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The Voice

The Voice

VOICE OF THE EDITOR

Kimberly Steinhauer, PhD

THE EFFECT OF HORMONAL CHANGES ON VOICE QUALITY

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BY KIM STEINHAUER, PHD

This issue of The Voice Foundation Newsletter addresses the effect of hormonal changes on voice quality. Our clinical treatment, artistic performance, and pedagogic training of voice assume certain anatomic and physiologic baselines for laryngeal function. But what if that baseline varies monthly, weekly or even daily? The body and cover of our source for phonation, the true vocal folds (TVF), are highly susceptible to hormonal fluctuations; yet, we sometimes question our clients when they *voice this complaint*. The delicate balance among power, source, and filter easily can be thrown off by a minute change in thickness of the TVF and present as a heavy, unresponsive voice that is easily fatigued. I admit that I was not as sensitive to these hormonal changes until blindsided with my personal vocal recovery following my thyroidectomy. Vocal range, flexibility, and

endurance were impacted as they regulated my synthetic hormone replacement. Yes, everyone agreed my voice sounded just fine. But, I am highly familiar with the vocal demands of performance and knew that my voice was subpar and highly variable as my body, and especially those vocal folds, adjusted to the hormone replacement. We sometimes connect hormonal voice complaints with primarily female issues, but women AND men can be deeply affected by hormonal variations due to thyroid/parathyroid disorders, transgender transitions, menstrual cycles, and aging. As you can imagine, studying the effects of hormonal fluctuations on the voice can be daunting. There is much more to learn; however, our expert contributors for this newsletter provide insights that will help each of us as we work to improve voice in our students and patients.



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Voice of the Editor

OVERVIEW: IMPACT OF HORMONES ON VOCAL FUNCTION

BY LAURA PLEXICO AND MARY SANDAGE

Physiological changes observed in laryngeal function due to hormonal imbalance or cyclic fluctuations that accompany the menstrual cycle are believed to alter voice quality. The reasons for the proposed voice changes are not well understood. Women have a significantly higher prevalence of voice disorders than men (46.3% vs. 36.9%), with hormonal fluctuations being a clear difference between the two groups.¹ A review of the literature linking hormonal fluctuations and female voice production describes the larynx as a hormonal target organ. This means that hormonal changes may affect vocal fold structure, tissue integrity, and function.² Voice quality changes are often observed and described but the influence of specific hormonal fluctuations or imbalances on the voice is lacking. Hormonal imbalances can be brought on by a variety of factors such as stress, polycystic ovarian syndrome, pregnancy, birth control, thyroid disease, diabetes, and endocrine disorders.

Different hormones have different responsibilities within the female body. Hormones of interest often include: estrogen, progesterone, and testosterone. Another hormone of interest to us is Neuropeptide Y (NPY). Estrogen is primarily a female hormone responsible for the health and growth of the female reproductive organs. It causes increases in vaginal moisture and generates a watery, thin, and stretchable mucus. Reductions in estrogen causes dryness and excess estrogen causes fluid retention. Well-being is also influenced by estrogen levels as balanced estrogen is associated with optimal energy, restful sleep, clarity in thinking and increased concentration and memory. Progesterone is another female hormone that balances the effects of estrogen and is sometimes referred to as the relaxing hormone. It works to build the uterine lining, decreases or inhibits

capillary permeability, thus increasing swelling, and has dehydrating effects on mucosa making the mucus thicker and more opaque. Progesterone causes an increase in basal temperature and disappears at menopause. Testosterone is primarily considered a male hormone, but is also vital and produced in low levels in females. Testosterone helps both males and females maintain muscle mass and bone strength, as well as sense of well-being and energy. Increased testosterone in women can cause the fundamental frequency of the voice to decrease and can have a thickening and drying effect on the mucosa.² Decreased testosterone in men and women can cause a decrease in muscle mass. NPY and its influence on laryngeal health has not been explored. NPY acts as a vasoconstrictor and regulates immune and inflammatory responses,³ suggesting that it may result in decreased blood flow to the laryngeal tissues.

