

The Voice

The Voice

VOICE OF THE EDITOR

Kim Steinhauer, PhD

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IS IT RESONANCE OR VOICE QUALITY?

BY KIMBERLY STEINHAUER, PHD

Resonance or Voice Quality, that is the question...that I asked of our expert contributors. “How do you use these terms in your field?” “Do you interchange these terms lightly?” “Do you define these terms differently when talking to different populations?” “Do you provide singing or treatment exercises that address resonance and/or voice quality?” The inspiration for this issue arose during a Voice Foundation presentation when Dr. Ronald Scherer quietly commented to me in the back row, “Does she mean *voice quality* or *resonance*?” Brilliant! As careful as I try to be (*or not to be...*), I admit that I’m not always specific or

thoughtful about my choice of the term. So, I went to the source and asked Ron Scherer to represent the Scientists, Elizabeth Benson to represent the Teachers, and Michelle Horman to represent the Clinicians. The Voice Foundation provides us with a special forum to engage conversation gathered from multiple disciplines. You will appreciate the candid comments from our authors as they share their thoughts on the topic of Resonance and Voice Quality.

Also, thanks to the keen urging of Maria Russo, we are proud to announce a new column inspired by our past issues highlighting favorite



KIM STEINHAUER, PHD

President
Estill Voice International

voice exercises. *Tools for your Voice Box* will feature a voice exercise for the studio or clinic. We’re fortunate to present Dan Ihasz as our first contributor.

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Voice of the Editor

VOICE QUALITY VS RESONANCE

BY RONALD C. SCHERER, PhD

This informal essay is an approach (actually, an appeal) for differentiating “resonance” from “voice quality” with a scientific bent and an interdisciplinary concern.

First, there is a rather obvious and typical scientific differentiation – “voice quality” is a perceptual or psychophysical notion, and “resonance” is an objective description of airway acoustic structure. The word “quality” in “voice quality” suggests a whole-istic auditory-interpretive orientation to a sound we hear, separate from the pitch and loudness. It should be noted that many like to link modulation aspects such as vibrato into the word, but what we need to do is to split “quality” into static features and gross dynamic features, or have a separate term for the dynamic perceptual features themselves. I am sure people are working on that.

The Voice of the Scientist

“Resonance” strictly speaking refers to the transfer function that defines the acoustic structure belonging to the vocal tract where resonance center frequencies (in Hz), resonance bandwidths (in Hz), and relative intensities (resonance peaks in dB) are important, as well as the between-the-peaks acoustic structure (that is, how deep the valleys are, including any relatively large dips due to acoustic shunts such as the nose and the piriform sinuses).

What about the phrase “voice quality?” Obviously, this is supposed to refer to the perceptual quality that we hear that is related to the “voice.” But now what about this word “voice?” Should it really refer to the sound (any sound) that comes out of the mouth? This is the first dictionary definition of “voice” among many (my dictionary gives 27). Look around in our literature and web sites – “voice” very often refers to any phonated sounds that are produced and we



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“THE IDEA THAT THE SOURCE OF SOUND AND THE FILTERING OF THAT SOUND ARE SEPARATE AND INDEPENDENT IS APPROPRIATE FOR A BASIC AND USEFUL UNDERSTANDING, SINCE FOR PRIMARY PROBLEMS OF PHONATION AND RESONANCE THAT IS THE CASE, FOR ALL VOICE PROFESSIONS.”

