



## LSVT Global Public Webinar Series

Title: **Am I too Early to Start LSVT BIG® or LSVT LOUD®?**

Presenters: Elizabeth Peterson, MA, CCC-SLP  
Heather Cianci, PT, MS, GCS

Date Presented: October 18, 2017

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## AM I TOO EARLY TO START LSVT BIG® OR LSVT LOUD®?



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### Presented by:

**Elizabeth Peterson, MA, CCC-SLP**  
LSVT LOUD Training and Certification Faculty  
LSVT Global, Inc.

**Heather Cianci, PT, MS, GCS**  
Dan Aaron Parkinson's Rehab Center  
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Laura Gusé, MPT, MSCS  
Lorraine Ramig, PhD, CCC-SLP

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### Plan for Webinar

#### Logistics

- Handout attached
- Additional information for CEUs at the end of the presentation (instructor bios, disclosures)

Review and discuss Early PD and LSVT LOUD and LSVT BIG

Discuss your questions related to Early PD and intensive behavioral treatment

Complete survey at the end of the webinar  
(5 minutes or less to complete)

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## How to ask questions LIVE:

1. Type in the QUESTION BOX on your control panel
2. Raise your hand! *(Click on the hand icon.)*
  - Your name will be called out
  - Your mic will be unmuted (make sure your mic is unmuted as well)
  - Ask your question out loud
3. Email [info@lsvtglobal.com](mailto:info@lsvtglobal.com) if you think of questions later

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## Instructor Biographies

### Elizabeth Peterson, MA, CCC-SLP

Ms. Peterson received her master's degree in Speech, Language and Hearing Sciences from the University of Colorado-Boulder. She began working with Dr. Lorraine Ramig's research team while completing her master's thesis. Ms. Peterson is LSVT LOUD certified and primarily delivers LSVT LOUD in the research setting. She has worked as a research associate at the National Center for Voice and Speech-Denver and the University of Texas Health Science Center, San Antonio. Ms. Peterson is currently involved in Dr. Ramig's research investigating the short and long-term impact of LSVT LOUD on neural underpinnings of speech in Parkinson disease.

### Heather Cianci, PT, MS, GCS

Ms. Cianci is the Geriatric Team Leader and founding therapist of the Dan Aaron Parkinson's Rehab Center at Pennsylvania Hospital in Philadelphia, PA. She received her bachelor's in PT from the University of Scranton in Scranton, PA and her master's in gerontology from Saint Joseph's University in Philadelphia. Heather received her GCS in 1999. She is certified in LSVT BIG and is a graduate of the NPF's Allied Team Training for PD. She has written and lectured for both the NPF ("Fitness Counts") and PDF, and performed research on PD with respect to falls and bed mobility. Heather is also a former board member for CurePSP, and the coordinator of their Medical Professionals Advisory Committee.

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## Disclosures

All of the LSVT Global faculty have both financial and non-financial relationships with LSVT Global. Non-financial relationships include a preference for the LSVT LOUD as a treatment technique and equipment which will be discussed as a part of this workshop.

Ms. Peterson is an employee of and receive lecture honorarium and travel reimbursement from LSVT Global, Inc.

Ms. Cianci receives honorarium, consulting fees and travel reimbursement from LSVT Global, Inc.



STATEMENT ON DISCLOSURE AND CONFLICT: All members of this research team have fully disclosed any conflict of interest. The conflict of interest management plan has been approved by the Office of Conflict of Interest and Commitment at the University of Colorado, Boulder (Ramig, Fox and Halpern).

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All clients shown in videos during this presentation have given consent for their videos to be used for educational purposes

Any copying of videos or viewing outside of this course is strictly prohibited.

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### Learning Outcomes

After finishing this webinar, participants will be able to:

1. Summarize common mobility and speech/swallowing issues facing individuals with Early PD.
2. List how early therapy intervention helps with brain change in positive ways.
3. List how early therapy leads to better mobility, speech, and quality of life.
4. Describe how LSVT BIG and LSVT LOUD can help individuals with Early PD.

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### What is “Early PD”?

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### Rating Parkinson Disease Severity

#### Hoehn and Yahr scale (1967)

- STAGE 1 = Unilateral disease.
- STAGE 1.5 = Unilateral plus axial involvement.
- STAGE 2 = Bilateral disease, without impairment of balance.
- STAGE 2.5 = Mild bilateral disease, with recovery on
- 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.

