

VOCAL DISORDERS AND THE VOICE CARE NETWORK

A Report of a Senior Study

by

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Fall, 2013

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Acknowledgements

I would like to dedicate this thesis to Mrs. Alicia Massie-Legg, who not only inspired this choice of topic, but inspired my career path as well. Thank you for being such an encouraging mentor throughout this process.

Abstract

Singers have a responsibility to themselves to be educated about their instruments. As singers, our instruments are our voices. To make a professional career with the voice is difficult, not only because of the complexity of the instrument itself, but because of the lengths to which singers must go to keep the voice healthy. A vocal professional must be able to treat the voice with care and understand how to keep it healthy.

Vocal disorders are ailments of the voice that can prevent vocal professionals from successfully continuing with their careers. Because singers rely so heavily upon their voices, their knowledge of common vocal disorders is imperative. They must understand what the most common vocal disorders are, their symptoms, and their treatments, all of which will be explained in this study. Singers must also have an understanding of where to seek treatment if they develop voice disorders. The most effective treatment available at present is a voice care network, or voice care team. This study will offer an explanation of a voice care network, and will include information about which professionals make up these networks and how they all work together.

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CHAPTER I

INTRODUCTION AND LITERATURE REVIEW

Vocal professionals, and singers in particular, often do not realize the ever present risk of vocal disorders. As singers, we often assume that we will not develop a vocal disorder. We tell ourselves that nothing like that will ever happen to us. In truth, vocal disorders are extremely common and, if not treated properly or in adequate time, can be the cause of an end to a career. Therefore, singers should possess a knowledge of the risks, the causes, the symptoms, and the most common treatment techniques. Hopefully, after becoming aware of the common causes and avoiding these, the symptoms and treatments won't be necessary. Nonetheless, it is valuable to understand the possibilities and to be educated about them. As singers, our voices are our instruments. We must know our instruments thoroughly.

In this first chapter, the focus will be on important literature and resources regarding voice care networks and vocal disorders that have been pinpointed throughout this study. In the second chapter, there will be a focus on voice care networks, each team member's individual job, and how the team works together to treat and diagnose vocal disorders. This chapter will also touch on proper vocal hygiene in the hope of providing

practical information on how to keep the voice healthy and prevent the development of a disorder. The third chapter of this study will give an overview of the science of the voice and discuss five of the most common vocal disorders: vocal nodules, spasmodic dysphonia, vocal polyps, vocal cysts, and vocal fold hemorrhage. This chapter will explain what each disorder is as well as their possible causes, how they're diagnosed, and popular treatment methods.

First, it must be noted that information regarding voice care networks, or teams, is quite limited due to the fact that it is a new concept for treating voice disorders. However, there are a few resources that were available and helpful. One of the most important resources used for the discussion about voice care networks is the article “Who Takes Care of Voice Problems? A Guide to Voice Care Providers,” by Yolanda D. Heman-Ackah, Robert T. Sataloff, and Mary J. Hawkshaw. This article, which came from the *Journal of Singing*, published by National Association of Teachers of Singing, was valuable for its information on the members of a voice care network and what they do individually. The article begins by describing what a voice care team is and why it's needed. It goes on to list each of the main members of a voice care network, or team, and describe what each member does in detail. For the purposes of this study, the sections on otolaryngologists, speech-language pathologists, and singing voice specialists were most useful. However, the article does mention other medical professionals who can be brought into voice care teams, if needed. In addition to the descriptions of the members, the article also discusses when a person might need a voice care team and which members will address certain issues. It provides an excellent look into the world of vocal

disorders, who treats them, and what each team member's responsibility is in the treatment and diagnosis process.

Karen Wicklund's *Singing Voice Rehabilitation: A Guide for the Voice Teacher and Speech-Language Pathologist* outlined some of the ways an otolaryngologist, a speech-language pathologist, and a singing voice specialist work together in a voice care team. In this book, Wicklund goes into detail about the anatomy of the voice, vocal injuries, the effects of voice loss, voice therapy, song repertoire used for therapy, ways to prevent vocal injury, and the way voice care team members work together. In this study, however, Wicklund's book was used mainly for information about a voice care team and how the members work together in chapter two.

Also in the second chapter, Friedrich Brodnitz's *Keep Your Voice Healthy* was referenced in regards to the section on vocal hygiene, which encompasses the habits a singer should develop to keep his or her voice healthy. This is not all that Brodnitz's book covers, though. In the book, he discusses the voice and the way it works, how to keep the voice healthy, simple colds and how to treat them, how to improve the voice, as well as many other vocal issues. The section on keeping the voice healthy was the most beneficial for the second chapter of this study, but the book also was referred to briefly in the third chapter. Brodnitz outlined proper vocal hygiene, including how much rest is required, proper nutrition, the issue of alcohol consumption, and a great deal more. This was extremely beneficial for this study.

In chapter three, this study will focus on the science of the voice and will delve into vocal disorders and their treatments. The vocal science section will briefly describe

the larynx and explain how the voice works. *Basics of Vocal Pedagogy: The Foundations and Process of Singing*, by Clifton Ware, was the main source for this discussion. This book does an excellent job of outlining the science of the voice so that it is easy to understand. Since this was the goal for this study, this source provided particularly useful information. Though Ware's book is used most often in the first section of chapter three, it is also referred to throughout the entire chapter.

The first disorder discussed in chapter three is vocal nodules. Vocal nodules, callus-like growths on the vocal folds, are probably the most common of the disorders discussed in this study. The information available about them is overwhelming. There were two main sources used for this study that gave adequate information about the disorder, as well as their effect on singers and the treatment procedures that follow. The first of the two is an article called "Vocal Nodules: Their Cause and Treatment," by Darrel L. Teter. This article was split into sections, and includes a discussion of the symptoms of nodules, management of nodules, and therapy for nodules. Since this study focuses on singers, this article provided a great deal of information with singers in mind. The next source used for the vocal nodule section is *The Diagnosis and Correction of Vocal Faults*, by James C. McKinney. This book provided insight on the vocal tension that can lead to vocal nodules, one of those being singing at too high a pitch level for too long. This is believed to be a very common cause for vocal nodules.

For the section on spasmodic dysphonia, a disorder that causes spasms of the vocal folds, the National Spasmodic Dysphonia Association website was an extremely valuable source. From audio clips of patients with spasmodic dysphonia to possible

treatments, this website provides an overview of the disorder as well as an in-depth look, and is the source for much of the information given in chapter three. Additional information was obtained from the National Institute on Deafness and Other Communication Disorders (NIDCD), which provided information on what spasmodic dysphonia is, the different types, the causes, how it's diagnosed, how it's treated, and what research is being done currently. This website, along with the National Spasmodic Dysphonia Association website, were the main materials used for this section of chapter three.

Another important source throughout this research is Meribeth Bunch's *Dynamics of the Singing Voice*. This book provided helpful information about vocal polyps, benign growths on the vocal folds, and vocal nodules. It is designed to be a reference book for those dealing with the singing voice, which makes it especially useful for this study. It contains information on polyps and nodules, their treatment methods, and causes, as well as much more.

In addition to Bunch's *Dynamics of the Singing Voice*, there is a book entitled *The Functional Unity of the Singing Voice* by Barbara Doscher, which is also referenced in the vocal polyp section in chapter three, as well as other sections of this study, including the vocal hygiene section in chapter two. Doscher, considered an authority in the field of vocal pedagogy, presents authoritative information regarding polyps and nodules, and their causes. Another source that must be mentioned is the Voice Medicine website by Dr. Lucian Sulica, whose medical practice is located in New York. Dr. Sulica is an expert in voice disorders. The purpose for his website and his practice is to make sure the correct

information about the voice is disseminated, since there is so much misinformation dominating the internet and voice studios. This resource was utilized throughout chapter three, including the vocal polyps section previously discussed. This website was also used for the section following that, which discusses vocal fold cysts. Vocal fold cysts are growths on the vocal folds caused by a build-up of mucous. Dr. Sulica's website contained an entire page dedicated to cysts, in which he discusses what a cyst is, what the symptoms are, what it looks like, and how it's treated. In addition to vocal cysts, this website was used for vocal polyps and vocal fold hemorrhage, which will be discussed later.

In the section on vocal cysts, the East Virginia Medical School Department of Otolaryngology website was very helpful. A page entitled “Vocal Fold Nodules, Cysts, and Reinke's Edema” described what a cyst is, and it also showed pictures of cysts, which were invaluable for the purposes of this study. Although, this website wasn't used for vocal fold nodules because the information about them was not any different than other sources, the section on cysts was much more beneficial.

Another important source used for the section on vocal cysts is an article called “Benign Vocal Lesions-Nodules, Polyps, Cysts,” by Ken W. Altman. This article did discuss other disorders that are highlighted in this study. However, only the information on vocal cysts was included, because most of the information on the other vocal disorders was very similar, if not the same, as that offered by other sources. The article explained how nodules, polyps, and cysts are diagnosed, a rather difficult process due to the many

similarities in symptoms. Altman's discussion of the individual disorders provided further support for this study.

The last section in chapter three is on vocal hemorrhage, which is a ruptured blood vessel in the vocal fold. The main source for this section is the Osborne Head and Neck Institute Voice and Swallowing Center based out of Los Angeles, California. On this website, there is a page dedicated to vocal fold hemorrhage that includes sections on what it is, what the symptoms are, what it looks like, complications, truths and myths, and treatment. This website became the main resource because of the in-depth look it provides regarding this disorder. In addition, the Voice Medicine website by Dr. Sulica was also a major reference.

