LSVT Global® Virtual SLP Mini-Conference

Title: **Beyond Parkinson's: Use of Evidence-based LSVT LOUD for Other Movement Disorders, Aging and Children**

Presenters: Cynthia Fox, PhD, CCC-SLP
Angela Halpern, MS, CCC-SLP

Date Presented: November 19, 2020

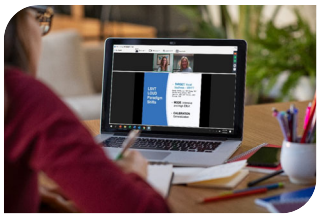
Contact Us:

Web: www.lsvtglobal.com Email: info@lsvtglobal.com

Phone: 1-888-438-5788 (toll free), 1-520-867-8838 (direct)

LSVT Global's Virtual SLP Mini-Conference

Beyond Parkinson's: Use of Evidence-based LSVT LOUD for Other Movement Disorders, Aging and Children



LSVT GLOBAL Innovation in Science. Integrity in Practice.®

1

On-Demand Viewing - Information to Self-Report CE Activity

- The On-Demand version of this webinar is NOT ASHA or state registered for CEUs for speech, physical or occupational therapy professionals, but it may be used for **self-reported CEU credit as a non-registered/non-preapproved CEU activity**. That is, the credit can count towards your CE maintenance progress if you choose to self-report your activity.
- Request certificate by e-mailing webinars@lsvtglobal.com after you have viewed the webinar in full or forward the post-webinar e-mail for your certificate request.
- After your attendance has been verified we will e-mail you a certificate of completion, which will include your name, date of the webinar and the number of hours earned. It may take 1-2 weeks for certificates to be emailed.
- Attendance for the full webinar is required to earn your certificate.

2

On-Demand Viewing - Information to Self-Report CE Activity

- Licensing requirements for CEUs differ by state. Check with your state licensing board to determine if your state accepts non-ASHA registered or non pre-approved CEU activities.
- For more information on including non-ASHA registered CEUs for certification maintenance, visit ASHA's website: http://www.asha.org/Certification/Certification-Maintenance-Frequently-Asked-Questions--Earning-Professional-Development-Hours/#earnASHA
- Completion of the on-demand viewing of this webinar **will not be** reported to the ASHA CE registry by us and cannot be added to the ASHA CE registry by you. It will be your responsibility to retain documentation of completion just as you do with any other non-registered CE activity.

3

Video and Photography Restrictions

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 webinar, is strictly prohibited.

Thank you for respecting the contribution of these clients for allowing their videos to be shared.

4

Logistics

- ✓ Handouts are available in control bar
- ✓ Microphones are all muted
- ✓ You can type in questions at any time, we will answer at the end

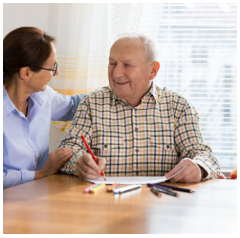
5

Polling Question: Who is joining us today?

- LSVT LOUD certified professional or student
- SLP professional not LSVT LOUD certified
- SLP student not LSVT LOUD certified
- Other

6

Beyond Parkinson Disease: Use of Evidence-based LSVT LOUD for Other Movement Disorders, Aging and Children



LSVT GLOBAL Innovation in Science. Integrity in Practice.®

7

Presenters and Biographies

Cynthia Fox, PhD, CCC-SLP is a Co-Founder and CEO 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 a world leader in administration of LSVT LOUD speech treatment for people with Parkinson disease. She was the first to apply this treatment to disorders other than Parkinson disease (e.g., multiple sclerosis) and pioneered the application to pediatric populations including children with cerebral palsy and Down syndrome. Dr. Fox worked closely on the development of a physical/occupational therapy program, LSVT BIG, that was modeled after the speech treatment protocol.

Angela Halpern, MS, CCC-SLP is Chief Clinical Officer of LSVT LOUD and a research associate with Dr. Ramig's research team at the National Center for Voice and Speech in Denver, CO. She received her master's degree in the Department of Communication Science and Disorders at the University of Pittsburgh and has been LSVT LOUD Certified since 1997. Ms. Halpern has worked extensively in the area of neurogenic disorders with a specialty in Parkinson disease. She has presented at national and international conferences and authored and co-authored publications related to voice and speech in Parkinson disease.