The influence of hormonal changes on voice function has been studied but is limited in scope. An investigation into premenstrual vocal syndrome revealed that during the ischemic phase of the menstrual cycle mucosal, vascular and muscular changes were observed.² More specifically, the vocal mucosa was edematous and dry with a reduction in vibratory amplitude. Vascular changes included the presence of a submucosal hematoma in select patients and/or dilation of microvarices and reactionary edema. Muscular changes included decreased tone, power of contraction and range. Clinically, patients presented with vocal fatigue, decreased phonatory range, diminished power, and a flat timbre. However, other studies have not reported significant differences in acoustic measures of vocal quality during the menstrual cycle.⁴⁻⁵ The prevalence of voice complaints associated with menopause ranges

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Voice of the Scientists

OVERVIEW: IMPACT OF HORMONES ON VOCAL PRODUCTION, CONTINUED

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from 17%² to 77%.⁶ Literature on the effects of menopause on voice function indicates that menopause can affect laryngeal tissues and result in muscular and mucosal atrophy, fluid retention and swelling of the vocal folds, and increased viscosity of the mucosa.^{2,7} Vocal discomfort reported with menopause has been associated with the perception of dryness, throat clearing, a lower fundamental frequency, reduced frequency range, reduced intensity,⁸ and increased roughness and hoarseness.^{2,4,7} Whereas others have not been able to confirm findings of a lower fundamental frequency or reduced frequency range.⁹

Little is known about the variations observed in voice function secondary to hormonal changes. Developing basic knowledge of the influence of hormones on vocal function and identifying

periods of vocal vulnerability in healthy women is a necessary first step. This knowledge would serve as a platform to later study the influence of hormone changes on vocal loading in women with comorbid conditions believed to contribute to the development of voice disorders, e.g., allergies, asthma, reflux, thyroid disease, diabetes, and endocrine disorders. Discovery of laryngeal mechanical differences through the menstrual cycle may help identify time points of vocal vulnerability that may predispose women to develop voice disorders, leading to better habilitation of occupational voice users (e.g., teachers) and more efficient and knowledgeable clinical voice rehabilitation. Identification of hormonal influences on voice function that occur could also further delineate the risks or benefits associated with hormonal replacement therapy on voice function.



REFERENCES

1. ROY N, MERRILL RM, GRAY SD, SMITH EM. VOICE DISORDERS IN THE GENERAL POPULATION: PREVALENCE, RISK FACTORS, AND OCCUPATIONAL IMPACT. *THE LARYNGOSCOPE*. 2005;115:1988-1995.
2. ABITOL J, ABITOL P, ABITOL B. SEX HORMONES AND THE FEMALE VOICE. *JOURNAL OF VOICE*. 1999;13(3):424-446.
3. DIMITRIJEVIC M, STANOJEVIC S, MITIC K, ET AL. THE ANTI-INFLAMMATORY EFFECT OF NEUROPEPTIDE Y (NPY) IN RATS IS DEPENDENT ON DIPEPTIDYL PEPTIDASE 4 (DP4) ACTIVITY AND AGE. *PEPTIDES*. 2008;29:2179-2187.
4. CHAE SW, CHOI G, KANG HJ, CHOI JO, JIN SM. CLINICAL ANALYSIS OF VOICE CHANGE AS A PARAMETER OF PREMENSTRUAL SYNDROME. *JOURNAL OF VOICE*. 2001;15(2):278-283.
5. AMIR O, KISHON-RABIN L. ASSOCIATION BETWEEN BIRTH CONTROL PILLS AND VOICE QUALITY. *THE LARYNGOSCOPE*. 2004;114:1021-1026.
6. BOULET MJ, ODDENS BJ. FEMALE VOICE CHANGES AROUND AND AFTER THE MENOPAUSE - AN INITIAL INVESTIGATION. *MATURITAS*. 1996;23:15-21.
7. CARUSO S, ROCCASALVA L, SAPIENZA G, ZAPPALA M, NUCIFORO G, BIONDI S. LARYNGEAL CYTOLOGICAL ASPECTS IN WOMEN WITH SURGICALLY INDUCED MENOPAUSE WHO WERE TREATED WITH TRANSDERMAL ESTROGEN REPLACEMENT THERAPY. *FERTILITY AND STERILITY*. 2000;74(6):1073-1079.
8. RAJ A, GUPTA B, CHOWDHURY A, CHADHA S. A STUDY OF VOICE CHANGES IN VARIOUS PHASES OF MENSTRUAL CYCLE AND IN POSTMENOPAUSAL WOMEN. *JOURNAL OF VOICE*. 2010;24(3):363-368.
9. MEURER EA, CELESTE M, WENDER O, CORIETA HVE, CAPP E. PHONO-ARTICULATORY VARIATIONS OF WOMAN IN REPRODUCTIVE AGE AND POSTMENOPAUSAL. *JOURNAL OF VOICE*. 2004;18:369-374.



