

Robert T. Sataloff, MD, DMA, Associate Editor

# How Do I Maintain Longevity of My Voice?

Yolanda D. Heman-Ackah, MD, Robert T. Sataloff, MD, DMA,  
Mary J. Hawkshaw, BSN, RN, CORLN, Venu Divi, MD

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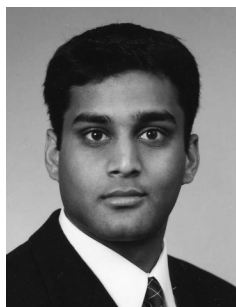
Yolanda Heman-Ackah



Robert Sataloff



Mary Hawkshaw



Venu Divi

**T**HOSE WHO USE THEIR VOICE PROFESSIONALLY for singing, acting, teaching, counseling, public speaking, telecommunications, oration, or other venues, need to maintain good vocal hygiene to sustain reliable, lifelong professional voice use. Like dental hygiene, vocal hygiene is a set of preventative measures that actively and consciously are undertaken by the voice user to maintain the health, reliability, and consistency of the voice. Proper training, strengthening, and conditioning are as important to the professional voice user as they are to a professional athlete.<sup>1</sup> Attention to these practices will help prevent voice injury and maintain the voice through rigorous vocal performance and speaking schedules.

## HOW CAN THE VOICE BE KEPT HEALTHY?

Preventative medicine is always the best medicine. The more one understands his/her voice, the more one will appreciate its importance and delicacy. Education helps us understand how to protect the voice, train and develop it to handle our individual vocal demands, and keep it healthy. A little bit of expert voice training can make a big difference. Avoidance of abuses, especially smoke, is paramount. If voice problems occur, expert medical care with a laryngologist (an ear, nose, and throat doctor who specializes in voice care) should be sought promptly. Interdisciplinary collaboration among laryngologists, speech-language pathologists, singing teachers, acting teachers, many other professionals, and especially voice users themselves has revolutionized voice care since the early 1980s. Technologic advances, scientific revelations, and new medical techniques inspired by interest in professional opera singers have brought a new level of expertise and concern to the medical profession, and improved dramatically the level of care available for any patient with voice dysfunction.

## HOW CAN A "NORMAL" VOICE BE MADE BETTER?

Voice building is possible, productive, and extremely gratifying. Speaking and singing are athletic; they involve muscle strength, endurance, and coordination. Like any other athletic endeavor, voice use is enhanced by training that includes exercises designed to build

strength and coordination throughout the vocal tract. Speaking is so natural that the importance of training is not always obvious. However, running is just as natural. Yet, most people recognize that, no matter how well a person runs, he or she will run better and faster under the tutelage of a good track coach. The coach also will provide instruction on strengthening, warm-up, and cool-down exercises that prevent injury. Voice training works similarly.

Voice building starts with physical development. Once vocal health has been assured by medical examination, training is usually guided by a voice trainer (with schooling in theater and acting voice techniques), singing teacher, or a speech-language pathologist. In the authors' setting, all three specialists are involved under the guidance of a laryngologist (the voice doctor), and additional voice team members are utilized, as well, including a psychologist or psychiatrist (for stress-management), pulmonologist, neurologist, and others. Initially, training focuses on the development of physical strength, endurance, and coordination. This is accomplished not only through vocal exercises, but also through medically supervised bodily exercises that improve aerobic conditioning and strength in the support system. Singing skills are developed (even in people with virtually no singing talent at all) and used to enhance speech quality, variability, projection, and stamina. For most people, marked voice improvement occurs quickly. For those with particularly challenging vocal needs, voice building also includes training and coordinating body language with vocal messages, organizing presentations, managing adversarial situations (interviews, court appearances, etc.), television performance techniques, and other skills that make the difference between a good professional voice user and a great one.

The process of voice building is valuable not only for premier professional voice users; virtually all of us depend upon our voices to convey our personalities and ideas. The right subliminal vocal messages can be as important in selling a product or getting a job as they are in winning a presidential election or convincing a jury. The initial stages of voice building are no more complex than the initial stages of learning to play tennis or golf; and their potential value is unlimited. A strong, confident, well modulated voice quietly commands attention, convinces, and conveys a message of health, strength, youth, and credibility.

