				Type of Study			
Reference	**Authors**	**Date**	**Sorting Code**	**Case/**	**Singl**	**Grou**	**Primary focus**
Netsell, R. & Daniel, B. (1979). Dysarthria in adults: Physiologic approach to rehabilitation. Archives of Physical Medicine and Rehabilitation, 60, 502-508.	Netsell & Daniel	1979	RESP	1			Pressure biofeedback program
Hanson, W.R. and Metter, E.J. (1980). DAF as instrumental treatment for dysarthria in progressive supranuclear palsy: A case report. Journal of Speech and Hearing Disorders, 45(2), 268-276.	Hanson and Metter	1980	**RATE** PHON	1			Delayed auditory feedback
Hanson, W.R. and Metter, E.J. (1983). DAF speech rate modification in Parkinson's disease: A report of two cases. In W.R. Berry (Ed.), Clinical dysarthria. San Diego: College-Hill Press.	Hanson and Metter	1983	**RATE** PHON	1			Delayed auditory feedback
McNamara, R. (1983). A conceptual holistic approach to dysarthria treatment. In W.R. Berry (Ed.), Clinical dysarthria. (pp. 191-202). San Diego: College-Hill Press, Inc.	McNamara	1983	RESP PHON	1			Hypertonic exercises; biofeedback
Scott, S. and Caird, F.I. (1983). Speech therapy for Parkinson's disease. Journal of Neurology, Neurosurgery, and Psychiatry, 46, 140-144.	Scott & Caird	1983	PHON RESP			1c	Prosodic exercises (volume and intonation) with and without a visual reinforcement device

Robertson, S.J. & Thomson, F. (1984). Speech therapy in Parkinson's disease: A study of the efficacy and long term effects of intensive treatment. British Journal of Disorders of Communication, 19, 213-224.	Robertson & Thomson	1984	RESP PHON			1c	Group therapy
Rubow, R. and Swift, E. (1985). A microcomputer-based wearable biofeedback device to improve transfer of treatment in Parkinsonian dysarthria. Journal of Speech and Hearing Disorders, 50(2), 178-185.	Rubow & Swift	1985	RESP PHON		1		Portable biofeedback device
Simpson, M.B., Till, J.A., & Goff, A,M. (1988). Long-term treatment of severe dysarthria: A case study. Journal of Speech and Hearing Disorders, 53(4), 433-440.	Simpson et al.	1988	RESP	1			Abdominal binder, biofeedback, voice amplifier
Daniel-Whitney, B. (1989). Severe spastic-ataxic dysarthria in a child with traumatic brain injury: Questions for management. In K.M. Yorkston and D.R. Beukelman (Eds.) Recent advances in clinical dysarthria (pp. 129-138). Boston: College-Hill Press.	Daniel-Whitney	1989	RESP	1			Biofeedback of intraoral air pressure
Johnson, J. A. & Pring, T.R. (1990). Speech therapy and Parkinson's disease: A review and further data. British Journal of Disorders of Communication, 25, 183-194.	Johnson & Pring	1990	PHON RESP			1c	"Less intensive" treatment program targeting pitch and volume with visual feedback

Adams, S. and Lang, A. (1992). Can the Lombard effect be used to improve voice intensity in Parkinson's disease? European Journal of Disorders of Communication., 27(2), 121-127.	Adams & Lang	1992	RESP PHON	1			Presentation of masking noise to increase voice intensity
Workinger, M. and Netsell, R. (1992). Restoration of intelligible speech 13 years post-head injury. Brain Injury, 6(2), 183-187.	Workinger & Netsell	1992	RESP	1			Respiratory support and coordination exercises
Countryman, S. & Ramig, L.O. (1993). Effects of intensive voice therapy on voice deficits associated with bilateral thalamotomy in Parkinson disease: A Case study. Journal of Medical Speech-Language Pathology, 1(4), 233-250.	Countryman & Ramig	1993	RESP PHON	1			Lee Silverman Voice Treatment program
Countryman, S., Ramig, L.O., Pawlas, A.A. (1994). Speech and voice deficits in Parkinsonian Plus Syndromes: Can they be treated? Journal of Medical Speech-Language Pathology, 2(3), 211-225.	Countryman et al.	1994	PHON RESP	1			Lee Silverman Voice Treatment program
Ramig, L.O., Bonitati, C.M., Lemke, J.H., Horii, Y. (1994). Voice treatment for patients with Parkinson disease: Development of an approach and preliminary efficacy data. Journal of Medical Speech-Language Pathology, 2(3), 191-209.	Ramig et al.	1994	PHON RESP			1	Lee Silverman Voice Treatment Program

Dromey, C., Ramig, L.O., and Johnson, A.B. (1995). Phonatory and articulatory changes associated with increased vocal intensity in Parkinson disease: A case study. Journal of Speech and Hearing Research, 38, 751-764.	Dromey, et al.	1995	PHON RESP	1			Lee Silverman Voice Treatment Program
Murry, T. and Woodson, G. E. (1995). Combined-modality treatment of adductor spasmodic dysphonia with botulinum toxin and voice therapy. Journal of Voice, 9(4), 460-465.	Murry & Woodson	1995	PHON			1c	Voice therapy after Botox treatment (compared to Botox treatment only)
Ramig, L.O., Countryman, S., Thompson, L.L., and Horii, Y. (1995). Comparison of two forms of intensive speech treatment for Parkinson disease. Journal of Speech and Hearing Research, 38, 1232-1251.	Ramig et al.	1995	PHON RESP			1c	Lee Silverman Voice Treatment Program versus respiratory only therapy
Smith, M.E., Ramig, L.O., Dromey, C., Perez, K.S., and Samandari, R. (1995). Intensive voice treatment in Parkinson disease: Laryngostroboscopic findings. Journal of Voice, 9(4), 453-459.	Smith et al.	1995	PHON RESP			1c	Vocal and respiratory therapy (Lee Silverman Voice Treatment) versus respiration only therapy
Ramig, L.O. and Dromey, C. (1996). Aerodynamic mechanisms underlying treatment-related changes in vocal intensity in patients with Parkinson disease. Journal of Speech and Hearing Research, 39, 798-807.	Ramig and Dromey	1996	PHON RESP			1c	Vocal and respiratory therapy (Lee Silverman Voice Treatment) versus respiration only therapy

