ICDA Conference 2024

Cultivating Vocal Health: A Comprehensive Guide for Choral Directors

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Objectives

1.) Participants will be able to describe basic anatomy and physiology of voice production.

2.) Participants will summarize research evidence that addresses and debunks three common myths about vocal fold lesions and singing.

3.) Participants will be able to implement at least three vocal hygiene principles and/or vocal efficiency techniques to help prevent vocal injury in themselves and students.

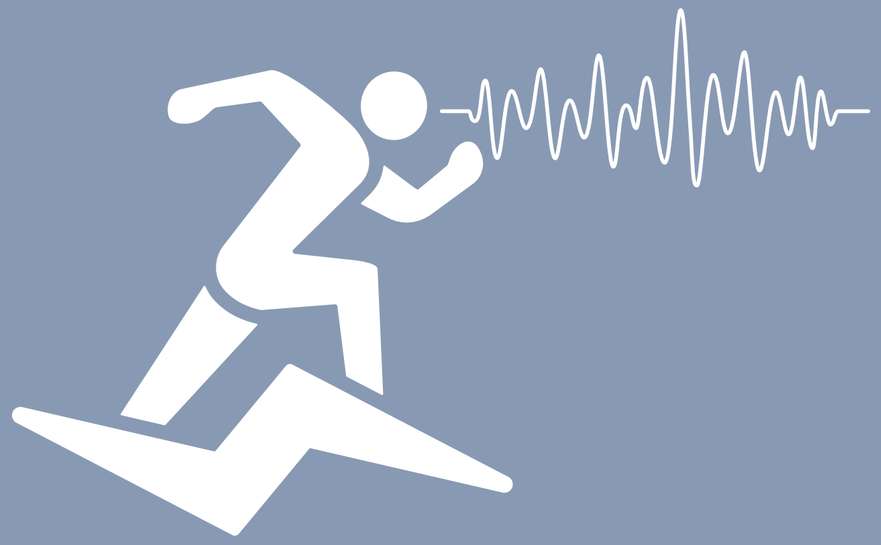
Defining Health

Health: …"a state of complete physical, mental and social well-being and *not* merely the absence of disease or infirmity"
(World Health Organization, 1946, Preamble)



Defining Vocal Health

Vocal Health: strategies to improve the vitality of the structures involved in voice production



Sapienza & Hoffman, 2022

Laryngeal Structure and Function

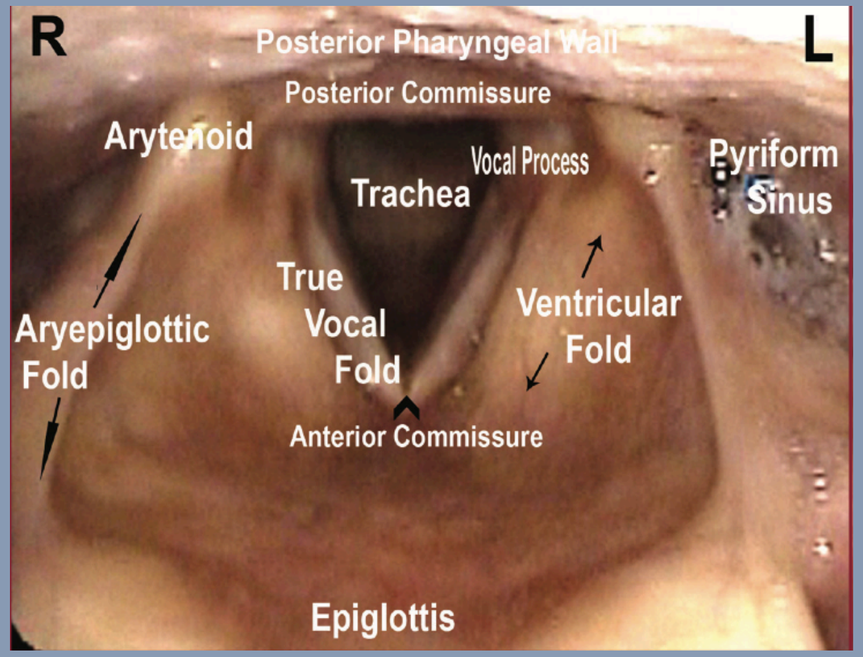
General structure: Bone, multiple cartilages, numerous muscles, membranous and connective tissues, and movable joints