## CARE OF THE CONVERSATIONAL VOICE

The source of many voice problems in both professional speakers and singers lies in unrecognized abuse or misuse of the everyday speaking voice. That can take the form of chronic throat clearing, yelling or shouting above loud noises, or engaging in prolonged or emotionally charged conversations without paying attention to breath support, resonance, or proper body alignment. Even for the best trained voice professional, it is easy to forget to employ proper voice techniques during normal conversation, and conscious efforts must be made to use them at all times. Otherwise, the larynx may be subjected to phonotrauma, which may lead to the development of nodules, polyps, cysts, or hemorrhage (bleeding) on the vocal folds and a resultant hoarse voice.<sup>2</sup>

The voice always should be warmed up at the start of each day, prior to talking, and cooled down at bedtime. Vocal warm-ups and cool-downs are analogous to stretching exercises used with other muscle groups. In the morning, they help to prepare the vocal muscles for prolonged use, that is, a day of conversational speech. The warm-up exercises used should include exercises in pitch variation to help stretch and tone the tensor muscles of the vocal folds, as well as exercises to help stretch and tone the opening (abductor) and closing (adductor) muscles of the larynx.<sup>3</sup> In addition, exercises that focus on proper breathing and control of respiration during phonation should be employed to help tone the abdominal muscles and prepare them for use in support of phonation.<sup>4</sup> Exercises to help relax the accessory muscles of phonation, such as stretching and loosening the tongue, lips, jaw, shoulder, and neck should be performed at the beginning of the warm-up. Exercises designed to recruit the appropriate muscles in the vocal tract for the production of an optimal resonance pattern should be employed each morning. The focus of such exercises should be forward placement of the voice. The cool-down exercises should also stretch the tensor, abductor, and adductor muscles, but the focus here is not to increase tone, but rather to help the vocal muscles achieve a state of healthy relaxation after a day of prolonged use.

All of the exercises chosen should be taught by and practiced initially with a voice teacher or speech-language pathologist who specializes in voice care (often referred to as voice pathologist or voice therapist). These



Figure 1. Vocal fold hemorrhage.



Figure 2. Vocal fold polyp.

individuals help to provide objective feedback and ensure that the exercises are being done safely and correctly. Just as improper technique while weight lifting without a trainer can result in a muscle tear or strain, so can improper performance of vocal exercises without proper guidance.

Prevention of harmful muscle use patterns during conversational speech helps to limit the development of vocal fold masses such as polyps, nodules, and cysts. Voice misuse and voice abuse can cause both acute and chronic vocal fold injury. Yelling and screaming, particularly during emotionally charged situations, and talking over loud noise, can cause forceful closure of the vocal folds, which can result in vocal fold hemorrhage (bleeding) (Figure 1), the development of “blisters” in the form of polyps (Figure 2) or cysts (Figure 3), or the formation of nodules, the laryngeal equivalent of calluses. For those who need to project their voices over

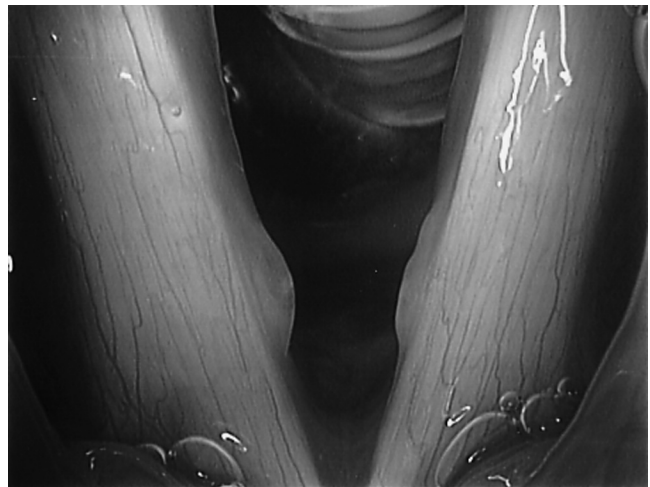


Figure 3. Vocal fold cyst (right) and contralateral vocal fold mass (left).

loud noises (for example, stock brokers, politicians, machinists, construction workers, or cheerleaders, to name a few), working with a voice teacher or voice pathologist to optimize vocal projection while eliminating strain can help to protect the voice and to prevent debilitating injury.

For those who use their voices for professional speaking, including acting and public speaking, as well as for singing, many of the same principles apply. In addition to routine vocal warm-ups and cool-downs at the start and end of the day, preparation (with exercises) for intense voice use before vocal performance should routinely be employed.