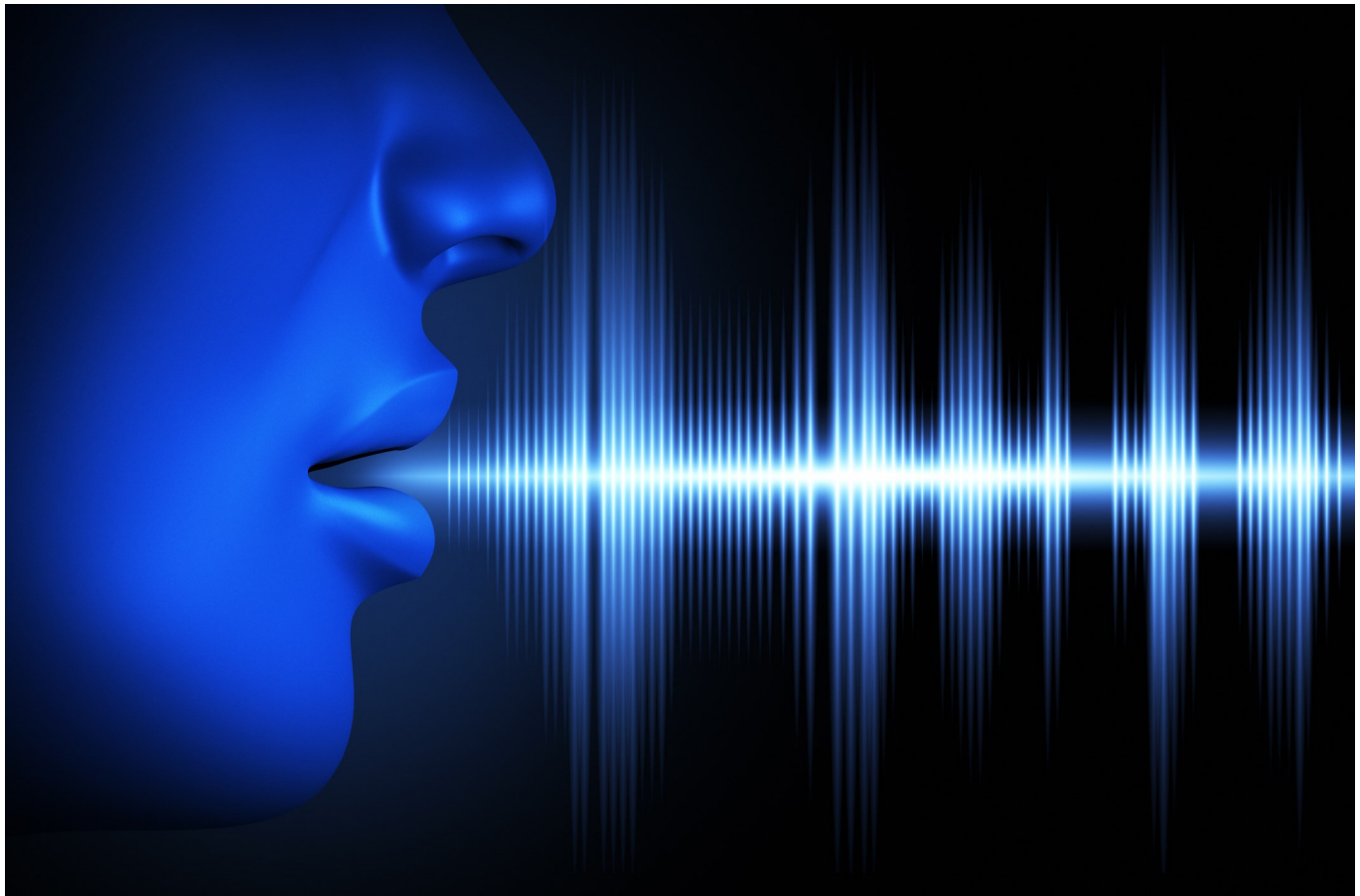
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hear. Is this what the word “voice” should stand for? Outside of ethnomusicology, is this what “voice” should be? For example, in singing and theatre voice training, does “voice” have a broad definition? In the clinical setting, do the phrases “voice therapy” and “vocal pathology” also refer to this broad orientation or is it more restricted?

Here is a logical suggestion for all disciplines that deal with helping others change or improve how they sound: Leave the “voice” part of “voice quality” specifically to the larynx and phonation, and reflect that in the phrases we use. “Voice” in this context then is associated with phonated sound created at the laryngeal level. The spectrum associated with the sound source at the larynx (which is due to the glottal flow signal, or for some the differentiated glottal flow*) goes into the vocal tract above the larynx. The laryngeal sound

source will sound like a buzz if heard alone. That buzz is then modified by the vocal tract resonators (acting as the filter or the transfer function) because of the complex shape and size of the vocal tract. The sound exits the mouth (and nose if nasalized) whereupon the “radiation characteristic” (a spectrum sloping up at about +6 dB per octave) acts upon the sound, which then travels to our ears for us to perceive. The sound quality that we hear therefore has two primary parts: 1. the quality of the larynx source sound, and 2. the effect of the transfer function of the vocal tract on that source sound. If someone says, “You sing [speak] with beautiful voice quality,” what that person really means is that the singer sings (speaker speaks) with a source (voice) and filter (vocal tract) combination that leads the person to hear a very desirable esthetic of sound. In the clinic, where diagnostic specificity is imperative, the distinction between source and filter is critical because of the necessity to locate the region of

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deviance in the sound. Thus, MDs and SLPs should consider saying that there is a **sound quality** deviancy, and then indicate the nature of it, including whether it belongs to the larynx (where voicing is produced) or to the vocal tract (where voicing source modification takes place), or to both.

