No Space to Sing: A Narrative Inquiry into the Experiences of Classical Singers with Primary Muscle Tension Dysphonia

Elizabeth Lepock
The University of Western Ontario
Supervisor
Roland, Sophie L.
The University of Western Ontario Co-Supervisor
Benedict, Cathy
The University of Western Ontario

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Abstract

This study was designed as a qualitative narrative inquiry study into the experiences of classical singers with Primary Muscle Tension Dysphonia (PMTD). PMTD is defined as Muscle Tension Dysphonia (MTD) without organic or neurological factors. In the population of professional voice users, PMTD is typically associated with occupational/behavioural causes.

A review of the literature shows that occupational disorders are associated with stigma in the classical music community, that research on PMTD in the demographic of singers is sparse and often broadly defined, and that PMTD is not well-represented in the vocal pedagogy literature. Additionally, PMTD may present differently in classical singers than in other populations of singers, or in the general population. The gap in the vocal pedagogy literature, and the stigma present could contribute to students developing PMTD and could cause delayed diagnosis for singers. Further, living with undiagnosed PMTD could have a grave impact on the ability to sing and on mental health.

Narrative inquiry was chosen as the most appropriate qualitative approach for an early study in this population. Eleven adult classical singers with PMTD diagnoses – in career stages from still undergoing undergraduate training to the midst of major international careers – were interviewed regarding their experiences prior to diagnosis, during treatment, and post-recovery. These interviews pursued a dual purpose: to discover emergent themes relating to PMTD in this population, and to create a space for voices to be heard that may have previously been rendered voiceless both by the disorder and the classical singing community.

The many themes that emerged across participant experiences fell into mainly medical and vocal pedagogy categories. Without fail, participants were severely impacted by the disorder, often by stigma and isolation, and in a few cases by medical mismanagement. Both institutional factors, and specific voice technique elements (such as registration), in the current vocal pedagogy paradigm appeared to be causal factors in this demographic.
Keywords

dysphonia, classical, singing, pedagogy, technique, registration, MTD, PMTD
Summary for Lay Audience

This study was designed to examine the experiences of classical (sometimes referred to as operatic) singers with Primary Muscle Tension Dysphonia (PMTD) through interviews with those singers. PMTD is a voice disorder in which muscle tension causes disturbed vocal function, without the presence of physical injury or neurological factors. In the population of professional voice users, PMTD is typically associated with occupational/behavioural causes (often related to their speaking or singing work).

A review of the literature shows that those suffering from occupational disorders are often unfairly judged (stigmatized) by the classical music community, that research on PMTD in singers is sparse and often broadly defined (for instance does not differentiate between different styles of singing), and that PMTD is not well-represented in the voice teaching literature. Additionally, PMTD may appear differently in terms of symptoms or severity in classical singers than in other populations of singers, or in the general population. The gap in the voice teaching literature, and the stigma present could contribute to students developing PMTD and could cause delayed diagnosis for singers. Further, living with undiagnosed PMTD could have a grave impact on the ability to sing and on mental health.

Interview-based research was chosen as the most appropriate approach for an early study in this population. Eleven adult classical singers with PMTD diagnoses – in career stages from still undergoing undergraduate training to the midst of major international careers – were interviewed regarding their experiences prior to diagnosis, during treatment, and post-recovery. These interviews pursued a dual purpose: to discover themes relating to PMTD in this population, and to create a space for voices to be heard that may have previously been rendered voiceless both by the disorder and the stigma in the classical singing community.

The many themes that emerged across participant experiences fell into mainly medical and voice teaching/study categories. Without fail, participants were severely impacted by the disorder, often by stigma and isolation, and in a few cases by medical mismanagement. Both institutional factors, and specific voice technique elements in the current voice teaching system appeared to be causal factors in this demographic.
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Chapter 1

1 Introduction

In qualitative research such as this study, researchers make their values and biases known, and the researcher’s voice is evident, showing that observations are voiced through the lens of the researcher’s understanding. In narrative inquiry, researchers often include their own stories and life experiences as a significant element in their research. To this end, I include my own story here.

1.1 Background

I cannot remember a time when I did not sing. I grew up singing every chance I had, including at church, in choirs and musicals, and local music festivals. One of my earliest memories is of sharing a hymnal and singing in harmony with my mother, while standing on a pew in church because I was too small to see over the one in front of me. I remember asking for music lessons for the first time when I was two years old. I remember the day that we brought the keyboard home and set it up in a corner of the living room. I sat at that keyboard, playing random notes and chords and singing along with absolute joy.

In hindsight a few experiences in elementary and secondary school suggested vocal tendencies that later would become problems. When I was in grade seven, I auditioned for my school’s rendition of Rogers and Hammerstein’s *Cinderella*. During my audition the directors asked me to sing louder. When I tried, I was disconcerted when my voice made a strange noise and felt choked. During my youth-choir days I also experienced vocal fatigue – increased effort to sing and speak and a soreness/aching in the muscles in the front of my neck – at the end of many rehearsals. Finally, I seemed to be prone to respiratory viruses lingering, often experiencing almost chronic coughing. From an early age I became somewhat neurotic about infectious respiratory illnesses.

Over a number of years a gradual realization came to me that singing was harder than it had been before, but I had no way of knowing that it was harder than it should have been.
I had heard regularly from voice teachers that singing was not easy and took considerable physical effort. Years later, I read Christine Harrison and Barbara Paull's book, *The Athletic Musician: a guide to playing without pain*, which suggests that, “music-making is one of the last areas of endeavour where the 'no pain no gain' myth still exists,” resulting in many musicians playing through dysfunction rather than seeking medical attention.¹ I now realize that for a long time I struggled along, believing in this, “no pain no gain,” myth.

I do not know when I developed Primary Muscle Tension Dysphonia (PMTD), but as an undergraduate voice student I definitely experienced symptoms of PMTD in my singing. I had difficulty projecting my voice and was not able to make a smooth transition between loud and soft, or feel comfortable at either extreme, sometimes making breathy/light/quiet sounds, and sometimes brash/strained/shouted sounds. I also experienced quick vocal fatigue (especially when singing high-tessitura coloratura repertoire), slight dysphonia and often produced strange sounds that were similar to what I had experienced as an adolescent auditioning for *Cinderella*. (I now hypothesize these were caused by false vocal fold phonation.) I became terrified of the sound that would occur on every vocal onset – as my voice was extremely inconsistent – and began trying all kinds of compensatory measures, warming-up multiple times per days. As a result, I was probably vocally fatigued nearly all the time. Despite all of this, I was never sent to an Otolaryngologist (ENT) or Speech Language Pathologist (SLP), maybe because these symptoms only appeared in my singing voice, or maybe because my teachers did not recognize them as symptoms of a voice disorder. I was told I was a light soprano and would likely never be able to project my voice well enough for a performing career.

In the first year of my master’s degree I suffered a concussion and broken rib in a car accident. When I was physically recovered enough to sing, my PMTD symptoms were much more pronounced, including frequent dysphonic moments. This was a frightening and isolating experience for me. I did not want to go see a medical professional for fear

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that something irreversible was wrong, and I did not want to share with my friends, family, or colleagues that I was experiencing these worrisome vocal symptoms.

However, my voice professor was wise and did what no previous teacher or coach had done over the course of the decade of singing since beginning my undergraduate degree. He sent me to Aaron Low – a Toronto SLP whose practice specializes in treating singers. He quickly and easily diagnosed me with PMTD and suggested a treatment of laryngeal massage, and re-training the registration of my voice (a voice technique element) to include more connection to chest production. At first, adding more chest production into my singing seemed counter-intuitive to me. If I was experiencing vocal fatigue, surely it would make more sense to sing quietly and lightly! However, this therapy and voice training was effective and quickly resolved my acute symptoms. My voice is now bigger and fuller, many other technical issues are being resolved, and I'm beginning to be able to express myself vocally the way I have always intuitively wanted.

This terrible experience, and the joy of my recovery, inspired me to want to bring about a change in the current paradigm of voice training. I want to help foster a pedagogical community in which voice instructors begin to know the causes and symptoms of PMTD and when to refer students to medical care. I want to reduce stigma, helping singers feel less isolated in the experience of vocal pathology, particularly PMTD. To this end, I have chosen to research this disorder.

The counter-intuitive voice training that formed the greater part of my treatment – adding more chest connection to my registral balance – made me reconsider some of my pedagogical beliefs. Prior to my own treatment, I had thought of chest voice as more tiring and more likely to cause injury than head voice. I now noticed that contrary to this belief that singing with a chest-dominant vocal production was inherently harmful, head voice, or cricothyroid dominant production (CDP), shared some characteristics with the symptoms of PMTD. I began to wonder both what in my own pedagogical training had led me to believe that use of chest production was so dangerous, and how many other singers had struggled silently and alone through the experience of PMTD. Given all of
this, I began to believe that a study interviewing singers and exploring the disorder from many different angles was needed.

1.2 Purpose of the Study

The purpose of this study is twofold. First, it examines the narratives of classical singers with PMTD (this population is defined with more specificity in the study methodology) in order to discover any emergent themes relating to the disorder in this population addressing causes/development, incidence, impact/severity, treatment, and recovery. Secondly, as previously mentioned, in the presentation of these narratives, this research creates a space for voices to be heard that may have previously been rendered voiceless both by the disorder and the opprobrium of the singing/vocal pedagogy community. Because the tension associated with this disorder can almost choke the singer, and because the stigma associated with chronic disorders and injuries in the classical music community renders silent many who suffer, this study is entitled “No Space to Sing.”

1.3 Research Questions

The research questions that this study explores in order to accomplish its purpose include:

1. In what ways are singers affected by PMTD?
   a. In what ways are singers physically affected by PMTD?
   b. In what ways are singers emotionally affected by PMTD?

2. What is the relationship between vocal pedagogy in the studio context, and PMTD?
   a. in terms of vocal technique?
   b. in terms of repertoire?

1.4 Significance of the Study

Two medical professionals were consulted at the onset of this research. The first of these consultations was with Dr. Kevin Fung, chair of otolaryngology at the Schulich School of Medicine and Dentistry at Western University. Not only did he believe that this research project was sound from a medical standpoint and important for the singing community,
he also thought that it would be important to reach medical specialists with its results. He encouraged pursuit of publication beyond journals dedicated to singing and teaching music, and also suggested holding a meeting with speech language pathologist Lori Holmes while still in the early stages of the project.

Lori Holmes, a speech language pathologist specializing in work with professional voice users, and a professor at the School of Communication Sciences and Disorders at Western University, agreed with Dr. Fung that this research should be published in such a way as to reach the medical community. Her experience has been that voice disorders in professional voice users often do not present in ways that would be visible/audible enough in the normal speaking voice to be diagnosed by doctors and speech language pathologists who are not knowledgeable about the demands of professional use. In her opinion, this project could be part of a deeply-needed dialogue between the medical and professional voice use communities. In addition, she felt that going years without diagnosis/treatment was an unfortunately familiar story and that initial research ideas (e.g. voice registration as a causal factor in professional voice) were supported by her experiences in her many years of work with the performing artists of the Stratford Festival.

The primary populations that will benefit from reading this monograph include students and voice teachers at the university level, and professional singers. These are the people most likely to encounter and miss the signs of Primary Muscle Tension Dysphonia in “classical” singers, resulting in years of disordered singing. However, private voice teachers and choral directors would also benefit from this research.

Dr. Fung and Ms. Holmes believe that it would be valuable to make this research available to medical professionals such as otolaryngologists and speech language pathologists. This will hopefully lead more ENTs and SLPs to become aware of the demands and impacts of professional voice use, and the potential for delayed identification and misdiagnosis of voice disorders in this population.
1.5 Limitations to the Study

There are a number of limitations to this study. The scope of this project meant capping the participant pool rather than continuing to collect information from participants to the point of data saturation – the point when the collection of new data does not shed further light on the topic.\(^2\) As a result, it is possible that elements may have gone unremarked in this study. Additionally, because the population is limited by location, it is possible that participants could share characteristics because of belonging to a similar culture (for instance, even a localized voice-teaching culture). Furthermore, perhaps because there are many more female than male classical singers, or perhaps because this disorder is more common in women than in men,\(^3\) the participant pool did not split exactly between these two cis-genders (nine female and two male).\(^4\) Finally, because functional voice disorders like PMTD are essentially examples of faulty singing technique found in an extreme form and therefore classified as voice disorders, it is difficult or impossible to distinguish between general technical flaws and symptoms of the disorder.


\(^4\) Additionally, no transgender singers or male high-voice singers (e.g. countertenors) contacted the researcher to participate, so these groups were not represented.
Chapter 2

2 Review of Literature

In this literature review, I first explore the concept of stigma and seriousness of injury and disorder in the field of classical music. Next, I examine the clinical literature to gain a strong understanding of Primary Muscle Tension Dysphonia (PMTD) and how singers are represented in medical studies on the topic. Following the clinical literature, I investigate crossover literature – material written by experts in both vocal pedagogy/vocal health and medicine. Finally, I survey the vocal pedagogy literature to discover whether PMTD is well-represented and understood, and to detect any further relationships/correlations between vocal pedagogy (technique and repertoire) and PMTD.

2.1 Stigma and Seriousness of Injury in Classical Music

A cursory internet search naming vocal injury of a high profile pop singer such as Adele reveals responses full of vitriol, shouting that she is “doing this to herself” due to her “poor singing technique,” ⁵ ⁶ while others respond defending her against these armchair doctors and vocal pedagogues. ⁷ ⁸ It seems obvious that this public shaming and blaming response would not create an environment in which singers feel safe coming forward when in vocal difficulty. In a blog post in which Canadian soprano Erin Wall discusses her experience with breast cancer, one of her comments underlined this precise situation.

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She confesses that when she realized that she would have to cancel many engagements while she was in treatment, it was important to avoid giving the impression that she was suffering from a vocal health issue:

I decided to be very specific and honest about why I was cancelling the engagement. I wanted control of the narrative, leaving no doubt in anyone’s mind that I was cancelling for a good reason. When vague “health reasons” are cited in operatic cancellations, doubts are often cast by both administrators and audience members alike, and speculation about a person’s vocal health is often rampant. This was exactly what I didn’t want, so the press release made it clear that I was undergoing treatment for cancer and planned to return to singing full-time once treatment ended.9

Ms. Wall’s sense that there would be a more negative reaction from both administrators and audience members if her vocal health was suspect than if they knew she had been diagnosed with cancer suggests that vocal dysfunction is stigmatized in the classical singing community. Academic literature confirms that this stigma is certainly present in the classical music community.

The literature makes it abundantly clear that, as suggested in Christine Harrison and Barbara Paull’s book, *The Athletic Musician*, the stigma associated with injury and disorder in classical musicians is serious and wide-spread. Eight articles on musician health were surveyed, and all in various ways confirmed this stigma and further devastating effects of injury in the classical music community.

In the case of several articles, the connection with stigma was primarily found in their witty titles. Without wide-spread belief in the “no-pain, no-gain myth,” titles such as, “Music Shouldn’t Hurt,”10 and “Playing Healthy, Staying Healthy: No Pain, All Gain,”11

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would be less compelling. Additionally, in a classical music parallel to the pop music case of Adele, an article discussing tenor Rolando Villazón’s vocal injuries used a title that appeared to blame him for them: “Der Fall Icarus,”\textsuperscript{12} – The Fall of Icarus. This title suggests that Mr. Villazón, “flew too close to the sun,” and that his own carelessness and hubris were the causes of his vocal decline.

Moving past article titles to actual content first revealed a link between lack of knowledge or resources and musicians’ injuries. Several articles agreed that lack of student and teacher understanding of physiology, health, and injuries, led to dysfunction going unreported.\textsuperscript{13} \textsuperscript{14} \textsuperscript{15} One musician described music audition preparation as similar to the training an athlete undergoes prior to a competition. This musician commented that an athlete would never prepare without the support of medical staff and coaches who are knowledgeable about injury, but many musicians prepare without this type of assistance.\textsuperscript{16} Two articles went on to specifically address singers and vocal pedagogues. One stated that many teachers who work with singers do not have adequate knowledge about the related anatomy and physiology to prevent or identify injuries.\textsuperscript{17} The other found that most singing students do not have much knowledge about how their instruments work,\textsuperscript{18} that students who were more educated about vocal health were more

\begin{thebibliography}{9}
\bibitem{13} Polniak, "Music Shouldn't Hurt," 42.
\bibitem{16} Ibid., 87.
\bibitem{17} Polniak, 42.
\bibitem{18} Aaron Ziegler, "Health Promotion and Injury Prevention Education for Student Singers," \textit{Journal of Singing} 68, no. 5 (2012), 537.
\end{thebibliography}
likely to seek medical attention,\(^\text{19}\) and that singing students were at higher risk than instrumental students of developing an occupational injury because they cannot see the majority of their instrument.\(^\text{20}\)

In addition to lack of knowledge leading to development and underreporting of injuries, fear was found to play a significant role in musicians staying silent. For many musicians, the chief fear arose from the practical/financial side of the situation: they feared that reporting an injury would lead to a diminished reputation and loss of work.\(^\text{21}\)\(^\text{22}\)\(^\text{23}\)\(^\text{24}\) One article suggested that another fear-related disincentive to seeking medical attention was the potential for flippant or dismissive doctor responses to musician health concerns: “Another reason for not seeking help was exposure to other musicians’ ‘horror stories’ of physicians trivializing their problem, and telling them to ‘just stop playing’ and ‘get a real job.’”\(^\text{25}\)

As if lack of knowledge and support from teachers and doctors was not enough to keep musicians silent about pain associated with their craft, deeply entrenched cultural beliefs about music-making were shown to also play a crucial role. Many musicians reported that they had been trained in an atmosphere in which pain was regarded as necessary for excellence, or a natural consequence of performing.\(^\text{26}\)\(^\text{27}\)\(^\text{28}\) Some even elaborated that

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\(^\text{19}\) Ziegler, "Health Promotion and Injury Prevention Education for Student Singers," 538.

\(^\text{20}\) Ibid., 537.

\(^\text{21}\) Keegan K. Barker, et. al., "Occupational Strain and Professional Artists: A Qualitative Study of an Underemployed Group," *Arts & Health* 1, no. 2 (2009), 141-142.

\(^\text{22}\) Horvath, *Playing Healthy, Staying Healthy: No Pain, all Gain*, 94.

\(^\text{23}\) Guptill, 91.


\(^\text{26}\) Barker, "Occupational Strain and Professional Artists, 145."
pain and sacrifice were considered essential in order to lend legitimacy to their work – raising it to the status of profession rather than a hobby.  

Finally, living with injuries was shown to lead to serious mental health consequences for musicians. In one study, musicians described the emotional effects of living with injury as, “traumatic, devastating, horrible, frightening.” In another article, social isolation was revealed as a consequence of musician injury.  

Worst of all, for many musicians, personal identity was shown to be deeply linked to the ability to make music. Fear of a loss of identity led to injuries/disorders going long-unreported, and in some cases the loss of ability to make music resulted in a breakdown, threatening the “intactness of the person.”

**2.1.1 Conclusions on Stigma and Seriousness**

It is clear from the literature that injury/disorder is a serious issue in the classical music community. Several factors lead to injuries going long undiagnosed and untreated, including lack of knowledge among students and teachers, fear of stigma and loss of reputation/work, lack of access to medical resources and in some cases trivialization from the medical community, and a cultural belief in pain/sacrifice as necessary to music-making. It is also apparent that living with injury and disorder not only reduces musicians’ ability to work but can have far-reaching mental health consequences.

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27 Fotiadis, “Prevalence of Musculoskeletal Disorders in Professional Symphony Orchestra Musicians in Greece,” 94.
29 Barker, 145.
30 Zaza, 2018.
31 Guptill, 91.
32 Ibid., 84.
2.2 Clinical Literature

This review of the clinical literature was completed to gain the necessary understanding of Primary Muscle Tension Dysphonia in order to be able to pursue research into the topic, and to discover how singers are represented in medical studies on the topic. To be sure of having a comprehensive knowledge of the current research, in addition to previously reviewed articles for early versions of this literature review, a search was made in The Journal of Voice (an otolaryngology and speech language pathology journal) database for the keyword combination “Muscle Tension Dysphonia.” The six hundred sixty-seven articles containing this keyword combination were filtered first by title and then by abstract to remove unrelated articles (for instance, many of those about dysphonic disorders associated with organic or neurological conditions) leaving approximately two hundred fifty articles with some relevance. Many of these articles were not specifically about Muscle Tension Dysphonia but included some information about it in comparison to other voice disorders, or discussed broader categories of disorders including Muscle Tension Dysphonia. Most articles referenced here are more recent studies into their respective topics, but earlier studies into the same topics or by the same researchers were also surveyed. Though reviewing a few of the most recent literature reviews on the disorder might have been adequate to defining the current knowledge, this much more in-depth exploration enriched the understanding of progression of the still-young field of study into muscle tension voice disorders, and the even younger field of study into these disorders in the population of professional voice users, and more specifically, singers.

2.2.1 Primary Muscle Tension Dysphonia – Definition/Background

Muscle Tension Dysphonia is a vocal pathology in which excessive tension in muscles relating to voice production causes an altered (typically elevated) vertical laryngeal position (as well as an elevated hyoid bone).\textsuperscript{34} \textsuperscript{35} The name, “Muscle Tension

\textsuperscript{34} Van Houtte, “Pathophysiology and Treatment of Muscle Tension Dysphonia: A Review of the Current Knowledge,” 203.

Dysphonia,” was originally coined for this disorder in 1983, but a variety of other names were used before it was more permanently settled upon in 1993. Primary Muscle Tension Dysphonia (PMTD) is a sub-type of the broader disorder, defined by a lack of organic or neurological causes. Instead, in the literature it is often placed in the category of “functional” voice disorders, since it is believed to at times be caused by the way the voice is used (though some current literature cautions against MTD or PMTD becoming a synonymous term with “functional voice disorders,” because these disorders are multifactorial tension disorders). Because excessive tension is one of the main features of this disorder, it is also often classified as a hyperfunctional voice disorder. A confusing array of labels for PMTD (non-organic/non-neurological dysphonia) appears throughout the literature. Some of the other names used in reference to non-organic/non-neurological dysphonias include: functional dysphonia, behavioural dysphonia, muscle misuse dysphonia, non-organic habitual dysphonia, supraglottic hyperfunction, Bogart-Bacall syndrome, and psychogenic dysphonia. Some of these names come from the time prior to the creation of the name Muscle Tension Dysphonia and are now largely defunct, but others are still in use in recently published literature, which can cause confusion and make the disorder difficult to research. PMTD is one of the most frequent diagnoses in patients seeking care from otolaryngologists (ENTs), accounting for between ten and forty percent of caseloads at voice centres, and is found primarily in women.

37 Ibid.
38 Ibid., 202.
39 Melda Kunduk, Daniel S. Fink, and Andrew J. McWhorter, “Primary muscle tension dysphonia,” Current Otorhinolaryngology Reports 4 no. 3 (2016): 175.
42 Kunduk, “Primary Muscle Tension Dysphonia,” 176.
44 Kunduk, 175.
2.2.2 Causes

While the excessive tension in the laryngeal and paralaryngeal muscles and altered laryngeal position comprise the root of symptomatic vocal dysfunction in PMTD, there are a variety of potential causes for this excessive tension.\(^{46,47}\) Therefore, the etiology of this disorder is considered to be multifactorial, including four main contributing factors: technical misuses of the voice in the context of exceptional/unusual vocal demands, learned adaptations after illness such as upper respiratory tract infections (URIs), laryngopharyngeal reflux disease (LPRD) – though some articles associate URIs and LPRD with PMTD and some only with secondary/organic MTD, – and certain psychological/personality traits or stressful events.\(^{48,49}\) Though these contributing factors are widely accepted, current literature generally agrees that the pathophysiological mechanism leading to the development of the disorder is unclear and requires further study.\(^{50,51}\) Over the years, some studies have proposed that there should be defined subcategories of PMTD based on primary underlying cause/symptoms.\(^{52,53,54}\) Some have even attempted to define these subcategories (such as Muscle Misuse Dysphonia for...

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\(^{46}\) Ibid.

\(^{47}\) Kunduk, 176.

\(^{48}\) Van Houtte, “Pathophysiology and Treatment of Muscle Tension Dysphonia,” 203-204.

\(^{49}\) Kunduk, 176.

\(^{50}\) Van Houtte, “Pathophysiology and Treatment of Muscle Tension Dysphonia,” 203.

\(^{51}\) Kunduk, 180.


\(^{54}\) Kunduk, 180.
PMTD with behavioural causes), but as yet this has not been successful, and may even have been a source of some of the confusion around labels of this disorder.\footnote{Van Houtte, “Pathophysiology and Treatment of Muscle Tension Dysphonia,” 203.}

\subsection*{2.2.3 Symptoms}

In PMTD, the alterations to the usual relationships between the cartilages and intrinsic muscles of the larynx lead to disturbed vocal fold function such as vocal fold bowing, posterior chink, and/or ventricular or false vocal fold involvement.\footnote{James A. Koufman et. al., “Laryngeal biomechanics of the singing voice,” \textit{Otolaryngology - Head and Neck Surgery} 115 no. 6 (1996): 531.} This physically disturbed function can cause widely varying presentations of symptoms.\footnote{James Paul Dworkin, Robert J. Meleca, and G. G. Abkarian. “Muscle tension dysphonia,” \textit{Current Opinion in Otolaryngology & Head and Neck Surgery} 8 no. 3 (2000): 170-171.} In this literature review, the symptoms described in the literature were found to be in three overlapping categories: symptoms related to the quality of sound produced, symptoms related to sensations experienced, and symptoms related to general function of the voice.

ventricular/vestibular fold involvement, high-pitched falsetto, and diplophonia (the involuntary production of two pitches at once). Sensory symptoms can include pain and discomfort, and a feeling of obstruction or lump in the throat, (also known as foreign body sensation or globus pharyngeus). Vocal function symptoms are often related to vocal fatigue, a term defined as vocal tiredness after voice overuse, misuse, or abuse. Vocal fatigue can include sensation of overall increased effort in vocal production, generally reduced maximum phonation time, and increased fundamental frequency of speaking voice. However, vocal fatigue elements can also overlap with those in the vocal quality and sensory categories: vocal harshness, strained voice quality, hoarseness, reduced pitch range, reduced vocal control, reduced vocal projection and

65 Dworkin, “Muscle tension dysphonia.” 170.


70 Colin O’Rourke et. al., Hyoid Bone Tenderness as a Clinical Indicator of Laryngeal Pathology,” Journal of Voice 28 no. 6 (2014): 836.


73 Lowell, 370.


power, voice loss, laryngeal discomfort, throat dryness, throat and neck pain, muscle tension in neck and shoulder, and worsening of symptoms throughout the day of voice use.\(^{77}\)\(^{78}\)

Another symptom that is correlated with PMTD is persistent, subacute, or chronic cough. The need to cough or clear throat, and the sense of a lump in the throat are sometimes associated with tightness in laryngeal muscles.\(^{79}\) Coughing for more than three consecutive weeks is defined as persistent cough. A three- to eight-week period of coughing is called subacute cough, and chronic cough is indicated by more than eight weeks of coughing.\(^{80}\) It is not clear whether in cases of dysphonia associated with chronic cough the coughing is causal to the dysphonia, whether the muscle tension or laryngeal irritation are causal to the coughing,\(^{81}\) whether coughing exacerbates already-present symptoms of dysphonia,\(^{82}\) or whether inhaled steroids or other treatments for chronic cough are causal to the dysphonia.\(^{83}\) Perhaps because of the lack of clarity around the relationship between chronic cough and dysphonia, most literature on dysphonia does not discuss chronic cough in detail, and most literature on chronic cough does not explore coexisting symptoms such as dysphonia and globus pharyngeus.\(^{84}\)


\(^{78}\) Altman, “Current and Emerging Concepts in Muscle Tension Dysphonia,” 263.


\(^{83}\) Tuzuner, “Voice Assessment After Treatment of Subacute and Chronic Cough With Inhaled Steroids,” 484-485.

2.2.4 Diagnosis

Kunduk’s 2016 review of the literature on PMTD states that there are no standardized tests available for its diagnosis. Therefore, the diagnostic procedure outlined here is a more general procedure for diagnosing voice disorders which has been gleaned from the broader literature.

Typical voice disorder diagnostic procedures include taking a history from the patient, a clinical examination with laryngeal palpation and videostroboscopy, use of a perceptual voice quality rating tool such as the Dysphonia Severity Index (DSI), the GRBAS method (grade, roughness, breathiness, asthenia, and strain), acoustic and aerodynamic voice analyses, and patient self evaluation of voice handicap and/or quality of life.

Voice production is a complex task including physiological, auditory-perceptual, aerodynamic, acoustic, and emotional processes, and therefore requires an interdisciplinary (i.e. both medical and psychological) method for evaluation, diagnosis, and treatment.

Given that PMTD is defined as Muscle Tension Dysphonia without an organic or neurological component, it is a diagnosis of exclusion (first other diagnosis options are ruled-out). A number of factors have long led to complexity in arriving at this

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85 Kunduk, 176.


90 Alison Behrman et. al., “Anterior-Posterior and medial compression of the supraglottis: signs of nonorganic dysphonia or normal postures?,” *Journal of Voice* 17 no. 3 (2003): 404 and 408.
The variability of presentation of Muscle Tension Dysphonia, the multifaceted and indeterminate pathophysiology and consequent historical use of inconsistent labels for this disorder, and the overlap between its characteristics and those of other voice disorders, and even some non-disordered voices. The lack of standardized tests available for PMTD diagnosis is also linked to common issues of delay or misidentification of it and similarly presenting voice disorders.

The characteristics of PMTD overlap with disorders such as vocal fold paresis (muscular weakness or partial paralysis), Adductor Spasmodic Dysphonia, and subtle types of vocal fold lesions such as sulcus vocalis. Many of the tools used in diagnosis

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91 Kunduk, 175.
92 Behrman, “Anterior-Posterior and Medial Compression of the Supraglottis: Signs of Nonorganic Dysphonia or Normal Postures?,” 404.
95 Kunduk, 175.
96 Lowell, 370.
98 Kunduk, 176.
101 Schlotthauer, 346.
102 Kunduk, 176.
of MTD are subjective (history, voice rating indices, palpation for muscle tension), and the similarities between disorders can confound even experienced clinicians. Videostrobolaryngoscopy is the key means in distinguishing PMTD from subtle lesions, but even interpretation of stroboscopic images of laryngeal signs is a subjective task. Therefore, a number of studies have been working towards finding new objective measurements in order to add greater certainty to differentiating between MTD and other easily confused voice disorders. There are also limitations to some of the usual subjective tools used to diagnose voice disorders (for example, laryngeal palpation), therefore other studies are working to improve these or develop new tools. However, recent literature suggests that there is still significant work to be done in order to more easily differentiate between and diagnose these easily mistaken voice disorders.

Given that questions have been raised about the reliability and validity of various evaluation components, it is unsurprising that some clinicians have difficulty determining which are most pertinent. Behrman’s 2005 study revealed that at that time many voice therapists did not consistently use some of the most important diagnostic tools in their practices. Subjective measures were used more often than objective measures, and among

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105 Kunduk, 176.


109 Kunduk, 176.

objective measures, the ones used were not always the most useful. Close to half of the voice therapists surveyed did not have access to aerodynamic equipment (used to measure mean airflow, estimated subglottal air pressure, etc. as part of aerodynamic voice analyses), and only 31% of those with access reported being likely to use this instrumentation in the diagnosis of MTD. Two more recent studies into common practices in the diagnosis of dysphonic voice disorders indicated that many general otolaryngologists examine patients with mirror laryngeal exam and flexible fiberoptic laryngoscope rather than stroboscopy (even though this is one of the most important tools in differentiating between PMTD similarly presenting disorders), and that many are not comfortable diagnosing a voice disorder in the absence of a structural abnormality (as is the case in PMTD). Both studies recommended improving otolaryngologist education and encouraging the use of stroboscopy in order to reduce the likelihood of delayed or incorrect diagnosis in patients with low-grade dysphonia with no organic factors (the very definition of mild PMTD).

2.2.5 Treatment

The goal of voice therapy is to return functionality to a person’s voice in the life, work, and ability to communicate. As the etiology of PMTD is multifactorial, there is not a


117 Cohen, 772 and 777.

standard treatment protocol for the disorder. Instead, the causal elements of the disorder must be investigated, weighed for significance, and treated based on the specifics of the case. As a standard treatment for PMTD does not exist, the following is a general description of voice disorder treatment gleaned from the broader literature.

Treatment for voice disorders can be direct, indirect, or a combination. Direct voice therapy is occupational therapy focused on physical re-coordination through the use of exercises and behaviour modification voice therapies, and hands-on therapies that address the physiological elements of the disorder, such as Circumlaryngeal Manual Therapy. Indirect voice therapy consists of patient education regarding factors such as vocal hygiene and environmental awareness, and possible treatment of psychological/personality factors. Overall, direct therapy is found to have a more beneficial effect than indirect voice therapy when used in isolation as indirect voice therapy does not modify patients’ faulty voice production. However, the best approach to treatment appears to be a combination of direct and indirect therapies. Additionally, recent studies found that not only the type of treatment, but the manner of administering it impacted treatment effectiveness. Promoting better patient understanding of treatment, and building a relationship with the patient leads to greater success.

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119 Van Houtte, “Pathophysiology and Treatment of Muscle Tension Dysphonia,” 204.
121 Van Houtte, “Pathophysiology and Treatment of Muscle Tension Dysphonia,” 205.
122 Ibid., 204.
effects of voice exercises is essential to support their application in practice,\textsuperscript{127} and a positive relationship with the therapist (including patient-perceived physician empathy, interpersonal trust, and partnership) improves patients’ therapeutic motivation and outcomes.\textsuperscript{128}

Treatment for PMTD is comprised of elements aiming to address the causal factors of the case, primarily chosen from a combination of direct therapies including behaviour modifying exercises and laryngeal manipulation techniques.\textsuperscript{129} There is a huge number of direct voice therapies listed in the literature, which can be applied to a wide range of voice disorders. Many of these treatments are comprised of exercises meant to assist patients in practising behaviour modification to correct elements of faulty voice use such as posture, breathing, phonation, resonance, and articulation. Some, such as SOVTEs (Semi-Occluded Vocal Tract Exercises) and Circumlaryngeal Manual Therapy, aim to mechanically reduce tension in the vocal tract, returning it to a more natural posture. Medical procedures such as the application of topical lidocaine (anaesthetic) and Botox injections (reducing tension through temporary muscle paralysis) are generally only used in cases which do not respond to other therapies.\textsuperscript{130}

There are many types of SOVTEs including voiced fricatives, nasals, lip and tongue trills, phonation into tubes with the outer end in the air or immersed in water, face mask facilitated semi-occlusion with more natural mouth/face postures, etc. Vocalizing using SOVTEs helps improve efficiency of vocal fold vibration as increased oral air pressure reduces the intensity of medial contact between the vocal folds.\textsuperscript{131} These exercises have also been found to result in a lower vertical laryngeal position and higher soft palate, a


\textsuperscript{128} White, “Patients’ Perceptions of and Attitudes Toward Voice Therapy: A Pilot Study,” 1.

\textsuperscript{129} Kunduk, 180.

\textsuperscript{130} Dworkin, 172-173.

narrower aryepiglottic opening, and a wider pharynx than resting position, while reducing stiffness in the vocal body and cover, thus creating better glottal closure, a greater maximum flow declination rate, and contributing to increased vocal intensity without additional vocal effort.\textsuperscript{132} \textsuperscript{133}

Circumlaryngeal Manual Therapy (CMT) and other hands-on massage/laryngeal reposturing techniques are comparatively recently developed therapies, with most studies surveyed here taking place after the year 2000. These therapies primarily involve reducing tension by manually massaging and stretching the laryngeal, neck, and jaw muscles in order to restore the larynx to a healthy posture, return the spaces between the cartilages and hyoid bone to their natural state, and reduce the associated symptoms of discomfort and pain.\textsuperscript{134} Some of these techniques also address tension in muscles of the shoulders, upper chest, and back.\textsuperscript{135} These reposturing techniques have been found to be useful treatments in cases where traditional voice therapy has failed, but also comprise an important addition in the multifaceted treatment of other cases.\textsuperscript{136} Some of the key benefits of CMT include a short-cut to allow the patient to experience the sensations associated with healthy voice production, and a fast-acting release of long-held patterns of muscle tension.\textsuperscript{137} These benefits can allow patients to build new, healthy habits more quickly, to better understand the goals in their retraining, and reduce the severity of symptoms earlier in the treatment process. This often accelerates the positive effects of


\textsuperscript{135} Elliot J. Kennard et. al., “A Preliminary Comparison of Laryngeal Manipulation and Postural Treatment on Voice Quality in a Prospective Randomized Crossover Study,” \textit{Journal of Voice} 29 no. 6 (2015): 751.

\textsuperscript{136} Van Houtte, “Pathophysiology and Treatment of Muscle Tension Dysphonia,” 206.

concurrently used treatments methods, shortening treatment times. Manual therapies are shown to have a significant effect in one to three sessions, whereas Yawn-sigh treatment often takes up to twenty-five sessions, and treatment with Vocal Function Exercises typically takes six to eight weeks.

There are concerns raised in the literature both with the effectiveness of voice disorder treatment in general, and with the specific treatment of PMTD. Desjardins’ 2017 study concluded that it is difficult to ascertain how effective current voice disorder treatments are because of inherent limitations in the literature (small and widely varying types of studies, differing definitions of “effectiveness” between research and treatment settings). This is concerning because inappropriate voice care can prolong the treatment period and raise the costs associated. Van Lierde’s 2007 study found that approximately six years after treatment 51% of hyperfunctional patients still showed signs of pathological tension on their scope findings, indicating continued chronic voice dysfunction. Other studies found that with the lack of standardized diagnostic and assessment protocols it was difficult to achieve accurate diagnoses, to pinpoint

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141 Kunduk, 176.


143 Desjardins, 392.e14.

144 Ibid.


causes for PMTD,\textsuperscript{148} and to design treatments tailored to address the unique causal factors of each case.\textsuperscript{149} Additionally, the tension in PMTD and other muscle tension voice disorders can be so severe that behavioural methods such as Accent Method, Yawn-Sigh, resonant voice therapy, and vocal function exercises may not be effective without the use of additional hands-on reposturing techniques because they do not release enough tension independently.\textsuperscript{150}

Just as research is ongoing to improve voice assessment methods for diagnostic accuracy, a number of studies aim to improve both subjective and objective voice assessment tools for voice disorder treatment specificity and to enhance the ability to measure treatment efficacy. Other research aiming to generally improve functional voice disorder treatment outcomes includes studies comparing the efficacy of short-term intensive treatment (bootcamp style) to more long-term treatment,\textsuperscript{151} \textsuperscript{152} studies comparing the success of group versus individual therapy,\textsuperscript{153} and studies attempting to create treatments with improved capability of transferring healthy skills into typical voice uses such as conversational speech.\textsuperscript{154} There are even studies emerging comparing the effectiveness of

\begin{itemize}
\item \textsuperscript{148} Ibid.
\item \textsuperscript{149} Cohen, 772.
\item \textsuperscript{150} Roy, 198.
\item \textsuperscript{153} Abrahamsson, “Effects of Voice Therapy: A Comparison Between Individual and Group Therapy,” 437.
\end{itemize}
various MTD treatments.\textsuperscript{155} The findings from recent literature conclude that improved assessment techniques for PMTD would lead to quicker and less costly treatment, and encourage the pursuit of research in this area.\textsuperscript{156}

### 2.2.6 Impact

Most articles addressing impact of voice disorders discussed a variety of disorders rather than specifically addressing PMTD, so the majority of this section is devoted to describing the general impact of voice disorders/dysphonias.

Objective measures of the symptoms of voice disorders do not adequately indicate the experience of the patient.\textsuperscript{157} Awareness of the level of impact on the patient is key to the evaluation process, and may direct treatment decisions in dysphonias.\textsuperscript{158} Perhaps because the occupation, living and working environment, family and friends’ reactions to the disordered voice, and a person’s overall personality are all variables that can affect the manner and degree to which a voice disorder is disabling,\textsuperscript{159} even for patients who only experience mild to moderate dysphonia, it can often have a profound impact to their quality of life.\textsuperscript{160} The extent of the impact of a voice disorder on an individual varies significantly depending on both the severity of the voice disorder and the voice needs of

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\textsuperscript{156} Kunduk, 180.

\textsuperscript{157} Carissa R. Portone et. al., “Correlation of the Voice Handicap Index (VHI) and the Voice-Related Quality of Life Measure (V-RQOL),” \textit{Journal of Voice} 21 no. 6 (2007): 723-724.


\textsuperscript{160} Soni, 755.
the patient and goes far beyond the measurable level of hoarseness. Eadie’s 2010 article expressed the importance of measuring impact most eloquently: “An individual’s perception of the severity of his or her dysphonia is critical, because the success of voice treatment is largely based on that individual’s perception of his or her voice, regardless of the clinician’s perceptions of that same voice.”

Physically, voice disorders can cause discomfort and pain, and because the levels of these experienced by voice disorder patients are not easily quantified by medical professionals, tools based on patient-rating have been developed to assess this. Some of these tools are the Vocal Tract Discomfort scale (VTD or VTDS), and the Voice Symptom Scale (VoiSS). In addition to physical impact, because the voice is essential in expressing oneself – sharing ideas and emotions – voice disorders can also impact patients’ quality of life and mental health, causing social isolation and depression. In fact, voice disorders at times have as serious an impact on social relationships, emotional state, and health, as other chronic disorders generally seen as much more serious, such as heart failure, angina, and chronic obstructive pulmonary disease.

Considering the types of vocal symptoms that are associated with PMTD, it is unsurprising that the disorder can have a significant impact on those who develop it. Physically, it impacts communication and employment, but is also known to be one of the voice disorders causing the most discomfort and pain. The VTDS was actually


165 Desjardins, 392.e13.

designed for, and is primarily used in the evaluation of patients with MTD. PMTD may even lead to the development of organic voice damage such as vocal nodules, polyps, and cysts. Some recent studies show that pain and discomfort can actually be more severe in Primary MTD (without organic factors) than Secondary MTD (with organic components such as nodules).

2.2.7 Psychology

Psychological factors can relate to voice disorders as a causal element, as a result of the disorder, or a combination of cause and impact. A general trend observed in the course of this literature review was that older studies often seemed to implicate psychological factors as a primary causal factor, while many recent studies stated that though there is a correlation between psychological factors and voice disorders, a clear causal link has not been established. Many earlier studies also do not refer often to misuse or


168 Lopes, “Vocal Tract Discomfort Scale (VTDS) and Voice Symptom Scale (VoiSS) in the Evaluation of Patients With Voice Disorders,” 1.


overuse as a causal factor, instead often labelling voice disorders in the absence of organic elements as “Psychogenic Voice Disorders,” suggesting a psychological etiology. A 2003 study lent support to this reading of the literature, suggesting that since the 1980s there has been a trend toward researchers distancing their work on psychology and non-organic voice disorders from the theoretical model of the Freudian psychogenic conversion disorder (loss of voice as a result of psychological distress, often due to feelings of powerlessness).  

Though there are still numerous current studies delving into the psychological elements of non-organic voice disorders, it appears that there may have been an element of sexism in the earlier theories that functional voice disorders were primarily caused by predisposing or precipitating psychological factors; these disorders are more common among women than men, and “hysteria” (a word derived from the same Latin and Greek words for the uterus/womb, and typically used to describe a volatile emotional state in women) was long believed to be a personality factor in these disorders. It has emerged in more current research that there are non-organic/functional voice disorders with stronger psychological elements, and those with stronger misuse/overuse elements (typically a combination). Those with stronger psychological elements are often still labeled Psychogenic Voice Disorders, and those with stronger misuse/overuse elements are labelled Muscle Tension Voice Disorders, of which Muscle Tension Dysphonia is a very common diagnosis.

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176 Ibid., 309.

177 Kollbrunner, “Encouragement to Increase the Use of Psychosocial Skills in the Diagnosis and Therapy of Patients With Functional Dysphonia,” 132.e1.


180 Ibid.
Tezcaner’s 2017 study suggested that it can be quite difficult to distinguish between Psychogenic Voice Disorders and MTD. Therefore, the discussion of correlated psychological factors here can only indicate that various levels of the following factors can be found to be predisposing to, causal of, or resulting from non-organic-functional voice disorders, of which PMTD is one.

Functional voice disorders have been correlated with both extraversion and introversion, neuroticism, type A personality (ambitious, rigidly organized), negative affectivity (depressive attitude), loneliness, perfectionism, general anxiety, obsessive-compulsive trait, hyperactivity/impulsivity, and other similar personality traits. Of these factors, a tendency towards depression or anxiety – or actual diagnoses with these mood disorders – and neuroticism of various kinds (including somatization and hypochondria) appear most often in the literature.

Both Tse’s and Roy’s studies suggest causal links between the above factors and dysphonia, but as outliers were found in some of the populations studied it seems that the extent of causal links varies. Others, including Holmqvist’s 2013 study, found that stress appeared to be causal in vocal symptoms that appeared more often when voice

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182 Kollbrunner, 132.e1.


187 Ibid.
use was associated with a stressful situation, such as public speaking.\textsuperscript{188} In some studies, including Misono’s in 2014, the opposite finding was presented: psychological symptoms were found to be caused by the social and physical impact of the disorders. Participants described a negative impact from voice disorders on their ability to work and their sense of identity.\textsuperscript{189} In both Holmqvist and Misono’s studies participants also described voice problems leading to a vicious cycle which included psychological symptoms in both cause and effect roles: emotional distress caused by a voice disorder led to worsening voice symptoms.\textsuperscript{190} \textsuperscript{191} Several articles concluded that in cases where exceptional vocal demands are the primary cause for dysfunction – such as in singing and teaching careers – there may be little necessity to address psychological co-factors. Therefore, many current studies recommend that psychological factors be considered in diagnosis and in treatment – for both those cases with causal and those with resulting psychological elements – but to guard against giving this element undue weight in the process.\textsuperscript{192} \textsuperscript{193} \textsuperscript{194} Kunduk’s 2016 review of the literature on PMTD supports this moderate approach to psychological factors and PMTD, stating that personality/psychological factors and reaction to high level stress are thought to be additives (rather than fully causal) in the development of PMTD.\textsuperscript{195}

Three studies raised an interesting correlation between psychological factors and the


\textsuperscript{189} Misono, “Dysphonia, Perceived Control, and Psychosocial Distress: A Qualitative Study,” 5.

\textsuperscript{190} Ibid., 8.

\textsuperscript{191} Holmqvist, “The association between possible stress markers and vocal symptoms,” 787.e7-8.

\textsuperscript{192} Kollbrunner, 132.e3-4.


\textsuperscript{195} Kunduk, 176.
higher rates of non-organic voice disorders in women. Holmqvist stated that though both women and men experience stress, men’s stress levels tend to return to normal after work, whereas women’s tend to remain elevated.196 Baker suggested that women in family and interpersonal relationships often bear the burden of responsibility while feeling powerless make any changes in this arena of their lives.197 Dietrich suggested that stress should be considered a women’s health issue.198 Perhaps socialization and societally constructed gender roles are a contributing factor in the development of voice disorders in women.

Misono’s 2014 study also presented a unique correlation between psychological factors and treatment success. As previously mentioned, in this study, MTD patients reported the vicious cycle of voice symptoms, emotional distress, and rapid worsening of symptoms.199 Working towards these patients having a sense of greater control over their symptoms, or their reaction to those symptoms, led to the development of improved adaptive emotional and behavioural responses, assisting in the improvement of symptoms.200 This supports the previously discussed study on the effectiveness of voice disorder treatment which suggested that promoting better patient understanding of treatment, and building a relationship with patient leads to greater success.201 Addressing the human needs, rather than just the vocal needs, of patients may be important for successful treatment.

196 Holmqvist, 787.e7-8.
200 Ibid.
201 White, 1.
2.2.8 Singing/Professional Voice – Prevalence and Causes

There were no articles found specifically focused on the prevalence and causes of PMTD in classical singers. The following is a discussion of the prevalence and causal factors of voice disorders in professional voice users and singers, with a brief mention of the overall prevalence in classical singers.

Many of the articles surveyed stated that there is a higher prevalence of voice disorders in the population of professional voice users than in the general population of voice users. Most suggest that the primary cause of this higher frequency is due to elevated occupational demands. Some studies assert that within the population of professional voice users, singers have the most demanding voice use, and others advise following the 1991 suggestion of Koufman that an additional sub-category for singers (especially opera singers) should be created within the professional voice user category. This category would be “Elite Vocal Performers” who have high occupational voice demands and sensitivity to even minor dysfunction. Pestana’s 2017 study

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209 Ibid.

delved for the very first time in the literature into the prevalence of voice disorders in singers, and found that 40.53% of classical singers report experiencing dysphonia over the course of their careers.\textsuperscript{212}

In addition to engaging in more demanding voice use than other professional voice users, some studies also hypothesize that singers and other stage performers have a higher risk of developing voice disorders because of personality traits common to this population,\textsuperscript{213, 214} and the high-stress lifestyle and environment of their occupational voice use.\textsuperscript{215} However, as stated earlier, several other articles indicated that in cases where exceptional vocal demands are the primary cause for dysfunction – singing or teaching professionals – there may be little necessity to address psychological co-factors.

Throughout the literature, there is also some controversy regarding the effectiveness of voice training to prevent the development of vocal dysfunction. Some studies suggest that voice training can act as a mediating factor, actually reducing the likelihood of developing voice disorders in highly-trained professional voice users such as singers,\textsuperscript{216} and that failure of proper training or lack of training can lead to more severe

\begin{itemize}
  \item \textsuperscript{212} Pestana, “Prevalence of Voice Disorders in Singers: Systematic Review and Meta-Analysis,” 724.
  \item \textsuperscript{214} Bastian, “Do Talkativeness and Vocal Loudness Correlate With Laryngeal Pathology: A Study of the Vocal Overdoer/Underdoer Continuum,” 561.
  \item \textsuperscript{215} Kwok, “The Impact of Vocal and Laryngeal Pathologies Among Professional Singers: A Meta-analysis,” 1.
\end{itemize}
dysphonia,\textsuperscript{217} while others found no evidence of voice training having this effect.\textsuperscript{218}

2.2.9 Singing/Professional Voice – Impact

No articles were found specifically addressing the impact of PMTD in the populations of professional voice users or singers. Therefore, the following is a general discussion of voice disorder impact on these populations.

As discussed earlier in this literature review, the extent of the impact of a voice disorder on an individual varies significantly depending on both the severity of the voice disorder and the voice needs of the patient.\textsuperscript{219} Because singers are vocal athletes, regularly using their voices over the threshold of normal speaking voice functioning, singers’ voices must be healthier than those of the general population to be capable of professional performance requirements.\textsuperscript{220} Therefore, it is unsurprising that the function of professional voice users, including singers, is more severely impacted by a mild vocal dysfunction than that of the general population.\textsuperscript{221}\textsuperscript{222}\textsuperscript{223}\textsuperscript{224} In addition to experiencing a more significant impairment of their vocal function from even mild dysfunction, professional voice users experience more pain and discomfort than the general

\begin{thebibliography}{99}
\bibitem{217} Kwok, 1.
\bibitem{219} Murry, “The Relationship Between Ratings of Voice Quality and Quality of Life Measures,” 184.
\bibitem{221} Pestana, 722.
\bibitem{222} Claudia Pacheco, and Mara Behlau, “Immediate Impact of Vocal Demand on Musical Theater Singers in Brazil,” \textit{Journal of Voice} 0 no. 0 (2018): 5.
\end{thebibliography}
The emotional impact of voice disorders on singers can also be devastating. Singers often associate their voice with their identity so when their voice becomes disordered their sense of identity can be disturbed. Feelings of personal failure can also be associated with a voice disorder diagnosis in professional voice users. Voice impairment scales concerning the impact of a disorder are not designed to measure handicap associated with occupational voice use, so clinicians may not have a clear idea of how much distress professional voice users are experiencing. This higher impact of voice disorders on singers indicates that it is essential to take preventative measures against vocal dysfunction in this population, and vital that changes in the vocal function of singers are detected and diagnosed at an early stage.

2.2.10 Singing/Professional Voice – Preventative Care Needed

No articles were found specifically addressing preventative care to avoid the development of PMTD in classical singers. The following is a discussion of the need for preventative care to avoid the development of voice disorders in the general population of singers.

Several studies reveal that not enough preventative measures are being taken to avoid the development of voice disorders in singers, and that there are several hurdles blocking


230 Pestana, 726.

231 Pacheco, 5.
early detection and diagnosis. One of the main barriers to early detection of voice disorders in singers is that they do not seek out professional help for vocal dysfunction until it has developed into a severe disorder. Three reasons why singers do not seek treatment until dysfunction has progressed to an acute level are fear of the result of examination (fear of diagnosis), and expense (often inadequate health insurance coverage), and a lack of vocal health knowledge.

Lack of knowledge of vocal health appears to be the primary reason why singers delay seeking medical attention, and may also be a causal factor in the development of dysfunction. Vocal health instruction aids singers in avoiding vocal misuse and abuse, and some studies suggest that teaching singers about vocal anatomy and physiology can also help establish a conceptual framework which can assist in learning singing technique. Broaddus-Lawrence’s 2000 study into the effects of vocal hygiene education in singers suggested the following beneficial topics to include: common voice disorders, the possible effects of vocal abuse on the vocal folds and how voice quality is affected by abuse, ideal vocal technique for speaking, and components specifically tailored for singing health (e.g. the value of daily warm-up and the dangers of singing

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234 Broaddus-Lawrence, 59.


237 Broaddus-Lawrence, 59.


239 García, 246.e11.

240 Broaddus-Lawrence, 59.
outside of one’s ideal vocal range). Onofre’s 2017 study suggested that both warming up prior to intense singing, and cooling down the voice after vigorous vocal effort are key preventative vocal health measures. However, though warming up is a commonly taught vocal health measure which appears often in the literature, cooling the voice down (performing exercises which reduce built-up tension and return the laryngeal muscles to their basal state) is seldom discussed in the literature, and is not in common practice among singers. Weekly’s 2018 study indicated that singers do not seek treatment because of a lack of knowledge of where or how to pursue appropriate care. Finally, in Lemon-McMahon’s 2018 study most voice teachers surveyed were resistant to the idea of sending students for medical examination. This suggests that singers who have transitioned into teaching may also have inadequate knowledge of vocal health. Lack of vocal health knowledge appears to be a significant correlating issue to the development of vocal dysfunction in singers, and to delays in diagnosis. Working towards better vocal health education could be a useful preventative measure.

### 2.2.11 Singing/Professional Voice – Better Diagnosis Tools/Techniques Needed

The following is a general discussion of the need for better diagnostic procedures and techniques in the diagnosis of general voice disorders in the population of singers (not specifically PMTD in classical singers).

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241 Broaddus-Lawrence, 59.


243 Ibid.

244 Ibid., 129.e10.

245 Ibid., 129.e14.


Another issue leading to delayed diagnosis in professional voice users and singers is the previously discussed lack of subtlety in diagnostic procedures and lack of knowledge on the part of medical practitioners. Just as some diagnostic tools are not capable of distinguishing between PMTD and voice disorders with similar features, there are limitations to the ability of diagnostic tools to evaluate the singing voice. Several studies described limitations in the capability of standard videostroboscopy and endoscopy to diagnose subtle dysphonic characteristics, especially in the singing voice.

Because of the speed at which the vocal folds open and close at higher sung pitches, and because singers may experience significant impact from more subtle voice problems than the general population, several studies suggested a move towards the use of highspeed video imaging to diagnose singers and subtle voice dysfunction. Another study lamented the lack of sensitivity in typical perceptual rating scales (such as the GRBAS) used by medical practitioners, as they lacked the capacity to identify subtle changes in voice quality which had significant impact for professional voice users. This study presented a new tool designed to rate subtle changes to the level of dysphonia.

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252 Ibid., 686.

253 Ibid.


255 Woo, “Objective Measures of Laryngeal Imaging: What Have We Learned Since Dr. Paul Moore,” 75.

found in professional voice users.\textsuperscript{257} Other articles raised concerns with the capability of impact rating scales such as the Voice Handicap Index (VHI) to accurately assess the severity of the disability experienced by professional voice users, suggesting that it was not a sensitive enough measure to detect changes from pre- to post-treatment voice handicap, or did not adequately address occupational voice use.\textsuperscript{258} One article declared one of the hallmarks of MTD as the presence of dysfunction in \textit{all} vocal tasks.\textsuperscript{259} If clinicians were to stick rigidly to this diagnostic criterion, singers experiencing debilitating symptoms of MTD in their singing but not their speech would not receive a diagnosis until the disorder progressed to a more severe state. Kwok’s 2017 study supported this point, suggesting that because research into voice disorders in singers is still a relatively new field, many clinicians have a poor understanding of the diagnosis and treatment of this population.\textsuperscript{260} Kwok, Sielska-Badurek and others also confirmed that there exists no standardized assessment protocol for evaluating the singing voice,\textsuperscript{261} and suggested that due to the specialized vocal needs of singers, their voices should be analyzed using an entirely different framework than those of the general population.\textsuperscript{262} All of these issues with diagnosis could lead to delays in professional voice users and singers receiving treatment.

\textsuperscript{257} Gould, e169.
\textsuperscript{259} Shannon Kraft et. al., “Refractory Dysphonia Due to Isolated Cricothyroid Muscle Dystonia,” \textit{Journal of Voice} 30 no. 4: 504.
\textsuperscript{260} Kwok, 2.
\textsuperscript{261} Ibid.
2.2.12 Singing/Professional Voice – Preventative Baseline Examinations

The following is a discussion of the need for preventative baseline examinations to avoid the development of general voice disorders in the population of singers, (not specifically to avoid PMTD in classical singers).

Two studies surveyed for this literature review recommended that singing students undergo baseline examinations into their vocal health prior to beginning elite voice training (which is done in some universities, but is not standard procedure in the field). Both studies performed laryngoscopic evaluations on singing students who were not exhibiting signs of dysfunction, and found that high percentages of these students exhibited organic or functional deviations from ideal vocal function. This finding supports another article’s suggestion that vocal health is best described as a spectrum rather than binary (normal versus abnormal). Perhaps some of these vocal abnormalities could be described as technical faults rather than vocal dysfunction. Studies did not suggest that all findings be treated. However, they hypothesized that these deviations from ideal vocal function had the potential to become symptomatic with the increased voice use that comes with elite training. Prior knowledge of abnormalities would provide useful information if acute symptoms occurred, and would give students the knowledge to pursue their unique vocal health needs, helping them to avoid vocal dysfunction, and allowing for earlier intervention in the case that it did arise. This intervention – introducing singing students to the medical side of voice care so early –


might also reduce the fear of seeking diagnosis. If this service was provided by music faculties and facilitated by student health plans, it could decrease the cost and associated reluctance to seek diagnosis. Given that these asymptomatic deviations from ideal vocal function could be technical faults, this early information about students’ vocal abnormalities could be useful in guiding voice instruction.

2.2.13 Singing/Professional Voice – More Treatment Research Needed

The following is a discussion of the need for more treatment research into general voice disorders in the population of professional voice users and singers, including a brief mention of a recent study into singing voice outcomes after treatment for MTD.

If the goal of voice therapy is to return functionality to a person’s voice in their life, work, and ability to communicate, professional voice users such as singers would have different treatment needs than the average voice user. Professional voice users require a higher daily level of vocal function in several ways: superior stamina to withstand greater-than-average time spent using their voices, and the ability to sustain higher intensity, greater pitch range, and more complex voice use. Therefore, it is possible that for professional voice users mild issues would be experienced as dysfunction earlier in development, and dysfunction would need to be more fully resolved to no longer impact function. In spite of this, articles directly addressing professional voice use confirmed that there is a lack of research into the efficacy of treatment of voice disorders in this population. Few studies addressing treatment in professional voice users were found, and even fewer into the treatment of singers were discovered. Those that were found lamented the lack of research done into these populations, including a

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270 Kwok, 7.


272 Guss, 355.
2017 study which was the first ever research examining the perceptual singing voice outcomes for treatment of MTD.\textsuperscript{273} Another study researching use of warm-up and cool-down techniques as preventative vocal health measures in singing suggested that, though vocal rest is considered one of the most important elements in treating vocal fatigue and preventing dysfunction,\textsuperscript{274} in terms of treating singing-induced tension in the vocal mechanism, vocal rest was not an adequate tool for reducing the vocal folds to their basal state.\textsuperscript{275} Overall the literature advised that not only are more controlled, randomized clinical studies into the efficacy of various treatments needed,\textsuperscript{276} more studies are needed into their effects on the singing voice.\textsuperscript{277}

2.2.14 Singing/Professional Voice – Possible Voice Technique or Behavioural Elements

The consensus in this literature review is that muscle tension voice disorders such as PMTD are prevalent among singers, and that these disorders are primarily caused by behavioural factors in this population. Unfortunately, the variability of singing styles (among other factors) makes it difficult to specifically define these behavioural causal elements.\textsuperscript{278} \textsuperscript{279} However, some behavioural factors/voice technique elements which are repeatedly correlated with functional/hyperfunctional voice disorders and dysphonia include: posture, breathing, vocal tessitura, and registration. Yet, within this literature, the discussion is mostly about the relationship between behavioural elements of hyperfunctional voice disorders/dysphonia and singing in general terms. There is very


\textsuperscript{274} Onofre, 129.e14.

\textsuperscript{275} Ibid., 129.e13.


\textsuperscript{277} Mendes, 8.

\textsuperscript{278} García, 246.e11.

