

1-1-2012

Current Practices of Speech-Language Pathologists in Treating Presbyphonia

Erin Taylor Carey
bellomy18@marshall.edu

Follow this and additional works at: <http://mds.marshall.edu/etd>

 Part of the [Speech Pathology and Audiology Commons](#)

Recommended Citation

Carey, Erin Taylor, "Current Practices of Speech-Language Pathologists in Treating Presbyphonia" (2012). *Theses, Dissertations and Capstones*. Paper 348.

This Thesis is brought to you for free and open access by Marshall Digital Scholar. It has been accepted for inclusion in Theses, Dissertations and Capstones by an authorized administrator of Marshall Digital Scholar. For more information, please contact zhangj@marshall.edu.

CURRENT PRACTICES OF SPEECH-LANGUAGE PATHOLOGISTS IN TREATING
PRESBYPHONIA

A Thesis submitted to the Graduate
College of Marshall University

In partial fulfillment of requirements
for the degree of Master of Science
in Communication Disorders

by

Erin Taylor Carey

Beverly Anawalt Miller, MA, Committee Chairperson

Mary E. Reynolds, PhD

Karen McComas, EdD

Lisa Thomas Fry, PhD

Marshall University

August 2012

DEDICATION

I would like to dedicate this work to my son, Maximus, who inspires me every single day. He has been patient and forgiving as I have spent the past year working on this project. I hope it makes him proud of mommy.

ACKNOWLEDGMENTS

First, I would like to thank Beverly Anawalt Miller for always supporting me in any way she can. She has always believed in me and been there to remind me that I could do it. I cherish her mentorship and friendship. I wish to thank her for all of her encouragement.

Second, I would like to thank Dr. Lisa Thomas Fry who first invited me to give research a try and introduced me to her passion, voice. She encouraged me to submit my research for presentations and reminded me that my work matters. I want to thank you for all the support you have given me in the past four years.

Third, I would like to thank Dr. Karen McComas and Dr. Mary E. Reynolds for being on my committee and offering helpful, encouraging advice.

Fourth, I want to thank the Marshall University Community of Research Practice (CORP) for always supporting my research. Their helpful advice, listening to my practice defense, and participation in piloting my survey is much appreciated.

Fifth, I want to thank my family and friends who believed in me throughout this journey and helped me with Max.

Last, I want to thank all my fellow Communication Disorders students for always asking how my study was going and supporting me along the way. Specifically, I would like to thank Danielle Thorne for helping me work through many ideas of the study in our weekly meetings.

TABLE OF CONTENTS

DEDICATION	ii
ACKNOWLEDGMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vii
LIST OF FIGURES	viii
ABSTRACT	ix
CHAPTER I	1
INTRODUCTION	
<i>Anatomy of the Aging Voice</i>	1
<i>Voice Therapy</i>	2
<i>Purpose of the Study</i>	4
<i>Methods</i>	5
<i>Significance</i>	5
CHAPTER II	6
REVIEW OF THE LITERATURE	
<i>An Overview of Voice</i>	6
<i>Laryngeal Changes</i>	6
<i>Anatomical Changes</i>	7
<i>Epithelium</i>	7
<i>Lamina Propria</i>	7
<i>Muscle Layer</i>	8
<i>Visual/Perceptual Changes</i>	8
<i>Auditory Features of Presbyphonia</i>	9
<i>Incidence and Rates</i>	10
<i>Impact of Presbyphonia on Quality of Life</i>	11
<i>Treatment Options for Presbyphonia</i>	11

<i>Surgical</i>	11
<i>Pharmacological</i>	12
<i>Behavioral (Voice Therapy)</i>	12
<i>Previous Studies on Therapy for the Aged Voice</i>	13
<i>Aims of the Study</i>	16
CHAPTER III	17
METHODS	
<i>Participants</i>	17
<i>Design</i>	18
<i>Survey</i>	18
<i>Background/Experience</i>	18
<i>Treatment of Presbyphonia</i>	19
<i>Research</i>	20
<i>Procedures</i>	20
<i>Data Analysis</i>	21
CHAPTER IV	22
RESULTS/FINDINGS	
<i>Analysis of Background/Experience Information</i>	22
<i>Analysis of the Study's Aims</i>	26
<i>Additional Findings of the Study</i>	29
<i>Overall Conclusions</i>	33
CHAPTER V	35
DISCUSSION	
<i>Findings</i>	35
<i>Strengths and Limitations</i>	41
<i>Future Studies</i>	41
<i>Conclusion</i>	42

REFERENCES	43
APPENDICES	48
Appendix A. Survey Document	48
Appendix B. IRB Approval Letter	57
Curriculum Vitae	58

LIST OF TABLES

<i>4.1 Gender of respondents</i>	22
<i>4.2 Respondents' highest degree in field</i>	23
<i>4.3 Type of facility in which therapy is provided</i>	24
<i>4.4 Number of years respondents reported treating patients with disorders of voice</i>	25
<i>4.5 Types of specialized training respondents reported beyond Master's Degree</i>	25
<i>4.6 Number of cases respondents reported treating per year</i>	26
<i>4.7 Initial course of therapy for cases of presbyphonia</i>	26
<i>4.8 SLP opinions on most "effective" speech therapy treatment methods for presbyphonia.....</i>	27
<i>4.9 Frequency of therapy visits for patients with presbyphonia</i>	28
<i>4.10 Average number of sessions expected before discharge</i>	28
<i>4.11 Average length of a session for treating presbyphonia</i>	29
<i>4.12 Goal categories with examples.....</i>	30
<i>4.13 Tests of independence and relationship between type of treatment deemed to be most effective and respondents' goals for their patients</i>	31
<i>4.14 SLPs Perceptions of Voice Therapy Benefit</i>	31
<i>4.15 Reported frequency of reading professional literature related to presbyphonia treatment</i>	32
<i>4.16 Reported frequency of reading professional literature related to the field at large</i>	32
<i>4.17 Most common sources utilized</i>	33

LIST OF FIGURES

<i>5.1: Frequency count of which method of voice treatment participants find most effective</i>	<i>35</i>
<i>5.2: Frequency of participants' initial course of therapy</i>	<i>36</i>
<i>5.3: Responses to benefit of voice therapy for treatment of presbyphonia</i>	<i>37</i>
<i>5.4: Average number of sessions (of voice therapy) expected before patient discharge</i>	<i>38</i>
<i>5.5: Number of presbyphonia cases treated per year</i>	<i>39</i>

ABSTRACT

The purpose of the research was to determine the current practices of Speech-Language Pathologists (SLPs) who treat presbyphonia, deterioration of the voice resulting from age-related changes in the larynx, observed mostly in elderly males. Recent research indicates voice therapy may hold promise for treatment of presbyphonia. However, concern exists for finding the best method of voice therapy for this condition. Several physiologic methods have been shown efficacious in the treatment of voice disorders, yet only one physiologic treatment has been examined in the treatment of presbyphonia. Information about SLPs' treatment choices will expand the knowledge base of the field. The online survey was emailed to members in the American Speech-Language Hearing Association's Special Interest Group 3: Voice and Voice Disorders. Quantitative and qualitative methods were used to analyze the results of the survey, which indicated that the majority of SLPs who completed the survey use physiologically-based methods to treat presbyphonia. The most commonly identified methods were Vocal Function Exercises and Resonant Voice Therapy.

CHAPTER ONE: INTRODUCTION

I completed a study titled *Vocal Function Exercises and the Voice of Elderly Men* (Carey, Mease, Banks, Miller, & Fry, 2010) to examine treatment methods for the aging voice. The disorder related to the aging voice is termed "presbyphonia." While preparing that study, I started to take note of the existing "hole" in the evidence to support voice therapy for this population and/or any specific methods of voice therapy. Upon further investigation, I discovered the crucial need for more studies in this area.

Aging of the larynx and its associated voice changes are a notable concern for many older adults (Hagen, Lyons, & Nuss, 1996; Herrington-Hall, Lee, Stemple, Niemi, & McHone, 1988; Roy, Stemple, Merrill, & Thomas, 2007). With the number of elderly projected to double by the year 2030 to comprise nearly 20% of the United States population (Aging Statistics, 2011), the number of persons experiencing the effects of the aging voice is likely to increase as well. In an epidemiologic study, 29% of people over 65 in an outpatient setting reported having a voice disorder (Roy et al., 2007). With the large percentage of seniors reporting voice disorders, it is increasingly important to find a method of voice therapy that is evidence-based and generally agreed upon in the clinical realm.

Anatomy of the Aging Voice

A number of anatomical changes of the larynx have been reported in the literature. The vocal folds, from superficial to deep, are comprised of an epithelial layer, a three-layered lamina propria, and a muscle layer. Studies of cadaveric larynges have revealed changes in each of these layers with vocal fold age. Changes range from discoloration of tissue to changes in thickness and density of the layers (Hirano, Kurita, & Sakaguchi, 1989; Ximenes, Nascimento, Tsuji, &

Sennes, 2003). Clinical, physical differences have also been observed upon examination of elderly men. These include prominent vocal processes, spindle-shaped closure of the vocal folds, and bowing of the vocal fold edges during phonation/voicing (Pontes, Brasolotto, & Behlau, 2005). The above changes are considered more common in elderly men than women (Hagen et al., 1996; Honjo & Isshiki, 1980; Mueller, Sweeney, & Baribeau, 1985). These age-related anatomical changes, or "presbylarynx," may result in changes to the way the voice sounds.

Presbyphonia is the resulting voice change stemming from aging of the larynx (Stemple & Fry, 2010). The extent to which presbylarynx contributes to dysphonia is still being studied and is currently unclear (Tanner, Sauder, Thibeault, Dromey, & Smith, 2010). Age-related dysphonia is often described as a weak, breathy voice with an increase in pitch for males (Honjo et al., 1980, Mueller et al., 1985; Stemple & Fry, 2010). Other characteristics include muffled voice quality, pitch instability, and lack of vocal endurance (Mueller et al., 1985; Ramig & Ringel, 1983; Stemple, Glaze, & Klaben, 2010).

