Exhibitor Sponsored Seminar

Title: **From Parkinson's to Pediatrics: Why a "Think BIG" approach makes sense!**

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LSVT BIG® Training and Certification Faculty

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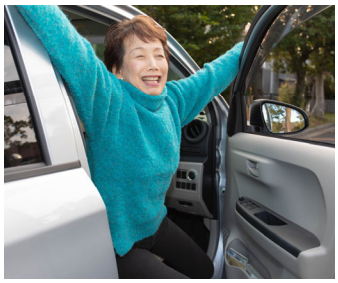
From Parkinson's to Pediatrics: Why a "Think BIG" approach makes sense!



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Erica Vitek

Ms. Vitek has been certified in LSVT BIG® since 2009 and is a graduate of the Parkinson Foundation's Team Training program. She is also a trained PWR! (Parkinson's Wellness Recovery) provider. Erica has a special interest in the unique pelvic floor, bladder, bowel, and sexual health issues experienced by individuals with PD. She is Board Certified in Biofeedback for Pelvic Muscle Dysfunction, a Board-Certified Pelvic Rehabilitation Practitioner, and Herman & Wallace Pelvic Rehabilitation Institute faculty authoring Parkinson Disease and Pelvic Rehabilitation. She presents and authors articles for the Wisconsin Parkinson Association. She is employed by Aurora Sinai Medical Center in Milwaukee, WI, leading LSVT programing, including LSVT BIG graduate exercise classes.

Erica Vitek, MOT, OTR, BCB-PMD, PRPC
LSVT BIG Faculty

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Disclosures

- Ms. Vitek has both financial and non-financial relationships with LSVT Global.
- Non-financial relationships include a preference for LSVT BIG® as a treatment technique.
- Financial Relationships include:
  - Ms. Vitek receives lecture honorarium and travel reimbursement from LSVT Global, Inc.

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Learning Objectives

1. Define LSVT BIG and the goal of treatment.
2. Identify key considerations in clinical rationale used to determine if LSVT BIG is appropriate for a patient.
3. Summarize emerging research that use LSVT BIG for neurological conditions other than PD.
4. Review case studies using LSVT BIG in pediatrics.

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Up to 1 billion people globally are living with a neurological disorder.

World Health Organization Report 2007

Parkinson's disease (PD) 10+ million	Stroke 101.5 million	Alzheimer's and dementias 24.3 million	Atypical Parkinsonisms over 3 million
Multiple Sclerosis 2.8 million	Cerebral Palsy 17 million	Down Syndrome 6 million	

Statistics. Parkinson's Foundation.; 2021 Heart Disease & Stroke Statistical Update Fact Sheet Global Burden of Disease; Ferri et al., 2005; Levin et al., 2016; Walton et al., 2020; Alliance, C. P. Facts about cerebral palsy. Cerebral Palsy Alliance; Presson et al., 2013; World Health Organization. Neurological disorders affect millions globally: Who report 2007; Global Down Syndrome Foundation

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How does PD negatively impact ability to do daily activities?

Tremor
Bradykinesia
Hypokinesia
Rigidity
Impaired kinesthetic awareness
Limb kinetic apraxia
Difficulty sustaining repeated movement
Difficulty with initiation of movement (GO)
Difficulty stopping movement (NO GO)
Dyskinesias

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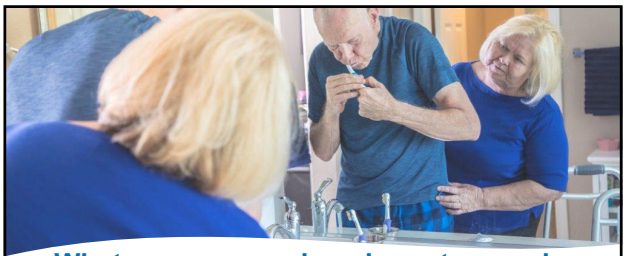

What are common impairments seen in OTHER neural disorders or in aging?