\textsuperscript{279} Lemon-McMahon, “Toward Defining “Vocal Constriction”: Practitioner Perspectives,” 74-75.
little literature specifically discussing the behavioural or voice technique elements associated with PMTD in the population of classical singers.

Posture was mentioned regularly in the clinical literature as a factor in hyperfunctional voice disorders. Three articles described abnormal head/neck posture with an upward and forward thrust chin (hyperlordosis) as a potential causal factor in hyperfunction in singing. This kind of head or neck posture often results in a higher laryngeal position and increased tension in the neck muscles. One study also linked this posture to vocal pitch range, suggesting that as pitch changes, head alignment also at times alters. All of this suggests that imbalanced head/neck posture could be correlated with the development of chronic hyperfunction in singing.

A number of studies suggested that issues with breathing were causal or correlated with hyperfunctional voice disorders. One study even found that there were differences in which abdominal muscles were recruited in phonation between healthy versus dysphonic singers. Healthy subjects were found to have greater recruitment of the transversus abdominis muscle in phonation, and dysphonic subjects were found to have greater recruitment of the internal oblique muscle. This finding suggests that imbalanced use of respiratory muscles could lead to hyperfunction in singing, and that more research needs to be done into this phenomenon.

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283 Ibid.


A correlation between increased tension and fatigue and higher tessitura singing arose many times in the literature. One study found “markedly elevated” activation in neck muscles when singing the highest pitches, including pharyngeal constrictor muscles.286 Another study found that the hyoid bone typically elevated with increased pitch.287 A third study described the well-known phenomenon of the larynx rising for the production of high pitches and lowering for low pitches, especially in untrained singers.288 The subject of a case study into MTD and classical singing – one of the few studies of MTD in classical singing – was a coloratura soprano, a voice type that sings primarily high tessitura repertoire.289 Another study reported on the case of an opera singer who pushed her voice “to its upper limit” so often during practice that her laryngeal muscles fatigued.290 Finally, a study into the effects of vocal warm-up and cool-down in singing found that after singing the fundamental frequency of the voice was higher than normal, indicating that the vocal folds remained stretched due to increased tension in the muscles responsible for that action.291 From these findings, it seems clear that high tessitura singing can be a cause of increased vocal fatigue and tension – hallmarks of MTD. This also correlates with the previous suggestion that pitch changes and associated alterations in head/neck alignment can be a causal factor of high laryngeal position and increased tension in neck muscles.


291 Onofre, 129.e13.
The findings of other studies were less conclusive, adding complexity to the concept of singing range as a factor in muscle tension voice disorders. A 1996 study cited several researchers (Sander and Ripich, Stone and Shaft, and Colton and Casper) who demonstrated that voices will exhibit fatigue and strain at both high and low extremes of vocal production. Many more recent studies agreed that elevated fundamental frequency, in which excess tension leads to the vocal folds remaining in a stretched or stiffened state) was a common vocal symptom of tension and fatigue. However, several other studies from varying times throughout the literature suggested that an abnormally low fundamental speaking frequency was a cause of harmful tension or a symptom of edema (swelling) caused by unhealthy tension. Finally, one study stated that alterations of the speaking fundamental frequency in either direction were potential signs of hyperfunction, and another study suggested that singing outside

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293 Tse, “Analogy Instruction and Speech Performance Under Psychological Stress,” 196.
of one’s own register can cause vocal overload. These findings seem to indicate that both excessively high tessitura, and disproportionately low tessitura voice use can create tension and fatigue.

The topic of registration arose many times over the course of researching this literature review. As registration is an extremely complex element of voice technique, a brief explanation of registration based on vocal pedagogy sources is included here prior to the discussion of the registration-related findings in the clinical literature.

Though many voice pedagogues have had semantic disagreements about the definition and number of vocal registers, nineteenth century pedagogue Manuel Garcia II created this generally accepted definition: “...a series of consecutive and homogeneous tones going from low to high, produced by the development of the same mechanical principle, and whose nature differs essentially from another series of tones, equally consecutive and homogeneous, produced by another mechanical principle.” Voice scientists agree that there are two primary mechanical principles or physiological modes of voice production. These modes are named after the muscles primarily used to produce them – thyroarytenoid dominant production (TDP), and cricothyroid dominant production (CDP) – but are often referred to by a variety of other descriptive terms, such as chest voice or heavy production and head voice, falsetto, or light production. Because of scientific study, many pedagogues are now teaching that these two modes are the two primary singing registers. Even someone untrained can feel these two modes occur when contrasting their lowest and highest notes.

In CDP, the mode more dominant for higher notes, the vocal folds are stretched to become thin, resulting in a smaller surface area of the folds coming together than in TDP.

301 García, 246.e11.
In the CDP mode the folds are also open for a longer time per open-close cycle of phonation.\textsuperscript{304} These factors result in a less complex vibration (fewer overtones) and more air escaping,\textsuperscript{305} therefore the production of a quieter/lighter, duller and breathier sound. In contrast, in TDP (more dominant for lower notes) the vocal folds are closed for more of each cycle, and a more complex vibration with more overtones/partials is created. The CDP mode of voice production is more common throughout female than male classical singing (excluding countertenors),\textsuperscript{306} and in untrained voices it is correlated with an elevated larynx.\textsuperscript{307}

Lists of potential symptoms for PMTD found in the clinical literature included both those that seem associated with cricothyroid dominant production (CPD) or head voice – breathiness, shrill or chronically high-pitched quality, and high-pitched falsetto – and those that seem associated with thyroarytenoid dominant production (TDP) or chest voice – glottal fry, hard glottal attack, and stridency. Phonatory breaks\textsuperscript{308} and difficulty navigating vocal registers were also mentioned regularly as symptoms of resulting from increased vocal mechanism tension and raised laryngeal position.\textsuperscript{309 310} Registration is a strong correlating factor with PMTD.

Much of the literature suggests that in addition to occupational risks associated with overuse, singers are at risk of developing behaviourally caused functional voice disorders from chest dominant use. Many studies and much of the language associated with PMTD


\textsuperscript{305} Ibid.

\textsuperscript{306} Ibid., 147-148.

\textsuperscript{307} J. A. Stark, \textit{Bel canto: A history of vocal pedagogy} (Toronto: University of Toronto Press, 2003), 38.

\textsuperscript{308} Lowell, 370.

\textsuperscript{309} Onofre, 129.e14.

\textsuperscript{310} Morrison, “Pattern Recognition in Muscle Misuse Voice Disorders: How I Do It,” 111.
suggest that one of the primary causes of PMTD with occupational or behavioural etiology is overly strong or forceful vocal production, which could be extrapolated to mean with an overly chest voice dominant quality.\textsuperscript{311, 312} One case study into PMTD in a classical singer listed “bottom-up” registration training (overuse of TDP or carrying chest voice up too high in the voice) as a causal factor in MTD in singers.\textsuperscript{313} In another study, several voice teachers listed “singing too loudly” as a voice technique cause of constriction in singing.\textsuperscript{314} Some of the most common terms associated with PMTD – its descriptor as a “hyperfunctional” voice disorder, the potential cause of “vocal abuse” – also suggest that it is associated with an imbalance towards a forceful, or chest-dominant production quality.

However, a few studies paint a more complex picture of PMTD and registration. Though it is mentioned far less often in the literature than hyperfunctional dysphonia, several articles briefly mentioned the existence of hypofunctional dysphonia,\textsuperscript{315, 316, 317} dysphonia with bowing or hypoadducting vocal folds,\textsuperscript{318} or other hypofunctional voice dysfunction.\textsuperscript{319, 320} Some articles conflated hypofunctional symptoms such as breathiness

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\textsuperscript{311} Andrade, “The Frequency of Hard Glottal Attacks in Patients with Muscle Tension Dysphonia, Unilateral Benign Masses and Bilateral Benign Masses,” 241.
\textsuperscript{312} Eustace, 146.
\textsuperscript{313} Goffi-Fynn, “Collaboration and conquest: MTD as viewed by voice teacher (singing voice specialist) and speech-language pathologist,” 391.e9.
\textsuperscript{314} Lemon-McMahon, 74-75.
\textsuperscript{316} Marco Guzman et. al., Vocal Tract and Glottal Function During and After Vocal Exercising With Resonance Tube and Straw,” \textit{Journal of Voice} 27 no. 4 (2013): 523.e28.
\textsuperscript{317} Kollbrunner, 132.e1.
\textsuperscript{318} Morrison, “Pattern Recognition in Muscle Misuse Voice Disorders: How I Do It,” 109.
\end{flushleft}
with vocal fatigue, suggesting they arise from laryngeal muscle fatigue arising from overuse or hyperfunctional vocal behaviours. This again supports the idea that chest-dominant voice production is causal in the development of functional voice disorders such as PMTD. However, other studies indicate that the opposite causal relationship is also possible. One article discussing vocal fold paresis observed that this form of hypofunction in the laryngeal muscles can lead to hyperfunction as a form of compensation. An article discussing vocal fold microsurgery in singers commented that the technique of intentionally breathy speech (for the purpose of reducing vocal fold collision force) actually seemed to put patients at risk of developing MTD. Further, an article attempting to find common terminology across voice instruction and medical practitioner disciplines postulated that hyperfunction could be viewed as a muscular imbalance in phonation – occurring when one muscle or muscle group works excessively and another muscle or muscle group suffers from hypofunction – rather than being solely a problem of hyperfunction. The same article went on to recommend further investigation of the relationship between hypofunction and constriction/tension in singing. Perhaps singing in an overly CDP or head-voice dominant production could be a cause of PMTD. This might account for the differences in presentation across different styles of singing, such as pop or musical theatre (more chest voice dominant).


321 Eustace, 146.


325 Lemon-McMahon, 71.

326 Ibid., 77.
and female classical (more head voice dominant). It also might partly explain the higher prevalence of voice disorders in women.

### 2.2.15 Singing/Professional Voice – Premenstrual Dysphonia

Several articles surveyed for this literature review studied the effects of the hormonal fluctuations of the menstrual cycle on the singing voice. These studies established that for some women, prior to or during the first few days of menstruation, the voice is negatively impacted,\(^{327}\)\(^{328}\)\(^{329}\)\(^{330}\) and described the past practice at European opera houses of “grace days” during which females were excused from singing during premenstrual or early menstrual days.\(^{331}\)\(^{332}\) Symptoms can include vocal fatigue, weaker/husker voice, roughness, breathiness, instability,\(^{333}\) decreased vocal efficiency, reduced flexibility, breathiness, loss of high notes, hoarseness, intonation problems, muffled voice, reduced ability to perform high and soft singing,\(^{334}\) increased tendency to develop vocal fold hemorrhage, edema (swelling), and increased vocal fold vascularity during the premenstruation period.\(^{335}\)\(^{336}\) Two studies stated that vocal symptoms were more easily

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\(^{331}\) Ibid.


\(^{333}\) Arruda, “Vocal Acoustic and Auditory-Perceptual Characteristics During Fluctuations in Estradiol Levels During the Menstrual Cycle: A Longitudinal Study, 6.

\(^{334}\) Shoffel-Havakuk, 232.

\(^{335}\) Gunjawate, “The Effect of Menstrual Cycle on Singing Voice: A Systematic Review,” 188.
identifiable by the singer than by an expert listener.\textsuperscript{337} \textsuperscript{338} This suggests that audible vocal symptoms are either extremely subtle, or that symptoms are more associated with discomfort or increased effort than with audible changes. Vocal Handicap Index (VHI) score changes were minor between different phases of the menstrual cycle. However, perhaps here again a more sensitive instrument is needed to measure the severity of impact experienced by singers.\textsuperscript{339} Two studies asserted that vocal fold injury could possibly arise from singing while experiencing premenstrual dysphonia. Perhaps chronic voice disorders could arise in part from increased laryngeal tension associated with trying to sing in a high tessitura or create a clear tone quality under these conditions. Studies recommended that further research be pursued.\textsuperscript{340} \textsuperscript{341}

\textbf{2.2.16 Singing/Professional – Mutational Falsetto/Puberphonia}

Several articles surveyed over the course of this literature review discussed the less common functional disorder of mutational dysphonia or puberphonia. This disorder is defined by the failure of a patient’s voice to make the anticipated drop in pitch at puberty, despite the normal laryngeal growth and associated changes occurring.\textsuperscript{342} \textsuperscript{343} \textsuperscript{344} It is

\begin{itemize}
  \item \textsuperscript{336} Shoffel-Havakuk, 226.
  \item \textsuperscript{337} Ryan, “Perceived Effects of the Menstrual Cycle on Young Female Singers in the Western Classical Tradition,” 99.
  \item \textsuperscript{338} Gunjawate, 188.
  \item \textsuperscript{339} Shoffel-Havakuk, 230.
  \item \textsuperscript{340} Gunjawate, 188.
  \item \textsuperscript{341} Shoffel-Havakuk, 232.
  \item \textsuperscript{342} Kraft, “Refractory Dysphonia Due to Isolated Cricothyroid Muscle Dystonia,” 504.
\end{itemize}
associated with excessive contraction of the cricothyroid muscles, high laryngeal position, decreased thyrohyoid space, tense and thin vocal folds, and reduced vocal fold mass. In addition to exhibiting abnormally high pitch in this disorder, the voice may also be breathy and weak, or difficult to project. This disorder is usually diagnosed in men, and is even often considered to be a disorder unique to men, but has sometimes been diagnosed in women, at times under the names “Juvenile Resonance Disorder” or “Little Girl’s Voice.” Given that the symptoms of this disorder are very similar to those of PMTD, and that female voices undergo a much less obvious drop in pitch at puberty than male voices (one octave in men and one-third to one-quarter octave in women), perhaps some cases of female mutational falsetto/puberphonia go undiagnosed and later manifest as PMTD, inflating the female diagnosis rate of this disorder. Perhaps some of these cases only emerge under more significant vocal demands, such as those of a singer.

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345 Kraft, 504.


347 Ibid., 18.

348 van den Broek, “Bilateral In-Office Injection Laryngoplasty as an Adjunctive Treatment for Recalcitrant Puberphonia: A Case Report and Review of the Literature,” 221.

349 Kraft, 504.

350 Lim, 13.

351 van den Broek, 221.

352 Ibid.

353 Lim, 16.
2.2.17 Conclusions from the Clinical Literature

The overwhelming conclusion of the body of articles surveyed for the clinical literature review is that more research is needed. Though most agreed that professional voice users are more susceptible to vocal dysfunction – and some that singers were even more prone to developing voice disorders – and the impact of even mild vocal dysfunction is highest in the population of Elite Vocal Performers, few studies have been done into causes, impact, diagnosis, and treatment in this population. Many studies specifically excluded singers or those with voice training from their participant groups. Though within the population of singers there is wide variation in style, level of training, and vocal load, (classical, jazz, pop, musical theatre, amateur, student, choral, touring professional, etc.) in the few studies specifically into the population of singers, many did not define populations specifically enough to make connections with style, technique or repertoire, and few of those that did specify style studied the population of classical singers. Though muscle tension disorders such as PMTD are some of the most prevalent voice disorders in this population, few of the studies found researched muscle tension disorders and singing, and even fewer were focused on these disorders and the subcategory of classical singing. Research into every element of classical singers’ experiences with PMTD is needed.

2.3 Crossover Literature

Crossover literature – books researched and written by experts in both vocal pedagogy/vocal health and medicine – was investigated. The works of three vocal pedagogy authors with dual qualifications in music and medicine were explored. These included Dr. Jean Abitbol, Dr. Anthony Jahn, and Dr. Robert Sataloff. All these researchers were previously encountered in the clinical literature review, but the hope was to find more detailed information into presentation/voice technique causes of PMTD in classical singers in their print publications.

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While the crossover literature did not contain much of the hoped-for information on specific presentation and voice technique causes of PMTD in classical singers, some indirect references supported the developing ideas of technical causes from the clinical literature, and much of the information was found to be organized with a useful focus for singers and voice teachers. Dr. Abitbol's book did not discuss Muscle Tension Dysphonia at all, however it did contain several interesting insights. Dr. Jahn's book, *The Singer's Guide to Complete Health*, was an excellent resource on vocal health (both accessibly written and priced, and broad-scoped, it should probably be included on recommended reading lists for university vocal pedagogy courses). It did mention Muscle Tension Dysphonia and contained several related insights, though did not contain any research specifically about Muscle Tension Dysphonia in classical singers. Dr. Sataloff’s books were the most useful, including a great deal of the same information as in the clinical literature, but few new insights.

Though no mention was made of MTD in Dr. Abitbol’s *Odyssey of the Voice*, this book relayed information previously unencountered in this literature review about voice anatomy/physiology changes associated with puberty and the voice change process. The larynx is positioned high in the throat when a child is born and descends throughout childhood to allow for the creation of sung and spoken sound.\(^355\) If the larynx did not properly descend during puberty, an unnaturally high laryngeal position would persist, negatively impacting vocal function. Perhaps there is a link between MTD and a child-like laryngeal placement like that found in puberphonia/mutational falsetto. Abitbol also suggests that the configuration of the vocal folds is responsible for the initial qualities present in a sound, and the resonators cannot magnify qualities that were not present in the original sound.\(^356\) This is significant because if the sound produced at the folds is not already a firmly produced, clear sound, with many overtones present, rather than a breathy, complexity-lacking sound, it cannot be altered significantly through the process of resonance. This supports the idea that a hypofunctional registration with an imbalance

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\(^{356}\) Ibid., 162.
towards CDP, and consequent compensatory tension developed in the extrinsic musculature could be a behavioural cause of MTD.

Dr. Anthony Jahn's book, *The Singer's Guide to Complete Health*, mentioned Muscle Tension Dysphonia, but did not contain any research specifically about Muscle Tension Dysphonia in classical singers. However, in a chapter entitled: “Self-Screening for Vocal Injuries,” the suggestion is made that 10-20% of singers develop chronic voice disorders, but most teachers attribute symptoms to poor technique, underdeveloped instrument or even inferior vocal apparatus.\(^{357}\) This suggests that more voice teacher knowledge of chronic voice disorders is extremely important in order to avoid delayed diagnosis and the development of greater severity of disorders in singers. This book also included several other related pieces of information: because the extrinsic laryngeal muscles are primarily used to raise the larynx and protect the airway during swallowing, there are more and stronger laryngeal elevators than depressors.\(^{358}\) As a result of this physiology, though most singers train their larynges to rest lower than the average person, abstaining from singing for more than a day or two allows the larynx to resume a higher position.\(^{359}\) Long periods of vocal rest may not only be inadequate to reduce tension associated with the raised laryngeal position in PMTD, extended vocal rest may encourage it. This book also suggests that the posture/alignment fault of “pushing the head forward like a turtle” can be a factor in elevating the larynx.\(^{360}\) Specifically regarding registration, Jahn’s book states that many classical singers have trouble finding their true chest voice, instead training their voices by carrying their head voice quite low (a possible correlation between registration and hypofunction).\(^{361}\) Finally, this book describes “hyperfunction underclosure,” a technique that some singers use to create a breathy sound with a high


\(^{358}\) Ibid., 29.

\(^{359}\) Ibid., 247.

\(^{360}\) Ibid., 392-3.

\(^{361}\) Ibid., 369.
degree of tension in the laryngeal muscles,\textsuperscript{362} causing vocal fatigue and loss of range, among other symptoms,\textsuperscript{363} and states that this disordered phonation technique is treated using speech-like sounds.\textsuperscript{364} All of these additional pieces of information reinforce the idea that MTD is a very common disorder to develop, and that it could be caused by a breathy or too-light type of production in singing. However, like all the other crossover books reviewed, little of this information specifically addressed classical singing.

Dr. Sataloff is one of the most widely recognized researchers and practitioners in the field of professional voice care. Possessing both Medical Doctor (MD) and Doctor of Musical Arts in Voice (DMA Voice) degrees, he is editor-in-chief of the \textit{Journal of Voice}, editor-in-chief of \textit{Ear, Nose and Throat Journal}, associate editor of \textit{The Journal of Singing}, and is chairman of the Boards of Directors of the Voice Foundation and of the American Institute for Voice and Ear Research. His book, \textit{Professional Voice: The Science and Art of Clinical Care}, first published in 1991, is now in its fourth edition and has been expanded from the original thirty-three chapters to three-volumes, and one hundred twenty chapters. The chapters on “Voice Therapy” and “The Singing Voice Specialist,” are particularly useful resources for the singing community, and were recommended as background research for this study in correspondence with Dr. Sataloff.

The chapter on “Voice Therapy,” in Sataloff’s \textit{Professional Voice}, contains detailed descriptions of the necessary features of both clinicians and therapies for treating professional voice users, including singers. This chapter confirmed that specialist teams are needed to diagnose and treat this population, and that these teams should include a laryngologist (ENT), speech language pathologist (SLP), singing voice specialist or voice teacher (if singer), acting voice specialist (to work on projected speech if necessary), and possible adjunct members such as voice researcher, singing coach, psychologist or


\textsuperscript{363} Ibid., 379-381.

\textsuperscript{364} Ibid., 381-382.
psychiatrist, and other specialist physicians.\textsuperscript{365} This chapter warned that in singers, singing technique is often highly advanced, but speech has received little training and therefore needs treatment/training.\textsuperscript{366} However, it also went on to verify that singing typically does need to be evaluated and treated, and that SLPs are usually not qualified to evaluate singing technique to the level needed for professional singers. Therefore, a singing voice specialist/voice teacher must be included in the diagnostic and treatment process for professional singers.\textsuperscript{367} Therapies are not useful if patients are not taught how to transfer the skills learned in treatment into their daily voice use,\textsuperscript{368} which for singers includes their singing. This chapter also confirmed that the goal of treatment in this population is not adequate vocal function, but excellent vocal function,\textsuperscript{369} and because of this, more nuanced and thorough criteria are needed in voice evaluation in professional voice users.\textsuperscript{370} Verifying that the patient has adequate knowledge of vocal hygiene may be necessary,\textsuperscript{371} (including reinforcing the importance of regular warm-up, cool-down, and near-daily voice training/conditioning as key to maintain singing voice).\textsuperscript{372} Educating patients on stress-management/relaxation strategies may be helpful,\textsuperscript{373} and patients should be referred for psychological care if necessary.\textsuperscript{374}


\textsuperscript{366} Ibid., 1172.

\textsuperscript{367} Ibid., 1176.

\textsuperscript{368} Ibid., 1188.

\textsuperscript{369} Ibid., 1171.

\textsuperscript{370} Ibid., 1173.

\textsuperscript{371} Ibid., 1179-1181.

\textsuperscript{372} Ibid., 1191.

\textsuperscript{373} Ibid., 1189.

\textsuperscript{374} Ibid., 1192.
A number of behavioural therapy techniques were also briefly described in the Voice Therapy chapter. Overall, these did not focus on the treatment of specific voice disorders such as PMTD, but two were listed as potentially useful treatment strategies in MTD. Sataloff suggested that circumlaryngeal massage may be a helpful treatment element in patients with muscle tension dysphonia who have particularly rigid posture. He also comments that inhalation phonation may be helpful in some patients with severe muscle tension dysphonia, and glottic insufficiency. Perhaps this could be an example of MTD presenting as hypofunction.

The chapter on “The Singing Voice Specialist,” in Sataloff’s Professional Voice, expanded on the necessity of specialist singing care for professional singers in treatment for vocal dysfunction, and described requirements for this type of specialist care. As mentioned in the “Voice Therapy” chapter, other members of the team necessary in treatment of professional singers often do not have training in evaluating and instructing singing, so singing voice specialists are necessary for this care. The term “Singing Voice Specialist,” was coined by Sataloff in 1981 as the team approach to the treatment of professional voice was developing. Oren Brown and William Vennard (two voice pedagogues and the authors of vocal pedagogy texts) were pioneers in the field. Training and accreditation for these specialists is a complex issue. Voice teachers cannot legally perform treatment or rehabilitation on voices, and health insurance typically does not cover any amount of voice teacher fees. As a result, many singing voice specialists are voice teachers who also have degrees in speech language pathology. However, SLPs often do not receive much training in the remediation of voice disorders, so the time and money spent pursuing this training can feel wasteful if the goal is to become a singing voice specialist. The field of vocology is growing in response to this issue, but a clear

375 Rose, 1178.
376 Ibid.
378 Ibid., 1232.
path to pursue the qualification of singing voice specialist still does not exist.\textsuperscript{379} Additionally, there is no minimum accreditation standard to call oneself a voice teacher, so careful vetting is needed on the part of the other members of a professional voice care team before a voice teacher can become a member.\textsuperscript{380}

The rest of the chapter is devoted primarily to techniques for evaluating and remediating excessive tension and inefficient use of the vocal mechanism in singing. While posture, breathing, and resonance (placement) are included here, there is no mention of registration or singing tessitura. This chapter also confirmed that it is important to consider the psychological and emotional stress that is often caused by voice problems. Most people have strong self-identification around their speaking voices, and can experience significant stress when their ability to vocalize is disrupted, but this reaction can be severely magnified for professional voice users (including, or even especially, singers).\textsuperscript{381}

In the same text, Sataloff makes a number of specific mentions of MTD outside of the chapters he recommended for this literature review. MTD was listed as a possible pediatric voice disorder.\textsuperscript{382} The potential for association between MTD and reflux was outlined.\textsuperscript{383} The possibility for confusion between MTD and neurological voice disorders such as Spasmodic Dysphonia was reiterated.\textsuperscript{384} The importance of Laryngeal

\textsuperscript{379} Baroody, “The Singing Voice Specialist,” 1232.
\textsuperscript{380} Ibid., 1234.
\textsuperscript{381} Ibid., 1236.
Manipulation in treating MTD was stated.\textsuperscript{385} It was confirmed that Odynophonia (painful phonation) is usually caused by muscle tension dysphonia, and expanded on this by stating that in professional voice users this can present in more subtle ways than pain, such as discomfort and fatigue.\textsuperscript{386} Finally, one possible behavioural cause was suggested: associations with the postural fault of hyperextended hyperlordotic neck position (chin elevation).\textsuperscript{387} As the clinical literature review showed that this exact postural issue is often seen in untrained singers when they attempt to move into higher tessitura singing, this may support the idea that high tessitura singing is a voice technique factor in the development of PMTD. However, though Sataloff’s \textit{Professional Voice} was the most comprehensive resource reviewed linking professional voice use/singing and vocal health, there was essentially no information on specific types of voice technique faults (the tension and posture issues discussed were quite broad) that are possible causal factors in the development of PMTD in classical singers.

2.3.1 Conclusions from Crossover Literature

Print publications by three crossover experts were reviewed. These experts included Dr. Jean Abitbol, Dr. Anthony Jahn, and Dr. Robert Sataloff. While this crossover literature did not contain in-depth information on specific presentation and voice technique causes of PMTD in classical singers, some indirect references supported the developing ideas of technical causes, and much of the information was found to be organized with a useful focus for singers and voice teachers. Dr. Abitbol’s book did not discuss Muscle Tension Dysphonia at all, however it did contain several interesting insights. Dr. Jahn’s book, \textit{The Singer’s Guide to Complete Health}, was found to be an excellent resource on vocal health. However, though it did mention Muscle Tension Dysphonia and contained several


related insights, it again did not present any research specifically about Muscle Tension Dysphonia in classical singers. Dr. Sataloff’s books were the most useful, bringing together a great deal of the same information as found in the clinical literature, confirming the necessity of specialized team care in the diagnosis and treatment of voice disorders in singers, even mild dysfunction taking a significant toll on the functionality of the singing voice, and the necessity of treating the singing (not just speech) of singers. However, even Sataloff’s book did not contain much in the way of new information on PMTD in classical singers.

2.4 Vocal Pedagogy Literature

This examination of the vocal pedagogy literature explored the level to which PMTD is represented and understood in the publications commonly published and consumed in this community. The books investigated in this literature review included the pedagogy textbooks assigned (and several found on lists of recommendations but not officially assigned) in undergraduate and graduate level voice pedagogy classes at three music faculties in Southern Ontario, as well as one vocal pedagogy book recommended in consultation with Lori Holmes, speech language pathologist and lecturer at the University of Western Ontario. This added fifteen book sources to the literature review.

To be sure of having a comprehensive knowledge of the current research into singing and PMTD, a search for articles on MTD was made on The Journal of Singing (The National Association of Teachers of Singing – or NATS – journal) database. A search for the keyword combination “Muscle Tension Dysphonia” brought up only seventeen articles. One article with a specific focus on MTD in classical singers was published while this review was in process, and was subsequently added, bringing the total number of articles to eighteen. Three previously reviewed Journal of Singing articles on the topic of premenstrual dysphonia and puberphonia were also included for context on those topics.

2.4.1 Vocal Pedagogy Books

Of the fifteen vocal pedagogy books reviewed, only eight had sections on vocal health. Those were Brown’s Discover Your Voice, Caldwell and Wall's five-volume Excellence in Singing, Chapman's Singing and Teaching Singing: A Holistic Approach to Classical
Of the vocal pedagogy books containing sections on vocal health, only two mentioned Muscle Tension Dysphonia by name (Your Voice: An Inside View, Second Edition by Scott McCoy, and Singing and Teaching Singing: A Holistic Approach to Classical Voice, Third Edition by Janice L. Chapman) and one other included a lengthy section devoted to functional voice disorders (Discover your Voice: How to Develop Healthy Voice Habits by Oren L. Brown). These three books were some of the most scientifically oriented vocal pedagogy texts surveyed. All three were written in collaboration with scientists/medical doctors. The Chapman and McCoy were also relatively recently updated versions of previously published pedagogy texts, suggesting that both authors’ have a commitment to staying up-to-date with current research. Additionally, the Brown and the Chapman were endorsed in forwards written by Dr. Robert Sataloff, and Brown was listed by Sataloff as one of the pioneers of the Singing Voice Specialist field described in his Professional Voice.

2.4.2 Vocal Pedagogy Books Discussing MTD/Functional Voice Disorders

In Chapman's Singing and Teaching Singing: A Holistic Approach to Classical Voice, Third Edition Muscle Tension Dysphonia was mentioned many times throughout and was discussed in more detail in one multi-page section. Some of the individual mentions of MTD found throughout Chapman’s book were inconsequential reiterations of previously defined facts regarding MTD, but a few of them were more relevant to presentation, voice technique causes, and treatment in singers.

While discussing MTD presentation in singers, Chapman suggested that the differences between MTD in singers and MTD in speech are significant enough to warrant distinct labelling, suggesting singing voice MTD should be labelled Muscle Tension Dysphonia
in Singers (MTDS), rather than including it the umbrella term of MTD.\textsuperscript{388} A case study of a student taught by Chapman went even further, seeming to indicate that symptoms of MTD might only arise in one style of singing for some singers. Her student, a light soprano, showed many of the symptoms of MTD – fatigue, hoarseness, throat pain, and loss of range – in her classical singing – but did not exhibit these symptoms when singing folk or country music. Chapman’s suggestion that MTD that occurs only in the singing voice should have its own label, supports the findings of the clinical literature that MTD can present differently in singers than in the general population. Studies investigating PMTD presenting only in the singing voice (rather than in all vocal tasks) or only in one style of singing would be invaluable to understanding presentation and voice technique causes in singers.

Additional information related to presentation of vocal dysfunction in singers arose in Chapman’s described anecdotal experiences of voice disfunction in her students, and the anecdotal experiences of a paramedical specialist interviewed in her book. Chapman listed a number of voice-quality criteria she uses to guide her choice to refer singers for medical care: sudden voice loss, strain during vocal production, sudden change in vocal quality in absence of infection, and persistent changes in quality after infection).\textsuperscript{389} Her interview with Jacob Lieberman, an internationally recognized osteopath and psychotherapist specializing in treating hyperfunctional voice disorders, also revealed the most common complaints of classical singers consulting him regarding their vocal health: general tension in the throat, recurrent voice loss, loss of dynamic range, and unreliable voice/pitch instability, tenderness or ache around specific laryngeal structures, high laryngeal position, hoarseness, loss of vocal stamina, stiffness/tension of tongue and tongue base, loss of the capacity to tilt at the cricothyroid joint, loss of resonance, inability to connect to support, increased and uncontrolled vibrato, jaw discomfort and limited movement, dryness in the throat or excess thick mucous, need for increased


\textsuperscript{389} Ibid., 298-299.
warm-up time, inability to engage diaphragmatic breathing, and neck/shoulder girdle discomfort/aching.\textsuperscript{390} The vocal dysfunction presentation characteristics in classical singers listed by both Chapman and Lieberman are potentially useful as references for singers and vocal pedagogues in making decisions regarding the pursuit of medical treatment. However, all are gleaned from the anecdotal experiences of Chapman and Lieberman, and are not stated to be specifically singing symptoms of MTD or PMTD. Instead of relying on anecdotal information, clinical research aiming to confirm presentation of voice disorders such as PMTD in classical singing should be pursued in order to add clarity to this topic in vocal pedagogy.

Several mentions of MTD in Chapman’s \textit{Singing and Teaching Singing} suggest specific voice technique elements could be causal factors in the development of PMTD in classical singers. These, overall, were similar to the behavioural causes found in the clinical literature: respiratory, articulator and laryngeal tension, registration, and posture.

Respiratory causes of PMTD arose as a topic when Chapman briefly mentioned that there is clinical research, in its infancy, into the involvement of respiratory abdominal muscles in PMTD. However, she confesses that this research is too new for a clear causal link to be established.\textsuperscript{391} This echoes the findings of the clinical literature review on respiration faults as a behavioural cause of MTD.

Articulator tension and laryngeal position are mentioned by Chapman multiple times over the course of her book. Chapman associates MTD with tongue root tension/artificially depressed larynx.\textsuperscript{392} \textsuperscript{393} While tongue root tension is consistent with the clinical literature, given that the tongue is an extrinsic laryngeal muscle and excessive tension in laryngeal muscles is a key feature of PMTD, the artificially depressed larynx Chapman

\textsuperscript{390} Chapman, \textit{Singing and Teaching Singing}, 299.

\textsuperscript{391} Ibid., 238.

\textsuperscript{392} Ibid., 10.

\textsuperscript{393} Ibid., 83.
describes is less easily linked to the literature. It is well-established that MTD is typically associated with an abnormally elevated laryngeal position. A depressed larynx is only mentioned occasionally, and in passing, in the clinical literature. Perhaps an artificially depressed larynx could be associated with specific styles of singing (i.e. singing with a heavy registration) if it is occurring more in singing populations than the general population.

Registration arises as a correlating factor to MTD when Chapman comments that she has found a more even tone across registers occurs when laryngeal tension is reduced and a healthily-produced relatively-low laryngeal position is achieved.\textsuperscript{394} Her description of a healthily-produced low laryngeal position improving the ease of register navigation suggests that registration may be a technique element with a correlating or causation relationship with PMTD. Chapman strongly suggests that this phenomenon requires further research.\textsuperscript{395} The previously mentioned case study of a student taught by Chapman also demonstrated correlations between registration and PMTD. As described earlier, this student exhibited symptoms of MTD in her classical singing. Particularly her middle register was affected where her tone was small, dull, breathy, and her voice tired easily. However, she did not exhibit these symptoms when singing folk or country music. In classical singing she avoided using her chest register, but in these other genres she did not. Chapman credits this student’s recovery to retraining using elements from her singing technique from folk and country music in her classical voice, as well as improving her breath training and awareness of tension in the tongue root.\textsuperscript{396} This case study suggests that registration may be a technique element with a correlating or causation relationship with PMTD.

\textsuperscript{394} Chapman, 84.
\textsuperscript{395} Ibid., 84.
\textsuperscript{396} Ibid., 101-102.
A final potentially correlating area between voice technique and MTD listed in Chapman’s book is head-thrust posture.\(^{397}\) As the clinical literature review showed that this postural issue is often seen in untrained singers when they attempt to move into higher tessitura singing, this may support the idea of high tessitura singing as a voice technique factor in the development of PMTD. Of these potential technique correlations with MTD, only respiratory muscle involvement and tongue root tension/depressed larynx were specifically linked in Chapman’s book. The other elements required a detailed investigation to be found.

In terms of treatment, Chapman suggests that the most effective and fastest method of remediating laryngeal muscle tension is a combination of manual therapy techniques and the singer’s awareness of tension and agreement to make changes.\(^{398}\) Her book dedicates an entire chapter to a detailed discussion of the use of manual therapy in the management of voice disorders.

It was encouraging to find that Chapman’s vocal pedagogy book discussed MTD from a variety of angles, reiterating its importance by mentioning it multiple times throughout. However, it did not contain any new clinical research into presentation and causes in singers. Rather, the included information addressing these topics was anecdotal.

The second vocal pedagogy book that included specific references to MTD was McCoy's *Your Voice: An Inside View, Second Edition.* Unlike Chapman’s *Singing and Teaching Singing,* this book had a specific subsection devoted to MTD within a larger section on vocal health, rather than having references placed sporadically throughout the book. However, this description took up only a partial page – a relatively small section. McCoy's listing of symptoms and causes echoed that of the speech language pathology articles defining MTD: excessive tension in the extrinsic and intrinsic laryngeal muscles (including neck muscles and tongue base), elevated larynx, vocal fatigue, hoarseness,

\(^{397}\) Chapman, 300.

\(^{398}\) Ibid., 83.
incomplete closure of vocal folds in voice production resulting in breathiness, and physical discomfort or pain in the thyrohyoid region and during singing or speech.\textsuperscript{399} McCoy suggests that causes can include prolonged speaking at an abnormally high or low pitch, use of hard glottal onsets on speech or singing, poor breath support in speech, and generally poor vocal technique. He particularly emphasizes the potential for disordered speech to result in singing dysfunction.\textsuperscript{400} In terms of treatment, McCoy does not delve into specifics, reiterating that behavioural treatment commonly includes exercises intended to realign and relax the muscles of the larynx and neck (including laryngeal massage), and to improve resonance.\textsuperscript{401} Nothing new or truly specific to singing was found in McCoy’s discussion of MTD.

Oren L. Brown’s \textit{Discover your Voice: How to Develop Healthy Voice Habits} was added to the literature review in consultation with Lori Holmes, a speech language pathologist and lecturer at Western University. This book did not include any specific mentions of Muscle Tension Dysphonia, but did contain a lengthy section dedicated to functional voice disorders (the larger category often listed as containing MTD). In this section, Brown defines functional voice disorders as those with an occupational cause, resulting from some type of misuse of the voice.\textsuperscript{402} He begins the section with an anecdote he discovered during his own vocal health studies, immediately supporting the developing idea that both overly heavy (chest-dominant/TDP) registration, and overly light (head-dominant/CDP) registration could result in dysfunction: in H. Holbrook Curtis’ 1974 book, \textit{The Singing Voice}, he recounted treating a singer with vocal fold nodules (a vocal pathology known for callus-like legions on the vocal folds often caused by overly forceful use/abuse of the voice) at the same time as another singer with bowed vocal folds. He sent each to study with the opposite teacher, and their vocal health conditions

\textsuperscript{399} McCoy, 134.
\textsuperscript{400} Ibid.
\textsuperscript{401} Ibid.
almost immediately resolved, suggesting that a basic principle of vocal health is balance, and that imbalance can occur in opposing directions.\textsuperscript{403} Brown cites Friederich Brodnitz as defining two types of functional disorders in his 1959 book, \textit{Vocal Rehabilitation}: hyperfunction, and hypofunction, with the majority of cases falling into the hyperfunction category.\textsuperscript{404} He suggests that malfunction is usually caused by a combination of factors but will fall predominantly into one category,\textsuperscript{405} and asserts that both hyperfunction and hypofunction voice disorders can lead to chronic laryngitis (perhaps similar to chronic vocal fatigue) which is a leading cause of organic vocal fold pathologies such as edema (swelling), polyps, nodes.\textsuperscript{406}

In this discussion of functional voice disorders, Brown includes eighteen examples of voice misuse that he has encountered as the major causes of hyperfunctional voice disorders,\textsuperscript{407} and eight examples he has encountered as the major causes of hypofunctional voice disorders.\textsuperscript{408} Some of the hyperfunction examples include posture or breathing elements, such as tensing the shoulders or holding too rigid a posture while singing, or breathing too high or too low.\textsuperscript{409} Other hyperfunction elements suggest a relationship with singing tessitura or registration: straining for high notes, squeezing for low notes (grunting or pushing), or carrying the low voice too high.\textsuperscript{410} All of these suggest the near-exclusive use of a heavily produced voice, and all three refer to tessitura. The vast majority of the hypofunction elements suggest a relationship with registration: not enough breath to finish normal phrases, tone lacks carrying power, breathy quality

\textsuperscript{403} Brown, \textit{Discover Your Voice: How to Develop Health Voice Habits}, 215-216.

\textsuperscript{404} Ibid., 216.

\textsuperscript{405} Ibid.

\textsuperscript{406} Ibid., 223-224.

\textsuperscript{407} Ibid., 219-220.

\textsuperscript{408} Ibid., 220-221.

\textsuperscript{409} Ibid., 218-219.

\textsuperscript{410} Ibid.
can be heard, notes give out in the middle of the range, and excessive breathiness in high and/or low tones. All of these suggest a lightly produced voice in which loose glottal closure results in quick breath expenditure, breathy tone quality, and a lack of complexity (partials or overtones) in the sound, resulting in a sound that does not project. This list of hyperfunction and hypofunction characteristics agrees with the clinical literature review and is an excellent reference for voice teachers and singers. However, since these observations are based on Brown’s personal experiences, they can only be considered anecdotal. Clinical research should be performed to verify these as voice-technique factors in the development of hyperfunction and hypofunctional presentations of functional voice disorders.

Brown’s vocal health chapter also comments on two other dysphonia factors encountered in the clinical literature review: puberphonia/mutational falsetto, and premenstrual dysphonia. In his discussion of puberphonia, he refers to it as “Childlike voice after puberty,” and implies that it is only found in males. He recommended treatment includes relaxed laryngeal position, and finding better glottal closure (perhaps a more chest-dominant or TDP sound) by first gently clearing the throat and then gradually adding speech sounds. This supports the idea that too light a registration can lead to vocal dysfunction.

Brown’s brief discussion of the menstrual cycle’s effect on singing asserts that, during certain phases of the cycle, high note quality can be decreased, and register changes can become more difficult. He warns that female singers must be aware of the changes in their voices around menstruation if they are to avoid building unhealthy compensatory technical habits. This is the first finding in the literature supporting the idea that one of the reasons why women are more likely to develop behavioural-based vocal dysfunction

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411 Brown, 220-221.
412 Ibid., 227-228.
413 Ibid., 230.
than men, could be due to unhealthy vocal technique compensation for cyclical instances of mild vocal dysfunction.

Though Chapman, McCoy and Brown’s vocal pedagogy books all contained either specific references to MTD, or a lengthy discussion of functional voice disorders, none of these books contained much information specifically about the development/causes, presentation, and treatment in classical singers. Most of the new information included was anecdotal in nature. This suggests that clinical research into MTD in classical singers is needed.

2.4.3 Vocal Pedagogy Books – Bias Against Chest Voice

Throughout many of the vocal pedagogy books surveyed, the approach to vocal health discussions revealed a potential pedagogical link to the development of Muscle Tension Dysphonia. Most of the books surveyed discuss vocal fold nodules (often caused by overly forceful use/abuse of the voice) and nearly all warn against overly heavy vocal production and overly forceful onset. None of the books approach the idea of potential for harm in singing with a breathy phonation or too much light mechanism/CDP with the same vehemence. Even in the books which mention functional voice disorders or MTD by name, the link between overly firm vocal fold adduction, singing with too much TDP, and vocal fold nodules were much more fervently described. This is very similar to information presented in the clinical literature about behavioural causes of PMTD. Overall, MTD is seen as a disorder caused by too much, or too forceful/heavy use (abuse). A few articles in the clinical literature suggest that laryngeal hypofunction could lead to imbalance and result in hyperfunction in the laryngeal mechanism, but this information is mentioned very seldom. Due to the many warnings against hyperfunction in both the clinical and vocal pedagogy literature, some classical voice teachers could be teaching in an unbalanced way for fear of causing nodules in their students' voices. In classical vocal pedagogy, the pendulum may have swung towards a head-dominant/CDP style of training. Perhaps this imbalance in training could encourage the development of PMTD in certain voices.
2.4.4 Journal of Singing Articles – Keyword “Muscle Tension Dysphonia”

To be sure of having a comprehensive knowledge of the current research into muscle tension dysphonia in singing, a search for articles on singing and MTD was made on The Journal of Singing (The National Association of Teachers of Singing (NATS) journal) database. An initial search for the keyword combination “Muscle Tension Dysphonia” brought up only seventeen articles. One article specifically focused on MTD in classical singers was added to this section of the literature review when it was published while the review was in progress, bring the total number of articles to eighteen.

Among even the eighteen articles containing the search term, many did not add relevant or did new information to the body already surveyed. These included articles discussing other types of voice dysfunction, such as laryngeal granulomas, laryngeal cancer, thyroid disorders, reflux, and sulcus vocalis. Often these articles simply affirmed the previous findings that other types of disorders can be concomitant with either Primary or Secondary MTD. A number of articles discussed


recent advances in diagnosis and treatment paradigms for singers. These also reiterated the same information found in the clinical and crossover literatures, commenting on the necessity of team management.\textsuperscript{425} The severity of the physical and emotional impact of dysphonia described previously in the literature review was also confirmed.\textsuperscript{426, 427}

Two articles suggested potential etiologies of Muscle Tension Dysphonia in classical singers. An early article written by Dr. Sataloff suggests that a discrepancy between the spoken pitch (usually too low) and sung range or tessitura could lead to or indicate unhealthy speaking habits and levels of muscle tension, associating this with muscle tension dysphonia patients he has encountered.\textsuperscript{428} An article attempting to dispel vocal pedagogy myths suggests that singing while ill with an upper respiratory tract infection – singing “over” a cold – is less safe than generally believed in the vocal pedagogy community, and that this can lead to muscle tension dysphonia symptoms.\textsuperscript{429} These brief mentions of MTD echo some the findings of the clinical literature.

Two articles mention muscle tension dysphonia in relation to topics linked with registration. The first article, researching the varieties of glottal configurations in singing describes chest-dominant production (TDP) with a posterior gap between the vocal folds.

\textsuperscript{423} Sataloff, “Controversies and Confusions in Diagnosing Laryngopharyngeal Reflux,” 554.


as one of the glottal configurations found in an extreme form in hyperfunctional breathy voice or muscle tension dysphonia.\textsuperscript{430} The second article was a study into the physiological mechanism producing a non-classical singing technique labelled “Pharyngeal Voice,” associated with the vocal quality produced by singers such as Aretha Franklin and Eva Cassidy. This article suggests that the Pharyngeal Voice technique could be a useful treatment tool for vocal dysfunction such as vocal fold bowing and muscle tension dysphonia, because it creates a lengthened closed vocal fold phase (similar to chest-voice dominant production/TDP) without resorting to pressed phonation.\textsuperscript{431} These brief mentions of MTD continue the trend found previously in the literature review, linking the voice technique element of registration to MTD.

Two articles made brief mentions of MTD while discussing potential treatment strategies for voice disorders in singers. One suggests that addressing etiologically significant anxiety in muscle tension dysphonia (among several other disorders) by using breathing techniques could be a useful element in treatment.\textsuperscript{432} A second article discusses applying yoga principles (centering, warm-up, balance and endurance, and cool-down) to voice treatment for a variety of voice disorders, including muscle tension dysphonia and other hyperfunctional voice disorders.\textsuperscript{433} These potential treatment strategies also arose among more detailed lists in the clinical literature.

Finally, one recent article specifically regarding MTD and singing was found in the search of \textit{The Journal of Singing} database. This article begins with an excellent summation of the symptoms and causes of MTD, including stating that singers often experience a mild to moderate form of MTD, and comparing the development of MTD in singers to the development of decreased performance in more traditional types of athletes


due to muscular imbalances.\textsuperscript{434} This article also confirms that most of research into MTD focuses on the speaking voice, that MTD presents differently in the singers than in the general population – more subtly,\textsuperscript{435} to the extent that issues with singing voices can go unnoticed by others, especially if singers do not talk openly about what they are experiencing.\textsuperscript{436} The rest of the article is devoted to a detailed description of the potential for inhalation phonation as a treatment of MTD in singers. This is an excellent expansion of the description found in Sataloff’s \textit{Professional Voice}.

While it was encouraging to finally find one article devoted to MTD and singing in \textit{The Journal of Singing}, only eighteen articles mentioned the disorder by name, and seventeen contained only brief mentions of the disorder rather focusing on the topic. Considering that this is one of the largest international sources for research on vocal health and singing pedagogy, this confirms that not enough research is being done into the experiences of MTD in the population of singers, and the existing research is not adequately disseminated throughout the singing community.

2.4.5  \textbf{Journal of Singing Articles – Premenstrual Dysphonia}

Over the course of researching an early version of this literature review, two \textit{Journal of Singing} articles on the topic of premenstrual dysphonia were encountered. These articles did not confirm that women regularly singing through these cyclical episodes of vocal dysfunction could encourage the development of chronic muscle tension and as a result, PMTD. However, one did suggest that women who experience premenstrual dysphonia should take care to avoid exacerbating vocal fold swelling and causing physical vocal fold injury during this time.\textsuperscript{437}

\begin{footnotesize}

\textsuperscript{435} Ibid., 272.

\textsuperscript{436} Ibid., 273.

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2.4.6 Journal of Singing Article – Puberphonia/Mutational Dysphonia

Over the course of researching an early version of this literature review, a useful article regarding female puberphonia/mutational dysphonia was encountered. This article, by Kristin Samuelson, explored the voice disorder puberphonia in a small sample size of two female college-level voice students.\(^{438}\) Samuelson suggests that because the voice-change in females is less pronounced than in males, this disorder often goes undiagnosed and untreated in females, and is common in adolescent females.\(^{439}\) In women, this disorder may associated with the socialization received by adolescent females, teaching them to project an image of themselves which society will accept, including a still high-pitched permanently youthful voice.\(^{440}\) Samuelson posits that the psychological issues specific to female adolescence leave females more vulnerable to this voice disorder than males.\(^{441}\) Both the high likelihood of this disorder going undiagnosed in females, and the potentially correlating socialization psychological issues suggests a possible link muscle tension dysphonia. Both of these factors were also suggested in the clinical literature review.

It is also hypothesized in this study that singing teachers are far more likely than speech therapists to encounter and treat cases of puberphonia, as adolescent females are more likely to seek improvement in their singing voices than in their “adequate” speaking voices.\(^{442}\) The first case study in this article shares strong similarities to the case study of Maria, found in Chapman's *Singing and Teaching Singing*. Samuelson’s participant was a young female singer who showed evidence of two distinct singing voices. In this case a


\(^{439}\) Ibid., 25.

\(^{440}\) Ibid., 26.

\(^{441}\) Ibid.

\(^{442}\) Ibid., 27.
musical theatre voice which was primarily chest voice, and a classical voice made up primarily of head voice and which showed pathological symptoms such as voice breaks, and instability/poor quality of tone in the middle voice.\textsuperscript{443} This singer also had difficulty projecting both her spoken voice and her singing voice, often requiring amplification in performances.\textsuperscript{444} These symptoms correlate with those found in patients with MTD. The speaking and singing voices of Samuelson’s participant were improved using exercises focused on improved airflow and lower laryngeal position, and a lower spoken pitch.\textsuperscript{445} Perhaps some cases of MTD are long-undiagnosed cases of puberphonia. The idea that this disorder may be commonly encountered by voice teachers indicates that more research and writing regarding puberphonia and MTD in singers is necessary.

2.4.7 Conclusions from Vocal Pedagogy Literature

Though seven of the fifteen books surveyed contained sections dedicated to vocal health, only two mentioned MTD by name (McCoy and Chapman), and one included a large section devoted to functional voice disorders (Brown). Only one vocal pedagogy article focused on MTD was found, and most articles referencing the disorder contained only brief mentions. This is not an adequate number of sources within the commonly used vocal pedagogy literature for MTD to be known to students and pedagogues. More research and publications are needed to ensure acceptable levels knowledge of chronic voice disorders such as MTD in this community.

2.5 Conclusions from Literature Review

It is clear from a review of the literature on stigma of injury in classical music that injury/disorder is a grave issue. Students, teachers, and medical professionals need to be well-educated regarding the injuries and disorders that can happen. Unfortunately, this is often not the case, causing disorders to go long unreported and/or undiagnosed and

\textsuperscript{443} Samuelson, “The impact of puberphonia on the female speaking and singing voice,” 27.
\textsuperscript{444} Ibid, 28.
\textsuperscript{445} Ibid.
leading to the development of mental health challenges in addition to the physical disorder. Compounding this lack of knowledge about disorders, and resulting culture of silence, the clinical, crossover, and vocal pedagogy literatures indicate that not enough is known about Muscle Tension Dysphonia in classical singers. Finally, this review of both the clinical and vocal pedagogy literatures reveal correlations between MTD and voice technique factors. These findings confirm the value in researching vocal technique training as a factor in the development of PMTD in classical singers.
Chapter 3

3 Methodology

3.1 Design of the Study

3.1.1 Qualitative Research

According to John Creswell, researcher and writer on research methodology, qualitative research is concerned with studying the meanings that individuals or groups attach to social or human problems.\textsuperscript{446} Unlike quantitative research, qualitative research methodology is primarily inductive in its procedures;\textsuperscript{447} it is not involved in proving theories generated through earlier observation, but in generating theory.\textsuperscript{448} Also in contrast to quantitative research, qualitative researchers, “position themselves in the study,” making their values and biases known, rather than attempting to eliminate these variables, and the researcher’s voice is apparent in the text, making it clear that observations are voiced through the lens of the researcher’s understanding.\textsuperscript{449}

Qualitative research often falls under the overall interpretive framework of social justice, as the participants frequently come from underrepresented or marginalized groups.\textsuperscript{450} The research may have an action agenda to change the institutions in which the participants live and work, or simply to provide a voice for participants as issues are studied and exposed.\textsuperscript{451} In order to avoid remarginalizing participants, or creating too large a power imbalance between researcher and participant, qualitative research is often collaborative.

\begin{footnotes}
\item[447] Creswell, \textit{Qualitative Inquiry and Research Design}, 22.
\item[449] Creswell, 20.
\item[450] Ibid., 23.
\item[451] Ibid. 25-26.
\end{footnotes}
the inquiry is completed “with” others, rather than “on” or “to” others.\textsuperscript{452} Therefore, researchers in the qualitative paradigm focus on collecting data in a setting and manner which is sensitive to the people who are part of the study. Rather than bring participants into a laboratory setting, or send out impersonal instruments such as surveys, qualitative researchers often observe and interact with participants in natural settings and gather information through close contact, and self-designed instruments using open-ended questions.\textsuperscript{453}

3.1.2 Rationale for the Use of Qualitative Research

Over the course of the literature review it became clear that a qualitative approach would be best for this research. So little is known about classical singers with PMTD that there exists little to no theory regarding any aspect of the experience in this demographic. Everything is essentially unknown, from causes/development, incidence, impact/severity, to treatment, and recovery.

Additionally, this research fits powerfully into the social justice interpretive framework often associated with qualitative research. The original inspiration for this study was the personal experience of feeling failed by a system meant to support young singers – hoping to be part of changing that system and giving voice to others who had suffered from the same or similar experiences.

3.1.3 Rationale for the Use of Narrative Inquiry

Among the many qualitative research methods, narrative inquiry is the most appropriate to the aims of this study. Narrative inquiry is focused on life experiences told from the perspective of those who live them.\textsuperscript{454} Creswell states that narrative research is best for, “capturing the detailed stories or life experiences of a single individual or the lives of a

\textsuperscript{452} Creswell, 26.
\textsuperscript{453} Ibid., 45.
small number of individuals.” The result of narrative research is typically a story giving a chronological account of a series of related events or actions in the life of a person, or a set of these stories from a small group of individuals who have had similar experiences.

The raw material for these stories is gathered primarily from in-depth interviews with participants, but may also include other sources such as other documents from their lives (journal entries, mementos such as newspaper clippings, pictures, etc.), or interviews with other related people (friends, family, teachers, etc.). When this data is shaped into the resulting stories, there is often a strong collaborative element in which the researcher and participant shape the story together, or the participant is consulted to ascertain their agreement with it – the validity and accuracy of the account. Sometimes the collaborative nature of narrative inquiry research goes even further, and researchers include their own stories and life experiences as a significant element in their research. This can happen along a spectrum of ways, anything from simply stating researcher background in order to make biases clear and create a more equal relationship with participants, to including the researcher story as data and analyzing it along with the other data collected (an autoethnography or interpretive biography).

Often, narrative research is inspired by a desire to effect personal or social change for the sake of social justice. This can be accomplished by giving marginalized individuals the opportunity to contemplate and share their stories, by allowing them to have their voices

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455 Creswell, 74.
456 Ibid., 70.
457 Ibid., 71.
459 Ibid.
460 Ibid., 423.
461 Ibid., 427.
heard, or by attempting to bring injustice to the attention of institutions involved in perpetuating it, thereby creating dialogue.\footnote{462}

Narrative inquiry was the most appropriate methodology for pursuing this research. It explores the detailed stories and life experiences of a small group of similar individuals – Classical singers – to discover information which will effect a change on the vocal pedagogy community and give a voice to those who have suffered from PMTD. The in-depth interviews and collaborative element of the research prevented these individuals from being further marginalized by the research experience and allowed the personal experience that inspired the research to be present in it.

3.2 Identification and Selection of Participants

Creswell suggests that for narrative research sample size can be as small as one or two individuals, unless a collective story is being developed by interviewing a larger pool.\footnote{463} In The SAGE Handbook of Interview Research, the largest recommended sample size for interview research is 25 participants.\footnote{464} In this study, the goal of finding commonalities between stories means that a collective story \textit{is} being developed, but there is also a desire that individual stories be showcased in order to give voice to the participants. Therefore, a moderately sized sample of ten to twelve participants was sought and ultimately, eleven participants were found and interviewed.

It was necessary that the participants for this study share certain characteristics to be appropriate sources of data. These individuals needed to be classically trained singers (defined as being at the minimum level of third year of their training in a classical voice program at a university, college, or conservatory) who have been diagnosed with Primary Muscle Tension Dysphonia by an otolaryngologist (ENT) or speech language pathologist.

\footnote{462} Chase, 427-429.

\footnote{463} Creswell, 157.

(SLP). Care was taken during a pre-screening selection process that these diagnoses were accurate, as not all medical professionals are created equal. (For instance, participants were asked if they had been diagnosed by an ENT/SLP, and were requested to elaborate on the diagnostic procedures undergone, to see how these compared to those found in the literature review.) In order for these singers to be able to provide useful insight into their voice training experiences, it was necessary that they had been training for a significant length of time. Therefore, though the minimum age for a participant was be 18 years, preference was given to participants who were upper-year undergraduates, graduate students, or professional singers.

Participant recruitment was be done by advertising through medical professionals specializing in treating the singing voice, as well as through professors at universities/conservatories offering bachelor’s degrees in music. In order to build rapport with participants and come to an awareness of their emotions and body-language during interviews, it was considered ideal for interviews to be completed in-person rather than over the phone or internet. Therefore, recruitment was limited to medical practices and academic institutions in Southern Ontario. However, having as much variety as possible in terms of where and with whom these singers have studied and were treated was also considered, in order to be sure that the story discovered is the experience of classical singers with PMTD, rather than classical singers with PMTD from a specific institution who underwent a specific treatment. Below is provided a list of medical professionals and schools that were used for recruitment purposes.

**Medical professionals:**

- Dr. Simon McBride – an ENT who specializes in working with voice disorders and voice function
- Sarah Hawkins – an SLP who works closely with Dr. McBride
- Frances Reimer – an SLP and voice teacher who specializes in rehabilitating

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465 Creswell, 164.
singing voices

**Schools in Southern Ontario offering Bachelor of Music Degrees:**

- University of Toronto
- Wilfrid Laurier University
- The University of Western Ontario
- Queen’s University
- University of Ottawa
- Carleton University
- Brock University
- McMaster University
- University of Windsor
- The Glenn Gould School

The recruitment period lasted from June 2018 to April 2019. Over the course of what felt like long dry spells in the recruitment process, the theory was formed that it might be difficult to recruit participants due to a combination of the lack of knowledge about PMTD and the stigma associated with vocal dysfunction in the classical singing community. If classical singers (teachers, students, and professional performers) are unaware of the disorder and associated symptoms, how will they know to come forward? If classical singers fear stigma if they are exposed, will they be afraid to make themselves known, even anonymously in a study?

Ultimately, enough participants for the study were found. In addition, a number of singers with Secondary Muscle Tension Dysphonia (with organic elements), and several singers with undiagnosed vocal function concerns reached out to the researcher. It was gratifying to know that the profile of vocal health issues was being raised and discussion was beginning as a result of the study’s very existence.
In the end, many participants in the study heard about it through word-of-mouth from friends, colleagues, or mentors who encountered the advertisements due to their associations with the institutions listed above. As a result, not all participants were associated with these institutions, allowing for a greater variety of participants in the study.

3.3 Data Collection

This study gathered data primarily through in-depth semi-structured one-on-one interviews. Participants were also asked for written responses during the collaboration process, and some voluntarily sent other documents as additional sources of data to support the recollections of their experiences shared during their interviews. During the planning process, the decision was made that this study would not be using group interviews as they can be negatively impacted by interviewees withholding information because of anxiety of a negative impact to relationships with the others present. As all the participants in this study are associated with the same field, the thought was that they might fear appearing critical of the teachers and the institutions with which they are associated. Because of this, the choice was made to complete interviews one-on-one rather than in a group setting, as this would likely be most effective for gaining detailed background information and for putting participants at ease to discuss difficult experiences.

Since this study gathered data from multiple participants, completely unstructured interviews would not have been an appropriate method. Without some structure, it would be impossible to be sure that similar issues were covered in all interviews. Therefore, the interviews were semi-structured – allowing for wide-ranging discussion, but to also making sure that the same topics were brought up with all participants.

