

# Treatment of Voice Disorders

*Second Edition*



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**Robert Thayer Sataloff, MD, DMA**





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# Contents

Foreword by Raymond D. Kent, PhD	ix
Preface	xi
Acknowledgments to the Second Edition	xiii
About the Author	xv
Contributors	xix
Dedication	xxiii
Chapter 1    Voice Care Professionals: A Guide to Voice Care Providers <i>Robert Thayer Sataloff, Yolanda D. Heman-Ackah, and Mary J. Hawkshaw</i>	1
Chapter 2    Introduction to Treating Voice Abuse <i>Robert Thayer Sataloff</i>	7
Chapter 3    Speech-Language Pathology and the Professional Voice User: An Overview <i>Carol N. Wilder</i>	11
Chapter 4    Voice Therapy <i>Bridget Rose, Michelle Horman, and Robert Thayer Sataloff</i>	15
Chapter 5    Voice Rest <i>Adam D. Rubin, Robert Thayer Sataloff, Susan E. Cline, Jean Skeffington, and Karen M. Lyons</i>	39
Chapter 6    Increasing Vocal Effectiveness <i>Bonnie N. Raphael and Robert Thayer Sataloff</i>	45
Chapter 7    The Singing Teacher in the Age of Voice Science <i>Richard Miller</i>	57
Chapter 8    Historical Overview of Voice Pedagogy <i>Richard Miller</i>	61
Chapter 9    The Singing Voice Specialist <i>Margaret M. Baroody, Robert Thayer Sataloff, and Linda M. Carroll</i>	75
Chapter 10    Use of Instrumentation in the Singing Studio <i>Robert Thayer Sataloff</i>	95
Chapter 11    Choral Pedagogy and Vocal Health <i>Brenda J. Smith and Robert Thayer Sataloff</i>	99
Chapter 12    Amateur and Professional Child Singers: Pedagogy and Related Issues <i>Valerie L. Trollinger and Robert Thayer Sataloff</i>	107
Chapter 13    The Role of the Acting-Voice Trainer in Medical Care of Professional Voice Users <i>Sharon L. Freed, Bonnie N. Raphael, and Robert Thayer Sataloff</i>	121

Chapter 14	Laryngeal Manipulation <i>John S. Rubin, Jacob Lieberman, and Tom M. Harris</i>	131
Chapter 15	The Effects of Posture on Voice <i>John S. Rubin, Ed Blake, Lesley Mathieson, and Hala Kanona</i>	153
Chapter 16	Nutrition and the Professional Voice <i>Jennifer A. Nasser and Nyree Dardarian</i>	163
Chapter 17	Medications and the Voice <i>Robert Thayer Sataloff, Mary J. Hawkshaw, Joseph Anticaglia, Michelle White, Kirsten Meenan, and Jonathan J. Romak</i>	185
Chapter 18	Psychiatric Manifestations of Medications Prescribed Commonly in Otolaryngology <i>Steven H. Levy, Mona M. Abaza, Mary J. Hawkshaw, Robert Thayer Sataloff, and Reinhardt J. Heuer</i>	215
Chapter 19	Botulinum Toxin in Otolaryngology <i>Julia A. Pfaff, Michael C. Neuenschwander, Edmund A. Pribitkin, and Robert Thayer Sataloff</i>	219
Chapter 20	Voice Surgery <i>Robert Thayer Sataloff</i>	233
Chapter 21	Vocal Fold Hemorrhage <i>Robert Thayer Sataloff and Mary J. Hawkshaw</i>	341
Chapter 22	Vocal Fold Scar <i>Jaime Eaglin Moore and Robert Thayer Sataloff</i>	359
Chapter 23	Laryngotracheal Trauma <i>Yolanda D. Heman-Ackah and Robert Thayer Sataloff</i>	365
Chapter 24	Cricoarytenoid and Cricothyroid Joint Injury: Evaluation and Treatment <i>Robert Thayer Sataloff</i>	383
Chapter 25	Management of Gender Reassignment Patients <i>Reinhardt J. Heuer, Margaret M. Baroody, and Robert Thayer Sataloff</i>	395
Chapter 26	Premalignant Lesions of the Larynx <i>Amanda Hu, Carole M. Dean, and Robert Thayer Sataloff</i>	405
Chapter 27	Laryngeal Cancer <i>Timothy D. Anderson and Robert Thayer Sataloff</i>	421
Chapter 28	Nursing Considerations in the Care of the Professional Voice <i>Mary J. Hawkshaw and Robert Thayer Sataloff</i>	443
Chapter 29	Controversy in the Care of Singers and Professional Voice Users <i>Clark A. Rosen and Kimberly M. Steinhauer</i>	447
Chapter 30	Voice Horizons <i>John S. Rubin and Robert Thayer Sataloff</i>	455
Appendix I	A. Patient History: Singers	469
	B. Patient History: Professional Voice Users	477
Appendix II	Checklist of Vocal Abuse for Teachers	485