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“Early PD” is not Early in PD

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### Pathological Findings

Loss of Pigmented, Dopaminergic Neurons in the SNpc



**50-60% cell death at DX;**  
**70-80% loss of DA terminals**  
**Precedes DX ~5-6 years**

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What symptoms can be detected in early PD?

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Early Changes in the Speech Motor System

- Previous medical “chart review” literature suggested a mid or late-stage onset of speech and swallowing symptoms (Müller et al., 2001)
- Recent investigations with sensitive and valid measures consistently report speech and swallowing symptoms very early in the course of PD (e.g., Harel et al., 2004; Rusz et al., 2011; Sung et al., 2010).

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Early Changes in the Speech Motor System

**Early speech/voice dysfunction 78%**

- **Reduced loudness, monoloudness**
- **Monotone**
- **Hoarse, harsh, breathy voice quality**

Individuals perceived as bored, disinterested, apathetic

(Aronson, 1990; Harel et al, 2004; Little, et al, 2008; Ruiz et al., 2011; Skodda, et al, 2009; Stewart et al, 1995)

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## Early Changes in the Speech Motor System

### “Unmask” the deficits

- Use dual tasking with assessment tasks (sustained vowels, reading, conversation)
- Added “load” may unmask soft, monotonous voice
- Looking for negative impact on communication participation (CPIB, Baylor et al, 2013)
- Identify subtle changes that a person might not overtly identify with changes in speech and voice (e.g., lack of enjoyment, depth of interaction)

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## Non-motor characteristics of Early PD related to communication

- Even people who are clinically asymptomatic for speech deficits report feelings of embarrassment, social stigma and isolation due to speech concerns (Miller et al., 2006a, b)



### Does this matter?

- Consequences include being excluded from conversations, a loss of dignity and feelings of misery for many (Miller et al., 2006a, b)



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## Early Changes in the Limb Motor System

- Asymmetry of symptoms; initially on one side of the body
- Neck and trunk rigidity may be present
- Subtle changes in coordination and balance
- Gait changes
- Alteration in perception of movement (motor-sensory disconnect)
- Loss of automaticity
- Organizational and dual tasking ability changes
- Under-use of affected side
- Anxiety/Depression
- Sleep disturbances

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“My symptoms are well managed with medication.

Why should I do intensive therapy now?”

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Prepare and Repair!

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### What is Neuroplasticity?

- Neuroplasticity = Brain Change
- In the initial phase of neurodegeneration the most neurons are rapidly lost.
- This is the time where treatment can have the most impact on preventing further degeneration and symptoms.
- If “exercise plays a powerful enough mitigating/palliative role, it should be performed very early and aggressively, and ideally prophylactic years before the onset of this process.”

Foster PP, et al. *Front Neurol.* 2011; 2: 28.

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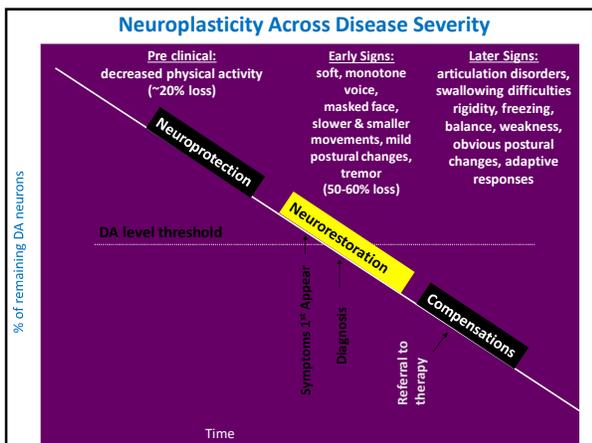
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“What type of exercise will drive neurplasticity?”

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- Key Ingredients**
- **Specific:** Exercise should target specific symptoms of PD and work on specific functional goals
  - **Intensive:** You must work hard, exerting energy!
  - **Meaning:** The exercise should have specific meaning and relatable goals which are important to you
  - **Repetition:** You must practice daily just like an athlete to continue to improve and maintain your skill
  - **Complex:** The exercise should never be easy or boring
  - **Timing:** The sooner you start the better the results
- (Alexander et al., 1990; Fox et al., 2002; Graybiel 1998; Kleim et al., 2003; Kleim and Jones, 2008; Jones et al. 1999; Saint-Cyr JA, 2003; Tillerson et al., 2002; Vergara-Aragon et al., 2003; Black et al. 1990; Comery 1995; Fisher et al, 2004; Kleim et al., 2001; 1996; Perez et al. 2004; Pisani et al., 2005 Plautz et al., 2000 )