Why not extend the clinical diagnostic and intervention notion about voice (associated with the larynx) into singing instruction and voice and speech training (being mindful, of course, that some practitioners do this already)? Wouldn't it be best to be more specific with the word "voice" so that it refers only to the laryngeal aspects of phonatory sound production, to avoid confusion with the vocal tract and be consistent with the clinical world? If the teacher or coach says, "Your voice isn't the same today," wouldn't it be more helpful to pinpoint the problem and avoid confusion? Perhaps a better choice is a diagnostic observation such as, "You seem to be having a difficult time getting your resonance established (vocal tract)," or "You sound a little hoarse today (laryngeal = voice)?" The phrase given above, "You sing (speak) with beautiful voice quality" could be altered to "You sing [speak] so beautifully." The phrase, "You have a very resonant voice," would also be inaccurate since the voice itself is not resonant, but the vocal tract resonates when provided the voicing source.

The idea that the source of sound and the filtering of that sound are separate and independent is appropriate for a basic and useful understanding, since for primary problems of phonation and resonance that is the case, for all voice professions. On a finer level of function, there indeed is an interdependence of the sound source and resonance structure of the vocal tract, where the vocal fold motion and the glottal flow can be affected by acoustic pressures at the glottal level (affected in ways that can promote voicing as well as destroy voicing), a topic for another essay.

In summary, for the professions that help people improve the way they produce speech and singing, let's consider isolating the word "voice" to laryngeal phonatory matters, since a resonance problem is a vocal tract problem and a phonation (voice) problem is a larynx problem.

*The concept of the laryngeal sound source is more than just the volume velocity exiting the glottis, but in general is tied to air particle velocities and associated density changes such that sound is created and propagated up the vocal tract at the speed of sound. The source of phonated sound is certainly not the moving vocal folds per se, but the changing velocities of the air associated with the interaction of the transglottal pressure and passive motion of the vocal folds.

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TERMS OF USE: Resonance and Voice Quality

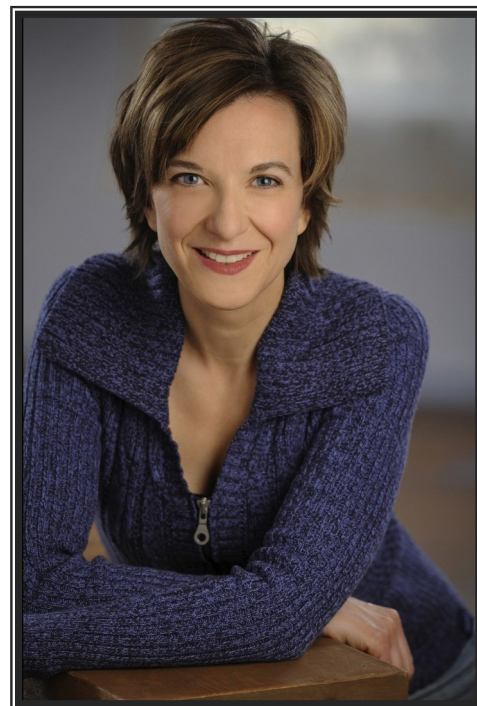
BY MICHELLE HORMAN, MS, CCC-SLP, SVS

The longer I work with patients, the more I strive to present simple ideas and easy exercises for reproducible results (although I suspect my patients might occasionally beg to differ). I try to use vocabulary based upon its usefulness in identifying and maintaining targeted changes in voice production. **With some trepidation, I admit that I value practicality and function over strict adherence to scientific validity when it comes to communication with my patients.** Unless a singer brings it up herself, I can honestly say that I never utter the word “formant” when discussing resonance. Confession over.

