Voice Therapy

Clinical Case Studies

Fifth Edition

Voice Therapy

Clinical Case Studies

Fifth Edition

Joseph C. Stemple, PhD, CCC-SLP, ASHAF
Edie R. Hapner, PhD, CCC-SLP, ASHAF

Plural Publishing Inc.

PLURAL PUBLISHING
INC.

5521 Ruffin Road
San Diego, CA 92123

e-mail: information@pluralpublishing.com
Website: http://www.pluralpublishing.com

Typeset in 11/13 Palatino by Flanagan's Publishing Services, Inc.
Printed in the United States of America by McNaughton & Gunn, Inc.

Library of Congress Cataloging-in-Publication Data

Names: Stemple, Joseph C. | Hapner, Edie R.
Title: Voice therapy : clinical case studies / [edited by] Joseph C. Stemple, Edie R. Hapner.
Description: Fifth edition. | San Diego, CA : Plural Publishing, [2019] | Includes bibliographical references and index.
Identifiers: LCCN 2018028949 | ISBN 9781635500356 (alk. paper) | ISBN 1635500354 (alk. paper)
Subjects: | MESH: Voice Disorders—therapy | Case Reports
Classification: LCC RF510 | NLM WV 500 | DDC 616.85/56—dc23
LC record available at https://lccn.loc.gov/2018028949

Contents

Preface

This fifth edition of *Voice Therapy: Clinical Case Studies* marks the twenty-fifth anniversary of this text. Since the first edition, the purpose of this text has remained the same.

> *. . . to provide both the student and the working clinician with a broad sampling of management strategies as presented by master voice clinicians, laryngologists, and other voice care professionals. The text is meant to serve as a practical adjunct to the more didactic publications.*

As the knowledge of voice production continues to expand, so, too, have the publications dedicated to describing this knowledge. There are currently excellent texts and journals that report and explore the scientific understanding of voice. Other publications are available to help prepare students to evaluate and manage clinical voice disorders. By necessity, these texts must include great quantities of didactic information so that the student learns not only the "how" but the "why" of voice evaluation and treatment. To utilize a management approach without understanding the underlying basis of the approach is inappropriate. Nonetheless, because of the breadth of material necessary in these texts, therapeutic methods for voice disorders are often given only a cursory and generalized discussion. *Voice Therapy: Clinical Case Studies* is meant to fill that gap.

The fifth edition of this text includes 54 case studies and 7 case vignettes sampling a wide variety of voice disorders with various pathologies, etiologies, and therapy techniques. Through a systematic case study format, 64 voice experts and master clinicians have provided detailed descriptions of voice assessment and management approaches and techniques. It is our hope that the expertise offered in these pages will serve the reader well in guiding clinical voice practice.

Utilizing the format of actual case studies, complete descriptions of diagnostic and therapeutic methods and results are provided for a full array of voice disorders. Chapter 1 is an expanded discussion devoted to the principles of successful voice therapy. What makes therapy successful or unsuccessful? This chapter examines both the qualities and preparation of the voice therapist and the responsibilities and challenges of the patient, and describes the pitfalls that may influence the ultimate goal of our interventions, improved vocal function.

Chapter 2 comments on various voice evaluation protocols. These include the formal questionnaire, the patient interview, perceptual voice analysis, patient self-assessment, and instrumental assessment of voice production. The role of the evaluation process as a part of the overall management plan is also discussed.

Chapter 3 presents treatment approaches for the most common type of voice disorder, muscle tension dysphonia (MTD). Following an overview of MTD by Nelson Roy, management approaches

for both children and adults including hygiene programs, symptomatic modifications, attention to psychosocial issues, and direct physiologic manipulation and exercises are presented in illustrative case studies of both primary and secondary MTD.

Aaron Ziegler introduces Chapter 4, a discussion of treatments for various etiologies of glottal incompetence. Management for presbyphonia, vocal fold paralysis, sulcus vocalis, and voice fatigue are described, including direct voice therapies, surgical intervention, and a combination of these approaches. Many techniques including voice facilitating techniques, semi-occluded vocal tract, expiratory muscle strength training, and phonation resistance training are discussed.

Chapter 5 presents management strategies for laryngeal dystonia, essential tremor, and Parkinson's disease. Following an introduction of neurogenic voice disorders by Richard Andreatta, a series of cases will describe strategies for behavioral and medical management of spasmodic dysphonia, voice therapy for essential tremor, and treatment of voice and speech symptoms related to Parkinson's disease.

Because of the speech language pathologist's unique blend of knowledge regarding upper airway anatomy and physiology and behavioral therapy, we have become the caregivers for complex respiratory and laryngeal disorders. Chapter 6 provides several detailed case studies regarding the various etiologies, patient profiles, and evaluation and treatment approaches used with those diagnosed with irritable larynx syndrome and paradoxical vocal fold motion (PVFM). These cases include treatments for laryngopharyngeal reflux, laryngeal sensitivity triggers, and PVFM in the young child, young athlete, and elite athlete. The background for these cases are first introduced in excellent discussions by Linda Rammage (Irritable Larynx Syndrome) and Mary Sandage (Paradoxical Vocal Fold Motion).