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**Use it or lose it:** Failure to drive specific brain functions can lead to functional degradation

**Use it and improve it!** Training that drives a specific brain function can lead to an enhancement of that function

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**Exercise-induced neuroplasticity in human PD: What is the evidence telling us?**

- High-intensity TM = increased corticomotor excitability (low excitability is a marker for PD severity)
- Increases in dopamine D2 receptor density
- Volumetric changes in brain grey matter (grey matter contains most of the brain's nerve cell bodies – it includes regions of the brain involved in muscle control and sensory perception, among others)
- BDNF and GDNF (Glia cell line-derived neurotrophic factor) increases

Hirsch MA, et al. Parkinsonism Relat Disord. 2015 Sep 15.

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**Early, Intensive Therapy in PWP**

**40 newly dx PWP followed for 2 years:**

- Group 1 – Rasagiline (Azilect) & intensive exercise
  - two 28-day multidisciplinary intensive rehabilitation treatments (at 1 year intervals)
- Group 2 – rasagiline

**Assessed at baseline, 6 months, 1 year, 18 months, & 2 years**

- UPDRS II & III, 6 Minute Walk Test, Timed Up & Go, PD Disability Scale, & the need for more meds

**Results:**

- ✓ Medication group only – made no changes...& they needed more meds
- ✓ Medication & **Therapy** group - improved in all measures and needed less medication

Frazzitta G, et al. Neurorehabil Neural Repair. 2014 Jul 18.

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# LSVT LOUD Evidence in Early PD

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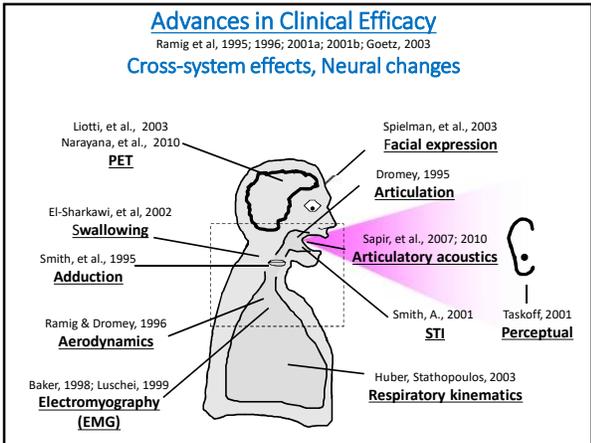
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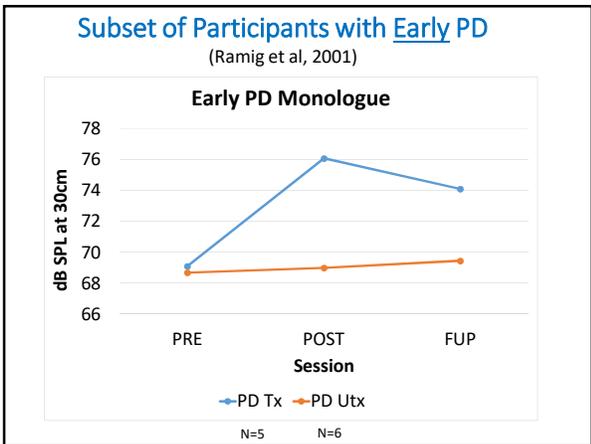
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## LSVT LOUD New Research

### Methods



- 84 Subjects (4 Groups)
  - Two groups received intensive treatment (LSVT or ARTIC)
  - Two groups remained untreated (PD and non PD)
  - Sample Size 20 Statistical Power .80

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## Subset of Participants with Early PD

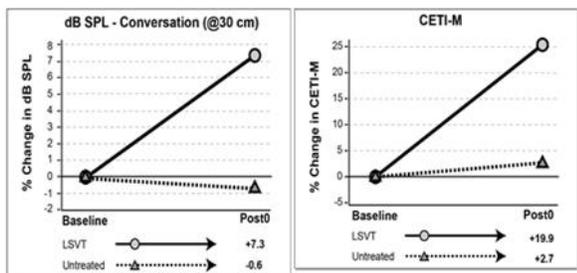


Fig. C. Percentage change in dB SPL for conversation for PD-LSVT [n=6; age 60.9 (8.2); Stage 1.9 (0.4); TSD 2.1 (1.4)] versus PD-untreated [n=6; age 59.7 (8.5); Stage 1.8 (0.4); TSD 2.3 (1.5)].