The easiest way for me to illustrate my use of these terms is through the example of my work with patients. Although they often use qualitative descriptors to explain their vocal complaints, I

don't tend to begin therapy by discussing voice quality. Rather, I begin by explaining that when I listen to a patient's speech or singing, I am always assessing three major elements I consider to be necessary to healthy voice production. I describe these elements as “**airflow**,” “**space**,” (to which I might refer in the beginning as the more easily grasped “open throat” for my patients with no previous training), and “**placement/resonance**.” Yes, I admit it, I use placement and resonance somewhat interchangeably. If I'm working with a more sophisticated voice user, I might explain that we can use *placement* in speech to impact *resonance*, just as in singing. For my untrained patients, I describe this element as referring to where they sense the voice “lives” - where they

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“I try to use vocabulary based upon its usefulness in identifying and maintaining targeted changes in voice production.”

TERMS OF USE CONTINUED

The Voice of the SLP & Singing Voice Specialist

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hear and feel its presence most strongly - grossly speaking, in the throat or in the mouth. I explain that maximizing resonance can be a way to increase the presence of the voice without having to pay for it at the level of the vocal folds. Clinically, I often use the term “placement” because it seems to be a more concrete concept and it makes sense to my patients as something they can impact through physical actions, e.g., “If I avoid retracting my tongue, my voice will be *placed* more frontally” or “If I lift my palate, my *placement* will be higher.” I find this three-element classification useful because this vocabulary can later be used with previously untrained voice patients to give them a sequence of physical actions: **create *space* during inhalation, begin *airflow* to onset the voice, and *place* the words via articulation.** As the individu-

al gains skill and we’ve moved beyond “throat vs. mouth,” our placement work becomes more truly about resonance in its strict definition.

At the first session, I’ll introduce those three elements, but not necessarily discuss “voice quality.” I’ll now try some therapy probes, basing my choice upon what element of the patient’s voice production I perceive as most problematic. If the probe is successful in relaxing the larynx, stimulating increased pharyngeal space, allowing for more adequate airflow, and/or improving the “placement,” then I would begin to help the patient identify “voice quality” changes. A gross example would be the difference in quality when a patient (possibly with hypofunctional vocal folds, or vocal fold masses that impede full closure) initially learns to unload Muscle Tension Dysphonia, possibly shifting from a strained, hoarse quality to a breathy quality. I want to teach the patient to be able to identify and name these two divergent qualities - hoarse

(the term I use for raspy/noisy) versus breathy, - so that I can then teach them more about their diagnoses and the mechanical and technical factors that might be contributing to these different qualities. It can be incredibly useful to say that we are initially going to choose to give up hyperfunction and its associated hoarseness and allow for a breathier quality to take pressure off the vocal fold edges, if even just for a week or two. Being able to make a simple choice like this from the beginning of therapy often empowers the patient. In a brief period of trial therapy, she has learned some of the functional implications of her diagnoses, the identification of various voice qualities, *and* the employment of technical strategies to allow her to affect vocal change. **This brings me back to the original question – how do I use the term “resonance” versus “voice quality?”** As the therapist, I now assure the patient that we will be adding our third element, *resonance*, so she will not be left with a breathy *quality* of limited functionality.

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RESONANCE AND VOICE QUALITY IN MUSICAL THEATRE VOICE TRAINING

Elizabeth Ann Benson, DMA

The study of resonance and voice quality is unquestionably important in training to sing classical music, but I focus on these concepts somewhat less so in training my voice students in the BFA Musical Theatre program at Auburn University. In my experience, two valuable products of resonance training are *amplification* and the *ability to modify vocal timbre*. However, the former is not crucial for musical theatre singing due to the pervasive use of microphones. By contrast, having access to many different voice qualities lies at the core of music theatre voice training. I prefer to use the word “timbre” or even the more-generalized term “sound,” but I use both terms interchangeably with “voice quality.”

In musical theatre voice training, vocal function is developed alongside and in service of acting. Singers learn to make sounds which express very specific emotional states by selecting timbres associated with the particular emotional state. For example, a singer could use breathiness to express surprise, or brightness to express desperation. I teach that different timbres come from making conscious adjustments to specific elements of vocal function. Breathiness comes from increas-

ing breath flow and decreasing vocal fold closure, among other tactics. Brightness comes from shaping the vocal tract to increase harmonic activity in the higher frequencies, which can be achieved through vowel modification or aryepiglottic (epilarynx) shaping, among other tactics. Developing a full expressive palette requires a thorough understanding of vocal function and how to adjust specific elements of vocal function. This takes a lot of time to master, but it is of vital importance for expressive acting and storytelling.