8

Disclosures

- Ms. Halpern and Dr. Fox have both financial and non-financial relationships with LSVT Global.
- Non-financial relationships include a preference for LSVT LOUD as a treatment technique.
- Dr. Fox is an employee of LSVT Global, receives lecture honorarium and has ownership interest.
- Ms. Halpern is an employee of LSVT Global, receives lecture honorarium and travel reimbursement.

9

Learning Objectives

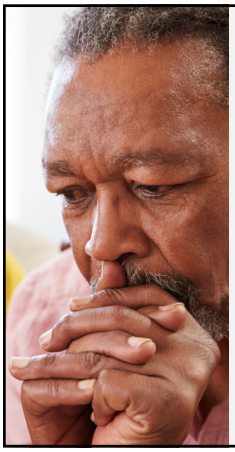
Upon conclusion of this presentation, attendees will be able to:

- Explain the rationale for using LSVT LOUD in conditions beyond Parkinson disease.
- Describe six non-PD diagnoses in adults and children where LSVT LOUD has been used.
- Discuss the outcomes of effectiveness, as self-rated by treating therapists, of LSVT LOUD in non-PD conditions and challenges associated with applying this treatment beyond PD.

10

Treatments for People With Dysarthria Secondary to a Neurological Diagnosis are Needed

11



Negative Impact of Dysarthria on Communication

- Decreased intelligibility
- Decreased naturalness
- Encounter negative attitudes or discrimination
- Diminished engagement in communication
- Complex – challenging to treat

Dickson, S., Barbour, R.S., Brady, M., Clark, A.M, & Paton, G. (2008) International Journal of Language and Communication Disorders, 2, 135-153.

Walshe, M, Peach, R.K., & Miller, N. (2009). Dysarthria impact profile: development of a scale to measure psychosocial effects. International Journal of Communication Disorders, 44, 693-715.

12

Treatment Options

- Restore or improve function
- Promote the use of residual function (compensatory strategies)
- Maximize the communication environment
- Incorporate augmentative communication devices

13

Efficacy of LSVT LOUD

30+ year LSVT LOUD journey from invention to scale-up

The **ONLY** speech treatment for PD with this level of evidence

Phase I, II Invention

- 1987-89: Initial invention; Pilot data Lee Silverman Center
- 1989-91: Treatment development OE-NIDRR

Phase III Research

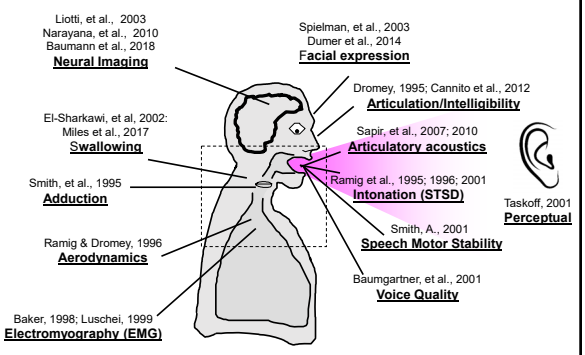
- 1991-94: Treatment follow-up OE-NIDRR
- 1990-95: Treatment Efficacy NIH R01 RCT
- 1995-00: Underlying Mechanism NIH R01 RCT
- 2002-07: Distributed effects NIH R01
- 2007-12: Target/mode NIH R01 RCT

Phase IV, V Clinical Implementation

- 2001-02: LSVT Companion Coleman Institute
- 2002-04: LSVT Companion NIH & MJ FOX Foundation NIH R21
- 2002-04: LSVT Virtual Therapist Coleman Institute
- 2004-06: LSVT Virtual Therapist NIH R21
- 2004: LSVT Down Syndrome Coleman Institute
- 2006: Technology Enhanced Clinician Training NIH SBIR
- 2009: Telehealth Delivery of Software Enhanced LSVT NIH SBIR
- 2010: Independent Delivery of Software Enhanced LSVT NIH SBIR
- 1993-present: Global LSVT LOUD Training & Certification Courses

14

Beyond Efficacy (3 RCTs) – numerous studies (over 30) examining distributed effects, neural correlates, mechanism of change



15

Why LSVT LOUD?

