Public Webinar Series

Title: **How to get the most out of your LSVT LOUD and LSVT BIG treatment.**

Presenters: Cynthia Fox, PhD, CCC-SLP

Heather Cianci, PT, MS, GCS

Date Presented: October 19, 2016

Disclaimer:

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Drive your BRAIN to CHANGE through LSVT LOUD® and LSVT BIG® Treatment!

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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.

Dr. Fox receives lecture honorarium and travel reimbursement and have ownership interest in LSVT Global, Inc.

Heather Cianci is a Consultant for LSVT Global, Inc. All of the LSVT Faculty receive consulting fees, lecture honorarium 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).

Plan for Webinar

Logistics

Brief Introduction

Learn what research is telling us about brain change (neuroplasticity) and how LSVT LOUD and LSVT BIG help to drive this change and improve your quality of life.

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

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Instructor Biographies

Cynthia Fox, Ph.D., CCC-SLP

Dr. Fox received her doctorate degree in Speech and Hearing Sciences from the University of Arizona, Tucson. Dr. Fox is a research associate at the National Center for Voice and Speech and Co-Founder of LSVT Global. She is an expert on rehabilitation and neuroplasticity and the role of exercise in the improvement of function consequent to neural injury and disease. Dr. Fox is among the world's experts in speech treatment for people with Parkinson disease. She has multiple publications in this area of focus, as well as numerous national and international research and clinical presentations. Dr. Fox has worked closely with Dr. Ramig for the past 18 years on studies examining the efficacy of LSVT LOUD, the underlying mechanisms of speech disorders in PD, and the application of LSVT LOUD to other disorders (children and adults) and other motor systems (e.g., limb). She is an expert on rehabilitation and neuroplasticity and the role of exercise in the improvement of function consequent to neural injury and disease.

Heather Cianci, PT, MS, GCS

Ms. Cianci is the founding therapist of the Dan Aaron Parkinson's Rehab Center (a Good Shepherd Penn Partners facility) 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 and PDF. Heather is also a former board member for CurePSP, and the coordinator of their Medical Professionals Advisory Committee.

Learning Objectives

Upon conclusion of this webinar, you will be able to:

1. Define key principles of neural plasticity.
1. Describe how neural plasticity principles are applied in your LSVT LOUD and LSVT BIG treatment sessions.
1. Understand why and how your therapist will challenge you during treatment to facilitate maximum brain and functional change, while avoiding complacency.

Neuroscience Advances

Principles that drive activity-dependent neuroplasticity

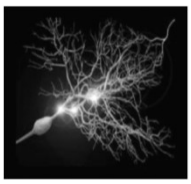
(Alexander et al., 1990; Fox et al., 2002; Graybiel 1998; Kleim et al., 2003; Kleim and Jones, 2008; Jones et al. 1999; Saint-Cyr JA, 2003; Tillerson et al., 2002; Vergara-Aragon et al., 2003; Black et al. 1990; Comery 1995; Fisher et al, 2004; Kleim et al., 2001; 1996; Perez et al. 2004; Pisani et al., 2005 Plautz et al., 2000)

Activity-dependent Neuroplasticity

Promotes "Brain Health" & "Recovery" from injury (stroke, SCI)

Exercise acts directly on molecular machinery

- Neurotrophic factor expression
- Neurogenesis (age and anatomical sites)
- Synaptogenesis
- Pre & Post-synaptic modulation
- Glucose utilization
- Immune system changes
- Angiogenesis
- Suppress oxidative stress
- Stabilize calcium homeostasis
- Reduce inflammation



(Cotman & Berchtold, 2002; Kleim JA, Jones TA, & Schallert T., 2003); Zigmond & Smeyne, 2013)

Neuroplasticity Drivers

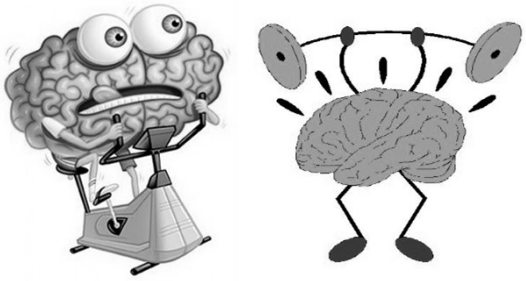
Use it or lose it: Failure to drive specific brain functions can lead to functional degradation

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

Specificity
Intensity
Salience
Repetition
Complexity
Timing

(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)

Exercise as a physiological tool to promote brain change from the inside!
Activity-dependent Neuroplasticity



www.womeninneuroscience.org

Specificity

- Train to the deficits of hypokinesia & bradykinesia
- Specific functional TASK practice is important.
  Singing does not necessarily carryover into speaking.