Fig. D. Percentage change in CETI-M for PD-LSVT [n=6; age 60.9 (8.2); Stage 1.9 (0.4); TSD 2.1 (1.4)] versus PD-untreated [n=6; age 59.7 (8.5); Stage 1.8 (0.4); TSD 2.3 (1.5)].

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“I already exercise regularly. Why therapy?”

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### Top Four Considerations

1. Therapists are the voice and movement experts in PD and will be the best ones to educate you, establish a baseline, and help you design a customized exercise plan for you.
2. General fitness does not include functional task specific training important for your life now and later.  
*e.g. Singing does not improve speech. Boxing will not teach you how to better button your shirt faster.*
3. Therapists understand the underlying pathology to assure that exercise is safe and comprehensively addresses your PD.
4. General fitness does not address the sensory deficits in PD.

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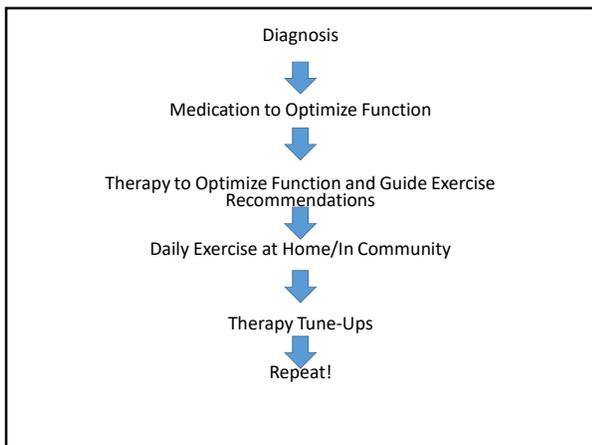
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### How Can LSVT LOUD and LSVT BIG be Applied in Early PD?

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## LSVT LOUD

Consistent with principles of [neuroplasticity](#)  
(Kleim & Jones, 2008)

Administered in an intensive manner to  
to [challenge the impaired](#) system.

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## Neural Plasticity

**Specificity:** Train the deficits

**Intensity:** Frequency, effort, repetitions, accuracy, force/resistance

**Complexity:** Complex movement, environmental enrichment

**Salience:** Practicing rewarding tasks (success/emotionally salient) activates basal ganglia circuitry. Be motivated, engaged

**Use it or lose it:** Failure to drive specific brain functions can lead to functional degradation

**Use it and improve it:** Training that drives a specific brain function can lead to an enhancement of that function

(Alexander et al., 1990; Fox et al., 2002; Graybiel 1998; Kleim et al., 2003; Kleim and Jones, 2005; Jones et al. 1999; Saint-Cyr JA, 2003; Tillerson et al., 2002; Vergara-Aragon et al., 2003; Black et al. 1990; Comery 1995; Fisher et al. 2004; Kleim et al., 2001; 1996; Perez et al. 2004; Pisani et al., 2005; Plautz et al., 2000 )

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## Video: Pre to Post LSVT LOUD in Early PD

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# LSVT LOUD Treatment Concepts

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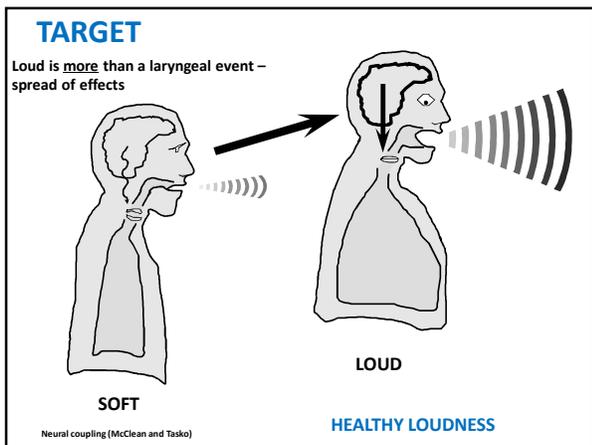
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**MODE: Intensive and High Effort**  
Treatment delivered 4 consecutive days a week for 4 weeks  
Individual 1 hour sessions (↑ repetitions)  
Daily homework practice  
(all 30 days of the month)  
Daily carryover exercises  
(all 30 days of the month)  
**LIFE LONG HABIT OF PRACTICE!**  
Consistent with practice principles that drive activity-dependent neuroplasticity.  
Kleim & Jones, 2008; Kleim et al, 2003; Zigmund et al, 2009