Established Treatment Approach → LSVT LOUD (25+ years research)

Applied to a different population → Phase 4 research

16

Why LSVT LOUD?

- **LSVT LOUD focuses on restoring residual function**
- **LSVT LOUD may help facilitate speech motor control in the case of developmental diagnoses**

17

LSVT LOUD incorporates multiple principles that drive neuroplasticity

Intensity matters
Intensive practice is important for maximal plasticity

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

Repetition Matters
Induction of plasticity requires sufficient repetition

Salience matters
Practicing rewarding tasks (success/emotionally salient) activates basal ganglia circuitry

Timing matters
Injury creates fertile field for plasticity - need behavior to make it happen.

Specificity matters
Train the deficits (target hypokinesia in PD)

(Alexander et al., 1990; Fox et al., 2002; Graybiel 1998; Kliem et al., 2003; Kleim and Jones, 2005; Joneset 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)

18

Plasticity Principles Also Apply to Pediatrics

Plasticity occurs when treatments incorporate:

- Intensive task repetitions
- Progressive challenges to the learner with increasing difficulty
- Presence of motivators and rewards (internally driven)
- Active participation
- Skill acquisition of a functional goal
- Practice must be structured

Shertz & Gordon, 2008

19

LSVT LOUD Key Concepts

TARGET: Voice – healthy vocal loudness

MODE: Intensive and High Effort

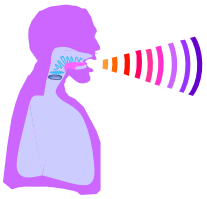
CALIBRATION: Addresses barriers to generalization outside of treatment room

These **Key Concepts** of LSVT LOUD are applicable for a range of neurological disorders and a variety of dysarthria types

Ramig, Bonitati, et al., 1991; Ramig, 1992; Dromey, Ramig, Johnson, 1994; Sapir et al., 2003; 2007; Fox et al., 2002; Fox et al., 2006

20

Voice as a



Source:

-Carrier in signal transmission

-Targets healthy, WNL vocal loudness

-Voice as a point of entry to establish foundation in pediatrics

Trigger:

-Enhance effort and coordination across motor speech system

-LOUDNESS is a global variable

Schulman, 1989; Dromey, Ramig & Johnson, 1995; Sapir et al., 2008; Watson & Hughes, 2006

21

SLP shapes and models normal LOUDNESS with healthy vocal quality, which can also impact...

- Deep breath
- Open mouth
- Intonation
- Improved articulation
- Reduced rate
- Naturalness
- And more!

Mahler et al., 2015; Huber et al., 2003; Spielman et al, 2003; El Sharkawi et al., 2002,Sapir et al., 2003; Sapir et al., 2007

22

Mode of delivery: Intensive and High Effort

- Important for both healthy and disordered motor systems
- Key to effecting behavioral changes that last over time
- Applicable for adults and children

23

LSVT LOUD Treatment

- Treatment is delivered 4 consecutive days a week for 4 weeks
- Individual 1 hour sessions by LSVT Certified Therapists found in all practice settings
- Daily homework practice (all 30 days of the month)
- Daily carryover exercises (all 30 days of the month)

LIFE LONG HABIT OF PRACTICE IS ESTABLISHED!

24

Calibration In Treatment

Parkinson's Disease

- Sensory mismatch
- Problem with internal cueing
- Subtle neuropsychological changes
  - Slower thinking
  - Slower learning
  - Problems shifting cognitive set

Other Neural Conditions

- Sensory disorders
- Vocal effort required for improved speech
- Social stigma
- Cognitive challenges
  - Language deficits
  - Abstract reasoning
  - Delayed expressive/receptive language

25

Link to Function and Task Specific Practice Personalized for Each Patient is VITAL for Generalization

- Incorporate tasks that are meaningful and salient to person – enhances motivation
- Link program to functional goals
- Hobbies and passions should be incorporated and used to achieve self-realization and improved communication

26

THE REAL-WORLD CLINICAL USE OF LSVT LOUD IN NON-PARKINSON'S CONDITIONS

- 13 question online survey sent to LSVT LOUD speech therapists in 6 English speaking countries
- 248 speech therapists representing all six countries responded
- Respondents:
  95% professionals
  5% students

27

94% of respondents reported providing LSVT LOUD to clients with PD

Beyond PD, 75% of therapists reported using this treatment with adults with non-PD diagnoses

