

A Home Based or Community Based Program Designed to Improve and Strengthen Voice

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Disclosure statement:

To comply with professional boards/associations standards:

I declare that I am president of Voice Aerobics, LLC with a commercial interest in products or services discussed in my presentation.

All Planner's involved do not have any financial relationship.

Current accreditation status does not imply endorsement of any commercial products displayed in conjunction with this activity

Overview of Seminar:

- Brief review voice, speech, and swallowing problems associated with Parkinson's disease.
- Present Voice Aerobics™ as an adjunct to formal therapies, and appropriate for healthy older adults with age related changes in respiration and voice.
- Demonstrate a method to assess stimulability, which includes auditory masking to elicit louder voice .
- Discuss how home based programs can provide continuity in patient's lives by helping them maintain functional abilities and reduce dependence on others.

Home Based Patient Directed Programs

Voice Aerobics™ DVD is a three part exercise program designed for individuals experiencing changes in voice and speech resulting from Parkinson's or other neurological disorders.

Voice Aerobics™ Grand Slam is a companion to the dvd and puts the exercises in your hand.

Voice Aerobics™ Songbirds is an audio CD for voice practice on the go.

Why Voice Aerobics?

- Idiopathic Parkinson's disease (IPD) affects 3% of adults age 65 and older.
- 1.5 million in the US.
- As many as 90% of people with Parkinson's (PD) will develop a speech and voice disorder.
- As many as 95% of people with PD have a swallowing disorder.
- Numerous studies have failed to find significant improvement in voice and speech functions with levodopa or dopamine agonists.
- To protect dopamine cells, exercise should start as early as possible, yet, patients receive **referrals to physical or speech therapy only 12–16% of the time.**

A Patient Says: *"I was just diagnosed with Parkinson's and my doctor already wants me to have speech therapy. Why bother, my voice is not that bad?"*
Some patient characteristics:

- **Reluctant:**

Unconcerned, resentful, unaware, "it bothers other people"

Pat, 62, "I'm not really bothered by my speech, apparently you are"

- **Remind Me:**

Forgetful, dependent on others for motivation, schedules, exercise
Larry, 70, PD, Lewy Body Dementia. Can't remember exercise strategy from visit to visit. Spouse frustrated.

- **Reward Me:**

Aware of problems, likes reinforcement, goal oriented, uses feedback tools.

John 64, consultant, "I do a lot of speaking, my voice has softened." I do slow down when my meds wear off."

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- **Remorseful:**

Regrets affect of speech/voice on work and relationships

Raymond, 66, "it cost me my job"

Bill, 59, "I find myself fearful, I start to panic that I'm going to stutter"

Parkinson's is "sneaky" like a cat burglar lurking in the background changing the way muscles work.

Parkinson's affects 3% of adults age 65 and older in the US.

PD diagnosis occurs when 70–80% of the neurons in the substantia nigra are gone.

As cells die, dopamine levels in the basal ganglia drop.

As dopamine levels drop, automatic movements become more difficult.

Dopamine and Movement

- When dopamine levels drop, movements become slow (bradykinesia)
- Incomplete (hypokinesia)
- Not terminated (festination)
- Sensory mismatch between how they move, how loud they talk, and how the movements feel.
- Medication (dopamine) replacement may yield dyskinesias

Speech, voice, and swallowing symptoms may include:

- Hypokinetic dysarthria
- Hypophonia
- Pressed speech or festination of speech
- Vocal tremor

- Reduced lingual movements with lingual pumping.
- Reduced breath support due to rigidity of rib cage.

Swallowing Difficulties and Parkinson's Disease

- Changes in the shape and function of the vocal folds, reduced tongue coordination and strength, and reduced sensory awareness leads to swallowing disorders, including aspiration.
- Reduced reciprocity of respiration and swallowing.
- Patient's Swallowing Difficulty May:
 - Cause problems with safely taking pills and other medication;
 - Cause inadequate nutritional intake of food or liquid;
- Lead to aspiration pneumonia;
- May occur at any sate of the disease, and correlated with cognitive impairment and postural instability. Walker et al, 2010

One study found that only 35% patients reported swallowing difficulties, however, video swallow studies (MBS) identified swallowing abnormalities in 75% patients.