The consequences of a voice disorder not only may impact the quality of life but may also threaten the livelihood of individuals dependent upon a healthy voice. Marina Gilman introduces Chapter 7, which presents case studies for those dependent upon their voices, such as the elite vocal performer, the occupational voice user, and those whose avocational voice use is related to their quality of life.

The final chapter, Chapter 8, is new to this text. Vrushali Angadi introduces the reader to a chapter dedicated to discussing nontraditional therapy delivery models and therapeutic challenges. Case studies describe the use of telemedicine in the delivery of voice therapy in a traveling performer, a child who lives in a rural area, and an individual with Parkinson's disease. Speech-language pathologists also treat individuals desiring to make their voices representative of their gender identity. Cases describing communication and voice modification in the transgender population are included. Because of the shared anatomy, voice and swallowing issues may co-occur in an individual. This chapter also includes an interesting case of "muscle tension dysphagia." Finally, glottal fry phonation has become somewhat of a social norm. In some cases, however, this recognized vocal register may create vocal difficulties as described by a case in which chronic and pervasive use of vocal fry appeared to be a primary component of a voice complaint.

As with the first four editions of *Voice Therapy: Clinical Case Studies*, the most exciting element in the preparation of this text was the support received by the voice experts and master clinicians who graciously and generously submitted case studies. The list of contributors is literally a "Who's Who" in the field of voice disorders. What a wonderful opportunity it is to learn from those who are in the trenches, those experts who embody not only superior clinical skills, but a wonderful insight as to why they do what they do. We are deeply indebted to all of them and proudly offer their collective expertise. We are certain that the reader will benefit from their vast clinical experiences.

Text preparations are extremely time-consuming and require many hours of tedious work. Checking and preparing references, organizing tables, figures, and their legends, reading and rereading in an attempt to make the intent clear to those we are trying to reach are only a few of the tasks involved. We were so very fortunate in the preparation of this text to have the invaluable editorial assistance of the Plural Publishing professionals. We are indebted to Angie Singh, Valerie Johns, and Kalie Koscielak for encouraging and supporting this fifth edition and to Linda Shapiro and Jessica Bristow on the production side of the text preparation. In addition, we wish to thank our students and colleagues who have suggested ways to improve the text with each new writing. Finally, as usual, we are most appreciative for the support of our families.

—Joseph C. Stemple &
Edie R. Hapner

Contributors

Richard D. Andreatta, PhD
Associate Professor
Department of Rehabilitation Sciences
Division of Communication Sciences and Disorders
University of Kentucky
Lexington, KY

Vrushali Angadi, PhD
Assistant Professor
Department of Rehabilitation Sciences
Division of Communication Sciences and Disorders
University of Kentucky
Lexington, KY

Susan Baker-Brehm, PhD
Professor & Chair
Department of Speech Pathology and Audiology
Miami University
Oxford, OH

Julie M. Barkmeier-Kraemer, PhD, ASHA-F
Professor
Department of Surgery
Division of Otolaryngology
University of Utah
Salt Lake City, UT

Alison Behrman, PhD
Assistant Professor
School of Health Sciences, Human Services, and Nursing
Department of Speech-Language-Hearing Sciences
Lehman College
City University of New York
New York, NY

Kristen Bond, MM, MS
Speech Language Pathologist
San Francisco Voice and Swallowing Center
San Francisco, CA

Maia Braden, MS
Speech-Language Pathologist
University of Wisconsin–Madison
Voice and Swallow Clinics
American Family Children's Hospital
Madison, WI

Starr Cookman, MA
Assistant Professor, Clinical Faculty
Voice and Speech Clinic
University of Connecticut Health Center
Farmington, CT

Mark S. Courey, MD
Professor, Otolaryngology–Head and Neck Surgery
Division Chief, Laryngology
Director, Grabscheid Voice and Swallowing Center
Mount Sinai Health System
New York, NY

Lyn Tindall Covert, PhD, ASHA-F
Speech-Language Pathologist
Department of Veterans Affairs Medical Center, Retired
Lexington, KY

Daniel Croake, PhD
Assistant Professor
Department of Rehabilitation Sciences
Division of Communication Sciences and Disorders
University of Kentucky
Lexington, KY

Ilter Denizoglu, MD
Phonosurgeon and Voice Pathologist
Clinical Vocology Unit
Medical Park Izmir Hospital
Izmir, Turkey

Kate DeVore, MA
Speech-Language Pathologist
Total Voice, Inc.
Chicago, IL

Maria Dietrich, PhD
Assistant Professor
Department of Communication Disorders
University of Missouri
Columbia, MO

Patricia B. Doyle, MA
Instructor
Voice and Speech Clinic
University of Connecticut Health Center
Farmington, CT

Eileen M. Finnegan, PhD
Associate Professor
Department of Communication Sciences and Disorders
University of Iowa
Iowa City, IA

Cynthia M. Fox, PhD, ASHA-F
Research Associate
National Center for Voice and Speech
University of Colorado–Boulder
Denver, CO

Lisa Fry, PhD
Adjunct Faculty, Department of Communication Disorders
Marshall University
Huntington, WV