Appendix III	A. Outline for Daily Practice	487
	B. Sample Phrases	489
	C. Frontal Placement Words	492
	D. H/Vowel Minimal-Pairs	493
	E. Vowel-Initiated Words	494
	F. Phrases for Blending	495
	G. Phrases to Practice Easy Onset and Blending	496
	H. Homographs	497
	I. Open-Vowel Words	498
Appendix IV	A. Sample Laryngologist's Report	499
	B. Stroboscovideolaryngoscopy Report	501
	C. Objective Voice Analysis and Laryngeal Electromyography	505
	D. Speech-Language Pathologist's Report	515
	E. Singing Voice Specialist's Report	519
	F. Acting Voice Specialist's Report	521
	Glossary	523
	Index	543





## Foreword

Robert T. Sataloff's *Treatment of Voice Disorders* covers its subject with exceptional breadth and clarity. This book, consisting of 30 chapters, is the essential compendium of information on treating voice disorders. As suggested in the opening chapter ("Voice Care Professionals"), the contemporary treatment of voice disorders draws on interdisciplinary expertise, and the book is true to that perspective. The team approach to voice treatment is realized through the contributions of laryngologists, speech-language pathologists, singing voice specialists, nurses, physiotherapists, acting voice trainers, and others. The reader will find discussion of various treatment procedures, including surgical, pharmacological, and behavioral. It should be emphasized that this volume presents essential information that allows for the effective interaction of various specialties. For example, behavioral specialists

can draw on the excellent information that is given on surgery, trauma and injury, and medications. This book is at once a template for team-based treatment and a deep informational resource for treatment alternatives. Its scope and depth make it a book that the voice specialist will want to keep close at hand.

This impressive book draws on Dr. Sataloff's substantial experience as a clinician, researcher, and scholar. He has ably recruited a cadre of related professionals to achieve an interdisciplinary view that is unified and collective, overcoming the risk of fragmentation that often characterizes interdisciplinary efforts. The information is current, and it is presented lucidly yet concisely. Surely, *Treatment of Voice Disorders* is an essential volume for anyone concerned with voice disorders. It is a landmark publication in the field of voice.

—Raymond D. Kent, PhD  
Madison, Wisconsin, 2016



# Preface

*Treatment of Voice Disorders* is part of a three-book student edition of selected chapters from the fourth edition of *Professional Voice: The Science and Art of Clinical Care*. That compendium fills over 2000 pages, including 120 chapters and numerous appendices, and it is not practical for routine use by students. However, *Professional Voice* was intended to be valuable to not only laryngologists, but also to speech-language pathologists, voice teachers, performers, students, and anyone else interested in the human voice. *Treatment of Voice Disorders* and the other volumes of the student editions were prepared to make relevant information available to students in a convenient and affordable form, suitable for classroom use as well as for reference.

**Chapter 1** introduces the many professionals who may be involved in voice care and explains their roles. **Chapter 2** introduces the basic concepts of treating voice abuse. In **Chapter 3**, the late Carol Wilder provides still-current, classic perspective on the role of the speech-language pathologist in caring for professional voice users. **Chapter 4** is a comprehensive chapter on voice therapy directed primarily at management of professional voice users. The chapter has been rewritten extensively to include substantially more detail regarding specific therapeutic techniques that were not included in the previous editions, highlighting our current practices. **Chapter 5** discusses what little is known about voice rest and concepts of management following vocal fold trauma or surgery. The chapter has been revised to include additional information published on this controversial topic since the last edition. **Chapter 6** provides guidelines on effective vocal presentation (speaking), which may be useful for patients as well as for students and teachers. **Chapter 7**, *The Singing Teacher in the Age of Voice Science*, is a classic chapter by the late Richard Miller that was retained unchanged, as was his chapter, **Chapter (8)** which presents an invaluable historical overview of voice pedagogy. This information is useful not only useful for singers, but also for laryngologists and speech-language pathologists who may need to understand the basis and thinking of various schools of voice training through which patients may have been