15% of the therapists reported using LSVT LOUD with children

28

Survey Results from LSVT LOUD Clinicians

LSVT LOUD Speech Therapy		
Movement Disorders	Usage	Effectiveness*
Progressive Supranuclear Palsy	30%	75%
Multi-system Atrophy	24%	79%
Lewy Body Dementia	19%	81%
Ataxia	14%	88%

*Combined ratings of Very Effective and Somewhat Effective

29

Published Research

(case studies, single-subject designs and small group designs)

Sale, P., Castiglioni, D., De Pandis, M. F., Torti, M., Dall'armi, V., Radicati, F. G., & Stocchi, F. (2015). The Lee Silverman Voice Treatment (LSVT®) speech therapy in **progressive supranuclear palsy**. *European Journal of Physical and Rehabilitation Medicine, 51*(5), 569-74. PMID: 26138088

Countryman, S., Ramig, L., & Pawlas, A. (1994). Speech and voice deficits in **Parkinsonian plus syndromes**: Can they be treated? *Journal of Medical Speech-Language Pathology, 2*(3), 211-225.

Lowit, A., Egan, A. & Hadjivassiliou, M. (2020) Feasibility and Acceptability of Lee Silverman Voice Treatment in **Progressive Ataxias**. *Cerebellum*. https://doi.org/10.1007/s12311-020-01153-3

Sapir, S., Spielman, J., Ramig, L., Hinds, S., Countryman, S., Fox, C., & Story, B. (2003). Effects of intensive voice treatment (the Lee Silverman Voice Treatment [LSVT]) on **ataxic dysarthria**: A case study. *American Journal of Speech-Language Pathology, 12*(4), 387-399. https://doi.org/10.1044/1058-0360(2003/085)

30

Speech characteristics of PSP vs. MSA

(Rusz et al., 2015)

PSP
- Increased dysfluency
- Decreased, slow rate
- Inappropriate silences
- Deficits in vowel articulation
- Harsh voice quality

MSA
- Pitch fluctuations
- Excess intensity variations
- Prolonged phonemes
- Vocal tremor
- Strain-strangled voice quality

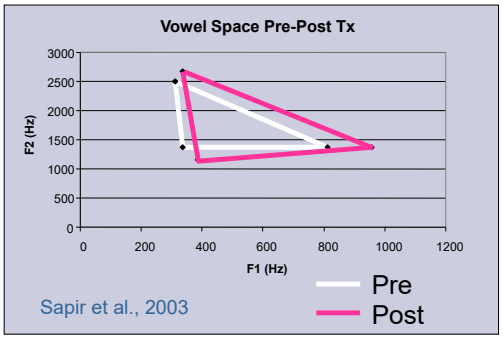
31

Advanced PD/MSA Audio Sample

32

Ataxic Dysarthria – Audio Sample

Pre Post



Sapir et al., 2003

33

Survey Results from LSVT LOUD Clinicians

LSVT LOUD Speech Therapy		
Other Disorders	Usage	Effectiveness*
Stroke	34%	96%
Multiple Sclerosis	19%	89%
Vocal Fold Paralysis	20%	92%
Aging voice	17%	91%

*Combined ratings of Very Effective and Somewhat Effective

34

Published Research

(case studies, single-subject designs and small group designs)

Mahler, L., & Ramig, L. O. (2012). Intensive treatment of dysarthria **secondary to stroke**. *Clinical Linguistics and Phonetics, 26*(8), 681-694. https://doi.org/10.3109/02699206.2012.696173

Wenke, R. J., Theodoros, D., & Cornwell, P. (2008). The short- and long-term effectiveness of the LSVT for dysarthria following TBI and **stroke**. *Brain Injury, 22*(4), 339-352. https://doi.org/10.1080/02699050801960987

Mahler, L., Ramig, L., & Fox, C. (2009). Intensive voice treatment (LSVT LOUD) for dysarthria **secondary to stroke**. *Journal of Medical Speech-Language Pathology, 17*(4), 165-182.

Sapir, S., Pawlas, A., Ramig, L., Seeley, E., Fox, C., & Corboy, J. (2001). Effects of intensive phonatory-respiratory treatment (LSVT®) on voice in individuals with **multiple sclerosis**. *Journal of Medical Speech-Language Pathology, 9*(2), 35-45.