All interviews were audio-recorded for later transcription and analysis, but informal notes were also kept on a printed page of interview questions. This helped with the early stages

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466 Beitin, “Interview and Sampling,” 244.
of identifying themes and reduced the potential impact of data loss if recording equipment had failed.\textsuperscript{467}

3.4 Data Analysis

The recorded interviews were transcribed, and the resulting transcriptions were analyzed to fulfill the parallel research goals of searching for commonalities between these individual stories and of giving a voice to participants by presenting their individual stories. Two analysis methods were used in order to reach these two goals: \textit{coding}, and \textit{re-storying}.

3.4.1 Coding

In order to find commonalities between the experiences of participants, \textit{coding} was used. \textit{Coding} is the process of reading and re-reading the data (in this case interview transcripts) and assigning labels or \textit{codes} to pieces of information.\textsuperscript{468} This information included material that the researcher expected to find from the beginning of the study, surprising data that was not anticipated, and also conceptually interesting or unusual information.\textsuperscript{469} \textit{Codes} are defined as small categories of information or themes which are found throughout all the data gathered.\textsuperscript{470} These codes can be \textit{prefigured}, which are often recognized as early as the literature review, or \textit{emergent}, which are themes only arising from the gathered data.\textsuperscript{471} This study uses a combination of prefigured codes from the literature review (such as potentially causal voice technique elements), and emergent codes.

\begin{flushleft}
\textsuperscript{467} Creswell, 166. \\
\textsuperscript{468} Ibid., 184. \\
\textsuperscript{469} Ibid., 186. \\
\textsuperscript{470} Ibid., 184. \\
\textsuperscript{471} Ibid., 185. 
\end{flushleft}
3.4.2 Re-storying

Re-storying is defined as the process of reorganizing each participant’s story into a general framework for presentation. Often this framework consists of making note of key elements such as time, place, plot, scene, conflict, struggle, and resolution, and then arranging these elements into a chronology in order to create something similar to a literary short-story.\(^{472}\) This is the ideal type of analysis to allow participants an individual voice in this research project.

3.5 Validity

Validity in qualitative research is a contentious topic. Beliefs about validation in qualitative research vary along a spectrum. Some consider it completely unimportant and contrary to the purposes of qualitative research while others exist at the opposite end of the spectrum – believing that using validation terminology taken from quantitative research helps bridge the gap between the two paradigms.\(^{473}\) For the dual purposes of this research – finding commonalities between participants’ experiences in order to lead toward future research into causes, and giving voice to participants – exploration of validity was required for two reasons. First, in order to ensure that the commonalities discovered are credible topics for future research, and second, to confirm that participants felt that the stories presented were authentic representations of their experiences.

In an effort to lend credibility for future research to commonalities discovered between participants’ experiences, three validation strategies were used: triangulation, negative case analysis, and clarifying research bias. In triangulation, researchers use multiple different sources and methods to provide corroborating evidence.\(^{474}\) In this study, this was accomplished by interviewing multiple participants, including non-interview data such as voluntarily provided documents, and cross-checking data with information found

\(^{472}\) Creswell, 74.

\(^{473}\) Ibid., 244.

\(^{474}\) Ibid., 251.
in the literature review. *Negative case analysis* is the process of refining a working hypothesis as the research moves forward by including negative/disconfirming evidence.\(^{475}\) Every effort was be made in this research to present all the results, including outliers. For example, many participants stories suggested light registration as a causal voice technique factor, while the stories of others seemed to suggest the opposite. Both phenomena were discussed. *Clarifying research bias* is done by including a statement of the researcher’s position and assumptions in the presentation of the research.\(^{476}\) In this study this was accomplished by including the researcher’s personal experiences as background to the study.

In order to ensure that participants felt that the stories presented in this research were authentic representations of their experiences, one further validation strategy, *member checking*, was used. *Member checking* is the process of taking interpretations and conclusions back to the participants so that they can judge them for accuracy and credibility.\(^{477}\) In this research, this involved sending each participant a draft of their individual narrative for comments, prior to considering these stories to be finalized.

As mentioned in the limitations section of this document, one threat to the validity of the results of this study was capping the participant pool rather than continuing to collect information from participants to the point of data saturation – the point when the collection of new data does not shed further light on the topic.\(^{478}\) As a result, it is possible that elements may have gone unremarked and the data could be incomplete.

\(^{475}\) Creswell, 251.

\(^{476}\) Ibid., 251.

\(^{477}\) Ibid., 252.

Chapter 4

4 Findings

Because of the dual purposes of this study, the findings are presented in two sections. The first section is comprised of the individual narratives crafted from each interview, and the second presents the themes that emerged from an analysis of the entire body of data.

4.1 Findings Section One: Individual Participant Stories

The following stories were crafted through the process of re-storying – creating an organized and chronological narrative from the information collected in the semi-structured in-depth interviews carried out with each participant. After drafts were completed, each participant had the opportunity to collaborate with the researcher to create the finished product, and to withhold or grant their approval for inclusion in this document.

4.1.1 Alana’s Story

Alana is a young soprano in the third year of her Bachelor of Music degree in classical voice. She describes herself as being both extraverted and introverted; she loves people and being around people, but also likes keeping to herself at times. She believes she is both creative and emotional: cries during basically every movie she sees and at every notable event in her life (for instance, she cried at the ceremony when she was awarded her black belt in karate). Alana considers herself to be have an A-type personality, especially when it comes to singing and school. In these avenues, she describes herself as being a perfectionist and “control freak.”

Alana started singing when she was a very young child. Her family did not have much musical background, but they did often have music playing in the house, including Shania Twain, Celine Dion, Abba, and Bon Jovi, and Alana always enjoyed singing along. She fell in love with music from that carefree childhood experience. Though neither of her parents sang or played any instrument, they saw how much she loved
singing and encouraged her in her singing activities. When she was in senior kindergarten, or in grade one, she began singing in her church choir. Around that same time, Alana’s grade one teacher recognized her natural inclination toward singing, suggesting that she perform in her school talent show and encouraging her parents to sign her up for singing lessons. That was Alana’s first solo performance, and she remembers it vividly. She sang “Up,” by Shania Twain, and loved every minute of it. After that, Alana joined every musical activity she could. She sang in church, community, and school choirs, in talent shows, and in some competitions too. She sang soprano one in choir most of the time, but occasionally joined the second sopranos if they needed someone extra there. Some of the comments or compliments Alana remembers receiving over the years include, “She has a beautiful voice,” and “You should be on Canadian Idol.” Her favourite compliment was, “She gives me goosebumps when she sings.”

Though Alana remembers that her early voice lessons and choir rehearsals always began with warm-ups, she does not remember any of the associated exercises. Looking back, she thinks this is a sign that she did not understand their purpose. In fact, she believes that she never really understood the goals of any technique exercises until she was studying at the university level. However, Alana does remember the repertoire that she sang in those early lessons. She and her teacher began with repertoire from the Royal Conservatory of Music (RCM) grade two voice syllabus including “Lullaby,” and “Skyboat Song.” Alana also loved musical theatre repertoire, and one of her pieces from that genre was “Castle on a Cloud,” from Les Misérables. She also studied piano and theory with the same teacher, which she believes helped her become a well-rounded musician.

By the time Alana was in high school, she had made the decision to study voice at the university level, so her lessons became geared towards preparing her for that. These lessons were still with the same teacher who had begun teaching her at age six or seven. Her lessons were an hour and a half long with thirty minutes dedicated to achieving an

479 The Royal Conservatory of Music is an internationally influential Canadian music education institution with headquarters in Toronto. It designs and administers a primarily classical music curricula and examinations of practical and theoretical musical skills for a variety of instruments. 
https://www.rcmusic.com/
RCM grade six piano proficiency, and an hour dedicated to voice. Alana’s voice lessons still opened with warm-ups, and though she remembers some of them, she still does not have a clear sense of their purpose. She prepared repertoire for RCM exams, and the Kiwanis Festival competition and remembers having to work hard at correcting her French diction. In terms of technique challenges in repertoire, she remembers that she had a tendency towards shifting into a weak, breathy, falsetto-type sound, and she had difficulty getting through long phrases. Alana’s teacher worked with her on making a clearer sound in her upper range by thinking about forward placement, and encouraged her to focus on taking larger breaths to be able to sing longer phrases.

Alana does not remember learning about vocal health in much detail as a child. She remembers her teacher being very strict about not yelling or clearing her throat, and suggesting she not eat dairy or citrus products before performing. Though she did not know what was happening at the time, looking back she remembers experiencing vocal fatigue during childhood and youth choir rehearsals. She sang for long periods of time, and was encouraged to sing louder/project better in assigned solos, but was not given guidance on how to project in a healthy way. She sometimes experienced a raspy voice quality and some aching in her throat in or after these situations.

After studying with the same voice teacher for her whole childhood and adolescent singing career, Alana felt like it was quite a learning curve when she began studying voice at the university level. Her new voice teacher was male, which was initially confusing for her. His demonstrations were in a different octave and were a very different quality than her own voice. Additionally, Alana finally began to seriously work on voice technique, and she felt that she had big gaps to fill in that area. Some topics she remembers working on included breath support, placement, and vibrato (which she felt her first voice teacher had been averse to, and had avoided teaching her about). Her university lessons began with short scalar exercises aimed at warming up her middle voice, followed by longer scales intended to warm-up the extremes of her voice (especially high range). Once she was mostly warmed-up, her teacher would have her work on more sustained singing so that she could focus on tone quality and vibrato
production. Alana felt that with these exercises her range increased dramatically and her tone quality improved.

Part way through her first year, Alana’s teacher was away for several months singing in an opera and a different voice teacher was substitute teaching Alana’s studio. This teacher regularly pushed her voice to the extremes of what she was capable in her high range. While Alana’s regular teacher had also worked with her on extending her upper range, he had never taken her to the point where her voice cracked, squeaked, or no sound came out. However, this substitute teacher did take her to that extreme, and she found it uncomfortable. When doing this type of work, Alana had to push the sound out. It did not feel like she was using good technique to create these super-high sounds, and she experienced a lot of tension in her whole singing mechanism. However, as she noticed her range was increasing, Alana brushed off her misgivings.

In terms of repertoire, in her first two years of her undergrad Alana concentrated on art song repertoire and a few arias. Some of the art songs that Alana explored were “Falls the Snow,” by Walter McNaught, “When I bring to you color’d toys,” by J.A. Carpenter, “Selve amiche,” by Caldara, “Nel cor non più non mi sento,” by Paisiello, “Der Musikant,” by Wolf, “Wie Melodien,” by Brahms, and “Villanelle,” by Berlioz. Arias included “Una donna a quindici anni,” from Così fan tutte and “Tornami a vagheggiar,” from Alcina. Alana was also given the opportunity to explore some musical theatre repertoire, including “The Sound of Music,” from The Sound of Music. In her second year her voice teacher was leaning towards defining her Fach as a lighter soprano voice type such as soubrette.

In addition to singing lessons, Alana’s university program also requires her to participate in a singing ensemble each of her years. In first year, she was placed in the soprano section of the university choir as her ensemble. In second year, she participated in opera ensemble, which performed a lot of large ensemble numbers from operas. She was also assigned to the highest voice parts in these opera ensembles. In opera ensemble in the second semester of second year, she was assigned to sing a voice part in an ensemble from Massenet’s Cendrillon that required her to sing a high D. The teacher in charge of
the ensemble asked her if this was possible, and though Alana had never had a consistent high D in the past, she said yes. She was very determined that she would succeed and began spending a significant amount of time each day on extending her upper range. She did not consult her teacher about this for two reasons: she thought she should use her lessons to concentrate on recital repertoire, and she was not sure he would approve of her accepting this very high role in opera ensemble. Instead, she used the method for range extension that her substitute teacher had taught her the previous year.

During her second year of university Alana had some stress-inducing issues in her personal life. She had such regular problems with her roommate that she began seeking out methods for dealing with stress and associated tension. She began journaling, doing yoga, taking study breaks – doing whatever she needed to do to process and release the stress of life as a university student.

In the spring around the end of her second year, Alana came down with a nasty viral illness the week before she was scheduled to sing her jury performance. After the first couple days of being ill, she completely lost her voice. She saw a doctor at a medical clinic, and he told her that she had laryngitis and there was nothing that could be done about it besides resting and waiting. She started feeling better the next day, but her voice was still gone, so she went to see the school voice coordinator to talk about what to do. Her jury was postponed to the end of the month. Alana did not sing for the next couple weeks, but when she tried again, her voice was not fully recovered. It had improved enough for her to sing a bit, but it was cracking, breathy, and some notes would not sound. Nonetheless, she started practising and preparing for her jury again, but soon it became clear that her voice was not improving, and her jury would have to be deferred further into the summer. The voice coordinator agreed to this, and also wrote Alana a note to take to the medical clinic asking that the doctor there refer her to an otolaryngologist (ENT). The doctor there agreed to send her referral, leaving Alana nothing to do but wait.

From mid-April until the beginning of June Alana waited with no word as to when she would be able to see an ENT. After waiting for a long time, she went to her family doctor
at home who said that if her referral at school did not happen soon he would write her a referral to see an ENT in her hometown. However, eventually she received word that she had an appointment in late June with the ENT associated with her university. In the meantime, Alana occasionally tested her voice to see how it was progressing. It sounded extremely breathy, and she had completely lost her highest and lowest ranges – she could only sing in a tiny area in the middle of her voice. She also could only sing for about ten minutes before her voice would completely stop making any sound.

Emotionally, Alana felt horrible. She was sad, angry, and terrified that she would never be able to sing again. She was convinced that she had permanently damaged her vocal folds. Her life was also missing her usual routine. Normally, she sang every day. When she was home in the summers she always sang in her church choir. Now she could not sing at all. All of her friends and colleagues had completed second year when they passed their juries. They were already comparing the grades and feedback they had received, and were planning their activities for the following year, while Alana had not even finished second year. Alana also worried that the dysfunction she was experiencing was her own fault. Maybe she had caused damage when she started practising while she still was ill. Amidst all the loss and fear, she also was feeling a sense of shame.

Alana feels lucky that she had a community to help her through this time. Her teacher was extremely supportive of her: keeping in close-contact throughout the summer and responding regularly to her countless emails. Alana also shared what she was going through with her close school friends, though mainly because she felt she had no choice. They all had asked her how her jury had gone, and she had to respond. They were very kind and understanding, checking-up on her regularly to see how she was holding-up. Alana’s family also tried to be supportive, but since they were not singers or even musicians she felt they could not truly understand what she was going through.

At the end of June, Alana finally had her ENT appointment. While she sat in the waiting room prior to her appointment time, she filled out a survey all about her voice-use and what kinds of problems she was experiencing. She had the great luck of being attended by both an ENT and a speech language pathologist (SLP) that day. They asked her to
expand on her survey responses, taking a detailed history describing when the onset of dysfunction had occurred, what kind of symptoms she had suffered, what she thought had caused it, and her general pattern of voice use. They looked into Alana’s mouth and ears using a tiny flashlight, then decongested her nose and progressed to the laryngoscopic examination (scope). The ENT examined Alana’s vocal folds with a flexible nasoscope. During the scope, Alana felt terribly nervous. The ENT and SLP kept talking to each other, saying things like, “Hm, interesting,” and “There’s a gap.” Finally, Alana heard the SLP say, “Really? No nodules?” and she was flooded with relief.

After removing the scope, the ENT and SLP explained to Alana that she had nothing physically/organically wrong with her vocal folds. They looked healthy. However, due to Primary Muscle Tension Dysphonia (PMTD), there was a gap where her vocal folds were not coming together when she tried to phonate. Additionally, there were some muscles above the larynx that were becoming involved in phonation. This supra-glottal constriction had been obscuring her vocal folds from view at times during her scope. The SLP outlined with Alana that they recommended she undergo a course of speech therapy to treat the excessive muscle tension that was occurring.

Unfortunately for Alana, there was another waiting period before she was able to begin her speech therapy. Though her diagnosis occurred the final week of June, she was not able to start treatment until the last week of July/first week of August. Alana was beginning to worry about what would happen when school started in the fall. She still had not performed her jury! When she was finally able to begin speech therapy, she was required to attend two group sessions at the hospital near her school. Her group consisted of people, including her, who all had muscle tension dysphonia. None of their situations were identical; there were two teachers, one older retired woman, and Alana, who was the only singer. Not everyone had the gap in their vocal folds, but some of them had other issues that Alana did not have.

The first group session mainly informed the patients about vocal health and lifestyle elements such as diet and reflux management, but the SLP also taught them a set of exercises to be used for reducing tension. This routine was to be practised twice a day,
and included shoulder rolls and lifts, stretching the middle of the upper back, stretching the side muscles of the neck, jaw and facial muscle stretches, lip trills, a swallow-release exercise, and self massage in many of the areas stretched. Alana did not seem to have significant reflux issues, so she was never prescribed reflux medications, but she was encouraged along with all the other patients to take preventative measures such as avoiding caffeine and chocolate, not eating in the three hours before bed, elevating the head of her bed, and sleeping with a humidifier in her bedroom. Alana felt that there was an immediate improvement within the first few days of doing these exercises. Her first session was on a Wednesday, and she scheduled a lesson that Saturday and was already able to sing somewhat better than before,

At the second group session the SLP reviewed the exercises assigned at the first session and then handed out personalized information sheets to each patient regarding their individual problems. The two teachers received a sheet about teaching, and Alana received one about singing. The group also learned a few more exercises, including one that involved singing through a straw. Then the SLP checked-in with each patient on how they were feeling/progressing. The usual treatment protocol at this vocal health clinic was to attend these two group sessions, and then to continue working without direction for four weeks, after which there was be a follow-up with the SLP. Individual therapy would follow at that point if the patient felt it was necessary. However, with Alana’s pressing situation – school was starting again in only a couple weeks – the SLP scheduled her to begin individual therapy the week immediately following her second group session.

In her individual speech therapy sessions, the SLP and Alana mainly focused on a type of therapy called Voice Resonance Therapy. The main purpose of this therapy was to keep the sound forward avoiding building tension in the back of the mouth/throat, use proper breath support even when speaking (not just when singing), and not allow words at the ends of sentences and final syllables of words to drop off from this support. This was accomplished through straw speech/singing, speaking/singing into a cup of water, and in various other speech activities. Later in the therapy they progressed to a more serious focus on breath support: taking in big breaths, and then monitoring in both the speaking singing voice that air was being expelled. One of the monitoring techniques was
sliding/performing sirens up and down through the voice and checking for air flow at the extremes. Finally, Alana’s SLP also taught her the concept of warming-down – doing exercises after singing to release tension built up while singing. Alana attended weekly individual voice therapy sessions from August through mid-November, and then reduced the frequency to biweekly sessions.

In hindsight, Alana wonders if she was already experiencing some signs of vocal dysfunction before she developed acute PMTD. She had studied karate for many years in her childhood and youth and wondered if all the yelling associated with this training had been damaging. She also thinks that she had inefficiencies in her technique which could have been factors in developing a voice disorder. Sometimes she was not conscientious about warming-up before singing and sang musical theatre repertoire without being properly trained in how to do so. She also thinks she had breath support issues, even in her speech. As she moved through the process of treating her speaking voice with Voice Resonant Therapy people started to comment: “You sound so much healthier! Like, your speaking voice!”

Throughout most of her treatment Alana also met with her university voice teacher for weekly lessons. She made sure to always communicate to her teacher what she was working on in her speech therapy, and to communicate with her speech language pathologist what she was working on in her lessons. Both voice professionals wanted to make sure that the work they did was supporting, not clashing with, the work the other was doing with Alana’s voice. In her voice lessons her teacher insisted on starting almost back from the very basics and spending a lot of time on technique. They focused mainly on placement, working within a comfortable middle range rather than working on range extension. At times Alana found this frustrating. She confesses to thrive on being challenged, so going back to basic technique felt like taking so many steps backwards. Additionally, by this point she had been singing the same repertoire (her jury repertoire) for more than a year. At the end of second year she had already been excited to start new and different repertoire in third year, and now felt she was being robbed of that opportunity.
Looking back, Alana feels that having a supportive community is one of the only reasons why she did not fully descend into clinical depression during the process of waiting, diagnosis, waiting, treatment and retraining. She cried often throughout the whole process and had many moments early on when she wondered if she would ever sing again. In the summer, prior to diagnosis, Alana attended a performance of *Mama Mia 2* with her mother, aunt, and cousin. In the show, young Donna began singing, “I have a dream,” which was a song that Alana had loved to sing when she was a child. Suddenly, Alana found herself crying. All she could think was, “What if I can’t sing again?” Though her diagnosis initially provided relief, later she continued to feel quite low and frustrated. She had to perform her jury knowing that she was not going to be able to do her best. She was not able to be as expressive and musical as she wanted to be. Instead she had to focus on “just getting the sound out safely.” As the school year progressed, all of her peers were moving forward in their training, while Alana felt that she had taken steps backward and was almost back at the beginning.

Currently Alana is still in recovery. She had hoped that at her scheduled January follow-ups with the ENT and SLP the gap between her vocal folds would be fully closed. However, it was not, and her voice is not quite back to where it was before she developed acute PMTD as it is still exhibiting a somewhat breathy quality. However, Alana is upbeat about the progress she has made, and feels that her experience with vocal dysfunction has had some positive effects on her as a singer. It prompted her to do a lot of reading and research of her own, leading to her gaining a lot of pedagogical knowledge. With this new information at her fingertips she feels much better prepared to teach voice if the opportunity arises in the future, and better equipped to recover if she ever finds herself in acute vocal difficulty again.

### 4.1.2 Anne’s Story

Anne is a young soprano just beginning her master’s degree in classical voice performance. She is highly extroverted: in her own words, “I love people! They’re my favourite thing!” She has ADHD, which means that she hates being idle and always has something on the go. It also means that she can be easily distracted, but if she cares a lot about a subject she hyper-focuses and can spend hours working without noticing the time
go by. She learns best if she cares a lot about the subject, if a professor is exceptionally engaging, if the learning process is experiential, or if she can find a way to study with a partner or group of friends. She has always done well in school, and thinks that she gives the impression of being fairly A-type and organized, but she is not sure that she is as perfectionistic as she appears to be. Anne generally keeps her emotions to herself, but that does not mean she does not experience them. She describes herself as easily excited, and confesses that music moves her deeply.

Though she did not come from a particularly musical family, Anne started singing at a very young age. Her parents did not know anything about classical music, so the first singers she listened to were all rock and roll, country, and pop. But somehow she always knew that she wanted to sing “properly.” Anne began private lessons at around five or six years old, and immediately took singing very seriously. She sang at school events, in music festivals, and in choirs. From the age of eight Anne competed in ten to twelve categories annually at the local music festival. One children’s choir in which she sang struck her as elite or geared towards serious young musicians. It rehearsed twice a week for an hour and a half and regularly performed a lot of classical music, including big works like masses. Anne’s voice part in choir was always first soprano. She always loved singing this range because it felt so easy and she enjoyed “floating” the high notes. As her first voice teacher was a huge musical theatre aficionado, Anne also became involved in local musical theatre, singing a variety of roles and often rehearsing five nights per week. She does not remember any specific compliments she received on her singing as a child, but does remember having the impression that adults thought she was really good, and also quite loud.

In her early voice lessons, Anne does not remember being taught much singing technique. Though her first voice teacher instilled in her the importance of a good vocal warm-up and taught her some lip trills and arpeggios, she does not remember much beyond that. With her second voice teacher, with whom she started to take lessons around age ten or eleven, Anne began to pursue RCM exams. She remembers learning the technique exercises associated with those exams, but again, does not remember being taught much about how she was supposed to sing them. She remembers those exercises as
just an exercise in learning to sing the correct notes and rhythms. Anne does not remember having any goals regarding her training, or her teachers having goals for her. Rather, the aim each year was to prepare her exam and competition pieces. Anne also does not remember being taught about vocal health or vocal fatigue beyond the basics: “when you’re sick, be careful, drink a lot of water, and don’t scream your head off all the time.”

When Anne was thirteen years old, she was cast in a leading role in a summer musical production about the life of a female writer. The show was three hours long and Anne portrayed the whole first half of the writer’s life, so sang almost continually for the first hour and a half of the show. The role was written in a belt style, which Anne was not trained to do, and the director of the show was not a singer or knowledgeable about vocal pedagogy. In hindsight, she thinks that no child should have been singing such a demanding role, and certainly not five nights per week for four months!

After that summer, Anne noticed that, especially in her lower range, it was really difficult to sing. She was losing her voice quickly, felt pain when she spoke and even more when she sang, and her voice was quite unreliable. After singing, or trying to sing, it would hurt to swallow. Her speaking voice had become fry-based, compressed-sounding, and she felt like she had to *push* it out. She began to take long periods away from singing and reduced her speaking, but when she returned to singing she would only last for a few minutes before her voice was gone again.

It was clear that Anne was experiencing significant vocal dysfunction, so she travelled to see an ENT in a big city some distance from where she lived. Prior to her appointment she filled out a detailed questionnaire regarding her voice use and experiences of vocal fatigue. The ENT examined her vocal folds with a rigid laryngoscope while instructing her to speak on a variety of vowel sounds, sing up and down through various ranges, and perform some onsets. To finish the vocal exam, the ENT also palpated her neck and shoulders. He diagnosed Anne with PMTD, explaining that though there was nothing organically wrong with her vocal folds, if she continued to speak and sing the way she currently was, she was likely to develop vocal fold nodules.
Though he did not state definitively what had caused her to develop this voice disorder, it seemed clear that it was connected to her intensive musical theatre activities. He also suggested that, since she often became sick as a child, singing when she was not completely recovered from these viral illnesses could have started a cycle of singing with extra tension. Finally, on her scope, he had noticed a faint redness on her folds. Though it was not conclusive, he thought this might be a sign of reflux (LPRD), which is sometimes a factor in developing muscle tension voice disorders. In terms of treatment, ENT suggested that Anne start taking proton-pump inhibitors (PPIs) to reduce stomach acid production, and see a voice therapist or speech language pathologist.

Regarding the necessity and effectiveness of her reflux treatment, though Anne took PPIs on-and-off for years, at the times she stopped taking them she found no difference in her vocal health. At this point she feels that reflux was not a significant factor in developing PMTD.

Because Anne lived quite far away from the city where she was diagnosed, her ENT did not refer her to a specific SLP or voice therapist. It was actually Anne’s voice teacher who recommended a local voice therapist to her. This voice therapist was also a singer/voice teacher, so seemed especially well-suited to treating her. Anne attended weekly appointments with this voice therapist for about six months. During these appointments she assigned Anne speaking exercises geared towards inflecting her voice into a higher register, and a set of self-massage and relaxation exercises. The self-massage included facial muscles around the jaw and neck muscles under the jaw and towards the top of the larynx. The relaxation exercises involved jaw movements meant to give it better vertical release, and gently moving the larynx itself side-to-side manually. The voice therapist also discussed posture/alignment with Anne and had her document voice use/abuse (coughing, sneezing, throat clearing, etc.).

After six months, the voice therapist was satisfied with Anne’s progress, and left her to maintain the therapy results on her own. Although Anne had recovered from the acute symptoms of PMTD, she continued to suffer from mild to moderate symptoms in her singing voice for many years. She attributes this to a variety of reasons. As a child she
did not have a strong understanding of vocal function, and therefore did not know *how* her voice had been dysfunctional. When her voice therapist discharged her from therapy and left her to continue on her own, she had some tools, but did not have a complete picture of what she was trying to accomplish. As a child, at times Anne was reluctant to continue with all the elements of her therapy. For instance, she was resistant to speaking in a higher register; she likens this response to that of a child not wanting to wear glasses in front of their peers. Additionally, Anne received no real singing voice retraining. She had stopped taking voice lessons while she was in this treatment process, and her voice therapist did not work with her on her singing voice. She theorizes that this was partly because the voice therapist, who was also a voice teacher, was reticent to trespass on Anne’s voice teacher’s territory. The voice therapist also seemed to believe that if the speaking voice was treated, the singing voice would become healthy in tandem. At that time Anne thought this made sense, but she now questions this line of reasoning.

In high school Anne continued to love singing and performing, never encountering another episode of acute Primacy Muscle Tension Dysphonia. However, she continued to regularly lose her middle bottom and bottom range (G4\(^{480}\) and lower) and felt that her voice was quite inconsistent. This inconsistency created a lot of nervousness, which led to greater physical tension in her singing. This vicious cycle and her previous experience of acute PMTD after singing a belt musical theatre role also made Anne afraid of using any chest register in her singing. She feared that it would catapult her back into severe symptoms. Her voice teacher also seemed nervous about working on Anne’s chest register. She would have Anne touch the low range for a few minutes in lessons, but then never return to it. Anne remembers the lessons as being very *careful*, and her teacher even asking her if she would prefer to take voice lessons with her voice therapist. Looking back, Anne feels that her teacher feared becoming the cause of ruining her voice.

\(^{480}\) Numbered pitches are referred to using the letter name of the note and the octave of the piano in which they are positioned as laid out in the following graphic: 
When Anne began studying voice at the university level, her first-year voice teacher had just finished her doctorate so was quite new to teaching, and Anne felt that her teaching style did not mesh well with Anne’s very kinesthetic and somewhat visual learning style. As a result, Anne did not feel that she progressed much that year. If Anne was singing high, floaty repertoire with long lines, she was often fairly successful. However, if she had to dip down into middle voice and lower, or if she had to sing a lot of words quickly, she would feel strangled/choked and at times experienced delayed phonation. Additionally, the more she sang while experiencing these symptoms, the more they compounded, and the greater the discomfort and pain she experienced in her singing. To her it felt like she had inflammation at the level of the larynx. However, Anne did not inform her first-year teacher about her previous experiences with PMTD, or about the dysfunction she was experiencing at the time. Anne was worried that if she did, she would be perceived as complaining or making excuses. She was also afraid of giving her teacher a preconceived notion that she was a naturally weak singer.

In her second year, Anne began studying with a different teacher whose teaching style was much more successful for her. This professor was very technical and had a strong pedagogy background. She also taught the undergraduate voice pedagogy course that Anne took that same year. Maybe because her new professor had such excellent anatomy and physiology knowledge, and did not shy away from talking about vocal pathology, Anne felt much more comfortable sharing her story with this teacher. As a result, she was completely upfront with her new teacher about her whole vocal journey. This clear communication and her newfound pedagogical knowledge helped Anne gain a better understanding of how the voice worked, and she began to make some progress.

Anne’s new teacher had a strong preference for a bright sound quality, so striving towards that was one of the main focuses of the work they did together. They also did some work towards Anne using her chest voice, but Anne was resistant to this, as she was afraid of what would happen singing in this lower range with a heavier sound. She still struggled with her voice feeling inconsistent – waking up every day and going into the practise room with no idea of what kind of sound would come out. The fear associated with her vocal inconsistency led to Anne spending hours in the practise room “warming
“up” before she would ever sing in a lesson or masterclass. Looking back, her voice was often fatigued before she even arrived at her most important singing for the day.

From second-year through graduation, Anne’s teacher allowed her the freedom to pick most of her own repertoire. Because the worst inconsistencies in Anne’s singing were in her middle and low range, she tried as much as possible to steer clear of anything low. She felt that this tactic served her well in her third-year recital. However, in her fourth year, Anne struggled much more again. She experienced many respiratory viruses which led to almost chronic coughing. She did not feel that she could rest her voice for the full amount of time that it took her to recover from these illnesses, and singing while still ill led to the build up of more tension.

Part way through the year another curveball was thrown Anne’s way; she was diagnosed with Celiac disease. Her health improved after eliminating gluten from her diet, but since her year was spent moving from one vocal emergency to another she did not progress in developing a solid technique. Instead she manipulated her voice to be able to sing with as much success as she could while ill, discovering new “tricks” in the practise room each week. Singing very breathily in the middle register seemed to help one week, so she completely dove into that. Creating brightness by spreading vowels horizontally seemed to work another week, so she put all of her energy into that. Anne seemed to bring a new issue to every lesson, and she also continued over-warming in fear of her vocal inconsistencies.

In addition to the solo singing requirements in Anne’s degree, it was mandatory to participate in an ensemble each year. In first and fourth year her ensemble was choir, and in second and third year her ensemble was opera workshop. Just as in her childhood choirs, Anne continued to sing first soprano in university choir. However, when her own voice teacher filled-in as choir conductor, she was moved to second soprano. Anne interpreted this as another subtle attempt on her teacher’s part to encourage Anne to work on gaining comfort with her middle voice. Though she does not specifically remember choir leading to vocal difficulties or fatigue, it is interesting that the two years of her
undergrad during which Anne experienced the most vocal dysfunction were the same two years that she sang in choir as her ensemble.

Even though her teacher knew her history and was understanding when she needed to take time off from singing, Anne did not feel like she could completely share her experience with her teacher, or with her fellow students. She continued to feel like if she explained her vocal inconsistencies – waking up completely unsure of what sound would come out each day – that it sounded like complaining. Other students insisted that they understood and experienced the same thing, but she felt that they were exaggerating, and did not understand what it was like to really be afraid of vocal inconsistency. They would be in good voice six out of seven days a week, whereas she would be in her best voice only one day of seven. They would go out drinking and shouting in a bar and feel a bit vocally tired the next day, but if Anne did the same thing she would experience much more severe symptoms (including delayed phonation on onset, and more effortful singing) and these results would linger for at least a week. Additionally, Anne’s voice professor seemed to have vocal cords of steel. Anne does not remember her having a single bad voice day in the entire three years that they spent together! As a result, in spite of her teacher being open and understanding, Anne always felt a bit isolated by her voice disorder.

At the time of this interview, Anne had just begun studying towards her master’s degree at a new school and with a new teacher. This teacher was again very technical and pedagogical in his teaching style, and Anne shared her experiences with him right from the start. The tactic he took in training her voice surprised her. He immediately began having her sing in a full isolated chest voice, something that she had considered wrong, ugly, and even dangerous since the time of her acute PMTD at age thirteen. He had her begin in the most uncomfortable part of her singing voice (ironically, her speaking range) and sing with a speech-like quality, carrying this same quality up as high as she could, even if it did not sound nice. She was immediately afraid that she would be unable to speak the next day, and that her singing would be negatively impacted for a week, but it was not! Instead, her middle range had a ring to it that it had never had before.
Anne had been told in her undergrad that her voice would probably mature to be a large voice, like a *spinto*, but she had always been unconvinced. She had not heard that quality in her own singing. But after working in full chest, she sang one of her old pieces, and it had completely changed. To her ear, it had more of the sound of a true solo singer, and for the first time Anne could hear a hint of a *spinto* quality to her voice! She had not done her usual warm-up – singing for a long time beginning in her comfortable high range and progressing as high as she could – but had instead only warmed-up for a short time using this “belty” exercise. Afterward this more efficient warm-up, when she sang in her high range in her repertoire, she felt that it *flew* out with so much ease!

Anne began to realize that the reason why her middle and bottom ranges were inconsistent was that she was trying to sing those ranges in head voice. Once her voice became even a little bit fatigued, she would have to employ quite a bit of tension to make a clear and stable tone in that range in head voice. That tone often would be almost falsetto-like, it would easily crack, and it did not have any resonance/carrying-power/cut. The tension she was using to try to force it to carry and keep it from cracking would end up lasting into the next day or throughout the week. Previously when she tried to sing in her low range, if she tried to speak afterwards her voice would be awful – cracking and exhibiting delayed phonation. But with this new way of singing, her speaking voice felt resonant and comfortable after singing. Anne is so excited to be in the process of discovering technique that feels like the key to finally fully recovering from PMTD.

Some final thoughts from Anne regarding her experiences with PMTD: For her, the onset of acute symptoms occurred during puberty. She wonders if some of the tension could have developed as a compensating mechanism for voice changes that were happening. In terms of the emotional impact of the disorder, she feels that as a result of her experiences with vocal dysfunction, she is hyper-aware of her vocal health. She thinks about it *all the time*, and vocal fatigue is much more distressing to her than it is to most singers. The experience of having PMTD was very difficult, because she has had to struggle to do something that she describes as: “my *everything*.” However, she now thinks that having to struggle has made her stronger, more knowledgeable about the voice, and more resilient in the face of failure. Finally, if she was not a singer, she would have considered
herself recovered from PMTD long ago. But, because as a singer her voice needs to be able to function at an extraordinary level and endure extreme demands, even the lower-grade chronic tension she has continued to experience for years has been quite debilitating.

4.1.3 Diana’s Story

Diana is a soprano in her early thirties with a Bachelor of Music in classical voice. She has a non-musical day job, but also sings professionally in several different contexts including jazz, pop, a professional choir, and musicals. She describes herself as an A-type personality: ambitious, and goal-oriented, and though she will take “no” for an answer, she works hard to make sure that “no” is not the answer she receives. She is quite extraverted, and assertive (a quality she described as “pleasantly aggressive.”) She does not believe that she is pushy, but is strong-willed, strong-headed, and maybe even a bit stubborn. She sometimes experiences strong emotions, but generally tries to keep them private. Emotions become more unstable for her at times tied to hormones, but overall she feels she is in excellent mental health. Exercise, taking care of herself and her space, and drawing on the support of her community (particularly her mother and her partner) are her main tools for maintaining good mental and emotional health.

Diana has been singing for as long as she can remember. Her first singing experiences were all associated with her grandmother and church. Her grandmother spent a lot of time singing with her, teaching her hymns. Diana had memorized “Holy, Holy, Holy,” by the time she was three years old, and performed her first solo in church at the age of four. Around the same time, Diana began preschool music lessons which included sound-matching and other fun activities. That teacher and Diana’s mother noticed that she had a lot of musical potential, so at the age of five she was enrolled in private singing lessons with a teacher who had her ARCT (performance diploma) from the Royal Conservatory of Music. Diana remembers being complimented as a child on having a very clear tone. She had beautiful high notes that were quite effortless, and just sailed out. Additionally, she remembers adults considering her very musical, as she had good expressive instincts, and big enough personality to be a natural entertainer. She was a very quick rote learner.
from early on – if she heard something once she could parrot it back with astonishing accuracy.

Besides her voice lessons, Diana also participated in a few community musical theatre shows, and continued to be active as a singer in her church. For many years she was the youngest member of the small church “choir” which was really a small group of women (about seven) who liked singing, and one man who sang tenor/baritone. There were not high-level children’s choruses available in the town where Diana grew up, and the music that her school choirs sang struck her as boring, so she instead played in school bands and studied instrumental music in school.

Diana ended up studying with her first voice teacher for her entire pre-university singing career. In terms of repertoire, from the start of lessons until early high school, Diana and her teacher focused on RCM graded repertoire. They progressed through these grades quite quickly, so that Diana was already preparing for her grade nine voice exam in early high school. At this point, Diana’s ability to learn repertoire and the other exam requirements had outpaced her physical and emotional maturity, so she and her teacher made the choice to stop pursuing exams and branch out into other repertoire.

In her elementary and high school era voice lessons, Diana does not remember her teacher explaining or having technical goals for her voice. She remembers that in every hour-long lesson her teacher would run her through about five to ten minutes of exercises as a warm-up, moving through her voice into a high range, and then back down. Some of these exercises were simple scales, and some were the technique exercises associated with whichever RCM exam she was currently working towards. However, none of this was explained as training with specific technical goals. She also does not remember being taught much about vocal health in her voice lessons. She recalls being cautioned on how to sing or how not to sing when she was ill, and being advised not to shout/scream. However, discussions on developing and maintaining good vocal health were lacking, just as technical training explanations were.

When Diana was in puberty, singing suddenly became more difficult for her. From the clear bell-like tone quality she had been lauded for as a child, there was an abrupt change
to a fuzzy or dampened sound, and everything felt like much more work. Diana’s singing had previously felt and sounded effortless, and though she felt able to make her voice do the same things as before, it did not feel good. It felt like work.

Still, Diana continued to love singing, and went on to study voice at the university level. Her first university voice teacher was an excellent fit for her. Diana felt like this teacher truly made the effort to get to know her and understand her both as a singer and a person. She seemed to really understand what Diana’s issues were: where she excelled and where she did not. Over the course of the year, the two of them reached a good understanding of how to work together. Diana was greatly enjoying learning from her and felt that her voice was progressing. However, this teacher had only been filling-in during the sabbatical of a voice professor who had a more permanent position teaching at the university.

In Diana’s second year, that professor returned, and she describes that year as by far the worst year that she has ever had for her voice. She could not understand what he was talking about in their lessons, and he seemed to have only two ways of asking for what he wanted from her voice: one specific set of words, and demonstration. The words he used did not click with Diana, and his demonstrations in a big baritone voice also did not help her as a young soprano. She tried to imitate him, he would say, “No. That’s not it,” reiterate the same instructions, and then would demonstrate again. Diana understood so little from these lessons that she did not know how to practise and does not remember specific technical exercises. She felt that if she was doing everything wrong, she obviously should not practise, or she would just be reinforcing this incorrect way of singing. Inevitably, every lesson ended with Diana in tears. Sometimes she would make it down the hall to the bathroom, but other times she would dissolve before she had even made it out the studio door. By the time she reached the end of her second year, Diana felt that any progress she had made in developing her voice in first year had been completely erased.

Diana was having such a miserable time with the thing she should have been enjoying most about studying music, that her motivation for all of her academic music subjects
also tanked. She threw herself into extra-curricular activities as a distraction. The community she found there helped distract her from her unhappiness, but at the end of the year she found that she had neglected her studies to such an extent that she had been placed on academic probation. Diana dreaded the return to school so much that she asked her mother if she could drop out or switch to a different major/degree program, but her mother encouraged her to go back and give it one more try.

When she arrived back at school in September, Diana found that she had been assigned to yet another teacher. This teacher was a much better fit for Diana. She understood that Diana was sometimes rushing into her lessons from some much different activity and needed a little bit of time to become grounded/centred and able to sing. Sometimes lessons would begin with a session of lying on the floor and breathing, rather than leaping directly into technical exercises or repertoire. With this teacher Diana remembers a little bit more of what they worked towards technically. Breath, breathing, and being grounded were an area of focus; Diana’s teacher often had her sing bent over to feel low-breath activation and release. One specific image was used a lot, and Diana believes its purpose was to tie together the concepts of grounding/breath-flow with articulator release and alignment (lack of spread and associated facial tension). This was the image of a long column of air originating in the floor and coming up through the singer before emerging like a laser beam and being projected to the very back of the room.

Though Diana remembers the term *Fach* being thrown around a lot at her school, especially by her second-year voice teacher, and she remembers the terms *soubrette*, and *lyric soprano*, she never had a clear idea of where her voice fit into this classification system. Her third university voice teacher never tried to put any label on Diana’s voice, instead taking a more intuitive approach to helping Diana discover new repertoire and find what she naturally gravitated towards both in terms of voice and in terms of personality. Diana never forged a good connection to German *Lieder* and Italian songs, mainly because of the languages themselves. She remembers starting to avoid singing in Italian after her coach criticized her Italian vowels without making it clear how to fix them. She also remembers finding the German language so complicated that she felt tense while singing in German, while at the same time finding the songs themselves overly
simple. She thinks that she may have had an interest in opera and oratorio repertoire when she started her degree, but the difficulties of her second year, combined with an overly-catty and competitive attitude in her peers, stifled her curiosity into this repertoire.

Of foreign-language art song, the only language that Diana really enjoyed was French. She was drawn to this repertoire because of the beautiful and dreamy qualities it possessed. As a result, she sang quite a bit of Fauré. However, the repertoire she really gravitated towards was mostly American art song with a folk influence. She remembers especially loving songs by Aaron Copland, a set of songs called *Octaves and Sweet Sounds* by American composer Richard Hundley (especially “Moonlight’s Watermelon”), and songs by Jewish-Canadian composer Srul Irving Glick (especially “I am dark, but lovely.”)

Looking back, though Diana felt that she made good technical progress in her singing in third and fourth year, she still does not have any memory of there being a clear technical goal in her lessons, or of learning a systematic way to practise. Diana was never required to take a vocal pedagogy class, so she did not have a venue other than her voice lessons in which to learn about physiology, acoustics, more complex vocal health topics, or other vocal pedagogy concepts. She mostly remembers being told that she needed to find better focus, a less spread sound, and to “use her column”. A couple examples of technical difficulties where this technique was suggested included moving quickly from low to high in her voice, or trying to float through her break between C5 and F5, so it seems like one purpose of the technique may have been to assist in smoothing out registration issues, but it is not clear. Instead of having a clear idea of where she was going vocally, she feels that similar to her early study towards RCM exams, she was being guided through the process of checking off curriculum requirements – “being put through the repertoire and making sure she sounded okay doing it.”

Choral singing was a requirement of Diana’s degree program, and she was generally placed as a second soprano in choir. If she had to define her Fach while in school, she would say that she was a “reluctant soprano.” She had the opportunity to be part of her university’s chamber choir for several years, and this was one of the most fulfilling
musical activities that she took part in while studying at the university level. The choir had a collegial and fun atmosphere, with all the members taking real ownership of what was accomplished – a very similar vibe to that of the professional choir of which she is now a member.

Diana graduated with her Honours Bachelor of Music, jaded by her experience of being bounced between teachers, and with her joy of singing somewhat stifled by the strict repertoire requirements. However, over the years after her graduation, she became involved in some very fulfilling musical activities. She began singing as an alto/mezzo with a professional choir specializing in Afrocentric music of all genres, she became part of a four-piece jazz/pop band that performs at weddings and corporate gigs, and she also became involved in local musical theatre.

A few years after her graduation, Diana had the opportunity to sing a musical theatre role that she describes as being in a “big person Gospel style.” It required singing in a full belt up to around D5, was rehearsed and performed with a track at high volume and without monitors for the performers, and Diana did not have any formal training in belt technique. Performing this role a couple times a day under these conditions led to acute vocal trouble for her. It progressed to the point where she almost could not speak, her voice was breaking/cracking in a way that it never had before, and she was in a lot of pain. She felt like all the muscles in her neck and shoulders were seized up. She felt like the more energy she put into her voice, the less it would actually do, but if she backed off that also did not help! It was terrifying that no matter what she did it seemed to get worse. Nothing was resonating, and everything felt foggy and awful. Diana was sure that she had done physical damage to her vocal folds.

The director of the show was a voice teacher so Diana spoke to her about what she was experiencing. That director suggested getting some sleep and then warming-up her voice better for future runs of the show. This was not unsupportive but did not offer any real help to Diana in such a time of crisis. The advice did not help her voice recover. Diana was so panicked, and so sure that something serious was wrong, that she chose to only share what was happening with her closest community: her mother and roommate. She
continued to sing in choir and did not inform her colleagues and director there of what she was going through. Though Diana was having sleepless nights worrying that she had done permanent damage to her voice, she did not want to share her worries. Talking about it with other people would make it real, and she desperately wanted it not to be real.

Singing had always been such a huge part of Diana’s life, and as she worked at a non-musical day job, it had become her creative outlet, source of joy, and identity in a whole new way. Following her difficult university years, Diana had built many wonderful musical elements into her life and regained her joy in singing. Now she was imagining all of that going away. To her, singing was not just an activity, and she was not just a singer while at choir or her gigs. It was a part of her identity and her *being* at all times. Little sing-song phrases had even become a quirk of her day-to-day speech. Diana felt full of horror and sorrow at the thought of losing all of that. She felt bereft, and in addition to all the raw emotion of loss, she felt shame. She believed she had somehow done this to herself – was a bad singer or unskilled musician. Though she believed she was strong enough to recover from devastating losses like a job, family, or wealth, she was not sure she would be able to recover from losing her voice.

Either near the end of the run of performances, or right after the show closed, Diana mustered up her courage and went to see an ENT who specialized in treating the singing voice. At this point her voice was cracking a lot in her middle-high range (between A5 and E5), was not vibrating, had become breathy at times and in certain areas, and was extremely painful. That doctor palpated her neck muscles and larynx, performed a nasoscope on Diana, and revealed, to her very great relief, that no physical damage had been done. She had PMTD. This doctor recommended a procedure which struck Diana as a very drastic response, if the cause of the dysfunction was muscle tension. To her, his treatment recommendation felt aggressive. If there was no physical damage, she wanted to fix the way she was producing the sound, not make physical changes to the voice mechanism. So, she decided that rather than continuing to pursue treatment with the ENT, she would go to a speech language pathologist (SLP) who specialized in treating the singing voice.
The treatment with the SLP ended up being wonderful, and just what Diana needed. He treated her PMTD using a variety of methods, giving her exercises to help her produce both her singing voice and speaking voice more healthily, and also performing hands-on massage/manipulation of the muscles in her neck/throat and shoulders. Some of the exercises were geared towards balancing resonance in her voice for better spoken projection: use of the [ng] consonant sound in isolation and in phrases like “Good morning,” and sirens starting very low and sliding through her range. The massage/manipulation offered the most immediate relief of the pain, discomfort, and vocal symptoms she was experiencing, but it was an extremely unpleasant experience in the moment. Diana described it as feeling like she was being choked. Some of the manipulations he performed included grasping the larynx and pulling it forward while massaging around and almost behind it, massaging down towards the shoulder blades in the back and collar bone in the front, working to release some upper-chest muscles, and massaging under and above the jaw and the temporomandibular joint. The SLP suggested that one cause of Diana’s tension might have to do with teeth grinding, so she had a night mouth guard made.

Within three or four sessions with the SLP, Diana felt recovered from the acute symptoms she had been experiencing. He suggested that she would benefit from some voice lessons, and so she reached out to a few voice teachers she knew from her professional choir, and tried some lessons, but while the lessons were somewhat helpful, she could not find a teacher whose pedagogy style coordinated with the style of singer she had become (more jazz, pop, and Gospel, rather than classical). Most of the teachers she knew who were focused on vocal pedagogy taught from a classical perspective, and most of the pop/jazz teachers she knew were more focused on coaching repertoire and style rather than technique. Diana stopped after a few lessons and instead tried to be her own teacher.

The experience with PMTD has made Diana much more aware of the physical sensations of tension and pain when she sang. Knowing what causes these sensations and how deal with them, has given her much more calmness in dealing with them. She now is able to notice when she is attempting to use unhealthy manipulation to create the full and dark
sound requested of her in choir, and can to modify what she is doing to be more efficient and healthy. She has tools to deal with tension, and also knows she can go see a specialist if she ever gets to the point where things progress beyond what she can deal with on her own, or if she wants a vocal health tune-up a couple weeks before a performance. She knows who to see and what kind of information is useful to share in order to guide treatment.

Diana also uses this new awareness when teaching herself how to sing pop repertoire for her jazz/pop band gigs. She has become much more goal-oriented in her warm-ups and training, using vocal exercises to release tension and encourage breath flow rather than just singing random “warm-ups” for some arbitrary length of time. When training her voice in a pop idiom, she listens for hours to reputable pop singers trying to establish how they accomplish certain feats. She then attempts to do the same physical feat using her own voice in a healthy and sustainable way. She records herself experimenting, listening back to the recordings for immediate feedback, all the while being very aware of the physical sensation associated with what she is doing. She slows things down and works on tiny excerpts with careful repetition. When she began practising like this, Diana was amazed at how quickly she learned and how much it improved the sustainability of her singing. She now realizes that this is probably also how she should have been practising classical singing, but was not taught how to do so.

Reflecting on her vocal journey, Diana now wonders whether her experience with voice change and puberty had a causal role in her development of PMTD. When it became more difficult for her to produce a clear tone quality, she could only do so through increased effort. This was never addressed in her voice lessons at any stage of her training, and the habits formed in making her voice work seem to Diana to connect to her experience in the lead-up to her acute muscle tension issues.

Diana had one final thought at the end of her interview. She is thankful that this research is being done, because she thinks that vocal dysfunction is a topic that is not discussed enough, especially in the classical singing community. She believes that if more of us
understood the kinds of struggles that our colleagues are experiencing, the whole community might be less catty, judgmental, and competitive.

4.1.4 Jolene’s Story

Jolene is a young soprano with a Bachelor of Music who completed her undergraduate degree a few years ago. She describes herself as being introverted and somewhat anxious. She confesses that she can be a bit messy and disorganized, but with things she cares about (like music) she is very particular. Because she grew up in a musical family, Jolene feels she has always understood that being critiqued in music lessons or in masterclasses is constructive and an opportunity to improve, but she still sometimes finds herself defensive in the face of that critique. Jolene also describes herself as a people-pleaser. Her enjoyment of a social event depends very much on whether the people she is with are enjoying themselves. In fact, she admits that this has often mattered more to her than her own personal preferences.

Jolene began singing when she was quite young. Her mother describes her as having always sung, but her first organized exposure to singing was when she joined a high-level community choir when she was in grade six. The choir director was amazing, and Jolene credits studying under them as inspiring her love of singing. Jolene goes so far as to say that she was obsessed with choral singing. She started out in the first soprano section of the choir, but was later moved to soprano two, because she had a good ear and her bright sound helped with tuning the section. She enjoyed blending in with the group, but also took pride in being offered some opportunities to sing as a soloist. She was often told as a young singer that she had a pretty voice: light, cute, nice, and pretty.

Sometimes now Jolene feels sad when she thinks back to her choir days. She loved choir so much, but those memories are now sullied by the fact that she believes she formed some habits during her days of choral singing which may have been part of why she developed PMTD. Vocal health was discussed only very broadly with the choir. The range of vocal abilities and issues among the members of a choir is so broad that instructions may be given to the group that are inappropriate to the vocal development of some members. Choir directors cannot hear most individual voices and discern the
technique or habits which are involved in their vocal production, so issues can go undiscovered for long periods of time. Choral directors may also not have much knowledge about healthy versus disordered vocal production, and therefore be unable to recognize when things are going wrong. Jolene believes that this happened to her in her days of intensive choral singing. She now listens back to recordings of herself singing solos with her choir, and she believes that she can already detect a somewhat choked quality to her sound. She also remembers trying hard to produce more sound, and not being able to do so. She now believes this to be a precursor to, or an early stage of, her development of PMTD.

Jolene first started taking voice lessons when she was in grade ten in school. This first voice teacher was a performer who was a family friend, and Jolene was their first student. These lessons were more about musicality than about technique. However, what was difficult was that Jolene feels that the teacher often was suggesting that she do expressive things that her technical ability and knowledge did not support. It was frustrating to Jolene, that she was unable to vocally express the things she wanted to. For instance, she would try to crescendo and created dramatic contrasts, but at a certain point she felt that there was a stop or a wall that she could not get past. She felt that she had so much she wanted to say with her singing, and she heard what she wanted to sound like in her head, but could not make it physically happen, no matter how hard she tried. Jolene stayed with this teacher for about two years, or until the end of high school, after which she switched to a different teacher with whom she studied while taking a year off before beginning university studies. She remembers doing slightly more technique with her second teacher, but this teacher again did not see the need for significant technical changes to how she was singing. Instead, they suggested that Jolene’s voice was perhaps somewhat immature and slower to develop, and that technique would come later. Like many of the other music educators from her youth, this teacher thought Jolene’s voice was so pretty saying: “Oh, don’t change anything. You sound so nice and musical.”

Some of the solo repertoire that Jolene sang in high school and her gap year included folk songs, Quilter, Schumann, and Schubert. Especially when singing folk song repertoire and Schumann, Jolene noticed that when she first began singing she felt fine, but after a
short time she would start cracking in the low transition between her chest voice and head
voice, and then that range would be essentially unusable or completely gone. However,
neither of her early teachers commented on this or tried to work on it. Jolene got the
feeling that both of these teachers thought her voice would grow naturally, and she
wanted to trust them. She also did not want to admit to them or herself that something felt
wrong, so she never told them about what she was experiencing vocally. Coming from a
family of musicians, she did not want to let anyone down.

In choir, her absolute favourite repertoire had always been Bach’s monumental works: *St.
Matthew Passion, Mass in B Minor*, etc., so Jolene also learned arias from those works,
and movements from solo cantatas. She now wonders if singing these very high tessitura
choral works, which required long periods of singing and a lot of stamina, started
building tension into her singing. She also was afraid to stick out in choir, and attempting
to blend led to a sensation of tightness in her throat.

The following year, Jolene began university voice studies. Her first university teacher
was her first real introduction to studying voice technique. She remembers one of her
teacher’s key focuses being air; they talked about air being what fueled everything and
would often make a cone shape in front of their nose and say, “Send your air out.” Other
times they would indicate that Jolene should be supporting from lower in the torso. But
when Jolene tried to send more air out, or support, she just tightened. Very seldom did
her teacher give her any positive reinforcement. At times Jolene felt that her teacher was
frustrated, as she was not progressing very well in their lessons together. The competition
was also extremely fierce at Jolene’s school. She auditioned for performance in first year,
and did not get in. She re-auditioned in second-year and again was not successful. At this
point her teacher told her it was time to consider giving up on that dream.

Throughout all of this time, Jolene was beginning to realize that something was really
wrong with her voice. Her upper range was hit and miss. As she ascended, sometimes her
voice would just suddenly cut out and make no sound at all. It felt like her throat had
squeezed inwards and stopped the air and sound from escaping. Singing high had felt like
a lot of work to Jolene from the very beginning, and had made her nervous and tense. She
had always believed that the difficulty she felt when singing high was normal because singing was *supposed* to be difficult. There were so many clichés about it present in voice teaching: “Singing isn’t easy!” and “You have to physically use your whole body to sing!” But, in high school she had been able to sing up to B5, whereas in university she gradually became inconsistent at sustaining even E4 and up. The transition between her low and middle voice was also still having the same kinds of issues that had worried her in high school; when she would first start singing she felt like she could navigate pretty smoothly through this area, but it did not take long before she could only sing between middle C and F4 if she sang it in full chest. It was a similar story in choir; she progressively experienced more and more tension until she was only able to sing for about five minutes before she would have to stop and just sit there for the rest of the two hours. Her throat felt like her larynx was rising and rising until she would feel a lump in her throat, like the sensation of right before sobbing. Jolene was terrified. She was absolutely convinced that she had nodes or some other kind of serious physical damage to her vocal folds. She confided her fears to her teacher, and her teacher sent her to an ENT who specialized in treating the singing voice.

At Jolene’s appointment with the ENT she told him about the vocal symptoms she had been experiencing, and her fear that she had nodes. He palpated her throat, performed a laryngoscopic examination, and informed her that her vocal folds looked healthy: that she definitely did not have nodes or any other physical damage. Jolene was so relieved that she immediately started crying, sobbing. Then, her appointment took a strange turn. The ENT talked for a long time about chakras, telling Jolene that hers were not in alignment and giving her a book about this type of issue. Jolene felt that the ENT was very eccentric, and his chakra-alignment suggestions were not what she needed. What she wanted was a treatment that helped her fix what she was doing wrong with her voice, not one that aimed to fix all of her life problems. Happily, as her appointment progressed further, it seemed the ENT intended for her to receive treatment from a speech language pathologist (SLP). He recommended that she go to see a specific SLP who specialized in treating the singing voice.
When Jolene went to the recommended SLP, he wanted to scope her again, in order to get a more detailed idea of what was going on with her voice. She had a chance to see and keep a picture of her vocal folds, and it was evident in the picture that they were partially obscured by muscles above them in her throat. This supra-glottal constriction was probably why her voice was sometimes cutting out completely and why she felt like she could not get air out/allow air to flow in her singing. The SLP also told her that as a result of muscle tension her vocal folds were not closing completely when she phonated. However, he confirmed that there was no physical/organic damage to her folds. She had PMTD.

During that same appointment, the SLP moved on into treatment. One of the main treatments that he prescribed and performed was laryngeal massage/manipulation. He would pull out the larynx and massage around and almost behind it. He would move it side to side making the cartilages around it crack (somewhat like cracking one’s fingers) many times in a row. All of this was extremely uncomfortable while it was going on. Jolene describes it as feeling like she was being choked. However, as soon as the massage would stop, she would feel tremendous relief from all the unpleasant sensations she had been experiencing prior to treatment. It felt like her larynx was settling back into the correct position, rather than being too high in her throat. Jolene’s muscle tension was severe enough that the SLP suggested that she come to him for weekly treatments. She ended up seeing him weekly for almost her entire degree, eventually reducing frequency a little.

The SLP also assigned her vocal exercises to practise. He suggested that Jolene gag herself every day with her toothbrush to reduce her gag reflex. She thought this was a very strange exercise, to the point where she had to ask him if he was joking! He also prescribed a lip trill in chest voice from around middle C all the way up to C5. She initially found this exercise equally difficult to believe. She thought it seemed crazy! She did not think she was supposed to sing that way, and even had previously believed that using her voice that way could be dangerous or could hurt her voice. It took her a while to really commit to doing that exercise, but when she finally did, her voice felt really good after doing it.
Aro

Around the same time as all of this was going on, Jolene’s voice teacher became seriously ill and had to stop teaching. Jolene was transferred to the studio of a different voice professor, and her original university voice teacher died shortly after that. This was a huge shock, and terribly sad. Thankfully, her new teacher was a good match for her, both in terms of technique and personality. This new teacher was funny. They made Jolene laugh, and kept her from getting negatively fixated on any one thing by having a fairly fast pace to their teaching. Her lessons with them never felt awkward or uncomfortable, and she did not feel as nervous as she had with her previous teacher. Their main focus with Jolene was to use her natural speech as a model for her singing. They would ask her to speak any short colloquial phrase, and then go straight into a sung scale beginning in the same range where she had been speaking (around middle C). This vernacular teaching technique, in combination with her treatments with the SLP, made a huge difference in Jolene’s singing. This teacher could not only hear the tension in her voice, but also offered vocal exercises that targeted these problems. Jolene could not fully express just how grateful she was to have found this teacher. They were a life saver for her.