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### LSVT LOUD Treatment Session Summary

#### Daily Exercises

1. Maximum Duration of Sustained Vowel Phonation (Long Ahs) – 15+ reps
2. Maximum Fundamental Frequency Range (High/Low Ahs) – 15 reps each
3. Maximum Functional Speech Loudness (**Functional Phrases**) – 5 reps of 10 phrases

#### Hierarchy Exercises

Structured reading – multiple reps, 20+ min.  
 Off the cuff – bridge the gap to conversation  
 Build complexity across 4 weeks of treatment towards your long-term communication goal

#### Homework

Includes all daily exercises and hierarchy exercises  
 Assigned all 30 days

#### Carryover Exercises

Use loud voice in real life situations outside of the treatment room  
 Assigned all 30 days

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### LSVT LOUD Example



Treatment Exercise:  
long "ah"

Treatment Goal:  
louder voice in conversation

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### CALIBRATION

Addresses Barriers to Generalization

*If you don't feel like you are talking "too loud" you are not talking loud enough!!*

Retrain sensory perception of the amount of effort and loudness needed to speak with a normal loudness level.

Arnold et al., 2014; Fox et al, 2002; Mollaei et al., 2013; Sapir et al, 2011

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(Alexander et al., 1990; Fox et al., 2002; Graybiel 1998; Klem et al., 2003; Klein and Jones, 2005; Jones et al. 1999; Saint-Cyr JA, 2003; Tillerson et al., 2002; Vergara-Aragón et al., 2003; Black et al. 1990; Conroy 1995; Fisher et al. 2004; Klein et al., 2001; 1996; Perez et al. 2004; Pisani et al., 2005; Plautz et al., 2000 )

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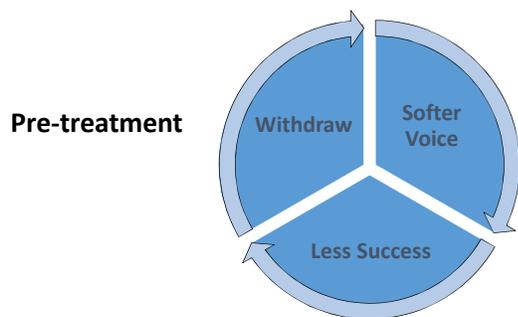
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### Train via Principles of Neuroplasticity: Use it or Lose It in Early PD




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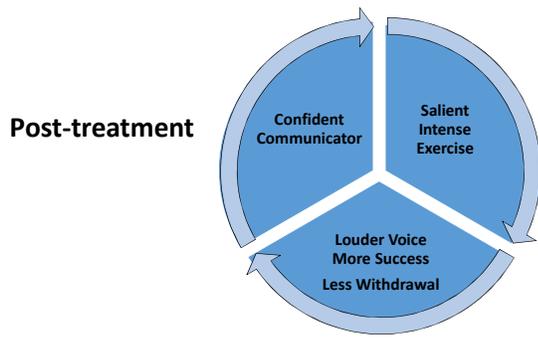
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### Train via Principles of Neuroplasticity: Use it and Improve It in Early PD




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### Comments as treatment progresses?

- I hadn't realized how much I was repeating myself until I didn't have to do it anymore.
- I have so much more confidence with communication.
- My voice doesn't feel "wiped out" at the end of the day anymore.
- I love how people interact with me now.

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### LSVT BIG Treatment Session

#### Maximal Daily Exercises

1. Floor to Ceiling – 8 reps
2. Side to Side – 8 reps
3. Forward step – 8 reps
4. Sideways step – 8 reps
5. Backward step – 8 reps
6. Forward Rock and Reach – 10 each side (work up to 20)
7. Sideways Rock and Reach – 10 each side (work up to 20)

#### Functional Component Tasks

5 EVERYDAY TASKS– 5 reps each

#### For example:

- Sit-to-Stand
- Pulling keys out of pocket
- Typing

#### Walking BIG

Distance/time may vary

#### Hierarchy Tasks

Patient identified tasks:

- Getting on/off bus
- Hiking
- Setting up work station

#### Carryover Task Assigned

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### LSVT BIG Treatment Session

#### Maximal Daily Exercises

1. Floor to Ceiling – 8 reps
2. Side to Side – 8 each side
3. Forward step – 8 each side
4. Sideways step – 8 each side
5. Backward step – 8 each side
6. Forward Rock and Reach – 10 each side (working up to 20)
7. Sideways Rock and Reach – 10 each side (working up to 20)




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### Neuroplasticity Principles- Exercises in LSVT BIG

- Intensive – Aerobic, Strength, Balance
- Complex- Challenging movements, dual tasking
- Repetitive- hundreds to thousands of reps over a month
- Specific- Target slow and small movements common to all people who have PD.