There are a number of other sources used for background information in this study. Though not a main resource, Eva Lukkonen's dissertation entitled, "Speech-Language Pathology and the Singing Voice: Implications for Clinician Training and Suggestions for Assessment and Intervention," provided further information for the second chapter. An additional resource for chapter three includes the article from the *Journal of Singing*, "A Case for Silent Vocal Abuse," written by Deborah K. Williamson, Rafer S. Lutz, and Randolph E. Deal. Also, the article, "Spasmodic Dysphonia: Onset, Course, Socioemotional Effects, and Treatment Response," by Kristine Tanner, Nelson Roy, Ray M. Merrill, Cara Sauder, Daniel R. Houtz, and Marshall E. Smith, provided helpful insight for chapter three.

Unfortunately, it was not possible to mention all the resources used in this study, but it should be stated that all references provided useful and relevant information.

Naturally, only a selection of the vast amount of resources available about vocal disorders were utilized. One of the main difficulties in writing this thesis lay in deciding which resources were most pertinent. Sources were chosen after a great deal of research and reading in order to outline the most important aspects of the voice care network and common voice disorders. Nevertheless, in the process of finding these main resources, there were a great deal of articles reviewed and studied to prepare for the writing of this paper. Those that were not directly referenced but provided helpful information are included in the bibliography because they contributed to the knowledge needed to complete this paper.

CHAPTER II

THE VOICE CARE NETWORK AND VOCAL HYGIENE

The Voice Care Network

Over the years, there have been significant advancements in the way in which the voice is cared for. When voice problems are present, the process to diagnose and correct these problems has been organized so that the patient receives the best care possible. There is now a group of professionals who work together to treat these voice patients. This group of professionals is referred to as a “voice care network” or “voice care team”. The individuals on these teams are all trained in separate disciplines. The combination of their specialized skills creates optimum care.

A voice care team includes both physicians and non-physicians. The physician that serves on the voice care team is usually an otolaryngologist. An otolaryngologist is a specialist in aspects of the ear, nose, and throat. The non-physician voice care team members often include a speech-language pathologist and a singing voice specialist or acting voice specialist, depending on the profession of the patient. In addition to the most common voice care team members, other professionals can be brought in for consultation.

Otolaryngologists frequently refer voice patients to other specialists. These specialists may include neurologists, pulmonologists, gastroenterologists, psychologists, and psychiatrists. However, the professionals already mentioned are not the only ones who may be called upon. Otolaryngologists may refer voice patients to any professional – including, but not limited to, nutritionists, physical therapists, chiropractors, and acupuncturists. For example, a psychologist may be called upon to aid an otolaryngologist, speech-language pathologist, or voice instructor because, according to “Vocal Disabilities as Described by a Voice Physician,” “At the very bottom of most ills from which artistic people suffer there is a subtle psychological element which must not be overlooked and which must be weighed in the balance with all other findings...”¹ Clearly, the possibilities for members of a voice care team are endless. Even so, a typical voice care team will almost always include an otolaryngologist, a speech-language pathologist, and a singing voice or acting voice specialist.²

The principal member of a voice care team is usually the otolaryngologist. Otolaryngologists are normally familiar with standard voice disorders, their treatment and diagnostic procedures. Even simple voice disorders can be a serious issue in vocal professionals. A vocal professional can be described as anyone who needs his or her voice to make a living. Some examples include singers, actors, clergy, teachers, and lecturers. These vocal professionals need the utmost care to ensure that their voices are

¹Irving Wilson Voorhees, “Vocal Disabilities as Described by a Voice Physician,” *The Musical Quarterly*, Vol. 10, No. 1 (1924): 39.

²Yolanda D. Heman-Ackah and others, “Who Takes Care of Voice Problems? A Guide to Voice Care Providers,” *Journal of Singing*, Vol. 50, No. 2 (2002): 139.

healed properly so that they may continue with their careers without further harming their voices. This is where voice care networks come in.

Most often, someone experiencing a potential voice disorder will begin his or her quest for diagnosis with an otolaryngologist. Though otolaryngologists may be familiar with singers or voice professionals and how they use their voices, there are often times when an otolaryngologist experiences difficulty in understanding and diagnosing problems related to singing. For example, a singer may use “such terms as head voice, tone, register, etc., which mean nothing to the scientist; the scientist, on the other hand, may confuse the singer by concentrating too heavily upon the larynx as the vocal organ, forgetting the equally important factors of respiration and resonance.”³ The link between science and the voice can be a difficult one when it comes to voice professionals and physicians. Voice professionals want to be told what is wrong and how to fix it in terms they understand, and otolaryngologists alone cannot do that. By themselves, otolaryngologists do not usually have the tools or knowledge to properly treat vocal professionals. Therefore, an otolaryngologist will refer a patient to a speech-language pathologist or to a singing or acting voice specialist.

A speech-language pathologist “is a certified, licensed healthcare professional, ordinarily with either a Master's or Ph. D. degree. After college, speech-language pathologists generally complete a one or two year Master's degree program, followed by a nine month, supervised clinical fellowship, similar to a medical internship. At the conclusion of the clinical fellowship year, speech-language pathologists in the United

³Douglas Guthrie, “Physiology Of The Vocal Mechanism,” *The British Medical Journal*, Vol. 2, No. 4066 (1938): 1189.

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.”⁴ Speech-language pathologists treat a variety of disorders. For example, they treat patients who have a variety of disorders, including pediatric language disorders, adult swallowing disorders, cognitive disorders, autism, or disorders caused by a stroke.⁵ Some speech-language pathologists (SLPs) decide to focus on one area in their careers, such as voice disorders. However, there are few places to which a SLP could go in order to study voice disorders extensively, especially those who want to work specifically with singers. Many decide to engage in vocal training and/or research on their own so that they may be able to treat voice disorders. This may include outside research, which they may do by attending seminars, conferences, or workshops.⁶ Those SLPs who decide to do this are able to provide much more accurate treatment for those suffering from voice disorders than those who are general SLPs. The use of SLPs is increasing because of the growing popularity of singing and acting careers.⁷ Otolaryngologists are usually aware of the SLPs in their area who specialize in voice disorders, so that they may refer patients to them when necessary.⁸

The final member of a voice care network is the singing voice or acting voice specialist. For the purposes of this study, we will focus on the singing voice specialist

⁴Heman-Ackah, et al, 141.

⁵Eva Lukkonen, “Speech- Language Pathology and the Singing Voice: Implications for Clinician Training and Suggestions for Assessment and Intervention,” Graduate diss., California State University (2009): 4.

⁶Lukkonen, 4.

⁷Lukkonen, 1.

⁸Heman-Ackah, et al, 142.

(SVS). A singing voice specialist can be defined as a vocal instructor who has specific knowledge and training in the medical aspect of the voice.⁹ It has been noted that a singing voice specialist will most often have a degree in vocal performance or vocal pedagogy and have experience in the field of performance, as well as specific training in the anatomy and physiology of the voice. In addition, they usually are familiar with the treatment of voice disorders.¹⁰ A SVS is most often brought in when surgery is trying to be avoided. They are used to teach non-singers some techniques involved in caring for the voice. They will help “to improve vocal control, volume, projection, quality, and variability.”¹¹

The point of a voice care network, or team, is for the physician, speech-language pathologist, and singing voice specialist to work together, along with any other members who may be added, to give the patient the best care possible. This will begin with the physician, usually an otolaryngologist, who will serve as the leader of the voice care team because he or she will make an official diagnosis and decide whether or not to refer the patient to a speech-language pathologist or singing voice specialist for an evaluation and/or treatment. Following this, according to Karen Wicklund's *Singing Voice Rehabilitation*, “The MD then collaborates with the SLP and SVS by alerting them to any changes in the client's medical status, such as any vocal fold changes upon reexamination, medications prescribed, or pertinent general health information.”¹² Also, if there are any other medical

⁹Lukkonen.

¹⁰Lukkonen, 5.

¹¹Heman-Ackah, et al, 145.

¹²Karen Wicklund, *Singing Voice Rehabilitation: A Guide for the Voice Teacher and Speech-Language Pathologist* (Clifton Park, NY: Delmar Cengage Learning, 2010),

professionals needed, the otolaryngologist will be the one to refer the patient to such a person.

The speech-language pathologist who serves on the voice care team may be responsible for many different tasks. This will most likely include “videoendoscopy/stroboscopy (VES) vocal tract visualization and imaging.”¹³ SLPs and physicians can perform VES, but the way in which they describe their findings is different. Depending on the findings, an SLP may send a patient back to the physician for further diagnosis.¹⁴ Beyond the diagnostic process, the “SLP who works with injured singers can use many therapeutic interventions that involve the singer's speaking voice. Even when the injured singer appears to have few or no problems with the speaking voice, some researchers believe that the SLP possesses a critical role in convincing the injured singer to use proper breath support, relaxation, and healthy vocal onsets.”¹⁵ Because of this, the communication between the SLP and SVS is extremely important to be sure that the patient is being told the same thing by both members of the voice care team.

Karen Wicklund points out that, in order for the voice care network treatment to be effective, the team must be able to work together efficiently. This includes frequent communication. The patient also must give consent for the team members to share information with one another. If this consent is given, Wicklund states, “All team members write and share an initial evaluation report that details the diagnosis of singer's disorder and treatment plan from each member's perspective. All team members may also

68.

¹³Wicklund, 70.

¹⁴Wicklund.