Jackie Gartner-Schmidt, PhD, ASHA-F
Professor of Otolaryngology
Co-Director of the UPMC Voice Center
Director of Speech Pathology-Voice Division
University of Pittsburgh Medical Center
Pittsburgh, PA

Shirley Gherson, MA
Clinical Specialist–Voice Disorders
NYU Langone Medical Center
Rusk Rehabilitation
New York, NY

Amanda I. Gillespie, PhD
Assistant Professor
Co-Director
Emory Voice Center
Otolaryngology Head and Neck Surgery
Emory University
Atlanta, GA

Marina Gilman, MM, MA
Speech-Language Pathologist
Emory Voice Center
Otolaryngology Head & Neck Surgery
Emory University
Atlanta, GA

Laureano A. Giraldez-Rodriguez, MD
Director, The Voice and Swallowing Center of Puerto Rico
Assistant Professor
Section of Otolaryngology–Head and Neck Surgery
University of Puerto Rico School of Medicine
San Juan, Puerto Rico

Leslie E. Glaze, PhD, ASHA-F
Speech-Language Pathologist
Minneapolis, MN/Tucson, AZ

Stephen Gorman, PhD
Voice Pathologist
Blaine Block Institute for Voice Analysis and Rehabilitation
Dayton, OH,
Professional Voice Center of Greater Cincinnati, OH

Rebecca Lynne Hancock, MEd
Speech-Language Pathologist
Children's Healthcare of Atlanta
Atlanta, GA

Edie R. Hapner, PhD, ASHA-F
Professor, Caruso Department of Otolaryngology Head and Neck Surgery
Director of Speech-Language Pathology
USC Voice Center
Keck School of Medicine
Los Angeles, CA

Sara Harris, FRCSLT
Speech-Language Pathologist
Lewisham Hospital Voice Disorders Unit
London, United Kingdom

Leah Helou, PhD
Assistant Professor
Department of Communication Sciences and Disorders
University of Pittsburgh
Pittsburgh, PA

Rita Hersan, MS
Speech-Language Pathologist/Voice Clinician
University of Pittsburgh Voice Center
Pittsburgh, PA

Sandy Hirsch, MS
Speech-Language Pathologist
Give Voice
Seattle, WA

Henry N. Ho, MD, FACS
Director, Head and Neck Program
The Florida Hospital Cancer Institute
Orlando, FL

Bari Hoffman Ruddy, PhD, ASHA-F
Professor
Department of Communication Sciences and Disorders
University of Central Florida
Orlando, FL

Michael M. Johns, MD, FRCS
Professor
Caruso Department of Otolaryngology Head and Neck Surgery
Director of Laryngology
USC Voice Center
University of Southern California
Los Angeles, CA

Christina H. Kang, MM, MS
Speech-Language Pathologist
Department of Otolaryngology–Head and Neck Cancer
Mayo Clinic
Scottsdale, AZ

Lisa N. Kelchner, PhD, BCS-S, ASHA-F
Professor
Department of Communication Sciences and Disorders
University of Cincinnati
Cincinnati, OH

Wendy DeLeo LeBorgne, PhD
Voice Pathologist/Singing Voice Specialist/Clinical Director
The Blaine Block Institute of Voice Analysis and Rehabilitation
Provoice Center of Cincinnati College–Conservatory of Music
Dayton, OH/Cincinnati, OH

Jeffrey J. Lehman, MD, FACS
Clinical Professor
College of Health and Public Affairs
University of Central Florida
Medical Director
The Voice Care Center
Winter Park, FL

Claudio F. Milstein, PhD
Director, The Voice Center
Cleveland Clinic
Associate Professor of Otolaryngology
Cleveland Clinic Lerner College of Medicine
Cleveland, OH

Jennifer Muckala, MA
Speech-Language Pathologist
Vanderbilt Bill Wilkerson Center
University of Vanderbilt
Nashville, TN

Thomas Murry, PhD, ASHA-F
Professor, Department of Otolaryngology
Loma Linda University Medical Center
Loma Linda, CA

Chayadevie Nanjundeswaran, PhD
Assistant Professor
Dept. of Audiology and Speech-Language Pathology
East Tennessee State University
Johnson City, TN

Diana Orbelo, PhD
Speech-Language Pathologist
Department of Otorhinolaryngology
Mayo Clinic College of Medicine
Rochester, MN

Rita R. Patel, PhD
Assistant Professor
Department of Hearing and Speech Sciences
Indiana University
Bloomington, IN

Madeleine Pethan, MA
Speech-Language Pathologist
Levine Children's Hospital
Charlotte, NC

Brian E. Petty, MA, MA
Speech-Language Pathologist
Emory Voice Center
Department of Otolaryngology Head and Neck Surgery
Emory University
Atlanta, GA

Carissa Portone-Maira, MS
Speech-Language Pathologist
Emory Voice Center
Department of Otolaryngology Head and Neck Surgery
Emory University
Atlanta, GA

Lorraine A. Ramig, PhD, ASHA-F
Professor, University of Colorado–Boulder
Senior Scientist, National Center for Voice and Speech–Denver
Adjunct Professor, Columbia University
New York, NY