Three primary functions:

- **Airway preservation**
- **Airway protection**
- **Phonation (i.e., voice production)**

Sapienza & Hoffman, 2022

Laryngeal Structure and Function



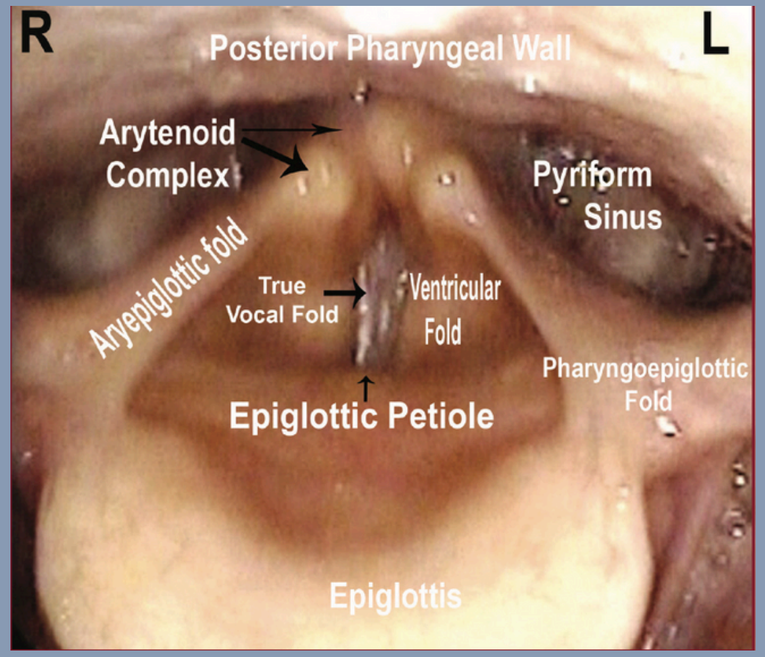


Image from Stepmle et al. 2020

Physiologic Voice Production

Vocal cord closure

↓

Airflow from the lungs builds pressure below the cords

↓

Pressure reaches threshold and sets vocal cords into passive vibration

↓

Aerodynamic energy converts into acoustic energy and is amplified via the resonating chambers

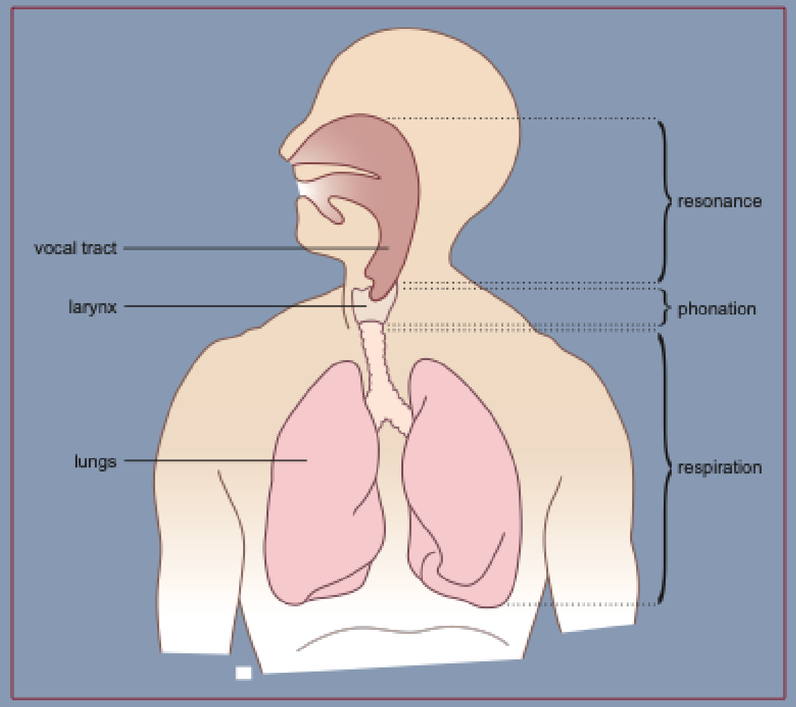


FIGURE 2–1. Orientation of the larynx in the body, at the juncture between the subglottic trachea and lungs and the supraglottic pharyngeal and oral cavities. These structures form the three subsystems of voice: respiration, phonation, and resonance.

