If you are viewing this course as a recorded course after the live webinar, you can use the scroll bar at the bottom of the player window to pause and navigate the course.

This handout is for reference only. Non-essential images have been removed for your convenience. Any links included in the handout are current at the time of the live webinar, but are subject to change and may not be current at a later date.
Movement-Based Interventions When Treating Parkinson’s Disease

Presented by:
Jason Mahilo MOTR/L

Learner Outcomes:

- 1) Identify various stages of Parkinson's and levels of functional decline expected at each stage.
- 2) List various interventions to accelerate functional outcomes for individuals living with Parkinson's.
- 3) Describe the LSVT approach and alternate movement-based interventions as a clinician.
Prevalence of Parkinson’s Disease

- Estimated 1 million people in the U.S. (4-6 million worldwide) have PD
- ~60,000 individuals are diagnosed with PD annually
- ~164 individuals daily
- ~7 individuals per hour

- Kittie, G. (Ed.).

What does PD look like?

- PD is a type of movement disorder that can affect the ability to perform common, daily activities. PD can present with a wide range of motor / non-motor symptoms that these individuals will experience.
- Dopamine is a chemical signal that our body produces to allow smooth coordinated movements (without thinking about it).
  - The decreased production of these dopamine-producing neurons is what leads to the difficulty in movement (“freezing”, shuffling, etc.)

### Common Motor Symptoms

- Tremor
- R rigidity (Stiffness of muscles)
- Slowness of movement 
  (Bradykinesia)
- Posture / Balance /
  Coordination / and Walking 
  Deficits

### Other Common Motor Symptoms

- Freezing or quick shuffled gait
- Loss of facial expression 
  (Hypomimia)
- Low/Muffled voice volume 
  (Dysarthria)
- Reduced arm swing
- Backwards falling
- Small/crammed handwriting, 
  and many more.

---

### Common Non-Motor Symptoms

- Sleep
- Constipation
- Anxiety
- Depression
- Fatigue
- Pain
- Urinary incontinence

### Other Common Non-Motor Symptoms

- Executive Functioning 
  cognitive changes (attention, 
  memory, planning, etc.)
- Neurogenic Orthostatic 
  Hypotension
- Hallucinations / Delusions
- Impulsive behaviors
- Loss of sense of smell
- Decreased visual capabilities

---

American Parkinson Disease Association, Inc. (2008)
Diagnosis of PD

- Can be difficult as MD needs 2 of 4 symptoms for consideration (tremor, bradykinesia, rigidity, and postural instability).
- Not 1 single diagnostic test exists to diagnose
  - Sometimes trial of medication is given
- Over time, individuals with PD (15%) can show complex PD with atypical symptoms of Parkinson’s. Some include, but not limited to:
  - Progressive supranuclear palsy, drug-induced parkinsonism, dementia with lewy bodies, and more.

Stages of PD

- Stage 1 – Early (mildest) Stage
  - Symptoms are not as severe to interfere with daily tasks. Distinct symptom includes tremors/rigidity and difficulty with job demands (handwriting, etc.).
- Stage 2 – Early (mild/mod) Stage
  - Stiffness, tremors, trembling more noticeable (possible facial expressions) in bilateral motor disturbances. Difficulties can be experienced on both sides of the body. Balance is not impaired and they can ambulate independently, but difficulties could exist with balance/posture.
  - Typically seen 1-2 years after diagnosis (can vary)
Stages of PD

- **Stage 3 – Middle Stage**
  - MAJOR TURNING POINT!
  - Many similar difficulties from Stage 2, but tend to experience loss of balance and decreased righting and equilibrium reactions.
  - Home modifications are necessary at this stage with decreased energy to be seen.


---

Stages of PD

- **Stage 4 – Advanced PD**
  - Potential ability to stand without assist, but movement would require assistive device. This stage demonstrates the need for additional assistance with daily living tasks.

- **Stage 5 – Advanced PD**
  - Advanced freezing leading to difficulty standing or walking. Typically requires wheelchair for mobility, and need 24 hr. assistance to prevent falls due to depending on others for most self-care activities.

  - ***Stage 4 & 5 is where many non-motor cognitive functions become impaired***

Non-Pharmacological Interventions

- Boxing
- Motor imagery
- LSVT BIG
- Music/Dance Therapy
- Robot-assisted Technology
- Physical Agent Modalities
- Portable, personalized cuing devices (Nu-Step)
- Hydrotherapy
- Virtual Reality
- Tai Chi
- Telemedicine
- Swimming

Functional improvements

- When utilizing any approach to address amplitude, progress can be seen in alternate areas:
  - Speed
  - Balance
  - Functional endurance
  - Functional ambulation
- Amplitude can help to reduce potential freezing and shuffled gait during balance activities.
- Akinesia can be shown to improve when motor-based interventions included low-intensity reciprocal progressive cycling.