These days, the musical theatre industry repertoire has very little to do with Gilbert and Sullivan, and quite a lot more to do with popular and rock aesthetic, the default sound is the “untrained” voice, wherein resonance is limited to that which is present in everyday speech. This speech-level resonance is sufficient in musical theatre due to the standard use of microphones. Singers barely phonating can sound quite powerful aided by highly sensitive head-mounted condenser microphones coupled with sophisticated sound systems. With the standard eight



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The
Voice
of the
Singing
Instructor

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MODIFIED VOCAL FUNCTION EXERCISES (CONTINUED)

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show week, the musical theatre industry requires a high level of vocal endurance. Singers prevent fatigue by minimizing the level of vocal effort and leaning on the support of the sound system. This means that musical theatre singers can spend the majority of their time singing in the medium to soft range and still achieve a satisfying range of expression.

Occasionally, I encounter a student experiencing fatigue from speaking their lines onstage too loudly, usually in a large space, and without the help of a microphone. They may have been guided by the old chestnut: “project the voice.” This misleading phrase is the theatre equivalent to “sing from the diaphragm.” When asked to

“project the voice,” students often get louder by increasing sub-glottal air flow, resulting in fatigued vocal folds. I help them to find a speaking sound that is naturally amplified (not forcefully amplified, and certainly not projected) by changing the shape of the vocal tract. Boosting volume through optimal shaping of the vocal tract is often less taxing than boosting volume through increased sub-glottal air pressure. Moving out of the default speech-position of the vocal tract and into an optimal shape may be achieved through vowel modification or sometimes through placement. I use this term reluctantly because it is not functional (sound cannot actually be placed in the mask or anywhere else); however, if a student finds an optimal shape of the vocal tract through imagining that the sound is placed in the mask, I will

encourage them to use that tactic. They have to do whatever it takes to increase the amplification function of resonance, rather than forcing air to make the sound louder. The goal is to increase vocal efficiency, while decreasing effort.

Although the terms “resonance” and “voice quality” are often used in the context of classical singing, there are still elements of these concepts that are valuable to me as I train my musical theatre students. Enriching or coloring the sound is the most important element of resonance for musical theatre students because it allows them to act expressively, through singing. However, understanding how the voice functions in order to access all possible timbres of the human experience will be a life’s work.

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TOOLS FOR YOUR VOICE BOX: *Glissando(i)*

Objectives: airflow consistency, laryngeal stability, register transition, lighter/heavier mechanism

BY DAN IHASZ, MM

This exercise is intended for all voice types and should be initiated below the first register transition.

- Establish a tonal center, then
- Have the student begin with an ascending glissando from the tonic note to the fifth scale degree.
- Once the fifth scale degree is reached, sustain a brief fermata, during which there is a “messa di voce”, followed by a descending glissando to return to the tonic note.
- Sing on the voiced consonant [v] while maintaining an [i] vowel inside the mouth.
- After the initial pattern has been completed, repeat the pattern up one semitone at a time until surpassing the first register transition. (Eventually, the basic exercise can be expanded by adding a vowel to follow the [v]. For the male voice follow the [v] with an [o] and for the female voice an [i]. Also, the interval can be expanded from a perfect fifth to an octave.)

To begin, simply have the student do the exercise while listening and observing everything and especially the posture of the head, chin and position of the larynx to determine if it remains stable or tracks with the ascending or descending pitch. Corrective suggestions to avoid the typical tracking might include; asking the student to breathe in on an [a] vowel and maintain the sensation of that moment between the inhalation and exhalation, feel the stretch of tall vowels in the back of the throat or to have the feeling of surprise and notice the sensation of the lift in the soft palate. If the larynx continues to move along with the pitch it may be useful to have the student lightly touch the tip of their larynx to increase awareness and train independence from pitch.

Once conquered the student’s attention can be directed to the sensation of the vibrations, vocal weight, volume, breath flow, vibrancy during the messa di voce portion of the exercise to increase awareness of what they experience when creating

the crescendo or diminuendo. Finally, the student should be made aware of the change in timbre that accompanies the resonance change at the first register transition. This is probably more significant for the male voices. The timbral shift may sound deeper or darker in quality as compared to the speaking voice in the same range and may be preceded by the feeling that something must or wants to change before repeating the pattern up an additional semitone.