### Vocal Fold Lubrication

The vocal folds need adequate lubrication to maintain healthy vibration, particularly with prolonged phonation. This is achieved best by ensuring that the body is well hydrated at all times, but particularly prior to performing. Hydration is accomplished by drinking water or drinks that have balanced electrolyte, such as Gatorade. Urine color is a good guide to the state of hydration. A pale urine color implies that there is adequate hydration for the kidneys, which usually is a good sign of adequate hydration throughout the body. Those with known kidney disorders, heart disease, hypertension, pituitary abnormalities, and other health problems should consult their physician and exercise caution before attempting to maintain hydration in this manner, as these individuals' usual mechanisms for fluid control may be impaired. Water is pre-

ferred over juices or concentrated beverages. The sugar, salts, and sweeteners in such drinks limit the amount of water that is absorbed by the body. Caffeinated beverages and alcohol are dehydrating and should be avoided during and for several days prior to vocal performance. It is most ideal for the busy voice to be hydrated at all times to prevent rapid changes in the body's fluid content. Because of the concern for reflux during performances, large quantities of liquid/water should not be consumed within the two hours prior to or during vocal performance.

### Minimizing Reflux

Because nearly everyone has some degree of reflux when intraabdominal pressure is increased, care should be taken to minimize reflux episodes during vocal performance. Reflux is the regurgitation of stomach contents into the esophagus and occasionally larynx, throat, and/or nose, and usually occurs when the pressure in the stomach surpasses that of the lower esophageal sphincter, the sling of muscles that is designed to help keep stomach contents in the stomach. A common misconception is that reflux is synonymous with heartburn. Heartburn is a symptom of severe and frequent refluxed gastric acid into the esophagus. Reflux episodes often occur without the sensation of heartburn. The sensation of heartburn is an indication of injury to the esophagus. Because the esophagus is lined by several layers of cells, it takes a significant amount of reflux to destroy these cells and cause deeper tissue injury. The larynx, portions of the throat, and nose are lined by tissue that is only one cell layer thick. It takes significantly less acid reflux to injure this cell layer and cause damage in the larynx and upper airway than it does to cause heartburn. Another way of understanding this concept is to use the skin on the back of the hand and the lining of the eye as analogies. Like the esophagus, the skin on the back of the hand is several cell layers thick; and like the larynx, the lining of the eye is only one cell layer thick. If one were to place a drop of vinegar (which is acidic) on the skin once daily, no visible damage would occur. If one were to place a drop of vinegar on the eye once daily, the eye would be chronically red, inflamed, and irritated. In this example, the drop of vinegar is analogous to occasional, mild reflux episodes, which typically do not cause heartburn or esophageal injury, but frequently cause laryngeal injury and symptoms. For those utilizing proper

breath support techniques for public speaking and singing, abdominal pressures needed to project the voice can trigger a reflux episode.<sup>5</sup>

The stomach normally produces acid and enzymes to help digest food. If these reflux through the esophagus to the larynx, they may cause a contact irritation or laryngitis. Such irritation can trigger a cough, a sensation of tickle in the throat, a need for throat clearing, swelling of the vocal folds, a sensation of postnasal drainage or phlegm in the throat; and they can alter sensation (ability to feel) in the larynx.<sup>6</sup> These irritative behaviors can, in turn, result in vocal fold trauma and predispose to the formation of other vocal fold pathologies. The best way to minimize refluxing during vocal performance is to avoid eating meals or filling the stomach with liquids for at least three hours before performance, even in those who have no symptoms of reflux at all. Everyone has the potential to reflux when intraabdominal pressure increases, especially the amount of abdominal pressure needed to support healthy phonation.

### Breath Support

Proper breath support is a key element of proper voice technique in all forms of voice use and vocal performance. The lungs and related muscles of the chest, abdomen, and back are the power source for phonation and can be used to produce and modulate sound with minimal impact on the vocal folds themselves. It is important when breathing to remember that the lungs are three dimensional. Accordingly, expansion of the lungs should be both down into the abdomen and out on all sides. Inhalation should involve relaxation of the abdomen and back muscles, and exhalation should involve a sustained and controlled contraction of the abdominal and, perhaps to a lesser extent, the back muscles. Phonation occurs during exhalation and should be supported by an adequate, inhaled breath prior to phonating. Proper posture with an erect spine, along with relaxation of the shoulders and muscles related to the collarbones and shoulder blades must be maintained.