Ramig, L.O., Countryman, S., O'Brien, C., Hoehn, M. and Thompson, L. (1996). Intensive speech treatment for patients with Parkinson's disease: Short- and long-term comparison of two techniques. Neurology, 47, 1496-1503.	Ramig et al.	1996	PHON RESP			1c	Vocal and respiratory therapy (Lee Silverman Voice Treatment) versus respiration only therapy; long-term treatment effects
Sullivan, M.D., Brune, P.J., and Beukelman, D.R. (1996). Maintenance of speech changes following group treatment for hypokinetic dysarthria of Parkinson's disease. In D.A. Robin, K.M. Yorkston and D.R. Beukelman (Eds.), Disorders of motor speech: assessment, treatment, and clinical characterization. Baltimore: Paul H. Brookes Publishing Co.	Sullivan et al.	1996	RESP PHON	1			Group therapy
Cerny, F.J., Panzarella, K.J., and Stathopoulos, E. (1997). Expiratory muscle conditioning in hypotonic children with low vocal intensity levels. Journal of Medical Speech-Language Pathology, 5(2), 141-152.	Cerny et al.	1997	RESP			1	Expiratory resistive breathing
Countryman, S., Hicks, J., Ramig, L.O. and Smith, M.E. (1997). Supraglottal hyperadduction in an individual with Parkinson's disease: A clinical treatment note. American Journal of Speech-Language Pathology, 6(4), 74-84.	Countryman et al.	1997	PHON RESP	1			Lee Silverman Voice Treatment Program
DeAngelis, E.C., Mourao, L.F., Ferraz, H.B., Behlau, M.S., Pontes, P.A.L. and Andrade, L.A.F. (1997). Effect of voice rehabilitation on oral communication of Parkinson's disease patients. Acta Neurologica Scandinavica, 96, 199-205.	DeAngelis et al.	1997	PHON			1	Increasing vocal intensity through group therapy
Thompson-Ward, E.C., Murdoch, B.E., and Stokes, P.D. (1997). Biofeedback rehabilitation of speech breathing for an individual with dysarthria. Journal of Medical Speech-Language Pathology, 5(4), 277-288.	Thompson-Ward et al.	1997	RESP		1		2 types of biofeedback (from respiratory kinematic instrumentation).

Cariski, D. and Rosenbek, J. (1999). The effectiveness of the Speech Enhancer. Journal of Medical Speech-Language Pathology, 7(4), 315-322.	Cariski & Rosenbek	1999	PHON	1			Use of Speech Enhancer with and without behavioral therapy
Murdoch, B.E., Pitt, G., Theodoros, D.G., and Ward, E.C. (1999). Real-time continuous visual biofeedback in the treatment of speech breathing disorders following childhood traumatic brain injury: Report of one case. Pediatric Rehabilitation, 3(1), 5-20.	Murdoch et al.	1999	RESP		1c		Traditional therapy versus physiological biofeedback methods
Theodoros, D.G., Thompson-Ward, E.C., Murdoch, B.E., Lethlean, J., and Silburn, P. (1999). The effects of the Lee Silverman Voice Treatment Program on motor speech function in Parkinson's disease following thalamotomy and pallidotomy surgery: A case study. Journal of Medical Speech-Language Pathology, 7(2), 157-160.	Theodoros et al.	1999	RESP PHON	1			Lee Silverman Voice Treatment
Ward, E.C., Theodoros, D.G., Murdoch, B.E., Silburn, P. (2000). Changes in maximum capacity tongue function following the Lee Silverman Voice Treatment program. Journal of Medical Speech-Language Pathology, 8(4), 331-335.	Ward et al.	2000	RESP PHON			1c	Lee Silverman Voice Treatment
Ramig, L.O., Sapir, S., Fox, C., and Countryman, S. (2001). Changes in vocal loudness following intensive voice treatment (LSVT) in individuals with Parkinson's disease: A comparison with untreated patients and normal age-matched controls. Movement Disorders, 16(1), 79-83.	Ramig et al.	2001	RESP PHON			1c	Lee Silverman Voice Treatment

Sapir, S., Pawlas, A.A., Ramig, L.O., Seeley, E., Fox, C., & Corboy, J. (2001). Effects of intensive phonatory-respiratory treatment (LSVT) on voice in two individuals with multiple sclerosis. Journal of Medical Speech-Language Pathology, 9(2), 141-151.	Sapir et al.	2001	RESP PHON	1			Lee Silverman Voice Treatment
Solomon, N.P., McKee, A.S. and Garcia-Barry, S. (2001). Intensive voice treatment and respiration treatment for hypokinetic-spastic dysarthria after traumatic brain injury. American Journal of Speech-Language Pathology, 10(1), 51-64.	Solomon et al.	2001	RESP PHON	1			Lee Silverman Voice Treatment versus LSVT combined with respiration treatment and physical therapy
Ramig, L.O., Sapir, S., Countryman, S., Pawlas, A.A., O'Brien, C., Hoehn, M., Thompson, L.L. (2001). Intensive voice treatmetn (LSVT) for patients with Parkinson's disease: A 2 year follow up. Journal of Neurology, Neurosurgery and Psychiatry, 70, 0-5.	Ramig et al.	2001	RESP PHON			1c	Vocal and respiratory therapy (Lee Silverman Voice Treatment) versus respiration only therapy
Baumgartner, C.A., Sapir, S., and Ramig, L.O. (in press). Voice quality changes following phonatory-respiratory effort treatment (LSVT) versus respiratory effort treatment for individuals with Parkinson disease. Journal of Voice, 14, 1-XX.	Baumgartner et al.	in press	RESP PHON			1c	Vocal and respiratory therapy (Lee Silverman Voice Treatment) versus respiration only therapy

Subject Charateristics																								Candidacy Summary	Type of Dysarthria	Medical Diagnosis	Rationale for Treatment	Replicability		
Numl	age	gen	type	acou	med	treal	diad	TPC	med	seve	phys	neu	SES	dise	spe	cog	hea	sens	othe	Total								Repli	Gene	Incon
1	1	1	1			1		1	1	1	1	1			1	1	1			**12**	Severe flaccid dysathria from TBI	flaccid	TBI	Flaccidity/weakness was uniformly distributed throughout the speech musculature; respiratory (and VP) system targeted initially as remaining subsystems were dependent on improvement at this level. Patient was only able to generate 2-3 cmH_20 for $\leq$ 3 sec (versus 5/5).	1		
1	1	1	1		1	1		1	1	1	1	1			1		1			**12**	Severe hypokinetic dysarthria from progressive supranuclear palsy	hypokinetic	PSP	Patient presented with accelerated speech rate, weak vocal intensity, monopitch, imprecise articulation and poor speech intelligibility. He had undergone eight months of speech therapy without improvement. DAF was found to have a positive effect on speech intelligibility during trial therapy.			1
2	1	1	1	1	1	1		1	1	1	1	1		1	1		1			**14**	Moderate to severe hypokinetic dysarthria from Parkinson's disease	hypokinetic	PD	Both patients presented with rapid speech rate, monopitch, and weak vocal intensity. Patient A had poor speech intelligibility. He had received approximately nine months of speech therapy for various rate control strategies, but carryover outside of treatment sessions was not successful. Patient B had mildly impaired speech intelligibility and had not received speech therapy prior to the study. DAF was implemented for its potential ability to modify rate, as well as articulation time, loudness, pitch and prosody.		1	
1	1	1	1					1	1	1	1		1	1	1	1				**11**	Severe flaccid dysathria from CVA	flaccid	CVA	Patient had rapid tidal rate and markedly reduced vital capacity (with considerable nasopharyngeal leak and mild paresis of left vocal fold). Authors speculated inadequate subglottal pressure secondary to VF paresis and need to use greater expiratory effort due to VP leak.		1	
26	1	1			1			1	1	1						1	1			**8**	Parkinsonian speech disorder	not specified	PD	Patients had mild to severe Parkinsonian speech disorders. The prosodic exercises emphasized the variety of prosodic patterns commonly found in conversational speech, particularly the role of volume and intonation. The Vocalite was used as a visual reinforcement device, and enabled the patient to monitor some of the prosodic features of his/her speech.		1	