Linda Rammage, PhD, RSLP
Director
Provincial Voice Care Resource Program, UBC
Vancouver, BC, Canada

Clark A. Rosen, MD, FACS
Professor, Otolaryngology–Head and Neck Surgery
Chief, Division of Laryngology
UCSF Voice and Swallowing Center
University of California, San Francisco
San Francisco, CA

Nelson Roy, PhD, ASHA-F
Professor
Department of Communication Sciences and Disorders
Division of Otolaryngology Head and Neck Surgery
Department of Surgery, School of Medicine
University of Utah
Salt Lake City, UT

Brienne Ruel, MA
Speech-Language Pathologist
UW Voice and Swallow Clinics, Department of Surgery
Madison, WI

Mary J. Sandage, PhD
Associate Professor
Department of Communication Disorders
Auburn University
Auburn, AL

Christine Sapienza, PhD, ASHA-F
Dean, Brooks Rehabilitation College of Health Sciences
Professor, Communication Sciences and Disorders
Jacksonville University
Jacksonville, FL

Sarah L. Schneider, MS
Speech-Language Pathology Director
UCSF Voice and Swallowing Center
University of California San Francisco
San Francisco, CA

Erin Pearson Silverman, PhD
Research Assistant Professor
University of Florida
Gainesville, FL

JoAnna Sloggy, MA
Speech-Language Pathologist
University of Kentucky Voice and Swallow Clinic
Lexington, KY

Heather Starmer, MA
Assistant Professor
Director of the Head and Neck Cancer Speech and Swallowing Rehabilitation Center
Department of Otolaryngology Head and Neck Surgery
Stanford University
Stanford, CA

Joseph C. Stemple, PhD, ASHA-F
Professor, Communication Sciences and Disorders
College of Health Sciences
University of Kentucky
Lexington, KY

Lauren Timmons, MS
Speech-Language Pathologist
USC Voice Center
Caruso Department of Otolaryngology Head and Neck Surgery
Los Angeles, CA

Michael Towey, MA, ASHA-F
Manager, Department of Speech-Language Pathology
Voice and Swallowing Center of Maine
Waldo County General Hospital
Belfast, ME

Miriam van Mersbergen, PhD
Assistant Professor
School of Communication Sciences and Disorders
University of Memphis
Memphis, TN

Kittie Verdolini Abbott, PhD, ASHA-F
Professor, Communication Science and Disorders
University of Delaware
Newark, DE

Barbara Weinrich, PhD, ASHA-F
Professor Emerita
Department of Speech Pathology and Audiology
Miami University
Oxford, OH

Nicole Yee-Key, PhD
Assistant Professor
School of Communication Sciences and Disorders
McGill University
Montreal, QC, Canada

Aaron Ziegler, PhD
Assistant Professor
Oregon Health and Science University
Northwest Clinic for Voice and Swallowing
Portland, OR

1

Principles of Successful Voice Therapy

Joseph C. Stemple

Introduction

The profession of speech-language pathology began in 1925, with the birth of the American Academy of Speech Correction, the predecessor of the American Speech-Language-Hearing Association (ASHA). The first practitioners of speech correction were most interested in correcting articulation and treating fluency disorders. In the middle to late 1930s, two first-edition textbooks, *The Rehabilitation of Speech* by West, Kennedy, and Carr[1] and *Speech Correction Principles and Methods* by Van Riper,[2] began to discuss improving the quality of disordered voice. As many of the early speech correctionists had backgrounds in training the theater voice, elocution, and public speaking, many of the voice therapy techniques arose from these disciplines with a heavy emphasis on keeping the vocal instrument healthy, or vocal hygiene. The number of traditional therapy approaches that continue to be used in voice therapy today is a strong statement of appreciation and admiration for the voice pedagogues, clinicians, and speech scientists of earlier days. The accuracy of their practical observations regarding voice function has proved to be uncanny. The efficacy of many of these traditional voice therapy techniques is now being tested through systematic outcomes

research.[3] Proof of the usefulness of many of these techniques, however, has been well established by the clinical results of skilled speech-language pathologists (SLPs).

The major difference in voice therapy today compared with even 20 to 30 years ago is the ability to diagnose vocal function quickly and accurately and to confirm the efficacy of our management approaches through a multimodal assessment approach. As you will read in the case studies in this text, voice evaluation and treatment are interdisciplinary with speech-language pathologists and laryngologists often practicing side-by-side in patient care. The recommended evaluation process comprises five domains of voice assessment, patient self-report, audioperceptual evaluation, acoustic analysis, aerodynamic measures, and visual imaging of vocal fold function.[4] These objective measures may also be used as patient feedback during the therapeutic process. Although our management approaches have evolved over the years, voice therapy remains a blend of science and art.