Lu, F. L., Presley, S., & Lammers, B. (2013). Efficacy of intensive phonatory-respiratory treatment (LSVT) for **presbyphonia**: Two case reports. *Journal of Voice, 27*(6), 11-23. https://doi.org/10.1016/j.jvoice.2013.06.006

Ramig, L., Gray, S., Baker, K., Corbin-Lewis, K., Buder, E., Luschei, E., Coon, H., & Smith, M. (2001). **The aging voice**: A review, treatment data and familial and genetic perspectives. *Folia Phoniatrica et Logopaedica, 53*(5), 252-265. https://doi.org/10.1159/000052680

35

Stroke Audio Sample

Pre

Post

36

37

Survey Results from LSVT LOUD Clinicians

LSVT LOUD Speech Therapy		
Children	Usage	Effectiveness*
Cerebral Palsy	7%	100%
Down Syndrome	5%	100%
Vocal fold Paresis/Paralysis	2%	80%
Developmental Disorders	2%	50%

*Combined ratings of Very Effective and Somewhat Effective

38

Published Research

(case studies, single-subject designs and small group designs)

1. Langlois, C., Tucker, B. V., Sawatzky, A. N., Reed, A., & Boliek, C. A. (2020). Effects of an intensive voice treatment on articulatory function and speech intelligibility in children with motor speech disorders: A phase one study. *Journal of communication disorders, 86*, 106003. https://doi.org/10.1016/j.jcomdis.2020.106003

2. Reed, A., Cummine, J., Bakhtiari, R., Fox, C.M., Boliek, C. (2017). Changes in white matter integrity following intensive voice treatment (LSVT LOUD®) in children with cerebral palsy and motor speech disorders. *Developmental Neuroscience*. Jul 28. doi: 10.1159/000478724. [Epub ahead of print]

3. Bakhtiari, R., Cummine, J., Reed, A., Fox, C.M., Chouinard, B., Cribben, I., Boliek, C.A. (2017) Changes in brain activity following intensive voice treatment in children with cerebral palsy. *Human Brain Mapping, 38(9)*: 4413-4429. doi: 10.1002/hbm.23669.

4. Boliek, C.A. & Fox, C.M. (2016). Therapeutic Effects of Intensive Voice Treatment (LSVT LOUD®) for Children with Spastic Cerebral Palsy and Dysarthria: A Phase I Treatment Validation Study. *International Journal of Speech-Language Pathology*, Oct 5:1-15. DOI:10.1080/17549507.2016.1221451

5. Boliek, C.A. & Fox, C.M. (2014). Individual and environmental contributions to treatment outcomes following a neuroplasticity-principled speech treatment (LSVT LOUD) in children with dysarthria secondary to cerebral palsy: a case study review. *International Journal of Speech-Language Pathology, 16(4)*: 372–385.

6. Boliek, C.A., Fox, C.M., Norton, J., Gan, L., Archibald, E., Knuttila, E., Rosborough, C., & L'Abbe, A. (2009). Changes in trunk muscle activation and respiratory kinematics during speech following Intensive voice treatment (LSVT LOUD) for children with spastic cerebral palsy. *Movement Disorders, 24*, S450.

7. Fox, C.M., & Boliek, C.A. (2012). Intensive voice treatment (LSVT LOUD) for children with spastic cerebral palsy and dysarthria. *Journal of Speech Language Hearing Research, 55*, 930-945.

8. Fox, C.M., Boliek C.A. (2015). Technology-enhanced maintenance practice following intensive voice therapy (LSVT LOUD) in children with cerebral palsy and dysarthria. Movement Disorders, Vol. 30, Suppl 1, p. S205.

9. Fox, C.M., Boliek, C.A., Namdaran, N., Nickerson, C., Gardner, B., Piccott, C., Histad, J., & Archibald, T. (2008). Intensive voice treatment (LSVT) for children with spastic cerebral palsy. *Movement Disorders, 23*, S378.

10. Fox, C.M., Boliek, C.A., & Ramig, L. (2005). The impact of intensive voice treatment (LSVT) on speech intelligibility in children with spastic cerebral palsy. *Movement Disorders, 20*(10), S149.