¹⁵Wicklund, 71.

write progress reports as well as therapy dismissal reports.”¹⁶ Each team member must know what is going on with the patient at all times to increase the likelihood of successful treatment. Normally, there will be progress reports sent out to all team members, which may include client attendance, therapy tasks, and the amount of goals reached. Any noteworthy changes in the patient's progress or goals must be communicated to everyone involved.¹⁷

Diagnosing and treating singers with voice disorders is a much different task than doing the same with those who are not singers. Because singers depend on their voices and the health of their voices to continue in their livelihood, it becomes a much more serious matter to make sure that they are treated properly.¹⁸ There are some otolaryngologists and speech-language pathologists who are comfortable and familiar with working with singers. Many have had past training in music, while others simply find it particularly interesting and have studied it extensively.¹⁹ “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.”²⁰ Nonetheless, there are

¹⁶Wicklund, 71- 72.

¹⁷Wicklund, 73.

¹⁸Lukkonen, 1.

¹⁹Heman-Ackah, et al, 144.

²⁰Heman-Ackah, et al.

those out there who dedicate their careers specifically to treating voice disorders and singers.

Those considered “voice professionals” need their voices for their occupations.²¹ The way in which these voice professionals use their voices is tremendously taxing on their vocal health. In “Vocal Nodules: Their Cause and Treatment,” Darrel L. Teter wrote, “The human larynx is an amazing mechanism that was never really intended for the use to which singers subject it. Indeed, the vocal mechanism was meant to close for the protection of the lungs. Human beings have superimposed upon this biological mechanism an incredible function in the form of the singing voice. It is only natural, then, that occasionally disorders of the vocal cords occur.”²² When we use our voices far more athletically than is normal, voice disorders can be the result.

There are as many types of voice disorders as there are levels of disorders. Normally, voice disorders are correlated with vocal misuse. This misuse can be nonvocal, such as “effortful vocal fold closure during physical exertion, coughing, and throat-clearing.” The misuse can also stem from vocal abuse, such as “yelling, shouting, and singing with poor technique.”²³ Those who hold positions as teachers, choir directors, and the like may suffer from a disorder because of prolonged periods of talking. Singers who

²¹Lukkonen.

²²Darrel L. Teter, “Vocal Nodules: Their Cause and Treatment,” *Music Educators Journal*, Vol. 64, No. 2 (1977): 38.

²³Peter R. LaPine, “The Relationship between the Physical Aspects of Voice Production and Optimal Vocal Health,” *Music Educators Journal*, Vol. 94, No. 3 (2008): 25.

sing outside a comfortable range, sing in unfavorable environments, or sing for too long may develop a voice disorder.²⁴

Because there are so many ways people can experience voice problems, a voice disorder may present itself in many forms. These disorders may manifest themselves with mild hoarseness or complete vocal loss.²⁵ In “The Relationship between the Physical Aspects of Voice Production and Optimal Vocal Health,” it is suggested that “any change in vocal quality that lasts longer than two weeks requires a medical practitioner to properly evaluate the physical status of the larynx.”²⁶ Generally, when a person suffering from voice problems does visit a physician, there is no major irregularity. Accordingly, the physician will send the patient on to a singing teacher or a speech therapist to work with the patient on maintaining a healthy voice.²⁷ It is not to be assumed that every person with a sore throat has a voice disorder. Realistically, only “3%- 9% of the population is diagnosed with a voice disorder.”²⁸ According to “Risk factors for the appearance of minimal pathological lesions on vocal folds in vocal professionals,” there are four recognized levels of voice disorder and usage. Level one includes minimal voice lesions and could be very damaging to the career of a professional singer or other voice professionals. Level two involves moderate vocal lesions and could hinder voice professionals (teachers, politicians, and the like) from performing their regular duties.

²⁴LaPine, 25-26.

²⁵Celia R. Hooper, “Treatment of Voice Disorders in Children,” *Language, Speech & Hearing Services in Schools*, Vol. 35, Issue 4 (2004): 320.

²⁶LaPine, 25.

²⁷Guthrie, 1194.

²⁸Jasmina Stojanovic and others, “Risk factors for the appearance of minimal pathological lesions on vocal folds in vocal professionals,” *Vojnosanit Pregl* (2012): 974.

Level three represents serious voice lesions that occur in non-professionals and affects those who do not require their voices for their profession. However, at this level, they will find it difficult to go about their everyday lives because of the loss of their voices. Lastly, level four is a category designed to include those who are considered nonvocal, or non-professional users of the voice whose professional lives would not be hindered by the presence of vocal lesions.²⁹ These four levels of voice disorder provide a simplified overview of the many ways individuals may be affected by voice disorders. It can be noted that, in the lives of some, a voice disorder will hinder their abilities to earn livings, while, for others, it may simply be considered a mild inconvenience.

Vocal Hygiene

To speak solely of disorders, what they are, and who treats them would be quite a disservice. Overall, the main goal should be to avoid having to deal with any of this to begin with. The singer should understand exactly how to keep his voice healthy, but, sadly, the singer usually does not know the first thing about how to do this. This lack of knowledge of vocal hygiene often puts singers in the situation where they are handicapped by a vocal disorder. Therefore, a brief overview of vocal hygiene will be provided. The reason for this is stated best by Friedrich Brodnitz in *Keep Your Voice Healthy*, “To no group should the preservation of physical health be more important than

²⁹Stojanovic, et al, 974.

to the men and women who make professional use of their speaking and singing voices.”³⁰

First, a singer must be aware of the weather. Because traveling is common for singers, they are often exposed to many different climates in a short amount of time. It is suggested that “you should, if at all possible, arrange your schedule to include a day of acclimatization before an appearance,”³¹ allowing your body to acclimate to the weather of a new place. Also concerning weather, dressing properly is one of the most important aspects of protecting yourself. It is a common myth that one must wear layer over layer, when, in fact, “more harm is done by too many and too heavy clothes than by too few and too light ones.”³² Heating and air conditioning causes quite a few problems with singers as well. A quick fix for the heating of our homes and offices is using a humidifier to create moisture in the air and to avoid dry throats.³³

The most important aspects of vocal hygiene are related to nutrition and proper rest. Simply, “our diet should be well planned, with a strong accent on fresh vegetables[,] fruit, and whole grains.”³⁴ This well-planned diet should take the place of over-the-counter vitamin tablets as well.³⁵ A singer should also make sure to get plenty of rest and exercise. Both of these will help to keep a person in good overall health.³⁶

³⁰Friedrich Brodnitz, *Keep Your Voice Healthy, Second Edition* (Boston, MA: College-Hill Press, 1988), 67.

³¹Brodnitz, 70.

³²Brodnitz, 71.

³³Brodnitz, 71- 72.

³⁴Brodnitz, 72.

³⁵Brodnitz, 72- 73.

³⁶Brodnitz, 75.

Additionally, the effect of nicotine has been made very clear by medical professionals in the past, but, for the purposes of discussing vocal hygiene, it must be mentioned. There can be an opposing case made for everything, technically, but there is no way it can be said that nicotine does not damage the voice. The fact is that pipe and cigar smoking is less harmful than cigarette smoking, but that does not mean it is not harmful at all. According to Barbara Doscher's *The Functional Unity of the Singing Voice*, “Smoke of any kind is extremely irritating and dries out the tissues of the nose and throat. Heat from a cigarette has been measured at 300°- 400° F. in the mouth, considerably above the boiling point of water.”³⁷ The best solution is to avoid it altogether.

Alcohol is another similar substance that is abused. Alcohol tends to cause excess mucus in the voice, which can be detrimental to singing. Alcohol also raises body heat, which makes people more likely to catch a cold. The point here is that alcohol does not have to be eliminated. Rather, it should be limited to a minimum and not be consumed before a performance. Also, a singer should avoid cold weather after drinking alcohol, so as to not run the risk of a cold.³⁸

Female singers face additional difficulties due to fluctuation in hormones – in particular, menstruation and pregnancy. It has been discovered that “many women suffer from nasal congestion immediately before and at the beginning of their menstrual periods.”³⁹ In addition, menstruation may cause pain in the abdomen that may hinder breathing. Similarly, because of the hormonal changes, advanced pregnancy may make

³⁷Barbara Doscher, *The Functional Unity of the Singing Voice, Second Edition* (Metuchen, NJ: The Scarecrow Press, Inc., 1994), 251.

³⁸Brodnitz, 75.

³⁹Brodnitz, 76.

singing difficult. To maintain vocal health, most pregnant women avoid singing professionally in the last trimester.⁴⁰

Singers with allergies have a constant struggle throughout their careers. Some may have seasonal allergies, while others have them all year round. The key to being vocally healthy with allergies is treatment. The way to do this is to see a medical specialist to find a treatment that best suits the individual.⁴¹ Sometimes, it may be as simple as eliminating the allergen, such as a food, an animal, or another irritant.⁴²

The healthier the voice is kept throughout a lifetime will protect the voice for a longer period of time. “Those with poor vocal technique are the first to fall by the wayside, while a singer who has devoted a lifetime to perfecting his technique and preserving health intelligently may be able to lead an active professional life in spite of advancing years.”⁴³ These suggestions for vocal hygiene should be implemented into the lifestyle of a singer. Merely avoiding harmful things and doing positive activities two days before a performance are not going to make much difference. The lifestyle of proper vocal hygiene will affect performances. As in *Keep Your Voice Healthy*, the best advice is, “Keep your body in good shape to withstand the rigors of wind and weather, dress sensibly but do not undermine your resistance by pampering yourself, plan your meals in accordance with nutritional requirements, get as much rest and sleep as possible, and exercise moderately. Finding the proper middle course between the two equally

⁴⁰Brodnitz, 76- 77.

⁴¹Brodnitz, 77.

⁴²Brodnitz, 78.