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Voice of the Laryngologist

HORMONES AND THE VOICE

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The Hormonal Environment of the body has major effects on the sound quality of the voice. It is important for singers and teachers to be familiar with the body's major hormones and their effect on vocal fold function.

The anatomy of the vocal apparatus is subject to changes based on the environment both inside and outside the body. For the purposes of this discussion, we will concentrate on the endocrine system, the glands that secrete hormones that control bodily function. The voice is exquisitely sensitive to changes in the hormonal milieu. Although there are numerous hormones in the body, evidence has shown direct effects of the sex hormones and thyroid hormones particularly on the voice.

The larynx is extremely responsive to sex hormones— androgens, progesterone, and estrogen. Abitbol et al. demonstrated that smears of the larynx and the cervix stained for estrogen throughout the menstrual cycle were indistinguishable with microscopy.¹ Both types of tissues have been shown to have

estrogen, progesterone, and androgen receptors.² Thus, the menstrual cycle and pubertal development both have an effect on the female larynx. In males, increased levels of testosterone and DHT during puberty are responsible for the increase in size of the laryngeal cartilages. This increase is accompanied by increased bulk of the laryngeal muscles and ligaments, leading to a drop of about one octave in the pitch of the voice. As the larynx changes in the growing male, the voice breaks occasionally as an adjustment reaction to the changing background.³

Females mature in response to increased amounts of progesterone and estrogen. While androgens are present, their effect is not as noticeable till after menopause. During puberty, the female voice does not undergo as drastic a change as the male voice. Sex hormones allow for a decrease in basal pitch of one third of an octave.⁴ However, the female voice does undergo cyclic changes with the menstrual cycle. The beginning of the menstrual cycle, the follicular phase, is marked by increased amounts of estrogen and markedly lower levels of progesterone. This combination of hormones is responsible for causing vocal fold edema and increased blood

flow to the structures. Polysaccharides in the vocal folds break down and bind water more readily, furthering the fluid build up in the vocal folds.⁵ The vessels in the nasal passages also dilate, resulting in changes in patency and the singer's perception of her voice. Additionally, the hormonal environment can cause an increase in reflux symptoms by slowing gastric motility. In the second half of the menstrual cycle, the luteal phase, progesterone levels increase to a greater degree than estrogen levels. Progesterone promotes sloughing of the laryngeal epithelium and works against proliferation. It also makes the glandular secretions more viscous, leading to a decrease in vibratory efficiency and possibly increased cell damage.⁶ These changes are responsible for changes in the voice during the menstrual cycle.

The period prior to menses also is marked by numerous symptoms, the most common of which is the difficulty of singing higher notes.⁷ The premenstrual syndrome (PMS) is a constellation of symptoms such as irritability, breast tenderness, increased reflux, anxie-

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HORMONES AND THE VOICE, CONT.

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ty, and edema that occur due to the high estrogen levels. Along with PMS, there are a number of voice changes that also may occur, an entity known as premenstrual voice syndrome, or *dysphonia premenstrualis*. The changes responsible for the entity known as *dysphonia premenstrualis* remain unknown but may be caused by some of the previously mentioned mechanisms along with an increase in acid reflux. One of the possible causes could be related to the increased incidence of submucosal hemorrhage during the period before menstruation.⁸ Due to the increased estrogen levels, there is also more edema during the premenstrual period because fluid flows from the inside of the cells and capillaries to outside. This edema may also be responsible for some of the voice changes noted prior to menses. This dysphonia may alter vocal efficiency and clarity in about one-third of singers. The presence of abdominal cramps during the menstrual cycle also can impair efficient phonation by interfering with support.

The most drastic changes in the female voice occur during menopause, when the levels of estrogen and progesterone fall. In the period immediately after the start of menopause, the level of FSH and LH is very high, continuing to cause ovarian androgen production. Usually, these ovarian steroids are converted to estrogen, especially in women with more peripheral fat stores. Women have excessive peripheral fat prior to

menopause, allowing more conversion of androgens to estrogen, preserving the effects of estrogen on the body. Some women however, have less ability to do so and have relatively higher levels of androgen as a result.⁹ Androgens deepen the voice and cause irreversible changes.¹⁰

Along with hormonal changes after menopause, effects of aging also become evident after menopause. Laryngeal muscles decrease in size, cartilages harden and eventually may ossify, vocal folds become thicker, and collagenous fibers decrease in quantity leading to an overall stiffening of the vocal apparatus. The changes of aging may be difficult to distinguish from potentially treatable hormonal changes caused by menopause.¹¹

Oral contraceptives, estrogen, and/or progesterone preparations used to combat the uncomfortable changes associated with menopause and menstruation, have been used to treat the voice changes, as well. Their use has found varying results in women, and more data still must be collected on the subject. However, if used, preparations should be titrated according to the patient's hormone levels.¹² Although androgens have been shown to increase libido, their use is relatively contraindicated due to the permanent masculinizing effects on the female voice.