Scientific Nature of Voice Care

The scientific nature of voice therapy involves the clinician's knowledge of several important areas of study. These areas include the anatomy and physiology of normal and disordered voice production; the nuances of laryngeal pathologic conditions; the acoustics and aerodynamics of voice production; and the etiologic correlates of voice disorders, including patient behaviors, medical causes, and psychological contributions. Regarding the scientific nature of voice care we may state:

- When considering the voice, we are considering the most widely used instrument on earth.
- To understand the voice disorder, we must understand the instrument's physical structure, functional components, and the interactions of the voice subsystems, respiration, phonation, and resonance.
- To fully evaluate the voice, we must possess a broad knowledge of the common causes of voice disorders and the nuances of laryngeal pathologic conditions.
- To document the voice, we must have the skills to measure these components objectively and to relate these measures to our management choices.

Artistic Nature of Voice Care

The artistic nature of voice therapy is dependent on the human interaction skills of the clinician as related to the desires and needs of the patient. Compassion, understanding, empathy, and projection of credibility, together with listening, counseling, and motivational skills are essential attributes of the successful voice clinician. Philosophically, we might make these statements about the artistic nature of voice:

- When considering the voice, we must consider the whole person.
- To examine a voice disorder is to examine a unique individual.
- The feelings of that individual, both physical and emotional, may be directly reflected in the voice.
- To remediate a voice disorder, we must have the skills to counsel and motivate the patient and empower readiness for change.

The successful voice clinician will combine attributes of the artistic approaches of voice therapy with the objective scientific bases to identify the problem and then plan and carry out appropriate management strategies. Possession of a solid base of didactic information related to evaluation and treatment augments practical experience. However, experience continues to teach even the master clinician. It is hoped that the experiences of others provided in this text will prove helpful in the development of superior voice clinicians.

How to Use This Text

In this fifth edition of *Voice Therapy: Clinical Case Studies,* over 60 master voice clinicians and voice experts share 54 complete case studies and 7 case vignettes that involve detailed background, history, and evaluation and management approaches for a wide variety of voice and upper airway disorders. These management approaches include a variety of voice therapy techniques from all orientations of voice therapy, including vocal hygiene therapy, symptomatic approach to voice therapy, psychogenic voice therapy, and physiologic orientation to voice therapy. The disorders include those classified as muscle tension dysphonia, disorders caused by glottal incompetence, neurogenic voice problems, voice disorders caused by an irritable larynx and other upper airway problems, and disorders specific to professional voice users. New to this edition is a final chapter that discusses treatment for nontraditional voice challenges as well as nontraditional service delivery models.

This text is meant for the novice clinician who seeks an understanding of the types of patients seen in a voice clinic and the decisions made by master clinicians in their care. The text is also meant for the seasoned clinician searching for additional treatment suggestions. Readers may search the textbook by type of disorder and/or type of treatment chosen to modify that disorder. We have stressed that cases should include the thought processes of the clinicians as they plan evidence-based treatments supported by evaluation data as well as detailed explanations of the specific management plans. *A word of caution . . .* This text is not meant to be a voice therapy cookbook. The authors stress that we do not treat disorders, rather we address the voice needs of our patients through systematic evaluation and treatment planning that will address those needs. Each patient is an individual with a unique problem associated with voice production. Successful voice therapy requires that we honor the individual and seek to understand that uniqueness.

Historical Perspective

In examining the evolution of the treatment of voice disorders, we find it was not until around 1930 that a few laryngologists, singing teachers, instructors in the speech arts, and a fledgling group of speech correctionists became interested in retraining individuals with voice disorders. This group used drills and exercises borrowed from voice and diction manuals designed for the normal voice in an attempt to modify disordered voice production. Many of these rehabilitation techniques were and

remain creative and effective, but they were not necessarily based on scientific principles as realized today. Indeed, the "artistic" portion of voice treatment was the strong point of the early clinicians.

Out of this artistic approach came the general treatment suggestions of (1) ear training, (2) breathing exercises, (3) relaxation training, (4) articulatory compensations, (5) emotional retraining, and (6) special drills for cleft palate and velopharyngeal insufficiency.[1,2] These treatment suggestions became the foundation of vocal rehabilitation.

Several general management philosophies have arisen from the early foundations of voice rehabilitation. These philosophical orientations are based primarily on the clinician's mindset and previous training regarding voice disorders that directs the management focus. For the sake of discussion, we classify these management philosophies as:

- hygienic voice therapy
- symptomatic voice therapy
- psychogenic voice therapy
- physiologic voice therapy
- eclectic voice therapy

In short, *hygienic voice therapy* focuses on identifying inappropriate vocal hygiene behaviors, which then are modified or eliminated. Once modified, voice production has the opportunity to improve or return to normal. *Symptomatic voice therapy* focuses on modification of the deviant vocal symptoms identified by the SLP, such as breathiness, low pitch, glottal attacks, and so on. The focus of *psychogenic voice therapy* is on the emotional and psychosocial status of the patient that led to and maintains the voice disorder. The *physiologic orientation* of voice therapy focuses on directly modifying and improving the balance of laryngeal muscle effort to the supportive airflow, as well as the correct focus of the laryngeal tone. Finally, the *eclectic approach* of voice therapy is the combination of any and all of the previous voice therapy orientations.[5]

Indeed, none of these philosophical orientations is pure. Much overlap is present, most often leading to the use of an eclectic approach. With this introduction, let us examine the orientations of voice therapy in greater detail.

