




Rehabilitation Center | 

MOVE BIG, LIVE BIG

Francine Bienvenu, LOTR


LSVT BIG Certified

MARCH 23, 2013



PARKINSON'S DISEASE

- Progressive neurodegenerative disorder
- Occurs due to deterioration of substantia nigra pars compacta in the brain
- 2nd most common neurodegenerative disorder after Alzheimer's Disease



PARKINSON'S DISEASE

- Insidious onset: progresses slowly in most individuals
- Mean age of diagnosis is 62 years
- Incidence and prevalence increase with age
- In US 50,000-60,000 new cases each year
- 4-6 million people around the worldwide



PARKINSON'S DISEASE

- Estimated US cases were 340,000 in 2005
- Predicted to rise to 610,000 by 2030
- In 2004 cost US 34 billion dollars in direct health related expenses, disability related costs, and loss of productivity
- Individuals become disabled, retire early, forced to give up enjoyable activities



PARKINSON'S DISEASE

- Disease attacks dopamine producing cells of the substantia nigra
- When 60-80% of these cells are damaged and not producing dopamine, motor symptoms of PD appear
- When levels of dopamine decrease, muscles become rigid: motor system constant state excitation



Young Onset Parkinson's Disease

- **Slower disease progression**
- **Increase rate of dystonia (abnormal cramping)**
- **Decrease rate of dementia**
- **Increase rate of dyskinesias in response to L-DOPA treatment**
- **often misdiagnosed (carpal tunnel, frozen shoulder, foot drop)**
- **Respond well to early treatment!**



Rating Parkinson's Disease Severity

Hoehn and Yahr scale (1967)

Stage 0= no signs of disease

Stage 1=unilateral disease

Stage 1.5= unilateral + axial involvement

Stage 2= bilateral disease, without impairment of balance

Stage 2.5= mild bilateral disease, with recovery on pull test



Rating Scale con't


- Stage 3= mild to moderate bilateral disease; some postural instability; physically independent
- Stage 4= severe disability; still able to walk or stand, unassisted
- Stage 5=wheelchair bound or bedridden unless aided



MOTOR SYMPTOMS

- Motor symptoms due to muscle rigidity include:
 - Tremors – resting, those that disappear with movement, pill rolling
 - Bradykinesia (slowed movement)
 - Hypometria (reduced amplitude of movement)
 - Hypokinesia (reduced movement)
 - Akinesia (loss of movement)


Adah Chung 2012

 **MOTOR SYMPTOMS**

- Postural instability
- Masked faces
- Stooped posture
- Gait disorders(slowed)

 **Clinical Implications for motor symptoms**

- ***Get Ready signal to weak (CLINICAL- Bradykinesia/hypokinesia)
- *** GO signal too weak (CLINICAL-Freezing/start hesitation)
- ***NO GO signal too weak (CLINICAL-Festination; sequential movements more difficult, run together or go back)

 **NON MOTOR SYMPTOMS**

Cognitive deficits

- Slow thinking
- Retrieval
- Self cueing
- Sustaining attention
- Inadequate preparation for movement

Depression

- 25%major/17%minor
- precedes motor symptoms
- may contribute to dementia



NON MOTOR SYMPTOMS

- Dementia
 - 30%
 - occurs 6.6X as frequently than in elderly non PD
 - shortens survival
- Sensory changes
 - pain
 - tingling
 - burning



NON MOTOR SYMPTOMS

- Generalized decreased kinesthetic awareness/
decrease self perception/monitoring
- Autonomic Abnormalities
 - hypotension
 - bowel/bladder/sexual function
 - blurry vision
 - shortness of breath
 - sleep disorders



NON MOTOR SYMPTOMS

- Emotional changes
 - anxiety
 - apathy
 - default to low energy despite
greater capacity



THOUGHT TO PONDOR

- Why do patient's with PD not self monitor + self correct their own movements?



- Sensory integration deficits interfere with movement plans, body orientation, and error detection capabilities

*** We want them to be able to self correct/calibrate
ERROR DETECT/ERROR CORRECT!



Pre- Treatment

- Problem in self perception: do not recognize movements are slow or small.....
- Self cueing deficits-reduce amplitude of movement pattern.....
- This reduced amplitude of motor output.....
- Results: produces slow movements..... And cycle continues.....