Image and information derived from Stepmle et al. 2020

Vocal Fold Layers

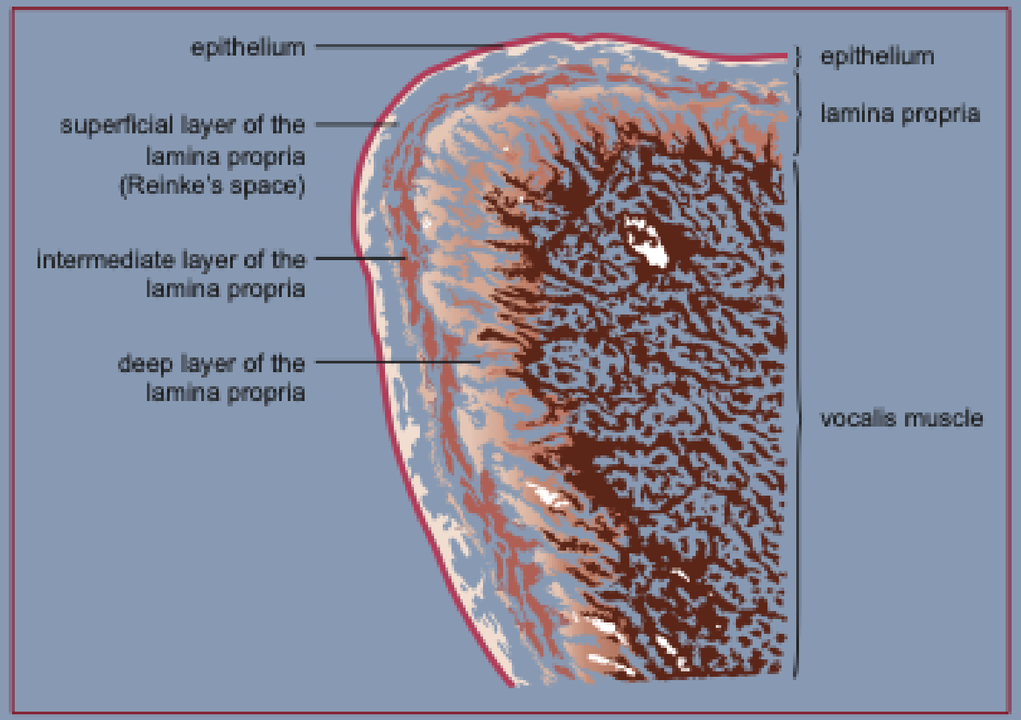


FIGURE 2–18. Vocal fold histologic layered microstructure.