⁴³Brodnitz, 79.

dangerous extremes of willfully neglecting the body and oversolicitous pampering is the most important maxim in vocal hygiene.”⁴⁴

⁴⁴Brodnitz, 80.

CHAPTER III

VOICE DISORDERS

The Science of the Voice and a Look at the Larynx

The ability for a vocal professional to understand the science of the voice has become increasingly more necessary. Meribeth Bunch has given four reasons as to why this is necessary: 1) the scientific community has its own terminology that vocalists should understand; 2) the science of the voice explains exactly what voice professionals do and goes on to discuss this in journals and other publications; 3) understanding the anatomy of the voice and how sound is produced helps vocalists to succeed; and 4) a successful and consistent understanding of the expressionistic and scientific sides of the field makes the singer a better musician.¹ For the purpose of this study, an overview of the vocal mechanism along with a brief description of sound production will be provided.

Singing, like any other instrument, requires the development of a set of skills. Therefore, the voice should be considered an instrument just as a violin, a piano, or a trumpet is an instrument. There are three elements that are required for sound production in all musical instruments: an actuator, a vibrator, and a resonator. The human voice has

¹Clifton Ware, *Basics of Vocal Pedagogy: The Foundations and Process of Singing* (Boston, MA: McGraw Hill, 1998), 52.

one additional requirement, an articulator. To correctly produce vocal tone, all four of these elements must be combined. The brain/nervous system serves as the “motivator” of the voice, because it is the intention behind the voice.²

There are five basic steps in the vocal process. First, volition (the will) causes the brain's neurological system to send a command to the body, which results in responses from the voice. Secondly, the breathing muscles and organs work together to produce air, which is the driving force behind the vocal tone, and manage the breath. This step is called respiration. The third step is phonation. This is when the larynx, which will be described later, works with the airflow to produce vibrations. The fourth step is resonance, which is the combination of the throat, mouth, and nose acting “as acoustical secondary vibrators for enhancing the fundamental buzz-tone.”³ The fifth and final step is named articulation. This involves the actual shaping of the tone, which is carried out by the tongue, teeth, mouth, and lips. These five steps are the key to proper vocal production. A single misstep with any one of these aspects will alter the overall product.⁴

The larynx is “a cartilaginous framework situated at the top of the trachea, serves as a housing for the vocal folds.”⁵ It has three main uses: “(1) keep food and other foreign matter from entering the lungs through the trachea by closing the epiglottis; (2) retain the inhaled air to provide back pressure (torque), known as thoracic fixation, for such activities as lifting heavy objects, giving birth, or defecating; and (3) produce vocal

²Ware, 53.

³Ware, 54.

⁴Ware, 54- 55.

⁵Ware, 95.

tone.”⁶ It is believed by many vocal scientists that the third of these functions was actually the last to come about. According to Ware, the production of sound “took thousands of years” because the larynx had “to be gradually coordinated with the mind and body into an instrument capable of producing such highly sophisticated levels of speech and singing.”⁷ Also, the larynx can be of various sizes. Women, for example, have larynxes usually 20 percent smaller than those of males.⁸

The larynx, sometimes referred to as the “voice box,”⁹ is made up of three cartilages and a bone. At the beginning of a person's life, there is only one bone in the larynx, which is the hyoid bone, but, as the person ages, the thyroid and cricoid cartilages can become ossified, turn into a bone. The hyoid bone is not attached to any other bone, but rather is connected to muscles. There is also what is commonly called an “Adam's apple” that is part of the larynx. This is actually the thyroid cartilage. The cricoid cartilage is the connector of the thyroid and trachea. Where these are connected is considered the inferior cornu.¹⁰

The arytenoid cartilages, which are on both sides of the larynx, are above the “posterior portion of the cricoid cartilage.”¹¹ These connect the muscles that open and close the glottis, or opening of the vocal folds, during tasks such as breathing. The anterior extension, near the front, is the vocal process. The vocal process is “the posterior

⁶Ware, 95- 96.

⁷Ware, 2.

⁸Ware, 96.

⁹Ware, 2.

¹⁰Ware, 97.

¹¹Ware, 98.

attachment of the thyroarytenoid muscle.”¹² The term “posterior” indicates that it is towards the back of the body.¹³ Furthermore, the epiglottis is joined to the thyroid notch at the inside. The epiglottis is “a leaf-shaped cartilage that functions as a cover for the glottis.”¹⁴ This is what protects the lungs from particles of food or other objects.

The conus elasticus is a “cone-shaped membrane sheet that connects the thyroid, cricoid, and arytenoid cartilages with one another.”¹⁵ The vocal ligament, a layer of the vocal folds, is part of the conus elasticus where fibers compact. From here, one may view the ventricle, which is an air space. The ventricle is “a tiny cavity that allows for free movement of the vocal folds.”¹⁶ There are mucous glands in the ventricle that lubricate the larynx. Above the ventricle lie the ventricular folds, which may also be referred to as “false folds.” These are made up “of fatty tissue and mucous glands that lubricate the ‘true folds.’ The ventricular folds are activated only by severe vocal utterances such as a harsh cough or gagging reflex, mechanisms designed to protect airway to the lungs. The ventricular folds may also adduct in persons with voice disorders as they struggle to phonate.”¹⁷

There are many muscles at work in the larynx. These muscles have four functions: to open, to close, to lengthen and thin, and to shorten and thicken. The muscles that open are called abductors. A muscle that is considered an abductor is the posterior

¹²Ware.

¹³“Posterior,” Merriam-Webster, accessed November 10, 2013, <http://www.merriam-webster.com/medical/posterior>.

¹⁴Ware, 98.

¹⁵Ware.

¹⁶Ware, 98.

¹⁷Ware, 99.

cricoarytenoid. This muscle “opens the glottis by causing the vocal folds to abduct.”¹⁸ This is used for breathing. In contrast, an adductor is a muscle that closes the vocal folds. This is used for speaking and singing, and other “biological functions that require a completely closed glottis.”¹⁹ A tensor lengthens and thins the vocal folds. “Contraction of the cricothyroid causes the thyroid cartilage to rock forward slightly on its joint along with the cricoid cartilage.”²⁰ This causes the vocal folds to stretch and become thinner, resulting in tension. Lastly, the relaxers shorten and thicken. When the thyroarytenoid muscle contracts, the arytenoids are pulled closer to the thyroid cartilage, causing the vocal folds to shorten. The vocal fold cover becomes relaxed and vibration becomes slower. This muscle is quite complex, because it also has adductor properties.²¹

This brief explanation of the larynx is necessary for the purposes of this study. However, it is important to remember that the larynx is a highly complex mechanism, and that this description is only a cursory explanation.

Vocal Nodules

Vocal fold nodules, one of the most common voice disorders, are small callus-like growths on one or both of the vocal folds. These are located on the edges of the vocal folds. Vocal nodules, or nodes, are soft when they first manifest themselves. They usually

¹⁸Ware, 100.

¹⁹Ware, 101.

²⁰Ware.

²¹Ware.

begin as a hematoma, a swelling of clotted blood within the tissues or a bruise²², on the edges of the vocal folds.²³ When the vocal folds are exposed to continuing use, these soft, premature nodules become hard or fibrotic. The look of these mature nodules can be compared with the look of corns, such as on a foot.²⁴

Vocal nodules are most generally caused by “excessive force, strain, or protracted detrimental use of the vocal folds.”²⁵ These most often occur in people who use their voices for extended periods of time. Because nodules are sometimes referred to as “singer’s nodes,”²⁶ many relate them to singers in particular. Though this is true, in “Vocal Nodules: Their Cause and Treatment,” Darrel L. Teter points out, “The vocal performer often contributes to the existence of nodules by his or her vocal usage when not performing.”²⁷ Singers tend to become so caught up with their singing voices that they often forget that it matters how they speak as well. Being too loud when talking and talking too much, among other things, are all risky for singers who also spend a great deal of time using their singing voices. However, one should not interpret this as meaning that singers cannot develop vocal nodules because of misuse of their singing voices. This is absolutely not the case. There are a variety of ways a singer can use his voice improperly or excessively so that vocal nodules will form. Singers who practice for multiple hours a

²²“Haematoma,” Merriam-Webster, accessed November 4, 2013, <http://www.merriam-webster.com/medical/haematoma>.

²³Meribeth Bunch, *Dynamics of the Singing Voice, Third edition* (New York, NY: Springer- Verlag/ Wien, 1982), 127.

²⁴Darrel L. Teter, “Vocal Nodules: Their Cause and Treatment,” *Music Educators Journal*, Vol. 64, No. 2 (1977): 38.

²⁵LaPine, 26.

²⁶Teter.

²⁷Teter, 39.

day may run a higher risk of developing nodules.²⁸In his book, *The Diagnosis and Correction of Vocal Faults*, James C. McKinney says, “A number of medical authorities have indicated that singing at too high a pitch level may contribute to certain vocal disorders.”²⁹ Why would a person sing at too high a pitch level for a long enough period of time to cause vocal nodules? Well, we live in a musical culture where we often hear that the money is in the high notes. Therefore, a mezzo-soprano may convince herself that she is a soprano, take on soprano roles, and practice soprano repertoire all in hopes of making it in the music business. This mezzo-soprano is doing severe damage to her vocal folds. McKinney makes a good comparison by saying, “Extensive singing in the upper limits of your voice is somewhat like driving a car at top speed all the time. You may cover a lot of miles, but the motor will wear out much sooner that it would if you drove at normal speeds, and you probably will have to pay some speeding tickets. Increasing tension on the vocal cords is one of the means of raising pitch. Singing above your best tessitura keeps your vocal cords under a great deal of unnecessary tension for long periods of time, and the possibility of vocal abuse is greatly increased.”³⁰This tension McKinney speaks of is one very common cause of vocal nodules.