Research suggests that quality of life is also adversely affected in a large number of people with voice disorders (Wilson, Dreary, Millar, & Mackenzie, 2002). In addition, elderly people are more likely to report a negative impact on quality of life resulting from vocal impairments than younger individuals (Smith et al., 1996). This makes it important to understand current practices for treating elderly patients with presbyphonia.

Voice Therapy

Speech-language pathologists (SLPs) are members of a multidisciplinary voice team. People with voice disorders also see an otolaryngology professional (Ear, Nose, and Throat Specialist) who treats voice disorders, including presbyphonia, from a medical perspective.

Voice disorders are treated with either medical, surgical, or behavioral interventions. Historically, behavioral voice therapy has been the responsibility of the SLP (Stemple et al., 2010).

Several research studies have explored promising behavioral therapy techniques for presbyphonia. In a 2008 study, Gorman, Weinrich, Lee, and Stemple researched Vocal Function Exercises (VFEs; Stemple, 1993), a physiologically based treatment method, in elderly men. Their results revealed significant improvement in maximum phonation time (MPT) during the twelve-week period as well as significant improvement of aerodynamic measures indicating improved glottal closure. Tanner et al. (2010) studied VFEs on male monozygotic twins with severe presbyphonia. The results showed improved scores on a self-rated voice questionnaire, and both twins showed greatly improved glottal closure. Sauder, Roy, Tanner, Houtz, & Smith (2010) also investigated VFEs as a potential treatment for presbyphonia and found significant improvements in self-ratings of voice, phonatory effort, and voice severity levels. All three of these studies have demonstrated improvements in the voice of patients with presbyphonia, using the physiological method of VFEs.

Presbyphonia has been well documented (Mueller et al., 1985; Pontes et al., 2005; Stemple et al., 2010) and studies have shown that older adults suffer quality of life changes as a result of voice problems (Smith et al., 1996). Hence, there is a pressing need to examine current treatment options and practice patterns for this population. Studies are emerging showing promising effects from one specific method of treatment, VFEs; however, current practice patterns in the field remain unclear.

It is the position of the American Speech-Language Hearing Association (ASHA) that SLPs engage in evidence-based practice (EBP), consisting of three components: client values, clinician expertise, and incorporation of current, high-quality evidence. An ASHA position statement on EBP states that SLPs should evaluate treatment techniques, evaluate evidence, and incorporate the best evidence into their therapy (American Speech-Language Hearing Association, 2005). The position statement thus supports the importance of the current study which aimed to determine the current treatment techniques being used by SLPs in the treatment of presbyphonia.

Purpose of the Study

Although an evidence base supporting a specific method of therapy for use with presbyphonia is only in its infancy, SLPs do treat presbyphonia in their practices. Therefore, it would be beneficial to the field to discover more about treatment choices for SLPs encountering this population. Information about treatment choices could aid decision making during the treatment planning of SLPs who are new to or unfamiliar with presbyphonia. Additionally, awareness of current SLP practices could help direct future research efforts in the field. An awareness of methods being used would aid researchers in methods to examine and/or compare in efficacy studies. The results of such information would benefit clients seeking therapy for their age-related vocal changes. The purpose of the study, therefore, was to describe the current practices of SLPs treating presbyphonia in elderly males, through a survey directed at answering the following research question:

1. What are the current therapy practices of SLPs who are treating presbyphonia in elderly males?

We hypothesized that SLPs would report physiological methods of voice therapy such as Vocal Function Exercises (Stemple, 1993) to treat presbyphonia.

Methods

A web-based survey method was used to investigate SLPs' current practices without restriction to geographical area. The participants were members of ASHA's Special Interest Group (SIG) 3 Voice and Voice Disorders. Sixty-six SLPs chose to participate in the study. Participants completed the survey directly on the survey website and their responses were stored on the website. Quantitative and qualitative methods were used to evaluate the responses.

Significance

This study is significant in that it provides readily available information regarding how SLPs are currently treating presbyphonia. These data will inform the field and may influence future decisions made by clinicians. The findings of the study may benefit SLPs, programs in Communication Sciences and Disorders (CSD), and medical professionals in otolaryngology by providing information about current practices. Furthermore, the current study and information provided could serve as a pilot study for a larger study in this area.

CHAPTER TWO: REVIEW OF THE LITERATURE

An Overview of the Voice

People depend on their voices every day to communicate their wants and needs. It is one of the ways individuals express their feelings. Voice is produced when air is exhaled from the lungs and flows upward to the adducted (closed) vocal folds. As air pressure builds below the folds, it eventually blows apart the folds, which then pull back together due to a combination of the elasticity of the vocal folds and aerodynamic pressures. This cycle of vibrating vocal folds creates the sound of voice (van den Berg, 1958). The modulation of air molecules above the level of the vocal folds helps to maintain this cycle of vocal fold opening and closing (Titze, 1994). The vocal tract further shapes the sound wave as it travels through the supraglottic system (Stemple et al., 2010).

The voicing process relies on a balance of three subsystems: respiration, phonation, and resonance (Stemple et al., 2010). When any one of the systems is not functioning properly, voice production is altered, and the voice signal can be disturbed. As a person ages, anatomical and physiological changes occur in each of the three subsystems (Stemple et al., 2010) which can subsequently alter the quality, pitch, and loudness of the voice (Linville, 1996; Ramig & Ringel, 1983; Stemple et al., 2010).

Laryngeal Changes

The larynx ages as the body does. These age-related changes have the potential to alter the sound of the voice. The true vocal folds (TVFs) are housed within the larynx. They are comprised of five different layers of tissue, each layer of varying elasticity and viscosity. From superficial to deep, the layers include an epithelial layer, a three-layered region of connective

tissue referred to as the lamina propria, and a muscle layer (the thyroarytenoid muscle). Changes have been documented in each layer of the vocal folds related to age (Hirano et al., 1989; Gray, Alipour, Titze, & Hammond, 2000; Honjo & Isshiki 1980; Kahane, 1988; Mueller et al., 1985; Ximenes et al., 2003). Such changes are reviewed in brief below.

Anatomical Changes

Epithelium

Epithelial tissue is the outermost layer of the vocal folds, providing a protective cover for the vocal folds (Gray, 2000; Gray et al., 2000; Kahane, 1988). Researchers have reported changes in cell density and tissue appearance with age, which are likely attributed to cell death (Ximenes et al., 2003). Discoloration of the epithelial layer with age has also been noted (Honjo & Isshiki, 1980; Mueller et al., 1985). These studies reported a yellow or gray appearance of aged folds which could be related to fatty degeneration in the layer or to keratosis (Honjo & Isshiki, 1980).

Lamina Propria

The lamina propria is a connective tissue layer made up primarily of elastin and collagen fibers resting within an extracellular matrix (Gray et al., 2000). Due to its composition and mechanical properties, the layer is especially important in vocal fold vibration. It is divided into three layers: the superficial layer (or Reinke's space), the intermediate layer, and the deep layer. Any alteration in its composition and flexibility may significantly alter voice (Ximenes et al., 2003).

Changes in the thickness of the lamina propria layers with age have been reported by several sources. Such changes are especially notable in men (Hirano et al., 1989; Gray et al., 2000; Ximenes et al., 2003). First, changes have been noted in the elastin and collagen fibers that course throughout the layer's extracellular matrix and determine the vibratory features of the layer (Sato & Hirano, 1997; Sato, Hirano, & Nakashima, 2002). The fibers undergo alterations in diameter, density, and in their configuration within the lamina propria (Sato & Hirano, 1997; Sato et al., 2002; Ximenes et al., 2003). Furthermore, a thinning and bowing of the intermediate layer of the lamina propria has been observed in older males. Finally, the deep layer becomes more dense in its composition and less flexible during vibration in aged larynges (Honjo & Isshiki 1980).

Muscle Layer

The thyroarytenoid muscle comprises the bulk of the true vocal fold proper (Seikel, King, & Drumright, 2005). Hirano et al. (1983) found that the thyroarytenoid muscle evidences atrophic changes with age. In addition, studies have also shown an increase in connective tissue in the muscle layer with age. The infiltration of this non-contractile connective tissue has the potential to alter the functional properties of the muscle and subsequently the production of voice (Kersing & Jennekens, 2004).

Visual/Perceptual Changes

In addition to the anatomical changes observed in the cadaveric studies reviewed above, laryngeal changes with age have also been observed clinically. Dynamic tests, such as videostrobolaryngoscopy, have offered a wealth of information regarding the features of the presbyphonic larynx. Key visual-perceptual changes of the aged larynx are noted below.

Posteriorly, the membranous portion of the vocal folds inserts into the vocal processes (bilateral cartilaginous processes to which the true vocal folds attach) of the arytenoid cartilages (Seikel et al., 2005). Interestingly, these vocal processes become more prominent in their appearance with age, resulting in a protrusion along the otherwise linear vocal fold edge (Hagen et al., 1996; Honjo et al., 1980; Pontes, 2005; Ximenes et al., 2003). Clinically, prominent vocal processes have been observed in males with presbyphonia (Tanner et al., 2010). As proper closure of the vocal folds along the entire vocal fold edge is critical to the modulation of exhaled air and the production of voice, the loss of linearity resulting from vocal process prominence has the potential to alter vocal fold closure patterns and airflow patterns during voicing (Stemple et al., 2010).

Again, a linear vocal fold edge is essential to normal voice production. Vocal fold bowing, or a thinning and concavity of the midsection of the membranous vocal fold, has been observed in older males (Honjo & Isshiki, 1980; Linville, 1996). This loss of linearity in each fold's midsection results in reduced vocal fold closure during voice production and in the appearance of a spindle-shaped gap between the folds (Honjo & Isshiki, 1980; Pontes et al., 2005). It is believed that atrophic changes within the vocal folds (Honjo & Isshiki 1980; Mueller et al., 1985) result in the bowed appearance (Honjo & Isshiki, 1980; Pontes et al., 2005).