12	1	1					1		1	1					1					**6**	Dysarthria from Parkinson's disease	not specified	PD	Profiles of subjects indicated similar patterns of impairment: main areas were respiration, phonation, prosody and rate. Chosen therapy program had been previously proven effective in patients with PD. Treatment techniques were designed to improve capacity/control of respiration & coordination/cotrol of voice production.		1	
1	1	1		1	1	1		1	1	1				1	1	1				**11**	Dysarthria from mild-moderate Parkinson's disease	not specified	PD	Patient was breathy and mildly imprecise with a notable reduction in loudness. Overall treatment used a subsystem approach: improve respiratory control first with feedback from storage oscilloscope then with feedback from microcomputer (in different speaking situations). Since transfer of behavioral treatments for PD has been problematic, the microcomputer was intended to facilitate generalization of improved respiratory control.		1	
1	1	1				1		1	1	1	1		1	1						**9**	Basilar artery infarct with residual quadraplegia (anarthric for first 21 MPO)	not specified	Basilar artery thrombosis	Inadequate respiratory support for speech; vocal intensity well below normal limits; periods of airflow cessation. Patient did not have upper torso motor control to lean into a rigid abdominal support surface, thus an **abdominal binder** was used. Even with binder, the patient continued to have periods of cessation of respiration; a **biofeedback** program was subsequently implemented. Despite assistance from abdominal binder and biofeedback program, inadequate loudness & vocal fatigue persisted; therefore, a commercial **speech amplifier** was used.		1	
1	1	1	1		1	1		1	1	1	1	1	1	1	1	1				**14**	Boy with severe spastic-ataxic dysarthria from TBI	spastic-ataxic	TBI	Subject was unable to initiate phonation (1 year post) so respiratory impairments could not be perceptually evaluated during speech. Estimated subglottal air pressure = 1 cm H20 / 1 sec with a 160-cc-per sec airflow leak with nostrils partially occluded.		1	
12	1	1		1					1	1										**5**	Dysarthria from Parkinson's disease	not specified	PD	Speech improvement for patients with PD. Wanted to determine if treatment benefits could be achieved from a less intensive program.		1	

10	1	1			1			1	1					1	1		1			**8**	Idiopathic Parkinson's disease with decreased voice intensity	not specified	PD	Patients had decreased vocal intensity with subsequently reduced intellibility.	1		
1	1	1				1		1	1	1	1	1		1	1	1				**11**	Severe dysarthria from TBI	not specified	TBI	Respiratory support for speech was significantly reduced; able to generate 5cm H20 for < 1 sec with no leak and nares occluded, and sustain /a/ for 6 sec. Severe difficulty with coordination of respiratory support, voice onset & articulation. Demonstrated positive prognostic indicators, such as ability to softly sustain /a/ and improvement in loudness with modification of "pushing approach". First training task involved use of the oral manometer, the second involved sustaining vowels. Also attached a grab bar to the patient's wheelchair to "push" or "pull" to facilitate coordination of respiration & vocalization.		1	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	**17**	Moderate speech and voice disorder from PD and bilateral thalamotomy	mixed hypokinetic-spastic	PD (with bilateral thalamotomy)	Patient presented with reduced loudness, intermittent hoarseness/harsh-raspy voice/vocal straining, abnormally low pitch, vocal fry, monotonicity, mildly impaired articulation, reduced respiratory support, and a mild vocal tremor. Patient demonstrated "some improvement" after 6-7 months of biweekly speech therapy. A more intensive therapy program was implemented which was designed to improve perceptual characteristics of voice by targeting the underlying laryngeal pathophysiology and maximizing phonatory and respiratory effort.	1		
3	1	1		1	1			1	1	1	1	1		1	1	1			1	**13**	Wheelchair-bound patients with moderate to severe dysarthria from Parkinsonian Plus Syndrome	not specified	Parkinsonian Plus Syndrome (PSP, multiple system atrophy, Shy-Drager syndrome)	Speech-language pathologists rated speech impairment as moderate to severe; families reported marked deficits in functional communication. A positive response to LSVT would provide the benefit of effective speech treatment to a large population of patients who normally are overlooked and generally considered nonresponsive to speech therapy.	1		
40	1	1		1	1				1		1			1	1					**8**	Parkinson disease with reduced loudness, imprecise articulation, etc.	not specified	PD	Majority of patients experienced reduced loudness and imprecise articulation. LSVT was designed to improve perceptual characteristics of voice by targeting the hypothesized underlying laryngeal physical pathology.	1		

1	1	1		1	1	1		1	1	1	1	1	1	1	1	1	1		1	**16**	Soft/raspy voice from early-stage Parkinson disease	not specified	PD	Patient's livelihood was dependent upon his oral communication. His voice had become softer and was periodically raspy. LSVT was designed to increase vocal intensity by increasing phonatory effort, vocal fold adduction and respiratory support.	1		
17 27	1	1	1	1		1		1	1		1				1				1	**10**	Adductor spasmodic dysphonia with no other accompanying speech disorder	hyperkinetic	ADD SD	Voice therapy was implemented to address symptoms often reported by patients after Botox treatment, namely, extrinsic muscle hyperfunction and impaired regulation of breath flow during phonation. The investigators also wanted to determine if adjunctive voice therapy would result in the need for less frequent Botox injections.	1		
45	1	1		1	1			1	1	1	1	1		1	1	1			1	**13**	Mild-moderate speech/ voice deficits from PD	not specified	PD	Patients averaged mild-moderate speech-voice deficits. Both forms of treatment were intensive, high effort repeated drills designed to increase (1) respiratory support or (2) increase vocal fold adduction and respiratory support.	1		
22	1	1			1			1	1		1			1	1				1	**9**	Impaired speech communication from Parkinson disease (average Stage III)	not specified	PD	Patients had disordered speech and/or voice from PD. Authors wanted to study the interactive role of respiratory and laryngeal systems, and document laryngeal abnormalities.	1		
17	1			1				1	1	1	1	1		1						**8**	Mild-moderate speech/ voice deficits from PD	not specified	PD	Patients averaged mild-moderate speech-voice deficits. Both forms of treatment were intensive, high effort repeated drills designed to increase (1) respiratory support or (2) increase vocal fold adduction and respiratory support. (Authors were specifically interested in the aerodynamic and adductory changes associated with intensity control in patients with PD following one of two forms of intensive speech treatment).	1		