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**LSVT BIG Treatment Sessions** should never be **EASY** or **BORING!**  
 They should always **BE BIG!**  
 Your therapist should Be **CREATIVE** to maximally challenge you in order to **DRIVE** neuroplasticity.

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#### Functional Component Tasks

5 EVERYDAY TASKS - 5 reps each

1 is **ALWAYS** Sit-to-Stand

- Personalized to each person
- **SIMPLE** movement
- **Over-learn** familiar, commonly used, and important **everyday** movements and bring amplitude rescaling into everyday living

Example for 44 y/o woman:

1. Pulling item out of purse
2. Writing signature
3. Reaching for seatbelt
4. Turning bra around

Example for 65 y/o man:

1. Pulling wallet out of pocket
2. Removing backpack
3. Using swipe card on bus
4. Pulling chair out from desk

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### Neuroplasticity Principles- Functional Training in LSVT BIG

- Intensive – Aerobic, Strength, Balance
- Complex- Challenging movements, dual tasking
- Repetitive- Hundreds to thousands of reps over a month
- Specific- Target slow and small movements common to all people who have PD. Function specific training.
- Meaning- Tasks chosen that YOU value

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### Mental Sticky Notes- Think BIG!!!



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Advancing FCM  
– Opening a gate AND standing on a balance pad



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### Walking BIG

- It isn't just up and down the hall
- It's turns, stops, starts, backing up, climbing stairs, stepping over things, turning your head, crossing the street...



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### Hierarchy Tasks

- Complex multi-step functional activities
- Identified through discussion on patient specific goals
- Can select from 1-3 tasks

#### Example for 65 y/o male:

1. Take backpack down from locker, place laptop inside, put on backpack and walk out of his office.
2. Walk in to conference room, get in and out of chair at table, and be able to write on board with marker.

#### Example for 40 y/o woman:

1. Opening trunk, taking out grocery bags, opening door, getting in to the house and placing bags in to the kitchen.
2. Walking on dock and getting in to and out of boat.

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### Summary

- In early PD, pathology is not "early".
- Community based fitness, while important, does not replace skilled therapy by PD experts. Seek out a therapist early! Don't wait until symptoms are more noticeable or problematic.
- Begin LSVT LOUD & LSVT BIG as soon as possible after diagnosis...prevent decline
- Your LSVT sessions should be functional, challenging, meaningful and fun!
- Keep practicing every day!
- See your therapists lifelong just like you see the dentist. They are your partners in PD!

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### How to get started with LSVT BIG and LSVT LOUD

- Ask your doctor for a referral and a prescription for a speech or physical/occupational therapy **evaluation and treatment**
- Visit [www.lsvtglobal.com](http://www.lsvtglobal.com) to find an LSVT LOUD or LSVT BIG Certified Clinician in your area (as per video demonstration)
- DVDs available to introduce you to movement exercises used in LSVT BIG and voice exercises used in LSVT LOUD: [www.lsvtglobal.com/products](http://www.lsvtglobal.com/products) or [www.amazon.com/shops/LSVTGlobal](http://www.amazon.com/shops/LSVTGlobal)

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### Tools and Resources for You

- LSVT Homework Helper Videos
  - DVDs
  - Streaming/Download
- BIG for LIFE® and LOUD for LIFE®
  - Exercise groups after LSVT BIG/LSVT LOUD
- LSVT LOUD Companion
  - Client Edition for home practice
- LSVT eLOUD: LSVT LOUD via tele-practice  
[Contact info@lsvtglobal.com](mailto:info@lsvtglobal.com)

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### Upcoming Seminars on LSVT

The Science and Practice of LSVT LOUD

- West Orange, NJ
- Sunday, November 5, 2017
- 12:30-2:30pm

The Science and Practice of LSVT BIG

- Tulsa, OK
- Sunday, October 29, 2017
- 12:30-2:30pm

Register at: <http://lsvtglobal.com/patient-resources/patient-symposium>

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QUESTIONS?



[www.lsvtglobal.com](http://www.lsvtglobal.com)  
[info@lsvtglobal.com](mailto:info@lsvtglobal.com)

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