Auditory Features of Presbyphonia

The vocal fold bowing and incomplete glottal closure present in presbylaryngeus (Honjo & Isshiki, 1980; Pontes et al., 2005) leave the larynx unable to properly modulate the exhaled airstream (Stemple & Fry, 2010). The remaining subsystems of respiration and resonance often respond to the laryngeal inefficiencies, creating an imbalance in voice production (Stemple et al.,

1994). The altered system leaves presbyphonic patients with several very characteristic vocal features. The hallmark auditory feature of presbyphonia is a weak, breathy voice (Honjo & Isshiki, 1980). Hoarseness is another common feature (Mueller et al. 1985). Other characteristics include muffled voice quality, increased pitch, pitch instability, and lack of vocal endurance (Stemple et al., 2010).

Incidence and Rates

In an epidemiological study of men and women over the age of 65, 47% of participants reported having a voice disorder at some point in their lifetime (Roy et al., 2007). Twenty-nine percent of participants had a voice disorder at the time of the study – during the period of old age. Out of those reporting current voice disorders, 60% reported voice problems longer than six weeks. This study points to the fact that nearly one-third of older adults may be experiencing the effects of chronic vocal problems.

Another report examining the composition of a metropolitan voice center caseload found that 22.4% of patients seeking care for voice disorders were over the age of 64 (Herrington-Hall et al., 1988). This finding points to the fact that the elderly make up a notable percentage of those seeking professional help for voice concerns.

As to why many of the elderly seek out specialty medical care for voice concerns, Lundy, Silva, Casiano, Lu, & Xue (1998) found that one of the two most common causes of dysphonia in patients over 65 years old was vocal fold bowing. Bowing, the hallmark of presbyphonia, was present in 19% of elderly patients who participated in the study. The above studies, and an additional study showing presbyphonia in 67% percent of elderly men (Honjo & Isshiki, 1980),

suggest that voice problems are a major concern among the elderly. In many cases, the vocal concerns stem from general age-related laryngeal change, or presbylarynx.

Impact of Presbyphonia on Quality of Life

Research suggests that quality of life is adversely affected in a large number of people with voice disorders (Roy et al., 2007; Smith et al., 1996). Interestingly, elderly individuals are more likely to report a negative impact on quality of life from voice concerns than younger persons with similar concerns (Smith et al., 1996). Elderly individuals report that vocal problems significantly impact their daily lives in several ways, including: a requirement for increased voice effort, increased discomfort with voicing, anxiety and frustration with the voice, and frustration with having to repeat statements to be understood. (Roy et al. 2007). These quality of life studies show the functional impact of voice changes in the elderly and point to the need to examine ways of reducing vocal concerns and the impact of those concerns on daily life.

Treatment Options for Presbyphonia

Over the years, three primary methods of treating voice concerns have been set forth (Stemple et al., 2010) – surgical, pharmacological, and behavioral (voice therapy). Although medication-based treatment has proven quite helpful in the treatment of some vocal concerns, such as dysphonia due to allergies or acid reflux (Stemple et al., 2010), surgical and behavioral treatments have been most commonly examined as potential treatments for presbyphonia.

Surgical

In the case of certain voice disorders, surgical interventions may be warranted. These can include injections/implants into the membranous vocal fold to increase vocal fold mass or more

significant surgery to alter the cartilaginous framework of the larynx (Stemple et al., 2010). Injections have been studied as a surgical intervention for the aging vocal folds as a way of manipulating the laryngeal closure (Ford & Bless, 1986, Stemple et al., 2010). Ford and Bless (1986) examined the effect of injectable collagen as vocal fold augmentation for the glottal insufficiency of presbylarynx and paralysis, bringing the damaged vocal fold closer to midline. The study revealed significant improvement in closure when one vocal fold was normal in appearance. Unfortunately, if damage was bilateral, as is the case with presbyphonia, the effects of the injection were weakened. Upon following the patients post-injection, the participants showed slight decrement in the effects after one year.

Pharmacological

Medications are available to improve certain illnesses which may be a primary cause of a voice disorder (Stemple et al., 2010). An example of this may be vocal fold irritation secondary to esophageal reflux, which can be controlled by the use of medication. Another common example is the use of antihistamines to control sinus drainage and coughing which can result in a hoarse voice (Stemple et al., 2010). No published studies are currently available on the effect of medication on presbyphonia.

Behavioral (Voice Therapy)

A third option of treatment for voice disorders includes behaviorally based voice therapy. Generally, voice therapy is classified into three main approaches: hygienic, symptomatic, and physiologic (Thomas & Stemple, 2007). Hygienic voice therapy targets lifestyle changes to reduce behaviors that may be harmful to the laryngeal mechanism (such as screaming or smoking) in order to improve the voice (Stemple et al., 2010). This type of therapy involves a

significant amount of education about abusive vocal habits and behaviors as well as helping the client to identify possible vocal misuse (Thomas & Stemple, 2007). Symptomatic voice therapy aims to change the specific features of the voice which are abnormal such as pitch, quality, loudness, or respiration (Thomas & Stemple, 2007). This approach, which includes methods such as raising the pitch, using an easy onset, or increasing loudness, is considered appropriate if the component of voice which needs modified is not the direct result of laryngeal pathology (Stemple et al., 2010). Physiologic therapy is aimed at improving the functioning of the laryngeal system through utilization of the entire vocal tract to achieve a balance between the three subsystems of voice: respiration, phonation, and resonance (Stemple et al., 2010; Thomas & Stemple, 2007). When one of the voice subsystems is not functioning correctly because of vocal pathology, a physiologic approach is often used to restore balance amongst the subsystems (Stemple et al., 2010). Examples of physiologic therapy are Vocal Function Exercises (VFEs; Stemple, 1993), resonant voice therapy (Lessac, 1965), Lee Silverman Voice Treatment (Ramig, Countryman, Thompson, & Horii, 1995), and the Accent Method (Smith & Thyme, 1976).

Previous Studies on Voice Therapy for Presbyphonia

Several research studies have explored promising physiological voice therapy techniques for presbyphonia. In a 2008 study, Gorman et al. researched the use of VFEs with elderly men with presbyphonia. The participants practiced VFEs twice a day for twelve weeks. The group measured the participants' progress over time with maximum phonation times (MPT) and the aerodynamic measures of glottal airflow and subglottic pressure at comfortable, high, and low pitches. The researchers found that with the use of VFEs, significant gains were observed in MPT over the twelve week period. Significant improvement was also noted on the aerodynamic measures, indicating improved glottal closure, a primary goal of therapy for presbyphonia.

Mau et al. 2010, studied three years of records of patients at a voice center to better understand presbyphonia treatment outcomes. Voice therapy methods were not specified; rather, the study looked at outcomes of voice therapy in general. Eighty-five percent of the patients whose records were examined showed improvement of their voice with voice therapy, a finding that indicates that voice therapy is indeed a beneficial treatment option for this population. Additionally, the group discovered that patients whose vocal folds evidenced a larger degree of atrophy did not respond as well to therapy as those with less marked vocal fold changes, suggesting that therapy may be most beneficial in mild and/or early cases of age-related voice change.

In a pilot study by Carey et al. 2010, researchers examined the effects of VFEs on the voices of four elderly men without reported age-related voice change. The group found mixed results across participants (Carey et al., 2010). Participants completed a six week course of VFEs, with weekly check-ins to ensure adherence to the treatment protocol. Subjects' voices were measured pre- and post-treatment using the Voice Range Profile, Laryngeal Airway Resistance measures, and the Voice Related Quality of Life self-rating scale (Hogikyan & Sethuraman, 1999). The results varied as one subject made marked gains, two showed improvement, and one showed regression. Qualitative interviews were also employed post-treatment which showed four themes: routine, progression, purpose, and understanding. Findings showed that the subject with the greatest gains (quantitatively) was the one who had the most intrinsic motivation and the strongest understanding of anatomical components of the program.

Tanner et al. 2010, studied VFEs on male monozygotic twins. Both twins had previously undergone surgical management for presbylaryngeus which resulted in improved vocal fold closure; however, the men still presented with voice characteristics of severe presbyphonia. They

were instructed to practice the VFEs twice daily for four weeks. The results showed lower (improved) scores on the Voice Handicap Index (Jacobson et al., 1997), indicating that their voices had less of a negative impact on their lives than pre-treatment. Both twins showed greatly improved glottal closure on laryngeal exam; however, significant acoustic differences were not observed and presbyphonic features of the voice remained.

In 2010, Sauder et al. completed a study of VFEs on elderly patients with presbylaryngeus. After a six-week VFE course of treatment, there were significant reductions (improvement) in Voice Handicap Index scores (Jacobson et al., 1997), phonatory effort measures, and voice disorder severity ratings. Maximum phonation times (MPT), acoustic measures, and laryngeal images did not show significant changes.

A recent study (2012) by Tay et al. also indicated that VFEs may be a promising treatment technique. The study consisted of 22 participants who were over the age of 65 and in a choir. The experimental group completed a five-week VFE program; the control group did not undergo any training and only participated in pre- and post- study measures (showing no improvements). The participants in the experimental group showed improvements in perceived roughness, MPT, and in the acoustic measures of jitter, shimmer, and noise-to-harmonics ratio. Participants also perceived their voices as better after the VFE program (Tay et al., 2012). Perceived breathiness, strain, and frequency range did not yield significant change.

Despite emerging evidence showing that VFEs may be beneficial in treating presbyphonia, little is known about the effectiveness of other voice therapy methods. In addition, little is known regarding what methods clinicians in the field are actually using in their treatment of presbyphonia. Are clinicians choosing to use physiologic methods (e.g. vocal function

exercises) supported by the literature, or are they choosing other methods of treatment? The purpose of this study was to determine the current practices of SLPs in treating people with presbyphonia. Such information will allow for more direction in researching efficacious methods for presbyphonia and more informed and expanded treatment choices in the field.