- Balance impairments
- Gait and mobility changes
- Decreased independence - ADLs/IADLs
- Impaired limb use and/or hand function
- Fear of falling with or without falls
- Reduced activity, deconditioning
- Sensory, visual, perceptual changes
- Complex – challenging to treat

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Treatment Options

- **Restore or improve function**
- **Promote the use of residual function (compensatory strategies)**
- **Maximize the external environment for movement and function**
- **Incorporate assistive devices and technology for function and movement**

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What is LSVT BIG®?

- Intensive, amplitude-focused physical and occupational therapy originally developed for people with Parkinson's.
- A standardized one-month treatment protocol that is customized to each person.
- **Goal: Restore normal movement patterns and function in everyday activities.**

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Summary of 20+ years of LSVT BIG Research

- Total of 50+ studies
- 5 Systematic Reviews & Meta-Analyses
- 2 Foundational RCTS (Ebersbach 2014, 2010); 8 total RCTs
- 2016-2026 Studies exploring motor, non-motor, functional outcomes
- Comparison to other interventions
- Telehealth delivery
- Other neurologic diagnoses

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What are the fundamentals of LSVT BIG?

TARGET: Amplitude-single target

MODE: Intensive and High Effort

CALIBRATION: Goal of Generalization
- Sensory
- Internal cueing
- Neuropsychological changes

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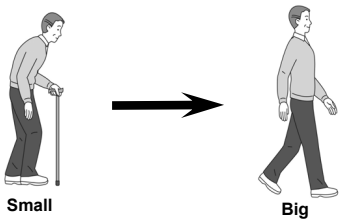
TARGET: Amplitude (Bigness)

Movements too small — Drive effort to increase amplitude

Single Target - Triggers Activation across motor systems



Berardelli et al, 1986; Hallett, 2011

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Training amplitude enhances other levels of motor output

Documented Cross-System Effects of LSVT BIG

- UPDRS motor score
- Trunk Rotation Range of Motion
- Stride length
- Speed with Gait, Transfers, Reaching
- Reaction Time
- Balance
- Coordination
- Dual Tasking
- ADLs
- Occupational Performance
- Upper Extremity Function

Doucet 2021; Ebersbach et al., 2010; 2014; 2015; Farley et al., 2008; Farley & Koshland, 2005; Fishel 2020; Henderson et al., 2020; Henry 2021; Isaacson et al., 2018; Janssens et al., 2014; Kaya Aytutuldu 2024; Millage et al., 2017; Schaible 2021

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MODE: Intensive & High Effort

Delivery LSVT BIG

- Certified LSVT BIG Physical & Occupational Therapists
- 1:1 intervention

Time of Practice

- 4 consecutive days per week for 4 weeks
- 16 sessions in one month
- 60-minute sessions
- Daily carryover assignments
- Daily homework

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Mode: Incorporates 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; 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., 1996; Perez et al. 2004; Pisani et al., 2005, Plautz et al., 2000)

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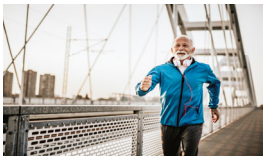
LSVT BIG Goal: CALIBRATION

Patient uses bigger movements "automatically" in her/his daily living and is able to maintain these bigger movements over time.



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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)

Functional Component Tasks

5 EVERYDAY TASKS– 5 reps each

For example:

- -Sit-to-Stand
- -Pulling pants up
- -Stepping into shower

Hierarchy Tasks

Patient identified complex tasks:

- Dressing
- Meal Preparation
- Toileting

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

Walking BIG

Distance/time may vary

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LSVT BIG Exercise Demo

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How can we connect these exercises to function to make it meaningful for the patient?

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Individualized Treatment Approach

Structure to individualize LSVT BIG:

- Adapt/progress exercises
- Use interview, exam, and outcome measurements to collaborate
- Select Salient Functional Component Tasks
- Select Salient Hierarchy Tasks
- Assign real-world Carryover Tasks

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Interactive Sit to Stand Demo

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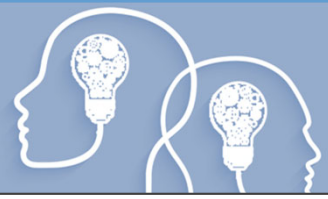

WHAT IF?

Opportunity

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Why LSVT BIG Beyond PD?