(Chang, H. C., Lu C. S., Chiou, W. D., Chen C. C., Weng, Y. H., & Chang, Y. J., 2018)
Best Approach with Interventions for PD

Brain Signals

Body Movements

Calibrate

Experience-Dependent Neuroplasticity

Research support

- Overall improvement from previously mentioned approaches is possible due to task-specific training. Especially with single-task interventions alluding to more abrupt results.

- Auditory and rhythmic stimuli can allow for positive emotions and outcomes due to safe focused movement in the environment.

  - Foster, Bedekar & Tickle-Degnen, 2014.

LSVT Research

- Individual at 6 month follow up showed continued long term affects in improved gait speed, reaching across limbs, decreased depression, anxiety, and fatigue.

  - Sandberg & Weiandt. (2016)

- Study shows that LSVT BIG may be a viable therapeutic option for management of PD patients, but vital for continued active interventions to maintain functional gains.

  - Ueno et al. (2017)
LSVT Research cont.

- LSVT BIG led to improved motor performance and clinically relevant changes when assessing UPDRS III, PDQ39, TUG, and Gait Speed.
  - Compared against treatments of Nordic walking and
    - Ebersbach et al. (2010).

What does the program look like?

- 7 Daily exercises
  - Non-changing exercises (8-10 reps)
- 5 Functional tasks/activities
  - Everyday tasks that won’t change (5 reps)
  - 1 has to be Sit to Stand transfers
- 6 min BIG Walk
- 1 Hierarchy task
  - Patient identified difficult activity
Length of time

- Typically seen 4x week for 4 weeks per the LSVT Global guidelines.
- 1 hour long tend to be the treatments.
- Tend to take longer in the beginning to complete the 7 daily exercises, and then as time progresses it becomes quicker and more equally distributed.

How to deliver

- Minimal cuing as just want to cue for **BIG**
- Need to be loud and simple as individuals will respond positively to your enthusiasm
- Therapist bringing their strong energy and intensity supports the delivery
Exercise 1

Exercise 2
Exercise 3

Exercise 4
Exercise 5

Exercise 6
Exercise 7

Movement-based Exercises adapted

- Utilize clinical reasoning to assess the progress of your patient, and providing the just right fit challenge. Can be done in various ways:
  - Complexity
  - Intensity
  - Resistance
  - Balance difficulty
  - Gait challenges
  - w/c for low level
  - One handed support
Additional Information

- Key to complete a HEP of the exercises that is developed with therapist to delay disease progression.
- Support groups can be beneficial for providing motivation to continue to success with exercising for delaying progression.
- Optimum application of any movement based interventions should be considered around medication intake.

Recommended Assessments

- LSVT Global provides various example assessments to use for tracking reps/progress during therapy.
- They also provide tips and handouts on modified exercises for individuals that may be more impaired.
- TUG is the golden assessment to test for positive response to LSVT BIG interventions.
Additional Functional Assessments

- 6 min walk test
- BERG balance
- Functional Gait Assessment
- Gait Speed
- Tinetti
- COPM
- Hoehn and Yahr scale
- UPDRS
- PDQ39
- 9 hole peg test (if dexterity is being addressed)

Case Study 1 - Lynn

- Presented 23 sec with FRW for TUG and 663 feet for 6 min walk test at eval
- Difficulty with escalators and alternate terrains, turning, and revolving doors.
- Completed LSVT in 6 weeks total with addressing 7 exercises, 5 functional activities, BIG walk, and hierarchy task.
- Living in ILF and actively shops in the community and takes public transportation.
Case Study 1 – Lynn at D/C

- 12 seconds for TUG
- No DME recommended for ambulation in community and facility
- Over 1200 feet of functional big ambulation in 6 minute walk test
- Improved to 3-4 steps for 360 turn without freezing at time of eval
- Overall increased self-efficacy improvement reported by the patient

Case Study 2 - Rose

- Multiple attempts to stand up with decreased step length in gait.
- Decreased motor initiation and required 2 minutes and 32 seconds for TUG at eval with max verbal cuing necessary.
- 4 wheeled walker used for ambulation with additional difficulty for transfers, dressing, reaching, and turning
Case Study 2 – Rose at D/C

- 26 seconds for TUG
- 100% independent in ADLs and no need for verbal cuing for BIG movements

OT Practice Act for LSVT BIG

- OTA must be supervised by an OT that holds LSVT BIG certification and valid state licensure
- OTA must complete workshop/training on LSVT BIG
- OTA could complete various exercises and activities as prescribed, directed, and supervised by an LSVT BIG certified OT.

Copyright 2012 LSVT Global, Inc. All rights reserved.
References


References cont.

- Kittle, G. (Ed.), *Parkinson’s Disease: What you and Your Family Should Know.* Hagerstown, MD.
Questions?
Email: jason.mahilo@gmail.com

thank you!