Aims of the Study:

1. To describe the current therapy practices of SLPs specializing in voice who are treating presbyphonia in elderly males.
2. To determine if SLPs specializing in voice are using physiologic methods in the treatment of voice.

We hypothesized that SLPs who treat elderly males with presbyphonia use physiologically based methods for voice treatment of presbyphonia. Likewise, our null hypothesis was that SLPs who treat elderly males with presbyphonia will report using methods of treatment other than physiologically based treatment of presbyphonia. This chapter has reviewed key literature related to the current study. In the following chapter, the study's methods are presented.

CHAPTER THREE: METHODS

Participants

The target population was members of the American Speech-Language Hearing Association's (ASHA) Special Interest Group (SIG) 3: Voice and Voice Disorders. The members of this group are speech-language pathologists (SLPs) or students in communication sciences and disorders who belong to ASHA or the National Student Speech-Language Hearing Association (NSSLHA) and who have an interest in voice and voice disorders. Members of ASHA and NSSLHA have the option to join a SIG in eighteen topic areas to gain access to journals and discussion boards. This group was chosen particularly for their interest in voice and voice disorders, as all SLPs do not treat or have interest in voice. Additionally, this group has a large membership (approximately 1000 members) geographically located across the entire United States and in other countries.

All SIG 3 members on the listserv were invited to complete an electronic survey, designed by the lead investigator, by clicking on a link which directed them to the surveymonkey.com website. Participation in the study was voluntary, and no compensation was offered. Individuals who elected to not participate in the study were instructed to discard the email inviting them to complete the survey. Those individuals included in the study were members of SIG 3 holding a Master's degree or higher and who have treated patients with presbyphonia.

The participants were not defined by geographic location. The original sample was composed of 59 females and 11 males; 4 participants chose not to finish the entire survey, resulting in a total of 66 completed surveys. Of those 66 participants, two were eliminated as

they only had a bachelor's degree, and four more were eliminated because they did not treat presbyphonia, resulting in 60 respondents who met all inclusion criteria. Those who did not meet the inclusion criteria were forwarded to the end of the survey.

Design

The study used a web-based survey method, which allowed a random sample of self-identified voice practitioners without restriction to geographical area. Using a survey offered flexibility, speed, and convenience at a low cost. It provided technology such as required completion of answers and piping (automatic forwarding to later sections in the survey). Those individuals who did not meet the inclusion requirements, which is to say that their educational level was less than a master's degree or that they have not treated presbyphonia, were piped, or moved ahead, in the survey to the research section.

The survey site allowed for collection and storage of the survey and results. SurveyMonkey.com offered many benefits including custom survey design, SPSS integration, question and answer piping, a progress bar, and the ability to randomize and sort choices. The survey was composed of three primary sections: SLP background/experience, treatment planning for presbyphonia, and research (See Appendix A for actual survey document.)

Survey

Background/Experience

The SLP background/experience section was devised in order to gather demographic data and filter participants for inclusion in the study. Questions pertained to general background information (e.g., gender, degree) as well as type of work facility, number of years working with

patients with voice disorders, and specialized training. In addition, participants were asked about their specific practices in treating people with presbyphonia.

Treatment of Presbyphonia

The section regarding treatment planning of presbyphonia encompassed both general treatment practices as well as specific information about service provision. Those SLPs who answered that they treated presbyphonia were asked questions regarding general treatment practices in order to address the “current practices” component of the study. Research indicates that presbyphonia is treated initially in several ways (medication, surgery, or speech therapy), and therefore the participants were asked about their initial course of treatment (Ford & Bless 1986; Stemple & Fry 2010). In addition, questions regarding frequency (cases per year, visits per week) and duration of the treatment were presented. In order to find out more about the participants’ treatment plans, they were asked to state their most common goal for patients with presbyphonia. This question was left open ended as it was anticipated that the goals could cross a wide range of theories and treatments. The participants were asked which three treatment methods are most critical to achieving their above goal, and then which is the most effective. There were fourteen choices including "other." The 14 options were determined following the literature review, after discussions with expert voice clinicians and a voice therapy textbook author (Stemple & Thomas, 2010), and after noting recent SIG 3 discussion threads about the treatment of presbyphonia. Other choices came from recent studies that looked at treatment options for presbyphonia such as Vocal Function Exercises and Vocal Hygiene (Gorman et al., 2008; Sauder et al., 2010; Tanner et al., 2010; Tay et al., 2012). Components of voice therapy which have been shown to be critical for many voices disorders, such as education, were also included (Stemple et al., 2010, Thomas & Stemple, 2007).

Research

Items in the research section were meant to gain more insight as to the information that the participants provided in the rest of the survey. Questions focused on the reading of professional literature in general as well as specific to presbyphonia. Participants were also asked to identify sources where they seek information (such as workshops or textbooks).

Procedures

The survey was piloted on a group of speech-language pathologists (faculty) and speech-language pathology students at Marshall University within a research community (the Community of Research Practice). They were given the survey and timed for completion. These individuals offered feedback in written and verbal form, and changes were made accordingly to the structure and wording of the study.

Potential study participants were contacted three times. An initial email invitation was posted to the listserv for SIG 3: Voice and Voice Disorders, to all SIG 3 members. The invitation included information about the study, the investigators, and consent. If the participants decided to participate in the survey, they were instructed to click on the link in the email thus giving their consent. The survey was open for four weeks, and two reminder emails were posted to the SIG 3 listserv during that time frame.

Administration of the survey took place directly on the website. There were no time limitations on the survey. After completion of the survey, the survey answers were stored on the SurveyMonkey website. Only the researchers of this study had access (via password) to the results. No identifying information was collected.

Data Analysis

Quantitative and qualitative methods were used to determine the results of the study. Quantitative responses were downloaded into an excel data sheet in order to analyze the results using SPSS 14.0. SurveyMonkey provided this download as part of the survey package. Data were entered electronically and automatically, thereby reducing the risk of input error and increasing reliability. Descriptive statistics were used to report the results of the survey; (George & Mallery, 2007). Results from open-ended questions were analyzed using qualitative methods of inductive coding. Qualitative data are not stated in numbers but narratively (Bordens & Abbott, 2008).

CHAPTER FOUR: RESULTS/FINDINGS

Analysis of Background/Experience Information

To better understand the characteristics of the sample (which consisted of 60 respondents, after six were eliminated due to failure to meet inclusion criteria), I first completed frequency analyses on respondents' answers to background/experience survey items. As can be seen below, 85% of the sample was female (table 4.1), approximately 77% held a master's degree in Speech-Language Pathology (table 4.2), and participants worked in a variety of settings, nearly equally distributed among otolaryngology practices, specialty voice centers, general outpatient and university clinics (table 4.3). The number of years participants reported treating voice cases varied widely (table 4.4). Table 4.5 shows that participants reported regularly completing a variety of types of continuing education to remain abreast of the latest methods for treating patients with disorders of voice, and table 4.6 shows that the number of voice patients treated per year ranged from more than 10 to more than 31.

Table 4.1

Gender of respondents

Gender	Frequency	Percent
Female	51	85.0
Male	9	15.0
Total	60	100.0

Table 4.2

Respondents' highest degree in field

Highest Degree in Field	Frequency	Percent
Master's Degree	46	76.6
Doctoral Degree	12	20.0
Post-Doctoral Work	0	0.0
Other	2	3.3
Total	60	100.0

One of the respondents in the "other" category in table 4.2 reported an ABD (all but dissertation), and the other reported holding a DMA (Doctor of Musical Arts) in voice in addition to an MA (Master's degree) in Communication Disorders.

Table 4.3

Type of facility in which therapy is provided

Facility Type	Frequency	Percent
Acute Care	3	5.0
Otolaryngology Practice	15	25.0
Specialty Voice Center	11	18.3
Inpatient Rehabilitation	1	1.7
Skilled Nursing Facility	0	0.0
General Outpatient Clinic	8	13.3
University Clinic	10	16.7
Home Health Care	0	0.0
Other	12	20.0
Total	60	100.0

The "other" category in table 4.3 represented a variety of additional settings, including private practices and hospital inpatient and outpatient clinics, and home health.

Table 4.4

Number of years respondents reported treating patients with disorders of voice

Number of Years	Frequency	Percent
1 – 5	4	6.7
6 – 10	9	15.0
11 – 15	8	13.3
16 – 20	16	26.7
21 – 25	8	13.3
26 – 30	6	10.0
31 +	9	15.0
Total	60	100.0

Table 4.5

Types of specialized training respondents reported beyond Master's Degree

Specialized Training	Number
Short Courses	45
Intensive Workshops	57
Additional College Courses	15
Specialty Training in Voice Instrumentation	46
Internship/Mentorship with Another Specialist	31
Other	12

Respondents were allowed to check more than one answer regarding specialized training, and continuing education experiences in the "other" category in table 4.5 included ASHA coursework, special certification courses, and specialized training.

Analysis of the Study's Aims

The frequency analyses described in this section followed the general aims of the study, which were to describe current therapy practices of speech-language pathologists who treat patients with presbyphonia and to determine if they most often use physiologic methods to treat these patients. As one can see in table 4.6, respondents reported treating a varying number of patients with presbyphonia in a given year.

Table 4.6

Number of cases respondents reported treating per year

Number of Cases	Frequency	Percent
Less than 10	20	33.3
11 – 20	17	28.3
21 – 30	12	20.0
31 +	11	18.3
Total	60	100.0

Table 4.7 shows that, rather than using medical or surgical treatments, the vast majority (95%) of respondents reported using speech therapy as their first course of treatment.

Table 4.7

Initial course of therapy for cases of presbyphonia

Therapy Type	Frequency	Percent
Medication	1	1.7
Surgery	2	3.3
Speech Therapy	57	95.0
Total	60	100.0

Table 4.8 shows that the majority (83.3%) of respondents reported that they felt that methods for treating presbyphonia that are physiologic in nature (Vocal Function Exercises, Resonant Voice Therapy, Lee Silverman Voice Treatment, and Accent Method) are most effective in most cases, supporting my initial hypothesis.