Prior to being diagnosed with PMTD, Jolene felt that teachers at her school had been quite unsympathetic to her struggles, dismissing her as having a lack of technical singing ability. While Jolene admits that this is partly true, as she believes that lack of technical knowledge was part of why she developed this voice disorder, it had been frustrating to be dismissed in this way. After all, she did not have poor technique for lack of trying, and to her it felt like being dismissed as having poor technique was almost like being dismissed for having lack of talent or natural ability. In third year, after working for some time with her new teacher, Jolene had a “studio swap” where she had an opportunity to have a lesson with a different teacher, just to get a different perspective on her voice. At this point, Jolene felt like her voice was “coming out a bit more,” especially in specific pieces. In this lesson, Jolene sang, “Ein Traum,” by Grieg, and felt like her breath was flowing and she was able to be expressive in some of the ways that she intuitively wanted to be. That teacher asked her, “Why aren’t you in performance?” This was an extremely sore point for Jolene, as she had been rejected from performance twice, and then discovered that the thing that had been holding her back was a voice disorder. She felt so
angry to be asked this question, but also somewhat vindicated that someone was finally recognizing her abilities as a singer and musician.

However, Jolene did not feel so successful in all of her singing. While she felt freer and more able to be expressive in some pieces, other pieces still caused her difficulty. It was, in many ways, a joyless struggle to get through to the end of her degree. Singing had always been Jolene’s escape from a personal life full of stress and upheaval and it had instead become an additional source of anxiety and frustration. When she graduated, Jolene stopped singing. At the time, she did not think she would ever sing again. She had been told as a child that she had so much potential as a singer: that she was so musical. As a result, she had thought that these were the qualities that made her special. Growing up in a family of professional musicians, she naturally decided that she would also pursue music as her career and calling. She had felt like there was not really anything else in the world other than music. So, she experienced vocal dysfunction as the destruction of her identity and world.

Looking back, Jolene wonders if stress and anxiety in her life could have actually played a part in her developing a chronic muscle tension voice disorder. She knows that she has always had a tendency towards social anxiety. Though she loved singing in choirs as a child and youth, she dreaded having to socialize with people during the break in rehearsal. She was bullied as a child and has struggled with social anxiety ever since. High school was difficult, and the same fear of her peers that she experienced at that time carried on into university. In addition to her school pressures, some family stresses began when Jolene was in grade six, leading to intermittent feelings of tightness in her throat. She also experienced tightness in her throat when singing, though she is not sure if it was caused by the outside stress or not. Singing was one of her only escapes from all the stress at that time. When singing became an additional source of difficulty in her life and she felt that her identity was crumbling away, Jolene’s mental health took a turn for the worse, and she ended up being prescribed anti-depressants.

After graduation, Jolene got a job working with animals and basically did not sing for two full years. Those years of rest from singing have been good for her. She has
discovered other interests and loves, and that she has value apart from being a musician. She found new activities to help her deal with stress, anxiety, and tension (Zumba and hot yoga!) and was able to stop taking her anti-depressants. Jolene’s family stresses have also reduced considerably. Recently, she has begun to take lessons and sing regularly again. A part of her does not want to hope too much and is afraid that all the tension will return. But, so far, it feels much easier than before; her voice feels bigger, yoga has helped her be able to release her breath in a more effective steady exhalation, her onsets are smoother, and her vibrato is more consistent. She feels like taking a long break has allowed her to have almost a fresh start. Many old habits are gone or dormant because she has not used them in so long. Jolene feels like she can be a stronger advocate for herself in her lessons now: if she feels that a song builds tension for her, she sticks to her guns and just will not sing it. She also feels more playful and experimental in how she practises, and can set intentions for herself, rather than just trying to please her teachers all the time.

Though Jolene does not feel that she is fully recovered from PMTD, she feels that she has recovered from the depression it plunged her into, and that she is in many ways a healthier and more fulfilled person than she was then. Though she does not know what the future holds, she has more avenues to joy in her life now, and has begun to be able to reclaim her joy in singing.

4.1.5 Joshua’s Story

Joshua is a baritone in his late thirties who is in the process of establishing his career singing lead roles for small indie opera companies. He is very friendly and quite extraverted. Joshua states that he aims for excellence in what he does, and tries to be hard-working and disciplined. However, over the course of his recent experience recovering from vocal dysfunction, this trait has grown into a tendency to value the joy of the path over the product or goal-driven desire for excellence that he feels ruled him in the past. Joshua admits to being an emotional person, but used to suppress his emotions for the sake of pleasing others. He valued the experiences of others above his own, and so would always smile and try to please everyone, even if it was not in his best interest. Now he feels much freer to explore his own emotions and needs.
Joshua did not come from an exceptionally musical family, but there were a couple singers who came before him. His great-uncle used to sing. His father loved to listen to a wide variety of musical genres and has always had a beautiful voice – from time to time playing guitar and accompanying himself. His father’s taste in music was an important influence for Joshua and he loved singing from very early in his childhood. His family tells him that he already spent a huge amount of his time singing when he was so young that he does not remember it. They also say that he has always had a loud singing voice. When he was about seven or eight-years-old, Joshua started taking guitar lessons. In a short time, He was able to accompany himself singing folk songs. In terms of ensemble singing in his childhood, when Joshua was about ten years old, there was another boy taking guitar lessons from the same teacher, and Joshua had the opportunity to play and sing some folk duets with this other student.

As Joshua grew into a teenager and his voice changed, he continued singing and accompanying himself on the guitar. Around the age of fifteen, Joshua really wanted to sing rock and heavy metal, but most of the singers associated with those genres had high voices, whereas he had developed the range of a baritone. When Joshua sang folk music and ballads, he had no difficulty, but when he tried to sing rock and heavy metal, he struggled. His voice tired out extremely quickly, and no matter how hard he tried, he could not reach the notes! He found this immensely puzzling. He had heard of falsetto, and tried to see if he could use that kind of production to reach his goals, but he describes that experiment as “just a mess.” He did not understand anything about how to access that type of vocal production, but kept trying unsuccessfully for a number of years before finally giving up.

When Joshua was about twenty, he started taking guitar lessons again after a long hiatus. In the meantime, his guitar teacher had begun taking voice lessons and passed along some concepts about singing. This marked the beginning of Joshua’s voice training. Though these were not really voice lessons – they were still primarily focused on guitar training – at this time Joshua learned some basic ideas about warming-up his voice and breathing properly for singing. However, Joshua’s first formal singing experience came when he was twenty-three and already pursuing an undergraduate degree in engineering.
At that time, he joined a choir at his university, just to try a completely different activity, and instantly fell in love with it. A number of years previously, he had considered pursuing a career in music, but his family had been against the idea, so he had given it up. But after he joined this choir, he was reminded how deeply he loved music.

With a little research, Joshua discovered that there was a program at the university-associated conservatory that was designed to prepare students to pursue university level studies in music. He decided to enroll in this program and work on it concurrently with his engineering degree. After graduation, he planned to find an engineering job, but he believed the musical training would be a very fulfilling hobby and he would be a high-level amateur musician. Initially, he wanted to take a training course in guitar, but he had already passed the upper age limit for enrolling in that course, so instead he registered to study voice. He was starting his musical training essentially from scratch, including music theory and reading music. As a result, he felt that this program opened up an entirely new world for him.

Particularly at the start of this training program, Joshua’s education was focused more towards musicianship/musical literacy than voice technique. He learned how to sing correct pitches and rhythms, how sing in tune, and how to memorize music well. His teacher often stressed the importance of these skills, declaring that the best singer with the loudest voice would not be hired a second time if he did not know his entrances and could not follow the conductor.

The technical teaching that Joshua’s first voice teacher did do was quite hands-off. As her student, Joshua was assigned readings and exercises from various teaching methods (Vaccai, Concone, etc.). When he sang these exercises in his lessons, his teacher would make small comments, but the main technical explanations he received were from the readings. He was not given many suggestions specific to his own voice. In terms of repertoire, this program mainly focused on antica arias from the old Italian masters and songs in Joshua’s mother-tongue. Part way through the program, German art song was added to the requirements. Then, in their final year, students were required for the first time to learn a small amount of French repertoire, one oratorio aria, and one opera aria.
Joshua finished his pre-university voice training program at the same time as he finished his undergraduate degree in engineering. While his family was still expecting him to follow the career path of an engineer, Joshua had begun forming a different plan. He had loved pursuing serious voice studies and had been encouraged by his teacher to continue studying. He felt that it was scary and risky to entirely change career paths in his late twenties, and his family was initially opposed to his choice. However, Joshua bravely made the choice to continue. He took his entrance exams and was accepted into the undergraduate degree in voice at his university.

In his undergraduate degree, Joshua continued to study with the same teacher as in his pre-university training. Her method of training university-level singers was not substantially different from what Joshua had experienced in the preparation program; she continued to lead her students to make discoveries about their own voices with a combination of the guidance of the old classic vocal pedagogy method books, and small suggestions. Looking back, Joshua thinks that the primary tenet of her method was, “First do no harm.” At that time, Joshua sometimes felt frustrated by what seemed like a slow learning process. His colleagues in other studios and from other universities described the new technical things they were learning in their lessons – the passaggio, placement, and space – and he would be forced to respond, “Well, my teacher doesn’t talk much about that.” Like all young singers, he wanted to explore very high and low ranges, sing very loudly, and perform as a soloist all around town. He occasionally worried that he was being held back by his teacher, but he also sometimes thought that learning slowly and carefully might be a better process than rushing into challenges before he was ready.

At the end of every term of his undergraduate degree, Joshua was required to perform a jury/performance exam. For the first six semesters, the jury requirements included performing six pieces in four languages from memory, and demonstrating the assigned technique exercises learned that term. From the sixth term onward the jury requirements increased. Joshua was still required to perform a similar number of technique exercises, but the number of compulsory pieces was raised to seven (and later to eight), an additional language was added, and a quick study component was introduced (Joshua was assigned a brand new piece one month before each jury).
In retrospect, Joshua feels that these very challenging jury requirements led to students practising in a rushed fashion. They often only had time to work to prepare their required repertoire and exercises, rather than working methodically on building a healthy and sustainable voice technique. In addition to all their solo singing, students were also required to sing in the university choir. Though Joshua does not remember experiencing any vocal dysfunction during his undergraduate studies, in his own words: “I believe that these things don’t just develop in one day.” He was able to identify and correct a number of technical issues during issues over the course of his undergraduate degree, but he now feels that other issues accumulated during that time.

When Joshua graduated from his undergraduate degree, he began singing with a local professional choir. This choir sang widely varying repertoire and performed often. Every Monday they presented a popular music concert, once a month they offered special concerts, they regularly appeared as the chorus for concerts with the local symphony, they mounted an opera/operetta season, they had a season of carols at the end of the year, and they sang an annual New Year’s Eve concert. The Monday popular music concerts were performed with amplification and sung with hand-held microphones. The environment was extremely loud, and it was difficult for singers to hear themselves. The technique required was very light and bright – quite a different sound and registration from the opera/operetta shows or for the symphonic concerts. Rehearsals were long, and singers were often required to switch between these different techniques with practically no time to adjust. They would rehearse popular music for an hour and a half, then after a twenty-minute break they would dive into Verdi’s Requiem for an additional hour and a half.

During the opera/operetta season the rehearsal and performance requirements of the choir were even more taxing. At this time, the choir rehearsed every night for the popular music concert for an hour and a half, then after a twenty-minute break went straight into a three-hour rehearsal in the theatre. On Sunday morning they would perform a concert, in the afternoon and evening they would have staging rehearsals, on Monday they would perform the weekly popular music concert, and then the cycle would repeat. Most rehearsals had only a nominal warm-up (if any) and no warm-down at all. Due to the
huge quantity of repertoire the choir was performing, Joshua did not have time to practise
technical exercises at all. The opportunities he carved-out to practise individually were
geared towards learning/correcting notes or rhythms.

During his preparatory and university voice training, Joshua had not received any
information about the anatomy and physiology of the voice. He did not know how to
identify warning signs of vocal dysfunction. There had not been any courses specifically
directed towards this kind of information, and the sheer quantity of repertoire and vocal
exercises to be prepared for juries meant that there had been no space for
pedagogical/health information to be included in his lessons. After the first two weeks of
working with this professional choir, Joshua started to experience some vocal fatigue. At
the end of rehearsals his voice felt tired, tense, and a little bit sore/achy. This was not
overly worrying to him, but after three or four months, the fatigue started to linger
overnight. At times he felt the need to tell the director that he would be marking\textsuperscript{481} in
rehearsal because his voice was tired. This small amount of extra vocal rest was helpful,
but not helpful enough. Joshua was still attending rehearsal so was becoming physically
tired, and he had not been trained in the technique of marking, so it was not as restful for
his voice as he had hoped. As time went on, the days on which he needed to mark became
more common, but because other long-time members of the choir were also speaking to
the conductor about fatigue, Joshua thought that what he was experiencing was normal.
However, at the end of a year of working with this choir, he knew that his voice was not
functioning properly.

When his year-long choral season came to an end, Joshua left the choir with a vision of
taking care of himself and pursuing further training. Though he thought about it, he did
not start working with a teacher or consult a medical professional. He was not sure what
he needed or who to choose with his voice in that state, so he just worked on his own. He
sang far less, resting his voice to recover from the rigours of the previous year, and when

\textsuperscript{481} In singing, “marking” is defined as singing in a less demanding/fatiguing way – possibly more
quietly and in less extreme tessitura/range. This marks out the pitch and timing of one’s line to allow
colleagues to rehearse their parts successfully.
he started practising again, he did not put any pressure on himself to learn new repertoire. In a short time, Joshua’s voice started feeling much better. Craving additional knowledge, he applied to and was accepted into a master’s degree at an overseas university. He went into a flurry of preparation: applying for his visa, completing all the required paperwork, finding the money, and looking for a place to live in a foreign country.

In the midst of these stressful preparations, Joshua found a competition taking place in August in a country which was a logical stopping place along his route to his new university. Shortly after sending in his recordings, he was excited to receive word that he had been accepted as a competitor! However, this opportunity added more complexity and pressure to the already difficult process of moving and beginning graduate studies. Joshua’s travel plans became more complicated and more expensive at a time when he could not afford to absorb the additional cost. When Joshua made his entrance onto the stage and performed at the competition, his voice did not feel right. His mother, hearing him from the audience, told him later that he had not sounded like himself. Though Joshua tried to reassure himself that he had not competed in a long time and had just been nervous, he knew even then that what had happened went beyond nerves. He now thinks that it was an early manifestation of something going wrong with his voice: a build-up of tension and an imbalance in his technique.

Since the competition was only a stopping point on his way to begin his master’s degree, Joshua tried to put that experience out of his mind and focus on what was more important. When he began his voice lessons at his new university, immediately in his first or second lesson, Joshua’s new teacher pinpointed what he now considers to be the key to his technical issues. He told Joshua: “You are aiming correctly – for open, flexible, and resonant singing – but you are using the wrong tools. You are trying to achieve it with muscular power.” The main goal of their lessons together was reducing excess tension: finding a way to sing that was more relaxed. Joshua’s teacher also encouraged him to take part in regular Alexander Technique workshops which were being offered at the school. Together, Joshua’s lessons and these workshops began giving him a greater awareness of his body and instrument. He felt happy with the process he was going through, and little by little felt he was changing how he sang.
While his studies were beginning to yield results, in both his academic and his personal life Joshua was feeling overwhelmed. Though the knowledge he was gaining from his studies was what he had been hoping for, all the requirements added up to create a heavy load of stress. He was experiencing some culture shock, living in a foreign country. His relationship with his partner was deteriorating due to its long-distance nature, and because of how busy he was with the demands of his program. He was also worried about money. Because his savings would only cover two terms of expenses, he was depending on finding work, but that was difficult in a foreign country and with his complex school schedule. Though Joshua found a job singing in a church choir, other work was not as easily forthcoming. He also felt lonely, having left his family and community behind. Joshua decided that he would go home for a couple weeks over Christmas break, but then realized that such a long time away would require him to miss important paid singing gigs with his choir. His travel home was further complicated by holiday flight prices. Ultimately, he only managed a six-day trip home. After the long-haul flight, he rushed around for the whole break, making appearances with all the key friends and family members, and then took another long-haul flight back. His break had done nothing to reduce his stress and anxiety. Instead, it had only served to increase it, as it had been so rushed and expensive.

When school began again for the second semester of his degree, in addition to Joshua’s other school responsibilities, he was singing a small role in the winter opera production. The role was tiny – it included only a few lines in one scene at the very end of the opera – so he did not anticipate a large rehearsal time commitment. However, only a brief time into the rehearsal period, he was told that he would now be required to also sing as a chorus member, as some singers dropped out of the chorus. Joshua did not like this new obligation being imposed on him. He was extremely busy already with school and trying to work to deal with his financial situation. His girlfriend had moved to be with him, but after living apart and struggling with long-distance, they were having difficulty adjusting to living together again. However, Joshua’s people-pleasing personality took over, and he did not make any complaint about the last-minute changes to his opera class duties.
Everything came to a breaking point for Joshua when during dress-rehearsals for the opera and while preparing his first of two required master’s recitals, he came down with a virus. He was dehydrated, congested, coughing, tired, stressed, and his voice was not functioning well. Though he felt that his training had been improving his voice technique, nothing had yet been consolidated or become reflexive; he had so recently begun these new studies and had previously worked for eight years with his only other voice teacher. In spite of all of this, Joshua sang his role and the chorus parts in the dress rehearsals and shows. Three days later, in his voice lesson his voice would not function at all. To sing above middle C required Joshua to push so hard he described it as practically screaming at triple forte over a Mahler orchestra. Below C3 or D3, he could not make any sound at all, and when he tried, it felt and sounded like choking. He could sing less than an octave with anything like a normal singing technique, and he knew that he was using extra effort on those notes as well. His teacher commended him for being honourable and respecting his commitment to the opera class, but advised him that he should have valued his own well-being higher than those responsibilities. Rather than having him try to sing through such dysfunction, his teacher sent him home to rest for a couple weeks before they would attempt to resume lessons again. He reassured Joshua that he should not worry, and they would defer his recital if necessary.

Joshua tried to rest, but he had other concerns besides school. His only income was from his church choir job, and he could not afford to have no income at all. Therefore, he rested from practising but continued to attend choir rehearsals and performances. After two weeks away from lessons his voice had improved, but it was still in very poor condition. His teacher instructed him to see an ENT to check his vocal folds for damage. The scope revealed healthy vocal folds with no damage of any kind, so his teacher instructed him to rest for two more weeks. Joshua continued to delay practising and lessons, but still felt that it was monetarily necessary for him to perform his choral singing duties. He confesses that the partial recovery had given him a bit more confidence, and he rested less. After two more weeks, Joshua’s voice had made more progress towards recovery, but he was not completely well. His teacher made the decision to defer his recital to the fall, telling him to forget about it and not worry. Joshua’s teacher also gave him a second piece of advice that he now feels is key to his
vocal health: “You seem to be really stressed. Please go out and have some fun.”

Suddenly Joshua realized that in the six months since he had begun graduate school he could not remember going for a single walk. He had been eating poorly and running between work, school, and rehearsal. He had been stressed in his home life, stressed at school, and stressed about money. Joshua started to try to take care of himself again, not just as a singer, but as a person.

Joshua took a few lessons that spring, just to check how his voice was recovering, and things were improving. He applied and was accepted as assistant conductor at his school’s spring opera study program, and shortly before it began he was asked if he could also sing in a couple scenes. When he did so, he was happy with how his voice sounded and felt. Joshua also had the chance to have a few lessons with a different teacher during the program. Confused about the reasons behind the traumatic vocal experience he had been though in the past year, and wary of staying with the same teacher as long as he had with his previous teacher, Joshua decided to request to move into this new teacher’s studio starting in the fall term. He had liked his first master’s level voice teacher but was looking for answers and wanted to try something different.

When Joshua began studying with his new teacher in September, things felt like they were going well. However, he was worried about having another episode of vocal dysfunction. Joshua asked for his professor’s opinion about whether he should audition for the opera. In his undergraduate lessons, if there had been any question that he was not ready for something, his teacher had vetoed it in an authoritarian old-school way. But the culture in the country where Joshua was pursuing graduate studies was more flexible and students were given greater independence to make their own decisions. His professor gave him the go-ahead to audition, assuring Joshua that he would advise the audition panel to avoid assigning Joshua anything too demanding. Looking back, Joshua wishes that his teacher had forbidden him to audition. For a second time, he was given a small role, but was then coerced to also sing in the chorus and attend far more rehearsals than the role required.
During this tremendous number of opera rehearsals, Joshua’s voice started to feel awkward. It was cracking in places where it previously had not. He was losing notes from his low range and having to push hard to sing in his higher range. His speaking voice began to be affected, coming out as a low, forced, and compressed-sounding vocal fry. When he tried to participate in class, or even just have a conversation with a friend or colleague, sometimes his voice would crack or would not respond at all. Joshua felt isolated because of these difficulties communicating. He could see that people were worried about him, which made him self-conscious and added to his tension. Joshua’s lessons had become frustrating because nothing that his teacher tried seemed to help. Finally, Joshua told his teacher: “I think this is more, way, way more than just a technical thing. I think this is beyond us. I need to see someone.”

When Joshua confided his vocal concerns, his teacher recommended a speech therapist who specialized in treating singers. Because Joshua had undergone a laryngoscopic examination when he had an even worse case of the same types of symptoms the previous year, he did not undergo a medical examination again. Instead, he made an appointment with the speech therapist as early as he could. In their first appointment, she did some of the usual things; she palpated his neck and asking him about his symptoms, diagnosing him with PMTD. What was different from his experience the previous spring, and what Joshua found crucial, was that she asked him about his life and how he was feeling. She commented on the stress and tension levels that he was exhibiting in their meeting, and that he was holding his breath. The very first therapeutic prescription he received was to become more aware of his breathing, the stress he was experiencing in his life, and the tension he was holding in his body.

Other elements of Joshua’s treatment included stretches meant to relieve overall physical tension and promote better posture, breath management exercises, and articulator exercises for the tongue and jaw. They made the discovery that his jaw was moving unnaturally, and he began to also see a registered massage therapist who specialized in treating the jaw. Joshua’s teacher suggested reducing the frequency of their lessons and letting go of repertoire and recital preparation goals so that he could concentrate on his treatment and recovery. Once he began treatment, the improvement in Joshua’s voice was
immediate and proceeded quickly. Suddenly, he saw connections between many of his experiences, almost as if his life had come into focus. Joshua remembered everything that had happened in his year singing in the professional choir. He remembered the comment from his first teacher in graduate school about singing with too much muscular power. He remembered all the things that he had felt were never addressed in his lessons in his undergraduate degree. It was like a light bulb had turned on: the problem had always been excess tension!

Over the course of about three months, Joshua recovered enough to finally be able to perform his deferred recital from the previous year. About a month and a half later, he performed his second master’s recital, fulfilling the requirements to graduate. Shortly after, Joshua again filled some roles in scenes at the school’s spring opera study program, and before long he felt confident enough to audition for a local indie opera company. However, it is only now, about a year and a half after beginning treatment, that Joshua feels he is almost fully recovered. As he has been recuperating and singing, sometimes he has felt tension creeping back and returned to having vocal symptoms in his singing voice (losing range, vocal fatigue). But his experience has made him more able to identify these moments and he can recover from them more quickly. Joshua estimates that disordered singing now occurs for him only about five percent of the time.

As a result of the anatomical/physiological and pedagogical knowledge Joshua gained from his lessons, Alexander technique, masterclasses, the vocal pedagogy course in his master’s degree, and his own personal experience with vocal dysfunction, Joshua now feels like a completely new singer. He says that this experience forced him to start from scratch and retrain – not that everything he was doing before was wrong, but that now everything is structured, understood, and embodied. Now, before he sings Joshua engages in fifteen to twenty minutes of stretching, massage, relaxation and awareness. When he listens to recordings from his past, he can hear the tension in his singing. However, he cannot remember how he used to sing, because at that time he did not understand what he was doing the way he does now. Joshua now feels that it takes no effort to fill a room with his voice, and that he has new stamina. He realizes that in the past, swallowing was an effortful action, and now he feels that it happens with an incredible amount of ease.
Joshua believes that his experience recovering and retraining from PMTD has taught him about more than just singing. He admits that used to suppress his emotions, valuing the desires of others above his own needs. He has gained an awareness of the necessity of taking care of himself both physically and emotionally, and highly values balance. He used to be an extremely driven perfectionist. Now, though he still aims for excellence, he values the joy of the process over product. Joshua is excited to continue learning, as he looks into his future as a singer with optimism.

4.1.6 Lynn’s Story

Lynn is a professional opera singer and voice pedagogue in her fifties. She has had a distinguished career as a mezzo-soprano, playing leading roles in A-list opera houses around the world. She is an extravert, and a self-confessed “big-talker.” Lynn also describes herself as an over-worker and over-achiever. She suffered a serious family trauma in her early teens and knows that as a result she functions as a survivor. Her current voice teacher has said to her, “If I’m ever in a life boat, I want you to be in that life boat. But singing is not about being in a life boat, and so you need to stop fighting.”

Lynn always sang, from a very early age. She loved musical theatre, and one of her most formative experiences was seeing Mary Poppins as a young child. She totally fell in love with Julie Andrews and her voice; there was just something about her as a person that seemed so magical and full of joy when she sang. Lynn felt that there was a beautiful sweetness to Julie Andrews’ sound, and it was the first sound that she ever thought about imitating. That love of singing mixed with love of Julie Andrews continued throughout her childhood. At about eight years old during a visit from her aunt, Lynn forced her to come down to the basement and sit through Lynn’s solo performance of the entire score of The Sound of Music. There were also a number of pop singers that Lynn admired and emulated as a child. These included Petula Clark and Lulu – female crooners who had a beautiful legato aesthetic and smooth vocal delivery. Lynn’s favourite games as a child were school (where she was the teacher) and dress-up, and one of her favourite alter-egos to dress up as was a glittery 60s-era pop singer.
In middle school Lynn had her first formal experiences with singing. Her school was blessed with a wonderful choral director who papered her classroom with posters of Mozart, Brahms, Bach, Beethoven, and Handel. She taught Lynn and the other students four-part singing in solfege, started building their sight-reading skills, and introduced them to a lot of “serious” music. Lynn remembers that one of their first ever sight-reading exercises was an excerpt from Beethoven’s Eroica symphony. This choir director was incredibly inspiring, and Lynn recalls doing a lot of performing in her choir.

Lynn also had her first introduction to theatrical singing in middle school. The drama teacher at her school had been in the chorus at Stratford Festival, and was a huge Gilbert and Sullivan fan. He led the school in mounting a performance of HMS Pinafore when Lynn was in grade seven – quite an extraordinary undertaking for a middle school. Lynn desperately wanted to be Buttercup and had practised and practised but was also terrified of her first-ever audition. At the audition, when she opened mouth to sing, her whole throat seized up, and no sound came out. However, Lynn quickly got over that embarrassment, and ended up loving the experience of singing in the chorus.

After Lynn’s wonderful introduction to formal singing contexts in middle school, she went on to attend a high school that also had an excellent choral program, developed and led by a dynamic choral director. During her time there, the choirs performed Mozart Requiem, Dvorak Stabat Mater, many excerpts from Handel Messiah, big Haydn choral works, Britten’s Rejoice in the Lamb and parts of his Ceremony of Carols, as well as some more in-vogue things like excerpts from Jesus Christ Superstar. For one of her many years of choral singing Lynn sang alto, but for all the rest of the time she sang soprano. These various choral experiences cultivated Lynn’s love of singing and also began developing her voice. When she was in grade eleven, her school choir director told her, “I think you really have a voice!” suggesting that she take lessons, and offering her a choral scholar position in his church choir. Lynn found all of this fun, and a bit funny! She had never even known that you could take voice lessons, but the idea appealed to her, so she decided to try it out.
When Lynn was in grade twelve she began taking voice lessons from a well-respected teacher at a local conservatory. At that time, voice science had not developed to the place where it is now, and Lynn thinks that many current pedagogues would find the style of her early voice lessons somewhat amusing, but she believes that much of the technique was sound. However, looking back she realizes that her first teacher came from a very top-down school of teaching. There was no real exploration of chest connection in these lessons. Preference was given to a heady sound, with almost an aversion to any kind of chest quality. Lynn describes developing a voice that was “disconnected to the point of being disembodied.” Because of her naturally sweet, youthful and girlish vocal tone, with easy coloratura and little difficulty with high notes, Lynn’s first teacher trained her as a soprano.

When it was time for Lynn to begin university, she initially started in a general arts program with the intention of preparing for law school. That first year of university, she continued taking voice lessons and singing at her choral scholar position. However, part way through the year she realized that she did not have enough time for singing, and that she was really missing it. She had a meeting with her voice teacher, explaining this, and decided to prepare to audition to transfer into a music degree the following year. She auditioned successfully and began studying voice at the university level. Her first voice teacher also taught at the music faculty at the local university, so Lynn continued studying with her, blissfully unaware of the level of difficulty of much of the music she was singing, and entirely oblivious of the fact that she was singing in the wrong range. But during that year, people around the university began asking her if she was a mezzo. Her teacher dismissed the idea, insisting that Lynn might well be a coloratura soprano, while also continuing to have her sing full lyric soprano operatic literature.

Since Lynn was training as a lyric coloratura, she was singing in a high tessitura, and began experiencing a lot of vocal fatigue. After her lessons her voice was tired and the muscles in her throat ached. Lynn tried a couple times to discuss this with her teacher, but each time her concerns were brushed off with the comment: “You just need to practise more to develop it, and this will go away with time.” In addition to the vocal fatigue and discomfort, Lynn felt that her technical progress had come to a standstill. She was
increasingly frustrated by her voice teacher’s refusal to address her concerns and all the comments questioning her Fach, so she decided to take matters into her own hands. There was a new voice teacher, a mezzo, who had recently begun teaching at the university and her students seemed to be making tremendous progress. Lynn decided to have a consultation with her over the summer.

At Lynn’s consultation lesson with this new teacher, the very first question the teacher asked her was, “Why are you singing everything in the soprano key?” She told Lynn that, “Under no circumstances,” was she a soprano. Lynn is not sure what this teacher heard that made her so certain that Lynn was singing the wrong Fach – maybe the colour of her voice, or maybe some of the strain that was evident in the repertoire – but when Lynn left her first teacher to study as a mezzo with this new teacher, her voice felt so much more comfortable, and her vocal development was immediate and dramatic.

Lynn’s new teacher was quite a technical teacher. They worked together on exercises and vocalises, and spent a lot of time on breath. This teacher had a few anatomical misconceptions, and also abhorred “too strong a chest sound à la Marilyn Horne”, which she called “chesting.” Her pedagogy was very focused on bringing the warm, sweet quality of head voice down into the middle, and Lynn thinks this resulted in her continuing to have a somewhat unanchored sound. However, overall, Lynn believes she was singing quite well at that time. She and her teacher were the same voice type, so she gained a great deal from her teacher’s unparalleled knowledge of their shared repertoire. Her sound developed through instinctual imitation and gaining awareness of the sensations associated with producing these sounds, as well as a much firmer understanding of the sensations of more full-bodied breaths. Lynn stayed with this teacher throughout her whole undergraduate degree, opera diploma, throughout the years she spent at an opera internship program and into her early years as an active professional.

Though Lynn continued to study with her long-time university professor while participating in this opera internship, she also began receiving other feedback on her voice. The vocal consultant at the program had a fantastic ear, a real knowledge of
voices, and at that time was teaching some of the greatest singers in the world. However, she also never talked about the bottom of the voice with Lynn. The first time that Lynn remembers someone suggesting she sing with more chest quality, it was a colleague at her opera internship. When Lynn performed “Parto, parto,” in a masterclass with an internationally acclaimed singer as clinician, one of her colleagues asked if she should be singing with more chest voice in the final section of the aria. Lynn does not remember what the clinician’s response was, but she does remember thinking, “First of all, we don’t do that because it’s bad and dangerous, and secondly, I can’t do that. I don’t know how.” She had never developed any access to her chest voice. In the repertoire she was singing – Cherubino, Dorabella, etc. – she had been able to get away with this because they are quite high tessitura and somewhat zwischenfach roles. There had continued to be a dialogue around her voice: was she a soprano or a mezzo? But she had never been able to sustain the tessitura of soprano repertoire, and with an overabundance of sopranos around her, Lynn had finally realized: why be a soprano if you can choose to be a mezzo?

After finishing her internship, Lynn worked freelance and performed in some highly regarded competitions, raising her profile. She was encouraged to go work in Europe, and so she did. This was the first point in her singing career that she did not have a consistent teacher (although she consulted occasionally with her long-time voice teacher when their schedules permitted), and now thinks that this is when the first signs of missing pieces in her technique began to emerge. At the time she always blamed any issues she was having on singing repertoire in contrasting ranges in too quick succession, or not having had a lesson in a while, etc. When she would return to Canada for a visit, she would have a lesson, and things seemed to sort themselves out. However, when she became pregnant and had her children via caesarean section, she did not know how to rebuild the musculature and train her singing voice for that challenge. She sang a familiar role far too soon after major abdominal surgery, and for a while singing was rough.

A few years later, in her mid-thirties, Lynn was realizing that she needed to see a teacher more regularly than just when she was home for a visit. She consulted with a Canadian colleague who was also working and studying in Europe, and began taking lessons with a European teacher. This woman was the first teacher to ever ask Lynn: “Why don’t you
access the lower part of your voice?” Over the course of a few years she helped Lynn begin to become a little bit friendlier with her chest voice, but eventually Lynn felt that things were no longer clicking with this teacher. Instead, she began working with a vocal coach who was teaching very high-level mezzos such as Anne Sophie von Otter. He had made quite a study of vocal physiology and was the first teacher to discuss technique with Lynn in scientific terms. Lynn studied with him for a few years, having continued success as a performer, before a real crisis occurred.

When Lynn had been singing professionally for about fifteen years, she began to notice that her voice was not functioning optimally. She confesses that it is hard to say whether deficiencies in her technique were a primary causal factor or if other things were. Around that time, she hit perimenopause, and had a string of chronic sinus infections and bronchitis. She had to sing to pay the bills, so she would take steroids and go through with her performances. Finally, she had an illness that she just did not seem able to recover from. She went to see an ENT who, from her history and scope, diagnosed her with PMTD (though he called it hyperfunctional dysphonia). She had nothing physically/organically wrong with her folds, but there was bowing present; the folds were not meeting in the middle, and in addition to the muscle imbalances causing that, Lynn was using further tension try to overcome the bowing.

The ENT prescribed Lynn speech therapy, because he was also concerned about her speaking voice. She began to work with an excellent European speech pathologist who talked with her about laryngeal position, resonance, and efficiency of articulation. Some of the exercises that they did together included lip trills, tongue trills, and nasal continuants – especially [ng]. They worked on jaw release, tongue and palate independence, feeling depth of resonance, and palate activation. She worked on breath function, having Lynn read text musically, and with awareness of taking more time for breaths. Additionally, she drew Lynn’s awareness to the natural resonance of a room – was it friendly to a voice, or not? In speech, she required Lynn to make her consonants lighter and “airier” rather than pressing into and being aggressive with them. To Lynn’s great relief, with this treatment she began regaining function and really feeling a difference in her singing.
Though her treatment was yielding positive results, Lynn was experiencing a lot of pressure and fear because she had several high-profile engagements approaching. She had a performance coming up at a major house in Canada only three months after her diagnosis, and a couple months after that she was making her debut at one of the most famous opera houses in Europe singing a familiar role. Her performance in Canada went well. Then, as she was preparing to sing this major European debut, that same opera company called her and asked her to sing the role she had just sung in Canada, filling in for one of the most famous mezzos in the world. Lynn was thrilled, and of course accepted the opportunity, but this added still more pressure into her life.

Shortly before her performance filling in for this big-name mezzo, Lynn had a terrible allergy attack which may have caused a setback to the progress she had been achieving through treatment. Though the performance ended up going well, there were worrying signs in her voice. In her middle range, there was almost a hesitation before she would begin to sing, like a brief dysphonic moment. This same area felt unstable, and she had to use chest voice more and more often to negotiate the lower passaggio. There even started to be a gap or hole in her voice where she felt that she could not get full resonance and had to work much harder than usual. After this cover performance, Lynn went almost straight into her official debut at the same major European opera house, with colleagues whose names matched the name of the company in level of fame. Though the role she was singing was a familiar one, she experienced a lot of fear, and found the rehearsal process absolutely brutal. She continued experiencing the same kinds of vocal symptoms, and the first performance did not go well. Though things improved over the course of the run, the experience compounded the negative emotions that Lynn was already experiencing, and the emotional fallout lasted years.

Receiving the diagnosis of PMTD had felt like a devastating blow to Lynn. She had never heard of it before, did not know of any colleagues or friends who had ever experienced it, and when she tried to do research into it, there was very little literature available. Though her teacher at that time had talked with her about vocal function more than any previous teacher, she did not work with him on this issue, or even tell him about it. She felt too ashamed. After her experience singing in the months after her diagnosis, she became
terrified to sing. She felt like every time she opened her mouth to sing, she was not sure what would come out. She had phases and roles during which she felt like she could sing quite well, but these occurred back to back with roles that would go terribly, and in which she felt like she had a completely different voice. At times she almost felt that her voice was her enemy.

In the midst of this, a year or two after her diagnosis, Lynn was hired to teach voice at the university level. Though she had never had trouble in her speaking voice before, when she started teaching, she also began to experience some symptoms in her speech. She became fatigued and hoarse at times, and then also developed tension in her articulators and neck muscles. She went to a highly regarded local master teacher to see if he could help her. His pedagogy was again quite top-down in terms of registration, and though she learned a lot from his lessons, her voice never became consistent. She kept feeling like there was a piece missing in her technique.

After about twelve years of living with and singing through this inconsistency in her voice, Lynn hit another crisis. She was singing a leading role at a major North American opera house, and during the rehearsal period she was discovering that this was one of the times that she had no idea what kind of voice would come out when she opened her mouth. She had been through this before, and she knew that as an artist and a professional, she could do it. She could put herself through the torture and uncertainty and sing the role, but it was at such a psychological cost. Suddenly, she thought, “I’m too old. I’m too old to do this. I can’t put myself through this anymore.” And sitting there in rehearsal, she broke down. She had tears streaming down her face, and she thought, “Oh my God. I’m having a public nervous breakdown.” When the break came, she ran to the bathroom, trying to pull herself back together. But she was not alone. Two very kind colleagues had followed her. After years of keeping her struggles to herself, Lynn blurted it all out, and to her relief, they were incredibly supportive.

One of Lynn’s colleagues recommended a teacher who had a reputation of tremendous success with rehabilitating voices and working with older women in and after menopause. Lynn was so emotionally exhausted that she was a hair’s breadth away from
quitting entirely, but she mustered up the energy to call him and book a lesson. She told him, “Don’t bullshit me. I can take it. There can’t be anything worse that you’re going to tell me than what I’m already saying to myself. If you say to me that I’ve damaged my voice and it would be better if I didn’t sing publicly anymore, I’ll be able to make my peace with that. I just want to know the truth.” When she sang for him, she felt sure he was going to tell her, “You’re done. I’m sorry.” But what he said was, “There is nothing wrong with your voice. But you haven’t been using it correctly. There’s no integration of your chest voice. You have virtually no mix. You’re using way too chest dominant a sound in your middle register, and in the lower register it is way too head dominant. You can fix this, but it’s going to take time because you’re a professional, and you have a lot of habits and will be holding very tightly to them.” When they began rebuilding her voice together, Lynn finally felt like she had found the piece that had been missing from her technique for so many years.

At the time of the interview, it had been five years that Lynn had been working with this teacher. She now feels like she knows what integrated registration feels like, and how to do it. She feels like even when her voice is not technically ideal, it is far more honest and direct than it ever was before, and she feels happy about that. Though she thinks that unhealthy tension is still sometimes present in her sound, especially when she is anxious, it no longer gets to the point of causing physical pain. She has undergone several laryngoscopic examinations, and though sometimes extrinsic tension is still found in her tests, she no longer has bowed vocal folds. The learning she has done with this teacher has also had a huge influence on Lynn’s teaching. Integrating the voice so that there is chest connection throughout is now a central tenet of her pedagogy.

Her teacher was right that it would be a struggle to let go of old habits – crutches that had gotten Lynn through so many hard times. It required tremendous vulnerability to use new technique, throwing caution to the wind about what kind of sound would come out, when for years she had lived in survival mode, making the best sound she could using whatever mode was necessary. Because Lynn had a long-standing reputation and many years of successful international performing behind her, it was hard to become a student and publicly show weakness singing in masterclasses. However, that process also was
incredibly freeing. At times Lynn let go of caring what the audience thought, what her colleagues thought, and even what her teacher thought of her singing, and was able to almost defiantly sing with new technique, come what may.

Lynn is happy that she is moving towards better vocal health, but at times is sad that she was not taught to sing this way when she was in her twenties and thirties when her voice was in full bloom. She feels like she lost a wonderful chance during the many years she suffered from PMTD. She also felt truly alone and bereft for many years. Her husband knew what she was experiencing, and could feel her anguish, but Lynn believes that only someone who sings for a living can really understand how difficult it is to experience chronic vocal dysfunction. Because of the secrecy associated with vocal health issues in the opera world, Lynn did not have any singer colleagues or friends with whom she could share her struggles. Speech language pathologists have told her that there are other professional singers out there who have had the same disorder, but due to privacy issues, she does not know who they are or how to get in touch with them. Both while she was in the throes of the worst of her vocal uncertainty, and while she was finally retraining, she was afraid to tell both her colleagues and students. She believes that culturally, vulnerability and illness are equated with weakness, and weakness is seen as the opposite of mastery, which is the font of all virtue. Having technical issues was a dirty secret that had to be kept private, but as an international opera singer, her vocal dysfunction happened on the world’s stages. She was continually at risk of being unmasked. Sometimes she wished there was something physically wrong with her, like reflux, because that would have been less shameful.

Lynn had one final thought at the end of her interview. She hopes that sharing her story can help even one person avoid suffering for as long as she did.

4.1.7 Madame Chiaroscuro’s Story

Madame Chiaroscuro is a professional opera singer and voice pedagogue in her fifties. She has had a distinguished career as a soprano, playing leading roles in A-list opera houses around the world. She describes herself as a high achiever, immediate clearer of inbox, immediate answerer of emails, and always early. She identifies as a “doer,” an A-
type personality, and an over-achiever. However, she also believes that she has a
humbleness or modesty about her (and this was born out in her demeanor in her
interview). No matter how successful she has become, she is always happy to accept help
and have her areas of weakness improved. Madame C would not say that she has an
anxiety disorder, but she knows that as a person she is wound tightly. She also describes
herself as an emotional and expressive person. She feels things deeply: when she is happy
she is very happy, and when she is sad she is very sad. She is the type of person who cries
a lot and enjoys that.

Madame Chiaroscuro loved to sing from a young age. As a child she remembers having a
vocal quality that would project easily. She did not grow up in a classical or opera-loving
family, so her childhood musical idols were musical theatre people. She loved the Carol
Burnett show and wanted to be Julie Andrews. From early on, Madame C acted in local
and school musical theatre productions, and was a ham right from the start, often playing
funny secondary roles like Bumble the Beedle in Oliver Twist, and the maid in My Fair
Lady. Sometimes she totally upstaged the lead characters with her acting. She also
participated in musical activities at summer camp where she played guitar and sang folk
music.

Madame Chiaroscuro started taking voice lessons at the local conservatory when she was
fourteen years old. She studied with her first teacher for just one year, finding her mean
and forceful. The only technique she remembers that teacher passing on to her was the
suggestion that support or engagement was like bearing down as if defecating. Madame C
did not care for her personally, or as a singing teacher, so the following year she switched
to a different teacher who was a sweet and supportive minister’s wife. She was a much
better fit for Madame C, and so, over the years they worked together on RCM exams up
to grade 10, and many Kiwanis Festival competitions. In her final year of lessons prior to
university, Madame C switched to a third voice teacher who was something of a grand
dame of voice teaching in the area. Though Madame C knows that she studied scales and
vocalises with these voice teachers of her youth, she does not now remember much of
what they did together, or any technical goals. She also does not remember learning much
(if anything) about vocal health in her early voice training. What she does remember is
that her third voice teacher had a maxim that she liked to repeat: “Sing on the interest and not the capital.” This was good advice, and young Madame C tried to follow it, but in retrospect, she is not sure that a soundbite like that was the clearest way to explain a concept to a teenaged singer.

In terms of repertoire, in these high school voice lessons Madame C worked exclusively on classical repertoire. She remembers singing music by Handel, Purcell, Britten, and possibly some soubrette Mozart arias. She also stuck to competing in the classical categories in her local Kiwanis Festival. She had a sizable voice from the start, and did not have a dance background, so her early enjoyment of musical theatre quickly gave way to the pursuit of a classical or operatic vocal path. In high school Madame Chiaroscuro also began singing in formal choral contexts. She sometimes sang first soprano, but preferred second soprano from the start. Her voice did not enjoy sitting in the very high tessitura of soprano one, and it felt tension-inducing for her to sing in the very quiet and white/vibrato-free sound so often requested of the first sopranos.

Madame Chiaroscuro went on to study voice at the university level, and remembers enjoying it very much. She performed not only her own recitals, but paid concert/oratorio gigs around the city. At school she was handpicked to sing second soprano in a prestigious chamber choir run by a “genius of a choral conductor.” Madame C loved the small ensemble singing in that choir and found it incredibly artistically rewarding. Unlike many undergraduate students, Madame C was never very worried about deciding on Fach. She and her teachers always felt she was a soprano, and it was clear that she was not a super-light or super-high soprano, but they also did not feel driven to push towards a dramatic or spinto voice categorization.

The first university level voice teacher that Madame Chiaroscuro studied with was a lovely, sympathetic man. He taught in what she describes as a Detmold school of voice pedagogy that she remembers being strangely forceful or heavy. Each lesson began with about fifteen to twenty minutes of technical exercises, but she does not recall these having a clear goal or purpose. The rest of each lesson was devoted to repertoire, and again, she does not remember any link being made between the technique and repertoire.
of the day, nor did she receive much technical feedback on her repertoire. What Madame C does remember is that for the entire length of her undergrad she was always somewhat nervous about the state of her voice. She tended to become sick a lot, and illnesses seemed to hit her hard. Convinced that keeping a moist environment would be beneficial for her vocal health, she kept a humidifier running almost all the time in her residence room, to the point where it was like a monsoon. (Thankfully, she had a very sweet and understanding roommate.) Considering the level of concern that Madame C had about her voice at that early time, she thinks that she may have already been experiencing some issues of tension and unpredictability in her vocal function.

After the end of her third year, Madame Chiaroscuro was diagnosed with the beginning of vocal fold nodules. She attributes this to the forceful technique that she had been learning, but thinks that there were probably other factors as well. She had been using her voice a lot, experiencing vocal fatigue while music directing a camp, singing through illness, etc. The frequency and severity of her illnesses had already led to her having her tonsils removed that same year. She was prescribed vocal rest, and all summer she was terrified to even speak. She moped around the house in tears, even more worried about her voice than she had been previously. With rest the pre-nodules resolved, and she was never prescribed any kind of voice treatment/rehab or told to modify how she was singing.

When she returned to school in the fall for the final year of her undergraduate degree, Madame C’s teacher was away on sabbatical. She was so relieved. She had been afraid to tell him what had happened, because she did not want to hurt him, and did not want him to think it was his fault. Looking back, she now sometimes wonders if she had a duty to tell him, but she never did. However, Madame C did tell her new teacher about her experience with pre-nodules. She does not remember the technique they worked on in any detail, but she does credit him with singing her back to vocal health so that she could execute a successful fourth-year recital and audition for and be accepted into an opera program for the following year.
In the first year of her opera program Madame Chiaroscuro studied with a teacher who was a mezzo and had a preference for teaching mezzos and baritones. She did not feel that she made much progress in that year. However, in her second and third year, she had the wonderful opportunity to study with a teacher who has now gained the reputation of a master teacher. That teacher was more pedagogical and addressed tongue and jaw tension with Madame C. At that time, her upper range began to grow and become more stable. In her undergrad, Madame Chiaroscuro’s high range was capped at A6, or B-flat 6 which she could touch, but maybe not sustain. But in the second year of her opera program, she found her voice opening up in terms of her soprano range. Soon she was able to sustain a C6.

During the first part of her opera program, Madame Chiaroscuro continued to become ill a lot, and she began to see a pattern. It seemed that her illnesses were often correlated with anxiety, including pre-performance anxiety. However, later in the program, after some study with her second teacher, Madame C began to feel happier, healthier and less worried about the consistency of her voice, resulting in less pre-performance anxiety. Her voice opened up to the point where she had a consistent high C#. She began to win prestigious competitions and be hired to sing chorus and small roles at important opera companies.

Eventually, Madame Chiaroscuro moved to Europe and continued building a successful singing career. To an outside observer, things seemed to be going perfectly, but privately she experienced some vocal health issues again in her early and mid-thirties. She was twice diagnosed with and underwent successful surgery for vocal fold nodules. Looking back, she finds it hard to say how she developed those lesions. She had never heard of Muscle Tension Dysphonia at that time, but it is possible that she was experiencing tension issues in her singing. What she is able to link to her vocal health issues of those times is her mental health. She was living on her own in Europe and went through bad break-ups of her romantic relationships. She suffered, and that suffering would go into her voice.
Madame Chiaroscuro had never heard any terminology like, “Muscle Tension Dysphonia,” until around 2009-2010. At that time, she was about to sing a leading role at one of the most famous opera houses in Europe and had just come from singing one of the heaviest and highest roles in her repertoire. She had begun to experience issues in her singing and knew her voice was compromised. Madame C felt like she had a thick ring of tension in her throat near the hyoid bone and tongue root. She had begun to experience delayed or dysphonic onsets, and her voice felt laboured rather than spinning easily the way it usually did. She felt that her tone quality was a bit duller and did not bloom the way it should – it was lacking overtones.

Knowing that she was in trouble vocally, Madame Chiaroscuro called an incredible local ENT who was part of a “dynasty” of voice doctors. (His father had treated some of the most famous names in opera.) He reassured her that she could get through the role, and she did, pulling out every trick she could, though most of them (lozenges, etc.) probably had nothing but a placebo effect. Though she was able to get through that performance, it was not pleasant to sing that way. She felt that singing when her voice was in this condition was one of the worst things she had ever experienced. It caused a lot of mental/emotional suffering, including a lot of anxiety, which probably contributed to developing further tension.

At Madame Chiaroscuro’s appointment with the ENT, he performed laryngeal stroboscopy on her, and they could both see that though her vocal folds were not damaged, they were not meeting, or not meeting in an ideal fashion. The ENT explained that this was due to tension in extrinsic muscles, diagnosing her with PMTD (though he called it by a slightly different name, perhaps due to the language of the country where she was living at the time). Thankfully, he had a plan and the ability to help Madame C. He used a machine to deliver electrical impulses to various voice muscles to help stimulate them and release tension. He also assigned her a period of rest, and a gradual process of re-introducing singing, during which she sang for approximately ten minutes at a time – working on onsets, sighs, and semi-occluded vocal tract exercises in a comfortable range – and then rested her voice for an hour or two before singing again. She also saw a speech therapist who was recommended by her ENT during this time.
After a period of retraining, she was able to return to singing at just as high a level as before her diagnosis.

However, that was not the last time she would be diagnosed with PMTD. Madame Chiaroscuro would go on to have a bout of PMTD about every two years from 2009/2010 to the present. In each case, the lead up to diagnosis was similar. She might feel some warning signs and ignore them, pushing through and compounding the tension. Then, one morning she would wake up, and without even phonating she would know that her voice was compromised. The main sensation was always the ring of tension in her throat above her larynx – at about the level of the hyoid bone or the base of the tongue root. It was so uncomfortable that she felt like constantly palpating it and performing self-massage. Sometimes she used a heating pad or hot water bottle on her throat, as it felt achy with tension.

During these periods of vocal dysfunction, Madame Chiaroscuro suffered mentally and emotionally. She was depressed and almost obsessively preoccupied with how her voice was functioning. She felt ashamed, as if she had caused her own precipitation into disordered singing. At times she feared she would have to stop singing and began to consider how that would impact her family’s financial situation. The idea of quitting singing was horrible as she felt like it would be a huge loss of identity, but singing while her voice was in a disordered state was torture. There was also an incredible loneliness in the experience. Madame C told her close family and her agent what was happening, but she did not feel comfortable telling colleagues or opera houses that she was experiencing vocal dysfunction. When she had to cancel engagements, her agent would tell the opera houses, “She has a slipped disk,” or “She has an injured knee.” He would never suggest that she had a vocal health issue. When she confided in her voice teachers that she had been diagnosed with Muscle Tension Dysphonia, they responded, “But I’ve never heard of this!” This response led Madame C to feel that if some of the greatest voice pedagogues she had ever known did not know about MTD, she must be quite alone in her experience of it.
Usually, Madame C has been able to draw connections between these bouts of PMTD and singing her heaviest and most dramatic repertoire. These roles were also often her highest (going up to C# and D rather than capping at B-flat). Because of this Madame Chiaroscuro has now stopped performing a selection of the heaviest and most dramatic roles that she has sung. She wonders if for a time she may have been singing one Fach too heavy. It was wonderful, and she does not regret it, but it did cost her something. She also feels that at her age and time of life that these roles lead to a repetitive stress type of disorder. Therefore, she has pared down to a more comfortable repertoire.

Every time that Madame Chiaroscuro had a bout with PMTD she had to spend a period of time to rehabilitate and retrain. This often involved canceling some upcoming engagements, as the process usually took a month to six weeks, but in one case she remembers managing to do the majority of the rehabilitation work in just ten days, after which she was well enough to enter the rehearsal period of a show. But as she began rehearsal, she was terrified of the things that could go wrong, and continued to privately do rehabilitative work with someone through to the end of the run of that show. The ideal situation was to be able to take six weeks off and be very deliberate in retraining, because she has found that there is really no quick-fix to this disorder.

Madame C has seen many voice professionals over the years when recovering from bouts of PMTD, including an SLP whose method mostly involves laryngeal massage/manipulation. She found his method harsh, and though it offered temporary relief, it did not treat the reasons why the tension developed in the first place, so it was not an effective stand-alone treatment. She believes that his method contains scientifically sound elements: warming up by getting the blood flowing in chest voice (with the folds being short and fat) tongue trills, stretching and massaging the neck muscles. However, these things do not fully solve the problem, just as going for a back massage does not treat the reasons why one developed back pain. One must go to physio/rehab for that, and it is hard work. It is a longer, gentler, day-to-day process. Madame C believes that PMTD is the same, saying that one must do the work from a pedagogical point of view, develop an awareness of how one develops and holds tension, and then train to rebalance – do onset exercises.
In Madame Chiaroscuro’s case, she felt that in order to rehabilitate herself she had to rebalance her voice by working in the opposite registration that she used in most of her singing. She was using a lot of thick-fold mass and carrying it up high in her range. Therefore, she had to work in light registration and make friends with what she called her “falsetto” or head voice. She had to learn how to support effectively while using the thin edges of her vocal folds. She also had to reflect on and make decisions about Fach, and now believes that it is something that should be continuously revisited throughout the career. As the voice changes, one must decide again and again what is possible in order to “not be singing on the capital” to avoid causing work-related repetitive stress injuries.

Observing other singers at a similar level of expertise, Madame Chiaroscuro believes that sometimes too light a registration has also ultimately caused vocal problems. Multiple times she has heard a singer with a very light, almost white vocal colour, completely lacking in core, and thought that it sounded like that singer was controlling the sound at the level of the throat. She wondered if that vocal production was sustainable, lacking depth and body, and then observed these voices deteriorating with time. She does not know if Muscle Tension Dysphonia was the cause of vocal dysfunction for these voices, but she theorizes that their lightness was complicit in career-ending vocal dysfunction.

An area where Madame Chiaroscuro feels her technique was weak for many years, contributing to her recurrent PMTD, was breathing. None of her excellent voice teachers touched on breath support, fueling the sound with breath, or having a steady stream of air. Madame C now feels that this is one of the keys to avoiding controlling the sound from the throat, an issue that she has always had. Many of her teachers told her to, “Support, dear!” but she feels nobody really taught her how or explained the physiology. She prefers the term “resist collapse” and the idea of staying in an inhalatory posture. These concepts seem to really help Madame C. However, this is still relatively new in her concept of singing. She has been making discoveries about how to more effectively use her breath in the last couple years. Sometimes she wonders how she sang professionally for more than thirty years while not knowing this.
Working towards good mental health has also helped Madame Chiaroscuro in her struggles with PMTD. She has undergone years of Jungian therapy, helping her understand herself better and deal with her tendency towards anxiety. She has learned about and engaged in a practise of meditation. One of her favourite concepts in meditation is that of “Beginner’s Mind.” This is the practise of waking up every day and being open to what one will learn, rather than waking up with the idea that one is an expert. She believes that this has allowed her to be less devastated and ashamed when things are not going well with her voice, and has given her the ability to learn from teachers, medical professionals, and colleagues. As she has learned, she has become less anxious. Knowledge is power.

Over the years, Madame Chiaroscuro has been to ENTs all over the world. (She has their numbers on speed-dial!) Beginning when she was very young, for a long time she was insecure about her vocal health. Madame C had the experience of the start of vocal fold nodules while studying at the undergraduate level. She underwent those two nodule removal surgeries fairly early in her career. She used to feel the need to see doctors regularly to just hear them say that her vocal folds were okay, and she knows that in the singing world this type of voice anxiety is not isolated to her. The ENT she saw in 2009 was the personal ENT of another huge name in the opera world, and that singer went to see him prior to every performance. Madame C’s colleague was that nervous and insecure about her vocal health.

Madame Chiaroscuro is in a much better place now. She used to fear that her voice was gone forever when she had a bout of Muscle Tension Dysphonia, but now knows she can recover and will be okay. The knowledge and awareness she has gained have greatly reduced her voice anxiety, so she no longer feels the need to check in with ENTs in the somewhat obsessive way she did before. Madame C now has all kinds of techniques at her fingertips. She has a vibrator which she uses for reducing tension in her neck muscles. She warms down after long practising/rehearsal sessions and performances (though she does not feel she needs this tool as much when she is singing well as when she is already in difficulty). She is also more diligent and careful in her practising that she has ever been before; she regularly uses SOVTE’s such as straw technique. However, this
confidence came at the cost of a great deal of suffering. In her own words, “God knows what keeps me doing it sometimes.” Many might have given up, given what she has faced. But she loves it so much, and that has kept her working at it, and learning.

Madame Chiaroscuro believes that things are beginning to change for the better in the classical singing world. Some singers have teams that they travel with – similar to Olympic and professional athletes – and some singers are actually telling opera houses when they have vocal health issues. Madame C knows a coloratura who recently had a bout of MTD and told the opera house what was happening rather than using a story about a back or knee injury as a smokescreen. The famous French soprano Natalie Dessay not only divulged her vocal difficulties to opera houses but made her surgeries public knowledge. However, Madame C herself is just now beginning to feel comfortable sharing more about her own journey, and she knows many other singers who have suffered in silence, only divulging the smallest pieces of information as their careers came to very public ends. She often thinks that MTD may have played a part in these singers’ vocal dysfunction, but without them choosing to share this information in what is still a very judgmental atmosphere (blaming singers or blaming teachers), we will never know.

4.1.8 Melina’s Story

Melina is a young soprano with an undergraduate degree, artist diploma, and master’s degree in voice, but she is also a visual artist (painter) and an avid pianist. She now believes she is an extravert, but when she was younger she was shy and considered herself an introvert. Melina unashamedly confesses that she is a very emotional person, experiencing both highs and lows in a big way. The kind of student who achieves 90 percent or higher in most subjects, Melina describes herself as having a perfectionistic streak, and a drive to work very hard. She believes that she has always been pretty open to criticism from teachers and coaches, but is her own hardest critic.

Melina sang from a young age, beginning by singing for fun with her family. Her mom had always sung at church, often in harmony with her two sisters (Melina’s aunts), and eventually Melina became involved in this as well. She sang at formal events such as
family weddings and funerals, but Melina and her family also sang together at family Christmas and birthday gatherings. This music usually involved her mother accompanying on guitar, and the styles included hymns and folk songs. Melina’s first formal music education began with piano lessons at the age of six, and she requested voice lessons about two years later, beginning her voice studies at age eight. She also loved other kinds of music. She joined her school choir when she was in kindergarten, singing first soprano right from the start. When she had the opportunity to begin learning other instruments and types of music, she eagerly joined her school bands and vocal jazz ensemble.

In Melina’s childhood voice lessons, she began pursuing the RCM graded exams. Her repertoire was mostly made up of classical pieces from the RCM syllabus, but she also sang some musical theatre pieces, mostly from the “legit” category rather than belting. In terms of technique, Melina feels that she did not receive a lot of training in her early lessons. As a young child, she mostly sang with her natural voice. She does not think that it was an extremely breathy sound, like that of some child-singers, but she remembers that her parents would often tell her to “sing-out,” but she did not know how. From this, she surmises that she did not project exceptionally well as a child. Melina recalls that one of the special features of her voice from a young age was that she was able to sing very high without a lot of effort or tightness.

Around the age of thirteen, shortly before Melina began high school, her small-town voice teacher told her that to continue to progress towards serious singing goals, Melina needed to move to a more highly qualified teacher. She recommended that Melina start taking lessons from a teacher in a nearby larger city. So, Melina invested in her training, traveling to another city for her lessons. Around that time, Melina made the decision to pursue serious training and a career as an opera singer. Melina found her second voice teacher much more technical that her first. She showed Melina pictures of vocal anatomy as part of her explanations of the goals of various technical exercises. With this voice teacher, Melina remembers having some technical epiphanies. She gained new awareness of her soft palate from exercises involving the consonant [ŋ]. Melina’s vocal diction also benefited from this teacher’s attention, becoming more forward, and reducing use of the
rhotic/retroflex [r]. She gave Melina her first tastes of foreign language repertoire, introducing her to German and Italian for the first time, and helped her understand metre and other musical notations. That teacher told her that she expected Melina would develop into a coloratura, because of her natural ease with high range singing.