35	1				1			1	1	1	1	1		1		1			1	**10**	Dysarthria from early-middle stage Parkinson's disease	not specified	PD	Average severity of speech/voice deficits for groups was mild-moderate. Intensive, high-effort speech treatment teaches patients to rescale the magnitude of speech motor output and daily treatment with intensive practice and "knowledge of results" facilitates this training (treatment = 16 sessions within 1 month). Placebo treatment was designed to increase respiratory muscle activity for inspiration, expiration & sustained expiration. LSVT designed to increase vocal fold adduction and loudness.	1		
6	1	1	1		1			1	1	1		1	1	1	1		1			**12**	Hypokinetic dysarthria from PD	hypokinetic	PD	All individuals in the group displayed some type of motor speech deficit, including reduced speech volume, excessive speech rate and reduced intelligibility. Each group session consisted of a training period to introduce a technique to improve speech intelligibility followed by practice of the technique and social time to allow practice in a functional setting. Goals included increased breath support and increased voice projection.		1	
10	1										1				1	1	1			**5**	Children with voice impairments related to low muscle tone and weakness	not specified	hypotonia	Children were hypotonic with soft voice; majority had reduced intelligibility. Used expiratory resistive breathing to mimic muscle recruitment associated with voice.	1		
1	1	1		1	1	1		1	1	1	1	1	1	1	1				1	**14**	Decreased vocal intensity/ voice disorder from PD	not specified	PD	Patient had reduced vocal loudness and supraglottic hyperadduction. LSVT was implemented to improve the primary deficit (true vocal fold hypoadduction), reduce the need for secondary compensatory behavior (supraglottic hyperadduction), and result in improved loudness, intonation and overall vocal quality.	1		
20	1	1			1			1	1		1		1	1	1					**9**	Decreased vocal intensity from PD	not specified	PD	Reduced vocal intensity was the main factor leading to unintelligible speech. Thus, emphasis of treatment was on phonatory function with tasks that facilitate greater glottic closure.		1	
1	1	1	1			1		1	1	1	1			1	1					**10**	Moderate spastic dysarthria from CVA	spastic	CVA	After 5 years of speech therapy, patient had reached a functional level with no further improvement expected. At 15 years post: significant impairment in respiratory support for speech and speech breathing patterns. TX1 provided info on chest wall movement (to help pt. increase abdominal movement and overall lung volume). TX2 provided feedback on chest wall and phonation (to learn to continue phonation throughout breathstream).	1		

2	1	1	1		1	1		1	1	1		1		1	1	1				**12**	Severe hypokinetic dysarthria from PD/multiple CVAs	hypokinetic	PD; multiple CVAs	Subject 1 presented with dysphonia, reduced loudness and articulatory imprecision. Subject 2 had severely impaired loudness and articulatory imprecision. Both subjects had previous behavioral therapy with limited transfer of functional gains; both also had failed with traditional voice amplification in the past. The Speech Enhancer was reportedly designed to both amplify and clarify dysarthric speech. It was hypothesized that use of the Speech Enhancer combined with behavioral treatment (increasing phonatory effort) would have a greater effect on intelligibility.		1	
1	1	1	1			1	1	1	1	1	1	1		1	1					**12**	Child with severe mixed dysarthria from TBI	mixed spastic-ataxic-flaccid	TBI	Subject had a severe impairment in ability to control his expiratory airflow at all levels of the speech production mechanism; respiratory impairment was the major contributor to overall speech deficits. Authors noted limitations of traditional treatment techniques in terms of the nature of the feedback provided; wanted to contrast both traditional and physiological biofeedback techniques.	1		
1	1	1	1	1		1		1	1	1	1	1		1	1					**12**	Severe hypokinetic dysarthria from PD and thalamotomy/pallidotomy surgery	hypokinetic	PD	Subject had severe voice and speech impairments, characterized by severely reduced vocal volume, breath control, and consonant precision; severe breathiness; a severely hoarse vocal quality, and a moderately increased rate. LSVT was used to improve voice/speech deficits, and to document the immediate and long-term effectiveness of the treatment program in a patient who had both thalamotomy and pallidotomy procedures.	1		
30	1	1		1	1		1		1	1	1			1						**9**	Mild to severe dysarthria from PD and/or surgical treatment of PD	not specified	PD with or without pallidotomy and/ or thalamotomy	Investigators wanted to determine if LSVT affects the physiological function of the articulators, particularly the tongue. Kinematic studies of articulatory function in PD had previously identified a reduction in the amplitude of displacement of the articulators. Additionally, differential patterns of long-term benefits of LSVT had been found following neurosurgical management. Thus, the authors were interested in whether surgical PD patients responded similarly to LSVT as nonsurgical PD patients.		1	
14 43	1	1		1	1			1	1	1					1		1			**9**	Moderate speech/voice deficits from PD	not specified	PD	Vast majority of the subjects with PD experienced moderate speech/voice deficits from PD, and had weaker voices than the non-brain-injured subjects. LSVT was designed to maximize phonatory efficiency through intensive, high-effort treatment. The respiratory system is "indirectly" stimulated during the speech tasks.	1		