Hygienic Voice Therapy

Hygienic voice therapy often is the first step in many voice therapy programs. Many etiological factors contribute to the development of voice disorders. Poor vocal hygiene may be a major developmental factor. Some examples of behaviors that constitute poor vocal hygiene include shouting, screaming, vocal noises, chronic coughing, chronic throat clearing, smoking, and poor hydration. When the inappropriate vocal behaviors are identified, then appropriate treatments can be devised for modifying or eliminating them. Once modified, voice production has the opportunity to improve or return to normal.

Poor vocal hygiene may also include the habitual use of inappropriate pitch or loudness, reduced respiratory support, poor phonatory habits such as glottal attacks, or inappropriate resonance. Functional inappropriate use of these voice components may contribute to the development and maintenance of a voice disorder. Hygienic voice therapy presumes that many voice disorders have a direct behavioral cause. This therapy strives to instill healthy vocal behaviors in the patient's habitual speech/voice patterns. Good vocal hygiene also focuses on maintaining the

health of the vocal fold cover through adequate internal and surface hydration and diet. Once identified, poor vocal hygiene habits can be modified or eliminated leading to improved voice production.

Symptomatic Voice Therapy

Symptomatic voice therapy was a term first introduced by Daniel Boone.[6] This voice management approach is based on the premise that modifying the symptoms of voice production including pitch, loudness, breathing, laryngeal tension, and so on will improve the voice disorder. Once identified, the misuses of these various voice components are modified or reduced using voice therapy facilitating techniques:

> *In the voice clinician's attempt to aid the patient in finding and using his best voice production, it is necessary to probe continually within the patient's existing repertoire to find the best one voice which sounds "good" and which he is able to produce with relatively little effort. A voice therapy facilitating technique is that technique which, when used by a particular patient, enables him easily to produce a good voice. Once discovered, the facilitating technique and resulting phonation become the symptomatic focus of voice therapy. . . . This use of a facilitating technique to produce a good phonation is the core of what we do in symptomatic voice therapy for the reduction of hyperfunctional voice disorders.*[6(p11)]

Boone's original facilitating techniques included:

1. altering tongue position
2. change of loudness
3. chewing exercises
4. digital manipulation
5. ear training
6. elimination of abuses
7. elimination of hard glottal attack
8. establishing new pitch
9. explanation of the problem
10. feedback
11. hierarchy analysis
12. negative practice
13. open mouth exercises
14. pitch inflections
15. pushing approach
16. relaxation
17. respiration training
18. target voice models
19. voice rest
20. yawn-sigh approach

Many if not all of these facilitators remain useful and popular in the treatment of voice disorders and are described in greater detail in cases throughout this text.

The main focus of symptomatic voice therapy is direct modification of vocal symptoms. For example, if the patient presents with a voice quality characterized by low pitch, breathiness, and hard glottal attacks, then the main focus of therapy is to directly modify the symptoms. The facilitating approaches used to modify these symptoms might include explanation of the problem, ear training, elimination of hard glottal attack, and respiration training. The SLP constantly probes for the "best" voice and attempts to stabilize that voice with the various appropriate facilitating techniques. Symptomatic voice therapy assumes voice improvement through direct symptom modification.

Psychogenic Voice Therapy

Early in the study of voice disorders, the relationship of emotions to voice production was well recognized. As

early as the mid-1800s, journal articles discussed hysteric aphonia.[7,8] West, Kennedy, and Carr[1] and Van Riper[2] discussed the need for emotional retraining in voice therapy. Murphy[9] presented an excellent discussion of the psychodynamics of voice. Friedrich Brodnitz,[10] as an otolaryngologist, was one of the early physicians who was uniquely sensitive to the relationship of emotions to voice. These early readings are most interesting and remain informative to those treating voice disorders.

Our understanding of psychogenic voice therapy was further expanded by Aronson,[11] Case,[12] Stemple,[13] and Colton and Casper.[14] These authors discussed the need for determining the emotional dynamics of the voice disturbance. Psychogenic voice therapy focuses on identification and modification of the emotional and psychosocial factors associated with the onset and maintenance of the voice problem. Psychogenic voice therapy is based on the assumption of persistent underlying emotional causes for the voice disorder. Voice clinicians, therefore, must develop and possess superior interview skills, counseling skills, and the skill to know when the treatment for the emotional or psychosocial problem is beyond the realm of their skills. A referral system of support professionals must be readily available.

Physiologic Voice Therapy

Physiologic voice therapy includes voice therapy programs that have been devised to directly alter or modify the physiology of the voice producing mechanisms. Normal voice production is dependent on a relative balance among airflow, supplied by the respiratory system; phonation, dependent upon laryngeal muscle balance, coordination, and stamina; and coordination among these and the supraglottic resonators (pharynx, oral cavity, nasal cavity). Any disturbance in the physiologic balance of these vocal subsystems may lead to a voice disturbance.[5]

These disturbances may be in respiratory support, volume, power, pressure, and flow. Disturbances also may manifest in vocal fold tone, mass, stiffness, flexibility, and approximation. Finally, the coupling of the supraglottic resonators and the placement of the laryngeal tone may cause or may be perceived as a voice disorder. The overall causes may be mechanical, neurogenic, or psychological. Whatever the cause, the management approach is direct modification of the inappropriate physiologic activity through exercise and manipulation of the voice subsystems.