Melina first remembers experiencing vocal dysfunction in her final year of high school. She was spread quite thin with her academic work, school instrumental and vocal ensembles, preparing her grade 10 RCM voice exam, training for university audition recordings, and singing the role of Maria in *The Sound of Music*. The role required her to be able to sing in her chest register, and this was something she had never developed or trained for. While she was singing Maria, Melina lost some notes from her upper range, or at least they lost what she refers to as, “their shine.” She found this quite upsetting. When she confided in her voice teacher, she was advised, “I think we just haven’t focused on the low voice, and you’re doing it a lot right now, and it’s wearing you down. You just need some rest.” And sure enough, when the show ended and Melina got some rest and some sleep, her voice returned to normal.

When Melina went on to university level voice studies, she moved to a school quite far from home. She found it difficult to be away from her family and to manage the many changes involved. Her teacher in first year was quite elderly, and though they initially seemed to work fine together, towards the end of the year Melina began to realize that she had not learned a lot. Much of what she had done that first year felt like review of the work she had done with her voice teacher back home. When she had conversations with her colleagues from other studios comparing technical growth and repertoire learned, she felt like she was not being challenged and was falling behind.

In second-year Melina enrolled in Italian and German as electives, and the only timeslot available for German was during her studio’s masterclass time. In order for her schedule to work, Melina received special permission to participate in the masterclass of a different studio. As Melina worked with her alternate masterclass teacher, the feeling that she was not learning enough in her lessons intensified. As the year continued, her lessons deteriorated further, descending into a pattern of rambling story-telling rather than
singing. Melina was frustrated, and this may have been obvious to her studio teacher, because her lessons took yet another turn for the worse. Instead of being benignly unproductive, they started to be opportunities for her teacher to torture her, forcing her to sing in awkward positions for unreasonable lengths of time, calling her weak, and bringing her to tears.

At wit’s end, Melina went to talk to the professor who was voice program coordinator at her university. After checking her story for accuracy, he removed her from the abusive situation she was in and found space for her in his own studio. Melina was so relieved, but felt like she had not only learned no new technique in her first year and half of university, she had been set back to a worse state than before she had arrived. Her difficult studio experience also made her feel alone and apart from her peers, as most of them seemed very happy to be working with their respective teachers.

In addition to all the trouble that Melina had with her first university voice teacher, she was plagued with health problems through her first and second year of university. She contracted many upper respiratory tract infections (cold viruses), and her doctor theorized that part of the problem was that she was not used to, or allergic to, the atmosphere (weather and pollutant levels) in her new location. At the end of first year university, Melina came down with appendicitis, and because her anatomy was irregular – her appendix was located on the opposite side of her body from most – it ruptured. This may have caused her to have a compromised immune system, because in second year she suffered from laryngitis, bronchitis, whooping cough – it seemed like she caught everything.

Her second university voice teacher, the voice coordinator who stepped in and diplomatically resolved her studio teacher issues, began working with Melina in the midst of all the vocal chaos stemming from her conflict with her first university voice teacher, and the illnesses she experienced in that first year and half. His method was to start at the very basic level (Melina called it “ground zero”) and build her voice from there. He assigned her repertoire from the *24 Italian Songs and Arias* and his mantra was, “Si canta come si parla,” or “We sing as we speak.” However, Melina was having trouble with her
speaking voice, so this was not completely working. Either her voice was very
gravely/low/fry-based, or it was a falsetto sound. She’s not sure now what caused these
speaking voice issues. It could have been a combination of all kinds of things including
shyness, compensating from respiratory illnesses, etc.

Melina’s second university voice teacher worked with her in a very systematic way. He
would explain a concept, covering the physiology and other scientific background, and
then assign exercises applying it. He worked with Melina on resonance using onset
exercises and slides, and gradually built up her technique. He instructed her to quit her
job singing in an Anglican church choir as they were requiring her to sing in straight tone
and attempt to imitate the sound of a twelve-year-old unchanged voice in the English
choral tradition. Also core to his approach was to avoid any discussion of *Fach* until a
later date. He believed that with good technique the voice would emerge as the *Fach* it
was meant to be. Melina told him that she had been told at a young age that she would
develop into a coloratura, but he was skeptical and insisted that they wait on discussing
*Fach* until later in her training.

Because Melina continued to be almost constantly sick throughout her second year, she
regularly spoke and sang through illness. She also continued to struggle with living away
from her family. In spite of the excellent voice teaching she was receiving Melina’s voice
was not functioning well. She was experiencing some discomfort in her throat (which felt
to her like inflammation). Her speaking voice felt strange, almost like it was stuck in a
falsetto quality, but occasionally a very low and gravelly sound would come out. Her
singing did not have the variety of colours that it should have had, and it also did not feel
as free as she remembered it feeling prior to university. She felt like she wanted to release
it but could not. Melina also experienced quite a bit of vocal fatigue that year. What with
singing in school choirs multiple days per week, practising, attending
lessons/coachings/masterclasses, and being social, her vocal load would have been
challenging for even a healthy voice. She also found that trying to balance the technique
involved in singing soprano in choir, with learning and building a classical operatic sound
was a challenge.
At the end of second year, Melina’s voice teacher recommended that she see an ENT over her summer break. His rationale was that it could not hurt to have receive a medical opinion. If there was nothing wrong, Melina could feel confident in that, and spend the rest of the summer resting and recuperating from two difficult years of school. If there was something wrong, it would be better to know, as that knowledge could guide her continued learning process.

When Melina went home for the summer, she followed her teacher’s advice. She made an appointment to see an ENT who was associated with a nearby university. At her appointment, the ENT took a history, executed a physical exam by palpating her throat, and performed a nasoscope on Melina, having her speak and sing. There was nothing organically wrong with her vocal folds, but there was a lot of tension, particularly in her speaking voice. She was diagnosed with PMTD. The ENT explained to her that it looked like she was receiving good training with her voice teacher – her singing looked much healthier than her speech. However, if she continued to speak the way she was, she would develop vocal fold nodules. Her speech was so tense that some of the time her false vocal folds were becoming involved in its production. Her sternocleidomastoid muscles and other muscles around the larynx were tonicized, resulting in a high laryngeal position, and almost no freedom of movement for the larynx.

After her diagnosis, Melina immediately began treatment with a speech therapist in her hometown. Though Melina was a good patient/student and tried to follow the treatment plan laid out by her speech therapist, right from the start she felt that this approach was not working for her. The speech therapist tried to force an abrupt change in Melina’s speaking voice to a much lower pitch. With Melina’s lack of ability to access chest voice, this just did not work. She also gave Melina a long list of things she should and should not do. Melina felt very constrained by this, and felt that some of the rules on the list were quite arbitrary. For instance, the list forbade her from eating peppermints.

When she returned to university in the fall, Melina told her voice professor all about her diagnosis and her first attempt at treatment. He recommended that she begin working with a speech therapist who specialized in treating the singing voice and was local to the
area. This treatment consisted of a variety of physical and vocal exercises. Physical exercises included stretches to open up Melina’s chest and release neck, jaw, and facial muscles. Many of the vocal exercises were geared towards improving her speech preparation, breathing, and support – forming vowels in specific ways, emphasizing strong syllables by lengthening them, being mindful in preparing physically before speaking, and awareness of longer and shorter breaths. Two elements of her speech therapy were somewhat surprising to Melina. Her speech therapist worked with her on accessing chest voice in what she describes as, “a very nasty visceral way,” and she worked with Melina on balancing her onsets by beginning in a gentle vocal fry. She told Melina, “I know people freak out about fry, but you have to actually know how to make contact [with your vocal folds].” This speech therapist also suggested that Melina make some lifestyle changes in order to help maintain the work they did in therapy. Tension inevitably occurs in life. Melina’s speech therapist suggested that activities like yoga and running could be good coping mechanisms for dealing with that tension.

Around the same time, Melina was also recommended to work with a Registered Massage Therapist (RMT) who was a specialist in treating Temporomandibular Joint Disorder (an issue involving excess jaw tension). His work with Melina included intra-oral massage – a very specialized form of massage in which a gloved clinician massages and stretches the muscles inside the patient’s mouth.

All of these treatments made a huge difference in both Melina’s speaking and her singing. She found that it was helpful to do the exercises assigned to her in speech therapy before she sang, as that this made her much more aware of how her voice worked as she practised her singing technique. Melina pursued recovery from PMTD with her speech therapist for a full two years, and with her massage therapist for three years (one additional year after she stopped speech therapy).

Melina’s voice teacher was very supportive of her pursuing this therapy. He would often ask in her lessons how it was going: if she had seen her speech therapist or massage therapist recently. She thinks that he always had her diagnosis in mind as he planned and structured their lessons together, but he was not explicit in how the singing technique
they were studying was related to her therapy. Though Melina was mostly happy with the work she was doing with her new teacher, she initially did not understand the wisdom in not labeling her voice too early. After her childhood ease with high notes and receiving the prediction that her voice would develop as a coloratura, Melina felt a bit disappointed that her teacher did not want to define her Fach and even seemed skeptical that she would become a coloratura. However, after taking his pedagogy course, she understood and appreciated his teaching more.

When Melina finished her undergraduate degree, she felt that she was not ready to audition for master’s programs or professional engagements. She believed that the delays in her technical development caused by her traumatic experience with her first university voice teacher, and by the onset of her voice disorder, had put her a year or two behind her peers. Therefore, she auditioned for, and was accepted into a one-year artist diploma to continue study with the same teacher and at the same university where she received her undergraduate degree. During the summer between completing her undergraduate degree and beginning her artist diploma, Melina participated in a training program in Germany. Her teachers there encouraged her to explore the possibility that she might be a coloratura. When she returned from Germany, she began bringing coloratura arias to her lessons, and after about a month, her teacher agreed to begin training her voice with that Fach in mind.

The additional year of training provided by the artist diploma proved successful. Melina was accepted into a master’s degree program in voice at a highly respected university. Because she was moving to a new city, she ended her treatment program with her massage therapist. However, Melina was still nervous about her vocal function. She confided in her new teacher, telling her the whole story. That teacher finally gave her confidence that she was okay, saying: “I heard you sing, I hear you speak. I think there is lots we can do, lots we must do, but I don’t think you need to keep doing that [treatment]. If there is a problem… we will sort it out. But you are fine.”

At the time of this interview, Melina described her voice as much darker than she ever thought it could be. As she learned to access her chest voice, her sound became less
steely/hard-edged and more rounded. During her master’s degree, her teacher even briefly toyed with the idea that her Fach was actually coloratura mezzo. The biggest change that Melina describes in her voice is that it feels freer, more organic/natural, and more honest. She knows she still has tension at times but has learned to be more comfortable with it, realizing that everyone has technical imperfections and must continually learn.

The experience of developing, being diagnosed with, and recovering/retraining from PMTD was extremely difficult for Melina. When she was diagnosed she felt ashamed, betrayed by her own body, and like she was broken. When she had relocated for university, Melina had felt like the sacrifice of living away from her family was difficult, but that she could endure it for the sake of her development as an artist. Once she felt unable to pursue her art, she felt like she had lost her identity and her value as a person. Her ability to cope with the other challenges in her life began to crumble. Though her parents, voice teacher, coach, and one close friend were aware of her diagnosis, Melina did not feel comfortable sharing her struggles with anyone else. In the highly competitive environment of an undergraduate degree in voice, she was worried that if other professors found out that she had a voice disorder they would not want to cast her in shows or give her performance opportunities. Also afraid of gossip and judgement from her peers, she had no one to confide in, and felt quite alone in the experience. Melina felt that the attitude she had to project was, “Grin and bear it. Everything’s fine… I don’t have a problem.”

Over Christmas break during her third year, Melina was diagnosed with depression and prescribed anti-depressants. That depression came and went, but elements lingered for almost six years. She had developed almost a neurotic attitude toward her vocal health which hung on into her master’s degree. Looking back, Melina feels that she may have continued treatment with her massage therapist for longer than necessary because she felt the need to have someone regularly reassure her that her voice was okay. She had expected recovering from PMTD to be like healing from a bruise, but it ended up requiring her to break down everything she was doing and build something else back up. She felt like she broke into pieces as a voice and as a person, and those pieces could not
be put back together with glue. They had to be melted down and shaped into something new. Nobody seemed to understand that to treat a voice disorder, the patient’s well-being also needed to be addressed.

Melina now feels that the new person she has been sculpted into is both gentler to herself, and more resilient. She considers herself a better singer and musician, and a more well-rounded artist. Part way through her recovery she told herself: “If I feel like I have no value as a human being if I can’t sing… that doesn’t make sense!” When the melted pieces of Melina were stirred up and reshaped, she remembered that she loved to play the piano, and learned that she is also a painter, writer, and stage director. She recently has been dealing with a repetitive stress injury in her elbows, which has caused some issues in her piano playing. This time around, Melina feels able to go through the process of recovery from a disorder without it having such a negative effect on her mental health. She trusts that she will get through this challenge. She has found that life as a multidisciplinary artist is good for her mental health, and that the tension-management tools she learned in treatment (yoga and running) are still serving her well. Melina confessed that used to feel like Eeyore meets Piglet: depression meets neurosis. Now she proclaims that she feels like Freddie Mercury: an open, loving, accepting, and free version of herself.

4.1.9 Michael’s Story

Michael is a young baritone nearing the end of his undergraduate degree in voice in a primarily musical theatre program, where he studies both musical theatre and classical singing technique and repertoire. He describes himself as very goal-oriented and extremely hard-working. When he loves the goal he is pursuing, he knows he can become quite single-minded in its pursuit. He is passionate about his art, and experiences emotions strongly, but he studies in a way that is scholarly; he enjoys exploring logistics and theory. He likes to understand the why and how of things, not just physically do them. He is gregarious (in his own words, “loud and outspoken,” when excited), but considers himself an introvert. He likes to work towards his goals independently and likes to be alone.
Michael grew up in a musical family but did not start pursuing singing until he was in his teens. His mother is a classical pianist, so he started his musical training by studying piano. He was intensely committed to that training for many years. However, when Michael was fifteen years old, one of his friends had the opportunity to sing on a television program. That sparked Michael’s interest in singing, and he began taking singing lessons and exploring musical theatre repertoire.

The first voice teacher with whom Michael worked was more of a coach who worked on repertoire rather than delving into singing technique. However, at that time Michael was also attending a high school with a specialized arts program, so had the opportunity for further voice training there as a vocal major. At his school he met other singers his own age who were serious about pursuing training, and one of them recommended a local teacher who was known for preparing her students for RCM voice exams. Since Michael had grown up working his way through the RCM piano exams and knew how well that curriculum had prepared him as a musician, it appealed to him to pursue voice through the same method. He switched teachers to begin that process, and stayed with his new teacher for the rest of high school, preparing exams and working on musical theatre repertoire for various shows.

Michael’s life was extremely occupied with singing during high school, including voice lessons, RCM exam preparation, two school choirs, a church choir job, and community and school musicals. Though the baritone range was more comfortable for him, he also often sang tenor in choirs, and felt that the teacher at his high school was very determined to develop him as a tenor because she heard a bright quality in his voice. She assigned him repertoire in high keys and worked towards training his voice to be light and high. His private voice teacher worked on a larger variety of technical goals with him. She advised him on how to differentiate between the techniques of singing involved in different styles, regularly spent time on scales aiming to develop his voice into a more agile instrument, and encouraged the development of his middle voice, which he describes as his, “core tessitura voice.” She trained him primarily as a baritone, rather than a tenor. Some repertoire that he sang in high school included: “By the Sea,” by

Since Michael did not start studying voice until he was around fifteen years old, his voice had already gone through its most intense time of change before that. He cites the age of thirteen or fourteen as his voice-change. Prior to his voice changing, Michael confesses that he tried to speak in a lower register, maybe with a somewhat pressed quality, because of the social implications of speaking-voice quality. However, when his voice really started changing, he tried to avoid public voice cracks by speaking higher. He thinks that these vocal manipulations may have caused some issues in the health of his speaking voice. When he began to train his singing voice, he had a lot of trouble accessing “head voice” or “falsetto,” and he wonders if that could have been caused by his attempts to control his speaking voice throughout the voice change process. He thinks he came into singing with already ingrained habits of controlling his voice in a very muscular way.

Looking back, Michael does not remember learning much useful information about vocal health during his early training. The little he remembers being taught about vocal health at his school involved limiting his intake of caffeine and dairy products. Because what he was taught at school felt inadequate, and he was also skeptical of some of it, Michael did some of his own research into vocal health as well. As a result, he chose to limit his diet in a variety of ways, was conscious of how he spoke, and attempted to pursue good vocal technique. However, he never understood important concepts like vocal fatigue, or the links between vocal and physical health, nutrition, and mental health.

When he began taking singing lessons, one of Michael’s biggest personal technical goals was to be able to sing higher. He always wanted to be a tenor because he wanted to sing the amazing lead tenor roles that he saw in musical theatre shows. As a self-confessed “technique geek” he thought that with enough research and effort he should be able to learn how to do this on his own. So, he read books and blog posts/articles, and watched videos, and practised a lot in an attempt to reach this goal. However, he did not tell his voice teacher that he was doing all this extra technical work or ask her opinion of the
exercises and sources he had discovered. He felt subconsciously that she might not approve of what he was doing.

It seems that this combination of a hard-working and eager to learn personality, inappropriate technical goals, and lack of knowledge about vocal health eventually resulted in vocal trouble for Michael. He always found choral singing to be a struggle, and his voice fatigued quickly in that context. He felt he had to sing in such a heady registration that he could hardly be heard. Otherwise, he would have been too loud to blend into the group sound. It has always felt tense – like he was unable to sing in a free way and still mesh with the other voices. He also sang seven days a week, often working on technique for an hour or two in an effort to extend his upper range with very high and demanding exercises. When his voice became fatigued, he thought he just needed to warm-up more, so he compounded the fatigue with more singing.

Michael started having frustrating inconsistencies in his singing voice. Some days his voice felt like it was moving and functioning, but other days he felt like he was not in control of it, like it could not do anything. He started to have to plan carefully when he would sing so that his voice could function when he needed it. For example, he began to lip sync when he was in choir rehearsals so that he could still practise technique the same day. Over the course of about a year and a half, the times when he felt that he could not sing increased in frequency, and he started needing to skip several days of singing in a row to prepare for a performance or lesson. Eventually it was only possible for him to sing once or twice a week. Particularly in his classical repertoire, his voice worked some days, and on other days singing was impossible. On those days Michael’s voice felt like it could not move, or it was a rusty machine that had not been oiled. When he tried to sing low pitches they were breathy and hard to control, and when he sang higher (not even particularly high) it felt like the space he was singing in became smaller and smaller, like he was stuck in a little hole.

Though Michael started to feel worried about his voice, he did not tell anyone what was happening. He actively went out of his way rest before his voice lessons so that his voice would function but may have also been trying hide his vocal dysfunction from his
teacher. He felt guilty, and like he might have caused what was happening, but rationalized that because it was not physically painful, that nothing was wrong. He wondered if he was less talented than other people. His peers practised less than he did, and were not as motivated to improve their singing, but had more stamina and consistency. Finally, Michael was afraid that if people in the music community found out that he was experiencing these difficulties they might be loath the cast him and recommend him for opportunities.

At the end of that school year, Michael completely lost the ability to sing. Every time he tried he felt like he was choking, and no sound would come out. There was no way he could continue to hide what was happening from his teacher. She suggested that he take an extended period of time away from singing – about a month – and revisit what was happening with his voice when he started lessons again. He took a break of about a month and a half from singing, but then participated in a summer musical theatre program. On his first day of singing he sounded fine, but on the second day his voice was already in difficulty again. The director of the program suggested that if he continued to struggle with his solo parts, they could always transpose them down, but he insisted that he would be fine, casually mentioning the hiatus from singing he had just been on. Luckily for him, she was very knowledgeable and a great advocate for vocal health, and she persuaded him to share more information. Upon hearing what had been going on, she recommended that he see an ENT and SLP who specialize in treating singers. She also helped him get through the rest of the program by allowing him a lot of vocal rest and giving him a few exercises to try to release tension, but he felt like he barely managed to get through it.

While the program was still going on, Michael began to set things in motion to medically address his voice issues. Unfortunately, his family doctor was on vacation, so he had to see a substitute or on-call doctor to get a referral to see the ENT and SLP singing-voice specialists who had been recommended to him. By this point even his speaking voice was being affected. It sounded tight, tense, quiet, and somewhat breathy. He also demonstrated to the doctor what would happen when he tried to sing; nothing would come out except a choking, unvoiced sound similar to the grunt that occurs when lifting a
heavy object. However, the doctor refused to give him a referral, stating that from the
description Michael had given of his voice issues there was no significant damage to his
vocal folds. Michael was able to speak, and singing was not essential voice use. He even
guilt Michael, declaring that giving him an ENT referral was a waste of the health care
system’s money and resources. Michael tried to explain how essential singing was to
him, how it was his passion and the career path that he was following, but the doctor
continued to refuse to write a referral for him.

After the musical theatre program finished, frustrated with his experience with the on-
call doctor, and worried about the expense of a scope without government medical
coverage, Michael chose to forgo the ENT visit and scope, instead going straight to the
SLP who had been recommended to him. That SLP took a history from Michael,
performed many diagnostic tests measuring acoustic parameters, and palpated Michael’s
neck and shoulders. Michael remembered the SLP performing extra diagnostic tests after
hearing that Michael’s doctor had refused him a referral and therefore he was unable to
get a scope. These extra tests included an instrument being placed in Michael’s mouth,
but he cannot remember precisely what occurred.

From the information gathered in the history and these diagnostic tests, the SLP
diagnosed Michael with PMTD. He was very reassuring, explaining that there was no
damage to Michael’s vocal folds and laying out a plan for his treatment and recovery. He
assigned Michael singing exercises including ascending lip trills in a heavy/full chest,
explaining that because of Michael’s desire to be a tenor, he had been singing in a way
that was too light/too heady, and that he needed more chest voice in the mix in order to
have the correct positioning of and balance between his muscles. Since Michael’s vocal
dysfunction had progressed into his speaking voice, the SLP assigned him some speech
exercises as well. These involved humming and other semi-occluded vocal sounds.
Finally, the SLP also performed laryngeal massage/manipulation on Michael in weekly
appointments for four weeks. Michael found that, just as the SLP had predicted, he made
rapid progress towards recovery from the acute symptoms he had been experiencing.
After those four weeks, the SLP gave him the go-ahead to begin singing again. At that
point, because this specialist was far too expensive for Michael to see on a regular basis, Michael stopped seeing him and tried to continue the process on his own.

When Michael tried singing again, it caused a tickling pain low in his throat at the level of the larynx. This scared him, and he was afraid that the muscle tension dysphonia would come back, so he chose to take a full month of self-imposed nearly complete vocal rest. He did not sing at all, and hardly spoke. His only significant voice use was continuing with the exercises that the SLP had assigned to him. When he felt brave enough to try singing again, he had a couple lessons with the musical theatre program director who had originally recommended he seek medical treatment. She helped him get to the point where he could sing without pain again. This involved a combination of semi-occluded work and lots of singing with his full voice (rather than holding back). Right from his first SLP appointment Michael had found all the heavy/chest-dominant singing a surprising treatment for tension and vocal fatigue. It seemed backwards, like it should cause tension, not release it. But it seemed to work.

About four months after his final SLP appointment, Michael returned to voice lessons with his former teacher. He had opened-up to her, explaining everything that happened during his treatment as it was going on, so when they began working together again, the goal she suggested was to retrain his voice in a very foundational way. This was a good next step, but he continued to struggle both vocally and emotionally throughout the year. Though his own voice teacher, the musical theatre program director, and his teachers at school had been very understanding and supportive through his treatment and recovery process, some members of the local music community threw doubt on it. Two voice teachers from the local university music faculty even suggested that he did not really have a voice disorder, just a technique issue which could easily be fixed if he just had a better teacher. They attempted to recruit him to study with them rather than continue to recover in the ways recommended by his SLP and his other teachers. These comments made him feel uncomfortable and guilty, like these teachers were blaming him for his disordered singing.
Singing was Michael’s whole life, but for a time he was completely unable to do so, and even when he returned to singing, he had to limit the time he spent on it. He could not sing for pleasure, both because he felt that all his singing had to be limited to training, and because he had developed an emotional distance from singing that had not existed before. It was his final year of high school, so he needed to prepare to audition for university programs and he was afraid he would not succeed at this goal. Michael had to decline many performance opportunities because he was not yet capable of executing what was required for them. This was both sad because of the missed opportunities, and stressful because it drew public attention to his struggles. He felt isolated and left out of many things his peers were doing, and also felt jealous of their vocal ease.

Michael became hyper-critical of small things going wrong in his singing and felt helpless to fix them. He had lost the sense of adventure and the confidence to train his own voice that he had previously had. Michael had always been proud of his hard work in pursuit of technical goals, but now felt that all of that work had been worse than pointless – it had dug him into a hole. Two huge parts of his identity were threatened: his identity as a singer, and his identity as a self-motivated and independent student. Finally, he had become almost obsessively aware of his voice, always afraid that something was about to go wrong with his vocal health.

Despite his fears and vocal issues, Michael was accepted into a wonderful undergraduate program, but his somewhat neurotic relationship with his voice continued until he was mid-way through the third year of his degree. Throughout his first year he was so cautious of becoming vocally fatigued that he planned his schedule so that he would not have to sing on Wednesdays, Saturdays, and Mondays. On days when he thought his voice would already be fatigued, he held back rather than singing in a way that was open and free. His worry became a self-fulfilling prophecy, as this type of singing (cautious, quiet, and held back) actually caused fatigue and fed his fear.

In the first two years of the program Michael studied Golden Age and Contemporary musical theatre, Operetta, arias, vocalise and technique work, and completed his RCM Grade 10 Voice exam. His teacher for those two years worked on agility and resonance –
attempting to get the voice into “the mask.” Part way through his third-year Michael began working with a new teacher. Her initial technical focus was the concept of mix voice/registration and resonance, and once that concept began to settle, she added belting and commercial sounds into their goals. She preferred to think of laryngeal position as flexible, and her philosophy around Fach was to train the voice while observing how it progresses rather than labelling it too early in the process.

When he began working with this teacher, both Michael’s singing and his relationship with singing turned a corner. Under her tutelage, he has begun to feel that he has a strong foundation and can sing consistently throughout whole songs, rather than having many small problem areas. His voice feels much more balanced and freer, and no longer feels the need for manipulation in order to conceal technical weaknesses throughout songs, or to transition between ranges. He believes he has gained a more physical/tactile sense of how his voice works, rather than only having a theoretical knowledge of it. Now Michael finds his voice brighter, fuller without requiring a lot of effort to create that fullness, more buoyant, and it feels like it is authentically his own voice, no matter what style he is singing in. In addition to all of this technical skill, his third-year teacher has taught Michael that he is allowed to experience fatigue and tension during the learning process; it is not a reason to panic. He can make mistakes and learn from them. The metaphor she used for this was: “A figure skater has to fall on their face so many times before they actually get the trick.” This has been mentally and emotionally freeing for Michael. He has learned to really enjoy singing again, rather than always feeling afraid that he will develop Muscle Tension Dysphonia again.

Through this process of recovery and retraining, Michael has also become aware that he has an anxiety disorder, and his very intellectual process to learning can be a cause of physical tension for him. His anxiety seems to sometimes stem from over-thinking while in the process of searching for understanding of concepts. When he is in this process, he finds that tension causes everything in his body to rise. Dancing, other physical exercise, and spending time in nature seem to help ground him and assist him in dealing with his natural anxiety.
At the end of his interview, Michael had two final thoughts to share about his experiences. His first thought was about another factor influencing his vocal fatigue experiences. He comes from a cross-cultural background and describes one side of his family as coming from a very loud culture. He thinks that this may have been a factor in his development of Muscle Tension Dysphonia. His base volume was set louder than that of most people which may have been one cause of vocal fatigue.

His second thought was regarding knowledge and attitudes in the voice community as a factor in his MTD experience. While there was a lot of information available about organic vocal damage (nodes or polyps) and the associated symptoms, Michael found that much less information was available about chronic voice disorders like Muscle Tension Dysphonia. Most of his teachers and mentors knew very little about the disorder. The symptoms of MTD were apparent early-on in Michael’s experiences, and if he or his teachers had been more knowledgeable regarding the development and presentation of chronic voice disorders, his might not have become so severe or lasted so long. His experience was that the communal attitude towards maintaining vocal health was, “if it hurts, don’t do it, but otherwise, you’re fine.” This attitude manifests in the community with teachers pushing their students to sing through experiences of illness and fatigue – because in the industry there is no chance to take a break – but there is not a lot of guidance on how to do this healthily. Though there were other warning signs in Michael’s experience with voice disorder, there was no acute pain involved, so he pushed through until he was in crisis. He believes that better knowledge of chronic voice disorders and an attitude shift in the voice community are required, or many singers will continue to have experiences like his.

4.1.10 PJ’s Story

PJ is a young soprano with an undergraduate degree in performance. Though her first degree was in classical voice, she now sings in a wide variety of styles and has completed a master’s degree in music technology. She describes herself a highly academic person with a natural perfectionistic bent. For her, the force to pursue her goals has always been internal. PJ’s parents were not hard on her and did not push her; she pushed herself. However, she does feel that a trait she inherited from her father is that of never
complaining – just powering through issues on her own. As a result, she can be quite private and self-contained. She feels that she is generally introverted but can appear to be very extroverted if she is in the right kind of social situation. PJ considers herself highly emotional and can move very suddenly between positive and negative emotions. She even thinks she may have tendencies similar to bi-polar disorder, though she has never been diagnosed. She considers herself highly emotional, and quite creative, but also has a need for rational/logical understanding, and thus, craves factual/scientific explanations in her learning.

As a young child, PJ already loved singing. She sang in her elementary school choirs and participated in musical theatre summer camps. She remembers that very early on she discovered her head voice, and she thought it was such a pretty way of singing that she would approach family members and show them how she could produce this pretty voice. She was always placed in the soprano section in choirs, because she had already found a heady tone-quality, whereas many of her peers could still only sing in their speaking registers. After choir concerts, her family members would tell PJ that they could hear her over the other children who were singing, and she felt proud that she could sing loudly. One of her peers who took voice lessons commented that PJ had a very nice voice. That made PJ happy, and awoke a desire to take voice lessons herself. Her family was not exceptionally musical, but one of her grandmothers loved singing and had sung in a church choir for many years. PJ briefly shared her love of singing with her, but unfortunately, that grandmother passed away when PJ was about ten years old.

PJ’s first foray into voice training occurred when she was in grade nine. Her father had noticed that she loved singing and playing guitar, so he purchased a block of five half-hour voice lessons for her. In those five lessons, PJ mostly sang jazz. She did not really delve into classical repertoire, even though that teacher was a classically trained contralto. However, what those lessons did provide was her earliest introduction to some technical concepts such as breath management and release, and vowel shapes, and even more importantly, an understanding of how voice lessons worked logistically.
A few times throughout high school PJ brought up the idea of pursuing music as a career, but every time she did, her father dismissed it. So, though PJ continued to be involved in musical activities at her school – performing in coffee houses, singing in choirs, playing the flute – she did not take any more voice lessons, and planned to pursue science at the university level. However, in grade twelve, an instrumental music instructor at her school approached her and told her that she was a natural performer. He said, “I see you on the stage. That’s your personality, so I think that you need to pursue that.” That was the first time that a professional musician had ever given her this kind of affirmation, and it gave her the courage to pursue her voice training more seriously. PJ convinced her parents to let her start taking voice lessons again, but though her mother was very supportive, her father was against music as a career, so would not support her taking lessons more than every other week. When PJ decided she would audition for university voice programs, she took a year off after high school to do so, knowing that her lessons during high school had been too few and infrequent to prepare her.

Throughout her year off PJ studied voice intensively to prepare for university auditions. She had returned to the same teacher with whom she took her original five 30-minute voice lessons, but now began taking six hours of lessons each week – usually three 2-hour long lessons. PJ hardly had time to practise with this amount of time spent in-lesson. Her teacher filled her scores with hand-written notes about what she should be doing or fixing, and PJ would go home and try to memorize these instructions for her next lesson. However, she found that nothing was really stuck. Some of the repertoire that PJ sang during this period included: “Hark the echoing air,” by Purcell, “Show me,” from My Fair Lady, “Batti, batti,” from Don Giovanni, “Les berceaux,” by Fauré, “Dein blaues Auge,” by Brahms, and “Vittoria,” by Carissimi.

Most of the technical exercises that PJ remembers being assigned during her university audition preparation were breathing exercises. These included: a breathing technique that her voice teacher called “cookies-milkshake” (inhale through the nose and then open the mouth at the end); an exercise that involved holding five-pound weights in each hand and then inhaling while expanding the ribs and lifting the weights then exhaling while slowly lowering the weights and maintaining the expanded ribs; an exercise that involved
leaning her stomach against an object against and wall and pulsating her stomach while making “ff ff ff” sounds; and an exercise comprised of lying down and breathing while trying to raise and lower books with her stomach. However, PJ did not really understand the purpose of these exercises at the time. She remembers hearing the word, “release,” over and over, and wanting to ask for clarification.

In spite of the limitations of her year of university audition preparation, PJ was accepted into an excellent bachelor of music program and began studying with a highly regarded voice professor. This professor taught in a mechanistic/technical style, and she progressed rapidly. Within two years her voice completely transformed from being white and vibrato-less to a much fuller and more consistent sound.

At university PJ was required to sing in choir four days a week. These rehearsals typically occurred after she had already had lessons and coachings throughout the day, and often before spending the evening in opera rehearsal or at her church choir job. She had no difficulty with stamina throughout the early parts of the singing day, or with singing through a full recital program, but in choir she felt like she would either have to start pretending to sing halfway through these rehearsals or force her voice through to the end of them. She originally was assigned to the first soprano section, but was eventually moved to second soprano, because no matter how hard she worked to hold back and sing quietly, she could not blend when singing in the high tessitura of the first soprano choral parts. The choral director insisted that she did not want choristers to sing unhealthily or hold back; she wanted them to sing healthily, but with minimal vibrato. However, PJ does not remember ever being instructed how to accomplish that type of sound. As a result, PJ experienced vocal fatigue a minimum of four days a week.

In terms of technical struggles in university, PJ felt that her middle voice was a source of difficulty. She could not accomplish a blended tone in choir. Her upper passaggio was very unpredictable, always feeling like it would crack or expose out of control vibrato unless she “muscled” into it. PJ had to transition into a heavy chest quality before she descended through her lower passaggio. She felt that her voice sat more easily in higher tessitura repertoire and exercises and was very eager to train as a coloratura, but her
teacher was resistant. She felt he was attempting to train her as a mezzo by having her sing repertoire in lower keys and forbidding her to work above G5 until her middle voice was more stable. PJ tried to convince him to allow her to train in a higher tessitura by explaining that she and her first voice teacher had worked above the staff regularly, but he stood firm. Finally, when she was in third year he began doing some flageolet training with her and allowing her to sing higher repertoire.

Between second and third year PJ had the opportunity to work with an elderly master-teacher, and she feels that was the time when she had her best singing technique. This was the first teacher to point out to PJ that space at the front of the mouth did not necessarily result in space at the back. She also helped PJ release pulled-down tension in her upper-lip and feel more lift in her zygomatic arch (cheek bones). This reduced PJ’s tendency towards over-opening her jaw and helped her find more ideal resonance.

Third year was an exciting year for PJ. Her teacher was finally allowing her to explore the Fach where she felt her voice naturally sat. She was cast in the school’s opera production, was preparing her third-year recital, and was even hired to sing a significant role in a professional operetta in a nearby major city. Both PJ’s recital and her professional show were scheduled around the end of winter term, so there was quite a bit of stress involved in all the travel and balancing school and rehearsal schedules. PJ only had about three weeks to learn the role while also working on her recital repertoire, finishing final assignments, and studying for exams.

While the music for the show was not very difficult, in her recital PJ was making her first foray into higher tessitura coloratura repertoire. She practised the cadenzas from this repertoire continually, working into higher and higher ranges. As she did this, PJ began to feel a slight sensation of a lump in her throat when she sang above high C. However, her high notes were also sounding better than they had ever been before, and initially that feeling did not occur in any other range and would dissipate when she was not singing. So, PJ did not feel worried and sang through it for a few days. After that, she began to experience this lump-in-the-throat sensation more consistently throughout her range. But she still sounded fine, and she had felt a lump lower in her throat previously when
suffering from a mild case of reflux. She thought this new lump sensation must just be a variation on that. She was not experiencing any other negative sensations, and no more vocal fatigue than usual, but the lump became progressively worse. One morning PJ woke up and could hardly make even a spoken sound, let alone sing. She could not sustain a tone anywhere in her range and could not speak a full sentence before her voice physically choked-off.

Though she was slated to begin rehearsals for her first professional operetta role in only a few days, PJ tried to stay calm. She decided that she had just overused her voice, and a bit of vocal rest should do the trick. But even with vocal rest, the condition of her voice continued to worsen. Because she was staying in the city where the show was to be rehearsed and performed, PJ was away from her teacher. Her voice was in such crisis that she could not speak on the phone, so she emailed him and then took last-minute transit to consult him in person. He recommended that she see a speech language pathologist (SLP) who specialized in treating the singing voice, and by some miracle managed to book her a same-day appointment. In spite of a series of anxiety-inducing transportation mishaps, PJ managed to make it to that appointment.

At her SLP appointment, PJ was basically unable to speak or sing. Taking a history was difficult, and though the SLP attempted to do acoustic testing by having her sing into a microphone and run her voice through analysis programs, her voice cut out so quickly that it was essentially impossible. As a result, she believes was diagnosed primarily on the results of a scope. Her vocal folds looked perfectly healthy, so she was diagnosed with PMTD. (PJ also felt vindicated in her desire to study coloratura repertoire when the SLP guessed from the length of her folds that her Fach was light lyric). When he began immediately working on releasing the acute tension through laryngeal massage/manipulation, PJ was extremely relieved. When researching her symptoms on the internet she had diagnosed herself with Muscle Tension Dysphonia. She had watched a number of videos suggesting that the only way to achieve any immediate relief was laryngeal massage, and now had miraculously found someone who could perform that exact treatment. It was extremely expensive, and her health insurance did not cover an appreciable amount of the cost, but PJ felt that it was worth it. In addition to the laryngeal
massage, the SLP prescribed her a number of vocal exercises and stretches: tongue trills in chest voice, phonation on inhalation, jaw protruding while looking up to the right and left, and a lot of self-massage of various jaw and neck muscles. These treatments yielded immediate results. After that first visit, PJ was able to speak again, and to some extent also sing.

After beginning treatment, PJ was feeling much more optimistic about rehearsing and performing her first professional role, when an upper respiratory tract viral illness caused a tension relapse and almost complete voice loss in the lead-up to dress rehearsals. With more SLP treatment PJ managed to get into workable (but not optimal) condition for the shows, and she also managed to sing through the opening in spite of a debilitating pain attack related to menstruation and endometriosis. After the run of performances were over, she accepted a last-minute opportunity to sing in a spring opera training program. She also barely endured that experience. With the tension she was experiencing, she was not able sing any of her assigned music as successfully as she wanted to. Towards the end of the program, she could even feel the lump-in-the-throat sensation returning. Looking back, PJ knows she should have declined that offer and focused on rehabilitation, but she had been told so many times that as a young singer she needed to power through adversity, taking all the opportunities that came her way.

This experience with acute PMTD was not only difficult for PJ physically, but also emotionally. She was continually trouble-shooting her voice problems and trying to maintain some level of function, while rehearsing, performing, travelling between cities, writing exams, completing and handing in final essays and other assignments, and hardly sleeping. All the while, she was terrified that she was establishing a poor reputation at her first professional engagement, and this would result in her not being hired again.

After the training program ended, PJ began seeing the SLP regularly for treatments, and throughout the fourth year of her degree she also went regularly to a registered massage therapist (RMT) specializing in treating muscle tension in the neck, jaw, and mouth. She began to build theories regarding the long-term causes of her muscle tension issues including over-darkening her tone quality, overuse of neck and face muscles in
supporting her sound (rather than appropriate athletic use of her abdominal and other breathing musculature in singing). However, PJ felt that her voice teacher was in denial about the existence of these technical issues in her singing and their contribution to her voice disorder. When she tried to talk to him about it, he said, “I never detected any strain in your tone,” or, “You’re using your breath well,” even though she felt that neither of these things were true.

PJ developed an almost neurotic fear of unnecessary muscle tension in her singing. She sang much less, and was very sensitive to the sensation of tension. Rather than ever force a sound out, she would immediately stop at the first hint of tension. Her coach and teacher would often ask why she was stopping, saying that she sounded fine, but she knew it was not fine because she could feel that she was using tension to produce the sound.

After graduating, PJ worked with a teacher at another summer program who pointed out that she was over-darkening her voice, and told her she should return to singing the way she had at the start of third-year (when that teacher had last heard her sing). Following that experience, throughout her post-graduation year PJ worked with another teacher in her hometown. During those lessons she confirmed that PJ was overusing her facial muscles and articulators in her singing. They worked together towards eliminating that unnecessary cause of tension. This was helpful to some extent, but PJ felt that though she managed to release a lot of extra tension that had been present in her singing, she only eliminated negative habits – never built new technique to replace them – and therefore did not develop the physical strength to support her singing appropriately.

PJ now feels that she never discovered a way to fix or manage her classical singing; she has continued to have moments of tension in which she needs to force her voice. She also never regained the stamina she had in her earlier solo classical singing. Instead she now feels fatigued after singing a single aria. During auditions after graduating from her undergrad, PJ would sometimes be singing through her first aria and feel like she was “crapping out;” she could not align her voice, and she could not reset her breath to release.
Sometime that same post-grad year, PJ bought a USB microphone for fun. She started recording herself singing all kinds music as a hobby and ended up loving it. She explored a variety of styles and new timbres and resonances in her voice, connected with an online community, and the hobby began to grow into something much bigger. While engaging in this singing, new colours began to emerge in PJ’s voice. It became brighter, more shimmery, and exhibited more overtones. When she was recording, PJ would often sing almost continuously for upwards of four hours. She would record many takes and would multi-track so that she was singing all the parts in an ensemble piece. Though her voice would fatigue when singing a single opera aria, these recording sessions did not fatigue her voice at all. Bringing some of the qualities of her non-classical singing into her classical singing seemed to help, but eventually PJ essentially stopped singing classically and began pursuing graduate studies in a new direction – music recording and technology.

While PJ’s struggles with vocal health seem very clearly correlated with her choosing to give up performing as a classical singer, she feels that the reasons why she stopped singing classically are more complex. She stopped enjoying participating in live performances, the rigorous rehearsal schedules, and the stress of performing such complex and technically challenging repertoire. She felt that for coloratura repertoire, her voice had to be in exactly the right place, or the notes would just not come out, and she would have to force them out, because the show must go on. When reflecting on her decision to study classical voice, she began to believe that she had never pursued classical singing for the love of it, but because she believed it was the correct or most academic way to pursue a singing career. Experiencing vocal dysfunction forced her to re-evaluate her relationship with classical singing. It was not necessarily the cause of her changing paths, and that change was not entirely negative.

Parallel to PJ’s terrifying experience of PMTD, she also went through a period of the worst mental and physical health of her life. Her endometriosis caused her debilitating pain, but the treatment was actually worse than the disease. When she was prescribed the birth control pill, she developed horrible cystic acne, new body hair, and terrible mood issues. That same year, she became depressed and suffered from panic attacks severe
enough to result in hospital visits. Because all these health issues developed while she was studying at the undergraduate level, PJ feels that the stress of her environment was a significant causal factor. She believes that the highly competitive environment of university voice studies fosters an attitude that young singers must take every opportunity, even if it is almost impossible to fulfill all their responsibilities. She found that the catty or gossipy atmosphere made it difficult to find the supportive community necessary in order to thrive under this kind of stress. When everyone in the community is completely focused on progressing in a singing career, PJ feels that it is difficult for it not to become a part of one’s identity and to consume one’s life. She also believes that her natural inner drive to succeed combined with her aversion to sharing/complaining when in difficulty may have exacerbated the impact of these environmental elements.

Another factor that PJ feels may have influenced her development of PMTD is that she often did not understand what she was trying to accomplish when practising. She feels that many (though not all) voice teachers hold an almost patronizing attitude that students will not understand the reasons behind exercises, and so do not offer explanations. Further, she believes that some teachers do not understand the physiology and acoustics of what they are trying to teach, which renders them incapable of explaining it when students do not understand their go-to methods. This could leave those students vulnerable to developing chronic vocal health issues.

At the end of her interview, PJ had two final thoughts to share about her experiences with PMTD. Her first thought was that it was amazing how quickly the acute symptoms improved with the hands-on treatment of laryngeal massage/manipulation. She could feel the ability to speak, and even sing, returning over the course of the first treatment. In a time when people see medicine as pills and surgeries, she thinks more value needs to be given to hands-on body-work styles of treatment of all kinds of dysfunctions.

Her second thought was that the mind-body connection is much more significant than most of us believe. As PJ developed her new musical career path, she also found a community which supports her, and developed better mechanisms for dealing with stress and criticism. She has regained her mental and physical health. She believes that more
attention to mental health factors could reduce the number of singers who develop chronic muscle tension disorders.

4.1.11 Whitney's Story

Whitney is a mezzo-soprano in her early forties who has mainly made her career out of singing secondary opera roles in major Canadian houses. She knows that she is extremely extroverted; her interview was intensely verbally communicative with a huge dynamic and emotional range to her conversation. She admits that she thrives on organization and routine, by her own admission partially because of personality features, and partly as a reaction to growing up in the chaos created by a mentally ill mother. She proudly states that she has always been self-motivated to strive relentlessly towards better singing and knows that she can at times be defensive when confronted with critique. She feels she experiences emotions intensely, particularly when anything to do with her voice is involved, but is not naturally the type to cry publicly.

Though she is not from a musical family, Whitney has always been a singer. She did not know as a child that some people could naturally sing, and that for some people it did not come so naturally, but she cannot remember a time when she did not sing. She loved being part of her church choir as a young child. At some point in her childhood, she and her mother moved from one part of her hometown to another, and it became impossible for her to get to rehearsal on time. It looked like Whitney was going to be unable to continue singing in the choir, but the church choir director came and picked her from school every week to bring her to rehearsal. This was the first clue to Whitney that her singing ability had value. Shortly after that, she started being chosen to sing solos, and her teachers at school began encouraging her mother to put her into music lessons.

However, Whitney’s mother did not initiate placing her in musical activities. Looking back, Whitney realizes that she did everything herself. Her first voice teacher was an excellent mezzo-soprano who sang regularly at her church and was also a voice teacher. At around age ten Whitney approached her at church, asked for her phone number, and enquired into taking voice lessons from her. She took similar actions to initiate many other singing activities, scheduling auditions for herself with youth theatre companies in
the city, and telling her mother, “We have to go to this place on Saturday.” Her audition for a highly regarded local girls’ choir was the same story. Whitney knew another girl who sang in the choir, so acquired the conductor’s phone number from her peer, and called the conductor asking if she could audition. She scheduled the audition, dragged her mother along to it, and voilà! She had joined another musical activity.

Whitney also sang a lot outside of her organized musical activities. Her mother was a school teacher, so Whitney was a latch-key kid who would return home about an hour and a half before her mother did. When she arrived home from school, Whitney would turn on the radio and sing along with pop songs until her mother got home. Sometimes she had friends over, and they would act as her back-up singers.

From her time as a very young child prior to beginning voice lessons into her early teens Whitney always received compliments on her performing ability. Right from the start people were always telling her mother that she needed to get Whitney on stage, with such a natural flair for performing. The other consistent comment she has always received throughout her singing career, is that she does not sound the way she looks. Whitney is a petite, blond, blue-eyed woman with a rich, warm, mezzo sound. That vocal richness was evident from her early teens onward. She was always placed in the alto section in choirs, and as she trained, nobody ever questioned her voice type. It was always clear that she was a mezzo.

Whitney took lessons with that first voice teacher who she approached at church from about age twelve to age fifteen. At age fifteen she switched to a different teacher (also a mezzo) who was more intense and goal-oriented, but she pursued RCM graded exams with them both. Whitney remembers being a bit frustrated by these lessons at times. Her second teacher seemed quite methodical and scholastic to her, encouraging Whitney to find more accuracy in her foreign language pronunciation and translations, when all Whitney wanted to do was get to the emotional and expressive aspects of singing. Whitney does not remember either of these teachers really teaching her vocal technique. The lessons were more about putting her through the RCM repertoire and other exam requirements. She also does not remember anybody teaching her about vocal health as a
child. The only kinds of vocal health instructions she remembers included: do not scream at the volleyball game the day before your RCM exam, wear a scarf, and drink tea. There was nothing about physiology, or about the connection between emotional and vocal health. Whitney does not remember ever experiencing chronic vocal fatigue as a young singer. As a busy chorister, she thinks she was probably tired at high impact times of year like Christmas, but she was not one of those kids who was sick all the time or lost her voice. In fact, she remembers stepping into many solos for children who were ill or laryngitic.

Because Whitney has a late birthday, her teacher recommended she wait an extra year before auditioning for music school. She waited that year, but already had begun taking university courses, including any music courses that she was allowed to enroll in. Therefore, she was already ahead in some core music subjects when she did audition, which was a bit strange because she never considered herself a naturally academic student. However, she remembers her applied music and performance skills being off the charts and feels that this really gave her the edge she needed.

At the university level, Whitney again studied with a mezzo. This teacher was a wonderful fit for her. Whitney felt like they connected on a personal level and that her teacher could really see and understand her. She knew just how to motivate Whitney: allowing her to learn crazy, too-advanced Bellini arias as long as she would also learn a simpler Mozart aria – for instance, “Voi che sapete” – to perform on her jury. In first year, Whitney discovered that she had a natural ability to sing super-fast coloratura. She describes this as another moment where she discovered her “value.” Her main technical challenge was tuning, and she believes that the issue was not knowing how to support correctly. Her teacher would tell her to support, but did not have any other ways of rephrasing the instruction, and Whitney never felt that she achieved this until after she had already graduated from university.

After graduating from university, Whitney continued to struggle with pitch/tuning issues. She never had any trouble when performing, but for some reason, generally had pitch issues in auditions. She felt that she was over-thinking or was stuck in analysis mode. She
sang with professional choirs, and participated in a highly-regarded opera internship program, performing the lead role in La Cenerentola countless times, all the while struggling with this huge technical gap. Finally, at around age thirty, she began studying with a new teacher who explained “support” to her as dropping the diaphragm and keeping a firm pelvic floor, and letting everything above relax. This explanation pulled together all the disparate pieces of knowledge Whitney had, and in an instant her pitch issues were gone. She began to be hired to sing secondary opera roles at major Canadian houses, and started building a solid and consistent career. As she grew older her voice quality shifted lower and lower. Between age thirty and thirty-two she stopped singing Cenerentola, because her high B was inconsistent, and she was being hired and paid for smaller and lower roles anyway. She enjoyed six to eight years comfortably paying her bills through income from voice teaching, professional choral work, and singing supporting opera roles.

Around age thirty-eight Whitney began to notice at her church choir section lead job that she was backing-off from notes in her middle register and feeling fear when singing in that range. She found this odd, because she has never particularly suffered from performance anxiety. But, assuming that her feeling of insecurity and lack of volume in this range was a vocal issue, she went to her voice teacher for help with it. However, nothing he tried seemed to help. As time went on, this issue worsened to the point where Whitney would actually not be able to phonate on B-flat 5. She would have to lip sync through the range where she could not phonate, and sing the notes she could. She was terrified to tell anyone about what was happening with her voice, but knew she needed to seek medical help, as working with her teacher had not made a difference.

Whitney contacted the office of a highly regarded ENT who specialized in working with opera singers to make an appointment, but the first appointment time available was eight months later. In the meantime, she gradually stopped taking new operatic and professional singing contracts as the condition of her voice worsened and she became less and less satisfied by what she was accomplishing artistically. However, she continued with her church choir position because she needed the income. She mostly kept her vocal troubles to herself, but the day before her first ENT appointment, she and several other
musician girlfriends had dinner together with a very high-profile singer who was in town performing. Part way through dinner Whitney’s friends were gently probing as to what was going on with her, and she opened up to them, sharing that she was having some vocal difficulties, and that she was about to have her first medical appointment looking into it. The high-profile singer immediately responded with: “That’s what happens with young singers singing too big too soon.” She jumped immediately to judgement rather than compassion. This experience made Whitney even more afraid to share her struggles.

When the eight months had passed and Whitney was finally able to see the ENT, the appointment was not a satisfactory experience. She was initially seen by the fellows (doctors still completing their fellowship period) associated with the ENT. They took her history, performed a laryngoscopic examination of her vocal folds, palpated her neck, and did acoustic tests. When all of this was done, the actual ENT came in, took a quick look, diagnosed Whitney, and left again. Whitney felt like she was so fragile and vulnerable, laying bare her heart and soul for diagnosis, and that she was not offered any compassion or care. To quote Whitney: “If you want someone to hold your hand, walk you through the experience, and understand you as a human being, this ENT is not the one to see. She had no empathy.”

However, the ENT did explain that there was nothing organically wrong with Whitney’s vocal folds. What was happening was that the left fold was contracting too much causing the folds not to connect at times. Certain notes did not phonate at all because of it, other ones leading up and out of the dysphonic area were out of tune and had poor tone quality. Whitney was able to bring them into tune with heavy chest voice, effortful singing, and straight tone. This was a case of PMTD. The ENT did not prescribe any exercises or hands-on treatment, or even suggest seeing a speech language pathologist. She suggested surgically inserting gel into the folds and waiting three to four months while the gel dissolves to see if that triggers the folds to return to normal function. They went ahead with the procedure, and Whitney waited. In the meantime, her voice continued to feel unwieldly and inconsistent.
Shortly after Whitney’s first appointment with the ENT, the music for the upcoming season at her church was announced. It included a huge gala concert with orchestra and large solo parts for a baritone, and a low mezzo. It was clear to Whitney that her church choir director had planned the concert with her in mind as the mezzo soloist, and she knew she could no longer hide her vocal troubles from him. After her experience with the judgmental high-profile singer, Whitney was terrified to divulge her current state. However, when she explained that she had been faking her way through a lot of the music for months, instead of being angry, her choir director was incredibly supportive. He not only kept her secret, he kept her on and continued paying her, though she was not performing her duties as section lead and had not been for months. He found the budget to hire an additional alto for the concert, and generally assigned to other singers the music that was traditionally Whitney’s.

This strategy worked well for months, and if other choir members suspected that something was going on, nobody let on. However, disaster struck one Sunday when Whitney arrived at church to find a substitute organist there with whom Whitney had worked in the past. This organist chose to make last-minute changes to the music for the service, which required Whitney to sing a long solo which exposed the most dysfunctional notes in her voice. Whitney did not know what to do. She felt if she refused to sing, it would expose her, so she suffered through performing the solo. Whenever she arrived at a note that she knew would be dysphonic, she sang an alternate note in the chord. She ended up basically rewriting the melody of the entire anthem. It took everything she had to not just burst into tears during the service. After the service she came across all the other soloists in a huddle talking. They stopped and dispersed when they saw her, but none of them asked her if she was okay or what was wrong.

The first gel insert procedure was not effective. The ENT suggested they try the same procedure a second time. Whitney’s voice continued not to function, and she had to go through another three to four month waiting period. The ENT also suggested a CT scan and an MRI to rule out cancer. Finally, they also tried electromyography – putting a needle through the barrier of the larynx into the intrinsic muscles to see if the nerve impulses in the brain are arriving properly and vice versa. None of these tests revealed
any problems. Everything was functioning normally. They tried a third gel insert procedure, all the while Whitney was receiving no other treatment besides attending psychotherapy and a therapist who worked with her on reducing physical tension and regulating breathing in high stress situations (this was primarily through use of a video game). The third gel insert procedure also did not yield any results.

Finally, about two and a half years after Whitney had noticed the first signs of vocal dysfunction, and after a long and fruitless course of treatment, she saw a segment on television about a local speech language pathologist (SLP) who specialized in treating the singing voice. She wasted no time, emailing his office before the segment on TV had even come to an end, and had an appointment set up almost immediately. Her first appointment with him was a complete contrast to her ENT appointments. While he performed a laryngoscope to examine Whitney’s vocal folds, and executed many of the same medical tests, his bedside manner was completely different: warm, funny, empathetic, and present. The ENT and her fellows had only been interested in medical and physical history: asking if there had been any physical accident involving the neck such as a car accident, a fall or anything else that could have thrown off the function of the neck. The SLP asked her to tell a much more comprehensive story, including mental health and significant life events leading up to and around the time when vocal dysfunction emerged.

As Whitney described her situation to the SLP, it came out that though her mother had always been supportive of Whitney’s music, it had been in a codependent manner. She almost took ownership of Whitney’s abilities. Her mother also suffered from depression and was a compulsive spender. Whenever they had run out of money in Whitney’s childhood, she had blamed Whitney for it because of the expense of her music lessons. As a result, Whitney had always been a parental child. She had always been required to take on a large role in managing their lives. Her cute stories about how she had found her own voice teacher and scheduled her own auditions were actually symptoms of a difficult and dysfunctional home life. Leading up to the onset of vocal dysfunction, Whitney both moved her mother into assisted living because she was declining mentally, and chose not to invite her mother to her own wedding. About four months later her mother had a bad
fall and had to live in the hospital for eighteen months while Whitney searched for a nursing home placement for her. During all of this, Whitney’s vocal health was declining, and she was going through the process of waiting for an ENT appointment, and the long and unsuccessful string of treatments.

The SLP suggested that all of these traumatic life events were playing at least a partial causal role in Whitney’s vocal difficulties. He was horrified that the ENT had not been more holistic in her diagnostic and treatment process, and by the amount of time that Whitney’s difficulties had been allowed to drag on. His treatment plan was much more comprehensive. It included laryngeal massage/manipulation, vocal exercises, stretches and self-massage, and coordinating mental health work such as yoga or meditation (in addition to the psychotherapy that she was already doing). Some of the vocal exercises included a “belting” tongue trill exercise and repeated chest-voice onsets including some vocal fry. Self-massage centered around the sternocleidomastoid muscles and collar bone. Whitney found some of the stretches that he assigned helpful, and others counterproductive. The SLP was always open to her having input into her treatment, listening to what she found productive and what was not working.

The SLP treatment yielded immediate results for Whitney. She was able to sing again for the first time in two and a half years, though imperfectly, and the results of each treatment would only last for a few days. Whitney and the SLP experimented for a few months with various vocal exercises and hands-on treatments. Some improved her pitch but destabilized her vibrato. Some improved her vibrato, but her pitch issues remained. In the midst of all of this, Whitney’s mother died, completely stalling her progress.

About one month after her mother’s death, Whitney’s SLP suggested that they try a drastic new procedure – Botox. Grief had made her unable to work on building new vocal technique, so he thought it might be the ideal time to paralyze her vocal folds, removing all tension, and then retrain as the folds regained the ability to move again. Whitney had already been feeling very isolated in this vocal health crisis and undergoing the effects of Botox magnified that. It was difficult for her to go out in public, because she would choke easily because her airway was unprotected, and because her voice was even more
dysfunctional than before while the full effects of the Botox lasted. However, she believes that this very difficult experience was worthwhile. A bit less than a year since the Botox treatment, Whitney felt like things had improved a lot. She was able to sing consistently on certain vowels, though smooth registration shifts continued to be somewhat elusive. At the time of the interview, her SLP still did not approve her singing above a certain range, because he did not want her to be lengthening her vocal folds a lot yet. At that time, when she physically massaged her cricothyroid muscle to release it, she heard more upper partials in her singing and the tuning was more stable. The progress continued to be slow, but she felt that her voice was always moving forward.

A few times shortly before the interview, Whitney thought about finding a voice teacher to help her with the retraining process. She even took a few voice lessons. However, at that time she found that even the most physiologically knowledgeable voice teachers were resistant to working with her while she continued treatment with her SLP. Some seemed skeptical of the treatment she was receiving; some went so far as to say that they thought she did not need to continue treatment, but should just take lessons with a good teacher. After all the trauma she had gone through, and considering that she was finally making progress towards recovery with her treatment, Whitney felt, at that time, that she could not study with a teacher who did not believe in the treatment and who was not willing to stay within the limitations that her SLP had temporarily placed on her singing.

Over the course of her vocal health struggles, Whitney felt that she completely lost her community. Her early experiences of other singers judging and blaming her for her voice dysfunction led her to fear sharing about it, but if she was in social situations with singers, she would inevitably be expected to sing. She felt like she was spending parties hiding in the bathroom avoiding having her secret exposed to a hostile community. The singers who she felt able to open up to, lived with her struggles as long as she did, and over time she felt that many of them tired of functioning as her emotional support.

Whitney had many conversations with herself, wondering why she continued to struggle against what felt like insurmountable odds – a health issue that does not seem to easily respond to treatment, and the mounting medical costs of treatment. Especially during the most difficulty and isolating time – during her Botox treatment, she often wondered: why
not just give up and cease to be a singer? It came down to identity: Whitney felt that she had to continue, because this was who she was. At the time of the interview, Whitney was still struggling, hoping, and being a singer.

Only three months after her interview, Whitney sat in on a friend’s lesson with to see if that friend’s voice teacher might be a good fit for her. That teacher’s voice and technique struck Whitney as remarkable, and she booked a lesson immediately. They began the process of retraining her singing voice, focusing almost exclusively on using air. This process was much simpler than Whitney’s previous training which required muscle holding, positioning, supporting, suspending, lowering, etc. With less complicated use of her articulators and abdominal musculature, and much more airflow, suddenly Whitney had resonance, no tuning issues, and in her own words: “top notes to burn.”