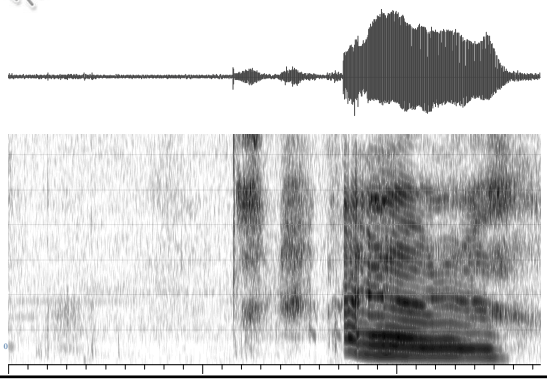
11. Levy, E.S. (2014). Implementing two treatment approaches to childhood dysarthria. *International Journal of Speech-Language Pathology. 16(4):344-54.*

12. Levy, E. S., Ramig, L. O., & Camarata, S. M. (2013). The effects of two speech interventions on speech function in pediatric dysarthria. *Journal of Medical Speech-Language Pathology, 20*(4). 82-27.

39

Pre-LSVT LOUD
"I don't know"

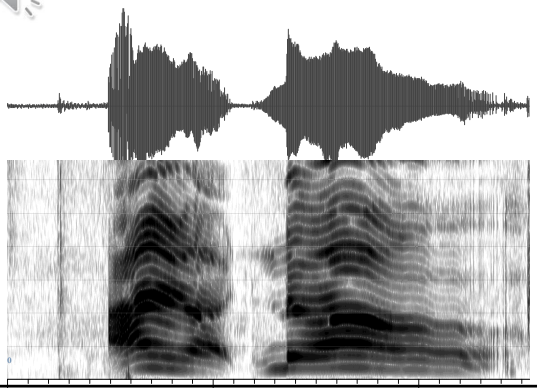
Cerebral palsy
Male; 3 years, 11 mos.



40

Post-LSVT LOUD
"I don't know"

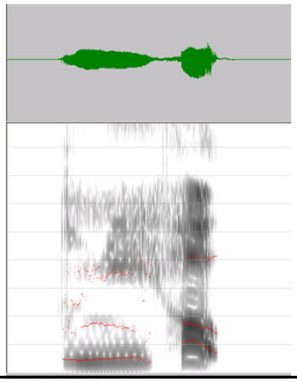
Cerebral palsy
Male; 3 years, 11 mos.



41

Pre-LSVT LOUD
"I need help."

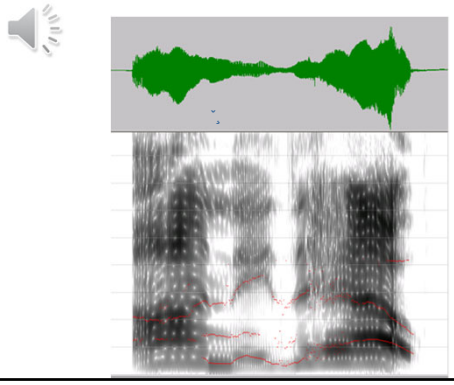
Down syndrome
Female; 5 years



42

Post-LSVT LOUD
"I need help"

Down syndrome
Female; 5 years



43

CHALLENGES ASSOCIATED WITH APPLYING LSVT LOUD TREATMENT BEYOND PARKINSON'S DISEASE

Survey Results from LSVT LOUD Clinicians

Cognitive impairments were the greatest patient challenge for success

Intensity of dosage was the greatest logistical challenge

44

LSVT LOUD Adaptations for Cognitive Challenges

Adaptations ARE:

- Increasing repetitions for shorter durations
- Allowing greater rest breaks
- Persisting at phrase/sentence levels of the hierarchy
- Utilizing family and support system for carryover
- Altering materials for visual/language impairments
- Adding additional sessions and more frequent follow-ups

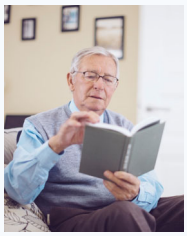
Adaptations are NOT:

- Altering core protocol
- Delivering fewer or shorter sessions
- Changing treatment tasks
- Eliminating core elements (target, mode, calibration)

45

Dementia Case Example

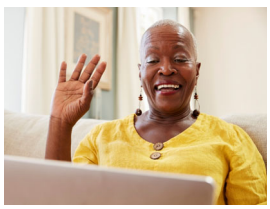
You have a person with PD who has significant dementia and as a result has difficulty reading unfamiliar material. This particular person is very involved in his place of worship. Thus, you can select familiar short phrases for him to read to keep the intensity of motor practice going and maintain salient engagement.