Complexity

- Complex movements or environmental enrichment have been shown to promote greater structural plasticity

Intensity

- Intensive practice is important for maximal plasticity (brain change)
- Amplitude, Frequency, Duration, Effort, Force, Resistance, Accuracy, Healthy Fatigue

Salience (Importance) Matters

- The training experience must be sufficiently salient to induce plasticity/brain change (Plautz, Milliken, & Nudo, 2000)
- Practicing successful, rewarding, and emotionally important tasks activates basal ganglia circuitry (Dopamine plays a role in reward)
- Motivation and active engagement requires meaningful communication

Repetition

Induction of plasticity requires sufficient repetition (Kleim et al, 2004)

Acquisition not sufficient, need continued performance of skill for long-term structural

Age Matters

- Training induced plasticity occurs more readily in younger brains (Kramer et al., 2004)
- Development fertile ground for plasticity – critical periods, growth spurts
- Change may take longer, and not be as robust, but it CAN occur

Timing matters

- The sooner you begin treatment the better, but it is never too late to start
- In PD, there is the potential to slow progression of symptoms

"Don't practice until you get it right. Practice until you can't get it wrong."
- unknown

LSVT LOUD Treatment Session

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 and spontaneous speaking – 25 min

Build complexity across 4 weeks of treatment

Week 1 – words, phrases
Week 2 – sentences
Week 3 – reading
Week 4 - conversation

Shorter, simple ↕ Longer, complex

Homework

Includes all daily exercises and hierarchy exercises. Assigned all 30 days

Carryover Exercises

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

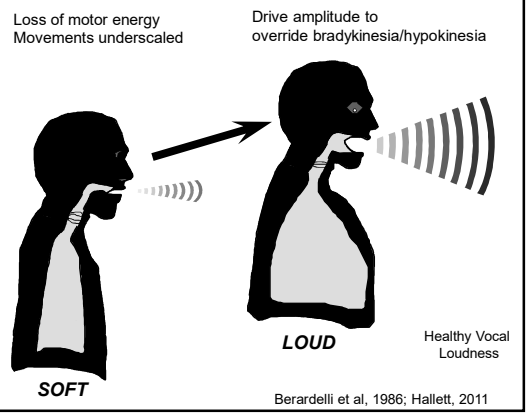
LSVT LOUD: Key Concepts

- Incorporates principles of neuroplasticity
- Administered in an intensive manner to to **challenge the impaired** system.

TARGET: Vocal loudness "WHY?"
(Ramig, Bonitati, et al., 1991; Ramig, 1992; Dromey, Ramig, Johnson, 1994; Sapir et al., 2003; 2007; Fox et al., 2002; Fox et al., 2006)

MODE: Intensive and High Effort

CALIBRATION: Generalization



Berardelli et al, 1986; Hallett, 2011

Target

Specificity of training

Mode

Intensity
Repetition

Specifically trains people with PD how to OVERCOME
Impaired kinesthetic awareness

"My voice is fine. My spouse needs a hearing aide."

Intensity across sessions:

- Treatment delivered 4 consecutive days a week for 4 weeks
- Daily homework practice (all 30 days of the month)
- Daily carryover exercises (all 30 days of the month)
- Life-long habit of continuous practice

Intensity within sessions:

High effort, Repetitions,
Force/resistance, Accuracy, Fatigue

	Treatment Sessions	Homework on treatment days (4 days/week)	Homework on non-treated days (3 days/week)	Total Minimum Repetitions in one month
Long Ah	15 repetitions per day X 16 days=240	6 repetitions per day X 16 days= 96	12 repetitions per day X 14 days = 168	**504 repetitions**
High ah	15 repetitions per day X 16 days=240	6 repetitions per day X 16 days= 96	12 repetitions per day X 14 days = 168	**504 repetitions**
Low Ah	15 repetitions per day X 16 days=240	6 per day X 16 days= 96	12 per day X 14 days = 168	**504 repetitions**
Functional phrases	10 phrases repeated 5 times per day X 16 days = 800	10 phrases, repeated 2 times per day X 16 days = 320	10 phrases, repeated 4 times per day X 14 days = 560	**1680 repetitions**
Structured reading	Week 1: 20 min X 4 days = 80 min Week 2: 20 min X 4 days = 80 min Week 3: 15 min X 4 days = 40 min Week 4: 5 min X 4 days = 20 min Total= 220 min	5 min per day X 16 days = 80 min	10 min per day X 14 days = 140 min	**440 minutes structured reading/verbal practice with target voice**
Conversational speech	Week 1: 5 min X 4 days = 20 min Week 2: 5 min X 4 days = 20 min Week 3: 10 min X 4 days = 60 min Week 4: 20 min X 4 days = 80 min Total= 180 min	5 min per day X 16 days = 80 min	10 min per day X 14 days = 140 min	**440 minutes structured conversation with focus on target voice**
All tasks increase in complexity and difficulty across the 4 weeks of treatment				

Calibration

Salience

Mode

Complexity

CALIBRATION

Addresses Barriers to Generalization

Sensory disorder: People with PD have soft speech, but they think it is within normal limits.

Internal cueing: Physiological substrate for movement is present – not being activated.

Neuropsychological: Slow thinking, slow learning, problems sustaining attention, problems shifting cognitive set, problems internally cueing, and problems in procedural memory.

Fox et al, 2002; Sapir et al, 2011

Complexity

Person with PD has single focus: **LOUD**

Therapist increases complexity over 4 weeks:

- Varying contexts
- Add a Dual Cognitive/Motor tasks
  - Walking & Talking
- Increasing difficulty of tasks
- Get outside of the treatment room
- Talk to a stranger
- Your therapist may interrupt /ask questions
- Seated motor task while reading

Salience - Calibration

We want you to have an "AH-HA" experience ASAP.

1. Who is important to you?
2. Communication situations that are important to you.

When you get positive feedback from others and situations, you will get hooked in to feeling how LOUD is working, and see the importance of LOUD.

LSVT LOUD Salience Example 1

Female, early H&Y Stage 3, motivated to improve speech

Functional Goal: Improve social communication

- Gain confidence to participate in conversations
- Not feel "ignored"
- Decrease the amount of times she has to repeat herself
- Enjoy conversations again

Hobby: Movie Buff

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)

Functional Component Tasks

5 EVERYDAY TASKS– 5 reps each

For example:

- Sit-to-Stand
- Pulling keys out of pocket
- Opening cell phone (flip phone)

Hierarchy Tasks

Patient identified tasks:

Getting out of bed
Playing golf
In and out of a car

Build complexity across 4 weeks of treatment towards long-term goal

BIG Walking

Distance/time may vary

Telepractice

LSVT LOUD Companion

Funded by: NIH-NIDCD & Michael J. Fox Foundation

www.LSVTGlobal.com

LSVT BIG uses the same Principles of Neuroplasticity & Key Concepts

Specificity
Intensity
Salience
Repetition
Complexity
Timing

TARGET: Amplitude of movement

MODE: Intensive and High Effort

CALIBRATION: Address Barriers to Generalization

LSVT BIG

Target

Specificity of training

PRIMARY TARGET:
Hypokinesia/Bradykinesia

- Slower walking
- Loss of arm swing
- Increased time to get dressed
- Smaller handwriting
- Increased time to eat meals
- Difficulty with getting out of bed and chairs

LSVT BIG specifically trains you how to overcome Impaired kinesthetic awareness

"I had no idea my arm did not swing!"