Whitney is now exploring the soprano range, and a part of her wonders if a major factor in her vocal health struggles was singing in the wrong Fach for so many years. Nobody ever questioned her mezzo Fach due to the timbre of her speaking voice. Maybe all of the manipulation required to sing in that range caused tension and obscured her true range. Now, as long as she does not over-manipulate her resonant space, instead singing through the space where she speaks, she feels is able to sing with incredible resonance, and reach notes that she never had before (high C). Interestingly, Whitney’s new teacher also has a lower speaking voice than most sopranos, and therefore trained for many years as a mezzo before switching Fach after beginning to study with a master who was teaching an “old European technique.” Whitney finds this technique remarkably simple, and different than any she has ever encountered in Canada or New York City.

Though her new teacher helped Whitney discover a completely different voice within twenty-minutes of their first lesson together, learning to sing again is proving an incremental process for Whitney. Learning to let go of forty-five years of ingrained singing habits is difficult, but when Whitney’s body releases into her new technique her voice is bigger than it has ever been before. She has committed to this new technique with her characteristic discipline and enthusiasm, replaying her lesson recordings each day to glean every last bit of information from them. As Whitney moves forward into her
future as a singer, she is thrilled to have found this new technique and voice, and her
gratitude and confidence are boundless.
4.2 Findings Section Two: Themes

In order to find commonalities between the experiences of participants, participant interviews were coded. In the analysis process, labels or codes were assigned to recurrent pieces of information. Some of these codes were prefigured, meaning they were recognized in and through the literature review (causal voice technique elements, physical and mental health, etc.). Others were emergent, which were themes only arising from the gathered data. Throughout this process, several themes emerged. One was lack of knowledge on the part of voice teachers, voice students, and in some cases both. This theme included subthemes relating generally to voice technique, vocal health, and vocal repertoire demands, and more specifically to lack of knowledge of PMTD. A second theme was voice technique correlating with dysfunction, including subthemes of pursuit of upper range extension/high Fach, heavy or low Fach, registration, breath management, articulator tension, and technique associated with choral singing. A third theme was physical health including subthemes of diagnosis preceded by respiratory illness, predisposition to respiratory illness or setbacks related to respiratory illness, and hormonal health. A fourth, and very important theme was mental health, which included two subthemes: one minor subtheme – additive mental health elements – and one major subtheme – mental health impact. A final theme was problems with medical treatment, which included subthemes of delayed diagnosis/treatment, medical professionals lacking understanding, expense, and ineffective treatment.

4.2.1 Lack of Knowledge

One theme that emerged repeatedly in these interviews was lack of knowledge on the part of voice teachers, voice students, or both. This theme was apparent from several different angles in participants’ experiences, including technical training, vocal health instruction, repertoire, and a lack of knowledge of PMTD.

4.2.1.1 Lack of Technical Knowledge

Nine of eleven participants made comments revealing that during their early lessons they received very little technical training, the technique they worked on lacked explanation, or they did not perceive any clear goal in their exercises and warm-ups. In many cases,
participants wished to make it clear that it was possible their teachers had attempted to explain technical elements, but that they had either not understood the offered explanations at that time, or there had been none offered. This experience led to participants having a lack of technical knowledge, which in some cases contributed to their development of dysfunctional singing. PJ, after describing breath management exercises involving lifting weights or pulsating her stomach against a wall, stated: “I didn’t grasp the importance of a lot of the exercises. I don’t have a good memory of how she explained the reasoning behind things. Back then, this all seem[ed] very arbitrary.” She also felt that throughout her later voice studies, explanations were missing at times. Her impression was that teachers did not offer explanations because they either believed that she would not understand or felt that she should just trust them as authority figures.

A second participant, Diana, commented that she did not understand or apply correct concepts of warming up or technical training until after experiencing vocal dysfunction. Before her experience with PMTD, she just cycled through exercises that she had learned at various points in her studies without a goal: “I was just doing the kind of warm-ups my teacher was doing for a long time, and then I got to university and I learned some new warm-ups… Now, if I’m warming myself up, I’m doing a lot more sighs and yawns and stuff to get the air moving, and stuff to start to release tension.” She also recounted a story of completely giving-up on practising for one year of university because she did not understand what her voice teacher was trying to accomplish with her. He seemed to only have one way of explaining, and it did not work for her. All she remembers from those lessons is that she was not able to do what he wanted, and she decided that if she was producing the sound incorrectly, she did not want to reinforce that, so she stopped practising. Even at other times when she was working with teachers with whom she was more compatible, Diana felt that a clear idea of long-term technical singing goals was never communicated to her.

A third participant, Madame Chiaroscuro, revealed that, in-hindsight, technique and repertoire had been strangely disconnected from each other in her undergraduate lessons. Her teacher worked on technical exercises with her at the start of each lesson, but when they moved on to the repertoire section of her lessons, there was no connection made
between it and that earlier technical work – in fact, very little mention was made of how her repertoire could be improved from a technical perspective.

Two participants, Anne and Diana, recounted spending time in their early voice lessons learning the technique exercises associated with their annual Royal Conservatory of Music (RCM) voice exams. However, those exercises were not used for the purpose of improving their voice technique. Anne stated: “We did do lots of RCM technique, but it was never based on what sound I was producing, or the tone, or how easy the sound was. It was more like, can you sing these notes?” Diana commented: “Some of the warm-ups were just the exercises from the RCM book. They weren’t done with like, a specific intention in mind. It was pretty arbitrary.” The sparse technical training and lack of explanation or understanding of the goal in exercises and warm-ups led to a lack of technical knowledge that likely contributed to the development of dysfunctional singing in some cases.

4.2.1.2 Lack of Vocal Health Knowledge

Along with this lack of technical knowledge, the theme of lack of knowledge also arose when participants discussed their understanding of vocal health prior to their experiences of vocal dysfunction. For vocal athletes, some of the most important pieces of vocal health knowledge could include: the difference between normal levels and chronic or pathological levels of vocal fatigue, or which vocal symptoms during illness preclude singing and which are safe to sing through. Instead of learning about these things, all eleven participants reported either receiving no instruction on vocal health or only very surface information on the subject. Many commented that their teachers suggested limiting certain foods or beverages (dairy, caffeine, citrus), maintaining good hydration, wearing scarves, and avoiding yelling prior to performances. Others described only receiving vocal health instruction at times when they were experiencing vocal symptoms due to illness. In many cases their teachers told them to “be careful,” with their voices, but did not give specific instruction on how to avoid injury or recover from the symptoms they were already experiencing. Not until after developing significant vocal dysfunction, and beginning treatment, were participants made aware of the importance of warming-down after strenuous vocal effort, releasing tension in the muscles surrounding the vocal
mechanism, when it is safe to sing through illness and when it is not safe, and how more holistic health concepts like nutrition and stress-management relate to vocal health.

Several participants recounted either intuitively learning, or being directly taught, that unless they were experiencing physical pain from singing, they should attend and participate in lessons, rehearsals, and often performances. PJ was offered a last-minute opportunity to sing in a summer program while in the midst of treatment for acute PMTD. During that summer program, in spite of working assertively to release tension, her symptoms began to return or worsen. Reflecting on that experience, she said: “Obviously, looking back I shouldn’t have accepted. But when you’re a young singer, you’re like, I have to take all the opportunities!” She believed that she had been encouraged by the culture of the classical voice community to take every opportunity, in spite of illness, but did not have the knowledge to make that decision safely.

Another participant, Michael, also described himself and his colleagues being required to sing through illness, but not taught how to do it safely: “at school… when some of my friends, they’re recovering from sickness… and there’s a lot of tension there… what’s put forward is you’re gonna have to do it when you’re in the industry, like, you’re not going to be able to take this break… so you need to learn how to sing through it… If it doesn’t hurt, you’re fine.” Michael strongly believed that there was a cultural attitude within the classical singing community encouraging singing through illness, but that the skill of how to make the choice of whether or not to do this, or how to do it safely, was not taught.

Two participants shared stories of experiencing negative impact to their vocal function due to inadequate knowledge of the symptoms of vocal fatigue. In both cases, these participants mistook vocal fatigue symptoms for a need to perform a more thorough warm-up. Spending additional time warming-up exacerbated, rather than ameliorating, their symptoms. Michael, when asked whether he experienced vocal fatigue as a young singer, responded:

Yes. A lot, actually. I was never aware that it was vocal fatigue, but definitely there were days where I was like, ‘What?! Why can’t I do what I can usually?’ But I wasn’t aware that it was vocal fatigue, so my thinking was, ‘Okay, I just
need to warm-up more.’ I would keep working more, with the idea that I just needed to warm-up more, which led to my voice getting more fatigued.’”

Anne told a similar story. Experiencing frequent vocal inconsistency in her undergrad, and already aware that she had a voice disorder, she thought that was why she had to warm-up more than most other singers: “I would never sing publicly until I’d basically tired my voice out. I would sing, like, an hour, hour and a half, two hours. And I knew that wasn’t normal, but I knew that was the only way that I could do it.” For both Michael and Anne, a lack of knowledge of the symptoms of vocal fatigue led to them exacerbating their fatigue through excessive attempts at warming-up.

The theme of lack of knowledge was clearly an important one when considering participants’ understanding of vocal health prior to their experiences of vocal dysfunction. All eleven participants reported either receiving no instruction on vocal health or only very surface information on the subject. In some cases, this led to participants’ making poor choices for their vocal health and resulted in dysfunctional singing.

4.2.1.3 Lack of Knowledge Linked to Repertoire Demands

A third topic in which the theme lack of knowledge came into play was repertoire and its connections to vocal technique and vocal health. Five of eleven participants specifically mentioned experiencing overwhelming repertoire and ensemble singing requirements, or felt that, during their training, repertoire and ensemble requirements were prioritized over the development of solid technical skill. Several participants also commented that between lessons, coachings, school-related choir and opera rehearsals, and extra-curricular singing like church jobs and professional or community shows, they experienced significant vocal fatigue a minimum of four days a week. Because of participants’ lack of knowledge about vocal health, they were not aware that this level of vocal fatigue was unhealthy. Even worse, experience of chronic vocal fatigue was normalized by the fact that these repertoire demands were often requirements of their degree programs or assignments from their voice teachers; to them, a heavy vocal load appeared to be condoned by their teachers and program administrators.
PJ was one participant who described experiencing repertoire demands which reduced her opportunity to practise effectively and normalized intense vocal demands. During the year she was preparing for university auditions she took six hours a week of lessons. In these lessons she sang her repertoire while her teacher wrote copious notes on her scores. As a result of this huge amount of weekly lesson time, she did not have time to practise, so she would instead just try to memorize what was written on her music. She was then tested on her memory of those written comments in her next lesson but would often not remember them. This excessive amount of lesson time clearly did not allow PJ to develop good practising habits or technical skills, and lent validity to overly strenuous vocal demands.

Anne also experienced overwhelming repertoire demands in her early voice training. She described the goals of her childhood voice lessons as performing in (and winning in) the local annual music festival, and completing the requirements for each year’s RCM voice exam. She remembers being encouraged to enroll in, and prepare repertoire for, as many as ten to twelve classes in that music festival, as early as eight years of age. These early experiences both caused her to develop a false idea of how much singing was appropriate or healthy, and neglected to teach her about the necessity of technical training (learning to sing healthily and efficiently). Finally, the initial onset of Anne’s acute PMTD was also linked to unreasonable repertoire demands; it developed during a summer she spent singing a lead role in a show five nights a week for four months – an extreme repertoire/performance demand for a thirteen-year-old.

Just as Diana’s and Anne’s experiences of early technical training were comparably coloured by their surface-learning of RCM technical exercises, their repertoire experiences were also similar. Like Anne, the goal of Diana’s early voice training was preparing the requirements of her annual RCM voice exams. She felt that this product-oriented training trend continued into her undergraduate university program, commenting: “I really just think that the goal was to put me through the repertoire, and make sure I sounded okay doing it. It was kind of a degree factory.” The imbalance towards repertoire in her voice training did not allow Diana to develop good practising habits or technical skills, and normalized strenuous repertoire demands.
A fourth participant who felt that her early voice training experiences were very repertoire and interpretation-focused, was Jolene. Her first voice teacher’s approach to lessons was to focus on the performance elements of repertoire. This was difficult for Jolene because at that time she did not have the technical skills to be successful executing either the suggestions she received, or her own expressive instincts:

What was tricky was that I was trying to do all these things musically that my technique did not support. So, it didn’t really help, and then I would get more tension because I was trying to produce the sound that I had in my head, but it wouldn’t translate out. I would try to make more sound, and more sound would not happen.

The focus on interpretation in Jolene’s early lessons did not allow her to develop the technical skills to successfully express herself, instead encouraging her to attempt to reach her dramatic goals using any means necessary.

Joshua was the fifth participant who believed that repertoire requirements had been a factor in delaying his technical development and normalizing vocal fatigue. He described his early voice training in detail, listing the overwhelming repertoire, vocalise, and technique exercise requirements for juries taking place at the end of every term of his early training and commented: “I felt that sometimes you wanted to work just on your voice, but you wouldn’t have the time.” He felt that he was often scrambling to fulfill requirements rather than practising thoughtfully and building his instrument. Though this did not cause vocal problems for him during his undergrad, he believes that issues accumulated at that time and were factors when he later did develop PMTD. After graduation, Joshua experienced significant vocal dysfunction for the first time while singing in a professional choir. Here again, the huge repertoire demands did not allow him to practise healthily with a focus on sustainable vocal production. Instead he was just trying to make sure he knew all the notes. When he began experiencing chronic vocal fatigue, he chose to mark\textsuperscript{482} (though he had never actually been taught how to mark

\textsuperscript{482} In singing, “marking” is defined as singing in a less demanding/fatiguing way – possibly more quietly and in less extreme tessitura/range. This marks out the pitch and timing of one’s line to allow colleagues to rehearse their parts successfully.
properly) or to rest vocally in an increasing number of rehearsals. He was not worried because he saw many of his colleagues doing the same. In fact, in that choir there was a culture normalizing chronic vocal fatigue. Later, during graduate studies, Joshua again experienced vocal dysfunction associated with extreme repertoire demands during two opera productions. After being cast in small roles, which he felt were reasonable for his vocal health and safe to pursue concurrently with his other singing commitments, he was belatedly informed that he would also be required to sing chorus parts. Having not had the opportunity to take these into account in his plans for his vocal load, Joshua was worried about the potential vocal health impact of this additional singing (many additional rehearsals, etc.). However, he had been conditioned to believe that these repertoire demands were normal during his previous training experiences, and therefore went ahead with them rather than expressing concerns about the potential impact to his vocal health. It was during this time that he was diagnosed with PMTD.

The theme of *lack of knowledge* was a significant one in participants’ memories of the impact of repertoire demands in their experiences of vocal dysfunction. In many cases, participants’ lessons were so focused on repertoire preparation that they failed to develop good practising habits and technical skills helping lead to a lack of technical knowledge. For a number of participants, a combination of lack of vocal health knowledge and overly demanding repertoire requirements normalized the experience of vocal fatigue and even led to the development of vocal dysfunction. Perhaps these requirements would not have been unreasonable for healthy singers with strong technical abilities and broad knowledge of vocal health. However, for student singers with developing technical skills and vocal health knowledge, this appears to have been a significant factor in the development of vocal dysfunction.

4.2.1.4 Lack of Knowledge of PMTD Symptoms and Delay in Seeking Treatment

The theme of *lack of knowledge* was also linked more directly to participants’ experiences with PMTD, in that for some it hindered timely access to treatment. Seven of eleven participants described delays in seeking or receiving medical care because of lack of knowledge of the symptoms of the disorder on their own part or on the part of their
teacher. Singers or their teachers often chose long periods of vocal rest to deal with what was a much more serious problem than one-time fatigue. In some of the most extreme cases, severe vocal dysfunction persisted for months or even years before participants were sent for diagnosis and treatment.

Michael experienced extreme vocal fatigue, manifesting as vocal inconsistency, for months. It escalated to the point at which he had to take multiple days off from singing prior to performances or lessons. Because he was not in physical pain when he sang, for a long time he did not believe he was experiencing vocal dysfunction. He had encountered information about organic voice disorders with physical damage such as vocal fold nodules, but had never even heard of chronic voice disorders. By the time he finally told his voice teacher what he was experiencing, he was practically unable to sing – his throat seizing up entirely when he attempted to phonate. His main voice teacher suggested that he take a month off from singing, not realizing that vocal rest was not a strong enough measure to combat the amount of tension he was experiencing. When he began singing again, his symptoms returned immediately. Reflecting on his experience, he stated: “The symptoms of MTD were there very early on in the process, and so I think if I had been more aware of it and knew what was happening, it would not have gone that far. I was surprised too how many teachers… I don’t think had a full understanding…” Had Michael or his teachers been more knowledgeable about PMTD and chronic voice disorders, he might have received diagnosis and treatment earlier, reducing both the length of time spent in vocal dysfunction and the severity of his symptoms.

A second participant, Joshua, described a similar experience. His initial experience with PMTD began when he sang through the dress rehearsals and performances of an opera while he was ill. When he exhibited moderately severe vocal symptoms at his lesson that week (loss of range, requiring very effortful production to phonate on the notes he was able to sing) his teacher suggested two weeks of vocal rest. When Joshua’s voice was not fully recovered after two weeks, his teacher recommended extending the period of vocal rest by two additional weeks. After that time had passed, his teacher finally advised seeing a doctor for a scope. Joshua’s recovery from that first bout of PMTD was facilitated almost entirely through vocal rest, so he did not acquire the necessary
knowledge of how to avoid, or recover from, future occurrences. The following year, Joshua developed the same symptoms without the catalyst of a respiratory illness. He was working with a new teacher at that time, and just as his first teacher did not initially recommend that he seek medical care, this teacher also did not recommend he consult a medical professional. Instead, Joshua took the initiative and informed his teacher that he believed what he was experiencing was beyond their capability to address in-lesson. In both of his bouts with PMTD he might have received treatment sooner and recovered more quickly had he and his teachers been more knowledgeable about the symptoms of PMTD and chronic voice disorders.

In a third case, Jolene, upon reflecting on her voice training experiences, also believes that she was experiencing the first signs of PMTD for years before her diagnosis, but the signs were missed by her teachers. During her high school voice lessons, she was already having trouble with the transition between her chest voice and middle voice; when she sang this range quickly tired and then became essentially unusable. She was also often unable to project her voice the way she wanted to, instead feeling like she was hitting a wall or coming up against a barrier. In early university, Jolene sometimes sensed that her teacher was frustrated by her slow or nonexistent progress in correcting technical faults in her singing. Later, after Jolene had been diagnosed with a voice disorder, her technical progress suddenly accelerated. If Jolene or her teachers had been more knowledgeable about the symptoms of PMTD or chronic voice disorders generally, she might have received treatment earlier, experiencing less severity in her symptoms, and less frustration.

A fourth participant, Madame Chiaroscuro, was diagnosed with nodules or pre-nodules three times during her career before later experiencing many bouts of PMTD. At the time of her first diagnosis with pre-nodules, she was prescribed a summer of vocal rest to resolve them. This treatment was successful at returning her vocal folds to a healthy condition, but no rehabilitation or retraining was suggested; no recommendations were made regarding modification of her vocal behaviours. This may well have kept her from making a full recovery, leaving her open to future voice crises. She now believes that it is possible that lack of rehabilitation and unaddressed technique issues are one of the causes
of all three of her pre-nodules/nodules diagnoses and her later recurrent bouts of PMTD. Though she received treatment for pre-nodules and nodules, muscle tension (or even PMTD) may have been an underlying cause of this organic vocal condition, and that was not diagnosed or treated until much later in her career.

The theme of lack of knowledge of PMTD symptoms played a prominent role in the delay of diagnosis and treatment in participants’ experiences of vocal dysfunction. In many cases, participants and their teachers did not recognize symptoms, leading to an increase in the severity of those symptoms and a long period before medical treatment was sought. Singers or their teachers often chose vocal rest to deal with what was a much more serious problem than one-time fatigue. Though vocal rest is the normal first step to addressing vocal fatigue, the periods of rest required to return the voice to a functional state in these cases were often quite long. In some cases, there was no effort, or not enough effort, made to discover and resolve what had precipitated fatigue or other vocal symptoms. In some of the most extreme cases, severe vocal dysfunction persisted for months or even years before participants received diagnosis and treatment.

4.2.1.5 Lack of Knowledge Linked to Emotional Suffering

Lack of knowledge was also directly linked to the emotional impact of PMTD on participants; uncertainty surrounding the disorder caused participants emotional suffering, while gaining knowledge relieved their anguish. Prior to diagnosis, having no knowledge of PMTD or chronic voice disorders, and inadequate knowledge of the treatability of organic dysfunctions such as nodules, several participants assumed that they had done permanent damage to their voices. Many other participants experienced years of fear and helplessness associated with their PMTD before these emotions were finally resolved by gaining knowledge about the disorder and therefore feeling more in control of their own vocal health.

Three participants shared that prior to diagnosis, not knowing about the variety of possible voice disorders, they had been haunted by the conviction that their symptoms were a result of nodules/permanent damage to their vocal folds. This fear reveals two ways that their vocal health knowledge was lacking. First, they believed that nodules
were a permanent condition, rather than one that can usually be treated. Second, they had no knowledge of the existence of chronic voice disorders such as PMTD. The first participant, Alana, described fearfully listening as an ENT and SLP cryptically discussed what they were seeing on her scope, and finally being flooded with relief upon hearing the words: “Really? But no nodules?” A second participant, Jolene, experiencing such extreme tension that she could only sing for a couple of minutes before her mechanism would completely contract, described being absolutely convinced that she had nodes because that was the vocal dysfunction that she had consistently heard discussed. The stress this fear caused her must have been extreme, because she described beginning to sob with relief when her ENT informed her that she had no organic damage to her vocal folds. A third participant, Diana, so deeply feared a diagnosis of permanent vocal fold damage that she delayed seeking diagnosis. She was sure that she had physical damage to her folds and felt that officially receiving such a diagnosis would extinguish the small spark of hope she had of recovery. She spent a number of sleepless nights, tossing and turning, until she concluded that this delay was unwise and mustered up the courage to see an ENT. When he told her that there was no physical damage, she was immensely relieved. The process of diagnosis, treatment, and retraining further alleviated her fears. Though at times Diana still feels tension as she sings, she feels much calmer about it now that she knows what is happening and has tools with which to deal with it. She reported: “Knowledge has been super-helpful and super-comforting.” All three of these participants might have experienced less anguish during the onset of their vocal dysfunction if they had had awareness of the existence of chronic voice disorders like PMTD and had understood that organic voice dysfunctions such as nodules are usually treatable.

Many other participants also relayed feeling that the fear and helplessness associated with their experiences with PMTD were only finally resolved by educating themselves. Madame Chiaroscuro suffered from anxiety about her voice for many years. Each time she had a bout of PMTD, she worried her career was over. But through the years she kept herself open to any avenue of knowledge that became available, and at the time of her interview she described herself as being much more mentally healthy now that she knows
she can retrain and recover, saying: “I feel more confidence because I’ve educated myself.”

Another participant, Lynn, described feeling devastated upon receiving her diagnosis of PMTD. She went on to explain that this feeling was intensified by the fact that she had never heard of the disorder before, and when she tried to research it, she could find very little information. It was not until after many years of fear and helplessness that she was able to gain more peace when a voice teacher finally explained to her what kinds of technical issues in her singing were leading to, and prolonging, her symptoms.

A third participant, Joshua, described experiencing anxiety and fear of a relapse after a vocal rest facilitated recovery from his first bout of PMTD. After his fears were realized when he developed acute symptoms for a second time, he underwent treatment with an SLP and informed himself by pursuing independent reading and research. He gained new confidence from the knowledge he obtained, stating that, as opposed to his singing prior to vocal dysfunction, at the time of the interview everything about his singing was, “structured, and understood, and embodied.”

A fourth participant, Melina, detailed her experience of sinking into depression during her treatment for PMTD because of her lack of knowledge. She had not been aware that her recovery would be so long and complex – that it would involve breaking down so much of how she sang and building something new in its place. She suffered from fear of a relapse for years and believes that she may have continued treatment longer than necessary due to this fear. Melina did not feel fully recovered until several years later when a teacher reassured her and taught her a new mindset: things might go wrong again in the future, but if they did, she would be able to deal with it. A couple years later, Melina injured both of her elbows, temporarily reducing her ability to play the piano. Instead of descending into a depression, she drew on the knowledge she had gained during the treatment of her PMTD and was reassured that she would also get through this new injury.

A fifth participant, Michael, recounted a similar experience: after his treatment he was anxious for years at any sign of vocal fatigue or tension in his singing. He did not fully
recover mentally and emotionally from the experience until a teacher who knew his
history with vocal dysfunction broadened his understanding of when tension and fatigue
were harmful and when they were normal. She informed him that though the long-term
build-up of tension he had experienced in the past was harmful, it was natural to
experience a degree of tension and fatigue at times, especially if he was in the process of
learning something new. She used this analogy: “A figure skater has to fall on their face
so many times before they actually get the trick.” This knowledge that incidences of
fatigue and tension were not reasons to panic, but signs of the learning process, was
extremely comforting to Michael.

A sixth participant, Anne, described experiencing long-term anxiety brought on by living
through many years of mild to moderate PMTD after being treated for acute symptoms in
her childhood. Maybe because of lack of knowledge and resources in her region, or
maybe even because some of her teachers avoided training certain areas of her voice for
fear of exacerbating her vocal health issues, Anne felt terrified of singing in certain
ranges. She found performing very nerve-wracking until she trained with two very
mechanistic/pedagogical teachers and studied vocal pedagogy under their tutelage.
Understanding physiological and pedagogical concepts gave her much more confidence.
With this new knowledge, she finally felt able to help herself rather than being at the
mercy of her vocal inconsistencies.

The theme of lack of knowledge was directly linked to participants’ experiences with
PMTD, as ignorance of PMTD – its causes and treatment – provoked emotional suffering
in participants, while gaining knowledge relieved their anguish. Prior to diagnosis,
several participants, having no knowledge of PMTD or chronic voice disorders, assumed
that they had done permanent damage to their voices. Many other participants
experienced years of fear and helplessness associated with their PMTD before this was
finally resolved by gaining knowledge, and therefore feeling more in control of their own
vocal health.

The theme of lack of knowledge appeared in numerous forms in participants’ interviews.
It was apparent in their stories about technical training, vocal health instruction,
repertoire requirements, and in their specific experiences with PMTD. Lack of understanding of singing technique and vocal health may have set up some participants to be unable to recognize or deal appropriately with vocal dysfunction. Overwhelming repertoire demands led to vocal fatigue and encouraged a culture of over-singing while also reducing the amount of time participants were able to devote to building efficient singing technique. Finally, a lack of information about the disorder gave PMTD the power to cause mental suffering for participants, while gaining knowledge was key to both their physical and emotional recoveries. As one participant observed: “Knowledge is power,” and lack of knowledge led to powerlessness for participants.

4.2.2 Voice Technique Correlating with Dysfunction

In addition to broadly linking many participants’ voice training experiences to the lack of knowledge theme, voice technique itself emerged as a theme in the stories of many participants as it correlated with, or was a causal factor in, their vocal dysfunction. Some participants described specific technique deficiencies as contributing elements in their development of PMTD, and specific technical retraining as an important tool in their recoveries. For instance, a number of participants (six) brought up efforts to extend upper range or sing in a high tessitura/Fach while a smaller number (two) recounted running into difficulties while singing in a low Fach. Many described registration as an important voice technique factor in their singing. Several also mentioned problems with breath management, and articulator tension. Finally, nearly all participants brought up voice technique experiences associated with choral singing as a factor in their experiences.

4.2.2.1 Pursuit of Upper Range Extension or High Fach

Pursuing the goal of upper range extension was reported by nearly every participant as they shared their experiences of PMTD. Some experienced frustration when forbidden to sing in a high range, others recalled experiencing tension in their early attempts/training to sing in a high range, and some even appeared to experience direct links between very high voice training and the onset of their vocal dysfunction.

Two participants, PJ and Melina, were informed in their pre-university training that they would likely progress into the Fach of coloratura soprano. Having developed a sense of
identity associated with this label, and expectations of how their voices would be trained, both experienced frustration and conflict with later voice teachers who wished to train their middle voices prior to upper extension, rezerving judgement on Fach until such a time as more technical groundwork had been laid. In both cases, pre-university training may have caused the beginnings of unhealthy high-tessitura technique. Additionally, both confessed to pushing their university voice teachers to allow them to do flageolet (very high tessitura) training. It is possible that PJ and Melina rushed through important technical development, or did not fully commit to middle-voice training as a result of this too-early established high-voice label, leading to the development of dysfunction. Two other participants, Joshua and Lynn, described experiencing significant tension during early attempts to extend their functional range upwards either on their own or under the supervision of a teacher. Joshua shared the story of his confusing experience of attempting to sing very high Rock and Heavy-Metal repertoire, and teach himself how to sing in falsetto, all without any concept of the existence of different voice types/ranges or any guidance from a voice teacher. During this experience, he remembered his voice fatiguing extremely quickly. Though it is unlikely that this contributed to Joshua’s later vocal dysfunction, it is possible that he may have begun to build unhealthy technical habits into his high-range singing at this time. Lynn, a mezzo, recounted spending her early lessons training as a coloratura soprano, experiencing vocal fatigue and muscle soreness by the end of every lesson, as well as a general plateau in her technical progress. Much of this was resolved when she switched Fach, becoming a mezzo. For all four of these participants, high Fach labels or pursuit of upper range extension were factors in their stories, though for some this had greater significance than for others.

For three participants, pursuing upper range extension was not only a factor, it seemed to have a direct link to the onset of PMTD. The first of these participants, Alana, described working with a short-term voice teacher in a tension-inducing manner to increase her high range: “He pushed us to the extremes…to when you crack, or nothing comes out.” The following year, outside of the guidance of her long-term teacher, Alana worked in
that same manner while attempting to train herself to have a consistent D₆.⁴⁸³ Later that term, after a respiratory illness, she experienced a debilitating bout of PMTD. PJ, one of the two participants to receive a high school label of coloratura soprano, described her development of acute PMTD symptoms as even more directly correlated with high tessitura voice training. Excited at finally being allowed to sing coloratura repertoire for her third-year recital, she intensively practised the cadenzas, pushing herself to sing as high as she could every day. While practising this way, she began to experience the sensation of a lump in her throat, which gradually became more frequent until she woke up one morning hardly able to phonate. When she tried to sing or speak, her voice would stop, like something was choking her from the inside. These symptoms led to a diagnosis of PMTD, and even after treatment, PJ recalled experiencing significant tension when singing coloratura repertoire: often having to force notes out or they would not come out at all. For PJ, it was very clear that range extension and high tessitura training were linked to the onset of her acute symptoms of vocal dysfunction. The third participant for whom pursuing upper range extension had a direct link to the onset of PMTD was Michael. He confessed having held a long-time goal to be a tenor and spending a lot of time outside of his lessons researching and practising technical exercises in an attempt to reach this goal. Additionally, while one of his teachers took a moderate approach to Fach, his other teacher was quite determined to mold his voice as a tenor, consistently assigning him repertoire in high keys. This training led to a great deal of vocal fatigue and inconsistency, with Michael’s voice working some days, and other days feeling like it would not move, like, “a rusting machine.” Just as for PJ, for Michael these symptoms progressed into an inability to phonate, his voice instead making a choking sound when he attempted to sing. These symptoms led to a diagnosis of PMTD. For all three of these participants, pursuing upper range extension seemed to have a direct link to the onset of PMTD.

⁴⁸³ Numbered pitches are referred to using the letter name of the note and the octave of the piano in which they are positioned as laid out in the following graphic:
Pursuing the goal of upper range extension was reported by nearly every participant in reference to their experiences of Primary Muscle Tension Dysphonia, whether only their frustration when forbidden to sing in a high range, tension associated in early attempts/training to sing in a high range, or in the appearance of direct links between very high voice training and the onset of vocal dysfunction.

4.2.2.2 Fach Outliers

While many participants’ interviews revealed connections between their PMTD and pursuit of high tessitura or Fach, some participants’ stories seemed to suggest almost the opposite. Instead, these stories included connections between muscle tension and heavy or low singing. One participant recounted experiencing a relationship between muscle tension and singing both her highest and heaviest roles, and two other participants described issues linked to singing in a low or heavy Fach.

The first participant, Madame Chiaroscuro, was noted as an outlier in this study even prior to analyzing data. She is the only study participant to have pursued a career singing many of the heavy-Fach female opera roles in the literature, so it is difficult to generalize her experiences in this area of the study. While her experience shows some similarities to the others in the study, and the study did include other professional opera singers, her repertoire demands were unique. She recounted developing PMTD on multiple occasions while singing some of her heaviest roles, stating: “I think I was probably singing one Fach too heavy… So, what I’ve done with my repertoire, I have said goodbye to several very heavy or dramatic things in my rep.” When asked whether she thought the range or tessitura of these roles was also a factor, she replied: “Also, yeah. D#, Cs, one role has a D and a C#, and you’re just like, here we go! Yeah. Scream-y. Yeah. Absolutely… So, what I’ve done, I’ve just sort of narrowed. So, you know, ‘no’ to that one. There’s a big difference between a B-natural and a C.” For Madame Chiaroscuro, high tessitura singing still was correlated with the onset of muscle tension, but heavy singing seemed to also be a factor.

Diana was the first of two participants who recounted developing vocal difficulties while singing in a low or heavy Fach. Trained as a soprano, Diana described experiencing
tension while singing as an alto in a professional choir and trying to manufacture a rich, warm tone quality in this low range. She now thinks that this range and vocal quality do not come entirely naturally to her voice. Later, Diana encountered her vocal crisis and diagnosis with PMTD while singing a musical theatre belt role which required a big sound and a similar rich vocal colour all the way from her low to her upper middle range. In Diana’s case, singing in a low range and singing heavy repertoire was correlated with her onset of vocal dysfunction.

A third participant, Whitney, having trained all her life as a mezzo (from early childhood), was amazed when after her treatment for PMTD her new voice teacher recommended she begin exploring singing as a lyric soprano. A part of her now wonders if a major factor in her vocal health struggles was singing in too low a Fach for many years. This is similar to the cases of Melina and PJ in that Whitney may have developed vocal dysfunction partially as a result of being assigned a Fach label far too early in her training. In her case the tessitura she was singing in may have been too low rather than too high. Perhaps the technical manipulation she required in order to sing in that low tessitura caused much of her tension.

While connections between PMTD and pursuit of high tessitura or Fach were more common in participants’ interviews, some participants’ stories seemed to suggest almost the opposite. Instead, their experiences included connections between muscle tension and heavy or low singing. One participant described experiencing a relationship between muscle tension and singing both her highest and heaviest roles, and two other participants related issues to singing in a low or heavy Fach.

4.2.2.3 Registration

(See literature review for an explanatory discussion of registration, starting page 48).

Along with range or tessitura, the related voice technique element of registration was mentioned recurrently in participants’ interviews. It arose both as a technical element leading to dysfunction, and as a tool used to treat and retrain voices, returning them to a healthy state in the stories of nine of eleven participants. The stories of five participants
revealed suggestions of too light/high registration in their early vocal qualities, followed by the use of chest voice as a tool used to restore balance to their voices during treatment, while a sixth participant’s story revealed similar early suggestions of too light/high registration without chest voice as a treatment tool. For a seventh participant, registration was also an important technique factor, but her background revealed indications of too heavy registration, and head voice was an important tool in her rehabilitation. For two final participants, registration seemed to be not only one issue, but the primary voice technique issue in their experiences of vocal dysfunction.

For Whitney, registration issues were her primary symptoms as she developed PMTD: a hole in the middle of her voice between F4 and B4 where delayed phonation progressed to an inability to phonate (except occasionally if using a chest-heavy registration and straight tone). Many of the exercises that her speech language pathologist (SLP) assigned her in treatment were in a reduced range and had a strong element of chest voice – chest voice trills, vocal fry – and her understanding was that her SLP meant for these exercises to treat her voice while avoiding lengthening the vocal folds for a period of time (thus avoiding head-dominant or cricothyroid dominant vocal production). Similarly, another very beneficial treatment element for Whitney was stretching out her cricothyroid muscle by pressing on it with her finger, which brought back the complexity to the sound which had been missing, suggesting a return to healthy registration balance. Perhaps Whitney’s cricothyroid muscle was in a state of continuous contraction, and any return to production using this muscle prevented her from releasing the unhealthy tension associated with her PMTD. This, along with her occasional ability to phonate in problem ranges by using isolated chest voice, suggests that lacking a healthy mix-voice is a strong correlating or even causal factor in PMTD in singers. Registration appeared to a significant element in this Whitney’s development of vocal dysfunction, and chest voice an important tool in her treatment.

Melina’s stories of early childhood singing also suggested too-light registration, as she was often told to sing out, but did not know how to do it and had little success. She was also unable to access chest voice when singing, and prior to her diagnosis with PMTD she was experiencing register integration problems in her speaking voice: either it was
gravelly and low, like fry, or it was falsetto. Melina’s treatment included using chest voice in, “a very nasty visceral way,” and gentle vocal fry as a tool to help her learn how to make contact between her vocal folds and thus achieve a balanced onset. All of this suggests that too-light registration was a causal factor in Melina’s vocal dysfunction and this is born out in her descriptions of her voice post-recovery and retraining. Her retrained voice has a darker and rounder quality – her teacher even briefly explored mezzo as a Fach option before returning to soprano – with easier access to chest voice. There are more colours (partials/overtones) present, and her voice has a more organic and honest quality, rather than sounding fabricated. Too-light registration may have been a reason for some of the vocal symptoms that Melina described both prior to and during her vocal dysfunction. Chest voice was an important tool in her treatment, and her post-recovery vocal qualities suggest much better integration of chest production into her whole voice. Just as in Whitney’s case, this suggests that lacking a healthy mix-voice is an important correlating or causal factor in PMTD in singers.

For PJ, another coloratura soprano, stories of her early childhood singing also suggested an imbalanced (too-light) registration, and descriptions of her university voice training include struggles with unsuccessful registration. She recounted discovering head voice as a very young child, thinking of it as, “pretty singing,” described her pre-university voice as “white, no vibrato,” and explained that her middle voice was a problem area during university:

I think that happens with a lot of lighter voices, where the middle is like, very rocky, the high is there, and the low is quite strong. I would go into heavy chest in the low register. In the passaggio… right around D5, I would have to kinda just muscle into it and just hope, hope it worked out! I couldn’t let the voice go there, or it would… vibrato went wild.

Though she felt that her voice worked better in a high tessitura, her voice teacher wanted to solidify her middle voice technique before working in an extreme range and refused to train her upper extension for the first two years of her undergrad. However, she never felt like her middle range was really was sorted out, only having success avoiding cracking in this range by “really hunker[ing] down into those notes.” From these descriptions, it seems that registration was an issue in the period prior to, and during, PJ’s development.
of PMTD. Her descriptions of her treatment bore this out, as her SLP used a lot of chest voice exercises to treat her PMTD, and PJ later found that while singing in more contemporary styles and in a more moderate range her voice had much more stamina, was brighter, more “forward,” more brilliant/multifaceted, and that it had more colours and overtones. From PJ’s descriptions of her pre-diagnosis vocal qualities, it seems possible that too light a registration was a factor in her development of vocal dysfunction. Chest voice was an important tool in her treatment and retraining, and her post-recovery vocal qualities seem consistent with a better integration of chest voice into her registration. This continues to support lack of a healthy mix-voice as a significant correlating or causal factor in PMTD in singers.

Jolene also exhibited too-light registration qualities in her pre-dysfunction voice, describing her adolescent voice as having had a choir-boy quality, and having difficulty projecting as a young singer: “I felt like I would try so hard to produce more sound, and I wasn’t able to.” One of the recurrent early symptoms of vocal dysfunction that Jolene experienced was trouble with the transition between chest and mixed voice. The area was relatively easy when she first started singing each day, but it soon began cracking in the area between middle C and F4, and required increasing amounts of chest voice to navigate. During Jolene’s treatment, her SLP assigned her a lip trill exercise in chest voice carried up to C5, while at the same time, her teacher was also working with her on adding more chest-registration to her singing voice by using her speaking range and quality as a starting point. This chest-voice treatment and training appears to have been effective, as Jolene now describes her voice as being, “the biggest it’s ever been,” and as having more consistent vibrato and smoother and easier onsets. From her pre-treatment descriptions of her voice, too-light a registration may have contributed to her vocal dysfunction. Chest voice was an important tool in her treatment and retraining, and her post-treatment vocal qualities sound consistent with a more integrated registration. Like those before her, Jolene’s story implies that lacking a healthy mix-voice is a correlating or causal factor in PMTD in singers.

Similar to Whitney, Melina, PJ, and Jolene’s stories, Michael’s story also included many elements suggesting that registration imbalance was a causal factor in his dysfunction.
His SLP stated that much of his throat tension was due to attempts to sing quietly in a high tenor *Fach*. To remediate this, Michael’s SLP assigned him chest voice exercises that felt, “like shouting,” meant to correct the internal positioning of his vocal mechanism. Additionally, some of his most beneficial post-treatment voice training included applying the concept of mix voice, balancing both chest and head voice elements and resonance. This registration balancing work appears to have been effective at treating Michael’s vocal dysfunction, as after treatment and retraining, Michael described his voice as more consistent across all areas in repertoire – “It didn’t feel like it was in *parts* [anymore]” – brighter, larger but also more buoyant, lighter in terms of effort/production quality, freer, and more authentic. Like the four previous participants, Michael’s descriptions of his symptoms of vocal dysfunction suggest that a lack of registration integration was a factor in its development. Chest voice was an important tool in his treatment, and a focus on integrating his registration from both the top and bottom was key in his retraining. Just as in the previous stories, Michael’s indicates that lacking a healthy mix-voice is a notable correlating or causal factor in PMTD in singers.

For all five of the previously discussed participants, pre-dysfunction voice descriptions suggest too-light registration, and chest voice was an important tool in rebalancing registration and thus returning voices to a functional state. For a sixth participant, Alana, childhood vocal qualities and symptoms of dysfunction reveal similar too-light registration factors – difficulty projecting, an upper range falsetto-type sound which was weak, light, and even diffuse/breathy at times. Alana recalled choir directors from her childhood trying to encourage her to project better – standing far away from her and asking her to sing loudly enough to reach them. When she was diagnosed with PMTD, her scope also revealed a gap between her vocal folds, which would certainly result in a breathy vocal quality. Unlike the five previous participants, Alana’s description of her treatment and retraining did not include registration exercises. Upon her last contact with the researcher, the gap between her folds had not yet closed, and she reported that there was still a breathy quality to her singing voice. From Alana’s descriptions of her pre-diagnosis vocal qualities, it seems possible that too-light a registration was a factor in her development of vocal dysfunction. The omission of registration exercises in her
treatment, and her continuing symptoms of a vocal fold gap and breathy tone quality could suggest continued problems with too light registration in her technique.

A seventh participant, Madame Chiaroscuro, was an outlier in terms of registration as her story suggested too-heavy registration as a factor in her development of PMTD. She recalled always having had a voice that projected, from early in her childhood and youth, and her undergraduate voice training was based in a school of vocal pedagogy that encouraged a forceful and heavy technique. She also linked many of her bouts with PMTD to singing her heaviest repertoire and “taking too much thick-cord mass up.” Registration was an important tool in her rehabilitation, but it was the opposite type of registration: “making friends with [her] falsetto,” (probably her term for quiet but connected head voice), and “getting back into feather-duster on a chandelier” singing. She felt this was necessary not because she needed to train her voice into a lighter registration, but in order to rebalance it from what she had been rehearsing and performing when she got into trouble. She was an outlier in this study both in terms of the type of registration required as a rehabilitative tool, and in that she seemed to be rehabilitating from one particularly intense vocal task rather than altering her technique in a large-scale manner. Perhaps this is unsurprising given that Madame Chiaroscuro was one of the most experienced and elite singers interviewed. What she does have in common with the other participants is that too extreme a registration appears to have been a factor in her development of PMTD.

For two other participants, Lynn and Anne, registration was not only one issue, but the primary voice technique issue in their experiences of vocal dysfunction. Reflecting on her years of voice training experiences, Lynn recalled many of her voice teachers having had an aversion to chest quality and teaching from a very “top-down” school of registration. She described her vocal quality in her early voice lessons as having “a disconnection, almost to the point of being disembodied.” For many years she had absolutely no ability to access her chest voice when singing, and no desire to do so, since she had only ever heard it disparaged. Because she sang repertoire that generally allowed her to avoid it, this seemed to work for a while. However, over a number of years of singing professionally, Lynn began to feel that there was something missing in her technique.
When she was in her mid-thirties, for the first time in her life a teacher suggested that she should sing with more chest connection. While working with this teacher allowed her to finally have access to her chest voice, the time they spent together did not completely resolve the issues she was having. Finally, after an illness from which she did not seem to be able to recover, Lynn was diagnosed with PMTD with bowed vocal folds. Her folds were not meeting in the middle, and there was a lot of laryngeal tension present because of the effort to make them meet. Treatment with an SLP resolved many of her most severe symptoms, but worrying signs in Lynn’s middle voice were intermittently present. It felt unstable, onsets were often preceded by a brief dysphonic moment, an increasing amount of chest voice was needed in order to negotiate her lower passagio, and there started to be a gap or hole in Lynn’s voice where she felt like she had to work harder to, or was completely unable to, get full resonance. She also often felt the need to clear her throat, and sound production generally did not feel easy or free. Over the course of years these symptoms came and went, making her voice feel quite inconsistent. She could always make her voice do what it needed to do to get through a rehearsal or a performance, but it was clearly not functioning ideally. When she finally began working with a teacher known for rehabilitating voices, he told her that she had not been using her voice correctly; she had practically no mix, but instead was using a chest-dominant sound in her middle range, and a head-dominant sound in her lower range. Retraining to balance her registration more appropriately has led to what Lynn describes as a far more honest, direct, and speech-like sound than she ever had before. From her descriptions of her pre-diagnosis vocal qualities, it seems that too light a registration was a major factor in her development of vocal dysfunction. Chest voice played an extremely important role in her retraining, and her post-recovery vocal qualities seem consistent with a better integration of chest voice into her registration. Lynn’s story indicates even more clearly that those of the previous participants that lacking a healthy mix-voice is an important correlating or causal factor in PMTD in singers. She suffered for many years, and was unable recover until she worked with a teacher who identified that she had practically no mixed voice at all.

Anne was the second participant for whom registration seemed to be the primary issue in her PMTD. She developed a fear of using chest voice when she was an adolescent
because singing too much in a chest-dominant production seemed to be a catalyst when
she initially developed PMTD, and a significant focus of her treatment at that time was
raising the fundamental frequency of her speaking voice. She also confessed that, as an
adolescent, she had not wanted to sing like pop singers with their “belted” sound. Rather,
she wanted to sing “properly,” indicating that she had an aversion to chest voice. After
her childhood experience with PMTD, Anne found her voice lessons “careful.” She said
of her voice teacher: “I think she was scared to push me to do things. We did try to do
some stuff in my low range, but it was only for a few minutes of the lesson, and then we
never touched that again. She was like, I don’t wanna make her do those things, because I
don’t want to be responsible for ruining her voice.” During Anne’s undergraduate degree,
her teacher was also “careful,” seldom working on her low range, and then only for a few
minutes. As a result of her childhood treatment and her voice teachers’ apparent fear of
training her chest voice, for many years Anne avoided singing in chest voice and in her
low range. She chose her own repertoire to shun the thing that caused her vocal problems
and thought that chest voice was “ugly and heavy” – that it was wrong to sing or speak
with that quality. During those years Anne’s voice always felt inconsistent; when she
opened her mouth, she had no idea what was going to come out. One of the techniques
she used to attempt to make her voice more consistent was expelling a lot of air in her
middle register. Whenever she sang in her low range, she tried to stay in head voice, and
while this worked when she first started singing for the day, her voice soon began to
 cracking and exhibit delayed phonation. After singing in this range she experienced soreness
in her swallowing muscles, and the same cracking and delayed phonation in her speaking
voice. It was only when she began working with a teacher who trained her using chest-
based exercises that her voice started to become more consistent. He assigned her to
practise by beginning in her speech register and carrying chest voice as high as possible.
After practising this way, Anne described her middle range has having a ringing quality
that it had never had before, and she felt that her voice had a more soloistic sound quality
than before. She also was surprised that though she thought her high range had been easy
before, it felt even easier after practising this new way, exclaiming: “I started to sing my
piece, and my high stuff just like, flew out! It was so easy!” Her speaking voice also did
not exhibit the symptoms it had after singing with too head-dominant registration in her
low range. Instead, it felt comfortable and resonant. From Anne’s descriptions of her post-treatment fear and avoidance of chest voice, and her symptoms over the years of singing this way, it seems very likely that too light a registration was a major factor in her ongoing vocal dysfunction. Chest voice was an extremely important tool in her retraining, and her vocal qualities afterwards were consistent with a better integration of chest voice into her registration. Just as in the stories of previous participants, Anne’s experience supports the idea that lacking a healthy mix-voice is a key correlating or causal factor in PMTD in singers.

Along with range or tessitura, the element of registration was one of the most frequently recurring voice technique components in participants’ interviews, appearing in nine of eleven narratives. It arose both as a technical element leading to dysfunction, and as a tool used to treat and retrain voices, returning them to a healthy state. The stories of five participants revealed suggestions of too light/high registration in their early vocal qualities, followed by the use of chest voice as a tool used to restore balance to their voices during treatment. A sixth participant’s story revealed similar early suggestions of too light/high registration, but chest voice was not used as a treatment tool, and her treatment was not entirely successful at the time of the interview. For a seventh participant, registration was also an important technique factor, but her background revealed indications of too heavy registration, and head voice was an important tool in her rehabilitation. For two final participants, registration seemed to be not only one issue, but the primary voice technique issue in their experiences of vocal dysfunction. As discussed in the literature review, typically heavier and more forceful voice use are correlated with PMTD, but imbalanced registration in either direction appears to be a significant behavioural element in the development of the disorder. In the experiences of participants in this study, many described lacking the ability to sing in a mixed registration, instead revealing signs of vocal production dominated by one laryngeal muscle group or the other (the majority in this study, cricothyroid dominant production). Perhaps in classical singing, a style which favours the use of more head registration than many other styles of singing, an overly head-dominant registration is more common than in the general population of singers.
4.2.2.4 Breath Management (Support/Release)

A third *voice technique* element that appeared repeatedly in the interviews of nearly every participant was breath management. Two participants described their teachers and speech therapists working on breath-related technique exercises with them. Three other participants described breath as an element in their speech therapy. Another participant remembered some of the most memorable and helpful technique she studied as focusing on breath management. Three final participants reported difficulty understanding breath management, or the terms support or release, for many years.

Two participants specifically described their teachers and speech therapists working on breath-related technique exercises with them both before and after developing vocal dysfunction. The first, Alana, recounted prior to developing PMTD having had issues with running out of breath in phrases longer than a couple measures, suggesting that she may have already had issues with expending too much air prior to experiencing vocal dysfunction. At that time, her voice teacher worked with her on a technique she called “blocking,” – breathing in, and then instead of letting the stomach collapse and releasing all the air at once at the onset of singing, pushing out with the abdominal muscles. After she developed PMTD, Alana’s speech therapist also worked with her on breath support during treatment, teaching her to support her speaking voice like a singer. After incorporating this into her speech, she received many compliments on how much healthier her speaking voice sounded. It is unclear whether Alana’s breath management problems were a cause or a symptom of her PMTD, as a gap between the vocal folds is a symptom of PMTD. However, it is possible that this gap was present prior to developing acute symptoms, and that this was why she was unsuccessful at breath management in long phrases. Perhaps the supraglottal constriction that was evident in her diagnostic scope developed in an effort to create better closure and more efficient use of breath. If so, this could again suggest a causal link between too-light registration and Alana’s development of, and ongoing symptoms of, PMTD. A second participant, Jolene, recounted that prior to her PMTD diagnosis, her teacher had been trying to help her find better breath release or flow in her singing, but she had been experiencing too much tension to be successful at this. After undergoing treatment, taking up the practice of
yoga, and working with a different teacher, Jolene was much more able to achieve and maintain a steady stream of air in her exhalation while singing. In Jolene’s case, breath problems seem to be symptomatic of tension she developed in an attempt to create better glottal closure. She described her voice as light and breathy, with difficulty projecting, which suggests a head dominant registration quality with poor glottal closure. Her symptoms of a choking and lump in the throat sensation suggest supraglottal constriction, and her diagnostic scope confirms this. Perhaps in an attempt to project her voice, she began to use excessive subglottal air pressure, and like Alana, developed this supraglottal tension in an attempt to remediate loose glottal closure. Breath management appeared to be an important factor – possibly influenced by too-light registration – in the stories of both of these participants.

Three other participants described breath as an element in their speech therapy. Lynn listed several ways her speech therapist talked about breath with her: legato speech, not too much subglottic breath pressure, taking relaxed breaths, and no pressure in the throat or diaphragm at the ends of phrases. Melina recounted speech exercises in which her speech therapist drew her attention to taking appropriately sized breaths (larger or smaller) depending on the requirements of the following phrase. Joshua placed great importance on the very first thing his speech therapist told him: as he sat in her office telling her his story, he was holding his breath. She drew his attention to his breathing as the very first element of his treatment. In all three of these participants’ speech therapy experiences, breath was an element that was addressed.

Diana, did not mention breath as a focus of her treatment, but listed breath-focused technique exercises as some of the most memorable and helpful she learned as an undergraduate student. Additionally, now one of the main focuses of her personal warm-ups is achieving adequate breath release/air flow in her singing (probably in an attempt to avoid too much subglottic pressure). While studying with her primary undergraduate voice teacher, she often spent lesson time lying on the floor breathing, or singing bent over to try to feel lower back expansion during breathing. A breath-related image was one of the most successful tools in her singing, addressing many issues at once: “A long column of air that comes from the floor, comes up through you, and out like a laser beam
to the back of the room.” To this day, Diana conjures up this image regularly to help herself sing with less tension. When warming up, for many years she did not have a good concept of what she needed to be doing, but after treatment Diana was aware of the types of tension typical to her. She began to try to use warm-ups to address this, describing one of her main focuses in warming up as breath release using yawns and sighs. In both her voice training experiences, and her post-treatment vocal health strategies, breath was an important topic for Diana. However, it is not clear whether it was causal or symptomatic in her development of PMTD; tension at the level of the vocal folds could reduce the ability to achieve and maintain a steady stream of air in singing, but a lack of air fueling sound production could also lead to tension at the level of the vocal folds.

Three other participants reported struggling with a lack of understanding of breath management, or the terms *support* or *release*, for many years. The first participant, PJ, exclaimed twice in her interview that teachers always told her to “release,” and that she always wanted to respond, “I have no idea what that means,” but never felt comfortable questioning her teachers. She attributed a lot of the tension in her singing to not knowing how to use her body effectively for breath support or release. A second participant, Whitney, also commented that nobody had explained breath support to her long after her primary training days were over: “No one ever talks about support. No one! People just said, you’ve gotta support. I was like, what is that? What am I, am I squeezing something, am I holding something? No one actually said what it was.” She suddenly had more success in her singing after a teacher defined support to her as dropping the diaphragm and using the pelvic floor muscles. After treatment, Whitney had another eureka moment with breath when a new teacher encouraged her to use more/expend more breath while singing. Suddenly her tuning and resonance improved dramatically, and her range and the size of her voice grew. A third participant, Madame Chiaroscuoro, also described her teachers as not explaining how to support her sound properly: “None of my teachers talked about breath support, no one talked about fueling, that the breath and that steady stream of air is your everything, really. And that you don’t control with the throat. They might say, ‘Support dear!’ The term even, *support*, I think is elusive.” Madame Chiaroscuoro felt that she had much less tension at the level of her throat once she learned about “resisting collapse” and remaining in an inhalatory posture with the ribs staying
“east and west.” Use of too-generic terms to describe breath management appears to have led to lack of understanding of the concept of breath management for these three participants. As a result, breath management may have been a factor in their vocal dysfunction. Perhaps these participants developed tension in the laryngeal and paralaryngeal muscles in an attempt to maintain consistent vibration at the level of the vocal folds because they lacked the ability to maintain consistent and balanced air pressure and flow using their respiratory muscles.

Breath management is a voice technique element that appeared repeatedly in these interviews. Nearly all participants brought up breath support or release in connection to their PMTD in their interviews. Some described their teachers and speech therapists working on breath-related technique exercises with them. Others described breath as an element in their speech therapy. Still more participants reported not understanding breath management, or the primary terms associated with it, for many years. For some participants, breath management issues seemed to have been caused by too-light registration, and for many, inefficient breath management appears to have led to glottal and supraglottal tension.

4.2.2.5 Articulator Tension

A fourth voice technique issue that arose less often, but still repeatedly, in these interviews was articulator tension, often considered a type of supraglottal tension or constriction. Nearly all participants listed facial, neck, and shoulder stretches as an element of their treatment. A small group of four participants even described articulator tension as having varying levels of causal relationships with their PMTD, and even being linked to breath management issues.

Of the group of four participants who felt that articulator tension played a causal role in their development of PMTD, PJ specifically stated that her two biggest issues, articulator tension and breath support, were linked. She believed that because for many years she did not adequately use her body to support her singing, she instead developed tension in her face, jaw, and throat muscles in an attempt to achieve a supported sound. For a second participant, Lynn, breath management and articulator tension also appeared to be linked.
She described at times having issues with over-articulating and tongue tension. Her speech therapist cautioned her about having too much subglottal air pressure, and assigned her exercises to address these symptoms, asking her to release her jaw, create a constant connection between consonants and vowels, learn tongue and palate independence, and to avoid being too aggressive with articulation – not pressing into consonants but instead making them feel lighter. A third participant, Anne, confessed that she experienced much more tension in her singing when there was a lot of text or the song was quicker and more rhythmic:

If you gave me a piece that was floaty up in my high register the entire time, nobody would know I had many issues. I loved singing long lines and slow pieces because that was what created minimal tension for me. It’s when you gave me a piece that I had to say a lot of words really quickly, or change the vowels really quickly, the tension would take over and sound would not come out, especially in my low range.

In legato repertoire, encouraging steady airflow, Anne’s tension was much less-apparent. In Anne’s early treatment, her speech therapist assigned her tongue and jaw stretches, and facial massage to address the symptom of articulator tension. A fourth participant who experienced breath management issues, Madame Chiaroscuro, also described tongue and jaw tension as among her most serious technical issues. She made some of her most dramatic technical progress while working with a teacher who addressed these areas with her, and over the course of her career many speech therapists and voice specialists also worked with her on efficiency of articulation in her speech: not speaking too quickly, eliding consonants, being more mellifluous. In her case, attention to legato – continuous airflow and vocal fold vibration – was an important factor in her vocal health, again linking breath management and supraglottal articulator tension.

Though the voice technique issue of articulator tension arose less often in these interviews, it still occurred repeatedly, and often was linked with breath management. Nearly all participants listed facial, neck, and shoulder stretches as an element of their treatment and a small group of four participants even described articulator tension as having varying levels of causal relationships with their PMTD. Perhaps for some of these
participants tension in the articulators was related to an inability to maintain consistent and balanced air pressure and flow using their respiratory muscles.

4.2.2.6 Choral Singing Technique

(The researcher does not mean to imply that singing chorally is inherently harmful to the voice, but that there may be an association between elements of how choral singing is being taught, directed, or pursued and the development of PMTD).

A fifth voice technique element that appeared frequently during the analysis of these interviews was choral singing technique. Nine of eleven participants began singing chorally as young children or adolescents, meaning that choral singing techniques played a long-term role in their vocal development. Issues related to choral singing technique included limited tessitura singing, erroneous technique, and choral technique countering solo technique – for instance, being required to sing with a quiet, vibrato-free, blending tone quality, without being trained how to do this healthily.

The issue of limited tessitura singing arose in many participant accounts. Paralleling the common voice technique elements of pursuit of high tessitura or Fach, and head-dominant registration, nine of eleven participants recounted singing soprano or tenor during all or many of their years of choir, and the majority remembered being placed in the first soprano section for all of these years. By virtue of how choral music is constructed, choristers often sing in a restricted range, reducing the opportunity to train the other parts of their voice. In this population, it seems that the majority of participants primarily trained the high range at the expense of the middle and low range during their choral singing. Two participants, Jolene and Madame Chiaroscuro, specifically mentioned that singing in the very limited range required of the soprano section caused them tension. Jolene stated: “There was a lot of high singing for an extended period of time. There’s no time to rest, and you just keep going and going, and the tension builds.” Madame Chiaroscuro confessed that she had not been able to stay in the first soprano section long before moving to second soprano: “Soprano one is that white, very high, in the cracks, G and F#. I think I was more comfortable as a second soprano.” This subtheme of choral singing resulting in training in a high and limited tessitura occurred in
many participant accounts, with some even commenting specifically that it caused tension in their singing.

Erroneous technique teaching was another recurrent topic within the subtheme of choral singing technique. Two participants expressed concern that in the large group setting of choirs, and with directors who may not have much knowledge of voice physiology and technique, sometimes young singers receive technical directions that are not appropriate to their voices. The first, PJ, recounted coming to this realization while beginning to teach voice herself: “Choir directors, I think they can give directions sometimes that [are] counter-productive to vocal health, and that’s my biggest thing as a teacher right now – seeing people come in and saying, ‘Oh, my choir director saying [do this],’ and I’m like, ‘Oh no!’” The second, Jolene, described herself over-committing to technical directions from choral directors that may not have been directed at her: “I think I picked up a lot of bad habits that led to the build-up of tension. Sometimes kids take things the wrong way. You hear one thing and you make too much of it, or you overcompensate. Maybe the director is referring only to some people, and I’m such a keener that I would try hard to do everything that she said.” Both of these participants expressed concern that learning erroneous technique from choral singing was a possibility for young singers.