influenced by their teachers. **Chapter 9** on the singing voice specialist includes techniques for management of the singing voice and for using singing techniques to help nonsingers. This chapter has been rewritten extensively to include the most current techniques for management of the singing voice, for using singing techniques to help nonsingers, and to reflect our latest beliefs and practices, as well as the most recent information from the evolving literature in this field. **Chapter 10**, *The Use of Instrumentation in the Singing Studio*, was added to clarify how technology can help train singers. **Chapter 11**, *Choral Pedagogy*, introduces the complex topic of choral singing and includes not only revisions of the previous chapter, but also new material on choral pedagogy for geriatric singers. **Chapter 12** is a new chapter on pedagogy for children that provides insights into the training and approaches to teaching voice in primary and secondary schools. **Chapter 13**, defines the role of the acting voice training in medical management of the professional voice user. **Chapter 14** on laryngeal manipulation was written by an osteopathic physician and two laryngologists. This topic was added because of their unusual experience and success, and because laryngeal manipulation has been used for decades by voice therapists and for centuries by singing teachers. This chapter is intended to provide an introductory medical perspective on the subject. **Chapter 15** reviews important information on postural analysis, a subject more familiar to other medical specialties (such as physiatry) than to otolaryngology, speech pathology or voice pedagogy. **Chapter 16** on nutrition has been largely rewritten and includes important recent changes in criteria and strategy, reflecting developments in nutritional science over the last decade. **Chapter 17** reviews common medications and their effects on the voice. **Chapter 18** reviews the psychiatric manifestations of medicines that we prescribe commonly. Most of us do not think about these issues routinely; but we need to be aware of them especially in voice professionals in whom such complications might lead to performance disasters.

**Chapter 19** discusses the use of botulinum toxin in detail. **Chapter 20** provides an extensive review of voice surgery. This chapter is important not only for

surgeons, but also for speech-language pathologists and other voice professionals. All voice care professionals are prepared better to work with a patient who has undergone surgery if they understand the nature of the individual procedures. It includes a great deal of surgical information and illustrations not included in previous editions. Topics covered in depth include, among others, patient selection, informed consent, approaches to anesthesia, selection of instrumentation, indirect laryngoscopic approaches, direct laryngoscopy, laryngeal framework surgery, and other subjects. The chapter is replete with details and “how I do it” suggestions. There are new sections on supraglottoplasty, subglottic stenosis, vocal fold injection, removal of Radiesse, false vocal fold medialization, mini-thyrotomy, viscosity of injectable materials, fascia injection, and other topics. Vocal fold scar is one of the most common challenging problems following vocal fold surgery or phonotruma, and this topic is reviewed in **Chapter 22** which has been updated. **Chapter 21** on vocal fold hemorrhage has been updated with the most current references. **Chapters 23 and 24** provide detailed information on evaluation and treatment of trauma to the lungs, trachea, and laryngeal joints. Both have been updated and expanded. **Chapter 25** reviews therapeutic and surgical aspects of treating transgender/

transsexual patients. It covers the voice therapeutic, behavioral (not psychological), and laryngeal surgical approaches through which we may assist gender reassignment patients. **Chapter 26** on premalignant lesions of the larynx has been rewritten and includes additional information on cosmetic procedures and their implications for voice professionals. **Chapter 27** on laryngeal cancer has been revised to include the most current management approaches, some of which have become popular since the last edition of this book was written. Chapter 28 describes nursing considerations in the management of voice patients. **Chapters 29 and 30** describe controversies in the management of professional voice users and speculate about future developments in and understanding of diagnosis and provides perspective on near-future horizons in laryngology and voice research.

Every effort has been made to maintain style and continuity throughout the book. Although the interdisciplinary expertise of numerous authors has been invaluable in the preparation of this text, contributions have been edited carefully where necessary to maintain consistency of linguistic style and complexity; and I have written or co-authored 22 of the 30 chapters. All of us who have been involved with the preparation of this book hope that readers will find it not only informative but also enjoyable to read.

—Robert T. Sataloff, MD, DMA

## Acknowledgments to the Second Edition

I remain indebted to the many friends and colleagues acknowledged in the first edition of this book. As always, special thoughts and thanks go to the late Wilbur James Gould whose vision and gentle leadership formed the foundation on which so many of us have continued to build, and to the late Hans von Leden.

I am especially indebted to the many distinguished colleagues who have contributed to this edition. Those who had contributed to previous editions worked diligently to revise and update their chapters. Those who had not contributed to previous editions have added insights and expertise that have made it possible to realize my vision of what I thought this book should be.

As always, I am indebted to the National Association of Teachers of Singing for permission to use material freely from my “Laryngoscope” articles which appear in the *Journal of Singing* (formerly the *NATS Journal*), and to Vendome for permission to republish articles and color pictures from my monthly “clinic” in *Ear, Nose, and Throat Journal*. I am also grateful to John Rubin and Gwen Korovin and to Plural Publishing for permission to republish a few chapters from our book (Rubin JR, Sataloff RT, Korovin G. *Diagnosis and Treatment of Voice Disorders*, 4th ed, Plural Publishing, Inc; San Diego, CA, 2015). In addition, I am indebted for permission to republish material from *Choral Pedagogy*, 3rd ed (Smith B, Sataloff RT. Plural Publishing Inc, San Diego, CA; 2013), *The Performer’s*

*Voice* (Benninger MS, Murry T, and Johns MM, Plural Publishing, Inc, San Diego, CA, 2016), Sataloff’s *Comprehensive Textbook of Otolaryngology and Head and Neck Surgery* (Jaypee, New Delhi, 2016), and Sataloff RT, Brandfonbrener A, Lederman R, *Performing Arts Medicine*, 3rd ed (Science and Medicine, Narberth, Pennsylvania, 2010).