Image from Stepmle et al. 2020

Vocal Fold Layers

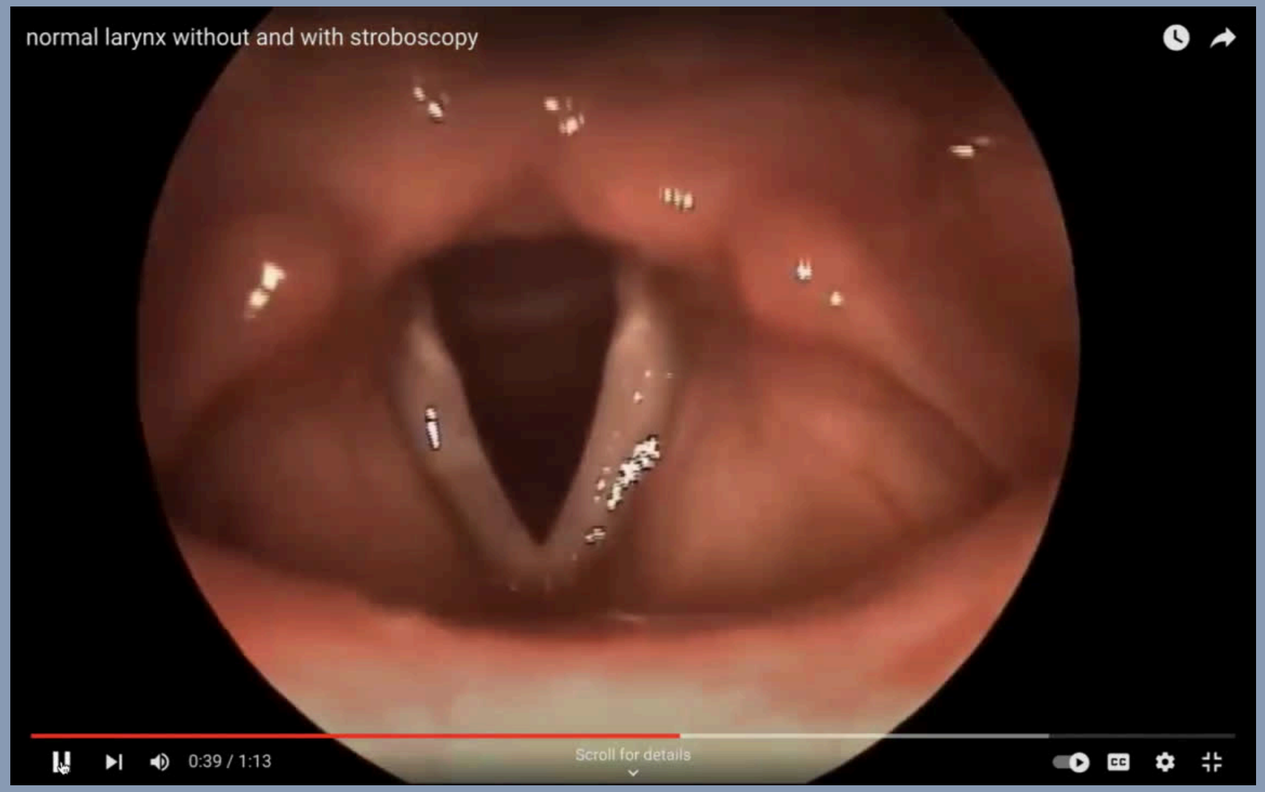
Epithelium: a thin, pliable covering of mucous lubrication that protects the vocal folds and is necessary for vibration

Superficial layer of the lamina propria: loose and flexible layer comprised of a soft, gelatin-like substance that vibrates significantly during phonation