Another possible cause of vocal nodules has to do with the use of glottal attacks while singing. A hard glottal onset, or attack, “is created when breath pressure builds up below the strongly adducted vocal folds and explodes them apart.”³¹A soft glottal onset is

²⁸Bunch, 127.

²⁹James C. McKinney, *The Diagnosis & Correction of Vocal Faults* (Nashville, TN: Genevox Music Group, 1994), 118.

³⁰McKinney.

³¹Ware, 107.

often necessary to articulate certain words that begin with vowels, and is also required for singing in some other languages.³² According to McKinney, “Making a proper attack is very difficult for a person with tense vocal folds. The resulting phonation tends to start with an explosion of air, because the glottis is firmly closed and breath pressure is increased until the vocal folds are almost violently blown apart.”³³ This violence that McKinney speaks of is the reason that these attacks have been identified as a cause of nodules. Therefore, it is very important that a singer learns how to correctly go about this so as not to harm his voice. A soft glottal onset is preferable and much less damaging than a hard glottal attack. To expand on this, any excess effort can be harmful to a person's voice. For example, singers are known for sometimes using too much muscle in the throat to sing, or singing from their throat. This is an example of tightening one's vocal folds.³⁴ Some singers are more prone to tightening and muscular singing than others.

The possible causes for vocal fold nodules are endless. In the article “A Case for Silent Vocal Abuse,” it was stated that vocally abusive behaviors could cause structural change in the vocal mechanism, which leads to vocal disorders. These vocally abusive behaviors include: “excessive, prolonged loudness; strained and excessive vocal use during periods of swelling, inflammation, or other tissue change; excessive coughing and throat clearing; screaming and other vocal noise making; and vocalizing as a sports and

³²Ware.

³³McKinney, 90.

³⁴Bunch, 127.

exercise enthusiast either as observer or participant.”³⁵ In the same article, the authors suggest that, although vocal abuse is an extremely common cause, another primary cause is psychosomatic. According to these authors, “The lesions are the result of abnormal speaking behavior, more often than not, motivated by personality or emotional factors.”³⁶ This indicates that the way in which a person speaks goes hand in hand with this person's emotional and mental well-being. Therefore, if a person is not emotionally or mentally healthy and displays that in his or her voice, this person has a particular risk for a voice disorder. The article also states that “vocal nodules can occur for the first time in singers as a result of emotional stress.”³⁷ Not only does vocal stress cause vocal nodules, but emotional stress is a major source of nodules as well. One can assume that this emotional stress may manifest itself vocally. To elaborate on the cause of vocal fold nodules, the nodules themselves may be worsened or more likely to occur if the individual suffers from allergies, upper respiratory infections, infectious laryngitis, or uses tobacco or alcohol.³⁸

Vocal fold nodules are more frequent in pop and rock singers, and also in salesmen and preachers. Though not the main focus of this study, salesmen and preachers often engage in the type of activity that will result in vocal nodules. These two occupations both depend on stress and tension when they produce sound. This is the same with many pop and rock singers. According to Bunch, vocal nodules occur in these

³⁵Deborah K. Williamson and others, “A Case for Silent Vocal Abuse,” *Journal of Singing*, Vol. 61, No. 4 (2005): 379.

³⁶Williamson, et al, 380.

³⁷Williamson, et al.

³⁸Teter, 38.

particular people as a “result of speaking and singing habits that cause too much friction when the vocal folds vibrate thus causing irritation of the edges of the folds.”³⁹ It must be noted that often there is little vocal training required to engage in these careers. Therefore, the individuals who speak or sing improperly on a daily basis have no idea they're doing anything wrong until their voices begin to deteriorate. Also, a pop and rock singer who is “required to sing over amplified instruments in a loud voice for three or four hours of performing at a time is an ideal candidate for vocal nodules. Those who sing rock music to the accompaniment of amplified guitars in noisy, smoke-filled environments are also running the risk of vocal nodules.”⁴⁰

If someone does do enough damage to the voice to develop a vocal disorder, the key then is being able to diagnose the disorder as vocal nodules. There are some symptoms that are particular to vocal nodules. Breathiness, hoarseness, and voice breaks are all common signs of nodes. These have been deemed as “classic” indications of nodules, but nodules can manifest themselves in many other ways or not show themselves at all. Many may assume that a voice with nodules would be easy to identify, but that is not always the case. Additionally, continual singing in the range in which the voice sounds its best may actually cause the most harm to the singer. The article, “Vocal Nodules: Their Cause and Treatment,” indicates that those with vocal nodules usually sound the best in the range that is most damaging for them. “This is understandable when one realizes that the nodules produce breathiness and hoarseness because they disrupt the contact of the normally smooth vocal cord edges. The presence of nodules keeps the

³⁹Bunch, 127.

⁴⁰Teter, 39.

vocal cord margins from making their normal contact and vibration. With increases in pitch and effort at glottal closure, the margins are forced together for vibration. Under these circumstances, the breathy, hoarse quality disappears, and the singer can produce a clear tone.”⁴¹ Regrettably, singing in this range can lead to the nodules hardening further, which brings them to a level where it is nearly impossible to be able to produce a normal sound again. Once nodules have reached this state, standard treatment may no longer be adequate to correct the problem.

Unfortunately, the presence or absence of common characteristics of nodules does not indicate the amount of damage done, or the size or hardness of the nodules.⁴² This is only something that a voice care team will be able to indicate. Consequently, if a voice professional experiences one or more of these symptoms from time to time, it does not automatically point to vocal nodules. For example, Bunch states, “Some light hoarseness may occur immediately after rehearsal, and with rest it will probably be gone by the next day. However, when hoarseness occurs after every practice, or when it does not become clear by the next day, it is an indication the voice is either being improperly used or that there may be something more seriously amiss.”⁴³ This does not necessarily mean that vocal fold nodules are present. It does, however, make it clear to the singer that the voice is being used in the wrong way, which means that a visit to a voice care team may be the best decision.

⁴¹Teter, 40.

⁴²Teter.

⁴³Bunch, 127.

After an individual has visited a voice care network and been diagnosed with vocal nodules, the treatment will begin. Usually, the treatment begins with vocal rest. After the amount of vocal rest indicated by the voice care team is completed, vocal therapy follows. The vocal rest section of the treatment process commonly is a period of five to seven days, depending on the stage of the nodes. The reason that vocal rest often does not work, however, is the fact that it is often misused. According to Darrel L. Teter, “The purpose of voice rest is twofold: first, to eliminate vocal abuse totally in order to allow any nonfibrotic thickening of the cords to disappear before starting any formal voice therapy, and second, to drastically reduce vocal usage and eliminate bad vocal habits in order to allow new patterns to be established... A well-designed voice-rest program calls for literally no talking or whispering for five to seven days.”⁴⁴ Because the vocal-rest programs are so strict, the patient rarely is able to complete it. The patient will receive a rather extensive list of suggestions for this five-to-seven day period. These may include instructions to avoid yelling, whispering, conversing in loud areas, speaking at a far distance away from someone, and speaking while doing any sort of exercise. The patient also cannot drink liquids that can create excess mucus, like milk. Also, he or she cannot drink hot liquids because they cause a drying of the throat. Smokers must quit; alcoholic beverages are not permitted.⁴⁵ This list makes it understandable as to why the vocal rest segment usually is not carried out properly.

As previously mentioned, vocal therapy will follow voice rest. The voice therapy program focuses mainly on eradicating abuses in the speaking and singing voice. The

⁴⁴Teter, 40.

⁴⁵Teter, 41.

voice therapist or speech pathologist will then attempt to develop better vocal habits that will not harm the patient further. Vocal hygiene, proper breath control, proper onset of voice, and proper pitch and volume will all be addressed in voice therapy, which is the most important aspect of the rehabilitation process. According to LaPine, what matters most “is identifying and eliminating the behavior that caused the lesion. If the audible changes in the voice are properly identified and appropriate treatment begun, with careful attention to individual behaviors, the voice will quickly return to normal.”⁴⁶ If the root of the problem is not found and addressed, the singer will continue to engage in the bad habits and find himself or herself in the same situation again.

Rarely, a singer with nodules may be able to take medication to relieve possible contributing factors. For example, if a singer is suffering from a sinus or respiratory infection and nodules simultaneously, medication would be useful to help clear up the infection.⁴⁷ To be clear, the medication does not cure nodules. Medication would only cure a possible contributing factor to the formation of them. Medication is very rarely used in the vocal nodule treatment process.

In a case where the vocal nodules may be fibrotic, an otolaryngologist might find it appropriate to surgically remove the nodules. When a node is fibrotic, it is generally believed that it will not respond to voice rest or vocal therapy. A surgical procedure to remove vocal nodules is done with a patient under anesthesia. The surgeon goes through the mouth to cut the nodule off of the vocal fold. Only one nodule is removed per surgical procedure. Therefore, if there are two, a second procedure will be necessary.

⁴⁶LaPine, 26- 27.

⁴⁷Teter, 40.