DANIEL IHASZ, MM

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Suggestions or guidance to elicit the desired result must be specifically individualized for each student by the instructor. Because the objectives of this simple exercise are multi-purposed, it should be presented in a layered approach, focusing on one element at a time.

Avoid explaining or getting mired in all of the detail and strive to make the exercise more like a game to keep things lighthearted and fun for the student.

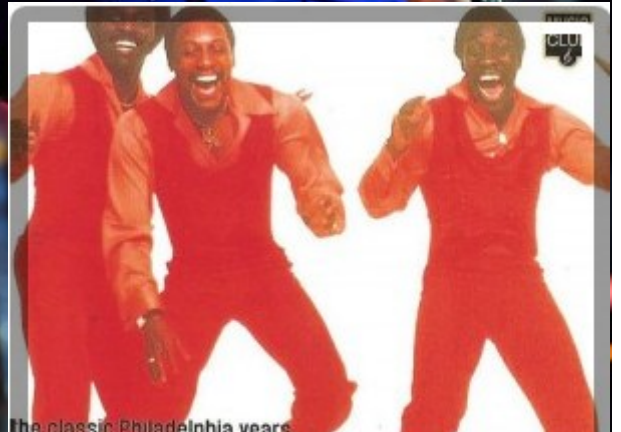
If the teacher utilizes visual feedback software like Voce Vista, they should have the student monitor both laryngeal stability and contact closed quotient (CQ) of the vocal folds using an electroglottalgraph (EGG). After that element is observed and adjusted their attention should be directed to the shape of the “EGG” signal at the messa di voce portion of the exercise to gain an awareness of sensation of the variability “CQ” when at the lighter/softer dynamic and how it changes as the volume increases to a heavier/louder dynamic and then returns to the lighter/softer dynamic. Utilize this to confirm what the student feels and hears so they can repeat it at will. This is confirmation that they have “learned” the purpose of the exercise.

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NATS CHAT WEBINAR CO-SPONSORED BY THE VOICE FOUNDATION

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DECEMBER CHAT

[Register Here](#)

Date: Sunday, December 10, 2017

Time: 9:30 p.m. ET / 6:30 p.m. PT

Guests/Topic: Emerald Lessley, DMA; Sandy Hirsch, MS, CCC-SLP, Liz Jackson Hearn, MM

“Transgender Voices: What Voice Teachers Need to Know”

Sponsored by Inside View Press

Co-sponsored by The Voice Foundation

From the fields of both singing teachers and speech language pathology these three experienced women will share a wealth of knowledge when working with this specialized population.

FEBRUARY CHAT

[Register Here](#)

Date: Sunday, February 11, 2018

Time: 9:30 p.m. ET / 6:30 p.m. PT

Guests/Topic: Laryngologist Al Merati, MD, and Met Opera singer Michaela Martens

“Care of the Professional Voice”

Sponsored by Inside View Press

Co-sponsored by The Voice Foundation

Renowned laryngologist Al Merati, MD (University of Washington Otolaryngology Department) and Metropolitan Opera singer, Michaela Martens will join us for an informative discussion on how to care for the singing voice; when to make difficult decisions to cancel a performance; stigmas around voice injuries and much more on vocal health considerations for all singers.



VOICE FOUNDATION NEWS

**47TH ANNUAL SYMPOSIUM:
CARE OF THE PROFESSIONAL VOICE**

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MAY 30—JUNE 3, 2018 PHILADELPHIA PENNSYLVANIA

Wednesday, May 30

Basic Science Tutorials
Presentation Coaching
Accent Reduction Coaching

Thursday, May 31

Science Sessions
Quintana Awardee: Luc Mongeau, PhD
Keynote Speech

Friday, June 1

Special Session:
Nancy P. Solomon, PhD

Young Laryngologists Study Group
Vocal Workshops

****Voices of Summer Gala****

Saturday, June 2

Medical, SLP Session
Panels

Vocal Master Class

***Sing Along with
Grant Uhle***



Sunday, June 3

Medical Session
Panels
Voice Pedagogy Session





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