Another issue raised by participants was the experience of choral technique working counter to the solo technique they were attempting to build. Of particular concern was the sense that the choral technique requirement of creating a blending sound ran counter to one of the primary goals of solo singing technique: learning how to produce a sound that cuts through surrounding musical textures. Two participants shared the experience that singing with choral technique while attempting study and solidify solo technique had been counterproductive and confusing. Melina stated: “That much choir in the week, while trying to figure out a more classical operatic sound, it’s a little trying, I think.” PJ commented: “As much as I love group singing, that is not something that should be complimenting someone who is looking to go into the opera realm.” A number of participants found the choral technique requirement of producing a blending tone especially troubling. Madame Chiaroscuro, now also a vocal pedagogue, stated: “I’m concerned sometimes, when you get a student now that, singing in a choir, that voice is,
they want the non-vibrato that’s withholding… that can lead to a lot of problems.”

Another participant, Michael, spoke from his own experience of the difficulty of singing quietly enough to blend, while also trying to singing freely:

Choral singing is something that I’ve always struggled with. I always find my voice gets fatigued really fast. In order to blend I always feel like I’m singing a little bit softer, so figuring out that balance of not sticking out from everyone, but also still singing healthily… It’s in a very heady kinda space where if I was singing by myself you’d barely hear me… Yeah. I’m still having trouble singing in a regular kind of free voice, in a way that still meshes.

For Michael, attempting to create a blended tone quality seems to have required him to sing so softly that he slipped into an isolated-head registration – the same kind of registration which precipitated his development of PMTD. PJ also described becoming vocally fatigued as she tried to blend in choral settings and finding it curious that she did not experience this in any of her other singing: “My soprano voice does not blend. It refused to blend. Every choir, I would have to either pretend I was singing half way through, or just force through it. But no other singing would do that. Subbing in church choir, [the tone quality was] probably even more white, less vibrato in there.” PJ also hypothesized that her fatigue in choral singing was at least partly due to not knowing how to blend:

[The director] never wanted us to shut down vibrato, but she made contradictory statements like, ‘I don’t want you to hold back, but there is a healthy way in order to not have vibrato. You just need to find that health way.’ And there was no instruction on how to find that healthy way other than just to make it kind of a thinner heady tone.

All of these participants felt that choral technique worked counter to solo technique, and of particular concern was the requirement of creating a blending sound. Though perhaps this tone quality should be possible to produce healthily and without subverting solo technique, many participants felt that it caused tension, led to fatigue, and disrupted their solo technical progress. Some even suggested that this was because a healthy technique for producing this type of quality was not taught in the context of choir. This was a final recurrent choral voice technique factor.
These *voice technique* issues involved in choral singing, including limited tessitura singing, erroneous technique, and choral technique seeming to be at odds with solo technique, were very common throughout participants’ interviews, and seem to have been correlated with dysfunctional singing for many participants.

A closely related theme to that of lack of knowledge was *voice technique* itself. This theme emerged in many ways in the stories of participants, some describing it as an important element of their recoveries, or even listing technique deficiencies as causal factors in their development of Primary Muscle Tension Dysphonia. A number of participants brought up the topic of tessitura/*Fach*, many described registration as an important voice technique factor, several mentioned issues with breath management, a few related difficulties with articulator tension, and many brought up choral technique as a factor.

### 4.2.3 Physical Health

A more minor recurrent theme discovered in the analysis of the interviews was that of *physical health*. Several participants described themselves as having been prone to respiratory illness prior to their diagnosis for Primary Muscle Tension Dysphonia or having encountered respiratory illness just prior to a bout of PMTD. One participant felt that improvements in her vocal health were partly linked to a diagnosis and subsequent treatment of Celiac disease. A number of female participants mentioned hormonal health issues – voice changes that occurred simultaneously with puberty or pregnancy/childbirth or perimenopause/menopause.

#### 4.2.3.1 Diagnosis Preceded by Respiratory Illness

Respiratory illness appeared to be a factor in four of eleven participants’ development of PMTD. These four participants recounted their PMTD diagnoses as being preceded by an illness or a string of illnesses. In the case of Alana, she developed symptoms of a respiratory virus shortly before she was scheduled to perform her annual jury for school. After a period of vocal rest her voice was not adequately restored to perform, so her jury was postponed indefinitely, and she sought medical treatment resulting in a diagnosis of PMTD. The story of a second participant was similar. Joshua became ill during the final
rehearsals and subsequent performances of an opera production. At his lesson a few days later his voice was completely unusable. Just like Alana, Joshua also had to postpone his annual school credit performance several times before seeking out medical treatment. He was not actually diagnosed with PMTD at that time but was told that the problem he was having was functional rather than organic. When he encountered the same symptoms the following school year, without the catalyst of illness, he was diagnosed with PMTD. A third participant, Melina, described experiencing the health catastrophe of a burst appendix, followed by a year of many respiratory illnesses. She now believes that as a result she may have been compensating for viral symptoms both in her singing and speaking voice at that time. The following summer, on her voice teacher’s advice, she sought a medical opinion on her vocal health, and was diagnosed with PMTD. A fourth participant, Lynn, recounted experiencing chronic sinus infections and bronchitis and needing to use steroids so that she was able to still perform her singing obligations. Finally, unable to fully recover from one illness, Lynn sought medical attention from an ENT who diagnosed her with PMTD. During treatment, Lynn also experienced a setback to her progress when she suffered a severe respiratory allergy attack. For all four of these participants physical health and the more specific category of respiratory illness appeared to be a factor in their development of PMTD. All four recounted their PMTD diagnoses as being preceded by an illness or a string of illnesses. For all of these participants, significant retraining of singing technique was required to even begin to restore their voices to functionality, so respiratory illness appears to have been a catalyst rather than a cause. Perhaps voice technique issues left them vulnerable to developing acute symptoms with the onset of illness.

4.2.3.2 Predisposition to Respiratory Illness or Respiratory Illness Setbacks

In the stories of three other participants, physical illness was not directly linked to the diagnosis of PMTD, but it was still a factor. For two participants, predisposition to respiratory illness came up over the course of their interviews. For a third, respiratory illness did not play a role in her development of vocal dysfunction, but it did result in a setback to her treatment. In the case of Anne, the first participant, she described herself as
having been prone to respiratory illness all her life. From childhood to young-adulthood, she developed respiratory illnesses more often than most people, and those illnesses would affect her more seriously than most, resulting in severe coughing which often became almost chronic. When she was diagnosed with PMTD, her ENT suggested that her many respiratory illnesses may have been a factor in developing habitual poor voice use, which is consistent with the finding in the literature review that PMTD can be associated with learned adaptations after illness such as upper respiratory tract infections. Later in her training, she was also diagnosed with Celiac Disease. After engaging in the diet modifications required by that condition, Anne felt that she developed respiratory illnesses less often. A second participant, Madame Chiaroscuro, also described herself as experiencing recurrent respiratory illnesses over the course of her training and being quite nervous about the state of her voice from an early age. She remembered continuing to fall ill a lot during her later training, and these illnesses were often linked to performances, so she had so sing through them. A third participant, PJ, did not experiences illness related to her onset and diagnosis of PMTD, but did experience a setback to her treatment when she contracted a respiratory illness during her treatment. She completely lost her voice, and it was necessary for her to undergo additional hands-on treatments such as laryngeal massage to recover her voice during and after that illness. In the stories of all three of these participants, physical illness was not directly linked to the diagnosis of PMTD, but it was still a factor. For two participants, the topic of predisposition to respiratory illness arose over the course of their interviews. For a third, respiratory illness did not play a role in her development of vocal dysfunction, but it did result in a setback to her treatment. Perhaps in addition to respiratory illness being a catalyst in the development of acute PMTD, vulnerability to more regular and severe vocal health impacts from respiratory illness could be a sign or symptom of underlying vocal technique deficiencies and muscle tension, or a mild or developing version of PMTD.

484 Van Houtte, “Pathophysiology and Treatment of Muscle Tension Dysphonia,” 203-204.
485 Kunduk, 176.
4.2.3.3 Hormonal Health

Another aspect of physical health that was mentioned recurrently in the interviews was hormonal health with five of the nine female participants commenting on their hormonal health. One suffered from endometriosis, three suggested actual links between puberty and their vocal health, and one alluded to links between her vocal health and both childbearing and menopause.

For PJ, no direct connection was drawn between vocal health and hormonal health, but hormonal health was a significant personal issue for her, as she suffered from the painful uterine disorder endometriosis. She was treated for this condition around the same time as she was also struggling with PMTD, and the hormonal birth control treatment that she was prescribed caused severe physical and mood side-effects for her, including cystic acne, excess body hair growth, and depressive symptoms. It is possible that this physical ailment or its treatment influenced her vocal health in ways of which we are not aware.

For three other female participants, hormonal health related to puberty/voice change arose as a potential factor in their development of PMTD. Anne was diagnosed with PMTD at the age of thirteen. She suggested that in addition to other factors at the time, her voice changing might have been a factor in her development of PMTD. The second participant, Melina, did not have as precise a theory regarding voice change and vocal dysfunction, but she listed “becoming a woman” as one of the major changes that she thought might have impacted her vocal function in the years prior to her diagnosis with PMTD. The third participant, Diana drew a direct link between her hormones and vocal health when she confessed that after progressing through puberty her voice did not have the ease that it had when she was a child: “All of a sudden, from this clear bell tone, it felt like everything was covered in fuzz. As if you’d taken felt and clamped it down over everything. [It felt like it was] way more work. I was still able to do all the things, but it didn’t feel as good, and it certainly was not effortless.” Diana theorized that she might have used tension to try to overcome this muffled vocal quality that emerged during her puberty voice-change. For all three of these female participants, hormonal health may have been a factor in their development of vocal dysfunction, as they hypothesized a link between the vocal changes they experienced during puberty and their vocal health. The
coordination of the intrinsic laryngeal muscles is in flux during the period of sudden growth that occurs at puberty. Particularly in the female voice change, the interarytenoid muscles are temporarily weakened, leading to incomplete glottal closure and a breathy vocal quality, and the thyroarytenoid muscles thicken, resulting in a somewhat lower and huskier vocal quality. It is certainly possible that attempting to overcome these pubertal voice changes in singing could lead to muscular imbalances which, if exacerbated, would develop into PMTD. Additional education in the private voice teaching community – the teachers who train singers in this age group – on how to address female voice change may be needed. The potential for the development of PMTD in young female singers if these changes are not properly addressed must be further researched and discussed in the vocal teaching community.

In the case of the final female participant of five who mentioned their hormonal health, Lynn believed that some of her vocal dysfunction was related to her childbirth/postnatal experiences, and to perimenopause and menopause. She recounted: “The biggest challenge I got myself into [in that time period] was when I got pregnant and post-childbirth: I lost weight very fast while I was nursing, and I think I didn’t know the right exercises to do – ‘cause I had Caesarian sections with both of my children – I wasn’t really sure how to rebuild the musculature.” Around the time when she entered perimenopause, she was diagnosed with PMTD. Many other factors occurred simultaneously, so as she put it: “It’s hard to know what came first, the chicken or the egg.” However, the teacher who she works with now told her that many women encounter difficulty in their singing at perimenopause or in menopause if their technique was not solid before that time. From perimenopause and onward, for many years Lynn experienced inconsistency and dysfunction in her voice. It is possible that hormonal health factors played a role in the development of that dysfunction. Attempts to sing before the abdominal musculature was healed and rehabilitated could have led to breath management issues and exacerbated supraglottal tension and coordination issues already present at the level of the vocal folds due to her too-light registration. Changes in

hormonal levels lead to alterations of mass and hydration of the vocal folds; this again could have exacerbated registration related coordination issues.

Hormonal health was an aspect of physical health that was mentioned recurrently in the interviews. Five of the nine female participants mentioned their hormonal health over the course of their interviews. One suffered from endometriosis, three suggested actual links between puberty and their vocal health, and one described connections between her vocal health and both childbearing and menopause.

4.2.4 Mental Health

One of the most widely occurring themes that emerged from analysis of the interviews was that of mental health, including two subthemes, one minor and one major. The minor subtheme was mental health additive elements in the development of PMTD, and the major subtheme was the mental health impact of the disorder.

4.2.4.1 Mental Health Additive Elements

Mental health additive elements which arose or were explored in participant interviews included personality traits, pre-existing mental health conditions, and emotional stress around the time of the onset of the disorder. The literature review for this study demonstrated that it is difficult to completely rule out mental health as a causal factor in PMTD. However, it was concluded from much of the current literature that behavioural elements such as vocal overuse or misuse tend to be more commonly implicated in the development of muscle tension voice disorders in the population of professional voice users. Therefore, the below factors are considered additive rather than causal in the majority of participants in this study.

4.2.4.1.1 Personality Traits

As the literature review suggested that personality traits could be correlated with, or even causal in, the development of PMTD, participants were requested in-interview to briefly describe themselves in terms of personality. These descriptions did not lead to a conclusive finding. Many participants listed themselves as highly extroverted, but others labeled decidedly introverted. Some described themselves as emotionally reactive or
negative, but others defined themselves as emotionally well-adjusted and stable. Most participants described themselves as A-type, but it is possible that individuals with this type of personality would be more likely to respond to a call to participate in a study of this nature. Considering this, sharing this personality trait could have no bearing on the actual disorder.

4.2.4.1.2 Pre-existing Conditions or Tendencies

Several participants divulged pre-existing mental health conditions or tendencies that are also sometimes associated with voice disorders. These included ADHD, anxiety tendencies or a diagnosed anxiety disorder, and anxiety-causing past trauma.\(^{487}\)\(^{488}\)\(^{489}\)

One participant, Anne, revealed having an ADHD diagnosis, which gives her a tendency towards hyper-focusing on things that really matter to her, such as practising. This has sometimes led to over-practising. ADHD combined with extraversion is also sometimes associated with voice disorders because it often is correlated with vocal behaviours such as speaking a lot, quickly, and loudly. Two participants, Jolene and Madame Chiaroscuro, shared predispositions towards anxiety, and one, Michael, disclosed having a diagnosed anxiety disorder. Anxiety is correlated with muscle tension voice disorders because it often manifests with physical tension.\(^{490}\) Another participant, PJ, described herself as having mood fluctuation issues similar to the symptoms found in bipolar disorder – manic episodes during which she works twenty hours a day and loses weight from not sleeping, and depressive episodes lasting months during which she is unable to get out of bed. Due to the extreme nature of these manic episodes, it is not difficult to see how they could correlate with physical tension. Finally, three participants shared stories of childhood experiences that had lasting effects on their mental health. Lynn, an eldest

\(^{487}\) Barona-Lleo, 115.


\(^{489}\) Kollbrunner, 132.e1.

\(^{490}\) Holmqvist, 787.e1.
child who underwent family trauma at a young age, developed into a “survivor and fighter.” Jolene, severely bullied as a child, experienced significant social anxiety. Whitney, the daughter of a single mother with depression, co-dependency, and compulsive-spending issues, became what she describes as a “parental child.” It is possible that all of these traumatic early experiences could be correlated with the development of excessive physical tension. Just as anxiety is correlated with physical tension, some studies suggest that emotional stress is correlated with greater laryngeal tension.\textsuperscript{491, 492} Perhaps for these participants, physical tension at the laryngeal level was exacerbated by these stressful and anxiety-inducing childhood experiences. However, though all of these pre-existing conditions or tendencies could be linked to participants’ development of vocal dysfunction, there was not a strong link throughout the population between pre-existing mental health tendencies and the development of PMTD.

4.2.4.1.3 Emotional Stress Preceding Onset of Symptoms

Five participants’ stories included a strong element of emotional stress just prior to the onset of PMTD symptoms. The first participant, Joshua, was living in a foreign country, experiencing culture shock, isolation from his family and community, financial worries, and all the usual stress associated with graduate school. The second, Melina, was also living far from home – missing her family and community – while also experiencing conflict with her first university level voice teacher and a lack of fulfillment in her studies. The third, PJ, was diagnosed with PMTD during an extremely stressful time of term – exams, final projects and her first professional opera role – and right in the middle of two years of the worst mental and physical health she had experienced in her entire life, including panic attacks severe enough to involve ambulance trips to the hospital. In the case of the fourth participant, Whitney, her vocal dysfunction developed as her mother’s health deteriorated, leading to her eventual death. Finally, the fifth participant, Madame Chiaroscuro related many incidences of vocal dysfunction to her mental health,

\textsuperscript{491} Baker, “Patterns of Emotional Expression and Responses to Health and Illness in Women With Functional Voice Disorders (MTVD) and a Comparison Group,” 762-3.

describing them as correlated with bad break-ups, living alone in a foreign country, and other events. In her own words: “I suffered, and the suffering would go into the voice.” In the cases of all five of these participants’ their experiences of emotional stress just prior to the onset of PMTD symptoms could indicate a link between emotional stress and their development of vocal dysfunction. Perhaps for these participants also, physical tension at the laryngeal level was exacerbated by these stressful life events.

4.2.4.2 Mental Health Impact of PMTD

The second, and more significant, subtheme of mental health which emerged in all participants’ interviews was the mental health impact of the disorder. The emotional effects of the disorder were already foreshadowed by the fear and anguish previously discussed in the lack of knowledge theme, but also included loneliness and shame stemming from stigma associated with the disorder, social isolation resulting from the physical symptoms of the disorder, financial and career stresses, a threat to or loss/change of identity, a vicious cycle between physical and emotional elements of the disorder (in some cases even a kind of neurosis), and finally depression arising from the effects of the disorder.

4.2.4.2.1 Stigma/Shame

Many of the participants described feeling a sense of stigma or shame/blame associated with having a voice disorder, and therefore a need to keep diagnosis and treatment secret. Seven of the eleven participants, including students, young professional singers, and established professional singers, made direct mention of feelings of shame and fear of stigma in their interviews.

Four participants, who were students or very young professionals at the time of their diagnoses, relayed feeling ashamed of having a voice disorder, or feeling less talented or capable than their peers. In many cases this led to an aversion to sharing their diagnoses within their communities, and therefore a sense of social isolation. Upon diagnosis, Melina felt broken and betrayed by her own body, and did not want to divulge her condition to anyone because she was ashamed. Anne also was afraid to tell her first university voice teacher about her voice disorder because she did not want to appear to be
complaining or making excuses and did not want her teacher to have the preconceived idea that, due to her voice issues, she was a weaker singer. Even when she did divulge her diagnosis, Anne felt like her peers and teachers did not understand what she was going through, because their worst vocal days were better than most of her best days. Like Melina, Michael described feeling guilty – as if he had caused his vocal dysfunction – and worrying that he might not be as “talented” or “gifted” as other singers. He also feared that his secret would get out in the local arts community and negatively influence casting decisions in community shows. When his disorder did become somewhat public knowledge, some of his fears were realized when two local voice teachers suggested that he did not really need treatment but just needed a better teacher (his impression was that they were trying to poach him as a student) implying that his voice disorder was only a technique issue, rather than being severe enough to be considered a medical problem. Diana, a young professional singer, experienced very similar feelings of shame and lack of natural ability. During the onset of her symptoms she worried that she had caused her vocal dysfunction, or that it was a sign she was not a good musician. All four of these participants relayed feeling ashamed of having a voice disorder, or a having sense of imposter syndrome (that they were less talented than their peers), and this led to loneliness and isolation.

Three professional singers with established careers described even more severe feelings of shame and social isolation. Whitney recounted feeling afraid to share concerns about her voice with colleagues right from the outset, and later having those fears repeatedly justified. When signs of her vocal dysfunction were revealed during a solo in a professional choral performance, she observed her fellow professional choristers in a huddle which broke apart when they noticed she was present, after which all the other singers went their separate ways, never reaching out to her. Later in the development of her PMTD, Whitney confided in a group of singers that she had made an appointment with an ENT to explore what was happening with her voice. One of those singers responded with immediate judgement and blame, showing absolutely no compassion or support towards her. Similar to Michael’s experience with teachers in his community, Whitney also was subjected to a voice teacher suggesting that she did not need treatment but only needed to take voice lessons to correct her technique. She felt that this belittled
the degree of vocal dysfunction she was experiencing. After receiving these types of responses from the singing community, Whitney began to feel unable to attend events with other singers, fearing exposure and judgement.

Multiple times during her interview, Lynn described feeling ashamed of her voice disorder. She characterized her PMTD diagnosis as, “This terrible dirty secret.” Almost hoping that she was suffering from some kind of physical condition rather than it being the fault of her technique, she pursued testing for reflux. She worried that if people found out that she was suffering from a voice disorder they would view her as less skilled: “Culturally it was difficult. We equate vulnerability with weakness. We equate illness with weakness, the opposite of mastery.” She felt terribly alone in the experience, even as she was singing in A-list opera houses with incredible colleagues. When she saw other singers going through vocal health crises, she did not know how to reach out to them, just as for many years nobody reached out to her. At the time of her interview, she was the only singer at her level who was part of this study, and she was not surprised, saying, “The shadow figure is that, nobody speaks about it, so how are you going to find people, because nobody knows.” Lynn’s shame and isolation were extreme.

The third established professional singer, Madame Chiaroscuro, also described feelings of shame, self-blame and isolation associated with bouts of PMTD. She was only able to tell her closest inner circle – very few colleagues, and certainly no theatres – and when she confided in her teachers, they responded that they had never heard of PMTD, which made her feel even more alone in her experience. She divulged her episodes of vocal dysfunction to her agent, and when performance cancellations were necessary, her agent would lie to theatres about the reason, most commonly citing back problems and knee injuries. Existing in this web of vocal dysfunction and concealment was an extremely negative experience for Madame Chiaroscuro, as the need for secrecy compounded the associated emotional turmoil.

Participants’ interviews revealed that many of them experienced a sense of stigma or shame/blame associated with having a voice disorder, and therefore a need to keep diagnosis and treatment secret. Seven of the eleven participants, including students,
young professional singers, and established professional singers, directly referred to shame and fear of stigma in their interviews, and a resulting sense of loneliness or isolation.

4.2.4.2.2 Social Isolation from Physical Symptoms

In addition to experiencing isolation as a result of the stigma and shame associated with PMTD, many participants felt socially isolated by the physical symptoms of the disorder. Due to the need to take special care of their voices, some no longer felt able to participate in their usual social activities such as spontaneously spending time with friends, singing in ensembles, going out drinking, or even simply speaking. Michael, diagnosed with PMTD while still in high school, felt unable to join in with his peers being normal goofy teenagers for fear it would delay his recovery. Alana, a young university student who was experiencing severe symptoms of PMTD over the summer term recalled how difficult it was that she could not reconnect with her church choir the way she usually did when she was home. A third participant, Jolene, experiencing extreme vocal fatigue during choir rehearsals described feeling embarrassed as her peers observed her sitting silently for the majority of each rehearsal. Anne, another university student, described feeling frustrated that her peers could go out drinking and shouting over the music in a bar and experience minimal vocal fatigue, while she would have long-lasting effects from that kind of behaviour. A fifth participant, Joshua, described feeling socially isolated because his speaking voice would not always respond when he tried to speak. This made it difficult for him to communicate, and also caused him to feel isolated by the worry he saw reflected in those around him. All five of these participants felt socially isolated by the physical symptoms of their PMTD. They were no longer able to participate in their usual social activities or experienced difficulties communicating, which led to loneliness, and reduced quality of life.

4.2.4.2.3 Financial/Career Stress

Another mental health impact that many participants experienced as a result of developing PMTD was stress related to finances or career progression. For student-participants, their technical development was delayed by the disorder; they had to
postpone major academic milestones, or they were worried that if their disorder became common knowledge they would be denied opportunities. Advanced students or professional singers also feared damaging their reputations and missing important opportunities, but had the added concern of actual financial stress, at times having to make decisions about whether to fully commit to treatment and rehabilitate, or to pay their bills.

4.2.4.2.4 Threat to Identity

In addition to the more practical concern of finances or career impacts, many participants experienced a sense of threat to, loss of, or change to their identity. When asked about their childhood singing experiences, nearly every participant in this study described themselves as having “always sung” or loving singing from a very young age. Often participants’ earliest stories about singing had been relayed to them by their mothers – occurring so early that they were not able to remember themselves. For all of them, singing was not just a job. They pursued this career because of a love and passion for singing, so to fear never singing again was to fear the loss of something almost inherent to their beings.

Many participants directly referred to the centrality of singing in their lives over the course of their interviews. Anne, a young graduate student, characterized singing as her “everything.” Diana, a young professional singer, described singing as, “so tied to who I am as a person. I don’t know if I could recover from losing my voice.” Melina described her experience of being diagnosed with and treated for PMTD in terms of her identity being broken into pieces and trying to rebuild: “It made me pick up the pieces off the floor, but it wasn’t like putting them back together with glue. You had to melt them down and reinvent. You put so much on your identity! You’re like, I am what I do. Because it’s your body!” Madame Chiaroscuro, one of the most established opera singers who participated in the study, described the extent to which she identified as a singer: “It’s what you do and what you love and what you identify as: a singer. And when it’s not working, you’re suffering.” For all of these singers, these expressions of the importance of singing in their lives make it clear that the loss of that would have a devastating impact. Four participants described how the loss of singing led to reduced quality of life
because it resulted in a loss of their source of passion and primary mental health coping mechanism. In spite of how fundamental singing was in their lives, all three established professional opera singers in this study – Whitney, Madame Chiaroscuro, and Lynn – recounted considering quitting singing, because of how difficult it became during the experience of vocal dysfunction. For all three, the anguish of singing through dysfunction was just balanced by the devastation associated with the thought of not singing at all, which would have been a huge loss of identity.

Four participants – Whitney, Jolene, Melina, and PJ – described their identities being wrapped up in singing to an unhealthy degree. For instance, both Whitney and Jolene described their singing ability as what had previously made them special, and how, thus, the loss of singing ability was also the loss of a sense of identity. For Jolene, Melina, and PJ, recovery required a dramatic shift in identity: Jolene gave up singing for two years. Melina, redefined her self-identity as a multi-disciplinary artist. PJ, previously a driven classical singer, now takes no pleasure in singing classically and has no desire to pursue it as a career. Instead, she is now a recording artist and primarily sings in other genres rather than classical/operatic music. For these four participants, their identities were associated with singing ability to an unhealthy degree, and three made identity adjustments to overcome the emotional impact of their experiences with PMTD.

Many participants experienced a sense of threat to, loss of, or change in their identity resulting from their experiences suffering from PMTD. For all of them, singing was not just a job. They had pursued this career because of a love and passion for singing, so to fear of never singing again was to dread the loss of something almost inherent to their being. For several participants, this even led to them choosing to redefine their identities.

4.2.4.2.5 “Neurosis”/Vicious Cycle

Another severe emotional effect that many participants experienced was an almost obsessive or neurotic worry about the physical symptoms of the disorder. Nine of eleven participants confessed to still having a strong awareness of physical tension in their singing at the time of their interviews and six of those participants described developing
an almost obsessive fear of that tension. For several of those participants, the physical symptoms and emotional symptoms fed into each other, creating a vicious cycle.

Melina, reflecting on her experience of a neurotic fear of tension stemming from her vocal dysfunction, hypothesized that she may have continued treatment for longer than was necessary because of this. PJ recounted so deeply dreading the return of her acute PMTD symptoms that she could no longer allow herself to sing with any tension, often stopping in the middle of lessons and coachings because of the smallest sensation of strain. A third participant, Michael, described becoming hyper-aware/afraid of vocal fatigue, planning many rest-days into his schedule and panicking at the smallest signs of tension or fatigue: “I was afraid of developing it again. The smallest signs of fatigue I immediately took on as much bigger than they were.” A fourth participant, Jolene, still experiences fear of tension and fatigue years after being treated for PMTD. She recounted recently beginning to work on an assigned song, immediately feeling tension building as she sang it, and choosing to indefinitely delay singing that song. A fifth participant, Madame Chiaroscuro, confessed having spent many years extremely anxious about her voice to the point of consulting ENTs as a pre-performance precaution. A sixth participant, Anne, ten years after the onset of her disorder confessed: “I still think about the symptoms all the time. When my voice is tired it affects my entire being. When it’s not working, I don’t feel good. I’m thinking about it all the time. It’s never not part of my day.” For all six of these participants, worry about relapsing or redeveloping symptoms of PMTD became almost neurotic or obsessive.

Several participants described symptoms of vocal inconsistency leading to nervousness and fear which created still more tension and worsening symptoms – a vicious cycle between physical symptoms and emotional reactions. This exact phenomenon was identified in the literature review,493 494 and is also consistent with earlier findings that anxiety and stress can manifest as physical tension, sometimes even at the level of

494 Holmqvist, 787.e7-8.
laryngeal muscles. Michael, fearing vocal fatigue, would begin to guard his voice and sing cautiously when he thought he had sung long enough to fatigue his voice. He now hypothesizes that this careful singing was not as free as his usual singing, and that it actually tired his voice out, leading his original fears to manifest as a kind of self-fulfilling prophecy. Anne recounted experiencing nerves in performances because of the inconsistent functioning of her voice, and that nervousness adding more tension to her singing. Lynn also recounted the long-lasting emotional impact of singing through times of great vocal inconsistency, and the physical impact of that: “I just became terrified to sing. My voice became the enemy. I’d open my mouth and I didn’t know what was going to come out. I would have phases where I would sing quite well and feel good, sometimes back to back… it was like I had a different voice.” For all three of these participants, not only did the physical symptoms have an emotional impact, the emotional effects of those symptoms fed back into physical symptoms creating a vicious cycle or loop. For many other participants, a strong awareness of physical tension in their singing continued to linger at the time of their interviews, and six of those participants described experiencing an almost obsessive fear of that tension.

4.2.4.2.6 Depression

Over the course of treatment, not only did some participants experience reduced quality of life and ability to cope, most suffered from a degree of depression, and two were actually diagnosed with and treated for depression. When queried about their mental health throughout the course of the disorder, quite a few participants gave answers beginning, “Well, I wasn’t depressed, but…” or “I was never clinically depressed, but…” or “I narrowly avoided depression.” Several other participants, when asked to describe their mental health during these periods responded frankly: “Depression.” Finally, two participants, Melina and Jolene, divulged that they had been diagnosed with and

495 Holmqvist, 787.e1.


medically treated for depression that arose from their experiences with PMTD, even hinting at verging on suicidal. Considering that so many used the word “depression” when describing their mental health over the course of their PMTD, and that two underwent medical treatment for depression caused by their experiences with PMTD, the severity of the emotional impact of PMTD on participants could not be clearer.

The mental health impact of PMTD was the more significant subtheme of the two found in the larger theme of mental health. The emotional effects of the disorder were already foreshadowed by the fear and anguish previously discussed in the lack of knowledge/understanding theme, but also included loneliness and shame stemming from stigma associated with the disorder, social isolation resulting from the physical symptoms of the disorder, financial and career stresses, a threat to, or loss/change of identity, a vicious cycle between physical and emotional elements of the disorder (in some cases even a kind of neurosis), and finally depression arising from the effects of the disorder. The less significant mental health subtheme that was explored was mental health additive elements. These included personality traits, pre-existing mental health conditions, and emotional stress around the time of the onset of the disorder. However, the conclusion of the literature review regarding psychological elements in PMTD in professional voice users was that behavioural elements are more commonly implicated in the development of muscle tension voice disorders in this population, and this was born out in this study.

4.2.5 Problems with Medical Treatment

Another significant theme found during the analysis of the interviews was the theme of problems with medical treatment. In addition to some participants experiencing delays in seeking or receiving medical care because of lack of knowledge of the symptoms of the disorder on their own part or their teacher, some participants experienced delays in receiving diagnosis or treatment because of long waiting times in the medical system. Some participants encountered medical professionals who exhibited a lack of sympathy or understanding of the seriousness of the impact of the disorder. The prohibitive expense of treatment was an issue for many participants. Some participants ended treatment early or chose not to undergo certain tests because of the high cost. A few participants implied or stated that medical professionals they encountered had income-related conflicts of
interest and were encouraging pursuit of certain treatments because of the monetary gain associated. Finally, a number of participants experienced ineffective or only partly effective treatments.

4.2.5.1 Delayed Diagnosis/Treatment

Two participants experienced significant delays in receiving diagnosis and treatment for PMTD due to long wait-times in the medical system. Alana waited six weeks after her doctor’s appointment to receive a referral for an appointment to be examined by an ENT and an additional two weeks before that appointment. Approximately two additional months passed before she was able to begin treatment. In total, from her initial doctor’s appointment until beginning treatment, she was forced to wait almost four months. The second participant, Whitney, was on a waiting list for eight months to consult an ENT, all the while her vocal symptoms were worsening. These two participants were both still in active treatment at the time of their interviews: the first had been in treatment for only four months, but the second had already been seeking or actively receiving treatment for almost five years. These delays are particularly concerning considering that PMTD symptoms tend to worsen with delayed diagnosis, leading to more severe tension, and greater physical and emotional impact.

4.2.5.2 Medical Professionals Lacking Understanding

Another instance where the theme of problems with medical treatment arose was in participant encounters with medical professionals who lacked empathy for or understanding of the seriousness of the impact of the disorder. Whitney described being seen for diagnostic testing by her ENT’s fellows, followed by a rushed whirlwind of a consultation with her actual ENT. She was given little to no opportunity to describe her experiences with the disorder. Rather, her diagnostic experience was physician-led, as she was only asked specific questions which exhibited the doctor’s expectations surrounding causes. The participant described her encounters with this ENT: “[They] just wanted to know if I was in a car accident, or if I fell down the stairs, or if I had done anything to

498 Soni, 753.
throw off my neck… If you wanted someone to hold your hand and walk you through this, and actually understand you as a human being, that was not the place… [They] just didn’t have any empathy for it.” This extremely unpleasant experience exacerbated what was already a difficult time in Whitney’s life.

A second participant, Michael, had a deeply disturbing encounter with a doctor who completely refused to give him a referral for a laryngoscopic examination or an appointment with an ENT, in spite of having such severe tension that his speaking voice was impacted, and being entirely unable to phonate when he tried to sing. Michael’s story was reminiscent of the worst encounters with medical professionals described in the stigma section of the literature review:

He had asked me a bunch of questions, and he said, from the questions I answered, I don’t have any nodes or polyps or anything on [my] cords, big enough that would inflict, that would cause damage or something of the sort. Essentially, you’re fine, is what he was saying. Because I was able to speak, he wouldn’t give me a referral. I was telling him, I’m a singer, and I can’t sing right now. I need my voice. It is essential to me. And he said, well singing’s not… essential to life, or something dumb like that. So, he refused to give me a referral. He gave me this whole speech about how it costs him money and the health care system money, and I was wasting money by trying to get this scope. He made me feel really bad. He was talking about how I was taking money away from people who actually needed this money.

Because of his negative experience seeking a referral to consult an ENT, Michael chose to forego this diagnostic step and go straight to an SLP for treatment. Attempting to get a referral would have only further delayed his treatment, and he could not afford to pay out of his own pocket for a laryngoscopic examination performed by his SLP after being denied access to government-funded health insurance for this diagnostic procedure.

4.2.5.3 Expense

Expense was another aspect of theme of problems with medical treatment. Six of eleven participants commented directly regarding the prohibitive cost of treatment. Two participants, Michael and Diana, stated that they had undergone the bare minimum of treatments (in both cases about four once-a-week sessions) before attempting to continue their recoveries on their own, because they just could not afford to continue to pay for it.
Including these first two participants, four mentioned stopping treatment due to expense before considering themselves completely recovered. All four of these participants either eventually returned to treatment or commented that they wished they could go for more treatment or knew they should. A fifth participant, Whitney, mentioned the expense of treatment several times, commenting: “A lot of [my friends] have no concept of why I would do this for so long, and spend so much money. And I have had conversations with myself, often, like, should I quit? …Does this look like someone who wants to give up on their voice? No. So, like, just make sure the money’s in your bank account when you go.” A sixth participant, Madame Chiaroscuro remarked: “If I count up all the money that I’ve spent on ENTs all over the world, I think I would buy many houses and yachts.” When discussing treatments that are only geared towards alleviating symptoms, rather than addressing causes of dysfunction through rehabilitation and retraining, she stated, “…paying an outrageous sum of money [for that] … I just, I find it highway robbery.” She believed that this type of treatment would leave patients always needing to return for more, rather than giving them tools to retrain and rehabilitate themselves when tension arises in their singing. For all of these participants, the expense of medical treatment reduced their ability to pursue rehabilitation.

4.2.5.4 Ineffective Treatment

Ineffective treatment was a final aspect of the theme of problems with medical treatment. Three participants described ENTs recommending strange or very invasive procedures before any attempt had been made to treat the muscle tension through massage and behaviour modification. The first participant, Jolene, described the ENT she saw as, “a little crazy,” or “eccentric.” After diagnosing her, he talked for a long time about how her chakras were not in alignment and gave her a copy of a book he had written about chakras. Her impression was that he felt she needed to make major life changes to reduce stress and anxiety. While she agreed that this could be a useful element for her treatment, she knew that much of the anxiety in her life was caused by things beyond her control. She wanted a treatment that would help her address the physical and behavioural causes of her muscle tension. She chose to pursue treatment with an SLP who used with a combination of laryngeal massage and rehabilitative exercises. A second participant,
Diana, experienced an ENT following-up diagnosis by recommending himself to treat her PMTD. She found his recommendation for treatment drastic, stating, “It was a course of treatment that I was like, this feels aggressive considering there’s no permanent damage. So, let’s just fix how I’m making the sound.” She also chose to instead pursue treatment with an SLP who performed laryngeal massage and assigned rehabilitative exercises.

A third participant, Whitney, had an even worse experience with her diagnosing-ENT. This doctor recommended a surgical procedure involving a post-surgery waiting period of three to four months. Completely trusting this expert in her treatment recommendations, Whitney underwent the procedure three times to no avail. After the failure of these three surgical procedures, the ENT recommended a number of diagnostic tests to rule out neural causes for the vocal fold dysfunction, including one which involved placing a needle into the larynx from the exterior. Whitney found this extremely traumatic. All these tests showed was that there was no neurological component to the disorder. Throughout this lengthy course of diagnostics and treatment, the ENT never recommended that Whitney see an SLP for rehabilitation or retraining. By the time she did choose to seek out treatment with an SLP, she had been working for two and a half years unsuccessfully with her diagnosing-ENT. The first session she had with the SLP was the first success she had in treatment. However, the results of that treatment initially would not last more than a few days before her voice would fully return to its disordered state, perhaps indicating that the disorder had become deeply ingrained and more difficult to treat.

Three other participants described their ENT and SLP/voice therapist treatments as mostly successful but neglecting to treat or retrain their singing voices. Lynn recounted having success with her speech therapy treatment, clearing up many of her most acute symptoms, but still suffering from significant vocal inconsistency for many years before finally finding a teacher who was knowledgeable about rehabilitating singing voices. When asked whether her speech therapist had suggested she take lessons to aid her singing voice rehabilitation, she could not recall that being a recommendation. The story of a second participant was similar. Having seen many ENTs around the world, Madame Chiaroscuro confirmed that though some ENTs recommended therapists knowledgeable
about singing, or singing teachers knowledgeable about rehabilitation, many did not. She
stated: “The odd ENT would. A lot of them, though, you know, not every ENT knows
much about singing. Sometimes they do, sometimes they just cut – they’re surgeons and
all they want to do is cut. It’s rare to find someone who gets the singing psyche, that
knows about MTD and can advise. Often they’ll just almost poo-poo it, you know, and
not be so sympathetic.” A third participant, Anne, described stopping her voice lessons
and singing activities for six months while pursuing speaking-voice treatment with a
voice therapist. At that point, the therapist ended her sessions, feeling that Anne could
continue on her own. Her impression was that the plan was to retrain her speaking voice,
and that the singing voice would just follow-suit. She stated: “I don’t think there was ever
any real discussion about how to sing without the tension, or properly. There wasn’t
much knowledge… things for me to go and do, and actually get over the symptoms in
singing… and a lot of the tension did come from just how I was singing.” Anne went on
to suffer from many years of vocal inconsistency before making progress to a more
settled voice while working with two technique-specialist voice teachers. Ineffective
treatment was a serious issue that occurred in the stories of many participants, often
delaying their full recovery from the disorder.

The theme of problems with medical treatment appeared numerous times during the
analysis of the interviews. In addition to some participants experiencing delays in seeking
or receiving medical care because of lack of knowledge of the symptoms of the disorder
on their own part or also their teacher, some participants experienced delays in receiving
diagnosis or treatment because of long waiting times in the medical system. Some
participants encountered medical professionals who exhibited a lack of sympathy or
understanding of the seriousness of the impact of the disorder, to the point of refusing to
help participants. Expense of treatment was an issue for many participants, and some
even felt that medical professionals they encountered might have income-related conflicts
of interest – encouraging pursuit of certain treatments because of the monetary gain
associated. In a few case participants were forced to end treatment early or chose not to
undergo certain tests because of the high expense. Finally, a number of participants
experienced ineffective or only partly effective treatments.
4.3 Summary of Findings Part Two: Themes

As the interview transcripts were analyzed, several themes emerged. One theme was *lack of knowledge* including subthemes relating to voice technique, vocal health, and vocal repertoire, and a lack of knowledge of PMTD resulting in delayed diagnosis/treatment and significant emotional suffering. A second theme was *voice technique correlating with dysfunction* including subthemes relating to pursuit of upper range extension/high *Fach*, heavy or low *Fach*, registration, breath management, articulator tension, and repertoire-based technique, including but not limited to, choral singing technique and musical theatre practices. A third theme was *physical health* including subthemes of diagnosis preceded by respiratory illness, predisposition to respiratory illness or setbacks related to respiratory illness, and hormonal health. A fourth, and very important theme was *mental health*. This them included two subthemes: one minor subtheme – additive mental health elements – and one major subtheme – mental health impact. A final theme was *problems with medical treatment*, which included subthemes of delayed diagnosis/treatment, medical professionals lacking understanding, expense, and ineffective treatment.
Chapter 5

5 Discussion and Implications

This chapter begins with a discussion and interpretation of the findings, including medical and pedagogical elements of participants’ experiences. The discussion aims to support the two research questions that framed this study which asked:

1. In what ways are singers affected by PMTD?
   a. In what ways are singers physically affected by PMTD?
   b. In what ways are singers emotionally affected by PMTD?

2. What is the relationship between vocal pedagogy in the studio context, and PMTD?
   a. in terms of vocal technique?
   b. in terms of repertoire?

The discussion is followed by an analysis of implications for practice and recommended areas to consider for further research.

5.1 Discussion

The purpose of this study was twofold. First, it examined the narratives of classical singers with PMTD in order to discover any emergent themes relating to the disorder in this population addressing causes/development, incidence, impact/severity, treatment, and recovery. Secondly, as described earlier, in obtaining and sharing these narratives, this research created a space for voices to be heard that may have previously been rendered voiceless both by the disorder and the perceived stigma from within the singing/vocal pedagogy community, thus the title of this monograph. The scope of this study was purposely broad in the hope of shedding light on the many facets of this topic, as well as giving a voice to participants. The findings of this study are significant to both the classical voice pedagogy and medical communities, as the data gathered illuminates important medical and pedagogical factors and lends a human face to the experience of PMTD in classical singers. It has opened up conversation about PMTD in classical
singers, thereby reducing the stigma of vocal dysfunction in the classical singing community. The findings also point to the possible need for systemic changes to be made in order to more effectively prevent and treat PMTD and other chronic voice disorders in classical singers, as well as suggesting potential directions for future research.

5.1.1 Medical Discussion

There have been great advances in the field of medical treatment of the professional voice since 1969 when The Voice Foundation – the world’s longest-standing organization dedicated to voice research – was created, bringing together physicians, scientists, speech-language pathologists, performers, and teachers to create an interdisciplinary model for the care of professional voice users. Additionally, participants described many positive elements to their treatment experiences in this study. For example, Melina confessed that though she felt isolated from her peers by her diagnosis with PMTD, the support she received from her incredible SLP and RMT went a long way towards making up for that. However, other participant experiences make it clear that there is still a great deal of work to be done. All participants described the severe impact of PMTD on their vocal function, and equal or greater mental health effects, including stigma, social isolation, financial stress, threat to identity, and even clinical depression. Considering the intensity of their singing voice demands, it is unsurprising that for all participants, the singing voice was much more severely affected than the speaking voice. Based on their stories, had the demand of elite singing not been present, in many cases, symptoms would not have progressed to as serious a level, and many participants would likely not have even pursued diagnosis and treatment. Pursuit of medical attention was for the purpose of diagnosing and resolving dysfunction in the singing voice. However, medical professionals who had no understanding or empathy for singing voice dysfunction, or who prescribed ineffective or incomplete treatment were encountered by five of eleven participants in this study – far too large a number given the severity of the impact of PMTD on this population.
5.1.1.1 Unethical Refusal of Treatment

One of the most abhorrent experiences of this kind occurred in the case of Michael, a young participant of this study. A family doctor refused to write him a referral for a laryngoscopic examination to diagnose the causes of acute symptoms in his singing voice and moderate symptoms in his speaking voice. This doctor expressed the opinion that singing was not essential to life and shamed Michael, accusing him of diverting and wasting government money needed for the diagnostic testing and treatment of other patients. As a result, Michael was never examined by an ENT and never received a laryngoscopic examination, reducing his chances for an accurate diagnosis. In addition to these tangible negative impacts, receiving these comments devaluing both his vocation and level of dysfunction from a person he should have been able to trust, increased the emotional impact he experienced from the disorder.

5.1.1.2 Incomplete Treatment – Neglected Singing Voice

Again, considering that participants were experiencing dysfunction in their singing voices, it is surprising that many medical professionals encountered by participants in this study did not suggest that voice lessons to correct singing technique with a singing voice specialist or voice teacher knowledgeable in voice rehabilitation would be a crucial element to treatment. Three participants described their speech therapy as successful at remediating acute symptoms, but either not returning them to full function, or not addressing the underlying causes of dysfunction, resulting in a full relapse at a later date. All three hypothesized that this was due to treatment which neglected to treat or retrain their singing voices. Lynn recounted having success with her speech therapy treatment, clearing up many of her most acute symptoms, but still suffering from significant vocal inconsistency for many years before finally finding a teacher who was knowledgeable about rehabilitating singing voices. When asked whether her speech therapist had suggested she take lessons to aid her singing voice rehabilitation, she could not recall that being a recommendation. The story of a second participant was similar. Having seen many ENTs around the world, Madame Chiaroscu confirmed that though some ENTs recommended therapists knowledgeable about singing, or singing teachers knowledgeable about rehabilitation, many did not. Her rehabilitation skills have been a
patchwork, learned from a variety of medical professionals and teachers over the course of many encounters with PMTD. Sometimes she had to ask herself, “If I had it, and I would learn how to rehabilitate, why would it recur?” She now theorizes that it was due to unaddressed technical and repertoire issues – the kinds of things that should be addressed by a voice teacher recommended by a medical professional. A third participant, Anne, stopped taking voice lessons and pursuing singing activities for six months after her diagnosis with PMTD while undergoing speech therapy. At the end of that six months, the therapist ended her sessions, feeling that Anne could continue on her own. Anne’s impression at that time was that when her speaking voice had been retrained her singing voice would just follow-suit. However, this was not the case. Anne went on to suffer from many years of vocal inconsistency. Shortly before her interview, she finally began making progress towards having a consistent singing voice under the tutelage of two technique-specialist voice teachers. For Lynn, Madame Chiaroscuro, Anne, and other participants, it is puzzling that many medical professionals did not suggest or prescribe voice lessons to correct singing technique as part of, or a follow up to treatment. Participants were experiencing dysfunction in their singing voices, and from many of their stories it was linked to their singing activities. It seems obvious that neglecting to retrain the singing voice meant their treatment was incomplete, and would lead to ongoing dysfunction or even recurrences of acute symptoms. This indicates that there should be greater collaboration between medical professionals and voice teachers in treating PMTD patients. Perhaps particularly ENTs who specialize in treating voice disorders in singers could make an effort to connect with the local voice teaching community in order to compile a list of voice teachers with the knowledge/skills to rehabilitate singing voices. NATS chapters could be a useful resource in trying to locate, and form relationships with this type of teacher.

5.1.1.3 Conflict of Interest – Monetary Gain in Symptom-Only Treatment

Even more concerning to one participant, Madame Chiaroscuro, was the existence of medical professionals who recommend courses of treatment for PMTD that are almost entirely comprised of symptom remediation rather than addressing causes. Referring to
the treatment method of laryngeal massage/manipulation, she acknowledged it as a useful tool when used in conjunction with exercises addressing the causes of dysfunction through retraining and rehabilitation, but denounced it as unethical – going so far as to describe it as “highway robbery” – when used in isolation: “When you go in and he [manipulates] your throat…you wake up the next day and the MTD is back. This is not going to get rid of it. You have to do the work from a pedagogical point of view. You need to do the physio.” Again, for patients experiencing dysfunction in their singing voices linked to their singing activities, it is puzzling or even troubling that some medical professionals would treat only symptoms rather than working to correct causes such as flawed foundational singing technique. It again seems obvious that neglecting to retrain the singing voice would lead to ongoing dysfunction or even recurrences of acute symptoms – a potentially profitable state of affairs for medical professionals performing these necessarily ongoing treatments.

5.1.1.4 Lack of Compassion/Unsuccessful Treatment from Acclaimed Specialist

Unfortunately, these kinds of diagnosis and treatment experiences – with medical professionals prescribing incomplete/ineffective treatment or lacking empathy/compassion – occurred even with those who specialized in diagnosing and treating the singing voice. Whitney had an extremely negative diagnosis and treatment experience with a highly celebrated ENT with a practice primarily dedicated to working with professional singers. At her appointment, Whitney hardly had a real chance to meet with this ENT or share her history and symptoms. Instead, after being processed by the ENT’s fellows, she had only an extremely brief and rushed-feeling physician-led diagnostic interview. In this interview Whitney was only asked very specific questions, which seemed to display the doctor’s bias surrounding the causes of her vocal dysfunction, rather than being allowed to share her own insights. She was only asked about physical experiences such as head and neck injuries, rather than voice behaviour/technique or the emotional life events surrounding the development of her vocal dysfunction. The prescribed treatment was comprised of several surgical procedures, rather than either symptom-reduction, in the form of laryngeal massage, or
rehabilitation, in the form of voice exercises. When these surgeries proved unsuccessful, the ENT followed-up with a series of progressively more invasive and trauma-inducing diagnostic tests. Over the course of this lengthy and unsuccessful treatment process, this ENT never assigned Whitney any vocal exercises or recommended that Whitney see an SLP or voice teacher, and also never addressed the potentially tension-exacerbating or causal force of her mother’s end-of-life health-decline. When Whitney did finally pursue successful treatment, with an SLP who used both laryngeal massage and rehabilitative exercises, and addressed her in a compassionate and human way, it was entirely independently from that celebrated singing-voice specialist ENT. Perhaps because of the lengthy delays in receiving effective treatment, Whitney’s recovery was a long and painstaking process. It was years before she was able to use her voice consistently enough to even consider a return to voice lessons to begin retraining.

For every participant in this study, the singing voice was more significantly impacted than the speaking voice. This is unsurprising, given the extent of their singing voice demands. In fact, it seems that in many cases symptoms would not have progressed to as serious a level, and participants would not have even pursued diagnosis and treatment, had the requirement of elite singing not been present. Pursuit of medical attention was for the purpose of diagnosing and resolving dysfunction in the singing voice. Additionally, all participants described the severe impact of PMTD on their mental health, including stigma, social isolation, financial stress, threat to identity, and even clinical depression. However, too many participants experienced encounters with medical professionals who had no understanding or empathy for singing voice dysfunction, or who prescribed ineffective or incomplete treatment. Though over the past fifty years there have been great advances in the field of medical treatment of the professional voice, and though many participants described positive elements to their treatment experiences in this study, these other experiences make it clear that there is still a great deal of work to be done. Greater collaboration between medical professionals and voice teachers is necessary for effective treatment. Important interdisciplinary centres for voice treatment, like those described by Dr. Robert Sataloff in his Professional Voice: The Science and Art of Clinical Care, exist around the world, particularly in major centres. However, even in the fourth edition of this text, published in 2017, Sataloff acknowledges that most ENTs and
SLPs lack the detailed knowledge of singing to adequately return the singing voice to the necessarily high level of function, and the accreditation process for singing voice specialists is in need of development and standardization.\textsuperscript{499} This fact was born out in the experiences of the participants of this study.

5.1.1.5 Two-Tier Health Care in Ontario, Canada – Institutional Delays

Two other concerns with medical treatment arose in this study that have little to do with the effectiveness of medical practitioners at diagnosing and treating PMTD in classical singers. Rather, these concerns have to do with the health care system in Canada, and more specifically Ontario: institutional delays in the diagnosis and treatment process, and the considerable expense of treatment. Two participants experienced significant delays in their diagnosis and treatment processes because of lengthy waiting lists to see specialists. Alana waited two months after her initial doctor’s appointment before she was able to be examined by an ENT. Two additional months passed before she was able to begin treatment. Whitney was on a waiting list for eight months before she was examined by an ENT. These delays are particularly concerning considering that MTD symptoms tend to worsen with delayed diagnosis,\textsuperscript{500} leading to more severe tension, and greater physical and emotional impact. These two participants were both still in active treatment at the time of their interviews. It is possible that their lengthy wait-times were a factor in their relative lack of success in treatment. A number of other participants chose to forego the step of seeing a general practitioner to request a referral to an ENT. These participants either did not undergo a laryngoscopic evaluation during diagnosis or chose to pay out-of-pocket for a laryngoscope not covered by government medical funding at specialist clinics. The government-funded medical system in Canada and Ontario allows for more equal access to medical care than some other countries. However, participant experiences in this study suggest that a combination of the shortage of specialists such as ENTs in


\textsuperscript{500} Soni, 753.
some regions, and the availability of unfunded private services could be leading to the development of a two-tier system in which those able to pay more receive high quality care.

5.1.1.6 Two-Tier Health Care in Ontario, Canada – High Expense of Treatment

This same concern also arises when considering participants’ experiences of expense of treatment. Six of eleven participants commented directly regarding the astronomical cost of treatment. Four participants described ending treatment due to expense before considering themselves completely recovered. All four of these participants either eventually returned to treatment or confessed that they wished they could receive more treatment or knew they should. Several of these participants were undergraduate students who were disappointed to discover that their university-provided health insurance did not include speech therapy. Another was a young artist who did not have health insurance. Two other participants, established professional singers, confessed that the amount of money that they had spent on treatment was viewed as exorbitant by friends and family, or if used for other purposes, this amount of money could have paid for a much higher scale of living. It is worrying that in this study, a larger proportion of participants were unable to pay for complete treatment than those who could afford to do so, and even some of those who were able to field the expense described it as a burden. This again points to a possible two-tier healthcare system emerging. This is particularly troubling in a demographic (professional classical singers) that is primarily self-employed, and therefore lacks access to employer benefits such as health-insurance. It also seems like a huge oversight that for many participants university-provided health plans for classical singing students would not cover even a percentage of the cost of speech therapy.

Perhaps as awareness of PMTD rises, conservatories and music faculties at universities should consider giving feedback to administration about the kinds of special medical needs that can arise from elite voice training and voice use, building towards the same kinds of advances that have evolved in the relationship between medicine and the field of sport. At some university music schools, collaborations with medical specialists are already being explored; here at The University of Western Ontario, Dr. Kevin Fung has a
cross-appointment between the Department of Oncology and the *Don Wright Faculty of Music*, and the voice students of the music faculty are able to access services when needed.

5.1.1.7 Recommendations for University Music Faculties

Addressing the long wait-times and medical professionals’ inconsistent understanding of diagnosis and treatment of the professional voice seems like an insurmountable task, especially in the face of cuts in both healthcare and education at the provincial level. For universities with both music faculties and medical schools/faculties of communication sciences and disorders, perhaps voice departments could make an effort to build partnerships benefiting the students of both programs. Creating opportunities for voice students with vocal health concerns to volunteer to be used as participants in medical instruction could allow for a reduction in the delays and expense associated with diagnosis and treatment and provide opportunities for medical and speech language pathology students to practise diagnosis and treatment skills on live participants. Partnerships between medicine and music could also expose students from both streams to the idea of career paths with intersections between these topics. This could lead to greater availability of medical specialists who understand the intricacies of diagnosing and treating professional voice users, and voice teachers and singers with an enhanced knowledge of voice health and pathology.

5.1.2 Voice Pedagogy Discussion

Many of the participants in this study made a point of stating that they did not want to blame their voice teachers for their vocal dysfunction. All but two of the voice teachers described by participants appear to have had good intentions and made positive impacts on participants’ voices. (The two teachers whose instruction led to solely negative outcomes included Melina’s first university voice teacher who was intentionally cruel to her, and Diana’s second university voice teacher who never addressed the fact that she cried during or after every lesson). For many participants, their voice lesson experiences were not only somewhat positive, but instruction from the right teachers was key to their recoveries. For example, Jolene declared that she would never be able to express how
grateful she was to the voice teacher with whom she worked after diagnosis, describing them as a “life saver.” However, upon analyzing the themes that emerged from participants’ interviews, it is clear that the system of classical voice teaching failed all participants in a variety of ways. Elements which created a system in which chronic voice disorders could develop undetected included a lack of student understanding of the purpose for technical exercises and how to practise effectively, only surface knowledge of vocal health among students, deficiencies among both students and teachers in knowledge of chronic voice disorders and more specifically PMTD, and common cultural attitudes or misconceptions especially in areas of technique and repertoire. This study does not intend to blame or find fault with individual voice teachers, as that would not be a helpful way of dealing with systemic issues in the culture of voice teaching. However, shedding light on these issues is the only way to begin providing both teachers and students with the information necessary to avoid repeating the traumatic experiences of the participants of this study.

5.1.2.1 Multifactorial Etiology of PMTD in Classical Singers – Mental/Physical Health

The etiology of PMTD in this population of classical singers was multifactorial, as was described in more general populations in the literature review. Causal factors included personality characteristics, mental health tendencies or diagnoses, physical illness, emotional stress, and voice technique/load (including Fach classification). All participants possessed varying levels of the most common personality traits associated with PMTD – perfectionism, extraversion, and a tendency towards experiencing emotions strongly – which can lead to anxiety or physical tension, and vocal overuse. Some of these participants even had diagnosed mental health conditions which are correlated with vocal dysfunction – anxiety disorders, ADHD – which also can lead to physical tension and vocal overuse. A number of participants also were in the midst of periods of extraordinary emotional stress or physical illness around the time of their development of serious or acute symptoms. Several female participants linked their development of vocal dysfunction to their hormonal health – puberty/voice change, menstrual side-effects, and menopause. The literature drew attention to a lack of attention paid to female voice
change in the vocal pedagogy and health communities, and a resulting delay or neglect of treatment of female puberphonia. The literature also confirmed the existence of premenstrual dysphonia, a cyclical experience of vocal fold swelling and associated difficulties with phonation experienced by some female singers. It is possible that singers could develop compensatory techniques and tension in an attempt to sing through hormonally associated vocal dysfunction. A few participants acknowledged having a tendency toward respiratory illness, and for some respiratory illness was a clear catalyst in their development of PMTD, when they sang through said illnesses. For some participants with a tendency toward recurrent bouts of respiratory illness, the question arose: had illness led to vocal dysfunction, or had technique weaknesses/vocal dysfunction led to greater vulnerability to the effects of illness? In the literature review, articles linking chronic cough and MTD suggested that there is a lack of clarity in the literature surrounding this exact question: is chronic cough causal in MTD or are muscle tension and laryngeal irritation causal to long-term bouts of coughing?  

Perhaps it should become common practice for voice students to undergo a medical examination prior to beginning elite-level (university or conservatory) training, just as it is often recommended to consult a doctor before beginning any new exercise regimen. This was recommended by two articles in the literature review, both of which found that many classical singing students had some markers of voice disorders prior to beginning elite training. It might also be useful for voice teachers to be aware of the mental and physical health elements that commonly correlate with voice disorders, to allow them to be extra-vigilant for symptoms in students possessing these characteristics.

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5.1.2.2 Etiology of PMTD in Classical Singers – Voice Technique

Though there were a variety of potentially causal factors at play for every participant, all participants also exhibited issues related to voice-study (technique, Fach assignment, repertoire, and vocal load) and without these issues and the necessity of singing at an elite level, it is doubtful that they would have sought or required medical care.