Thyroid hormones are also known to cause voice disturbances.¹³ In normal physiology, the hypothalamus releases a thyrotropin-releasing hormone (TRH), a molecule that stimulates the anterior pituitary gland to release a thyroid-stimulating

hormone (TSH). The TSH in turn stimulates the thyroid gland to produce T4 and T3, of which T3 is the more biologically active hormone. Thyroid hormones serve to increase the rate of metabolic functions in the body. When patients have hypothyroidism (low thyroid function), hoarseness and loss of range are common complaints. The mechanism is not known for certain, but it is believed to be related to increased levels of polysaccharides in the vocal folds, leading to increased fluid retention and vocal fold thickening.¹⁴ This thickening is similar to the mechanism by which sex hormones act on the female vocal folds. The vocal fold thickening causes a decreased vibratory capacity and hence a lower frequency production and a sensation of insufficiency. Hyperthyroidism (high thyroid function) also can cause hoarseness, usually when it is severe.¹⁵ The supplementation of thyroid hormone is usually sufficient to control hypothyroid symptoms, and the use of antithyroid medications like propylthiuracil can usually help control symptoms of hyperthyroidism. The effect of pituitary gland hormones on voice also has been studied. The pituitary gland is involved in the release of growth hormone (GH), prolactin, vasopressin, adrenocorticotrophic hormone (ACTH), thyroid stimulating hormone (TSH), follicle stimulating hormone (FSH, luteinizing hormone (LH), and oxytocin more common for singers to have problems associated with overproduction than underproduction. Patients suffering from increased prolactin levels from a prolactin secreting adenoma may suffer from symptoms of *dysphonia premenstrualis* since prolactin suppresses lutein-

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HORMONES AND THE VOICE, CONT.

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izing hormone (LH), the surge of which leads to ovulation. Men typically do not have changes in pitch, but they may complain of a decrease in intensity and range.¹⁶ Decreased levels of FSH and testosterone also may make the male voice less powerful.

Some patients may have increased growth hormone release (GH), causing the syndrome of acromegaly. Excess GH causes thickening of the laryngeal cartilages, as well as the thickening of the vocal folds themselves, leading to a drop in voice frequency.¹⁷ Also, people with excess

GH who go on to develop acromegaly may be prone to arytenoid cartilage dislocation.¹⁸

Patients who suffer from increased levels of ACTH may be subjected to irreversible virilization of the voice. Because of the propensity of these people to develop insulin intolerance, they also are prone to the effects of diabetes on their voices. Diabetes is known to cause xerostomia (dry mouth) and neuropathy. The neuropathy may lead to weakening of the phonation muscles and loss of control, while the xerostomia may cause difficulty in phonation by decreasing lubrication.¹⁹ Diabetes can also cause hearing loss, another imperative skill a singer would suffer from the loss of. Diabetic patients must be encouraged to keep a strict

watch over their medication regimen and diet.

It is clear that the human voice is susceptible to hormonal changes, daily and throughout life. From puberty to senescence, the vocal apparatus is undergoing numerous changes, some of which are quite different in males and females. Through an understanding of these mechanisms, treatment can be optimized to control symptoms and allow individuals to carry their normal voice use. Singing teachers should be familiar with these issues and should not hesitate to refer students for evaluation when hormone problems are suspected.



References:

- 1) ABITBOL, J., DEBRUX, J., AND G. MILLOT. "DOES A HORMONAL VOCAL CORD CYCLE EXIST IN WOMEN? STUDY OF VOCAL PREMENSTRUAL SYNDROME IN VOICE PERFORMERS BY VIDEOSTROBOSCOPY, GLOTTOGRAPHY, AND CYTOLOGY ON 38 WOMEN," *JOURNAL OF VOICE* 3 (1989): 157-162.
- 2) HIGGIN, M., AND J. SAXMAN. "VARIATIONS IN VOCAL FREQUENCY PERTURBATION ACROSS THE MENSTRUAL CYCLE," *JOURNAL OF VOICE* 3 (1989): 233-243.
- 3) ABITBOL, J., ABITBOL, P., AND B. ABITBOL. "SEX HORMONES AND THE FEMALE VOICE," *JOURNAL OF VOICE* 13 (1999): 424-446.
- 4) MARSIGLIANTE, S., MUSCELLA, A., RESTA, L., AND C. STORELLI. "HUMAN LARYNX EXPRESSED ISOFORMS OF THE ESTROGEN RECEPTOR," *CANCER LETTERS* 99(1996): 191-196.
- 5) FERGUSON B., HUDSON, W., AND K MCCARTY JR. "SEX STEROID RECEPTOR DISTRIBUTION IN THE HUMAN LARYNX AND LARYNGEAL CARCINOMA," *ARCHIVES OF OTOLARYNGOLOGY-HEAD AND NECK SURGERY* 113 (1987): 1311-1314.
- 6) MARSIGLIANTE, S., LEO, G., RESTA, L., AND C. STORELLI. "STEROID RECEPTOR STATUS IN MALIGNANT AND NON-MALIGNANT LARYNX," *ANNALS OF ONCOLOGY* 3 (1992): 387-392.
- 7) NEWMAN, S., BUTLER, J., HAMMOND, E., AND S. GRAY. "PRELIMINARY REPORT ON HORMONE RECEPTORS IN THE HUMAN VOCAL FOLD," *JOURNAL OF VOICE* 14 (2000): 72-81.
- 8) ANDERSON, TIMOTHY, ANDERSON, DAWN, AND ROBERT T. SATALOFF. "ENDOCRINE DYSFUNCTION" IN *PROFESSIONAL VOICE: THE SCIENCE AND ART OF CLINIC CARE* (SAN DIEGO: SINGULAR PUBLISHING, 1997), 537-549.
- 9) RUBIN, JOHN, SATALOFF, ROBERT, AND GWEN KOROVIN. "THE LARYNX: A HORMONAL TARGET" IN *DIAGNOSIS AND TREATMENT OF VOICE DISORDERS* (SAN DIEGO: PLURAL PUBLISHING, 2005), 392-417.
- 10) ANDERSON T, ANDERSON D, SATALOFF RT; 1997.
- 11) RUBIN, SATALOFF, KOROVIN; 2005.
- 12) ANDERSON T, ANDERSON D, SATALOFF RT; 1997.
- 13) RUBIN, SATALOFF, KOROVIN; 2005.
- 14) ANDERSON T, ANDERSON D, SATALOFF RT; 1997.
- 15) RUBIN, SATALOFF, KOROVIN; 2005.
- 16) DAVIS, C. AND M. DAVIS. "THE EFFECTS OF PREMENSTRUAL SYNDROME ON THE FEMALE SINGER," *JOURNAL OF VOICE* 7 (1993): 337-353.
- 17) ANDERSON T, ANDERSON D, SATALOFF RT; 1997.
- 18) RUBIN, SATALOFF, KOROVIN; 2005.
- 19) TSAI-MORRIS, C., AQUILANA, D., AND M. DUFAU. "CELLULAR LOCALIZATION OF RAT

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FILIPA LÃ AWARDED VAN LAWRENCE FELLOWSHIP

It is a great pleasure to announce Filipa Martins Baptista Lã, PhD as the 22nd Annual Van L. Lawrence Fellowship recipient. Congratulations, Filipa!

The Voice Foundation and the National Association of Teachers of Singing Foundation (NATS Foundation) have each contributed \$1,000.00 to the Van L. Lawrence Fellowship fund. This \$2,000.00 award will be presented at 11:00am on Friday, May 29, 2015 during the Voice Foundation's 44th Annual Symposium: *Care of the Professional Voice*.

Filipa is an Assistant Professor in the Music Department of Communication and Arts, National Institute of Ethnomusicology, Music and Dance at the University of Aveiro, Campus Universitário de Santiago in Portugal. She is an overseas member of NATS and the first international member to be awarded the fellowship.



Her area of intended study using the Van Lawrence Fellowship concerns understanding the impacts of the provision of real-time feedback of airflow during exercises of semi-occluded vocal tract gestures. The question is whether the provision of such feedback offers long-lasting glottal waveform effects toward flow phonation behaviours (translated in higher maximum flow declination rate). Dr. Lã put forth an interesting proposal and provided a detailed description of the aims of the research project for which the Fellowship will be applied.

Four judges rated each submission and the average of the ratings determined the winner.

Dr. Lã was a clear winner with a few submissions neck-in-neck as runners up.

The fellowship was created by The Voice Foundation and the NATS Foundation to honor Van L. Lawrence, MD, for his outstanding contribution to voice, and particularly to recognize the importance of the interdisciplinary education he fostered among laryngologists and singing teachers. **The Fellowship winners are members of the National Association of Teachers of Singing** who are actively engaged in teaching, have demonstrated excellence in their profession as singing teachers, and have shown interest in and knowledge of voice science.