2	1	1		1	1			1	1	1				1					**8**	Vocal weakness and fatigue from progressive MS	not specified	MS	Both subjects complained of vocal weakness and fatigue associated with their illness, even when the symptoms of the MS were in remission. They felt like talking was effortful, and were subsequently less inclined to engage in conversation. LSVT had been shown to be highly effective in improving the vocal function in individuals with PD who had complained of similar voice/fatigue problems.	1		
1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1		**16**	Moderately severe hypokinetic-spastic dysarthria from TBI	mixed hypokinetic-spastic	TBI	Patient had reduced loudness and rapid speech in short rushes; intelligibility was estimated at 50% (in group settings). Patient demonstrated improvement with strategies of increasing breath support and vocal loudness. A 4 week intensive LSVT program was subsequently initiated. Modifications were developed because there was no carryover of improved loudness outside the clinic and the patient exhibited severely reduced respiratory function during speech and flexed posture of the upper torso. A 2nd 6 week phase with added respiration treatment and PT was conducted. A 10-week period of maintenance treatment followed.	1		
33	1	1		1	1			1	1	1	1			1					**9**	Mild to moderate dysarthria from PD	not specified	PD	On average, patients had mild to moderate speech and voice impairments from PD. The investigators wished to assess the effectiveness of a respiratory-phonatory treatment (LSVT) versus a respiratory-only treatment, and measure the long-term (2 year) outcomes of treatment.	1		
20	1	1						1	1	1		1		1				1	**8**	Moderate voice/speech problems associated with PD	not specified	PD	All patients had at least moderate breathiness and hoarseness pretreatment (as determined by scores on a perceptual rating scale). The investigators wished to compare the effects of treatment emphasizing phonatory-respiratory effort with treatment emphasizing respiratory effort alone on perceived voice quality.	1		

Outcomes					
Impairment	Activity	Participation	Study Conclusions	Psychometric Adequacy	Evidence for Control
Estimation of subglottal air pressure (cm H_20/sec)			After 8, 20 minute treatment sessions, the patient was able to generate 10 cm H_20 of subglottal pressure for 10 sec.	present	Patient was beyond the period of spontaneous recovery at time of improvement. Performance was baselined (2 sessions); maintenance observed after treatment was discontinued.
Vocal intensity during reading and counting.	Speaking rate and speech intelligibility during reading and counting.	Family reported that the patient was more willing to participate in conversations when he wore the DAF device.	When the patient wore the DAF device, improvements were demonstrated for speech rate, vocal intensity, and intelligibility. The positive effects of DAF were maintained over a period of 3 months during which the patient continued to wear the instrument daily.	present	Measurement of performance with and without wearing of DAF device.
Voice intensity; fundamental frequency; phonation time for vowel /a/.	Speaking rate during reading; speech intelligibility from connected speech samples.		Both patients showed a marked reduction in speech rate, an increase in vocal intensity, and improved speech intelligibility under DAF. They reportedly continued to wear the DAF devices outside of the clinic.	present	Measurement of performance with and without wearing of DAF device.
Changes in intensity and duration of vowel phonation; perceptual improvement in loudness.			The biofeedback treatment, in conjunction with oral-articulatory management, resulted in increased vocal loudness.	absent	Limited
	Perceived abnormality of prosody as judged by tape-recorded test and spontaneous speech samples. (Used a seven point scale regarding perceived volume, pitch, tone, etc.). Perceived intelligibility on a scale of 0-3.	The patients' relatives were asked to comment on any abnormality of the voice or rate, and on loudness, monotony of speech, social withdrawal, and difficulties in using the telephone.	There were significant improvements in speech as assessed by scores for prosodic abnormality and intelligibility, and these were maintained in part for up to 3 months. The use of a visual reinforcement device produced limited benefit over and above that from prosodic exercises alone.	present	Random assignment of patients to two treatment groups (prosodic exercises with or without visual reinforcement).

	Scores from *Dysarthria Profile* (perceptual judgements of respiration, phonation, intelligibility, etc.).	Questionnaires sent to patients, relatives/friends immediately after treatment: addressed intelligibility at home, emotions relating to patient's attempts to communicate, etc.	Treatment group had a significantly higher mean score on the Dysarthria Profile than the (randomly assigned) group that did not receive treatment. Significant improvement included the individual "Respiration" and "Phonation" components of the D.P. Treated patients were able to maintain their improvements 3 months following cessation of treatment.	absent	Use of (no-treatment) comparison group.
Perceptual analysis of conversational and reading sample using a modified version of the 7-point, 38 dimension rating scale developed by Darley, Aronson and Brown (1975). Acoustic analysis of conversational and reading sample. Microcomputer vocal intensity data.		Probes outside of clinic (vocal intensity)	The subject transferred a substantial portion of clinic improvement to the outside environment while wearing the feedback device. The subject demonstrated improvement perceptually (on 8-9 out of 12 dimensions) and acoustically.	present	Comparison of Phase 1 of treatment (no feedback from device) with Phase 2 (feedback from device). Speech improvement while PD progressed from Stage 2-3 to more definite, severe stage 3.
Forced vital capacity on spirometer; oscillographic spirometer; postbiofeedback forced vital capacity. Speech intensity with and without abdominal binder (and with and without voice amplifier). With binder, speech was judged perceptually to be "somewhat louder".	Amplifier allowed JR to speak for a longer period of time without fatigue.		Abdominal binding resulted in increased speech intensity (but variability was substantial) and increased vital capacity. Biofeedback treatment enhanced inspiratory volume. The speech amplifier was implemented because of persisting inadequate loudness/vocal fatigue, and resulted in a 10dB gain for a listener 3 ft. away. Authors indicate that individual improvements were modest, but when combined with articulation and VP, these gains effected meaningful change in communication.	present	Patient was 33 MPO at initiation of respiratory treatment. Measurements documenting improvement were taken with and without abdominal binder, and with and without voice amplifier. Measurements were documented over time.
Estimation of subglottal air pressure (cm H_20/sec)			With visual feedback from U tube manometer, patient was maximally able to achieve 5cm H_20 for 2.5 sec. Following discharge from treatment, patient continued to work on respiration at home using water glass and straw technique.	present	50 baseline trials at maximal effort were performed: in this "no-feedback" condition, the patient never exceeded the 1 cm. H_20 mark or 1 sec duration.
Fundamental frequency range and modal pitches in speech and reading; loudest volume, volume range and mean volume in speech and reading.	Severity of dysarthria as measured by the *Frenchay Dysarthria Assessment*		All treated patients showed a significant improvement on the *Frenchay Dysarthria Assessment*; all patients in untreated group showed significant deterioration. Significant improvement observed as well on volume and pitch measures.	absent	Random assignment to a control (no treatment) group.