How You Breathe Matters

- Individuals with Parkinson's may swallow on the wrong "phase" of breathing
- (i.e. inspiration v/s exhalation). Gross, 2008
- Disorganized swallowing may lead to increased risk of "choking" (aspiration)

Why Exercise Breathing Muscles?

- Accurate coordination between breathing and swallowing could be the key to safety in Parkinson's Disease.
- Exhaling after the swallow can serve as an airway-clearance mechanism if the material entered the airway while swallowing. R.D.Gross 2008

- Strengthening the muscles of exhalation has been shown to increase the speed and efficiency of swallowing, and may have the potential to reduce the risk of aspiration pneumonia.

Sapienza, et al 2007

Sit up Straight, and Let's Practice

1. Sit up straight. Inhale through your nose and mouth to fill your lungs. **Hold your breath** for one or two seconds while you **swallow hard** (one time, two if you can), then immediately exhale (kick the breath out) through **pursed (rounded lips.)**

If your mouth is particularly dry, use a spray or sip of water prior to the swallow.

Repeat 5x's three times a day or before meals. To improve this automatic sequence.

Volitionally performed pursed lip breathing PLB by patients with COPD promotes a **slower and deeper breathing pattern** both at rest and during exercise, while prolonging exhalation (*Chest 2005;128;640-650*)

Daily Practice of Swallowing Exercises or Strategies is Important

- After completion of the LSVT®, some people report improved swallowing function with less episodes of coughing or choking during meals.
- Expiratory muscle strength training (EMST) Sapienza, 2009

Daily practice!!!

Voice Aerobics™ can be used as an adjunct to formal swallowing therapy and its use may serve to heighten awareness about :

- Diaphragmatic breathing and breath support for better coordination of respiration and swallowing.

- Emphasis on use of abdominal muscles (core muscles) for support of breath stream on exhalation for swallowing and cough power.
- Vocal glides to lift the larynx (voice box) and stretch the vocal folds which helps with protecting the airway.
- Use of Voice Aerobics™ Songbirds prior to eating may increase alertness and awareness of oral movements.

Questions:

Voice problems associated with Parkinson's Disease include:

- reduced loudness
- monotone
- hoarse and breathy voice
- DBS (deep brain stimulation) may also contribute to changes in speech clarity, with patients reporting slurring, or stuttering-like changes.
- Studies looking at the effect of deep brain stimulation report variable results.

Speech and voice disorders appear less responsive to deep brain stimulation surgeries, and some patient actually report onset of speech or swallowing difficulty following DBS. (DBS-STN.org: A Review of the Literature June 2004)

Behavioral speech treatment should be considered even for optimally medicated individuals and for those who have undergone neurosurgical procedures

Schultz and Grant 2000

Appropriate treatment for voice and speech disorders should address the underlying physiology that causes the disorder:

- Muscle weakness and rigidity
- Bowed vocal folds.
- Reduced sensory perception. Person doesn't accurately monitor his/her physical and vocal output
- Difficulty in generating the right amount of effort to produce adequate loudness.

LSVT® “LOUD” Treatment

Currently, the “gold standard” for treating voice problems related to Parkinson’s disease)

Intensive, 16 visits with home practice.

LSVT®.org

Voice Aerobics™ can be used as an adjunct to formal voice therapy as well as a program for healthy older adults who are experiencing age related changes in voice:

- Posture, diaphragmatic breathing and breath support to improve vocalization
- Vocal quality including resonant focus of voice and emphasis on oral facial postures;
- Emphasis on use of abdominal muscles (core muscles) for support of breath stream on exhalation.
- Improving Voice Production

Expiratory muscle strengthening has the potential for greater expiratory force for sustaining tones or longer speech phrases.