Table 4.8

SLP opinions on most “effective” speech therapy treatment methods for presbyphonia

Therapy Method	Frequency	Percent	Treatment Type
Vocal Function Exercises	26	43.3	Physiologic
Resonant Voice Therapy	20	33.3	Physiologic
Other (give examples)	7	11.7	Mixed
Lee Silverman Voice Treatment	3	5.0	Physiologic
Accent Method	1	1.7	Physiologic
Modified Stretch and Flow	1	1.7	Symptomatic
Vocal Hygiene Therapy	1	1.7	Hygienic
Education	1	1.7	Hygienic
Pushing Forceful Voice	0	0.0	Symptomatic
Pitch Modification	0	0.0	Symptomatic
Easy Onset	0	0.0	Symptomatic
Humming	0	0.0	Symptomatic
Pitch Glides	0	0.0	Symptomatic
Relaxation	0	0.0	Symptomatic
Total	60	100.0	

Data in tables 4.9, 4.10, and 4.11 show that the majority of respondents reported treating patients with presbyphonia one time per week, while 83.3% reported discharging patients following 3 – 9 therapy sessions. Finally, all respondents reported seeing patients for between 30 and 60 minutes per therapy session.

Table 4.9

Frequency of therapy visits for patients with presbyphonia

Frequency of Visits	Frequency	Percent
1 Time per Month	0	0.0
2 Times per Month	13	21.7
1 Time per Week	40	66.7
2 Times per Week	6	10.0
3 or More Times per Week	1	1.7
Total	60	100.0

Table 4.10

Average number of sessions expected before discharge

Average Number of Sessions	Frequency	Percent
3-5	24	40.0
6-9	26	43.3
10-15	9	15.0
15-20	1	1.7
Total	60	100.0

Table 4.11

Average length of a session for treating presbyphonia

Average Session Length	Frequency	Percent
0.5 – 1.0 hour	60	100.0
1.25 – 2.0 hours	0	0.0
2.25 – 3.0 hours	0	0.0
More than 4.0 hours	0	0.0
Total	60	100.0

Additional Findings of the Study

The participants were asked for their most common goal when treating patients with presbyphonia (in an open-ended format.) The answers were analyzed and inductively coded for themes which fit into six categories: improved vocal fold closure, decreased hypertension, balancing the subsystems of voice, increased volume, stable/more appropriate pitch, and functional voice. The goals of improved vocal closure, decreased hypertension, and balancing the subsystems of voice are all goals which are consistent with physiological methods of treatment. “Increased volume” is an example of a symptomatic goal which was submitted by a participant. Examples of goals written by survey respondents for each category are given in table 4.12.

Table 4.12

Goal categories with examples

Goal Category	Sample Goal
Improved vocal fold closure	Adduction of vocal folds to decrease dysphonia; Improved glottal closure
Decreased hypertension	Reduce strain; Decreased hyperfunction.
Balancing subsystems of voice	Produce voice with improved vocal balance (respiration, phonation, and resonance).
Increased volume	Stronger voice for voice projection; Increase volume.
Stable, more appropriate pitch	Improved use of airflow with modification of pitch and resonance.
Functional Voice	Increase overall functional voice quality.

Next, I tested the independence (Chi-Square) and association (Cramer's V) between respondents' reported goals (those that support physiologic, non-physiologic, and mixed treatment methods) and the treatments they felt were most effective in most cases (physiologic, symptomatic, hygienic, other). Figure 4.13 shows that these variables were independent of, and therefore not associated with, one another. Although 50 (83%) respondents said they felt physiologic treatments to be most effective in most cases, only 22 (44%) of those 50 respondents reported goals for their patients that were physiologic in nature.

Table 4.13

Tests of independence and relationship between type of treatment deemed to be most effective and respondents' goals for their patients

Variable	Physiologic	Symptomatic	Hygienic	Other	X^2	df	p	Cramer's V	p
	No.	No.	No.	No.					
Goal					6.040	6	.419	.224	.419
Physiologic	22	0	0	3					
Non-physiologic	23	1	1	4					
Mixed	5	0	1	0					

Table 4.14 shows how beneficial participants felt voice therapy is for their clients with presbyphonia, with the majority (approximately 77%) responding “beneficial” or “very beneficial.” In addition, the survey inquired about the research practices of the participants (tables 4.14-4.16). It showed that the majority of participants read the literature related to the field at large once a month and literature related to presbyphonia several times a year.

Table 4.14

SLPs Perceptions of Voice Therapy Benefit

Respondents' Perceptions	Frequency	Percentage
Not very beneficial	3	5.0
Somewhat beneficial	11	18.3
Beneficial	29	48.3
Definitely beneficial	17	28.3
Total	60	100.0

Table 4.15

Reported frequency of reading professional literature related to presbyphonia treatment.

Reported Frequency of Reading Professional Literature	Frequency	Percentage
Never	4	6.7
Several Times a Year	38	63.3
Once a Month	12	20.0
Weekly	6	10.0
Daily	0	0.0
Total	60	100.0

Table 4.16

Reported frequency of reading professional literature related to the field at large

Frequency	Respondents	Percentage
Never	0	0
Several Times a Year	13	21.7
Once a Month	13	21.7
Weekly	22	36.7
Daily	12	20.0
Total	60	100.0

Data in table 4.17 show that the top sources of information for professionals treating patients with disorders of voice were research articles, continuing education, voice textbooks, and communication with experts in the field, in that order. Please note that, although participants

were asked to choose their top three, the frequency count came to 177, indicating that a few of the participants made a larger number of selections than three.

Table 4.17

Most common sources utilized

Information Sources	Frequency	Percent
Voice Textbooks	27	15.2
Research Articles	43	24.3
Colleagues	15	8.5
Communication (email, phone, etc) with experts in the field	24	13.6
Continuing Education	40	22.6
Short Courses (1/2 day)	11	6.2
Intensive Workshops (2+ day courses)	16	9.0
Additional College Courses	0	0.0
Instrumental Training	0	0.0
Internship/mentorship with another specialist	1	0.6
Total	177	100.0

Overall Conclusions

Respondents overwhelmingly chose speech/voice therapy, rather than medical or surgical intervention, as the first course of treatment for patients with presbyphonia. Vocal Function Exercises were the most frequently reported therapy method, followed by Resonant Voice Therapy and Lee Silverman Voice Treatment. These methods are all physiological in nature,

which is consistent with current research on presbyphonia treatments, and confirms the study's hypothesis. Participants described goals that fell into six categories, half of which are consistent with physiologic methods of treatment.

CHAPTER FIVE: DISCUSSION

Findings

The main purpose of the study was to determine the current practices of SLPs treating presbyphonia. The results of this study indicated that the majority of participants are using physiologic methods of voice treatment for presbyphonic patients, namely Vocal Function Exercises (VFEs), resonant voice therapy (RVT), and Lee Silverman Voice Treatment (LSVT) (see figure 5.1). These results support the hypothesis of the study that SLPs who treat elderly males with presbyphonia use physiologically based methods for voice treatment of presbyphonia. The findings are promising, considering the fact that physiologic methods have more research support than other methods of voice therapy (Thomas & Stemple, 2007). Further, VFEs, the treatment method most supported by literature on presbyphonia (Gorman et al., 2008; Sauder et al., 2010; Tanner et al., 2010; Tay et al., 2012), was the primary method being used by the clinicians surveyed. This finding is encouraging and suggests that clinicians specializing in the treatment of voice are adhering to current evidence in the field.

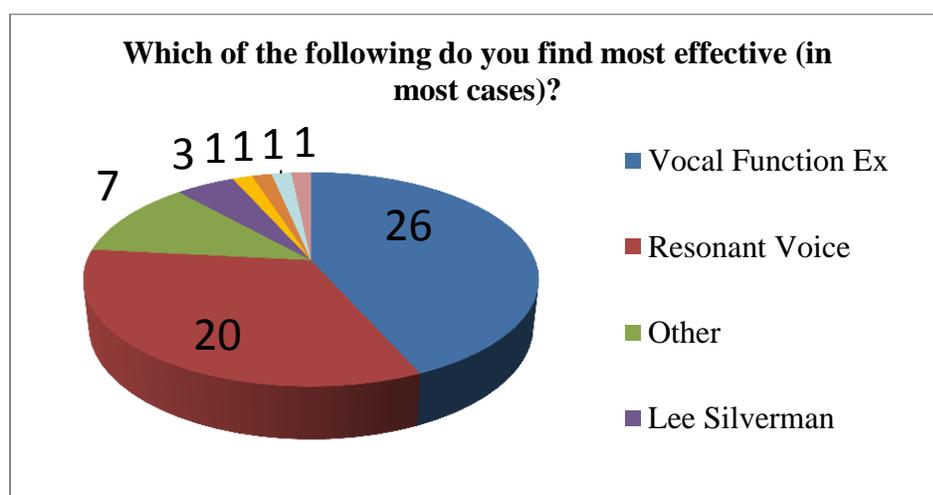


Figure 5.1: Frequency count of which method of voice treatment participants find most effective

This study revealed that speech/voice therapy was the first treatment option for patients with presbyphonia (above surgery and medication) as seen in figure 5.2. This finding confirms the importance of studies such as this one, to determine the practices of SLPs treating presbyphonia and the efficacy of the voice therapy methods they use, as speech therapy is a primary treatment for the disorder. Studies suggest that cases of presbyphonia comprise a notable portion of voice therapy caseloads (Herrington-Hall et al., 1988), a fact which further supports the need to examine current treatment practices in this area and to determine if treatments are in line with current evidence and if treatment practices are consistent across the field.