Inherent in physiologic voice therapy is a holistic approach to the treatment of voice disorders. They are therapies that strive to at once balance the three subsystems of voice production as opposed to working directly on single voice components, such as pitch or loudness. Examples of physiologic voice therapy approaches include Vocal Function Exercises,[15] Resonant Voice Therapy,[16,17] the Accent Method of Voice Therapy,[18] Manual Techniques,[19,20] and Lax Vox Therapy,[21] all of which are presented in this text.

Eclectic Voice Therapy

Adherence to one philosophical orientation of voice therapy would not be advisable. Indeed, successful voice therapy depends on utilization of an approach that happens to work for the

therapist and the individual patient. The more management approaches understood and mastered by the clinician, the greater the likelihood for success. Since we are treating the individual and not the disorder, management techniques that prove successful for one patient may not be successful for a similar patient. The successful voice clinician, therefore, must possess the knowledge and skills to adjust the management approach to fit the needs of the patient.

On the other hand, some techniques that work well for one clinician may prove to be difficult or challenging for another. In whatever management approach you choose, you must have supreme confidence in your understanding of the technique and your ability to make that approach work successfully. Your confidence is one factor that will determine the success or failure of therapy. Using a typical case, let us examine how each therapy orientation might be used to treat the vocal difficulties of this composite patient.

Case Study 1.1

Joseph C. Stemple

Case History

Patient A, a 52-year-old woman, was referred by her laryngologist to the voice center for postsurgical evaluation and treatment. Large bilateral draping polyps (severe Reinke's edema) were first identified by an anesthesiologist while intubating the patient for a laminectomy 6 months prior to her voice evaluation. Because of the large polyps, intubation had been difficult. The problem was reported to her family physician, who in turn referred the patient to an otolaryngologist for a laryngeal examination.

Indirect mirror examination revealed bilateral polypoid degeneration, worse on the left than the right. Audible inspiratory stridor was noted by the physician, and the patient reported shortness of breath during even limited physical exertion. Therefore, two KTP (potassium-titanyl-phosphate) laser surgeries were conducted 2 weeks apart followed by 7 days voice rest for each surgery. Surgeries were performed without complication, and the patient was seen for voice evaluation following appropriate healing.

History of the Problem. The patient reported that she had always had a "deep" voice, which had lowered even more over the past several years. Her presurgical voice quality had not been a concern to her, however. Instead, it was the shortness of breath that led her to agree to surgery. She reported that voice quality following the first surgery (left fold) was a little "hazy" but returned to "normal" within 1 week. The second surgery left her with significant, bothersome dysphonia that made her "wish I had never had surgery."

Medical History. The patient reported undergoing two previous surgeries: removal of her gall bladder 10 years earlier and the laminectomy performed earlier this year. Even with the difficult intubation and the risk of vocal fold paralysis inherent in laminectomy, her presurgical voice quality was maintained. In addition to surgeries, she had been hospitalized 3 years before for 3 weeks and treated for chronic depression.

Chronic medical disorders included frequent upper respiratory infections

including bronchitis, high blood pressure, circulatory problems in her legs, elevated blood sugar, and chronic neck and back pain. Daily medications were taken for blood pressure, chronic pain, depression, and sleep. She continued a 30-year history of smoking one-and-a-half to two packs of cigarettes per day. Her liquid intake consisted mostly of six cups of caffeinated coffee per day. Chronic throat clearing and a persistent cough were noted throughout the evaluation.

Social History. Patient A had been married for 12 years to her second husband, following a first marriage of 18 years and divorce. She had two adult children from her previous marriage. Her elderly mother-in-law lived with her and her husband, a situation that often caused friction and conflict with her husband. Indeed, she was not shy in reporting her unhappiness with her marital relationship. This unhappiness was said to be a major factor in her history of depression.

Both the patient and her husband were employed by the local automobile assembly plant. She had worked as an assembler for 14 years in an environment described as "noisy, dusty, and full of fumes" and was on a temporary medical disability because her back problems precluded her working in the plant. Present activities included shopping with her daughter, talking on the telephone, caring for her home, watching daytime television "talk" shows, and bowling two nights per week in two different leagues (back permitting).

Voice Evaluation

Audio-Perceptual Examination. Perceptually, the patient's voice quality as scored on the CAPE-V[22] was moderately dysphonic, characterized by low pitch, inappropriate loudness, roughness, and intermittent glottal fry phonation.

Acoustic Analysis and Aerodynamic Measures. These instrumental assessments revealed a low fundamental frequency (150 Hz), limited frequency range (118–290 Hz), increased habitual intensity (76 dB0), normal airflow volume (2300 mL H_2O), reduced airflow rate (<80 mL H_2O/sec), and reduced maximum phonation time (<12 sec).