Activation of expiratory muscles, which are primarily abdominal muscles, occurs during a variety of speech tasks, including conversational speech and sustained phonation. (eg: “ahhh”)

Examination of strength training and detraining effects in respiratory muscles. (Baker, Davenport, and Sapienza, *JSHR Vol 48, Dec. 2005*)

Speech and Voice exercises set in music may help to increase facial expression and animation and heighten awareness about shape of the mouth and vocal tract.

Voice Aerobics™ Songbirds is an audio CD for voice practice on the go.

Sit up or stand up and stretch and join me in a vocal warm-up

Mwah

Mnah

Myah

Patients Are Not All Alike

The *Art* and *Science* of Speech and Voice Therapy

The Patient's Goals:

Patients Are Not All Alike

Therapy Is Not A One Size Fits All

Appropriate treatment for voice and speech disorders should address the underlying physiology that causes the disorder:

- Muscle weakness or stiffness
- Changes in shape of vocal folds
- Difficulty in generating loudness
- Ability to self-monitor voice and speech

Successful treatment will include whatever approaches help patient to reach THEIR goals.

Quantification:

How Will You Know You Are Talking Louder?

- Have people stopped asking you to repeat?
- A portable digital sound level meter can be a voice "speedometer"
- Sometimes you just need a little help...
- Assistive Hearing Devices
- Speech and Voice Amplifiers

Auditory Masking: A Method to Assess Stimulability and Shape Louder Voice

- White noise masking takes advantage of Lombard effect to elicit louder voice with no cue to the patient to "be loud."
- Average increase in loudness 10dB from baseline.

- Video-tape of patient is reviewed for baseline information and for analysis with patient in goal setting.
- Age-Related Changes to Speech Breathing With Increased Vocal Loudness
- Cueing (talk loud), masking, and cue: twice as loud” all elicit increase in loudness.
- The respiratory mechanisms used to increase loudness differed depending on the cue used to elicit louder speech.
- In NOISE, conditions participants combined use of increased recoil pressures and increased expiratory force. Participants also slowed speech rate and used larger volume excursions. (Huber, et al, 2005)

Patient Uses Mini Digital Sound Level Meter to Self-Monitor Loudness

- With masking in place, patient is asked to identify level of loudness when SLM is placed at 2–3 ft (conversational) distance.
- Metaphor of “voice speedometer” is introduced.
- Transition patient from use of white noise masking to external cueing with SLM.
- Use SLM frequently during the day in conversation and when on the phone.
- Patient Monitors Progress With Daily Worksheet
- Feedback is important for motivation.
- Pursuing and achieving goals motivates patients.
- Optimal training effects during voice tasks generally depend on appropriate feedback about performance.
- Goal-oriented training with feedback.
- Compliments and supports LSVT® home practice.

Future Directions From Researchers/Inventors For Improving Voice: SpeechVive™

- Unobtrusive portable device designed to improve speech and communication in patients with PD.
- Uses the Lombard Effect, preserved in patients with PD, to elicit louder and clearer speech spontaneously. Researcher: Jessica Huber,PHD, Purdue.edu

Questions:

A Patient Asks: “I’ve finished all of my therapies...am I done now?”
(Remember who’s lurking.....)

- The Importance of Exercise In Parkinson’s Disease Is Indisputable.
- It has been shown many times that exercise both increases and maintains functionality.(Dept. of Disability and Human Development University of Illinois at Chicago)
- When patients with PD treated with drug therapy alone were compared to individuals treated with drug therapy and exercise, there was a significant lower level of disability in the exercise group.
Formissano,et al (1992)

Voice Aerobics™ incorporates techniques from general exercise physiology and voice therapy to offer a fun and easy program that can be done individually in a patient’s home or in a group.