Established Treatment Approach → LSVT Protocols (30+ years research)

Applied to a different population → Phase 4 research

- LSVT BIG focuses on restoring residual function in damaged or degenerative conditions
- LSVT BIG may help facilitate motor control for gait, and activities of daily living in neurodevelopmental diagnoses

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Key Concepts of LSVT BIG Apply to a Range of Neurological Disorders

TARGET: Amplitude (BIG)

MODE: Intensive & High Effort

CALIBRATION: Addresses barriers to generalization outside of treatment room

Ramig, 1992; Dromey, Ramig, Johnson, 1995; Sapir et al., 2003; 2007; Fox et al., 2002; Fox et al., 2012

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Target: Amplitude

- Cueing increased bigness does **NOT** mean you are training clients to use exaggerated movements.
- Bigness is what the client *may feel* to have movement that is actually **WITHIN NORMAL LIMITS**.
- Improving bigness promotes learning control of abnormal movement resulting from ataxia, hyperkinesia, spasticity, impulsivity, weakness, compensation.
- You are:
  - Training healthy movement amplitude.
  - Training body symmetry of amplitude.
  - Optimizing the speed-amplitude relationship.

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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
- Consistent with principles that drive activity-dependent neuroplasticity

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Mode of delivery: Neuroplasticity principles also apply to children

Neuroplasticity 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

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Mode of delivery: Personalized task specific practice is VITAL for generalization.

- Incorporate tasks that are meaningful and salient to person to enhance motivation
- Link program to functional goals.
- Hobbies and passions should be incorporated and used to achieve self-realization and improved movement, gait and ADLs.

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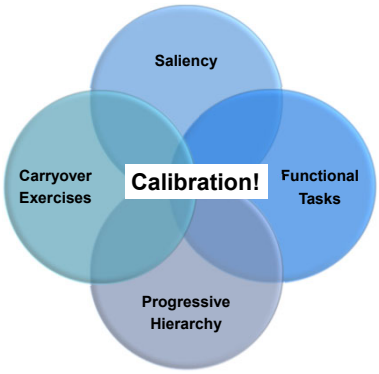
Calibration: Focus on Function in LSVT BIG

Goal: PERSON automatically uses improved movement in daily living and the *improvements last over time*.



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Calibration: Goal of Treatment

Parkinson's Disease	Other Adult Conditions	Pediatrics

• Sensory mismatch
• Problem with internal cueing
• Subtle neuropsychological changes
  • Slower thinking
  • Slower learning
  • Problems shifting cognitive set
	• Sensory changes
	• Effort required for improved control
	• Cognitive changes
	  • Attention
	  • Memory
	  • Reasoning
	  • Decision making
		• Sensory stimulation deficit
		• Muscle power activation deficit
		• Varying cognitive challenges
		  • Attention
		  • Slowed learning
		  • Delayed language development
		  • Impulsivity

Moreau, N., et al., 2012; Busboom, M., et al., 2022

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The dosage and framework are not modified when delivered beyond PD.

LSVT is LSVT is LSVT

- LSVT BIG is still delivered per protocol.
- Core fundamentals of intensity, complexity, repetition, task specificity and saliency apply beyond PD.

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Non - PD Diagnoses to Consider

- Atypical and Secondary Parkinsonisms
- Chronic Stroke/CVA
- Multiple Sclerosis
- Balance Dysfunction and Falls
- Brain Injury
- Pediatric Neurodevelopmental Conditions (CP, Down Syndrome, etc.)

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The real-world clinical use of LSVT BIG in non-Parkinson's conditions

Survey Results from LSVT BIG Clinicians

Movement Disorder	Usage	Effectiveness
Secondary PD	26%	91%
Lewy Body Dementia	26%	70%
Progressive Supranuclear Palsy	20%	73%
Other Disorder	**Usage**	**Effectiveness**
Stroke	40%	86%
Aging Balance	36%	94%
Multiple Sclerosis	17%	82%

541 physical and occupational therapists responded to 13 question online survey

Poster – **Beyond Parkinson's Disease: The use of standardized speech, physical & occupational therapies in atypical parkinsonism, other movement disorders & aging conditions.** – MDS 2020; Fox, Guse, Halpern