Lastly, as always, I cannot express sufficient thanks to Mary J. Hawkshaw, RN, BSN, CORLN, for her tireless editorial assistance, proofreading, and scholarly contributions. I am also indebted to Christina Chenes for her painstaking preparation of the manuscript and for the many errors she found and corrected, and to my associates, Karen Lyons, MD, Amanda Hu, MD, Robert Wolfson, MD, and Frank Marlowe, MD, and to my laryngology fellows. Without their collaboration, excellent patient care, and tolerance of my many academic distractions and absences, writing would be much more difficult. I remain forever grateful to my father and partner Joseph Sataloff, MD, D.Sc., who taught me to write and edit, and who encouraged me to write my first papers and book, and mentored me throughout our years of practice together, as well as to my other primary mentors in training, Drs. Walter Work, Charles Krause and Malcolm Graham. My greatest gratitude goes to my wife Dahlia M. Sataloff, MD, FACS, and sons Ben and John who patiently allow me to spend so many of my evenings, weekends, and vacations writing.



## About the Author



Robert Thayer Sataloff, M.D., D.M.A., F.A.C.S. is Professor and Chairman, Department of Otolaryngology-Head and Neck Surgery and Senior Associate Dean for Clinical Academic Specialties, Drexel University College of Medicine. He is also Adjunct Professor in the departments of Otolaryngology-Head and Neck Surgery at Thomas Jefferson University, as well as Adjunct Clinical Professor at Temple University and the Philadelphia College of Osteopathic Medicine; and he is on the faculty of the Academy of Vocal Arts. He served for nearly four decades as Conductor of the Thomas Jefferson University Choir. Dr. Sataloff is also a professional singer and singing teacher. He holds an undergraduate degree from Haverford College in Music Theory and Composition; graduated from Jefferson Medical College, Thomas Jefferson University; received a Doctor of Musical Arts in Voice Performance from Combs College of Music; and he completed Residency in Otolaryngology-Head and Neck Surgery and a Fellowship in Otolaryngology, Neurotology and Skull Base Surgery at the University of Michigan. Dr. Sataloff is Chairman of the Boards of Directors of the Voice Foundation and of the American Institute for Voice and Ear Research. In addition to directing all aspects of these two non-profit corporations, he has led other non-profit and for-profit enterprises. He has been Chairman and Chief Execu-

tive of a multi-physician medical practice for over 30 years; and he served as Vice President of Hearing Conservation Noise Control, Inc. from 1981 until the time of its sale in 2003. He has also served as Chairman of the Board of Governors of Graduate Hospital; President of the American Laryngological Association, the International Association of Phonosurgery, and the Pennsylvania Academy of Otolaryngology-Head and Neck Surgery; and in numerous other leadership positions. Dr. Sataloff is Editor-in-Chief of the *Journal of Voice*; Editor-in-Chief of *Ear, Nose and Throat Journal*; Associate Editor of the *Journal of Singing* and on the editorial boards of numerous otolaryngology journals. He has written approximately 1,000 publications, including 59 books, and has been awarded more than \$5 million in research funding. His medical practice is limited to care of the professional voice and otology/neurotology/skull base surgery. Dr. Sataloff has developed numerous novel surgical procedures including total temporal bone resection for formerly untreatable skull base malignancy, laryngeal microflap and mini-microflap procedures, vocal fold lipoinjection, vocal fold lipoinplantation, and others. He has invented more than 75 laryngeal microsurgical instruments produced by Microfrance and Integra Medical, ossicular replacement prostheses produced by Grace Medical, and novel laryngeal

prostheses with Boston Medical. Dr. Sataloff is recognized as one of the founders of the field of voice, having written the first modern comprehensive article on care of singers, and the first chapter and book on care of the professional voice, as well as having influenced the evolution of the field through his own efforts and through the Voice Foundation for nearly 4 decades. He has been involved extensively throughout his career in education, including development of new curricula for graduate education. Dr. Sataloff has been instrumental in training not only residents, but also fellows and visiting laryngologists from North America, South America, Europe, Asia and Australia. His fellows have established voice centers throughout the United States, in Turkey, Singapore, Brazil, and elsewhere. He also is active in training nurses, speech language pathologists, singing teachers, and others involved in collaborative arts medicine care, pedagogy and performance education. Dr. Sataloff has been recognized by Best Doctors in America (Woodward White Athens) every year since 1992, Philadelphia Magazine since 1997, and Castle Connolly's "America's Top Doctors" since 2002. Dr. Sataloff's books include:

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2. Sataloff RT, Sataloff J. *Occupational Hearing Loss*. New York, NY: Marcel Dekker; 1987.
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*To Dahlia, Ben and John Sataloff my patient and long suffering family who allow me the time to write and to Mary J. Hawkshaw, my dear friend and invaluable collaborator and to my fellows who have given me so much inspiration and pride.*





# Voice Care Professionals: A Guide to Voice Care Providers

*Robert Thayer Sataloff, Yolanda D. Heman-Ackah, and  
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Optimal voice care is delivered by an interdisciplinary team consisting of physicians and nonphysicians. The physician may be an otolaryngologist (a specialist who practices all aspects of ear, nose, and throat medicine) or a laryngologist, who specializes in voice and swallowing disorders. The physician commonly collaborates with other professionals, such as a speech-language pathologist, singing voice specialist, acting-voice specialist, nurse, and others who constitute the voice care team. Under the best of circumstances, all of the members of the team have received special training in not just the general aspects of their disciplines but also additional training in care of the voice. Although even the best training does not guarantee clinical excellence, it does improve the probability that a practitioner will provide superior, modern voice care. This chapter reviews the typical training and qualifications of the professionals associated most commonly with voice care teams.

## The Voice Care Team

A voice care team is ordinarily under the direction of a physician who is usually an otolaryngologist or laryngologist. In addition to the physician who diagnoses and provides medical treatment for voice disorders, the team includes the speech-language pathologist, who provides voice therapy and attends to problems that affect the speaking voice; a phoniatrist in countries without speech-language pathologists; a singing voice specialist; an acting-voice specialist; a nurse and/or a physician's assistant;

sometimes a voice scientist; and consultant physicians in other specialties. It is helpful for patients to understand the background and role of each key member of the voice team, as discussed below.

## Otolaryngologist/Laryngologist

The leader of the voice care team is ordinarily a physician (otolaryngologist). Otolaryngologists are physicians (surgeons) who specialize in problems of the ears, nose, and throat (ENT). Laryngologists are otolaryngologists who specialize in care of disorders of the larynx (particularly voice problems) and, in some cases, related problems such as swallowing. To practice laryngology, one must first complete training as an otolaryngologist. To become an otolaryngologist, a person completes college, 4 years of medical school, and 5 or more years of residency in otolaryngology-head and neck surgery. In the year following completion of residency, the physician takes a national, standardized board examination given in 2 parts (written and oral) to become a "board certified" otolaryngologist. Certification by the American Board of Otolaryngology, or the equivalent organization in other countries or for osteopathic otolaryngologists, is an important indicator of mastery of basic knowledge in otolaryngology and is considered a basic, minimum qualification. The only exception is "board eligibility" in the case of a physician who has finished residency but has not yet successfully passed the board examinations. Board certification is not granted until a physician has had about 1 year of clinical experience following residency and

demonstrated competency on the oral and written board examinations.

Most otolaryngologists' clinical practices include many or all components of the specialty, such as otology (disorders of the ear and related structures), laryngology (disorders of the voice and upper airway structures such as the throat and trachea), head and neck cancer, head and neck neoplasms (masses including benign or malignant lesions), facial plastic and reconstructive surgery, allergy and immunology, bronchoesophagology (lower airway and swallowing disorders), rhinology (nose, sinus, taste, and smell disorders), and pediatric otolaryngology (ear, nose, and throat disorders of children). Most otolaryngologists and laryngologists care for patients of all ages from early childhood through advanced years. Some otolaryngologists subspecialize, caring for disorders in just one or two areas of otolaryngology. This subspecialization can either be a keen interest in a specific area while still providing a broad range of ear, nose, and throat care, or the focused practice of only one or two of the subcomponents of otolaryngology. Laryngology is one such subspecialty.

Most of the senior physicians specializing in laryngology today did not receive laryngology fellowship training. That is always the case as a new field develops. Modern laryngology evolved out of an interest in caring for professional voice users, especially singers. The first comprehensive article guiding otolaryngologists on care of professional singers was published in 1981<sup>1</sup>; the first major modern American otolaryngology textbook with a chapter on care of the professional voice was published in 1986<sup>2</sup>; and the first comprehensive book on care of the professional voice was published in 1991.<sup>3</sup> So, most of the senior laryngologists practicing at the turn of the 21st century were involved in the evolution of the field before fellowships were developed. Most fellowship training programs started in the 1990s, although a few informal fellowship programs existed in the 1980s and earlier. It is reasonable to expect most voice specialists who finished residency training in the 1990s or later to have completed a fellowship in laryngology. There are approximately 2 dozen laryngology fellowship-training positions in the United States, and they are highly competitive. At present, completion of a fellowship is a reasonably good indicator of superior knowledge and clinical training in laryngology. Most laryngology fellowships include training in the diagnosis and treatment of voice disorders in adults and children, neurolaryngology (neurological problems that affect the voice and larynx), swallowing disorders, airway reconstruction, and laryngeal