- Exercises can be done seated or standing, and for variety, with weights or exercise bands.
- The exercise is guided, there is nothing to remember and addresses the voice and motor changes associated with Parkinson’s

Voice Aerobics™ Incorporates Guidelines for Patients With Parkinson’s Disease

- Focus on extensor muscle activation and duration;
- Cueing strategies to simplify movements;

- Motor learning principles such as multiple repetitions, high effort, simple cues;
- Sensory awareness training and aerobic conditioning.

Ready Yet??

- Rigidity in the vertebral and surrounding thoracic musculature, including the rib cage may affect respiration.
- Rigidity of the facial and cervical muscles as well as throat may also effect respiration.
- Rigidity of muscles in both axial and appendicular musculature demonstrates the importance of flexibility in an exercise program for individuals with PD. Stanley et al, 1999
- People with PD retain the ability to increase muscle activation, so they can learn to perform larger, faster movements using more conscious effort and attention strategies.
- They may need more practice, especially for sequential, complex movements.
- Patients can be coached while in therapy and continue independent use of the program at home.

Ready Yet???

Clinical data show that people who exercise several times per week show a reduced rate of cognitive decline with age compared with those who have low levels of activity.

- “It is likely that exercise for 3 or more times per week is beneficial”
- Patients can perform one part of Voice Aerobics™ or combine sections for 15 – 55 minutes of practice.

Ready Yet???

- Subjects with PD show dramatically slowed movement initiation and execution times in the absence of external cues (Georgia et al, 1993)
- However, in the presence of external cues, movement performance in PD subjects is dramatically improved.

Ready Yet??

- Self-vocalization of a positive reinforcing word ('yaah'), enabled people with Parkinson's disease to perform a daily upper extremity task faster and more smoothly. *Enhancement of reaching performance via self-speech in people with Parkinson's disease.*
Dept. of Occupational Therapy, College of Health Science Campus, Toledo, Ohio
- Voice Aerobics™ couples voice practice with movement for increased opportunity for repetition. Voice may serve as a self-cue for the movements.

Why Don't Patient's Behave?

The financial burden of Parkinson's disease is immense. **Drugs commonly used to treat Parkinson's disease cost between \$1,000 and \$6,000 per year per patient.**

- **Annual medical care, is estimated at \$2,000 to \$7,000 for people in early stages of the disease, and is probably much higher for advanced stages.**
- Comella et al (1994) found that even with documented gains in functionality, and instruction to continue exercise at home, at the completion of the rehabilitation program, every Parkinson's disease patient resumed a sedentary life style.

The Nature And The Quality Of The Relationship Between The Patient And Health Care Provider Is Critical To The Treatment Outcome.

The *Art* and *Science* of Speech and Voice Therapy

Why did the patient come to therapy?

What was the patient's perception of the problem?

It is essential to build up a patient's sense of personal responsibility.

Unrealistic expectations and over stringent criteria can set a patient up for failure.

Patient Variables Affecting Patient Adherence Why Don't Patient's "Behave?"

Treatment Variables

- Unable to get to therapy because of lack of transportation
- Can't afford treatment.
- Complexity of the treatment program
- Degree of behavioral change
- Forgetfulness and lack of social supports

Patient Variables

- *Reluctant*: Mismatch between what patient believes and therapists reports. Different treatment goals or hoping for a "magic cure."
- *Remind me*: Patient's cognitive skills limit retention and carryover
- *Remorseful*: Feel depressed and guilty for not having followed their therapist's suggestions previously, or feel morally weak for having complied and still experiencing decline.

Voice Aerobics™ A Home Based Program

- Home based and patient driven programs may address some of the treatment variables that have been associated with poor patient adherence
- Home based treatment may be no further than the patient's computer or remote.

Before, During, or After Therapy.. How Can Voice Aerobics™ Help ?