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Published Case Reports on LSVT BIG: NPH, PSP, Vascular Dementia, MSA

Outcomes Following LSVT BIG in a Person with Idiopathic Normal Pressure Hydrocephalus: A Case Report
Fillmore et al., 2020

Effect of the Lee Silverman Voice Treatment BIG® on motor symptoms in a participant with progressive supranuclear palsy: A case report
Hirakawa et al., 2023

Amplitude-based training in secondary Parkinsonism & Parkinson Plus Syndrome: A case series
Babcock, R., et al., 2025

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Published Studies on LSVT BIG in Chronic Stroke

LSVT BIG in late stroke rehabilitation: A single-case experimental design study.
Metcalfe, et al., 2019

Lee Silverman Voice Treatment BIG for a Person with Stroke
Proffitt et al. (2018, 2021)

Effectiveness of Telehealth delivered LSVT BIG in Chronic Stroke: single subject design
Jeong, Hong & Choi 2026

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Summary of Evidence

LSVT BIG Post-Stroke

- Decreased muscle tone
- Improved UE motor function
- Improved occupational performance
- Improved task performance satisfaction
- Increased performance in trained and untrained tasks
- Improved quality of life
- Generalization

Proffitt et al., 2018, 2021; Metcalfe et al., 2019

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Clinical Pediatric Case Example A

- 10-year-old female
- Diagnosed with Anaplastic Ependymoma grade 3 brain cancer 5 years prior
- Tumor extended from 4th ventricle into cerebellum
- History of 3 open brain surgeries for tumor removal
- 50 doses of targeted radiation

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Why LSVT BIG?

Traditional therapies had improved strength and ROM, but limited improvements to functional independence or gait independence.

Treatment Parameters

- Pre-assessment
- 4 sessions per week x 4 weeks
- LSVT BIG exercises conducted 2x/day
- High parent buy in
- Post-assessment

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LSVT BIG for Child with Brain Tumor Pre & Post Assessment Comparison

	Pre LSVT BIG	Post LSVT BIG
30 second sit to stand	6 times	15 times
6-minute walk test using AD	800 feet	1007 feet (Increase 25.9%)
Gait (Anterior ETAC walker)	AD for all gait	AD only for long distances, uneven surfaces; not in school
Bruininks-Oseretsky Test for Motor Development (BOT-2)	1st percentile	5th percentile (body coordination, strength, agility)
Single leg stance	Right:Left 0 seconds	Right:Left 3:4 seconds
Tandem stance	Right:Left 0 seconds	Right:Left 14:17 seconds

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Case Example B

- 9 Year Old Female
- Diagnosed with Cerebral Palsy- Spastic Triplegia
- Bilateral Lower Extremities and Right Upper Extremity
- History of Selective Dorsal Rhizotomy
- History of Traditional Therapies (PT, OT)
- Completed 4 weeks LSVT BIG intensive

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Two self-identified occupational performance concerns
SELF-CARE and PRODUCTIVITY

1. SELF CARE: Personal Care – Putting her hair into a ponytail.
- Rating of importance pre/post: 5/4
- Performance pre/post: 1/4 (noting difficulty being a 10/8)
- Satisfactory pre/post: 1/4

2. PRODUCTIVITY: Pet management – Helping clean out the cat's litter box.
- Rating of importance pre/post: 10/10
- Performance pre/post: 5/9 (noting difficulty being a 5/2)
- Satisfactory pre/post: 5/9

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Case Example B
Post LSVT BIG ROM

	PRE/POST R	PRE/POST L
Shoulder Flexion	125°/150°	165°/170°
Shoulder Abduction	113°/140°	180°/180°
Elbow Flexion	145°/150°	150°/150°
Elbow Extension	Lacking 30°/8° degrees	0°/0° (Full extension)
Wrist Flexion	80°/80°	90°/90°
Wrist Extension	Lacking 40°/20° degrees	74°/80°

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LSVT BIG Case Example C

- 13-year-old female
- Diagnosed with Ataxia-Telangiectasia
- Most community mobility using a manual w/c but is able to walk arm in arm with a parent