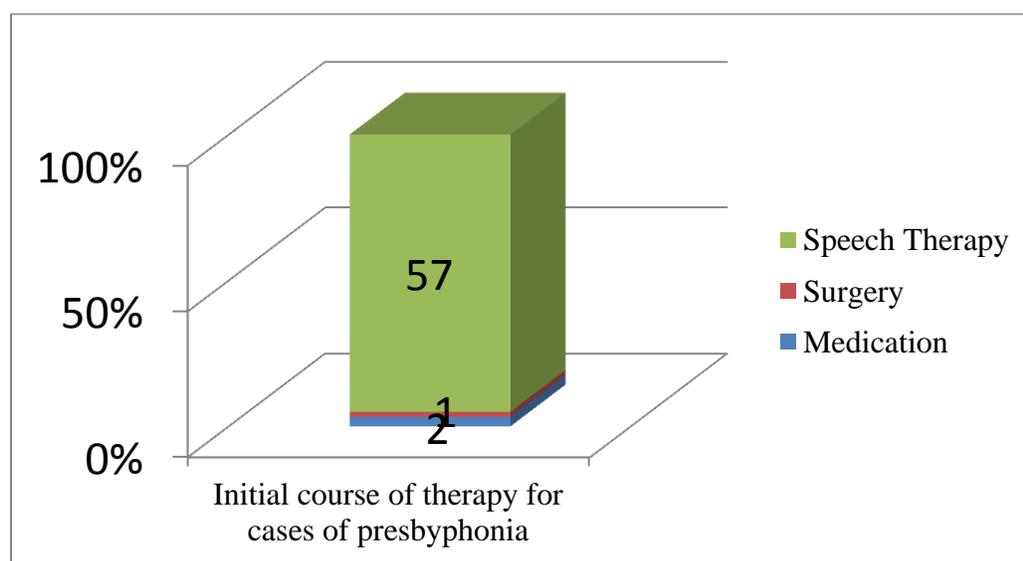


Figure 5.2: Frequency of respondent's initial course of therapy

Another important finding was that almost 2/3 of the respondents indicated that they found voice therapy to be beneficial for presbyphonia, and further, respondents reported that patients often improved to the point of discharge in < 10 treatment sessions (figures 5.3-5.4). These findings suggest that proper treatment can yield a positive benefit in a short period of time – a fact critically important in today's health care climate, where effective, efficient treatments

are considered premium. This also points to the need for studies which investigate not only the efficacy but also the *efficiency* of methods being used by SLPs in treating presbyphonia. If the results of such studies parallel those of this study, voice therapy for presbyphonia may be viewed favorably by insurance companies, rehabilitation companies, and governmental agencies overseeing the provision of care in today's stringent healthcare environment.

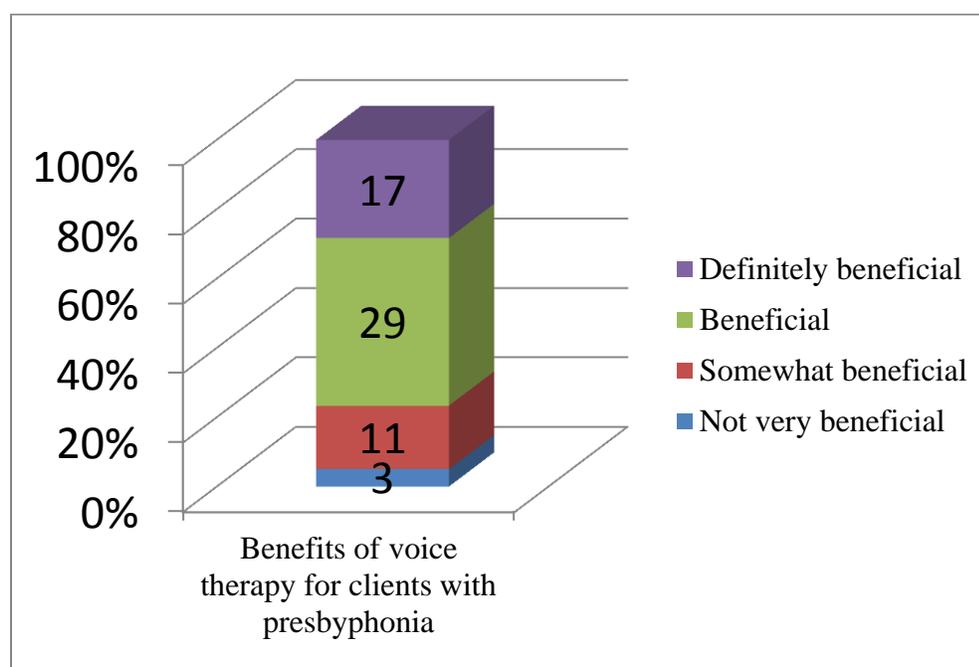


Figure 5.3: Responses to benefit of voice therapy for treatment of presbyphonia.

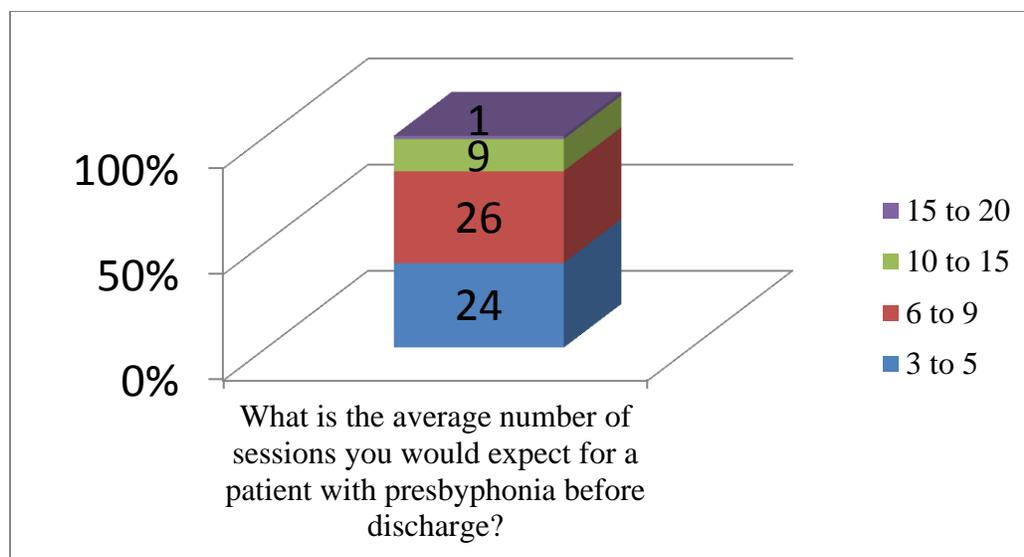


Figure 5.4: Average number of sessions (of voice therapy) expected before patient discharge.

Participants' reported goals were divided into six themes: improved vocal fold closure, decreased hypertension, increased volume, stable/more appropriate pitch, balancing the subsystems of voice, and functional voice. Several of these goals (e.g. produce voice with improved vocal balance (respiration, phonation, and resonance), improved glottal closure) were consistent with physiologic methods of treatment; however, fewer than half of the respondents submitted physiologic goals, an interesting finding considering that physiologic methods were reported as being widely used. This discrepancy may be due to the fact that some SLPs may be trained and/or required to state goals in a functional manner (rather than a more explicit physiologic manner) for reimbursement purposes.

Findings of the study related to the research section of the survey suggest the need for more research studies related to presbyphonia, as several different therapy techniques were chosen. All participants did not choose the same therapy methods, indicating that the field has not yet come to a consensus on what is effective; therefore, additional efficacy information

should support a more evidence-based consensus. Additionally, this study reflected that presbyphonia was commonly being treated by SLPs. Forty SLPs (two-thirds of the respondents) reported treating more than eleven cases per year (see figure 5.5) despite a lack of supporting evidence and/or group consensus on effective treatment. Continued research into this area would strengthen the services being provided by those speech-language pathologists.

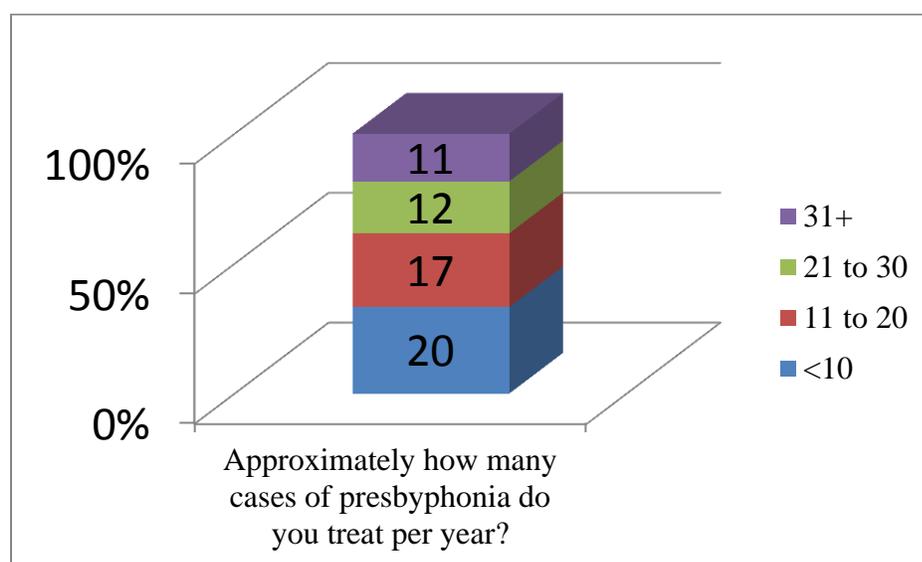


Figure 5.5: Number of presbyphonia cases treated per year.

The results of the study also suggest the need for better distribution of the current research for presbyphonia, as the participants reported only reading literature several times per year. This study did not aim to determine why people interacted with research literature at such a frequency, so speculation regarding the low frequency is challenging. Future studies might seek possible reasons for infrequent reading of research as, while the research is indeed limited, studies do exist. Perhaps research advances should be made more readily available across a variety of dissemination methods. Results of the research section of this study indicated that the best way to reach this specific group is through research articles as well as through continuing education opportunities, such as workshops, conferences, etc.