Average speech intensity (dB SPL).	Speech intelligibility as measured by a perceptual scaling procedure (DME by four SLPs).		All patients with Parkinson's disease showed a marked increase in speech intensity when they spoke under masking noise. Overall increase was statistically significant, although all of the patients demonstrated the Lombard effect to varying degrees. Thus, individual patients will require different levels of masking. Effect on rate and intelligibility of speech was inconsistent and non-significant.	present	Comparison of baseline (no masking) to masking condition.
Estimation of subglottal air pressure (cm H_20/sec) and duration of vowel prolongation; number of syllables per breath; perceived ease of onset of phonation.			After 12 months of treatment, the patient was able to generate 5 cm H20 for 5 sec with a leak tube in place (while wearing palatal lift as well) and sustain /a/ for 15 sec. Also, improved from producing one syllable/breath to six syllables/breath after drills. After 9 mo of treatment patient was able to discard communication board and use verbal communication functionally for first time since TBI.	absent	Patient was 13 years post TBI and had been discharged from therapies.
Jitter; shimmer; amplitude modulation; frequency modulation; maximum duration of sustained vowel phonation; harmonics-to-noise ratio; intensity during sustained phonation, sentences and paragraphs; fundamental frequency in sustained vowel phonation. Patient's self-ratings of loudness and monotonicity. SLPs ratings of tremor and vocal fry.	Patient's self-ratings of slurring in speech. SLPs ratings of overall quality of speech/voice.	Patient reported that during the one year period post treatment, she was more confident of her communication ability during social situations; she initiated and participated in conversations more frequently.	After 16 sessions of LSVT in one month, acoustic outcome measures were significantly improved immediately following treatment. The patient's and SLP's perceptual ratings also noted improvement pre- to post-treatment. However, 6 and 12 moths post-treatment, acoustic measures indicated deterioration to or below baseline levels.	present	Change in behavior demonstrated in patient with degenerative disease. Two pretreatment baseline measures taken.
Intensity, maximum duration and fundamental frequency of sustained phonation. Intensity, mean fundamental frequency and fundamental frequency variability during reading and speaking. Perceptual rating of loudness, monotonicity and slurring (imprecise articulation).	Perceptual rating of word and overall intelligibility.	Depression inventories, Sickness Impact Profile, and Profile of Mood States. Patients and family members completed perceptual ratings of speech.	Objective and perceptual data supported improvement of speech and voice deficits in all three patients following one month of LSVT. Increased intensity contributed to improved intelligibility and functional communication as reported by speech-language pathologists, patients and family members. By 6 months post-treatment, the patients' objective and perceptual data had declined from immediately post-treatment levels. However, the patients and families reported that overall functional communcation skills remained above pretreatment performance.	present	Change in behavior demonstrated in patients with degenerative disease.
Sustained vowel duration; slow/ forced vital capacities; max F_0 range; F_0 variability in reading. Perceptual rating of loudness.	Perceptual ratings of speech intelligibility and intonation.		Findings support the effectiveness of LSVT for patients with PD. Statistically significant differences were measured pre- to post-treatment on maximum vowel duration, F_0 range, mean F_0 and F_0 variability (reading). Improvement in perceptual measures documented as well. Improvements were maintained @ 6 & 12 months whether or not subjects received additional treatment.	present	Change in behavior demonstrated in patients with degenerative disease.

Variety of laryngeal measures (acoustic,aerodynamic and videostroboscopy), respiratory measures (lung volumes) and articulatory acoustic measures.			LSVT resulted in increased vocal intensity; this also led to changes in articulation that were not targeted in treatment.	present	Documented improvement was compared to baseline measures. Parallel changes observed in correlated variables (thus interpretation of data may be conducted with greater confidence).
Length of time between first and second Botox injections; airflow rate measurements; acoustic measurements (fundamental frequency, jitter, shimmer, and signal-to-noise ratio)			Subjects who received both Botox treatment and behavioral therapy demonstrated improved phonation in terms of increased airflow rate and acoustic measures of variability and perturbation for longer periods compared to Botox treatment alone. Adductor spasmodic dysphonia is treated most effectively when intrinsic laryngeal muscle spasms are reduced or eliminated by Botox injection and extrinsic hyperfunctional vocal behaviors are treated with voice therapy.	absent	Use of Botox-only comparison group
Intensity and duration of sustained phonation; intensity, F_0, F_0 variability, utterance and pause duration during reading and conversational monologue. Family and subject self-ratings of loudness, monotonicity, and hoarseness.	Family and subject self-ratings of intelligibility and initiation of conversation.	Beck Depression Inventory & Sickness Impact Profile (patient's perception of effect of illness on communication and social interaction).	LSVT, focusing on increased vocal fold adduction, is more effective than respiration treatment alone for improving vocal intensity and decreasing the impact of PD on communication.	present	Randomized treatment groups. Demonstrated significant effects with patients with degenerative disorder.
Glottal phonatory configuration; glottal incompetence; supraglottic function; sound pressure level			Patients with PD who underwent the combined vocal and respiratory treatment demonstrated improved laryngeal adduction which was correlated with increased vocal intensity. No differences were observed in the respiratory only group.	present	Randomized treatment groups. Improvement demonstrated in patients with degenerative disease at chronic stage (average)
SPL for /a/, /pae/, reading, monologue; estimated subglottal pressure; maximum flow declination rate; open quotient of vocal folds; EGG pulse width adduction measure; and forced vital capacity			Subjects who received the LSVT were able to achieve increases in SPL through improved vocal fold adduction and increase in subglottal pressure. SPL did not consistently increase pre- to post-treatment for subjects who received only respiratory training.	present	Subset of patients was (previously) randomized into treatment groups.

Vocal intensity during sustained phonation, reading and conversation; fundamental frequency during reading/ conversation.	Neurologic status	Beck Depression Inventory & Sickness Impact Profile (patient's perception of effect of illness on communication and social interaction).	Findings support the short- and long-term effectiveness of intensive voice therapy (LSVT) for improving vocal intensity in patients with PD. Placebo group made some improvements immediately after treatment, but they were unable to maintain those improvements up to 12 mo after tx. Only LSVT subjects rated a significant reduction in the impact of their sickness on their communication skills after treatment.	present	Random assignment to treatment groups; use of a comparison group.
Perceptual judgments of vocal tone, appropriateness of pitch and loudness.	Perceptual judgments of speech naturalness.	Questionnaires on communication strategies and communicative effectiveness (Yorkston et al., 1992)	Group speech intervention was effective. Five of the six participants improved their speech performance and maintained improvements for up to 10 months after treatment.	present	Improvement in context of a chronic/ degenerative condition.
Expiratory muscle strength and endurance; subglottal pressure; sound pressure level			Conditioning of the expiratory muscles with a face mask can improve respiratory muscle function and vocal performance in children with voice impairments related to low muscle tone. (Compared to baseline: expiratory muscle strength increased 69% by 6 weeks; endurance did not change. Subglottal pressure increased to 40%. Sound pressure level improved to 18%.	present	Group improvement was statistically significant compared to (3) baseline measures.
Sound pressure level; mean fundamental frequency and its variability; maximum duration of sustained vowel phonation; electroglottographic data; videolaryngostroboscopic data. Perceptual ratings of voice.	Perceptual ratings of speech during reading of "Rainbow Passage".		In this individual, LSVT increased vocal loudness, decreased supraglottic hyperadduction, and improved intonation and overall voice quality. Authors suggest that the supraglottic hyperadduction was due to a secondary compensatory behavior resulting from mild true vocal fold hypoadduction that responded positively to adduction therapy (LSVT).	present	Used a continuum of pre-post measures (functional ratings and physiologic measures). Improvement in the context of chronic/ degenerative condition.
Maximum phonation times; s/z ratio; air flow; vocal intensity	Self evaluation of oral communication (interview)		Voice rehabilitation resulted in a greater glottic efficiency (increase in maximal phonation times, decrease in s/z ratio and air flow), increased vocal intensity, decreased complaints of weak & strained-strangled voice and monotonous, unintelligible speech.	absent	Improvement in context of chronic/ degenerative condition.
TX1: abdominal excursion and % abdominal contribution. TX2: offset latency and phonation times. Plus: Lung volume excursion, phonatory flows.	Perceptual ratings of speech production (4 point scale). Number of syllables produced per breath during reading.		Patient was able to use output from the kinematic equipment to effectively alter aspects of his respiratory function (increased excursion of abdominal muscles for increased lung volumes and improved offset coordination and phonation times).	present	Used a multiple baseline design (experimental control). Prior to treatment, 6 baselines were conducted. Patient was 15 years post CVA at treatment initiation.