5.1.2.2.1 Lack of Student Understanding of Technique/How to Practise

One of the most common elements across participants’ stories was a lack of understanding of the purpose for technical exercises and how to practise effectively. It was not always clear whether this was due to a lack of explanation offered by teachers or difficulty grasping the explanation given on the part of participants. Some participants believed that they had no memory of teacher descriptions of technical concepts because they had been too young at the time to grasp and store those explanations. Others remembered their teachers having an almost paternalistic or patronizing attitude – suggesting that participants would not understand the technical reasons behind an exercise, or that understanding would even be counter-productive. Still others felt that some of their teachers had not used technique for any kind of goal, perhaps not even having adequate pedagogical knowledge themselves to do so. Across all cases, there seems to have been a spectrum, with “lack of student understanding” on one end, “lack of teacher explanation” on the other, and varying combinations of these factors across the continuum. However, this lack of understanding of technique and how to practise was definitely a factor in the development of PMTD for a large proportion of participants. Many admitted to using warm-ups and technical exercises ineffectively, over-practising, or being unaware of their own major technical issues for months or years. If this experience is as wide-spread as this sample indicates, there needs to be systemic change to how voice technique is being taught in the classical singing community, perhaps in the form of better professional development opportunities for teachers of all ages and stages of voice pedagogy.
5.1.2.2.2 Surface Student Knowledge of Vocal Health

Similarly, nearly all participants reported being taught very little about vocal health prior to their PMTD diagnoses. Some of the most important elements to understand as “vocal athletes” include the difference between normal levels and chronic or pathological levels of vocal fatigue, or which vocal symptoms during illness preclude singing, and which are safe to sing through. However, the kinds of vocal health instruction participants reported receiving was at best surface – suggestions to stay well-hydrated and avoid obvious vocal abuse such as yelling – and at worst, actually erroneous – being taught to avoid certain foods due to their influence on mucous texture/viscosity. (The belief that dairy consumption results in thicker mucous has been debunked in scientific studies.\(^{504}\)) Some participants recounted that they were encouraged to sing through illness – or even almost goaded, “You’re going to have to do this when you’re in the industry! You won’t be able to take a break.” – but did not receive any instruction regarding when it was safe and when it was potentially damaging or could delay recovery. This surface level of, or in some cases even incorrect, vocal health instruction was another factor in participants both over-practising and building tension into their technique by singing when ill.

5.1.2.2.3 Unbalanced Student/Teacher Knowledge of Vocal Pathology (Chronic Dysfunction)

In addition to only possessing surface knowledge of general vocal health, a large proportion of participants also confessed to having had an unbalanced understanding of vocal pathology. Many reported having been warned about organic voice disorders such as vocal fold nodules (and erroneously believed that this kind of vocal fold damage was almost invariably permanent), but had heard nothing about the existence or symptoms of chronic disorders (such as PMTD). As a result of their sparse knowledge of general vocal health, and this unbalanced understanding of vocal pathology, especially student-level singers either did not know what vocal fatigue was, or at what point it passed from being a normal level/frequency to becoming pathological. Some participants reported that, as a

\(^{504}\) B. Wuthrich et. al., "Milk Consumption Does Not Lead to Mucus Production or Occurrence of Asthma,” *Journal of the American College of Nutrition* 24, no. 6 Suppl (December 2005): 547S-555S.
result of repeatedly being told, “singing is hard work.” they believed that their sensations of difficulty/effort when singing were normal. Not understanding that this fatigue/effort and other worsening symptoms were potential signs of vocal dysfunction, several participants continued with behaviours which exacerbated their fatigue and tension, such as over-warming and over-practising. Once symptoms had progressed to the point at which they were causing significant dysfunction, many participants feared that they were experiencing permanent organic damage to their vocal folds – the type of dysfunction they had been warned about. Due to lack of knowledge, but also this fear, many participants did not share what they were experiencing with their teachers or pursue medical care until their symptoms had progressed into a state of serious or acute dysfunction. In many cases, participants employed self-imposed periods of vocal rest to attempt to resolve the dysfunction they were experiencing, though what they were experiencing was symptomatically much more serious than simple vocal fatigue or laryngitis. Other participants unknowingly spent frustrating years singing through moderate symptoms of dysfunction. For many participants, this lack of understanding of chronic voice disorders also led to a much more severe emotional impact both pre- and post-diagnosis, feeling isolated in their experience, experiencing stigma/shame, fearing permanent impact to their voices, and in some cases even resulting in depression and suicidal ideation. It is clear that students’ sparse knowledge of voice technique and vocal health, and lack of familiarity with chronic voice disorders, led to the development or exacerbation of symptoms, delayed diagnosis, and an aggravated emotional impact for some participants. What is not clear is why adequate vocal health instruction is not happening. Perhaps voice teachers do not have enough knowledge in this area, or maybe with all the technical and repertoire requirements to be covered in lessons there is not enough time to also address vocal health. Perhaps, if this kind of knowledge is not being included in voice lessons, voice students should be required to take vocal pedagogy courses earlier in their degrees, and from specialists in this area. (This recommendation could also likely be applied to the structure of instrumental music instruction in university and conservatory settings).

Teachers also did not recognize the symptoms of PMTD in their students as voice dysfunction. It is shocking the level of vocal dysfunction that these and other participants
described reaching before their teachers noted that there might be an issue beyond poor or unestablished technique and recommended seeking a medical opinion. In many cases, even at the stage of near-acute vocal dysfunction, the onus was on the student to divulge their experiences to the teacher, and, even then, students sometimes had to push their teachers for a referral to a medical practitioner. Though this may have been appropriate in some instances of the disorder with a more sudden onset or in the cases of trained professional singers who were not as regularly receiving voice lessons, it is not reasonable to expect inexperienced students to know when they need to be referred for medical care. Students who are in the process of receiving foundational voice technique and vocal health instruction naturally depend on their teachers to be capable of recognizing when vocal dysfunction is serious enough to warrant seeking a medical opinion. Upon participants receiving a diagnosis of PMTD, many teachers confessed to having never heard of the disorder, leaving students with an even greater sense of isolation and shame. In all cases, vocal symptoms did not affect the speaking voice, or had a much less significant effect on the speaking voice than the singing voice, perhaps encouraging voice teachers and students to consider the symptoms as voice technique faults rather than technique issues which had progressed to the level of symptoms of voice dysfunction. This appears to confirm that delays in diagnosis occurred due to a lack of knowledge of the symptoms of chronic voice disorders among not only voice students, but also voice teachers.

5.1.2.2.4 Cultural Attitudes About Talent

More disturbing than lack of vocal health knowledge leading to delayed diagnosis is that cultural attitudes about talent in the classical singing community led to a similar result for a few participants. Some participants described sensing prior to diagnosis and treatment that their teachers were frustrated with their lack of technical progress. Jolene, experiencing stalled technical development, was even instructed by her teacher to give up on her dream of pursuing a performance degree, implying that she did not have the inborn vocal qualities to pursue this path. Later, Jolene and other participants learned that the reason for their lack of progress or inability to perform was not a lack of natural ability. It was PMTD – a voice disorder. Perhaps the attitude within the voice community that some
students are naturally “talented,” and some are not, could be leading teachers to write-off students who are not making easy technical progress, leaving them suffering from undiagnosed chronic vocal dysfunction. Regardless, it is clear that broad gaps in knowledge and cultural attitudes in classical vocal pedagogy left participants vulnerable to reinforcing disordered singing through unhealthy practising and to delayed diagnosis and severe emotional impact when they developed PMTD.

5.1.2.2.5 Technique and Dysfunction – A Spectrum/A Fine Line

The physical symptoms of PMTD in classical singers appear to be similar to, or the same as some voice technique issues: elevated laryngeal position, vocal fatigue or effortful singing, difficulty allowing airflow or involuntary breathy quality in phonation (possibly a manifestation of vocal fold bowing or other types of gap between the folds), voice not projecting or resonating, delayed phonation or difficult onsets, voice cracks, obvious register breaks or imbalances, a “hole” in the lower middle of the voice where the sound will not resonate or project, lack of bloom/spin/shine to upper register, discomfort in neck muscles. Typically, participants were able to speak without much difficulty until their symptoms reached an acute stage, and even then, they spoke with much more ease than they sang. After diagnosis, many participants felt shame, believing themselves to be “at fault” for developing a voice disorder by using faulty technique or practising improperly. They felt untalented, comparing themselves to their peers who did not have diagnosed “voice disorders,” or technical challenges with a comparable negative impact, and worried that teachers and directors would exclude them from opportunities, believing them to be less able than their healthy-voiced peers. Some voice teachers suggested to participants that they were not actually experiencing a voice disorder, but were only exhibiting technique issues. If the symptoms of PMTD are so difficult to distinguish from technique mal-coordination, and if technique issues are causal in the development of PMTD in classical singers as this study suggests, there is an extremely fine line between what is a technical issue, requiring training/re-training, and what is dysfunction, requiring treatment.

While the actions of both students and teachers certainly appear to have had causal effects in the development of PMTD for these participants, the idea of blaming either
group is unhelpful. As stated in the literature review, elite vocal users such as classical singers are at elevated risk of developing voice disorders. Considering how complex voice training is, and how tremendous the vocal tasks of classical or operatic singing are, incidences of vocal dysfunction should not be surprising or stigmatizing. However, ideally, these disorders would at least be identified and treated in earlier stages. Perhaps teachers should discuss plateaus in technical progress with students if they persist longer than a few months (for instance, lack of progress on register integration, ability to produce a clear tone, ability to achieve and sustain appropriate airflow), attempting to ascertain how and how much they are practising and what other elements of vocal load exist. If it seems that students are taking appropriate steps and progress continues to be slow or non-existent, possibly teachers should recommend seeking a medical opinion to guide future training. However, it is not clear whether ignorance of chronic vocal disorders is the only reason why many teachers did not refer participants to medical care sooner. Perhaps the same stigma that led many participants to fear sharing their experiences with vocal dysfunction could also lead teachers to choose to be silent for fear of being blamed for their students’ dysfunction.

5.1.2.2.6 Specific Technique Elements/Cultural Attitudes

In the stories of the participants of this study, a relationship was revealed between a number of specific technique elements and PMTD, illuminating some potentially harmful cultural attitudes in classical voice pedagogy. These included range extension, registration, flawed choral singing technique, breath management, and articulator/supraglottal tension.

5.1.2.2.7 Tessitura/Registration/Choral Singing

Three specific technique elements, upper range extension, registration, and flawed choral singing technique, seemed to be related not only to PMTD but to each other. Nearly all participants mentioned some element of upper range extension in connection to their experiences with PMTD, with some even experiencing direct links between very high voice training (sometimes done without the approval or knowledge of their teachers) and the onset of vocal dysfunction. Most participants also reported singing soprano or tenor in
choirs (exclusively high tessitura) and being required to sing with a blending tone-quality (quiet, heady, and straight-toned). Many participants described early vocal qualities suggesting head-dominant registration – light/white/diffuse/choir-boy vocal qualities, having difficulty projecting, or developing a middle range hole in the voice – and two indicated direct links between too-light registration and long-term vocal dysfunction. For the majority of participants, treatment included some element of exploration of chest-dominant registration, and retraining resulted in vocal qualities possibly suggesting a better integration of chest-production into their registration – rounder, bigger, brighter, containing more colours/overtones, more honest/authentic/less manufactured, larger with less effort. Given that the cricothyroid muscles are associated with high range singing, raising pitch, and head-quality in vocal production, it seems likely that focusing on high tessitura training both in solo singing and in choral singing, and working towards a quiet and blending tone quality could create an imbalance in voice training. The vocal qualities described by many participants prior to and during dysfunction, the element of chest-dominant production in treatment, and the vocal qualities described post-recovery suggest that high-tessitura training, focusing training on a narrow range or tessitura, and the resulting too-light registration may be causal factors in PMTD in some classical singers. All of this supports the findings of the literature review, that hypofunctional registration and voice use could be a causal behavioural factor in the development of PMTD.

5.1.2.2.8 Bias Against Chest Voice

The accounts of several participants supported the theory developed over the course of the literature review that some classical vocal pedagogues favour head-dominant production or believe chest-dominant is harmful or dangerous. PJ revealed a personal bias against chest-dominant voice production when she confessed to considering head voice to be “pretty voice” as a child and commented that she had not experienced vocal fatigue as a child, “probably ‘cause I found head voice.” However, after experiencing PMTD as a coloratura soprano, PJ has now found her healthiest and most sustainable singing is in the more chest-dominant styles of jazz and pop. Anne first developed PMTD at the age of thirteen as a result of the age-inappropriate vocal load of singing a belt musical theatre role five days a week for several months. For almost a decade after that
she feared and avoided singing in chest voice, believing it to have been the cause of her dysfunction. She noticed that her teachers also seemed to fear training her in that range, almost entirely avoiding it in her lessons. She described knowing that she did not want to sing like pop and musical theatre singers, but rather wanted to sing, “properly.” However, this evasion of chest voice resulted in an actual exacerbation of her symptoms of tension and vocal fatigue, that was only resolved by adding more chest to the balance of her registration. Lynn described her voice teachers from her earliest voice lessons in her late-teens all the way to her mid-thirties as either neglecting to train her chest voice or actively disparaging chest quality. As a result, she struggled with moderate symptoms of PMTD for many years. Those symptoms only finally began to resolve when she started working with a teacher who informed her that her registration was backwards: she was using far too head-dominant a sound in her lower range, and too chest-dominant in her middle and upper range. Several participants also confessed to being shocked and even afraid when treated with rehabilitative voice exercises involving carrying chest-dominant production up quite high in their voices, often stating things like: “I didn’t think you were supposed to do that!” or expressing that it felt backwards to treat vocal fatigue with loud and heavy singing. In addition to these stories of culturally developed and reinforced aversion to chest-dominant sound, as stated earlier, nearly all participants described having been warned about the possibility of developing vocal fold nodules, associated with overly-loud and forceful singing. This suggests that a cultural aversion towards chest-dominant singing may exist in some areas of classical vocal pedagogy, and that it has been a causal factor in some cases of PMTD in this population.

5.1.2.2.9 Registration Outliers

Within this study, there were three outliers whose experiences either partly or fully represented the more common belief that overly chest-dominant vocal production can cause voice dysfunction. Madame Chiaroscuro described always having had the ability to project – a quality suggesting a more chest-dominant registration. For her, recovery from PMTD involved use of head-dominant registration as a tool. Lynn’s registration was unbalanced in two ways: her lower range was too head-dominant, and her upper range was too chest dominant. The onset of Diana’s acute PMTD symptoms was correlated
with rehearsals and performances of a belt role which involved carrying a chest dominant sound up very high in her voice (though she also admitted not having formal training in belting, so there were likely other technical weaknesses also associated with her onset of PMTD). Though these are outliers in this participant sample in terms of type of registration imbalance, these experiences suggest that imbalanced registration of either type can be a significant factor in cause, symptoms and treatment of unhealthy tension in singing and thus the development of PMTD.

The existence of both participants exhibiting too-light and too-heavy registration in this study supports the finding in the literature review that unbalanced registration in either direction can be a factor in the development of pathological tension in singing. Lists of potential symptoms for PMTD found in the clinical literature included both those that seem associated with cricothyroid dominant production (CPD) or head voice and those that seem associated with thyroarytenoid dominant production (TDP) or chest voice. Phonatory breaks\textsuperscript{505} and difficulty navigating vocal registers are also symptoms resulting from increased vocal mechanism tension and raised laryngeal position.\textsuperscript{506, 507} Hypofunctional symptoms such as breathiness, glottal chink, and vocal fold bowing can arise from laryngeal muscle fatigue from overuse or hyperfunctional vocal behaviours,\textsuperscript{508, 509} but hyperfunctional symptoms can also arise from hypofunction as a form of compensation.\textsuperscript{510} As one article postulated, hyperfunction could be viewed as a muscular imbalance in phonation – occurring when one muscle or muscle group works excessively and another muscle or muscle group suffers from hypofunction – rather than being solely

\textsuperscript{505} Lowell, 370.
\textsuperscript{506} Onofre, 129.e14.
\textsuperscript{507} Morrison, “Pattern Recognition in Muscle Misuse Voice Disorders: How I Do It,” 111.
\textsuperscript{508} Eustace, 146.
\textsuperscript{510} Heman-Ackah, “Determining the Etiology of Mild Vocal Fold Hypomobility,” 586.
The majority of the experiences and pre-treatment beliefs of the participants in this study suggest that singing in an overly CDP or head-voice dominant production could be a cause of PMTD, and that this was more common among the classical singers in this study than the reverse. However, in the cases of a few participants who were singing heavier or non-classical repertoire, overly TDP or chest-dominant production appeared to be a culprit. This might account for the differences in presentation in PMTD across different styles of singing, such as pop or musical theatre (more chest voice dominant) and female classical (more head voice dominant).

5.1.2.2.10 Breath Management and Articulator/Supraglottal Tension

Two technique factors, breath management and articulator tension (jaw and tongue tension), were only recurrent in a minor way. However, careful analysis of participant-stories suggested links between these two technique elements, and a connection to the previously discussed elements of lack of technical knowledge, and registration. Though many participants mentioned breath management as a secondary technical issue, three participants described incomplete understanding of the generic terms “support,” and “release,” as issues leading to the development of tension, with one preferring “avoiding collapse” as a more effective description of healthy breath management. This terminology-induced gap in knowledge of breath management is further evidence of lack of understanding of technique leading to voice dysfunction. Two of these participants also believed tongue and jaw tension were core elements of their disordered singing, and several others experienced supraglottal pharyngeal constriction. Though most only mentioned breath and articulator tension as minor elements addressed in treatment, PJ believed that breath management deficiencies were directly linked to her articulator tension. She believed that because for many years she did not adequately use her body to support her singing, she instead developed tension in her face, jaw, and throat muscles in an attempt to achieve a supported sound. Lynn also described links between breath management and articulator tension, at times having issues with over-articulating and

511 Lemon-McMahon, 71.
tongue tension, partially caused by excessive subglottal air pressure. Madame Chiaroscuro and Diana both described experiencing jaw and/or tongue tension, and difficulty maintaining a steady stream of air in their singing. Some other participant stories suggested links between breath management and supraglottal constriction, and with registration. For instance, Alana, was unsuccessful at breath management in long phrases, exhibited a breathy tone quality, and had a gap between her vocal folds. Though, upon diagnosis, this gap was identified as a symptom (or perhaps an indicator) of her PMTD, it could have been present prior to developing acute symptoms as a result of light-registration, and the supraglottal constriction that was evident in her diagnostic scope may have developed in an effort to create better glottal closure and more efficient use of breath. Similarly, prior to Jolene’s diagnosis with PMTD, she struggled with achieving and maintaining a steady stream of air in her singing, her vocal quality sometimes light and breathy with difficulty projecting, and sometimes too tense to allow any air or sound out. This again seemed to be indicative of tension developed in an attempt to create better glottal closure, and her diagnostic scope also revealed supraglottal constriction. Perhaps in an attempt to project her voice, she began to employ excessive subglottal air pressure, and like Alana, developed supraglottal tension in an attempt to balance this air pressure and remediate loose glottal closure associated with light registration. Though breath management and articulator/supraglottal tension were mostly described by participants as secondary technical elements related to their experiences with PMTD, these appear to be important interrelated symptoms. They may even be causal factors in the development of the pathological tension of PMTD in singing, and have a relationship with registration, one of the other important behavioural causes suggested by this study.

5.1.2.2.11 Repertoire/Cultural Attitudes – Overwhelming Repertoire/Repertoire-Driven Training

Just as there were vocal technique elements linked to potentially harmful cultural attitudes in classical voice pedagogy, approaches to repertoire within classical voice training were also revealed as possibly dysfunctional. Overwhelming repertoire requirements during training was a very common experience among participants. Five of
eleven participants specifically mentioned tremendous solo repertoire and ensemble singing obligations. Several described that between lessons, coachings, school choir and opera rehearsals, and extra-curricular singing like church jobs and professional or community shows, they experienced significant vocal fatigue a minimum of four days a week. For many participants, this normalized the experience of chronic vocal fatigue, especially as most of these were official requirements of their university training programs. A related, but distinct repertoire issue was repertoire-driven training. Some participants felt that during their training, repertoire and ensemble requirements were prioritized over the development of solid technical skill. Some recounted not having time to train their voices effectively, never able to take the time to apply technical concepts to their repertoire. Others reported that from their early voice training experiences – preparing for RCM voice examinations and local music festival competitions – all the way to their undergraduate voice studies, the goal was meeting the repertoire requirements and “sounding okay doing it.” They did not experience repertoire as a pedagogical tool (“didactic” repertoire), working in conjunction with their technique to build elements comprising a well-trained instrument. Both overwhelming repertoire requirements and a culture of repertoire-driven training resulted in participants feeling that they were not taught, and did not have time, to pursue the goal of building a solid singing technique. Many described experiencing an unhealthy degree of vocal fatigue and tied it to repertoire demands.

5.1.2.2.12 Early Fach Assignment

Just as range extension and registration were specific elements of voice technique with a relationship to PMTD, Fach choice had a relationship to the disorder as an element of the repertoire side of training. More than half of the participants in the study reported having had vocal health or technique issues in part because of their Fach being defined early in their training. When asked about Fach and choral voice-part, the majority of participants conflated the two – for example, PJ and Melina described having always been placed in the first soprano section from early childhood heralding their later Fach of coloratura soprano. For the vast majority of participants, this meant that they had identified with a high-voiced category from an early age. PJ and Melina recounted having been defined as
coloratura sopranos by their childhood voice teachers, and then pressuring their undergraduate voice teachers to allow them to sing repertoire from that *Fach*. For PJ, when she was finally allowed to pursue repertoire containing the upper extension of a coloratura she almost immediately developed acute PMTD. Lynn, a mezzo, described an early voice instructor making the decision to train her as a coloratura soprano. Though she was experiencing soreness and unhealthy levels of vocal fatigue from both the technique and repertoire elements of her lessons, her teacher was resistant when she expressed concerns that the *Fach* was not sustainable. A young baritone, Michael, attempted to train his own voice as a tenor after being encouraged to pursue that *Fach* by one of his high school voice instructors, precipitating himself into acute PMTD. Whitney, an outlier who was defined as a mezzo in early childhood by her very first voice teacher, experienced many years of unsuccessful or only partially successful treatment for her PMTD. When she finally had regained enough function to begin taking lessons again, within twenty minutes of the start of her first lesson had begun exploring the range and repertoire of a lyric soprano. For these participants, early attempts to label their voices appear to have been a significant pedagogical flaw and factor in their development of vocal dysfunction.

5.1.2.2.13 Adherence to *Fach* Label

Just as labelling *Fach* too early seems to have been a factor in participants’ development of PMTD, for Madame Chiaroscuro adhering to a label was an element in the incidence and recurrence of PMTD. She found that performances of her highest and heaviest roles were linked to bouts of PMTD over the course of her career. In her interview, she confided that she may have been singing one *Fach* too heavy, or that as her voice aged the level of vocal exertion associated with these roles may have become unsustainable for her. In her opinion, *Fach* must be revisited many times over the course of a career in order for the voice to remain healthy.

5.1.2.2.14 Product-Driven Voice Training

Overwhelming repertoire requirements, a culture of repertoire-driven training, and *Fach* being assigned too early in voice training – or held onto too rigidly – all shared a
relationship with PMTD in this study. This seems to suggest problems with product-rather than process-driven voice training. Ideally, voice training would be pursued with the goal of revealing the unique nature of each voice, assigning repertoire from an appropriate variety of Fach categorizations rather than focusing on one category very early-on. For example, not all light voices are excellent at coloratura, and not all heavy voices shy away from it. So, though all should be trained to be have functional agility, there will be some repertoire within a category that is more and less appropriate to a singer. Additionally, as Madame Chiaroscuro noted, Fach categorization may not remain the same across career. In her case, her heaviest repertoire ceased to be sustainable as her voice began to age, but the same concept applies to younger voices. Just because a singer shows signs of an early ability to sing in a high tessitura and has easy coloratura, that does not mean that the tessitura of coloratura repertoire is appropriate to their level of technical ability or age. As noted in this study, a student exhibiting a light or heady vocal quality could be showing signs of imbalanced registration rather than an inherent vocal quality.

However, nearly all participants described practising independently or receiving training based on their earliest exhibited vocal qualities. Many recounted the experience of beginning to identify with the voice-part assigned to them in their early choral singing, and then aspiring to technical and repertoire goals associated with label. Some of those participants were even actually assigned Fach labels in their pre-university training and then, becoming attached to those labels, pursued goals associated with them. Parallel to these Fach issues, five participants reported feeling, at various points of their training, like they were just being put through the process of meeting repertoire requirements. They were not aware of there being any overall goal or trajectory to their technical vocal training, and some found repertoire assignments too overwhelming to spend practising in a methodical way or focus on building their voices. One participant, describing how her training felt driven by the goal of meeting repertoire requirements, and “checking-off all the boxes” in her program of study; she even referred to her undergraduate program as a “degree-factory.” This is likely one example of an area in which private voice teachers and childhood/youth choral directors are lacking depth in pedagogical training – unaware of the potential for negative impact of bestowing Fach labels too early, and of repertoire-
driving training. However, it may also reveal a deeper issue in the system of voice training. Perhaps in an effort to prepare students to graduate with the necessary qualifications to pursue work, teachers are be making Fach choices too early and assigning students repertoire for which they are not ready. The requirement of allotting grades to students may be shaping programs that are driven by completion of assignments rather than the pursuit of technical progress. This issue could extend to the broader university education system rather than just being isolated to how singers are trained, with universities increasingly requesting statistics from faculties on how many students graduate into employment, and students and parents are being treated as customers who want to receive a quantifiable product from their education. It seems that this product-driven education style may, in some cases, be a factor in voice students developing PMTD.

5.1.2.3 Vocal Pedagogy Student-Teacher Dynamic

Another factor in vocal pedagogy that appears to be important for maintaining good vocal health is a good relationship between voice teacher and student. A number of participants reported developing vocal dysfunction or experiencing a plateau in technical progress due to a poor relationship with their voice teacher. For example, Jolene described having little technical success and developing acute PMTD while studying with a teacher who made her nervous, and who seemed frustrated with her lack of technical progress. Melina recounted regressing technically and developing PMTD while studying with a teacher who was actively cruel to her. Diana also reported backsliding technically and crying at the end of every lesson while studying with a teacher who did not understand her or seem to care about her. Similarly, many participants described experiencing their best progress and recovery from PMTD under teachers who were supportive of them and whose teaching took into account their human needs and personalities. Given how passionate singers are about what they do and how they associate the ability to sing with their identity, it should come as no surprise that many singing students learn better if they feel supported and addressed on a human level by their teachers, and suffer if the opposite is true. This study seems to indicate that a good relationship between voice teacher and student is an important factor in effective vocal pedagogy.
5.1.2.4 Voice Teacher/Choral Director Training

It is clear from participant accounts that lack of teacher awareness of pedagogical and vocal health concepts helped perpetuate disordered singing and was a factor in developing and prolonging vocal dysfunction. Almost across the board participants described lacking an understanding of the goals of technique training, and not learning how to practise effectively. Their vocal health instruction was sparse and their vocal pathology education omitted the category of chronic voice disorders. Repertoire training normalized unhealthy levels of vocal fatigue, left little time to train the voice systematically, and was product- rather than process-driven – assigning \textit{Fach} too early, and geared towards completing repertoire requirements rather than building the voice. A cultural bias against chest-dominant registration may lead to obliviousness to the potential for harm in specific technique issues such as high-tessitura solo and choral singing, too-light registration, and producing a blended vocal quality. Voice teachers often did not recognize the symptoms of PMTD in students until they had reached an acute level. Even then, students sometimes felt that their teachers continued to believe that the actual issue was that students lacked natural ability, that the issue was undeveloped technique rather than technical mal-coordination to the point of medical dysfunction, or that teachers did not grasp the seriousness of the disorder. Often an extended period of vocal rest was their recommended course of action, which did not resolve the chronic tension which was occurring. This suggests that there is a need to explore the factors that set-up well-meaning voice teachers to fail to address technical and vocal health knowledge deficiencies, and thus to miss the signs of PMTD in their students as it was developing. There is definitely a lack of knowledge of chronic voice disorders and their causes within the classical vocal pedagogy community, but that does not fully explain this phenomenon. Perhaps there is a disparity between the qualifications of voice teachers and choral directors versus their occupational duties. Primary and secondary school music teachers often teach voice classes without possessing voice degrees, and those obtaining a voice degree in education are often not required to take a course in vocal pedagogy. Thus, their training would not give them the background to know how to teach healthy ways to create a blended tone quality, or to be aware that always assigning young singers to the same parts creates an imbalance in their vocal
training, and an unhealthy early sense of identity associated with voice-part/Fach. Perhaps music education and choral conducting students should take a vocal pedagogy course, including information about the potential for long-term negative consequences of early Fach assignments, as part of their degree requirements.

A similar issue exists in institutions of higher learning. Though this practice appears to be in the process of changing, in the past, many university and conservatory voice teachers’ performance credentials were the primary element considered in hiring, and performance experience is still given a great deal of weight in this process. There is no standard practice of when professors learn how to teach, or how to teach voice. In some cases, their most significant training might come from their own years of voice lessons, with the possible result that they would best know how to train similar voices to their own, with similar technical challenges. Faced with a voice with much different needs than their own, it might be difficult to recognize when technique issues have progressed to the point of dysfunction. Depending on their level of interest in professional development, they may or may not be aware of advances in voice science and pedagogy. Perhaps voice teachers should have more background in vocal pedagogy and vocal health or should be required to be members of an organization like The National Association of Teachers of Singing (NATS), which is committed to expanding the boundaries of vocal pedagogy knowledge. Voice professors in charge of designing and teaching vocal pedagogy classes should certainly have vocal pedagogy qualifications rather than only performance qualifications. If performance qualifications continue to be more highly valued in voice teaching than pedagogy qualifications, perhaps there should be greater collaboration with medical specialists within vocal pedagogy institutions.

5.1.3 Cross-section between medicine and vocal pedagogy

Without fail, successful recovery from PMTD required a holistic approach. Patients who were the most happy and functional at the times of their interviews had all undergone treatment from supportive/understanding medical professionals and voice teachers which included hands-on work, behavioural exercises, voice retraining and rehabilitation, and lifestyle and mindset changes.
5.1.3.1 Holistic Approach – Supportive/Understanding Medical/Voice Specialists

Many participants described the feeling of being supported and understood by SLPs and voice teachers as key to their recoveries. Two participants, Michael and Melina, described reassurance from their voice teachers as final key elements in their recoveries. In both cases, these participants were experiencing a kind of neurotic fear of relapse until their voice teachers empathetically told them not to worry, that they might experience moments of less-than-ideal function again, but that this was not a reason to panic. This empathy and reassurance allowed them to sing without fear again.

Another participant, Joshua, when asked to describe his interactions with his speech therapist, listed her attention to him as a person as vital: “I think this was really crucial, and I really love her for this. Our first session was mainly talking, and she asked me about my life like how I was feeling and that. Well, she said, ‘You seem to be really stressed, really tense. And you’re holding your breath, which is a sign of too much stress, too [many] things inside your head.’ And I think that was the first point of our therapy, but a very important one.” He later listed this first moment with his speech therapist as one of the keys to him drawing together and making sense of all of his experiences leading up to and throughout his vocal dysfunction.

Jolene described both her SLP and her voice teacher as life-savers due to their emotional support during her treatment. She recounted her SLP giving her little pep-talks during her treatment when she was at very low points: “I was crying, and it was a horrible feeling, and we’d just chat, and he’d say something like, ‘You’re an athlete. Maybe you’ve hit a little problem, but you have the determination, you have the will. There’s no reason why you’re not going to get past this. It’s going to be a lot of work, but you’re no stranger to work, right? You’re in music.’ These encouraging words gave her the strength to carry on. Likewise, her voice teacher was exactly what he needed. He was funny, making her laugh and keeping her from getting too fixated on things. She had experienced a lot of tension and anxiety in voice lessons with other teachers. The way he adapted the lessons to take her personality into account was crucial in her recovery.
5.1.3.2 Holistic Approach – Balanced Elements of Treatment

Just as a number of participants reported having little success with treatment when it did not include all the elements of hands-on work, behavioural exercises, and voice training, participants whose treatment combined all these elements reported great success. Whitney pursued treatment for several years that did not involve hands-on work, rehabilitative exercises, or voice training. When she finally began receiving laryngeal massage/manipulation and working on behavioural exercises, she began to have success. Later, her voice took the final steps towards recovery when she began taking lessons again. Several other participants also did not feel that their recoveries were really successful until after finding the right voice teacher to retrain their voices. As mentioned earlier, Madame Chiaroscuro even described treatments that address symptoms, but not causes, as “highway robbery” as without retraining, the symptoms are bound to return.

5.1.3.3 Holistic Approach – Lifestyle and Mindset Changes

Finally, the participants who had made the most progress in their recoveries all described themselves as having made lifestyle and mindset changes over the course of their treatments. Many participants adopted mental health maintenance programs such as yoga, meditation, journaling, and exercise. Some recounted moderation of perfectionistic and goal-oriented tendencies in their personalities. A large number of participants confessed to working towards becoming able to accept critique and make mistakes with a more positive attitude. Joshua described himself as having experienced a “change in personality, a philosophy of life,” and as, “Still aiming for excellence, but the difference is that now I’m not too concerned, too stressed, too driven about it. Now [it] is more, like, a joy of a path? It’s not goal-driven, but a means whereby.” Two participants, Joshua and Jolene, explained that they were trying to be less motivated by their people-pleasing personalities, instead taking better care of themselves. Melina, PJ, and Jolene explained that they had become more well-rounded: one becoming a multi-disciplinary artist rather than only a singer, another singing in different styles and exploring recording technology, and the third exploring also working with animals. For most participants, lifestyle and mindset changes made over the course of their treatments were a significant element in their recoveries.
Without fail, successful treatment required a *holistic approach to recovery*. Patients who were the most happy and functional at the times of their interviews had all undergone treatment from supportive/understanding medical professionals and voice teachers which included hands-on work, behavioural exercises, voice retraining and rehabilitation, and lifestyle and mindset changes.

5.1.3.4 Team-Approach to Voice Training – Athlete-Style Training Model

Two of the participants in this study were highly acclaimed opera singers with long and successful careers. From their experiences, it is clear that even established singers heralded for great technique and artistry can develop chronic disorders, invalidating the myth that those who develop voice disorders lack the talent (natural technical singing ability) to succeed. However, both of these singers experienced a huge amount of stigma from the classical voice community – pursuing treatment in hiding while fearing being exposed as suffering from voice dysfunction and suffering judgement and ramifications to their careers. Considering that classical singing is such an intense and athletic activity, maybe voice training needs to be treated more like athletic training. An ideal parallel between high-level athletics and singing can be found in a comparison between figure skating and classical voice. A CBC Sports video shedding light on the preparation of Canadian figure skaters Tessa Virtue and Scott Moir for the 2018 Winter Olympics in PyeongChang, South Korea,\(^{512}\) highlights many similarities. Both are artistic pursuits, requiring preparation such as building programs which communicate the performer’s desired message, working with artistic coaches/instructors, and choosing the correct wardrobe to compliment the performance. Both are also athletic endeavors – requiring years of specialized physical training and continuous practise in order to be in peak condition.

\(^{512}\) CBC Sports, “Behind the Scenes of Tessa Virtue and Scott Moir’s Roxanne Choreography,” [https://www.youtube.com/watch?v=ryrBVGd9aQg](https://www.youtube.com/watch?v=ryrBVGd9aQg), Published February 7, 2018, Accessed February 20, 2018.
In the video it is clear that Virtue and Moir do not only train by skating. While they are in the creating and learning stages, they reduce the difficulty and danger of their programs by taking them off the ice and working on them in sneakers in a dance studio. They run to build cardio-vascular stamina, and they cross-train in a gym environment to verify that they are training opposing muscle groups in a balanced way. They work with physiotherapists and other specialists to maintain their physical health in the face of extraordinary physical demands, and they work with mental performances coaches to maintain their emotional equilibrium in the face of extraordinary mental health demands.

Virtue and Moir confessed that as they were reaching an older age for Olympic figure skating, they needed to be extra-vigilant in their training. However, in classical voice training, singers mostly only train with a voice teacher (comparable to skating coach) and a coach/accompanist (maybe comparable to choreographer), rather than being officially encouraged to cross-train and see a variety of other specialists. It is not made clear during training that pursuing such elite singing means it is almost inevitable that dysfunction will arise for many at some point in their training or careers. While the average voice student is possibly not comparable to an Olympic figure skater, some university voice students do end up on the international stage, and the comparison with the two elite opera singers in this study is apt. Unfortunately, these singers had the experience of having to find their own way to the kind of cross-training and interdisciplinary care absolutely required at their level of singing. Their training did not adequately prepare them, and they suffered physically from PMTD, and mentally and emotionally from the stigma associated with vocal dysfunction in the classical singing community. Maybe classical voice training would benefit from an athletic model more like the one demonstrated here for high-level figure-skating: including a larger variety of specialists and topics including cross-training, physio, direct coaching on how to deal with associated mental health challenges, etc. (among the technical and artistic elements already addressed in the current training model). Perhaps placing the responsibility of covering such a wide variety of topics almost entirely on the shoulders of the voice teacher is unfair and bound to result in deficiencies in some area of training. It would be impossible to even begin to address all of these topics in one hour of lesson time per week.
5.2 Implications

The following implications are significant to both the classical voice pedagogy and medical communities, as the data gathered illuminates important medical and pedagogical factors and point to the possible need for systemic changes to be made in order to more effectively prevent and treat PMTD and other chronic voice disorders in classical singers.

5.2.1 Summary of Medical Implications

- PMTD has a significant physical impact on the vocal function of classical singers, and a parallel severe mental health impact, including stigma, social isolation, financial stress, threat to identity, and clinical depression.
- Medical professionals need better knowledge of how voice disorders present in professional voice users.
- Medical professionals need better understanding of the impact of voice disorders on professional voice users.
- Treatment of voice disorders in singers needs to address the singing voice.
- There are concerns about the ethics of treatments that do not address causal factors, leaving singers vulnerable to relapse or incomplete recovery.
- In Ontario, shortages of specialists and the cost of treatment are running the risk of the development of a two-tier system where those who can afford to pay more for diagnosis and treatment have more timely access to these services and are more likely to be able to pursue treatment until recovery is complete.
- Universities with both music faculties and medical schools/faculties of communication sciences and disorders, should make an effort to build partnerships benefiting the students of both programs. Creating opportunities for voice students with vocal health concerns to volunteer to be used as participants in medical instruction could allow for a reduction in the delays and expense associated with diagnosis and treatment and provide opportunities for medical and speech language pathology students to practise diagnosis and treatment skills on live participants. Partnerships between medicine and music could also expose students from both streams to the idea of career paths with intersections between
these topics leading to greater availability of medical specialists who understand
the intricacies of diagnosing and treating professional voice users, and voice
teachers and singers with an enhanced knowledge of voice health and pathology.

5.2.2 Summary of Voice Pedagogy Implications

- Lack of understanding of technique and how to practise was definitely a factor in
  the development of PMTD for large proportion of participants. If this experience
  is as wide-spread as this sample indicates, there needs to be systemic change to
  how voice technique is being taught in the classical singing community.

- Adequate vocal health instruction is not happening both prior to and during
  undergraduate voice studies. Perhaps voice teachers do not have enough
  knowledge in this area, or maybe there is not enough time to also address vocal
  health amidst technique and repertoire requirements. Maybe voice students
  should be required to take vocal pedagogy courses from specialists in this area
  earlier in their degrees if this kind of knowledge is not being included in voice
  lessons.

- Does illness lead to vocal dysfunction, or do technique weaknesses/vocal
  dysfunction lead to greater vulnerability to the effects of illness? Perhaps it
  would be helpful for voice students to undergo a medical examination prior to
  beginning elite-level (university or conservatory) training, just as it is often
  recommended to consult a doctor before beginning any new exercise regimen.
  Two studies encountered in the literature review corroborated this
  recommendation.

- Several female participants linked their development of vocal dysfunction to their
  hormonal health – puberty/voice change, menstrual side-effects, and menopause.
  One article in the literature suggested that due to a lack of attention paid to
  female voice change in the vocal pedagogy and health communities, there was a
  resulting delay or neglect of treatment of female puberphonia. Several articles
  confirmed the existence of premenstrual dysphonia, a cyclical experience of
  vocal fold swelling and associated difficulties with phonation experienced by
  some female singers. It seems possible that possible that singers could develop
compensatory techniques and tension in an attempt to sing through hormonally associated vocal dysfunction. Perhaps voice teachers and female singers should be made more aware of the potential for vocal dysfunction associated with female hormonal health.

- Perhaps the attitude within the voice community that some students are naturally “talented,” and some are not, could lead teachers to write-off students who are not making easy technical progress, leaving them suffering from undiagnosed chronic vocal dysfunction.

- Given that the symptoms of PMTD are difficult to distinguish from technique deficiencies, and technique issues are causal in the development of PMTD in classical singers, the line between what is a technical issue, requiring training, and what is dysfunction, requiring treatment needs to be defined. Teachers should discuss plateaus in technical progress with students if they persist longer than a few months, attempting to ascertain how and how much they are practising, and what other elements of vocal load exist. If it seems that students are taking appropriate steps, but progress continues to be slow or non-existent, teachers should recommend seeking a medical opinion to guide future training.

- The same stigma that led many participants to be apprehensive about sharing their experiences with vocal dysfunction could also be leading teachers to fear being blamed for their students’ dysfunction. This stigma must be addressed in voice training institutions.

- Early voice training, including choral ensemble participation, and early voice lessons, appears to encourage early association of Fach and voice classification with singers’ identities. This can lead to resistance to healthy and moderate approaches to Fach in later training, and pathological attempts by singers to achieve the Fach with which they identify.

- In an effort to prepare students to graduate with the necessary qualifications to pursue work, teachers could be making Fach choices too early and assigning students repertoire for which they are not ready. The requirement of allotting grades to students may be shaping programs that are driven by completion of assignments rather than the pursuit of technical progress. This issue with product-
driven education could also extend to the broader university education system rather than just being isolated to how singers are trained.

- There was definitely a lack of knowledge of chronic voice disorders and their causes within the sphere of the classical vocal pedagogy community explored in this study.

- Several factors appear to be resulting in well-meaning voice educators failing to address technical and vocal health knowledge deficiencies in their students, and to missing the signs of PMTD as it is developing. There appears to be a discrepancy between the qualifications of voice educators and choral directors versus their occupational duties. Primary/secondary school music teachers and choral directors often teach voice classes without possessing voice degrees, and those obtaining a voice degree in education or a choral conducting degree are often not required to take a course in vocal pedagogy. This training does not allow for the background to know how to teach healthy ways to create a blended tone quality, or to be aware that always assigning young singers to the same parts creates an imbalance in their vocal training. Perhaps music education and choral conducting students should be required to study vocal pedagogy as part of their degrees.

- There appears to be a discrepancy between the qualifications of university level voice teachers versus their occupational duties. Many university and conservatory voice teachers have been, in the past, hired primarily on the basis of their performance credentials, and performance experience is still a very important factor in the hiring process. In some cases, professors’ most significant teaching training comes from their own years of voice lessons, with the possible result that they best know how to train similar voices to their own, with similar technical challenges. Faced with a voice with much different needs than their own, it might be difficult to recognize when technique issues have progressed to the point of dysfunction. Depending on level of interest in professional development, these voice instructors may or may not be aware of advances in voice science and pedagogy. Voice teachers should possibly have more background in vocal pedagogy, or be required to be members of an organizations
committed to expanding the boundaries of vocal pedagogy knowledge, such as NATS.

- Voice professors in charge of designing and teaching vocal pedagogy classes should have vocal pedagogy qualifications rather than just performance qualifications.

- Given the athletic nature of classical voice, classical voice training would benefit from a move towards a more interdisciplinary athletic model of training, including cross-training, physio, and directly addressing the mental health challenges associated. Perhaps placing the responsibility of covering such a wide variety of topics almost entirely on the shoulders of the voice teacher is unfair and bound to result in deficiencies in some area of training.

5.3 Future Research

One useful direction for future research would be to interview or survey medical professionals specializing in treating singers for their experience-informed perspectives. Given the rigorous nature of quantitative studies, the experiential knowledge of those in the field may be years ahead of what is published. For example, many of the participants in this study were treated using chest-voice dominant singing exercises, but this approach was not encountered in the literature review.

It was interesting to find that many participants in this study suffered from too-light registration, the opposite of what is usually warned-against in the vocal pedagogy literature as harmful/associated with vocal dysfunction, and the opposite of what was described as the typical presentation in the literature review. Perhaps the types of behavioural/technique causes are much different in classical singing than in the general population, or even in singers of other styles/technical approaches. Larger-scale studies into the types of technique elements associated with PMTD in classical singers should be pursued.

Several female participants linked their development of vocal dysfunction to their hormonal health – puberty/voice change, menstrual side-effects, and menopause. One article in the literature suggested that due to a lack of attention paid to female voice
change in the vocal pedagogy and health communities, there was a resulting delay or neglect of treatment of female puberphonia. The literature also confirmed the existence of premenstrual dysphonia, a cyclical experience of vocal fold swelling and associated difficulties with phonation experienced by some female singers. Based on these findings, it seems possible that singers could develop compensatory techniques and tension while attempting to sing through hormonally associated vocal dysfunction. However, no studies were found confirming this hypothesis. Perhaps studies investigating further into the phenomenon of female puberphonia are warranted. Additionally, it might be useful to perform studies investigating an association between the prevalence of premenstrual dysphonia and muscle tension voice disorders such as PMTD in female classical singers.

The scale of this study is small, and the participant base all shared the experience of suffering from PMTD. It is impossible to conclude that deficiencies in technical training, vocal health instruction, knowledge of chronic voice disorders, and experiences with product-driven training are the same throughout the entire field of classical singing. Large-scale surveys investigating this topic should be performed in the populations of classical voice students, university and conservatory voice instructors, and professional singers.
Chapter 6

6 Impact

In addition to the potential for future impact on the fields of medicine and vocal pedagogy through the broader implications and avenues for further research illuminated by this study, it had an impact on the participants, the classical singing community, and the researcher that was apparent both throughout the process of the study and upon completion.

6.1 Participant Impact

The process of forming these interviews into narratives and collaborating with each participant to ensure that their story accurately represented their experiences was extremely rewarding. During the process of obtaining narrative approval from participants, overwhelmingly positive responses poured in, making it clear that the creation of these stories had successfully accomplished the goal of giving a voice to the suffering that, in many cases, had previously been extremely isolating.

Alana wrote: “Wow thanks so much for doing all this – just reading this narrative even felt therapeutic!” Anne responded: “I am so pleased with my narrative, you’ve done a truly amazing job in explaining exactly what I’ve experienced! I would not change a thing. Thanks so much for this, this is really special for me to have.” PJ replied:

I have finished reading and am extremely impressed with how I have been represented. This story rings very true to me and brought back some emotions related to those experiences (in a good way!) Thank you so much for pursuing this research! It is absolutely invaluable, especially for young singers and I am sure we both wish we had had something similar to read through as we were going through this.

Finally, Lynn reacted: “I think you have captured very eloquently exactly what I experienced… you really reflected exactly what I said (not always what one experiences in an interview!)… Really and truly, everything is as it should be.” It was gratifying to hear in these and other responses that participants experienced their stories as authentic
and emotionally satisfying, and saw the product as an important resource to be shared with the singing community.

6.2 Community Impact

A number of singers with undiagnosed vocal health concerns contacted the researcher expressing an interest in the study. Though it was not possible to include these individuals in this research, it was rewarding listening to these singers’ vocal health concerns, reassuring them that they were not alone, and recommending medical professionals in their regions. It was pleasing to know that by the sheer existence of this study, awareness was raised about PMTD in classical singers, opening up conversation and reducing stigma surrounding voice dysfunction in the classical singing community.

6.3 Personal Impact

When I began graduate studies in voice, I had resigned myself to the decision that I was no longer going to pursue life as a singer. Though I had not consciously admitted it to myself, I knew that there was something wrong with my singing voice. There were technical issues that I just did not seem able to overcome: my voice was small and light and would not project, I had difficult to disguise register breaks, and I was experiencing dysphonic moments and quick vocal fatigue. I was almost neurotically afraid of catching respiratory illnesses, as these seemed to affect me more seriously that most singers – always having long-lasting impacts on my voice. Because I had an academic bent, and strong linguistic and musicianship skills, I had been encouraged to pursue teaching, but as I taught, I regularly felt that I did not have the technical and pedagogical knowledge that I needed. Especially as I did not even understand what was happening in my own voice, I sometimes felt fraudulent. I decided to go back to school, and learn everything I could about vocal pedagogy, devoting myself to teaching rather than singing myself. Whether through serendipity or blessing, I found myself under the tutelage of several professors who helped me to pursue the knowledge I had set out to find, but also the vocal health and training my own voice needed. They encouraged me to pursue this challenging and personally meaningful research, helping me find my singing voice and my academic voice simultaneously.
As I connected with participants, noticing the similarities between their experiences and my own, reliving with them the devastating impacts PMTD had on their lives, and thrilling to their phoenix-from-the-ashes recoveries, I experienced the same catharsis as they did. Now, when I teach my voice students, I feel confident in my ability train them, and to explain what we are doing in a way that provides the understanding and ownership they need in order to thrive. If I do not know the answer to something, I know how to find it. When I sing, I feel able to express the wordless things that music is meant to evoke. These six years of study have been so worthwhile – providing me with more than I could have hoped.
References or Bibliography

Clinical Literature


**Crossover Literature**


**Vocal Pedagogy Literature**

**Vocal Pedagogy Books**


**Vocal Pedagogy Articles**


**Vocal Pedagogy Historical Treatise**


**Musician Health Literature**


**Musician Health Popular Culture Articles/Blog Posts**


**Inspiration for Athletic Training Model**


**Research Methodology Literature**


Appendices

Appendix A: Letter of Information and Consent

No Space to Sing: Investigating the Lived Experience of Classical Singers with Primary Muscle Tension Dysphonia

Letter of Information and Consent

Principal Investigator: [Redacted]

Co-Investigator: [Redacted]

Co-Investigator: [Redacted]

As you are a classical singer who has been diagnosed with Primary Muscle Tension Dysphonia by an otolaryngologist (ENT) or speech language pathologist (SLP), you are being invited to participate in this research study about the lived experience of classical singers with Primary Muscle Tension Dysphonia.

The purpose of this study is to examine the lived experience of classical singers with Primary Muscle Tension Dysphonia in order to search for commonalities between singers’ experiences, and to give voice to those who have had this experience.

The study will take place from 2018 to 2019. The researcher will interview you in-person to begin to understand your experiences (this will include questions about your diagnosis and treatment).
If you agree to participate in this study, you will be asked to partake in one 60- to 90-minute which will take place at a location of your choosing and will be audio-recorded for future reference by the researcher. Audio-recording is mandatory, so participants not willing to be recorded should not participate.

The possible risks and harms to you include the potential for an emotional reaction to the interview. You may not benefit directly from participating in this study, but information gathered may provide benefits to society as a whole, including a better understanding of the effects of injury and disorder, especially Primary Muscle Tension Dysphonia, on classical singers.

If, at any time, you decide to withdraw from the study, you have the right to request withdrawal of information collected about you. If you wish to have your information removed, please let the researcher know. Even if you consent to participate you have the right not to answer individual questions and to withdraw from the study at any time.

The researcher will keep any personal information about you in a secure and confidential location for a minimum of seven years. The only identifiable information which will be collected about you is your name and contact information, and this is entirely for the purpose of contacting you to schedule an interview and verify your interview responses at a later date. A list linking your study number with your name and contact information will be kept by the researcher on an encrypted USB in a locked filing cabinet, separate from your study file. If the results of the study are published, your name will not be used, but unidentified direct quotations may be used.

Representatives of The University of Western Ontario Non-Medical Research Ethics Board may require access to your study-related records to monitor the conduct of the research.

All information collected in this study will be kept confidential and will not be shared with anyone outside the study, unless required by law.

You will not be compensated for your participation in this research.
Your participation in this study is voluntary. You may decide not to be in this study and not be penalized in any way. Even if you consent to participate you have the right not to answer individual questions and to withdraw from the study at any time without being penalized in any way.

We will give you new information that is learned during the study that might affect your decision to stay in the study.

You do not waive any legal right by signing this consent form

If you have questions about this research study please contact

If you have any questions about your rights as a research participant or the conduct of this study, you may contact The Office of Human Research Ethics ethics@uwo.ca.

*No Space to Sing: Investigating the Lived Experience of Classical Singers with Primary Muscle Tension Dysphonia*

Consent

Co-Investigators:
I have read the Letter of Information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

I consent to the use of unidentified quotes obtained during the study in the dissemination of this research.

☐ YES ☐ NO

____________________  ___________________  ________________
Print Name of Participant  Signature  Date (DD-MM-YYYY)

My signature means that I have explained the study to the participant named above. I have answered all questions.

____________________  ___________________  ________________
Print Name of Person Obtaining Consent  Signature  Date (DD-MM-YYYY)

This letter is yours to keep for future reference.
Appendix B: Screening Form/Questionnaire

1. Have you been diagnosed with PMTD by an otolaryngologist (ENT) or a speech language pathologist (SLP)?
2. Are you a classical singer?
3. Approximately how long have you been studying classical voice?
4. Have you ever taken a vocal pedagogy course? [The rationale for including this question is to assess whether the participant has adequate knowledge to be an ideal participant for the study.]
5. Please briefly describe the symptoms that led you to seek diagnosis and treatment. [The rationale for including this question is to assess whether the participant has adequate knowledge to be an ideal participant for the study.]
6. Please briefly describe the diagnostic process you underwent in order to arrive at a diagnosis of PMTD. [The rationale for including this question is to assess whether the participant has adequate knowledge to be an ideal participant for the study.]
Appendix C: Interview Guide

1. Tell me about your childhood singing experiences.

   Prompts:
   - Did you sing in a choir?
   - Which voice part did you sing?
   - Did you ever rotate to other voice parts?
   - What do you remember learning about vocal health?
   - Do you remember experiencing vocal fatigue as a child singer?
   - What were some of your childhood vocal models?

2. Tell me about your early voice training experiences.

   Prompts:
   - What kinds of technical exercises and goals do you remember?
   - List some examples of repertoire you sang?
   - When did you start taking lessons?
   - Can you describe your voice training experiences as a young child, during puberty, and as an older teenager?

3. Tell me about your university, conservatory, and/or professional voice training experiences.

   Prompts:
   - What kind of technical exercises and goals do you remember? Did you work to extend your upper register? Did you work to extend your lower register? Do you remember your teacher talking about vertical laryngeal position?
   - Did you sing in a choir? Was this required by your institution?
   - What voice part did you sing in choir?
- What Fach (classical voice category) did your teacher think best suited you? Did you have any changes to your Fach during training?

- What repertoire did you sing?

4. Tell me about your experiences leading up to your diagnosis with Primary Muscle Tension Dysphonia (PMTD).

Prompts:
- What were your symptoms?
- Did you feel supported by your teachers/coaches/colleagues?
- Did you feel you were not supported by some of your community?

5. Describe your diagnosis experience.

Prompts:
- Were you scoped by an ENT or SLP?
- Was your throat/neck palpated?
- Was your voice recorded and run through an analysis program?
- Were you given an opportunity to share your story/symptoms, etc.?

6. Tell me about your experience in treatment for PMTD, including both speech language pathology/medical treatment and retraining your singing voice.

Prompts:
- What kinds of exercises did your otolaryngologist (ENT) or speech language pathologist (SLP) assign to you?
- Can you estimate a period of time post-diagnosis it took before you felt basically recovered?
- Were you recommended voice teachers to re-train with?
- How would you describe your mental health during this period? Attitudes or feelings towards self, singing in general, and the pursuit of a career as a singer?
7. Tell me about your experiences in singing since recovery from PMTD?

Prompts:

- How would you describe your mental health since recovery? Attitudes or feelings towards self, singing in general, and the pursuit of a career as a singer?

- Are you singing the same Fach (voice type) as you were prior to treatment?

- Can you describe any changes in the quality of your singing voice?

8. Please describe yourself in terms of personality and the relationship to health and mental health.

Prompts:

- How would you describe your attitudes towards learning and receiving criticism – do you appreciate the opportunity to learn when critiqued, or do you tend to feel defensive?

- Would you classify yourself as “A-type,” “perfectionist,” or as more relaxed or pragmatic towards academic and professional demands?

- Would you classify yourself as more emotional (for instance, do you cry publicly) or more rational?

- Do you have a mental-health self-care program? Meditation, yoga, journaling, counselling?

9. Is there anything else you would like to tell me about your experiences with PMTD?
Appendix D: UWO Ethics Approval

Date: 25 May 2018
To: [Redacted]
Project ID: 110731

Study Title: No Space to Sing: A Narrative Inquiry into the Experiences of Classical Singers with Primary Muscle Tension Dysphonia

Application Type: NMREB Initial Application
Review Type: Full Board
Meeting Date: 04/May/2018 12:30
Date Approval Issued: 25/May/2018 11:40
REB Approval Expiry Date: 25/May/2019

Dear [Redacted],

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the WREM application form for the above mentioned study, as of the date noted above. NMREB approval for this study remains valid until the expiry date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

This research study is to be conducted by the investigator noted above. All other required institutional approvals must also be obtained prior to the conduct of the study.

Documents Approved:

<table>
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<th>Document Name</th>
<th>Document Type</th>
<th>Document Date</th>
<th>Document Version</th>
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<td>Written Consent/Assent</td>
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<td>Screening Form</td>
<td>Screening Form/Questionnaire</td>
<td>04/Apr/2018</td>
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</tr>
</tbody>
</table>

No deviations from, or changes to the protocol should be initiated without prior written approval from the NMREB, except when necessary to eliminate immediate hazard(s) to study participants or when the change(s) involves only administrative or logistical aspects of the trial.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario. Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB. The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Please do not hesitate to contact us if you have any questions.

Sincerely,

[Redacted], Research Ethics Officer on behalf of [Redacted], NMREB Chair

Note: This correspondence includes an electronic signature (validation and approval via an online system that is compliant with all regulations).
Appendix E: DMA Performance Event 1 Recital Program

April 1, 2016
8 p.m., von Kuster Hall
Elizabeth Lepock, *soprano*
Simone Luti, *piano*

Der Hirt auf dem Felsen
F. Schubert
(1797-1828)

*Scott MacDonald, clarinet*

Bess of Bedlam, Z 370
H. Purcell
(1659-1695)

Ariettes Oubliées
C. Debussy
(1862-1918)

*C'est l'extase langoureuse*
*Il pleure dans mon coeur*
*L'ombre des arbres*
*Chevaux de bois*
*Green*
*Spleen*

-Intermission-

Sequenza III
L. Berio
(1925-2003)

from Sei Romanze II
G. Verdi
(1813-1901)

*Il tramonto*
*Ad una stella*
*La Zingara*
*Il mistero*
*Brindisi*
Appendix F: DMA Performance Event 2 Description

Two performances of the role of Nella in Giacomo Puccini’s one-act opera *Gianni Schicchi* with University of Western Ontario Opera.

Dates: November 19, 2016 at 2 pm; November 20, 2016 at 2 pm.

Stage Director: Tom Diamond

Conductor: Simone Luti
Appendix G: DMA Performance Event 3 Recital Program

May 12, 2017
8 p.m., von Kuster Hall
Elizabeth Lepock, soprano
Simone Luti, piano

Wiewohl . . . Ich will dir mein Herze schenken
from Matthäus-Passion
J.S. Bach
(1685-1750)

Alles, was von Gott geboren
from Ein feste Burg ist unser Gott, BWV 80
Chad Louwerse, bass-baritone
J.S. Bach

Rejoice
from Messiah
G.F. Handel
(1685-1759)

De torrente in via bibet
from Dixit Dominus
G.F. Handel

Domine deus
from Mass in c minor
W.A. Mozart
(1756-1791)

Brianna DeSantis, soprano

Et incarnatus est
from Mass in c minor
Joel Heinbuch, oboe
W.A. Mozart

-Intermission-

Qui tollis peccata mundi
from Petite messe solennelle
Carmen Specht, mezzo-soprano
G. Rossini
(1792-1868)

Ihr hab' nun Traurigkeit
from Ein Deutsches Requiem
Brianna DeSantis, soprano; Carmen Specht, mezzo-soprano;
Marcel van Helden, tenor; Chad Louwerse, bass-baritone
J. Brahms
(1833-1897)

Cantique de Jean Racine
Carmen Specht, mezzo-soprano; Marcel van Helden, tenor;
Chad Louwerse, bass-baritone
G. Fauré
(1845-1924)

Vidit suum
from Stabat Mater
Carmen Specht, mezzo-soprano; Marcel van Helden, tenor;
Adam Ianetta, baritone; Chad Louwerse, bass-baritone
F. Poulenc
(1899-1963)
Appendix H: DMA Performance Event 4 Recital Program

February 8, 2019
8 p.m., von Kuster Hall
Elizabeth Lepock, soprano
Simone Luti, piano

Sweeter than Roses
H. Purcell
(1659-1695)

Tre sonetti di Petraca, S.270
F. Liszt
Pace non trovo
(1811-1886)
Benedetto sia 'l giorno
I' vidi in terra angelici costume

Pur ti miro
C. Monteverdi
Poppea and Nerone's duet from L'incoronazione di Poppea
(1567-1643)

-Intermission-

Mir ist die Ehre widerfahren
R. Strauss
Sophie and Octavian's duet from Der Rosenkavalier
(1864-1949)

Не пой красавица (Sing not to me, beautiful maiden), Op.4, no. 4
S. Rachmaninoff
Весенние воды (Spring waters), Op. 14, no. 11
(1873-1949)

Youkali
K. Weill
Je ne t'aime pas
(1900-1950)

Hab' mir's gelobt
R. Strauss
Sophie, Marschallin, and Octavian's trio from Der Rosenkavalier
Bethany Hynes, soprano
Michal Aloni, mezzo-soprano
Curriculum Vitae

Name: Elizabeth Lepock

Post-secondary Education and Degrees:
Wilfrid Laurier University
Waterloo, Ontario, Canada

The University of Western Ontario
London, Ontario, Canada
2013-2015 M.Mus.

The University of Western Ontario
London, Ontario, Canada
2015-2019 D.M.A. Candidate

Honours and Awards:
Province of Ontario Graduate Scholarship

Related Work Experience
Teaching Assistant
The University of Western Ontario
2013-2019

Private Voice and Piano Instructor
Private Studios
2002-2019

Voice Faculty/Director
Ontario Mennonite Music Camp (Conrad Grebel UC)
2009-2015