cancer. The training includes both medical diagnosis and treatment, and sophisticated laryngeal surgery. Typically, laryngologists care for both routine and complex problems that affect the voice. Such problems include voice dysfunction associated with something as simple as a common cold, especially when it affects the voice of a professional singer or actor. However, laryngologists also are called on to diagnose and treat structural lesions such as nodules or polyps, prolonged infections of the vocal folds, cancer, traumatic injury from fracture or internal trauma (intubation injuries from anesthesia, vocal fold injuries from previous surgery), neurological disorders, and other voice problems. The laryngologist is responsible for establishing a medical diagnosis and implementing or coordinating treatment for the patient. The laryngologist may prescribe medication, inject botulinum toxin, perform delicate microsurgery on the vocal folds, or operate through the neck on the laryngeal skeleton. He or she is also usually responsible for initiating evaluation by other members of the voice team and for generating referrals to other specialists as needed.

Laryngologists may practice in university medical centers or private offices, and in major cities in the United States, they are usually affiliated with a voice team including at least a speech-language pathologist, a singing voice specialist, and sometimes an acting-voice specialist. Laryngologists also should have, or have access to, a clinical voice laboratory with equipment to analyze the voice objectively and a stroboscope to visualize the vocal folds in slow motion. They also should be familiar with physicians in other specialties who have an understanding of and interest in arts-medicine. Even for patients with a voice disorder who are not singers and actors, such knowledge and sensitivity are important. Just as nonathletes benefit from the orthopedic expertise of a sports-medicine specialist, voice patients receive more expert care from physicians trained to treat singers, the "Olympic" athletes of the voice world.

Currently, there is no official additional certification for those who have completed a laryngology fellowship. However, there are organizations (medical societies) with which many of the leading laryngologists are affiliated. Essentially all laryngologists in the United States are fellows of the American Academy of Otolaryngology-Head and Neck Surgery (<http://www.entnet.org>), and laryngologists in other countries are members of their nations' analogous organizations. A few are also members of the American Laryngological Association (ALA), the most senior otolaryngology society in the United States (

www.alahns.org). The ALA also accepts “associate members” from other countries. Some laryngologists belong to the American Bronchoesophagological Association (<http://www.abea.net>), and the Voice Foundation (<http://www.voicefoundation.org>). The Voice Foundation was founded in 1969 and is the oldest organization dedicated to voice education and research. It provides seed grants for research, sponsors an annual symposium on care of the professional voice that started in 1972, and fosters voice education through conferences, educational videotapes, books, and publications such as the *Journal of Voice* and the *Voice Foundation Newsletter*. In recent years, several countries have developed organizations similar to the Voice Foundation, such as the British, Canadian, and Australian Voice Foundations. Laryngologists in such countries are usually members of their national organization, and many are also members of the Voice Foundation (Philadelphia, Pennsylvania). Although membership in these organizations is not a guarantee of excellence in practice, it suggests interest and knowledge in laryngology, particularly voice disorders.

### Speech-Language Pathologist

A speech-language pathologist is a certified, licensed health care professional, ordinarily with either a master’s degree (MA or MS) or doctorate (PhD). After college, speech-language pathologists generally complete a 1- or 2-year master’s degree program, followed by a 9-month, supervised “clinical fellowship,” which is analogous to a medical internship. At the conclusion of the clinical fellowship year, speech-language pathologists in the United States are certified by the American Speech-Language-Hearing Association, and use the letters “CCC-SLP” after their names to indicate that they are certified. Like otolaryngology, speech-language pathology is a broad field that includes care of patients who have had strokes or other neurological problems affecting speech and swallowing, undergone laryngectomy (removal of the larynx), have swallowing disorders, have articulation or stuttering problems, have craniofacial disorders, or have other related fluency disorders of speech, or have disordered swallowing. Some speech-language pathologists subspecialize in the care of voice disorders. The speech-language pathologist affiliated with a voice team is usually such a subspecialist and may call himself or herself a “voice pathologist” rather than a speech-language pathologist, although “voice pathologist” is not a term recognized officially by the American Speech-Language-Hearing Association, yet. Relatively few

speech-language pathology training programs provide extensive education in voice, and there are virtually no voice fellowships for speech-language pathologists. Many speech-language pathology training programs do not require even a single course on complex medical voice disorders. Thus, it cannot be assumed that all speech-language pathologists are trained in or comfortable with caring for individuals with voice problems. Most acquire the subspecialty training they need through apprenticeships, extra courses, and symposia, or by obtaining doctoral degrees that include voice-related research.