	Live transcription of orally read sentences for % speech intelligibility.		The Speech Enhancer effectively improved speech intelligibility in two patients with severe hypokinetic dysarthria. Both subjects' speech intelligibility scores increased across all three environmental test conditions when the Speech Enhancer was utilized. Superior treatment results may be obtained when a patient receives speech therapy in conjunction with using an amplification device.	absent	Measurement of intelligibility with and without the Speech Enhancer. Comparison to another type of amplification system. Improvement in the context of a degenerative condition.
	Frenchay Dysarthria Assessment; *Assessment of Intelligibility of Dysarthric Speech*, and perceptual analysis of a speech sample from reading of the "Grandfather Passage"		Real-time continuous visual biofeedback techniques for modifying speech breathing patterns in a child with persistent dysarthria were effective and superior to the traditional therapy techniques (as measured instrumentally). Perceptual assessments after both treatment approaches revealed unremarkable progress.	present	ABAB single subject experimental design (baseline, traditional therapy, withdrawal, physiologic therapy). Baseline = 6 instrumental and 2 perceptual assessments over 2 days. Withdrawal = 6 instrumental and perceptual assessments over 10 weeks.
Acoustic measures of sound pressure level, duration of phonation, % voiced, jitter, shimmer, and fundamental frequency. Physiologic measures of subglottal pressure, laryngeal resistance, phonatory flow.	Perceptual measures of word and sentence intelligibility, number of intelligible words per minute, and communication efficiency. Number of syllables per breath and per minute.		LSVT was effective for this patient with severe hypokinetic dysarthria following stereotactic surgery. Specifically, results demonstrated marked improvement in the subject's speech intelligibility immediately post-LSVT as reflected by increases in vocal volume, phonatory stability, respiratory-phonatory control, and a decrease in rate of speech. At 6 months post-treatment, however, initial gains in speech intelligibility and respiratory-phonatory control were not maintained.	absent	Baseline assessments using a range of perceptual, acoustic and physiologic measures. Improvement demonstrated in the context of a degenerative condition.
Sound pressure level during sustained phonation and reading; maximum tongue pressure, mean pressure over ten repetitions of maximum pressure; number of repetitions with fast rate, maximum pressures produced in 10 seconds, and endurance in seconds usnig a sustained submaximal pressure task.	Sentence intelligibility from the *Assessment of Intelligibility of Dysarthric Speech;*		Both subject groups demonstrated significant improvements following LSVT across the measures of intelligibility and SPL in sustained phonation and reading. Assessment of tongue function, however, revealed that only the nonsurgical PD patients had an increased capacity to generate maximal effort tongue pressures following intervention. The improved tongue strength and endurance noted in the nonsurgical group provides further support for the global effects of increasing SPL on the physiological functioning of the speech mechanism in speakers with PD.	absent	Use of a clinical comparison group; improvement in the context of a degenerative condition.
Sound pressure level (SPL) during four speaking tasks			Subjects with PD who underwent LSVT treatment showed a significant increase in voice SPL from baseline to post-treatment and from baseline to the 6-month follow-up. Subjects with PD who did not receive treatment, as well as the non-brain-injured control subjects, did not demonstrate a significant increase in SPL. This suggests that the effects of LSVT are treatment-specific and not related to extraneous factors.	absent	Random assignment to treatment groups; use of clinical (PD) and nonclinical comparison groups; improvement in the context of a degenerative condition.

Sound pressure level (SPL) during four speaking tasks; duration of sustained phonation. Perceptual ratings of loudness conducted by trained speech-language pathologists as well as naïve raters.		Report of changes in functional communication and quality of life from speech-language summary reports.	Subjects demonstrated statistically significant improvement in SPL and duration of sustained phonation from pre-treatment to post-treatment and to the 6-month follow-up. Significant improvement was also oberved in the perceptual rating of voice loudness after treatment. Both subjects indicated improved functional communication and quality of life following LSVT treatment.	present	Improvement in context of chronic/ progressive condition. Baseline of outcome measures established pre-treatment (n=3 measurements).
Chest wall kinematics, spirometry, laryngeal aerodynamic measures, and acoustic assessments. Perceptual ratings of loudness.	Speech intelligibility (*Assessment of Intelligibility of Dysarthric Speech*). Reading of "Rainbow Passage" and monologue used for ratings of vocal press and intonation.	Informal validation of functional results was obtained by the patient's perception of decreased effort and acquaintances' comments that his speech improved noticeably during and after the Combination Treatment.	After LSVT alone, improvements were generally minor and inconsistent, although sound pressure level and loudness increased notably. However, after an additional 6 weeks of intensive Combination Treatment (LSVT plus respiration and PT), gains were documented for resting and speech breathing, vocal intensity, and sentence intelligibility. Several measures returned to baseline at the 3 months after treatment ceased, but some improvements in resting and speech breathing remained.	present	Use of comparison treatments. Patient was 20 months post TBI at treatment initiation.
Sound pressure level, fundamental frequency, and variability in fundamental frequency (semitone standard deviations) during sustained phonation, reading and conversational speech			LSVT was significantly more effective than the respiratory-only therapy in improving sound pressure level and pitch variability immediately post-treatment and maintaining those improvements at the 2 year follow up.	present	Random assignment to treatment groups; improvement in the context of a degenerative condition.
Perceptual ratings of breathiness and hoarseness by expert listeners based on tape-recorded readings of the Rainbow Passage.			Statistically significant pre- and post-treatment improvement in hoarseness and breathiness was observed in the LSVT group, but not in the group that received respiratory therapy alone.	present	Participants were randomly assigned to treatment groups after stratification for stage, duration, severity of disease and age. Listener's were blinded to the participants and their treatment group, and performed perceptual ratings of randomized pre- and post-treatment recordings.

