email me at: HeatherCianci@uphs.upenn.edu

Thank you for your interest.
I appreciate your time and attention.