NATS Members: The application deadline for the next award is November 15, 2015

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VAN L. LAWRENCE FELLOWSHIP WINNERS THROUGH THE YEARS

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Voice of the Singer

HORMONAL CHANGES THAT AFFECT THE SINGING VOICE DURING MENOPAUSE

BY BARBARA DEMAIO CAPRILLI, DMA

The most frequent voice-related complaints among postmenopausal women are dryness of the throat, frequent throat clearing, lower frequency levels of the voice, and voice sound alterations with increased roughness and hoarseness¹, as well as edema in the vocal folds². These changes can be particularly troubling in the singing voice.

Abitbol, in his groundbreaking study of the effect of hormones on the voice, mentions dryness as one of the symptoms of the menopausal voice, and he attributes this to the loss of estrogen that occurs during menopause³. Investigators in Brazil researched the vocal sound alterations reported by many women by comparing 45 in reproductive age to 45 who were

postmenopausal and who were not on HRT (hormone replacement therapy) for at least three years. The scientists found less variation in formants and a slower diadochokinetic (DDK) rate in postmenopausal women as compared with women of reproductive age⁴. Since DDK rate may be indicative of motor coordination, this resulting impairment of articulation may interfere with the clear diction essential to singers.

Heman-Ackah, of the Women's Health Initiative for the Perimenopausal Singer, reports that, "Because one of the chief functions of estrogen is to maintain the tone and bulk of skeletal muscles, including those in the larynx, many women develop atrophy of the vocal fold

muscles and a reduction in the thickness of the mucosa of the vocal folds with estrogen loss during menopause."⁵ In addition, a perceived reduction in the mobility of the cricoarytenoid joint that can affect vocal mobility was ob-

served.⁶ Menopause also affects the vagus nerve that innervates the larynx. Estro-progestational impregnation improves the responsiveness of the vagus nerve. However, during menopause the radical drop in the secretion of estrogens and the complete halt in the secretion of progesterone due to the lack of follicles in the ovaries have the opposite effect. The result of these neurological changes is a slowing of the vocal response and difficulty with rapid changes of frequencies when singing. This phenomenon may contribute to the slowing of the vibrato rate from seven to four oscillations per second that is observed in some menopausal singers.⁷

Twenty percent of the professional singers in the Abitbol study had symptoms serious enough to merit treatment.⁸ When symptoms are severe, they can cause emotional and physical upheavals in both recreational and elite singers. Celebrated mezzo-soprano Christa Ludwig said of that time in her life, "It was a hell of some years. Sometimes I had the impression that



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"CELEBRATED MEZZO-SOPRANO CHRISTA LUDWIG SAID OF THAT TIME IN HER LIFE, "IT WAS A HELL OF SOME YEARS. SOMETIMES I HAD THE IMPRESSION THAT MY VOCAL CORDS WERE MADE OF GLASS, THEY FELT SO FRAGILE. SOMETIMES I WOULD BE AFRAID TO SING A FORTE TONE. THERE WAS A REAL FEAR, EVERY DAY, WHETHER THE VOICE WAS THERE."

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HORMONAL CHANGES THAT AFFECT THE SINGING VOICE DURING MENOPAUSE, CONTINUED

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my vocal cords were made of glass, they felt so fragile. Sometimes I would be afraid to sing a forte tone. There was a real fear, every day, whether the voice was there." ⁹

Researchers agree that vocal changes occur due to the loss of estrogen during menopause; however, no consensus exists on whether treatment, particularly HRT, is necessary or

desirable. Abitbol et al. define menopausal vocal syndrome as "characterized by lowered vocal intensity, vocal fatigue, a decreased range with loss of the high tones and a loss of vocal quality."¹⁰ All of the women in the Abitbol study showed signs of vocal muscle atrophy as well as a reduction in the thickness of the mucosa and reduced mobility in the cricoarytenoid joint.¹¹ Abitbol states that HRT is essential for the profes-

sional singer,¹² while Heman-Ackah feels that the risks outweigh the benefits and believes that, "the widespread use of hormone replacement therapy has been limited because of fears that the use of estrogens may predispose to the development of breast cancer, endometrial (uterine) cancer, clotting disorders and possibly contribute to deaths as a result of these disorders."¹³ Clearly more research is needed on both the effects of hormones on the voice and possible treatment options.