Findings from this study offer important information about current practices in the field of speech-language pathology. The data will inform SLPs of the specific treatments for presbyphonia currently being exercised in the field, which may aid in clinical decision making. As discussed previously, SLPs endeavor to implement evidence-based practice (EBP), one component of which is clinical expertise. Understanding methods of therapy being used by experts in the field for a particular disorder, in this case presbyphonia, will help SLPs provide services consistent with EBP. Similarly, students in communication sciences and disorders may take the data presented and use it to inform themselves of EBP practices in treating presbyphonia. Otolaryngologists can use these findings as well to be more informed of the options and practices of SLPs treating presbyphonia, which may impact recommendations for their patients.

The data suggest that current practices of SLPs include the use of physiologic methods (the approach to treatment with the most research support). The field of speech-language pathology is currently striving for evidence-based practice, and this study supports that elderly men with presbyphonia are indeed receiving EBP for their voice disorders. Information gathered from this study should result in clinicians being informed of the current practices of treatment, specifically the consensus of physiologically based therapy in support of treating presbyphonia. Such information may then impact greater use of this evidence-based therapy by all clinicians, those currently using physiological methods as well as those who are not, for their clients with presbyphonia.

Strengths and Limitations

Surveys have specific strengths and limitations. Strengths can include flexibility, speed, convenience, cost, technology such as required completion of answers, and the global reach of an online survey (Evans & Mathur, 2005). Limitations are also inherent, though, such as perception as “junk mail,” being impersonal, and yielding low response rates.

A strength of this study was that it is the first of its kind in the area of presbyphonia, offering new information to the field. It could easily be used as a pilot study and replicated with a larger group of individuals, especially as the survey has already been created. Another strength includes the wide range of data collected as the survey included twenty questions covering a broad range of topics, ranging from treatment of choice to means of accessing current evidence in the field.

Small sample size was a limitation of this study. The population targeted was very specific, perhaps not reaching SLPs who were not members of SIG-3 but who also work with individuals with presbyphonia. Limited responses may have been related to the nature of the group of SIG-3 members, practicing professionals and academicians engaging in practice who may have had limited time to respond to the invitation to participate.

Future Studies

The present findings indicate that this study could be used as a pilot study for one with a larger sample size. Other groups of voice specialists could be included. Another study might include two groups: SLPs who specialize in voice and those who do not. Such a study, with two groups of SLPs, would provide interesting information regarding treatment choices between the two and provide a more comparative study.

The participants' choices indicated that the treatments being utilized for presbyphonia (VFEs and RVT) are those with promising research behind them (Thomas & Stemple, 2007). Future studies should examine the efficacy of the techniques most reported by participants (VFEs and RVT) and what features of the presbyphonic voice they change.

The field would benefit from continuing efficacy studies on VFEs and presbyphonia. It is recommended that efficacy studies also be completed on the effects of RVT and Lee Silverman Voice Treatment on presbyphonia. Studies could include investigating other disorders of voice and seeing if SLPs are following EBP in those areas as well.

Conclusion

Presbyphonia is a condition that results in impaired communicative performance in a percentage of elderly men. Speech therapy is often sought out as a treatment for those suffering the effects of the condition. This study has attempted to define current practice patterns of speech-language pathologists who treat presbyphonia. Results of the study are promising, showing that the majority of voice specialists are using evidence-based physiologic methods to treat this disorder. Unsupported, or more loosely supported, hygienic and symptomatic methods are not frequently used. For those specializing in the field of voice, for ASHA leaders who have focused on moving the field toward EBP, and for elderly men suffering from presbyphonia, this finding is both important and encouraging. This study adds important data to the existing literature on presbyphonia and informs professionals of the choices of SLPs on treating presbyphonia, which can result in better practices regarding presbyphonia.

REFERENCES

- Aging Statistics (2011, September 1). In *Administration on Aging*. Retrieved June 28, 2012, from http://www.aoa.gov/aoaroot/aging_statistics/index.aspx
- Bordens, K. S. & Abbott, B.B. (2008). *Research design and methods: A process approach* (7th ed.). New York, New York: McGraw Hill Higher Education.
- Carey, E. T., Mease, S., Banks, C., Miller, B.A., & Fry, L. T. (2010, November). Vocal function exercises and the voice of elderly men. Poster presented at the American Speech-Language Hearing Association Conference. Philadelphia, Pennsylvania.
- Evans, J. R., & Mathur, A. (2005). The value of online surveys. *Internet Research*, 15(2), 195-219.
- Ford, C. N., & Bless, D. M. (1986, August). Clinical experience with injectable collagen for vocal fold augmentation. *Laryngoscope*, 96, 863-869.
- George, D., & Mallery, P. (2007). *SPSS for Windows step by step* (7th ed., pp. 68-114). Boston, MA: Pearson.
- Gorman, S., Weinrich, B., Lee, L., & Stemple, J. C. (2008, October). Aerodynamic changes as a result of vocal function exercises in elderly men. *The Laryngoscope*, 118, 1900-1903.
- Gray, S. D. (2000, August). Cellular physiology of the vocal folds. *Voice Disorders and Phonosurgery*, 33(4), 679-697.

- Gray, S. D., Alipour, F., Titze, I. R., & Hammond, T. H. (2000, January). Biomechanical and histologic observations of vocal fold fibrous proteins. *The Annals of Otolology, Rhinology & Laryngology*, *109*(1), 77-85.
- Hagen, P., Lyons, G. D., & Nuss, D. W. (1996, February). Dysphonia in the elderly: Diagnosis and management of age-related voice changes. *Southern Medical Journal*, *89*(2), 204-207.
- Herrington-Hall, B. L., Lee, L., Stemple, J. C., Niemi, K. R., & McHone, M. M. (1988, February). Description of laryngeal pathologies by age, sex, and occupation in a treatment-seeking sample. *Journal of Speech and Hearing Disorders*, *53*, 57-64.
- Hirano, M., Kurita, S., & Sakaguchi, S. (1989). Ageing of the vibratory tissue of human vocal folds. *Acta Otolaryngol*, *107*, 428-433.
- Hogikyan, N.D. & Sethuraman, G. (1999, December). Validation of an instrument to measure voice-related quality of life (V-RQOL). *Journal of Voice*, *13* (4), 557-569.
- Honjo, I., & Isshiki, N. (1980, March). Laryngoscopic and voice characteristics of aged persons. *Arch Otolaryngol*, *106*, 149-150.
- Jacobson, B. H., Johnson, A., Grywalski, C., Silbergleit, A., Jacobson, G., & Benninger, M. S. (1997, August). The Voice Handicap Index (VHI) development and validation. *American Journal of Speech-Language Pathology*, *6*, 66-70.
- Kahane, J. C. (1988). Histologic structure and properties of the human vocal folds. *Ear, Nose, & Throat Journal*, *67*(5), 322-330.

- Kersing, W., & Jennekens, F. G. (2004). Age-related changes in human thyroarytenoid muscles: a histological and histochemical study. *Eur Arch Otorhinolaryngol*, *261*, 386-392.
- Lessac, A. (1965). *The use and training of the human voice: A new approach to the biodynamics of voice and speech*. New York: Author.
- Linville, S. E. (1996). The sound of senescence. *Journal of Voice*, *10*(2), 190-200.
- Linville, S. E. (2004, October 19). The aging voice. *The ASHA Leader*.
- Lundy, D. S., Silva, C., Casiano, R. R., Lu, F. L., & Xue, J. W. (1998, April). Cause of hoarseness in elderly patients. *Otolaryngology– Head and Neck Surgery*, *118*(4), 481-485.
- Mau, T., Jacobson, B. H., & Garrett, G. (2010, April 5). Factors associated with voice therapy outcomes in the treatment of presbyphonia. *The Laryngoscope*, *120*(6), 1181-1187.
- Mueller, P. B., Sweeney, R. J., & Baribeau, L. J. (1985). Senescence of the voice: Morphology of excised male larynges. *Folia Phoniat.*, *37*, 134-138.
- Pontes, P., Brasolotto, A., & Behlau, M. (2005). Glottic characteristics and voice complaint in the elderly. *Journal of Voice*, *19*(1), 84-94.
- Ramig, L.O., Countryman, S., Thompson, & Horii (1995). Comparison of two forms of intensive speech treatment for Parkinson's disease. *Journal of Speech and Hearing Research*, *38*, 1232-1251.
- Ramig, L. A., & Ringel, R. L. (1983, March). Effects of physiological aging on selected acoustic characteristics of voice. *Journal of Speech and Hearing Research*, *26*, 22-30.

- Roy, N., Stemple, J., Merrill, R. M., & Thomas, L. (2007, April). Epidemiology of voice disorders in the elderly: Preliminary Findings. *The Laryngoscope*, *117*, 1-6.
- Sato, K., & Hirano, M. (1997, January). Age-related changes of elastic fibers in the superficial layer of the lamina propria of vocal folds. *The Annals of Otology, Rhinology & Laryngology*, *106*(1), 44-48.
- Sato, K., Hirano, M., & Nakashima, T. (2002). Age-related changes of collagenous fibers in the human vocal fold mucosa. *The Annals of Otology, Rhinology & Laryngology*, *111*, 44-48.
- Sauder, C., Roy, N., Tanner, K., Houtz, D. R., & Smith, M. E. (2010). Vocal Function Exercises for Presbylaryngis: A multidimensional assessment of treatment outcomes. *Annals of Otology, Rhinology & Laryngology*, *119*(7), 460-467.
- Seikel, A.J., King, D.W., Drumright, D.G. (2005). *Anatomy and physiology for speech, language, and hearing* (3rd ed.). New York, NY: Thompson Delmar.
- Smith, S. & Thyme, K. (1976). Statistic research on changes in speech due to pedagogic treatment (The Accent Method). *Folia Phoniatica*, *28*, 93-103.
- Smith, E., Verdolini, K., Gray, S., Nichols, S., Lemke, J., Barkmeier, J., & Dove, H. (1996). Effect of voice disorders on quality of life. *Journal of Medical Speech-Language Pathology*, *4*(4), 223-244.
- Stemple, J.C. (1993). *Voice therapy: Clinical studies*. St. Louis, MO: Mosby Year Book.
- Stemple, J. C., & Fry, L. T. (2010). *Voice therapy clinical case studies* (3rd ed.). San Diego, CA: Plural Publishing.