Intensity

FREQUENCY

***DURING* your therapy sessions:**
Treatment delivered 4 consecutive days a week for 4 weeks, 1 hour individual sessions

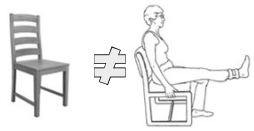
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		✖	✖	✖	✖	

Specificity

Train to the deficits of:

- Hypokinesia and Bradykinesia
- Specific functional task practice

**Cycling does not necessarily carryover to improved bed mobility*



Intensity

FREQUENCY
OUTSIDE of your therapy sessions - all 30 days

- Daily homework practice
  - →Once on treatment days
  - →Twice on non-treatment days

- Daily carryover assignments
  - Carryover activities/taskd
  - → Real world function targeting BIG movements
  - → Life-long habit of practice

ALLOWS FOR MORE PRACTICE!!

Mode

Intensity
Repetition

Intensity

HIGH EFFORT
During sessions and at home:

- Amplitude
- Repetitions
- Force/resistance
- Accuracy
- Fatigue

Intensive **EFFORT** is needed to **OVERRIDE** bradykinesia and hypokinesia!

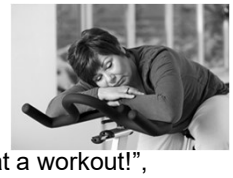
Why?

High level of Repetition is a key principle of brain change

- Needed even more so in PD due to
  Non-motor symptoms:
  - Apathy
  - Slow processing
  - Impaired motor planning/motor learning
  - Impaired memory and executive functioning
  - Broken internal cueing mechanism
  - "Other" neuropsychological changes

  Motor symptoms:
  - Deconditioning, weakness, postural changes

Intensity



FATIGUE

- Good "workout" fatigue
- "This is hard work!", "What a workout!", "You're relentless."
- Feeling a WORKOUT vs. STRAIN/PAIN
- Encouraging you to perform to levels beyond SELF-PERCEIVED CAPACITY

Petzinger, Fisher, McEwn, Beeler, Walksh & Jakowec 2013

Mode

Complexity

Intensity: Minimum Repetitions and Time Spent on Treatment Exercises in LSVT BIG

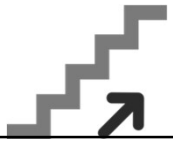
Task	Total Minimum Repetitions in one month
Sustained Exercises	384 repetitions
Repetitive Exercises	1280 repetitions
Functional Component Tasks	400 repetitions
Hierarchy and BIG walking	340 minutes minimum
All tasks increase in complexity and difficulty across the 4 weeks of treatment	

Complexity

Person with PD has single focus: **BIG**

Therapist increases complexity over 4 weeks with Max Ex, FCM, Gait, Hierarchy:

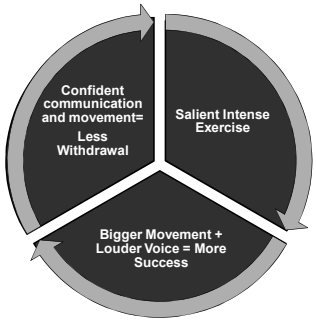
- Add a Dual Cognitive/Motor tasks
  - Walking & reaching in to your purse to get keys
- Increasing difficulty of tasks
  - Getting up from a chair while standing on an uneven surface
- Get outside of the treatment room
  - Walking outside
  - Going to an unfamiliar place



Calibration

Salience

Use it and Improve It – The Rehab Cycle



Salience

To drive brain change your therapist will help you to:

- Practice doing things you enjoy
- Practice doing things that are important to you
- Practice doing things that make you feel good
- Practice so you feel successful

This helps with motivation & active engagement

We want you to see a positive impact on your function outside of therapy

(Plautz, Milliken, & Nudo, 2000)

Summary

LSVT LOUDand LSVT BIG:

- drive activity-dependent brain change/ neuroplasticity
- adhere to the principles of neuroplasticity: specificity, intensity, salience, repetition, complexity, timing
- are Standardized YET Individualized

Calibration and Salience

How to get started with LSVT LOUD and LSVT BIG

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

Further Learning Opportunities

- Public Webinars - www.lsvtglobal.com
  - Live and On-demand
- "Ask the Expert" Questions - info@lsvtglobal.com
- Attend an educational session on "The Science and Practice of LSVT LOUD and LSVT BIG" and then join in for an hour of exercise practice

LSVT BIG:

October 23rd in Livonia, MI and in Worcester, MA

November 6th in Nashville, TN

December 2nd in NYC

LSVT LOUD:

December 3rd in NYC info@lsvtglobal.com

QUESTIONS??

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