Conventional wisdom holds that there is a smaller likelihood of complications when the nodules are removed in separate procedures. The patient is usually required to be hospitalized overnight and then complete several days of voice rest.⁴⁸ Because of recent technological advancement, there should be little risk of damaging the vocal folds. The article, “Vocal Nodules: Their Cause and Treatment,” mentions that, “In the hands of a skilled surgeon using modern microscopic techniques, the risk to the patient and the possibility of damage to the vocal cords is virtually nonexistent. The only problem with surgical intervention for the management of nodules is the possibility of the nodes returning following surgery. Obviously, the surgical procedure is going to remove the nodule without removing the vocal abuse that created it.”⁴⁹ Since the surgical procedure only will eliminate the actual nodules and not the cause of them, vocal therapy is recommended following surgery, along with proper vocal rest. Resting the voice is extremely important because the bad habit will return, which may result in yet another vocal nodule.⁵⁰

Spasmodic Dysphonia

Spasmodic dysphonia (SD) is “a neurological voice disorder that involves 'spasms' of the vocal cords causing interruptions of speech and affecting the voice

⁴⁸Teter.

⁴⁹Teter.

⁵⁰Bunch, 128.

quality.”⁵¹ It is a particularly uncommon disorder.⁵² This disorder is a disabling condition and is considered chronic. SD may cause the voice to sound tight or strained, almost as if someone is being strangled while speaking. There may be breaks in the voice as well.⁵³ This disorder customarily begins in a person's fifth decade. SD is a disorder believed to develop gradually, and it will worsen as time goes on.⁵⁴ It should be noted that SD is a neurological disorder. The group of neurological disorders that SD belongs to is called dystonias. According to the National Spasmodic Dysphonia Association, a dystonia “is a movement disorder that causes muscles to contract and spasm involuntarily. Dystonias can be generalized, affecting the entire body, or focal, affecting only a specific area of the body or group of muscles.”⁵⁵ The root of the disorder is in the brain, not the vocal folds. Because spasmodic dysphonia is a dystonia, the spasms only occur when a person with SD uses the voice. For example, when he or she tries to speak, the spasms begin, but if he or she is swallowing, no spasm occurs. The spasms take place in the small muscles of the larynx, which causes the voice to sound tight or breathy, or break. SD has been diagnosed in approximately 50,000 people in North America. The majority of these people are middle-aged. SD also tends to occur in women more than men. Spasmodic Dysphonia

⁵¹National Spasmodic Dysphonia Association, accessed November 4, 2013, <http://www.dysphonia.org/>.

⁵²Kristine Tanner and others, “Spasmodic Dysphonia: Onset, Course, Socioemotional Effects, and Treatment Response,” *Annals of Otolaryngology, Rhinology & Laryngology*, Vol. 120, Issue 7 (2011): 465.

⁵³National Spasmodic Dysphonia Association.

⁵⁴Tanner, et al, 471.

⁵⁵National Spasmodic Dysphonia Association.

also most often occurs in those who are not suffering from any structural abnormality of the larynx, like nodules.⁵⁶

There are three types of spasmodic dysphonia that a person may have. One is adductor spasmodic dysphonia, which is the most common. This form is distinguished by spasms that result in the slamming together or stiffening of the vocal folds. This makes the sound production of the vocal folds difficult. The spasms tend to cut words off or make it difficult to begin a word. As a result, speech may be uneven. Spasms are typically nonexistent when a person with SD is laughing, crying, or shouting. Also, stress is a factor that can make these spasms more intense. The second type of SD is abductor spasmodic dysphonia, which is when spasms keep the vocal folds open, preventing them from vibrating. This position also makes it possible for air to escape while speaking, causing the voice to sound breathy and weak. The spasms that occur with abductor SD are also nonexistent during activities like laughing, crying, or shouting, just as with adductor SD. The final type of SD is mixed spasmodic dysphonia. This is a blend of the other two types. This is the rarest of the three. In this case, the muscles of the larynx that open and close do not work. This gives it qualities of both adductor spasmodic dysphonia and abductor spasmodic dysphonia.⁵⁷

The overall cause of spasmodic dysphonia is unknown.⁵⁸ However, as previously mentioned, the complication lies in the brain. The National Spasmodic Dysphonia

⁵⁶National Spasmodic Dysphonia Association.

⁵⁷“Spasmodic Dysphonia,” National Institute on Deafness and Other Communication Disorders, accessed November 4, 2013, <http://www.nidcd.nih.gov/health/voice/Pages/spasdysp.aspx#4>.

⁵⁸Tanner, et al, 465.

Association states that SD “starts at the base of the brain in the basal ganglia, which regulate involuntary muscle movement. To oversimplify, this nervous system regulator does not function properly and produces incorrect signals, which cause the muscles to contract or relax more than they should or at the wrong time.”⁵⁹ It is possible that a person develops SD as a result of genetics, even if another family member's form of dystonia is not SD.⁶⁰ According to the National Institute for Deafness and Other Communication Disorders, “In some cases, spasmodic dysphonia may run in families. Although 14 genes have been recently associated with various dystonias, only mutations in one gene, named THAP1, have been associated with forms of whole body dystonia that begin in childhood and that appear with spasmodic dysphonia. This genetic defect does not seem to be associated with the more usual form of focal spasmodic dysphonia that begins in adults, however.”⁶¹ The simple fact is that no one is sure. The cause is still a mystery. The difficulty in determining a cause lies in the manifestation of the problem. The spasms that cause SD are not present in all kinds of speech. When an individual with SD laughs, cries, yells, clears the throat, coughs, whispers, and hums, the symptoms associated with SD will improve or even vanish. Normally, spasmodic dysphonia “does not affect the emotional aspects of speech. Researchers consistently have identified abnormalities in brainstem reflexes and other aspects of disordered neurological function in people with spasmodic dysphonia.”⁶² There has been, and continues to be, general debate as to how extensively psychological factors may contribute to the development of

⁵⁹National Spasmodic Dysphonia Association.

⁶⁰National Spasmodic Dysphonia Association.

⁶¹“Spasmodic Dysphonia.”

⁶²National Spasmodic Dysphonia Association.

SD. At one time, the cause was thought to be solely psychogenic because the voice can have moments of normality, and it has not been proven that this does not happen rarely. However, the spasms do result from abnormalities in the brain.⁶³ There has also been evidence that factors such as stress may cause the symptoms to begin. Also, viral infection, head trauma, bronchitis, and surgery have been linked to the appearance of symptoms. However, these remain only theories.

The symptoms of spasmodic dysphonia are similar to those of other voice disorders. Since this is the case, the diagnosis of the disorder is difficult.⁶⁴ A voice with SD and a voice with a common voice disorder tend to sound alike. These similarities create great difficulty for proper diagnosis. In addition, the larynx reveals no sign of abnormality. As stated by the National Spasmodic Dysphonia Association, “The excessive strain and misuse of muscle tension dysphonia (MTD), the harsh strained voice of certain neurological conditions, the weak voice symptoms of Parkinson's disease, certain psychogenic voice problems, acid reflux, or voice tremor are often confused with SD. Therefore, the best way to diagnose the problem is to find an experienced clinician with a good ear.”⁶⁵

A voice care team is the perfect combination of “good ears” to diagnose a person with SD. When SD is suspected, a “neurologist may also be part of the diagnostic team to evaluate a patient for other forms of dystonia or other neurological conditions.”⁶⁶ After the voice care team is assembled, the evaluation of the patient's voice begins. The sound

⁶³“Spasmodic Dysphonia.”

⁶⁴“Spasmodic Dysphonia.”

⁶⁵National Spasmodic Dysphonia Association.

⁶⁶National Spasmodic Dysphonia Association.

of the patient's voice is observed carefully to help eliminate other disorders. The patient will be required to “read and speak specific sentences loaded with certain sounds.”⁶⁷ Once other disorders are ruled out, the voice care team can proceed with a treatment plan.

Once a diagnosis has been made, there is no way to cure the disorder.⁶⁸ The patient must learn to live with his or her diagnosis of SD before, during, and after treatment. However, treatment is a way to improve the overall quality of life for a person suffering from SD. The treatment most commonly preferred is to inject the individual suffering from SD with a small amount of botulinum toxin, or botox, into the laryngeal muscles. On the authority of the National Institute on Deafness and Other Communication Disorders, “Botulinum toxin is produced by *Clostridium botulinum*, the same bacterium that occurs in improperly canned foods and honey. The toxin weakens muscles by blocking the nerve impulse to the muscle.”⁶⁹ These injections usually improve vocal quality for about three to four months. After this period, the voice returns to its original difficulties. To counteract this relapse, those with SD will often be reinjected with botulinum toxin to maintain an adequate speaking voice. Following botulinum toxin injections, symptoms of SD generally abate. These injections are most effective for those with adductor spasmodic dysphonia, but can be helpful in other cases, as well.⁷⁰ In a study reported in “Spasmodic Dysphonia: Onset, Course, Socioemotional Effects, and Treatment Response,” it was determined that “the vast majority of patients

⁶⁷National Spasmodic Dysphonia Association.

⁶⁸National Spasmodic Dysphonia Association.

⁶⁹“Spasmodic Dysphonia.”

⁷⁰“Spasmodic Dysphonia.”

who received Botox (91%) reported that it 'helped the voice.'"⁷¹ Subsequent to botox injections, treatments received by SD patients were voice therapy, medication, and surgery.⁷²

Another method of spasmodic dysphonia treatment is voice therapy. This will not cure or greatly diminish symptoms, but it can assist in relieving some symptoms. Additionally, psychological counseling is recommended for those who have a difficult time accepting their diagnosis. This can help them to be able to better live with SD. Though the last resort in most cases, surgery may be considered if no other treatment is resulting in any decrease of symptoms.⁷³

As already stated, the symptoms of SD never disappear because there is no cure. Dr. Kristine Tanner and others concluded, in "Spasmodic Dysphonia: Onset, Course, Socioemotional Effects, and Treatment Response," that "SD symptoms often plateau with the first year after onset, although some individuals experience progressive worsening over time."⁷⁴ Whether the symptoms continue to worsen or level out after a certain amount of time varies from patient to patient. There is no cure or set treatment process for SD because so little is known about the disorder, and it is so difficult to diagnose.