- Stemple, J. C., Glaze, L., & Klaben, B. (2010). *Clinical voice pathology theory and management* (4th ed.). San Diego, CA: Plural Publishing.
- Stemple, J. C., Lee, L., D'Amico, B., & Pickup, B. (1994). Efficacy of vocal function exercises as a method of improving voice production. *Journal of Voice*, 8, 271-278.
- Tanner, K., Sauder, C., Thibeault, S. L., Dromey, C., & Smith, M. E. (2010). Vocal fold bowing in elderly male monozygotic twins: A case study. *Journal of Voice*, 24(4), 470-476.
- Tay, E. Y., Phyland, D. J., & Oates, J. (2012, June 21). The effect of vocal function exercises on the voices of aging community choral singers. *The Journal of Voice*, 26 (1), e1-e10.
- Thomas, L. B., & Stemple, J. C. (2007). Voice therapy: Does science support the art? *Communicative Disorders Review*, 1(1), 49-77.
- Titze, I. R. (1994). *Principles of voice production*. Englewood Cliffs, NJ: Prentice-Hall.
- van den Berg, J. (1958, September). Myoelastic-aerodynamic theory of voice production. *Journal of Speech and Hearing Research*, 1(3), 227-244.
- Wilson, J. A., Dreary, I. J., Millar, A., & Mackenzie, K. (2002). The quality of life impact on dysphonia. *Clinical Otolaryngology*, 27, 179-182.
- Ximenes, J. F., Nascimento, P. S., Tsuji, D. H., & Sennes, L. U. (2003). Histologic changes in human vocal folds correlated with aging: A histomorphometric study. *Annals of Otology, Rhinology & Laryngology*, 112, 894-898.

APPENDICES: APPENDIX A

SLP Background***1. Gender?**

- Male
- Female

***2. What is your highest degree in the field?**

- Bachelor's
- Master's
- Doctorate
- Post-Doctoral
- Other (please specify)

***3. In what type of facility do you provide services primarily?**

- Acute Care
- Otolaryngology Practice
- Specialty Voice Center
- Inpatient Rehabilitation
- Skilled Nursing Facility/Long Term Care Facility
- General Outpatient Clinic
- University Clinic
- Home Health Care
- Other (please specify)

***4. What other type of facilities do you provide services in (if any)? (Check all that apply)**

- Acute Care
- Otolaryngology Practice
- Specialty Voice Center
- Inpatient Rehabilitation
- Skilled Nursing Facility/Long Term Care Facility
- General Outpatient Clinic
- University Clinic
- Home Health Care
- Other (please specify)

***5. How many years have you treated voice cases?**

- 1-5
 - 6-10
 - 11-15
 - 16-20
 - 21-25
 - 26-30
 - 31+
-

***6. Check all specialized training you have received in voice beyond your Master's program.**

- Short courses (1/2 a day)
- Intensive workshops (2+ day courses)
- Additional college courses
- Specialty training in voice instrumentation
- Internship/mentorship with another specialist
- Other (please specify)

Treatment of Presbyphonia

*In the following questions, you will be asked about treatment of presbyphonia. Presbyphonia is the voice concern resulting from the aging vocal fold system or presbylaryngeus (Stemple & Fry 2010). For the purposes of this survey, we are referring to patients who are elderly men (65 and above) with presbyphonia.

***7. Do you treat or have you ever treated a patient with presbyphonia in your practice?**

Yes

No

***8. What is the primary reason you do not treat such cases? (Choose the best answer)**

- I do not have presbyphonia cases referred to me in my practice.
- I do not feel therapy is appropriate for cases of presbyphonia.
- I do not feel that I have the expertise to treat presbyphonia.
- My caseload primarily involves the treatment of children.
- Other (please specify)

Treatment Planning for Presbyphonia

***9. Approximately how many cases of presbyphonia do you treat per year?**

- <10
- 11-20
- 21-30
- 31+

***10. What is the initial course of therapy for cases of presbyphonia in your local area?**

- Medication
- Surgery
- Speech Therapy

***11. What is your most common goal for patients with presbyphonia?**

***12. Which three of the following components are critical to achieve that goal?**

- Easy Onset
- Education
- Vocal Hygiene Therapy
- Lee Silverman Voice Treatment
- Vocal Function Exercises
- Resonant Voice Therapy
- Accent Method
- Modified Stretch and Flow
- Pushing/Forceful voice
- Humming
- Pitch Glides
- Pitch Modification
- Relaxation
- Other (please specify)

***13. Which of the above do you find most effective (in most cases)?**

- Easy Onset
- Education
- Vocal Hygiene Therapy
- Lee Silverman Voice Treatment
- Vocal Function Exercises
- Resonant Voice Therapy
- Accent Method
- Modified Stretch and Flow
- Pushing/Forceful voice
- Humming
- Pitch Glides
- Pitch Modification
- Relaxation
- Other (please specify)

***14. Which of the following best describes the frequency of therapy visits for your patients with presbyphonia?**

- 1 X per month
- 2 X per month
- 1 X per week
- 2 X per week
- 3 or more times per week

***15. What is the average number of sessions you would expect for a patient with presbyphonia before discharge?**

- 1-2
 - 3-4
 - 5-6
 - 7-8
 - 9-10
 - 10-15
 - 15-20
 - >20
-

Research

*** 18. How often do you read the professional literature related to presbyphonia treatment?**

- Never
- Several times a year
- Once a month
- Once a week
- 2-3 times per week
- Daily

*** 19. How often do you read professional literature related to the field at large?**

- Never
- Several times a year
- Once a month
- Once a week
- 2-3 times per week
- Daily

*** 20. What are the top three sources where you first seek out information related to the treatment of presbyphonia?**

- Voice textbooks
- Research articles
- Colleagues
- Communication (e-mail, phone, etc) with experts in the field
- Continuing education courses
- Short courses (1/2 a day)
- Intensive workshops (2+ day courses)
- Additional college courses
- Instrumental training
- Internship/mentorship with another specialist

APPENDIX B



Office of Research Integrity
Institutional Review Board
401 11th St., Suite 1300
Huntington, WV 25701

FWA 00002704

IRB1 #00002205

IRB2 #00003206

January 19, 2012

Beverly Miller, M.S.
MU Communications Disorders Department

RE: IRBNet ID# 275390-1

At: Marshall University Institutional Review Board #2 (Social/Behavioral)

Dear Ms. Miller:

Protocol Title: [275390-1] Current Practices of Speech-Language Pathologists in Treating
Presbyphonia

Expiration Date: January 19, 2013

Site Location: MU

Submission Type: New Project APPROVED

Review Type: Exempt Review

In accordance with 45CFR46.101(b)(2), the above study and informed consent were granted Exempted approval today by the Marshall University Institutional Review Board #2 (Social/Behavioral) Designee for the period of 12 months. The approval will expire January 19, 2013. A continuing review request for this study must be submitted no later than 30 days prior to the expiration date.

This study is for student Erin Taylor Carey.

If you have any questions, please contact the Marshall University Institutional Review Board #2 (Social/Behavioral/Educational) Coordinator Michelle Woomer, B.A., M.S at (304) 696-4308 or woomer3@marshall.edu. Please include your study title and reference number in all correspondence with this office.

CURRICULUM VITAE

Erin Taylor Carey

Home:

736 Shivel Lane
Huntington, WV 25705
bellomy18@marshall.edu
304-617-9984

EDUCATION

M.S.: Communication Disorders, Marshall University, August 2012

B.S.: Communication Disorders, Marshall University, May 2010

H.S. Diploma: Huntington High School, Huntington, WV, June 2006

CONFERENCES PRESENTED

Conference Name: West Virginia Speech Language Hearing Association Conference

Description: State conference held in Flatwoods, West Virginia.

Name of Study: Current Practices of Speech-Language Pathologists in Treating Presbyphonia

Presentation Type: Poster Session

Conference Date: May 2012

Conference Name: American Speech Language Hearing Association Conference

Description: Nationwide conference held in Philadelphia, Pennsylvania.

Name of Study: Developing a Professional Identity: One Graduate Student's Experience

Presentation Type: Poster Session

Date: November 2011

Conference Name: West Virginia Speech Language Hearing Association Conference

Description: State conference held in Flatwoods, West Virginia.

Name of Study: Developing a Professional Identity: One Graduate Student's Experience

Presentation Type: Poster Session

Conference Date: May 2011

Conference Name: American Speech Language Hearing Association Conference

Description: Nationwide conference held in Philadelphia, Pennsylvania.

Name of Study: Do Vocal Function Exercises Improve the Voice of Elderly Men?

Presentation Type: Poster Session

Date: November 2010

Conference Name: American Speech Language Hearing Association Conference

Description: Nationwide conference held in Philadelphia, Pennsylvania.

Name of Study: Do Vocal Function Exercises Improve the Voice of Elderly Men?

Presentation Type: Poster Session

Date: November 2010

Conference Name: West Virginia Speech Language Hearing Association Conference

Description: State conference held in Charleston, West Virginia.

Name of Study: Do Vocal Function Exercises Improve the Voice of Elderly Men?

Presentation Type: Technical Session

Conference Date: May 2010

CONFERENCES ATTENDED

Conference Name: West Virginia AG Bell Conference

Description: State conference held in Morgantown, West Virginia.

Conference Date: November 2009