Reported Risks & Complications	**Raters Comments**
None reported.	Anecdotal information on maintenance of improvement at 3 yrs post discharge. (Overall improvement allowed patient to independently operate a service station).
None reported.	
None reported.	The amount of selected delay was 150 ms.
None reported.	Did not have access to instrumentation for air flow/pressure recordings. Became frustrated by poor results with Visipitch alone (no permanent recording system) and lack of objective measurement, so devised own simple biofeedback paradigm.
None reported.	Therapy was provided daily for two weeks at the patient's home.

Several subjects evidenced fatigue at the end of the 2 week intensive treatment program.	2 group sessions daily were conducted for all treatment subjects, followed by "individual sessions for some patients, as required".
Subject fatigue and increased hoarseness	Treatment consisted of 26 within-clinic sessions plus the microcomputer sessions outside the clinic. Perceptual and acoustic analysis performed pre- and post-treatment and at 10 and 20 week follow-up visits.
None reported.	Did repeated measures of impairment outcomes.
1 side effect of trihexyphenidyl was dry mouth (not experienced; see "Rater's Comments").	Due to patient's probable labial-laryngeal myoclonus, it was thought that pulsing might be present throughout the speech mechanism and contributing to difficulty coordinating speech with respiration. Thus, trihexyphenidyl hydrochloride was initiated: Rhythmic pulsing continued but patient was able to generate 5 cm H_20 for 3 sec.
Patients in untreated group reportedly demonstrated deterioration of dysarthria.	10 sessions across 4 weeks.

None reported.	Unexpected finding that there was no consistent increase in intelligibility scores as a result of masking. Authors suggest that perhaps intelligibility should be evaluated in a varient of background noise conditions versus a sound booth. Brief discussion of the Edinburgh Masker (a portable masking device).
None reported.	Some "respiratory" treatment gain is attributable to wearing of palatal lift.
None reported.	"Other" subject characterisitc: otolaryngological and neuropsychological examinations. As noted by the authors, the deterioration of several outcomes measures over the 12-month period after treatment suggests a lack of maintenance of the treatment techniques and/or progression of the PD.
None reported.	"Other" subject characteristic: otolaryngological examinations. Authors suggested that PPS patients receive an extended (5 week) version of the intensive treatment with follow-up therapy sessions.
None reported.	During 2nd phase of treatment, 13 of the subjects continued in follow-up voice treatment 2x/week for 1 month, then 1x/ week for 2 months. Voice tx provided in the context of a multidisciplinary treatment program which involved rehabilitation (PT, OT, exercise, counseling, recreation) 4-5 hours/day, 4x/week.

None reported.	LSVT: 16 sessions within a 4 week period. "Other" subject characteristic: extensive acoustic/physiologic data provided for patient's baseline.
None reported.	"Other" subject characteristic: videolaryngoscopic and aerodynamic information Five voice-therapy sessions were offered to each patient. Group assignment was not random; patients who indicated an improved voice and declined voice therapy were placed in the Botox-only group (thus, extraneous factors, such as severity and motivation to improve, may have influenced the composition of the two groups).
None reported.	"Other" subject characteristic: magnitude of glottal incompetence. Treatment consisted of 16 sessions/1 month.
31% of patients did not tolerate rigid telescope examination. Reported swallowing problems of many patients precluded use of oral topical anesthesia. Many patients had head and neck tremors which affected stabilization of the rigid telescope. Vocal tremors created pitch-tracking problems for the stroboscope with both flexible and rigid views.	"Other" subject characteristic: laryngeal imaging examination. 4 weeks of treatment, 16 sessions total.
It was possible that respiration only treatment may be counterproductive in patients with PD; glottal incompetence actually became greater in certain subjects who increased respiratory effort without simultaneously improving vocal fold adduction.	17 subjects were a subgroup of the 45 subjects described in Ramig et al. (1995). Over 60% of the aerodynamic data were eliminated from further analysis in this study: many subjects were unable to perform the /pae/ syllable repetition task in a way that allowed valid data to be obtained. Others did not achieve a sufficient lip seal around the oral pressure tube which precluded valid pressure estimates.

None reported.	"Other" subject characteristic: self-rating of depression and sickness impact ratings on communication and social interaction.
None reported.	Intervention consisted of eight sessions given twice weekly. Some of the spouses interacted in the group therapy session. Efforts to obtain aerodynamic measures were considered unreliable (several participants were unable to maintain a consistent lip seal or spoke in an atypical manner). Aerodynamic measures were thus not used as indicators of treatment effectiveness.
None reported.	Subjects wore a face mask fitted with a resistor 15 min/day, 5 days/week for 6 weeks. Improvement in expiratory muscle strength decreased from 69% to 44% by 3 weeks post treatment. Further comparison of nonspeech versus speech tasks in training of expiratory muscles is warranted.
None reported.	"Other" subject characteristic included information from laryngostroboscopic examinations.
None reported.	Rehabilitation consisted of 13 (45 minute) group therapy sessions during 1 month, in groups of 5 patients. Given home exercises.
None reported.	

None reported.	Environmental test conditions were: (1) subject and judge seated back to back, (2) judge seated outside door about 14 feet away from subject, (3) subject and judge seated face to face.
None reported.	Subject received 8 sessions of each treatment type. Authors performed inter- and intra-judge reliability. Stability of baseline somewhat questionable across measures. Withdrawal phase characterized by considerable variability across a number of parameters.
None reported.	Following baseline, the patient participated in 16 one-hour sessions of the LSVT. Authors report that the lack of maintenance of treatment effects may be explained by a noticeable progression in the patient's PD post-LSVT.
None reported.	
None reported.	LSVT was conducted with 4 one-hour sessions per week for four weeks. Subjects randomized to the non-treatment group were offered treatment 6 months later at the completion of the study.

None reported.	
None reported.	The patient was able to secure a job that he held successfully for 1 year to date, partly because of his improved intelligibility with minimal prompting. The authors noted a possible order effect with the experimental design, i.e., speech might have improved by simply extending the LSVT an additional 6 weeks or by providing some other combination of treatment approaches.
None reported.	Group size: LSVT = 21; Respiratory-only therapy = 12.
None reported.	"Other" subject characteristic was average performance of participants on two measures of depression. Group size: LSVT, n=13, Respiratory treatment, n=7. Results of the study argued against the notion that LSVT produces excessive tension/compression in the vocal folds which would have led to increased breathiness or hoarseness.