- No need to drive anywhere.
- Opportunity for daily practice.
- Affordable
- Therapist guided and easy to follow.
- Patients with mild dementia can complete exercises with minimal supervision, reducing caregiver burden.
- Nothing to remember just notice:
 - *posture
 - *breathing
 - *voice.

Voice Aerobics™ Songbirds: A 20 minute audio CD that goes where you go.

- Vocal warm-ups and speech exercise set in music to heighten awareness of facial movement and facial expression.
Track 5: Speech Sounds in Waltz Time
- The integration of sound and movement can play a role in coordinating and invigorating movement.
- Once the rhythm is established, it may be played out with any motor modality, including the hands, feet, mouth, or whole body.
- Voice and Speech Practice Set In Music

Music therapy can help improve the quality of life for people with Parkinson's and other neurological disorders by:

- promoting a sense of well-being
- reducing stress, anxiety or pain
- improving movement
- improving breathing

- improving verbal and non-verbal communication
- promoting self-expression
- improving memory. Source: European Parkinson's Disease Association (EPDA)

Who Else May Benefit From

- Patients with Alzheimers and dementia.
- Patients with voice and speech decline from Parkinson's plus syndromes (eg: PSP, MSA)
- Voice and respiratory muscle changes from aging or illness. Patients with presbylarynx and related voice changes.
- Patients with late effect polio effect on voice.

Why Would It Help?

- Guided program, requires no memorization.
- Can be done alone, with family members, or in a group.
- Patients with mild dementia can complete exercises with minimal supervision, reducing caregiver burden
- May serve to alert and awaken residents in skilled facility prior to rehab/restorative dining.
- Coupling voice and movement may serve to provide opportunities for increased repetition and practice during activities of daily living.

Coming soon.....Voice Aerobics™ ADL (all day long)

- Task specific training can become a strength, balance and aerobic practice in one, when therapists include: cueing and attentional strategies, multiple repetitions, and intermittent rest periods.
- Voice Aerobics™ Songbirds audio CD coupled with functional activities of daily living for increased opportunity for repetition, motor learning, and practice.

In Closing... *Help Patients To Be Present*

“Parkinson’s classification as a movement disorder draws a great deal of attention to managing the physical symptoms such as tremor and stiffness.”

- But if movement is improving, and voice fading, than the *essence* of the individual is also beginning to fade.

Parkinson’s and Your Voice: The essence of you voiceaerobic dvd.blogspot.com/2011

Voice is the *essence* of who we are *Help Patients To Be Present*

- “The man or woman who is walking next to their spouse but now with words that are inaudible, is fading from the relationship.”
- Offer all of the methods available to preserve and improve voice.

My Mission:

To enlist individuals in their treatment, and help them express their personality & spirit through voice. To educate and empower

Mary Spremulli, MA, CCC-SLP

Questions??

Learn more: www.voiceaerobic dvd.com

Read more: www.voiceaerobic dvd.blogspot.com

Voice Aerobics Among Top 49 Parkinson's Blogs

<http://www.healthcaretechnicians.org/removing-the-mystery-top-49-blogs-about-parkinsons-disease/>

- ▶ Aerobic Exercise for Neuroprotection. Glaucoma Research Foundation .
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Reading and Resources:

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<http://voiceaerobicsdvd.blogspot.com>
- ▶ Shake, Rattle, and Roll: An insider's view of Parkinson's Disease .
http://katekelsall.typepad.com/my_weblog/2009/01/power-up-you-voice-and-body.html
- ▶ www.pnmedical.com info for obtaining the BREATHER®
- ▶ www.davisphinneyfoundation.org/ Improving the Lives of People With Parkinson Disease.
- ▶ Lee Silverman Voice Treatment (LSVT)® and LSVT Global. LSVT.org
- ▶ National Parkinson's Foundation. NPF.org
- ▶ Parkinson's Research Foundation (<http://www.parkinsonresearchfoundation.org/>)
Educational cruises