	Initial	Discharge
2-minute walk test	152 feet	169 feet
9-hole peg test - right	3 minutes 50 seconds	3 minutes 6 seconds
9-hole peg test - left	2 minutes 17 seconds	1 minute 34 seconds
Functional tasks recording form	4.0	3.3 (largest change eating with utensils, brushing teeth, floor to w/c transfer)

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LSVT BIG Case Example D

- 4-year-old male
- Down Syndrome
- Completed LSVT BIG and LSVT LOUD during the same month summer 2024 & 2025
- History of traditional therapies (PT, OT, SLP)
- Speech services currently only at school

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LSVT BIG Case Example D

Maximal Daily Exercises	BIG hands out down up
	BIG reach across
	BIG forward step
	BIG side step
	BIG back step
	BIG swings
	BIG twist

Functional Component Tasks	BIG sit stand
	BIG squeeze tracing name
	BIG 2-point grasp self feeding
	BIG jump
	BIG kick
Hierarchy	BIG stairs
BIG Walking	Running
Carryover task	

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LSVT BIG Case Example D
Discharge Functional Change

Post LSVT BIG Cognitive/Communication	Post LSVT BIG Gross Motor	Post LSVT BIG Fine Motor
Talking a lot more at home	Crawling out of crib	Picking up and putting down adult fork for meals
Imitating sounds	Jumping on couch/crib bil UE support	Holding adult fork for the duration of a meal
Imitates blowing	Initiates side stepping going up stairs bil UE support railing home & community	Successfully loading adult fork and bringing to mouth
Following simple directions	Repeating motor tasks when acknowledged/praised by older sisters	Pincer grasp vs 3-point grasp for small snacks
50% increased attention span for activity	Less foot inversion with AFOs off	Grasp of large dry erase marker, palmer grasp recognizing letters in name and tracing
More aware of what is going on around him	Increased running pace	
	Floating on back and holding self up in life jacket swimming	
	Balanced on rolling stool on own for school pictures	
	Reaching to counter & TV standing on 1 leg	

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LSVT BIG Case Example D

Sounds Pre-LSVT LOUD	Sounds Post-LSVT LOUD
“GU” (good)	“B” (“Ba”, “Bo”)
“mama” (mom)	“P” (pop)
“Ah” (on)	“hot” (ott)
	“scar” (ga) (his dog's name)
	Noise of the car blinker
	“beep beep”

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Decision Making Process for Applying LSVT BIG Beyond PD

- LSVT BIG is **not** for everyone – It is another tool in the toolbox.
- Medical diagnosis consideration, contraindications *(i.e. myasthenia gravis, ALS),* clinical judgment and client/family discussions should guide the decision to progress with assessment and treatment.
- Based on the physiology of the movement disorder, clinical rationale will guide LSVT BIG Certified therapists in movement evaluation and stimulability testing.
- If stimulability testing is successful, the LSVT BIG Certified Clinician can do a one-week trial treatment and proceed accordingly.

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Summary

- LSVT BIG is an evidence-based treatment program developed for Parkinson's but can be used for other diagnoses to improve mobility and occupational performance.
- Clinical assessment and decision making by LSVT BIG Certified Clinicians should be employed to determine candidacy.
- Early research shows possibility that LSVT BIG was helpful in improving function and arm use in some clients post stroke.
- Occupational performance measures are useful in identifying tasks which are meaningful to the client and evaluating change as a result of LSVT BIG.
- Continued research is needed.

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LSVT BIG Training and Certification Options

Online	• Offered for 1.45 CEUs (14.5 hours) • Self-paced, all online, 60 days course access
Virtual Live or In-Person	• 2-day course; blend of prerecorded and interactive • 15 contact hours/1.5 CEUs

Open to OTs, COTAs, OT students as well as PTs, PTAs, and PT students

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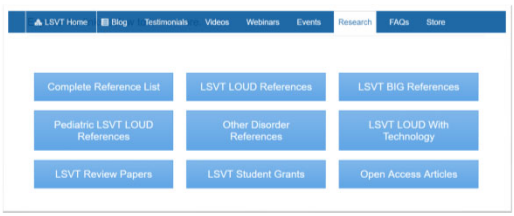
LSVT BIG References

https://blog.lsvtglobal.com/research/



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Thank you!

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