Laryngeal Imaging. Laryngeal videostroboscopic observation revealed mild-to-moderate bilateral true vocal fold edema and erythema. Glottic closure demonstrated an irregular glottal chink with a moderate ventricular fold compression. The edges of the vocal folds were rough and irregular, worse on the left than on the right. The amplitude of vibration was severely decreased bilaterally. The mucosal waves were barely perceptible. The closed phase of the vibratory cycle was strongly dominant, whereas the symmetry of vibration was generally irregular. No mass lesions, paresis, or paralysis was evident. In short, the patient had an edematous, stiff, hyperfunctioning vocal fold system.

Impressions

Patient A presented with a voice disorder that derived from the following possible causal factors:

- cigarette smoking
- harsh employment environment
- talking over noise at work
- large caffeine intake
- frequent upper respiratory infections
- prescription medications
- coughing and throat clearing
- emotional instability

- talking too loudly (suggesting possible hearing loss, which later proved not to be present)
- using a low pitch
- laryngeal muscle tension
- postsurgical vocal fold mucosal changes

Recommendations per Voice Therapy Orientation

The following are recommendations for voice therapy if one were to adhere to a single orientation of voice therapy. The folly of this approach is readily evident.

Hygienic Voice Therapy. The general focus would be to identify the primary and secondary vocal misuses and then to modify or eliminate these nonhygienic behaviors. The primary etiologic correlates include:

- smoking
- laryngeal dehydration from caffeine and prescription medications
- voice abuse, such as coughing, throat clearing, and talking loudly over noise at work

Therapy would focus on modification or elimination of the perceived primary causes. The patient would be aided in her attempt to stop smoking, encouraged to begin a hydration program, and given vocal hygiene counseling to aid in elimination or reduction of the vocally traumatic behaviors.

Symptomatic Voice Therapy. General focus would use facilitating techniques to:

- raise pitch
- reduce loudness
- reduce laryngeal area tension and effort

Psychogenic Voice Therapy. General focus would explore the psychodynamics of the voice disorder. Techniques would include:

- detailed interview with the patient to determine the cause and effects of depression
- determination of the relationship of emotional problems and voice problem
- counseling the patient regarding the effects of emotions on voice production
- reduction of the musculoskeletal tension with the use of laryngeal manipulation/laryngeal massage
- referral for marital counseling as deemed appropriate

Physiologic Voice Therapy. The general focus would be to evaluate the present physiologic condition of the patient's voice production and develop direct therapeutic exercises to improve that condition. We know that the patient presented with extreme laryngeal tension. Irregular vocal fold edges caused a glottal chink. In addition, her vocal folds were extremely stiff, as demonstrated by the amplitude of vibration and mucosal wave.

Normal voicing is dependent on near total closure of the vocal folds, permitting air pressure to build below the folds. As the pressure builds, it eventually overcomes the resistance of the approximated folds, permitting the release of one puff of air. As the air rushes between the vocal folds, subglottal, supraglottal, and intraglottal pressures, along with the static position of the vocal folds, draw them back together to complete one vibratory cycle.[23] Air gaps, or glottal chinks, change the physical dynamics of vocal

fold vibration, requiring an increased subglottic pressure. Patients such as this woman often make physical compensations in an attempt to push out the "best" voice by hyperfunctioning the supraglottic structures. Add vocal fold muscular and mucosal stiffness to this mix and the patient presents with a significant muscle tension dysphonia with associated respiratory, laryngeal, and resonance dysfunctions.

Direct physiologic voice therapy would focus on therapeutic exercises designed to rebalance the three subsystems of voice production: respiration, phonation, and resonance. Therapy methods chosen to accomplish this task might include Vocal Function Exercises, Resonant Voice Therapy, or the Accent Method of Voice Therapy, among others. (All methods are described in subsequent chapters.)

Eclectic Voice Therapy. In this review of philosophical orientations of voice therapy, you have seen the various strengths of each management orientation, as well as the difficulty in subscribing to any one philosophy. All patients will be treated best by a speech language pathologist with knowledge and understanding of all possible management strategies and alternatives. As you read and study the many case presentations of this text, it is beneficial to evaluate the philosophy behind the treatment approach as a means of better understanding the reasons for the selected approach. The successful SLP is both an artist and a scientist with an eclectic point of view. Consequently, therapy for Patient A should focus on:

- vocal hygiene counseling
- symptom modification as required
- attention to the psychodynamics of the problem
- direct physiologic vocal exercise

Voice Care Team

Thus far we have discussed the treatment of voice disorders in terms of voice therapy. Voice care, however, is a shared province, with contributions from the primary care physician, laryngologist, SLP, neurologist, allergist, gastroenterologist, pulmonologist, psychologist, vocal coach, singing instructor, and others. In addition to these professionals, the patient also carries great responsibility in the improvement of her/his voice. In fact, we would suggest that both clinician and patient share equally in the success or failure of voice therapy as described below.

Issues Related to Successful Voice Therapy

The chapters of this text focus on the successful management of a wide range of voice disorders by clinical, medical, and surgical methods. Each contributor demonstrates techniques and approaches that prove successful in improving voice quality of patients with various laryngeal disorders. These successful cases, however, may set an unrealistically high standard for the beginning voice clinician and may not adequately reflect the many management pitfalls that are encountered even by experienced voice clinicians. Such pitfalls may lead to delayed success in treatment, less than totally successful