### Resonance

In addition to adequate breath support, proper positioning and alignment of the vocal tract aid in vocal projection and in minimizing trauma to the vocal folds. The positions of the tongue, jaw, larynx, and palate participate

in the resonance of the voice as it leaves the larynx. Maximizing the effect of the resonator on the voice aids in vocal projection and minimizes the need for increased effort at the level of the vocal folds. The optimal position of each of these elements of the vocal tract varies depending upon the sound being produced, but in general, a more relaxed tongue, larynx, and jaw and an elevated palate produce a configuration of the vocal tract that helps to maximize vocal projection while minimizing vocal fold trauma.<sup>7</sup>

### BASELINE LARYNGEAL EVALUATION

Early during one's career, every vocal performer should have a baseline laryngeal evaluation. The purpose of such an examination should be to evaluate the movement of the vocal folds and to diagnose any subtle abnormalities that may contribute to the development of vocal difficulties if left unattended. The presence of mild vocal fold paresis is very common and is often thought of as the laryngeal equivalent of mildly poor vision.<sup>8</sup> Like mildly poor visual acuity, one can function reasonably well without correction; however, in some people this problem can be debilitating and cause excess compensatory strain, especially in those who are not aware that they have the problem. Techniques as simple as vocal fold strengthening exercises and retraining of the involved muscles can help prevent the development of other pathologies in these individuals and can help improve vocal performance.<sup>9</sup> Other subtle laryngeal abnormalities, such as reflux, that may have long-term effects on the voice also can be diagnosed and treated during a screening examination. For example, other more serious problems also may present as laryngeal or voice problems and should be identified early. Moreover, if asymptomatic abnormalities are present, it is important to be aware of them. Otherwise, if they are recognized first during a period of vocal problems, they may be diagnosed incorrectly as the cause of the complaint.

In some individuals, hoarseness and other vocal difficulties may develop as a result of illness. In these instances, it is useful to know if there were any preexisting pathologies and the relative contribution of these pathologies to the current vocal problem. Some individuals function well even in the presence of mild vocal fold weak-

ness, small vocal fold polyps, nodules, or cysts and are unaware that these lesions exist unless they have had a baseline examination.<sup>10</sup> If a new vocal difficulty arises, particularly after an illness, it is helpful to know that these conditions were preexisting and likely not contributing significantly to the current vocal problem. Such knowledge even can help prevent the performance of unnecessary vocal fold surgery on benign lesions when vocal difficulties do arise.

Maintaining longevity of the voice involves attention to training and proper hygiene of the vocal folds throughout one's career. Daily stretching, attention to diet and hydration, and the use of proper voice technique in all vocal situations are essential components of prolonged vocal health. Awareness of the health and state of one's larynx at baseline also can prove useful in preventing future problems and helpful in identifying the cause of new problems as they arise.

### NOTES

1. R. T. Sataloff, "The Human Voice," *Scientific American* 267, no. 6 (December 1992): 108–115.
2. R. T. Sataloff, "Structural Abnormalities of the Larynx," in R. T. Sataloff, *Professional Voice: The Science and Art of Clinical Care*, 3rd ed. (San Diego: Plural Publications, 2005), 1255–1390.
3. R. J. Heuer, R. K. Rulnick, M. Horman, K. S. Perez, K. A. Emerich, and R. T. Sataloff, "Voice Therapy," in Sataloff, *Professional Voice*, 961–986.
4. *Ibid.*
5. R. T. Sataloff, D. O. Castell, P. O. Katz, and D. M. Sataloff, "Reflux Laryngitis and Other Related Disorders," in Sataloff, *Professional Voice*, 1–157.
6. J. A. Koufman, G. J. Wiener, W. C. Wu, and D. O. Castell, "Reflux Laryngitis and Its Sequelae: The Diagnostic Role of Ambulatory 24-Hour pH Monitoring," *Journal of Voice* 2, no. 1 (January 1988): 78–89.
7. J. Sundberg, "Vocal Tract Resonance," in Sataloff, *Professional Voice*, 275–292.
8. Y. D. Heman-Ackah, C. Dean, and R. T. Sataloff, "Stroboscovideolaryngoscopic Findings in Singing Teachers," *Journal of Voice* 16, no. 1 (March 2002): 81–86; Y. D. Heman-Ackah and M. Batory, "Determining the Cause of Mild Vocal Hypomobility," *Journal of Voice* 17, no. 4 (December 2003): 579–588.
9. R. T. Sataloff, "Structural Abnormalities"; Heuer, et al.
10. Sundberg.

**Yolanda D. Heman-Ackah, MD**, is a laryngologist who specializes in professional voice care. She is board certified by the American Board of Otolaryngology and is a fellow of the American Academy of Otolaryngology—Head and Neck Surgery. She received her Bachelor of Arts degree in Psychology and her Doctor of Medicine degree from Northwestern University as part of the Honors Program in Medical Education. Following her residency in otolaryngology—head and neck surgery at the University of Minnesota, she completed a fellowship in professional voice care and laryngology under the preceptorship of Robert T. Sataloff, MD, DMA, at the American Institute for Voice and Ear Research and Jefferson Medical College of Thomas Jefferson University in Philadelphia. In addition to her medical training, Dr. Heman-Ackah is also a professionally trained dancer, a musician, and a vocalist.