REFERENCES

1. D'HAESELEER, FEMALE LARYNX: 30.
2. CATHERINE FRONEBERGER SIARRIS, "THE AGING FEMALE VOICE: MEDICAL TREATMENTS AND PEDAGOGICAL TECHNIQUES FOR COMBATting THE EFFECTS OF AGING WITH EMPHASIS ON MENOPAUSE, DMA DISS., UNIVERSITY OF SOUTH CAROLINA, 2009, 23.
3. ABITBOL, ABITBOL, AND ABITBOL, "SEX HORMONES," 431.
4. ELISÉA MARIA MEURER, MARIA CELESTE OSÓRIO WENDER, HELENA VON EYE CORLETA, AND EDISON CAPP, "PHONO-ARTICULATORY VARIATIONS OF WOMEN IN REPRODUCTIVE AGE AND POSTMENOPAUSAL," *JOURNAL OF VOICE* 18, NO. 3 (2004), 369.
5. YOLANDA D. HEMAN-ACKAH, "HORMONE REPLACEMENT THERAPY: IMPLICATIONS OF THE WOMEN'S HEALTH INITIATIVE FOR THE PERIMENOPAUSAL SINGER," *JOURNAL OF SINGING*, 60, NO. 5 (MAY/JUNE 2004): 471.
6. *IBID.*
7. JEAN ABITBOL. *ODYSSEY OF THE VOICE*. TRANS. PATRICIA CROSSLEY (SAN DIEGO: PLURAL, 2006), 225.
8. ABITBOL, ABITBOL, AND ABITBOL, "SEX HORMONES," 444.
9. BERNSTEIN, 27.
10. ABITBOL, ABITBOL, AND ABITBOL, "SEX HORMONES," 442.
11. HEMAN-ACKAH, 425.
12. ABITBOL, ABITBOL, AND ABITBOL, "SEX HORMONES," *IBID.*
13. HEMAN-ACKAH, 472.



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PENTAX
MEDICAL

Excellence in Focus

MK-442 Rev. A

World Voice Day

TVF EVENTS IN 2015

TVF is an official sponsor of the World Voice Day Website

world-voice-day.org

Philadelphia PECO Crown Lights display flashing: Celebrate World Voice Day 4/16 www.voicefoundation.org

Where: PECO Building, 2301 Market Street, Philadelphia, PA 19103

When: Wednesday, April 16th, all day

Expected audience: Philadelphians

Concert and Reception: **Can't Help Lovin' That Voice (of Mine)**

Hosted by: AVA's Daniel Pantano

WVD Mission Talk: Dr. Robert Sataloff

Who: Singers from The Voice Foundation and PENTA

When: 6:30pm, April 16th

Where: Academy of Vocal Arts, 1920 Spruce St. Philadelphia, PA

Do you have a **WORLD VOICE DAY** event?

List it here:

<http://world-voice-day.org/form-for-your-wvd-event/>

TVF EVENTS IN 2014

Thanks to

Michelle Horman, David Pershica, and Donna Snow



IS YOUR VOICE TRYING TO TELL YOU SOMETHING?

That sharp pain when you talk could be a temporary issue, or it could be a sign of a more serious problem. Learn about the warning signs of voice disorders and how we can help you get the education and care your voice deserves.

SPEAK UP ON WORLD VOICE DAY - APRIL 16

THE VOICE FOUNDATION
visit voicefoundation.org



World Voice Day



ST. JOHN
MACOMB-
OAKLAND
HOSPITAL

Celebrate World Voice Day

You are invited to celebrate the human voice
with a special concert led by:

Adam D. Rubin, MD and
Jean Skeffington, MA, CCC-SLP
and the Lakeshore Professional Voice Center



Thursday, April 16, 2015
7 p.m.
The Baldwin Theatre
415 S. Lafayette
Royal Oak, MI 48067

Raise awareness of your vocal health
while you enjoy wonderful performances of
popular musical theatre, opera,
gospel and rock and roll.

RSVP requested by April 10, 2015 by calling
1-866-501-DOCS or email at healthconnect@stjohn.org



World Voice Day

OPENMIND OPENBODY

connecting the voice community through
SCIENCE + SOUND

APRIL 11&12, 2015 UIC Eye & Ear Infirmary 1855 West Taylor, Chicago

The Chicago Voice Foundation Chapter, The Chicago Institute for Voice Care and Davin Youngs Voice are proud to present an exciting two-day workshop in Contemporary Commercial Singing Styles with New York based and internationally renowned singing specialist **JEANNETTE LOVETRI**.