Speech-language pathologists are responsible for voice therapy and rehabilitation, which is analogous to physical therapy. The speech-language pathologist analyzes voice use and teaches proper voice support, relaxation, and voice placement to optimize use of the voice during speaking. A variety of techniques are utilized to accomplish this goal. Speech-language pathologists do not ordinarily work with the singing voice, although they are involved in the treatment of speaking voices of singers.

Speech-language pathologists may be found in universities, private offices, or freestanding speech and hearing centers. In the United States, most are members of ASHA (the American Speech-Language-Hearing Association), and its voice-related special interest division (SIG-3), which can be accessed on the Internet. Many speech-language pathologists with special interest in voice in the United States and elsewhere are also members of the Voice Foundation. Like otolaryngologists, speech-language pathologists who subspecialize in voice provide more incisive, state-of-the-art treatment for voice disorders than most general speech-language pathologists who care for patients with various problems encompassing the entire field. So, it is worthwhile for patients with voice disorders to seek out a subspecialist to improve the likelihood of a rapid, excellent treatment result. Referrals to speech-language pathologists specializing in voice usually are obtained through a laryngologist or otolaryngologist.

### Phoniatrists

Phoniatrists do not exist in the United States, but they provide voice care in many European countries. The phoniatrist is a physician who is in some ways a hybrid of a laryngologist and speech-language pathologist. Phoniatrists receive medical training in diagnosis and treatment of voice, swallowing, and language disorders, including voice therapy, but they do not perform surgery. In countries with

phoniatrists, surgery is performed by otolaryngologists. In many cases, the phoniatriest and otolaryngologist collaborate as a team, just as otolaryngologists and speech-language pathologists do in the United States and elsewhere. A physician who has completed training in phoniatriy is generally well qualified to diagnose voice disorders and provide nonsurgical medical care, as well as voice therapy.

### **Singing Voice Specialist**

The singing voice specialist is a singing teacher with special training equipping him or her to practice in a medical environment with patients who have sustained vocal injury. Most singing voice specialists have a degree in voice performance or pedagogy, although some have only extensive performing and teaching experience without a formal academic degree. Nearly all have professional performance experience, as well as extra training in laryngeal anatomy and physiology of phonation, training in the rehabilitation of injured voices, and other special education. The singing voice specialist must acquire knowledge of anatomy and physiology of the normal and disordered voice, a basic understanding of the principles of laryngology and medications, and a fundamental knowledge of the principles and practices of speech-language pathology. This information is not part of the traditional training of singing teachers. Moreover, so far there are no formal training or fellowship programs that assist singing teachers in becoming a singing voice specialist. Their training is acquired by apprenticeship and observation. Many take courses in speech-language pathology programs, but usually not as part of a formal degree or certification program.<sup>4</sup> There is no certification of singing voice specialists. A few of the best singing voice specialists are also certified, licensed speech-language pathologists. This combination is optimal, provided the speech-language pathologist has sufficient experience and training not only as a performing artist but also as a teacher of singing. In patients with vocal injuries or problems, the fundamental approach to training the singing voice is different in important ways from that usually used with healthy students in a singing studio. Hence, even an excellent and experienced voice teacher may harm an injured voice if he or she is not familiar with the special considerations for this population. In addition, many voice teachers do not feel comfortable working with a singer who has had a vocal injury or surgery.

Virtually all singing voice specialists are affiliated with voice care teams. Most are members of the National Association of Teachers of Singing (NATS),

or the equivalent organization in another country, and of the Voice Foundation. In many cases, their practices are limited to work with injured voices. They work not only with singers, but also with other patients with voice disorders. As a member of the voice treatment team working with nonsingers, they help teach speakers the "athletic" techniques utilized by singers for voice production. Singing is to speaking as running is to walking. When rehabilitating someone who has difficulty walking, if the person can be helped to jog or run, leg strength and endurance improve and walking rehabilitation is expedited. The singing voice specialist applies similar principles to voice rehabilitation in collaboration with the speech-language pathologist and other voice care team members.

### **Acting-Voice Specialist**

Acting-voice trainers also are called voice coaches, drama voice teachers, and voice consultants. Traditionally, these professionals have been associated closely with the theater. Their skills have been utilized as part of a medical voice team only since the mid-1990s.<sup>5</sup> Consequently, only a few acting-voice trainers have any medical experience, but their contributions have proven invaluable.

Acting-voice trainers use a variety of behavior modification techniques designed to enhance vocal communication, quality, projection, and endurance in theatrical settings. They train actors to speak or scream through 8 shows a week, and/or theatrical runs that may last years, without tiring or causing injury to their voices. They also teach techniques for adding emotional expression to vocal delivery, and they work with body language and posture to optimize vocal delivery and communication of information. They may be a great asset to the voice team in teaching people how to apply the many skills learned through the speech-language pathologist and singing voice specialist to their everyday lives. Acting-voice trainers are especially valuable for people who speak professionally such as teachers, lecturers, politicians, clergy, sales personnel, and others concerned with effective vocal delivery and with vocal endurance.