Vocal Polyps

⁷¹Tanner, et al, 470.

⁷²Tanner, et al.

⁷³"Spasmodic Dysphonia."

⁷⁴Tanner, et al, 465.

Vocal polyps are benign growths that either “sit on the fold with a broad base” or are “attached to the fold by a narrow ‘neck.’”⁷⁵ Normally, a polyp is unilateral, which means that it occurs on only one side of the vocal folds.⁷⁶ Polyps are often compared with vocal fold nodules and even called “a nodule with a stalk.”⁷⁷ By “stalk” or “neck,” it is meant that the polyp itself is sometimes attached by a smaller stem-like piece to one fold. This is not always the case, however. Sometimes, as mentioned earlier, the polyp is simply broader and without a “stalk” or “neck.” Polyps can reach the size of a cherry stone.⁷⁸

The causes of vocal nodules and polyps go hand in hand. There is no direct explanation, but “chronic irritations (such as prolonged laryngitis, excessive smoking, constant abuse of the voice) are contributing factors.”⁷⁹ As mentioned in the vocal nodules section, improper glottal attacks may contribute to one's development of a vocal fold polyp. Tense folds can cause a person to increase air pressure, which causes the vocal folds to slam together violently. This causes the membrane that covers the folds to be damaged, which may lead to polyps, or nodules. Thus, it is of great importance that a singer understands that soft glottal onset is healthier and should be preferred.⁸⁰

Unlike nodules, it is possible for vocal polyps to be caused by a single event. In *The Functional Unity of the Singing Voice*, Barbara Doscher gives an example of a person yelling continuously at a sporting event and states that this, even on just one

⁷⁵Brodnitz, 123.

⁷⁶Ware, 215.

⁷⁷Bunch, 127.

⁷⁸Brodnitz, 123.

⁷⁹Brodnitz, 124.

⁸⁰McKinney, 90.

occasion, may cause someone to develop a polyp.⁸¹ According to Clifton Ware's *Basics of Vocal Pedagogy*, those who smoke run a higher risk of developing polyps, as well.⁸² When polyps are located at the midpoint of the vocal fold, it is suggested that the polyp is the “result of phonotrauma, the physical stresses on the vocal fold which occur with heavy voice use or voice use under adverse circumstances.”⁸³ According to Doscher, “Most polyps are the result of vocal fold hemorrhaging which, when absorbed, leaves the tissue swollen and distended.”⁸⁴ Dr. Sulica, of Voice Medicine in New York City, states that many believe “that polyps are formed by localized bleeding of the small blood vessels of the vocal fold when they are ruptured by shear forces.”⁸⁵ Vocal fold hemorrhages are, in fact, “the result of a ruptured blood vessel within the fold cause by internal or external trauma.”⁸⁶

As previously stated, the symptoms of vocal fold nodules and polyps are quite similar. The voice of a person who has a polyp often sounds hoarse, rough, and/or breathy.⁸⁷ Once the vocal folds are examined, however, it is quite easy to see the difference. “Whereas the vocal nodule is a callous formation, the polyp generally has the structure of a small, engorged blood vessel.”⁸⁸ The polyp with a stalk may hang beneath

⁸¹Doscher, 220.

⁸²Ware, 215.

⁸³Voice Medicine, accessed November 4, 2013, <http://voicemedicine.com/>.

⁸⁴Doscher, 220.

⁸⁵Voice Medicine.

⁸⁶Ware, 215.

⁸⁷Melda Kunduk and others, “Vocal Fold Vibratory Behavior Changes Following Surgical Treatment of Polyps Investigated With High- Speed Videoendoscopy and Phonovibrography,” *Annals of Otolaryngology, Rhinology & Laryngology*, Vol. 121, Issue 6 (2012): 356.

⁸⁸Doscher, 220.

the adducted (closed) vocal fold, which means that, when the folds are closed, the polyp hangs beneath. This may make the polyp more difficult to detect because there is little change in the vocal sound.⁸⁹ Physicians may even have a difficult time seeing the polyp by scoping. In *Keep Your Voice Healthy*, Dr. Friedrich Brodnitz mentions that the polyp “may move up and down with the breath and become visible between the folds only on forceful expiration (for instance, in coughing). In such cases the marked hoarseness which a polyp produces will alternate with clear voice, depending on the momentary position of the polyp.”⁹⁰ Because of the positioning and repositioning of the polyp, many otolaryngologists have missed the growth on a patient's vocal folds during examination only to have another physician find it upon a separate examination.⁹¹ A person with a vocal polyp that has a stalk or neck may experience “a sensation of a foreign body at the level of the vocal folds, or a feeling of wanting to clear the throat,”⁹² even if there is little change in the sound of the voice. This sensation may help in the diagnostic process if the patient knows enough to mention it.

Like most disorders of this kind, the treatment of vocal polyps depends upon the severity of the case. If the polyp is small, it is possible that vocal rest and therapy to train the voice user how to do so correctly may allow the growth to heal on its own. Otherwise, surgery is necessary.⁹³ In the case of polyps, however, most believe that surgery is really the only way to completely eliminate them. “Voice rest, often prescribed in cases of

⁸⁹Doscher, 220.

⁹⁰Brodnitz, 123.

⁹¹Brodnitz, 124.

⁹²Voice Medicine.

⁹³Bunch, 127.

hoarseness, may improve the voice somewhat, but is not likely to make a polyp go away.”⁹⁴

The removal of a polyp is considered a simple procedure, especially with modern medicine.⁹⁵ “More often than not, polyps require microlaryngoscopic surgery to be removed. Whether an individual should take this step depends on the level of vocal disability, the potential for future damage and the certainty of the diagnosis.”⁹⁶

Following surgery, voice therapy is recommended and considered by most to be a crucial step in the recovery process. According to Bunch, vocal therapy is important because “when the singer (or speaker) returns to the same patterns of vocal production, the growth will return. Surgery only eliminates the symptom, it does not cure the causal habit.”⁹⁷ Brodnitz gives one example of continual behavior causing redeveloped polyps: “To illustrate my point, the owner of a very noisy factory and a mediocre actress who both habitually strained their voices (the one by shouting in the workrooms, the other by speaking on and off stage with untrained force) had polyps removed. Within a year new polyps were formed on the vocal folds of both patients. Finally persuaded of the connection between vocal abuse and polyp formation, they both underwent systematic training of the speaking voice. No troubles have been experienced since, for six years in one case and eight years in the other.”⁹⁸ In vocal therapy, an effort must be made to determine the cause of abuse, if abuse is a factor in the existence of the polyp. For

⁹⁴Voice Medicine.

⁹⁵Bunch, 127.

⁹⁶Voice Medicine.

⁹⁷Bunch, 128.

⁹⁸Brodnitz, 124.

example, if a young woman is a cheerleader and her excessive yelling has caused her to develop polyps, this must be pointed out and addressed. If someone with a polyp has a successful surgery and follows that with vocal therapy to determine the cause and learn proper vocal technique, there should be no risk of reoccurrence.⁹⁹

Vocal Cysts

A vocal fold cyst is a “fluid collection in a sac-like structure.”¹⁰⁰ These are caused by the build-up of the mucus lining the vocal folds. When one of the glands that secretes the mucus does not drain correctly, a cyst can result. These are considered benign growths, not cancerous. Unlike nodules and polyps, cysts are not limited to a particular area in the vocal folds. Cysts normally only occur on one vocal fold, but they are not necessarily in the same area as nodules or polyps.¹⁰¹ Nonetheless, if the cause of the cyst is related to the misuse of the voice, it may appear at the midpoint of the vocal fold.¹⁰²

A symptom of a vocal cyst is hoarseness, which is also a common symptom with other benign vocal lesions. The hoarseness is caused by the inability of the vocal folds to close completely due to the restriction of the cyst. In certain cases, a person with a cyst may feel the need to clear the throat or cough often.¹⁰³ There is also the chance that a

⁹⁹Voice Medicine.

¹⁰⁰“Vocal Fold Nodules, Cysts, and Reinke's Edema,” Eastern Virginia Medical School Department of Otolaryngology, accessed November 10, 2013, http://www.evmsent.org/cysts_or_polyps.asp.

¹⁰¹“Vocal Fold Nodules, Cysts, and Reinke's Edema.”

¹⁰²Voice Medicine.

¹⁰³Voice Medicine.

person with a cyst may “develop vocal strain or muscular tension to compensate for poor vibration and closure of the vocal folds.”¹⁰⁴ It has been observed that cysts are more common in females and can differ in size with the menstrual cycle. Due to the fact that most cases with vocal cysts are unilateral, occurring on only one side, the other vocal fold may swell as a reaction to the cyst on the opposite fold.¹⁰⁵ According to the East Virginia Medical School, the swelling or “thickening that has developed in response to the cyst... should resolve spontaneously after removal of the cyst.”¹⁰⁶ Through examination using a strobe light, an otolaryngologist will identify a cyst as a “spherical white or translucent mass located underneath the mucosa of the vocal fold. Because the mucosa drapes over it, it may look like a mound within the fold. For this reason, very small cysts may be indistinct.”¹⁰⁷

The treatment of vocal cysts is quite different than that of vocal fold nodules and polyps. Because cysts may cause hoarseness, an automatic reaction may be to instruct one to go on vocal rest for a certain amount of time. For someone with a vocal cyst, vocal rest may improve the overall quality of the voice to some extent and make some of the swelling to go down, but there is little chance that it will result in the disappearance of the cyst.¹⁰⁸ Similarly, voice therapy is not recommended as often after someone has been diagnosed with a vocal cyst as it is when someone is diagnosed with vocal fold nodules

¹⁰⁴Ken W. Altman, “Benign Vocal Lesions- Nodules, Polyps, Cysts,” Northwestern Medical Faculty Foundation, accessed November 10, 2013, <http://www.nmff.org/documents/OtolaryngologyHeadandNeckSurgery/Otolaryngology.Voice.BenignVocalLesions.pdf>.