Treatment Focus

- Improve self perception/awareness of amplitude required to produce normal movement.....
- Improve self cueing/attention to action to increase amplitude of movement patterns.....
- Increase amplitude motor output.....
- Produce larger movements..... and improve overall cycle of self perception to consistently increase amplitude



Treatment Options

- No cure but several treatment options:
 - ***medical/medication management
 - ***surgical management
 - ***therapeutic intervention: occupational, physical and speech therapy



Medical Management

- Levodopa- carbidopa (sinement)
- Dopamine agonists (dopamine like drugs that directly imitate dopamine's activity in the brain)
- MAO-B and COMT inhibitors (reduces the breakdown of dopamine)



SURGICAL

Deep Brain Stimulation (DBS)

1. Subthalamic nucleus (STN)

- effective for all major symptoms of PD- tremors, slowness of movement, rigidity and problems with walking and balance
- decreases problems with involuntary movements i.e. dyskinesia primarily because able to reduce meds after surgery



SURGICAL

Deep Brain Stimulation (DBS)

2. Golbus pallidus (Gpi)

- also effective for PD but not as effective for walking and balance.
- remain on average amount of meds after surgery



Controversial Treatment

- Fetal –tissue implants
 - neurologists/neurosurgeons have explored various ways of grafting dopamine producing cells in the brain of those with PD, rather than trying to correct the neurotransmitter imbalance with drugs



- Scientists investigating use of glial cell-derived nerve growth factor to treat PD and other neurodegenerative diseases:
- This substance is produced naturally by tissues throughout the body. Some experiments indicate the injections of nerve growth factor may preserve or even restore nerve cells in the brain and spinal cord- specifically those that produce dopamine that help initiate muscle movement



THERAPEUTIC INTERVENTION

- Surgical and pharmacological treatment provide symptomatic relief in the majority of patients with PD, but even with optimized treatment plans and follow through, motor deficits continue to appear throughout progression of the disease



LSVT LOUD

- Initial development 1987-89
- Lee Silverman Voice Training
- Training of amplitude as a rehabilitative approach in individuals with PD



LSVT LOUD

- Provided by speech therapists to treat the deficit of reduced loudness in these patients
- Has shown short and long term (2 years) retention in loudness and articulation after 15 years of efficacy research



LSVT BIG

- Becky Farland and Gail Koshland developed a protocol for training the amplitude in the limb motor systems using same principles established in LSVT LOUD in order to test their hypothesis



LSVT BIG

Hypothesis: "that the generalized training of amplitude in the limb motor system may reduce bradykinesia and hypokinesia in the upper and lower limbs in subjects with PD across disease severity" (2005)



LSVT BIG PROGRAM

- Standardized, intensive, amplitude based exercise program for the limb motor system
- Re-education of the sensory motor system



LSVT BIG PROGRAM

- Adheres to the principles of neuroplasticity:
 - intensive practice
 - retrain normal use/forced use
 - repetition
 - complexity/challenging
 - feedback/motivation
- Emphasizes High Effort!



AMPLITUDE

- Defined: the largest range of motion that can be performed with the highest effort with the most maximally efficient biomechanics
- Every trial /every day!
- Emphasize BIG with good quality and safe movements



EFFORT

- High effort is part of intensity
- Overload, progressive resistance
- Arousing the sensorimotor system, go bigger, hold it longer, catch your breath, do it again
- High Effort/Reinforce/Motivate/Empower with Potential!!



CALIBRATION

- Defined: Patient knows and accepts the amount of effort needed to consistently produce bigger movements.
- Relationship between increased movement effort and movement output established
- Sensory re-calibration- the process of teaching the patient to self monitor and to accept that what feels too big is normal!



- **ULTIMATE GOAL:**
Trying to fix that broken kinesthetic sensory tract



CLINICIAN'S ROLE

- SHAPE THE MOVEMENT
- FEEDBACK
- MOTIVATE
- CALIBRATE



REFERENCES

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- Farley, B.G., Fox, C.M., Ramig, L.O., and McFarland, D.H.(2008). Intensive amplitude-specific therapeutic approaches for Parkinson's disease: toward a neuroplasticity-principled rehabilitation model. *Topics In Geriatric Rehabilitation, 24*(2), 99-114. doi:10.1097/01.TGR.0000318898.87690.0d
- Information gathered from the **LSVT® BIG** training and Certification Workshop 2012.
- www.lsvtglobal.com



Shea Amrhein

- A STUDENT'S PERSPECTIVE OF LSVT BIG PROGRAM
- RESEARCH/CASE STUDY INFORMATION WITH USE OF COPM ASSESSMENT TOOL

Touro OT In-service July 9, 2012

Shea Amrhein, MOTS
Louisiana State University Health Sciences Center,
New Orleans

LSVT BIG

- Lee Silverman Voice Treatment
- BIG is founded upon fundamental principles of LSVT LOUD (program for the speech motor system)



What is LSVT BIG?