46

46

Alternative delivery mechanisms of LSVT LOUD



LSVT® eLOUD
Telepractice

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

www.LSVTGlobal.com

47

GENERAL CONSIDERATIONS

- LSVT LOUD is **not** for everyone – It is another tool in the toolbox
- Diagnoses that are contraindicated
  - Myasthenia Gravis
  - ALS
  - Multiple Sclerosis in exacerbation
- Stimulability testing results, clinical judgment and client/family discussions should guide the decision to progress with treatment or not

48

How does an LSVT LOUD Certified Therapist Determine if LSVT LOUD is Appropriate for Other disorders?

- Evaluate the clinical diagnosis and rationale for focusing on improving voice.
- Determine if there are medical contraindications (e.g. ALS, myasthenia gravis) by consulting with the patient's medical team.*
- If there is a good clinical rationale, based on the physiology of the communication disorder, then try stimulability testing.
- If stimulability testing is successful, try one week trail treatment. Assess and proceed accordingly.

49

Stimulability: Give everyone a chance!

- Don't discount successful treatment options just because a condition is severe, advanced or complex
- The outcomes can be very impressive
- FUNCTIONAL oral communication of any kind can dramatically improve quality of life in severely disordered communication, even if supplementation is required

50

Summary

- There is a solid rationale for applying LSVT LOUD to conditions with disordered speech beyond Parkinson's
- Research evidence exists for select populations (case studies, single-subject designs and small group designs)
- The effectiveness, as self-rated by treating therapists, of LSVT LOUD in non-PD conditions has been quite high for the conditions reported here
- Challenges associated with applying this treatment beyond PD include cognitive impairment and logistical concerns
- There are there are adaptations and solutions available to address patient and logistical challenges

51

How to Ask Questions

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,
   - Then you can ask your question out loud
3. **Email info@lsvtglobal.com if you think of questions later!**

52

Join us for our virtual SLP mini-conference

November 18-21, 2020

Date	Time (EST)	Title	Presenters
11/18 Wed	6:00-8:00 PM EST	**Telepractice in Private Practice and University Clinics for Adults with Neurological Disorders** Register: https://attendee.gotowebinar.com/register/6816630554853117965	Lori Ramig, PhD Jessica Galgano, PhD Geralyn Schulz, PhD Deborah Theodoros, PhD
11/19 Thurs	6:00-7:00 PM EST	**LSVT LOUD® Applied to Adults with Cerebral Palsy: Two Single-Subject Studies** Register: https://attendee.gotowebinar.com/register/6754091432977020429	Gemma Moya-Galé, PhD
11/19 Thurs	7:30-8:30 PM EST	**Beyond Parkinson's: Use of Evidence-based LSVT LOUD for Other Movement Disorders, Aging and Children** Register: https://attendee.gotowebinar.com/register/1045756915052631823	Cynthia Fox., PhD Angela Halpern, MS
11/20 Fri	12:00-1:00 PM EST	**Enhanced Solutions for Voice and Mobility Maintenance Classes: Virtual Discoveries in PD Care!** Register: https://attendee.gotowebinar.com/register/2907244394828674831	Angela Halpern, MS Laura Guse, MPT Cynthia Fox, PhD
11/21 Sat	10:00-11:00 AM EST	**Improved Verb Use Following Intensive Voice Treatment in Individuals with Parkinson's Disease** Register: https://attendee.gotowebinar.com/register/8436832406637468431	Amy Ramage, PhD
11/21 Sat	11:30-12:30 PM EST	**Building a data base for automatic speech recognition in Parkinson's disease** Register: https://attendee.gotowebinar.com/register/7651336801707853839	Lori Ramig, PhD Bob McDonald, PhD

53

Thank you!

LSVT GLOBAL

info@lsvtglobal.com
www.lsvtglobal.com

Live viewing: Please complete the survey that will launch when you close the program.
Survey is required for ASHA CE Registry Reporting.

54