¹⁰⁵Altman.

¹⁰⁶“Vocal Fold Nodules, Cysts, and Reinke's Edema.”

¹⁰⁷Voice Medicine.

¹⁰⁸Voice Medicine.

or polyps. This is mostly related to the fact that cysts are rarely caused by vocal misuse.¹⁰⁹ Therefore, usually, “a cyst must be removed by means of microlaryngoscopic surgery. Because incomplete removal may lead to recurrence, every effort must be made to remove the cyst intact. At the same time, the overlying mucosa must be preserved and draped over the area where the cyst was removed to minimize the chance of scar. This type of surgery is technically challenging, since the cyst, which is usually fragile, may be attached to surrounding tissue and is likely to burst or leak if not handled very gently.”¹¹⁰ If compared to that of vocal nodules and polyps, the surgery is much more difficult. Also, surgery is required more often with cysts, whereas with nodules and polyps, it is a last resort.

Though not usually, cysts do sometimes occur due to vocal misuse. In these cases, according to Dr. Sulica, it is the physician's job to decide. “The physician must decide how much of a role chronic irritation and phonotrauma play in each individual patient and prescribe medication and voice therapy accordingly.”¹¹¹ Therefore, if the physician does determine that misuse is a contributing factor, then vocal therapy will be recommended for proper recovery. Altman states, “Treatment initially focuses on maximizing medical management of irritants, improving vocal habits, and vocal behavior modification through speech therapy.”¹¹² Normally, this use of therapy for treatment does not take the place of surgery in the case of vocal cysts. As previously mentioned, the voice may experience slight improvements with therapy, but the chance of complete

¹⁰⁹“Vocal Fold Nodules, Cysts, and Reinke's Edema.”

¹¹⁰Voice Medicine.

¹¹¹Voice Medicine.

¹¹²Altman.

recovery is rare. “While some vocal professionals may clinically improve to be able to use their voice with minimal limitation, vocal cysts typically do not completely resolve and typically eventually require surgery.”¹¹³ Depending on the case, the physician may want to try vocal therapy for a certain period of time before scheduling a surgery. This may be the case if the vocalist is particularly hesitant due to the use of the voice in his or her professional life. This is completely understandable due to the delicacy required for the surgery and the difficulty in performing it.

Vocal Fold Hemorrhage

The vocal folds house many delicate blood vessels.¹¹⁴ A vocal fold hemorrhage comes about when a blood vessel is ruptured within the vocal fold.¹¹⁵ This causes bleeding into the layer of the folds that is needed for vibration. “Because this layer is made up of a network of loosely- arranged fibers, blood spreads throughout it quickly and affects it so that the vocal fold does not vibrate as well.”¹¹⁶ A vocal fold hemorrhage does not necessarily mean mass quantities of blood. Sometimes, it takes only a small amount to cause a vocal fold hemorrhage.

When a person has a vocal fold hemorrhage, the vocal fold becomes red, either in patches or expanding over the entire fold. There is no actual bleeding outside of the fold.

¹¹³Altman.

¹¹⁴“Vocal Hemorrhage,” Osborne Head and Neck Institute, accessed November 11, 2013, <http://www.voicedoctorla.com/vocal-hemorrhage/>.

¹¹⁵Ware, 215.

¹¹⁶Voice Medicine.

“Because the bleeding takes place under the mucosa, the blood has no way out of the vocal fold and spreads throughout the loose tissue layer of the superficial lamina propria.”¹¹⁷ Like a bruise, as the hemorrhage heals, it will change colors, first to a darker red and then brown as it fades. If there has been bleeding once before in that same area, it may yellow as it heals. It is possible for a hemorrhage to recur.¹¹⁸

Vocal fold hemorrhage can occur due to internal or external trauma of the voice.¹¹⁹ Most often, vocal fold hemorrhages are caused by misuse or abuse of the voice in a single event.¹²⁰ This abuse can include: “singing aggressive styles (i.e., gospel, rock, etc), singing incorrectly (i.e., poor technique, when unwell), singing in poor environments (i.e., poor amplification, poor monitors, loud environment, etc), throat clearing, coughing, shouting.”¹²¹ Prolonged misuse is the most likely reason that a blood vessel will rupture. It is common for a person with laryngitis to develop a hemorrhage because the blood vessels are already swollen, making them more delicate. Anything that weakens the blood vessel wall, like a vocal fold polyp, will make a person run a higher risk of hemorrhaging.¹²²

There are a variety of symptoms that may present themselves, depending on the person and the vocal usage. For the person who is a professional voice user, the possible symptoms are “hearing two pitches at the same time, hearing a flutter in your voice, moderate-severe hoarseness in your voice, significantly decreased range (no longer

¹¹⁷Voice Medicine.

¹¹⁸Voice Medicine.

¹¹⁹Ware, 215.

¹²⁰Voice Medicine.

¹²¹“Vocal Hemorrhage.”

¹²²Voice Medicine.

hitting higher notes easily), inability to sing quietly, inability to hold a pitch steady, neck pain.”¹²³ The most notable symptom is loss of voice range. According to the Osborne Head and Neck Institute, “Singers often describe it as a 'curtain' suddenly dropping over their voice. It is rare, if not impossible, to access your full vocal range with a hemorrhage.”¹²⁴ For someone who does not use the voice professionally, that person may notice a feeling of tightness in the throat and/ or hoarseness in the speaking voice.¹²⁵ Vocal fold hemorrhages are not painful, nor do they cause in problems with swallowing or breathing.¹²⁶

Though the previously-mentioned symptoms may hint at a possible hemorrhage, the only way to know for sure is to visit an otolaryngologist to have the vocal folds examined under a strobe light.¹²⁷ Once an otolaryngologist has diagnosed a patient with a vocal fold hemorrhage, he or she will put the patient on vocal rest at once. “Voice use should be limited or entirely suspended for several days. The exact length of time can be determined by repeat examinations. Steroids should not be used to 'mask' the effects of a hemorrhage in order to press ahead with a performance, for instance. It is an invitation to further injury.”¹²⁸ Clearly, the most important form of treatment for a hemorrhage is vocal rest. If the hemorrhage is diagnosed early enough, this is sufficient for the vocal fold to completely heal.

¹²³“Vocal Hemorrhage.”

¹²⁴“Vocal Hemorrhage.”

¹²⁵“Vocal Hemorrhage.”

¹²⁶Voice Medicine.

¹²⁷“Vocal Hemorrhage.”

¹²⁸Voice Medicine.

If a person continues to develop vocal fold hemorrhages, something is wrong, whether it is a recurring cause that must be identified or an abnormality in the vocal fold. If it is a recurring cause, vocal therapy is an adequate form of identifying the misuse and teaching the wrongdoer how to properly use the voice. If there is an abnormality, “microlaryngoscopy may be necessary to remove or repair any small irregularities or blood vessels prone to bleeding. This is among the more delicate surgeries in laryngology.”¹²⁹ This is among the rarest of occurrences.

In the majority of cases, proper vocal rest and voice therapy to follow will be sufficient to cure the hemorrhage. If the diagnosis of a vocal fold hemorrhage is made too late, there are some possible complications that one might have to endure for the remainder of his or her life. These may include permanent hoarseness, scarring, uncomfortable phonation, and/ or loss of vocal range. The key to making sure one does not have any of the complications is visiting a doctor with the onset of symptoms.¹³⁰ If this is done and the voice professional “practices good vocal hygiene and uses proper technique, a hemorrhage typically resolves on its own after a period of time.”¹³¹

In this chapter, I have discussed vocal nodules, spasmodic dysphonia, vocal polyps, vocal cysts, and vocal fold hemorrhage. To be clear, these are only a few of the many vocal disorders from which vocal professionals can suffer. The most important aspect in recovering from a vocal disorder is early diagnosis, which helps to guard from

¹²⁹Voice Medicine.

¹³⁰“Vocal Hemorrhage.”

¹³¹Ware, 215.

further damage to the voice. The most harmful damage is done after a vocal disorder has developed.

Once a diagnosis has been made, a voice care network will be able to develop a proper treatment plan for the disorder. It is important to understand that the forms of treatment for vocal disorders referred to in this chapter are not all-inclusive of those that may be used.

Also, the understanding of the vocal mechanism is an important component of keeping the voice healthy. Singers, or any vocal professionals for that matter, need to understand their instruments, just as a guitarist would need to understand his guitar in order to be sure not to harm it. A singer must know if something he or she does is going to harm the voice. This knowledge is the key to preventing the voice disorders mentioned in this chapter as well as many others. If a vocal disorder is developed, it is imperative to seek proper treatment. As mentioned in chapter two, voice care networks provide this care.

My goal with this study has been to stress the importance of vocal health and to help to give some insight on possible disorders. With the hope of avoiding these disorders, I have provided brief information on the function of the voice and a number of ways to keep it healthy. Most do not realize the importance of their voices for their everyday lives, and they do not think about the impact it would have if their voices were damaged beyond repair. To avoid this, one must treat the voice with care and seek proper treatment when difficulties present themselves.

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