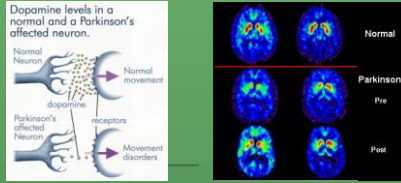


- BIG is an intensive amplitude-based exercise program for the limb motor system. Re-education of the sensory motor system.
- Adheres to principles of Neuroplasticity
 - Retrain normal use / forced use
 - Intensive practice
 - Repetition
 - Complexity/Challenging
 - Feedback/Motivation



Parkinson's Disease

- Neurodegenerative brain disorder of insidious onset that progresses slowly in most people.



- Parkinson's attacks the dopamine producing cells of the brain. When 60-80% are damaged and not producing enough dopamine, the motor symptoms begin to appear.

Parkinson's Disease

Motor Symptoms

- Resting tremor, rigidity, postural instability
- Dykinesias – impairment of voluntary movements
- **Bradykinesia** – slowness of movements
- **Hypokinesia** – reduced amplitude of movements

Non-motor Symptoms

- Depression / emotional changes
- Loss of higher cognitive functions
- Dementia
- Autonomic abnormalities – hypotension, blurry vision, short of breath
- Sensory changes
- Sleep disorders




Delivery of Program



- **TARGET:** *Bigness (amplitude)*
- **MODE:** *Intensity and High Effort*
- **CALIBRATION:** *Generalization*
 - Sensory
 - Internal cueing
 - Neuropsychological changes

Program Schedule



THERAPY (Delivered by LSVT BIG certified clinicians)

- Initial evaluation + 16 1-hr. individual sessions
- 4 consecutive days/wk for 4 weeks

+

HOME

- Daily carryover assignments (every day for 30 days)
- Daily homework (2x/day for 30 days)

HIGH effort every time

COPM

(Canadian Occupational Performance Measure)

- Client centered evaluation that can be used for clients across all developmental stages with a variety of disabilities
- Semi-structured interview used as an outcome measure by occupational therapists
- Purpose: for clients to identify, name, validate, & prioritize areas of concern in occupational performance

The Interview

Clients are asked to identify occupational performance problems in the following areas

- **Self Care**
 - Personal Care (e.g., dressing, bathing, feeding, hygiene)
 - Functional Mobility (e.g., transfers, indoor, outdoor)
 - Community Management (e.g., transportation, shopping, finances)
- **Productivity**
 - Paid/Unpaid work (e.g., finding/keeping job, volunteering, work tasks)
 - Household management (e.g., cleaning, cooking)
 - Play/ School (e.g., play skills, homework)
- **Leisure**
 - Quiet recreation (e.g., hobbies, crafts, reading)
 - Active Recreation (e.g., sports, outings, travel)
 - Socialization (e.g., visiting, phone calls/ texting, parties, e-mail)




Importance, Performance, & Satisfaction

- Clients are then asked to rate each activity in terms of its **importance** in his or her life
- 5 most pressing or important problem areas are chosen & entered onto scoring section
- Clients are then asked to evaluate their current perceived **performance** and their **satisfaction** with that performance of each area on a scale of 1 - 10.

Rating Scales

IMPORTANCE

1 2 3 4 5 6 7 8 9 10
 Not important at all Extremely important

PERFORMANCE

1 2 3 4 5 6 7 8 9 10
 Not able to do it at all Able to do it extremely well

SATISFACTION

1 2 3 4 5 6 7 8 9 10
 Not satisfied at all Extremely satisfied

Example

Occupational Performance Problems	Performance 1	Satisfaction 1	Performance 2	Satisfaction 2
1. Putting on pants	5	3	8	9
2. Pulling keys out of pocket	3	4	3	6
3. Pouring a cup of coffee	1	3	4	4
4. Getting in and out of car	6	2	8	9
5. Type on phone &/or computer	2	5	2	8
Scoring				
Total performance or satisfaction score number of problems	17/5	16/5	25/5	30/5
Total Score	3.4	3.2	5	6
Change in Performance	Performance score 2 -	Performance score 1	=	1.6
Change in Satisfaction	Satisfaction score 2 -	Satisfaction score 1	=	2.8



- VIDEOS PRE/POST LSVT BIG PROGRAM
- CASE STUDY