There are no formal programs to prepare voice coaches to work in a medical milieu. Those who do receive training generally do so through apprenticeships and collaboration with medical voice care teams under the direction of a laryngologist.

Acting-voice trainers interested in working with voice patients are generally members of the Voice and Speech Trainers Association (VASTA) and the Voice Foundation.

## Nurse

Nurses are indispensable assets in medical offices, and they are important members of the voice team in many centers. Nurses who work closely with a laryngologist generally have vast experience in the diagnosis and treatment of voice disorders. They are wonderful information resources for patients and frequently provide much of the patient education in busy clinical settings. These nurses usually are members of the Society of Otolaryngology-Head and Neck Nurses (SOHN). Nurses with advanced knowledge and skills may be certified (by SOHN) as otolaryngology nurses and are identified as such by the initials "CORLN" (certified otolaryngologic nurse) after their names.

Nurse practitioners are advanced practice nurses with master's or doctoral degrees, who are licensed to provide independent care for patients with selected medical problems. They are identified by the initials "CRNP" (certified registered nurse practitioner). They work in conjunction with a physician, but they can examine, diagnose, and treat selected problems relatively independently. A few nurse practitioners specialize in otolaryngology and work with voice teams. They ordinarily receive special training "on the job" from the otolaryngologist, and they provide care within their scope of practice. Nurse practitioners also can become members of SOHN, become certified through examination by SOHN, and upon certification will also use the certification CORLN after their names.

## Physician Assistants and Medical Assistants

Physician assistants, like nurse practitioners, function in association with a physician. Physician assistants graduate from a training program that usually lasts 4 years and teaches them various aspects of medical diagnosis and physical examination. They use the initials "PA" (physician assistant) after their names. They practice in conjunction with physicians but can perform examinations and treat patients independently. They are licensed in many states to write prescriptions. A few physician assistants specialize in otolaryngology, and a smaller number have had extensive training and experience in voice care. In collaboration with a laryngologist and voice team, they are qualified to evaluate and treat patients with voice disorders.

Physician assistants should be distinguished from "medical assistants" who have less training and are qualified to assist in medical care and patient education but generally not to diagnose and treat patients

independently. Medical assistants generally are trained to perform tasks such as phlebotomy (drawing blood) and electrocardiograms. In a laryngology office, a good medical assistant can be trained to perform many other tasks, such as taking histories, assisting with stroboscoped laryngoscopy, and assisting during the performance of surgical procedures in the office, participating in research, and other activities.

## Consultant Medical Professionals

Otolaryngologists often refer voice patients for consultation with other medical professionals. Other specialists consulted commonly include neurologists (nerves), pulmonologists (lungs), gastroenterologists (stomach and intestinal system), psychologists, and psychiatrists. However, physicians in virtually any medical specialty may be called on to care for voice patients. Traditional and nontraditional ancillary medical personnel may be involved in voice care, including nutritionists, physical therapists, chiropractors, osteopaths (for manipulation), acupuncturists, and others. Within virtually all of these fields, there are a select few professionals who have an interest in and an understanding of arts-medicine. Just as caring for voice professionals (especially singers) involves special considerations and challenges for the otolaryngologist, caring for hand problems in pianists or ankle problems in dancers poses challenges for the orthopedic surgeon. Orthopedic surgeons, neurologists, pulmonologists, and others who are accustomed to working with performing artists (dancers, wind instrumentalists, etc) are most likely to have the insight, sensitivities, skills, and state-of-the-art information needed to provide optimal care to voice professionals. Many such physicians tend to be associated with arts-medicine centers or are performers themselves. There is no certification or broad-based national or international organization that helps to identify such physicians, although some are members of the Performing Arts Medicine Association (PAMA). In most fields, there are no formal arts-medicine training programs or associations. Physicians acquire such training through their own interests and initiative, and through apprenticeship or observation with colleagues. If there is no arts-medicine center in the area in which a patient is seeking care, arts-medicine physicians are identified best by word-of-mouth or through arts-medicine-related websites. Referrals can be obtained through the local laryngologist or voice specialist or by consulting with eminent performing arts teachers in the community. For example, the leading private university and conservatory violin and piano teachers often know who

the best hand specialists are; the wind instrument teachers often know whom to see for neurological and pulmonary problems that affect musicians; and dance teachers know the best foot-and-ankle physicians.

## Conclusion

Voice care has evolved into a sophisticated, well-organized medical science. Patients with voice disorders are served best by a comprehensive voice team that coordinates the skills of professionals trained in various disciplines. It is important for health care professionals to assemble interdisciplinary teams and to affiliate with arts-medicine specialists and other disciplines in order to provide comprehensive care for voice patients. It is also important for patients to be educated about the kind of health care that is now available for voice disorders and how to evaluate and select health care providers.

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