She founded and directed the Voice Center at the University of Illinois at Chicago upon completion of her fellowship. After a few years in Chicago, she joined the practice of Drs. Robert T. Sataloff and Karen M. Lyons in Philadelphia, where she specializes in professional voice care and other aspects of otolaryngology—head and neck surgery as they pertain to the performing artist and professional voice user. She is an active member of the academic faculties of Drexel University College of Medicine, where she currently holds the position of Associate Professor, and Thomas Jefferson University. She is the National Medical Advisor for the Voice and Speech Trainer's Association (VASTA) and is actively involved in VASTA, The Voice Foundation, the National Association of Teachers of Singing (NATS), the Latin Academy of Recording Arts and Sciences, and the National Academy of Recording Arts and Sciences (the Grammy Foundation). She has authored or coauthored numerous publications, including award-winning journal articles, book chapters, and several books. She is a member of the Editorial Board of the *Journal of Voice*, and is an editorial reviewer for other medical journals.

**Robert T. Sataloff, MD, DMA** is Professor and Chairman of the Department of Otolaryngology—Head and Neck Surgery and Associate Dean for Clinical Academic Specialties at Drexel University College of Medicine. He is also on the faculty at Thomas Jefferson University, the University of Pennsylvania, Temple University, and the Academy of Vocal Arts. Dr. Sataloff is Conductor of the Thomas Jefferson University Choir and Orchestra and Director of The Voice Foundation's Annual Symposium on Care of the Professional Voice. Dr. Sataloff is also a professional singer and singing teacher. He holds an undergraduate degree from Haverford College in Music Composition, graduated from Jefferson Medical College, received a DMA

in Voice Performance from Combs College of Music, and completed his Residency in Otolaryngology—Head and Neck Surgery at the University of Michigan. He also completed a Fellowship in Otolaryngology, Neurotology, and Skull Base Surgery at the University of Michigan. Dr. Sataloff is Chairman of the Board of Directors of The Voice Foundation and of the American Institute for Voice and Ear Research. He is Editor-in-Chief of the *Journal of Voice*, Editor-in-Chief of the *Ear, Nose and Throat Journal*, an Associate Editor of the *Journal of Singing*, and on the Editorial Board of *Medical Problems of Performing Artists* and numerous major otolaryngology journals in the United States. Dr. Sataloff has written over 650 publications, including thirty-eight books. Dr. Sataloff's medical practice is limited to care of the professional voice and to otology/neurotology/skull base surgery.

**Mary J. Hawkshaw, BSN, RN, CORLN**, is Research Associate Professor in the Department of Otolaryngology—Head and Neck Surgery at Drexel University College of Medicine. She has been associated with Dr. Robert Sataloff, Philadelphia Ear, Nose, and Throat Associates, and the American Institute for Voice and Ear Research (AIVER) since 1986. She has served as Secretary-Treasurer of AIVER since 1988, and was named Executive Director of AIVER in January 2000. She has served on the Board of Directors of The Voice Foundation since 1990. Ms. Hawkshaw graduated from Shadyside Hospital School of Nursing in Pittsburgh, Pennsylvania, and received a Bachelor of Science degree in Nursing from Thomas Jefferson University in Philadelphia. In collaboration with Dr. Sataloff, she has coauthored more than 60 book chapters, 130 articles, and four textbooks. She is on the Editorial Board of the *Journal of Voice*, *Ear, Nose and Throat Journal*, and the *Journal of the Society of Otorhinolaryngology and Head—Neck Nurses* since 1998. She is recognized nationally and internationally for her extensive involvement in care of the professional voice.

**Venu Divi, MD** is Assistant Professor in the Department of Otolaryngology—Head and Neck Surgery at Drexel University College of Medicine. He received his undergraduate education at Kent State University and his medical training at Northeastern Ohio University College of Medicine. In 2006, he finished his residency in otolaryngology at Henry Ford Hospital in Detroit, Michigan. In 2007, he completed his fellowship in professional voice and laryngology with Dr. Robert Thayer Sataloff. His interests include care of performing artists, including singers and emcees. He is also passionate about investigating the utility of yoga and ayurvedic medicine (the traditional medicine of India) in the care of the voice patients.