As the creator of **Somatic Voicework™**, **The LoVetri Method**, and the widely used term, Contemporary Commercial Music (CCM), LoVetri will share how her body-based system of training helps singers uncover their unique and authentic sound. With over 40 years experience working with diverse clientele like Phish's Trey Anastasio and Broadway's D'Arcy James of Shrek, LoVetri's teaching is clear, simple and accessible to beginners and professionals in various styles, from jazz to gospel to pop to rock.

Additionally, Otolaryngologist, **DR. H. STEVEN SIMS** will present common voice issues amongst performers and best practices for vocal health.

ALL ARE WELCOME! Professional, amateur and aspiringsingers, voice teachers, students and speech pathologists are especially encouraged to attend.

REGISTER AT OPENMINDOPENBODY.COM



World Voice Day

SEATTLE/NORTHWEST CHAPTER OF TVF

Cyndia Sieden, internationally renowned opera singer for her portrayal as the Queen of the Night in The Magic Flute, will be giving a Mozart masterclass.

Cyndia Sieden
Mozart Masterclass
Monday, April 6 at 7:00
Brechemin Auditorium
University of Washington
School of Music
For attendance contact:
Kari Ragan : dkr@kariragan.com

MILWAUKEE CHAPTER OF TVF

**WILL BE DOING VOICE SCREENINGS FOR
HIGH SCHOOL PERFORMERS AS PART OF THE
ANNUAL SOLO AND ENSEMBLE COMPETITION.
THESE WILL BE CONDUCTED AT THE UNIVER-
SITY OF WISCONSIN - MILWAUKEE.**

Jonathan M. Bock, MD, FACS
Assistant Professor
Division of Laryngology & Professional Voice
Dept. of Otolaryngology & Communication Sciences

CLEVELAND CLINIC WVD EVENTS

www.clevelandclinic.org/worldvoiceday
<http://my.clevelandclinic.org/services/head-neck/patient-education/free-screenings-events>



WORLD VOICE DAY
APRIL 16th

VOICE FOUNDATION NEWS

JOINT MEETING:

44TH ANNUAL SYMPOSIUM, CHAIRMAN, ROBERT T. SATALOFF

AND

THE INTERNATIONAL ASSOCIATION OF PHONOSURGERY

PRESIDENT, MICHAEL S. BENNINGER

MAY 26—MAY 31, 2015 PHILADELPHIA PENNSYLVANIA

Tuesday, May 26

Basic Science Tutorials
Accent Reduction Coaching

Wednesday, May 27

Science Sessions
Keynote Speech Frank Guenther, PhD
Quintana Awardee Ulrich Eysholdt, MD, PhD
Panel

Thursday, May 28

Special Session: The Aging Voice
Speech-Language Sessions
Poster Session
Panel
Panel

Friday, May 29

Medical Sessions
Young Laryngologists Study Group
[Vocal Workshops](#)
[Voices of Summer Gala](#)

Saturday, May 30

Medical Sessions
Interdisciplinary Panels
G. Paul Moore Lecture - Brenda Smith, DMA
[Vocal Master Class-Dolora Zajick](#)

Sunday, May 31

Medical Sessions
Interdisciplinary Panels Sunday
Voice Pedagogy Sessions

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THE VOICE FOUNDATION

Advancing understanding of the voice through interdisciplinary scientific research & education

APRIL 2015

SUN	MON	TUE	WED	THU	FRI	SAT
			1	2	3	4
All Disclosure Forms due by April 1st.						
5	6	7	8	9	10	11
12	13	14	15	16 World Voice Day	17	18
19	20	21	22	23	24	25
26 Ends Early Bird	27	28	29	30		

THE VOICE FOUNDATION

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journal@voicefoundation.org

abstracts@voicefoundation.org

symposium@voicefoundation.org

MAY 2015

SUN	MON	TUE	WED	THU	FRI	SAT
					1	2
The Westin Hotel Group Rate—available until May 1st.						
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
			JOINT MEETING - SYMPOSIUM			
					GALA	
31 SYMP						

SCHEDULE OF EVENTS

- February 15, 2015—Submission Deadline for the Hamdan International Presenter Award
- March 1, 2015—Proposal Submission Deadline for New Investigator's Forum
- April 16, 2015—World Voice Day
- April 26, 2015 Symposium Registration Deadline for Early Bird Discount
- May 1, 2015 Deadline to reserve room at the Westin Hotel at Symposium Prices.
- May 28—June 1, 2015 43rd Annual Symposium: Care of the Professional Voice
- May 30, 2015—Voices of Summer Gala