- **Origin of many benign vocal fold lesions**

Sapienza & Hoffman, 2022
Stemple et al. 2020

Normal Vocal Fold Vibration



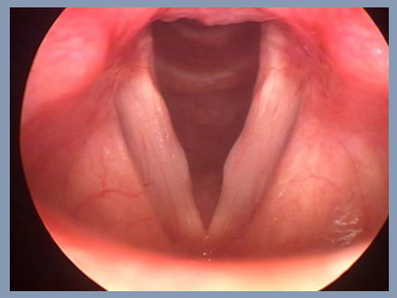
Common Vocal Fold Lesions

Nodules

Pseudocysts

Polyps







Images from Zhukhovitskaya et al. 2015

Common Vocal Fold Lesions

Nodules

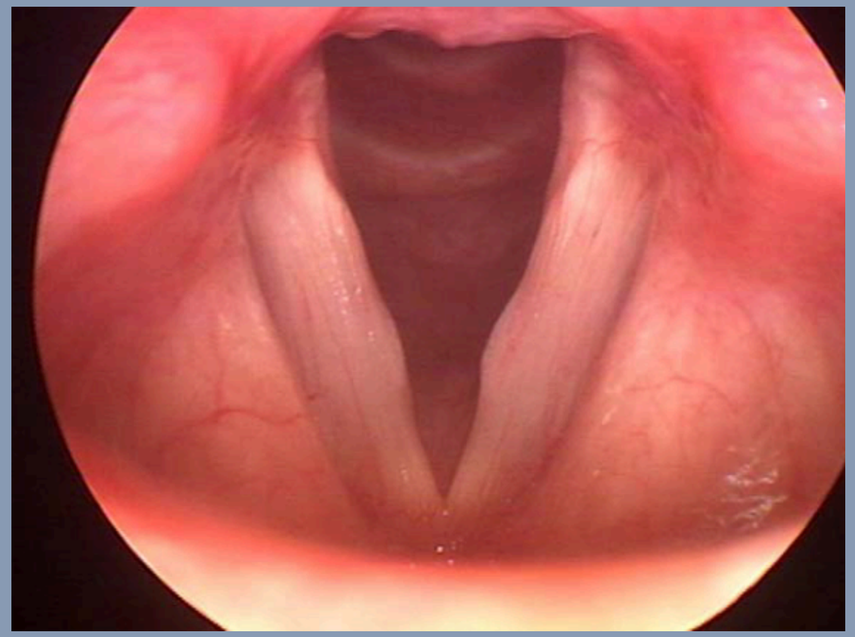


Image from Zhukhovitskaya et al. 2015

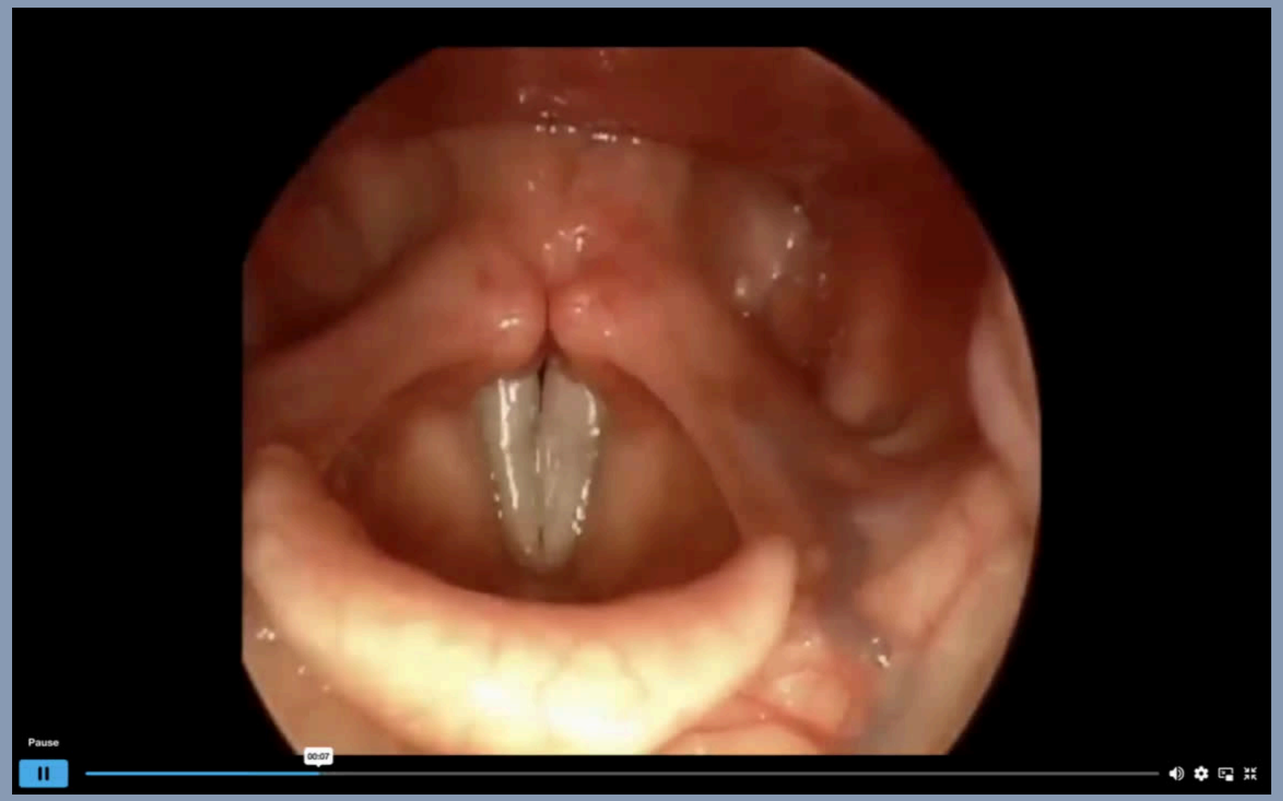
Common Vocal Fold Lesions

Vocal fold nodules: Inflammatory swellings that occur due to repeated phonotrauma

- **Present at the middle of both vocal fold edges where collision force is greatest**
- **Likely more related to speaking than singing**
- **Significance: A raspy, breathy voice that easily fatigues due to increased mass, stiffness (sometimes), and incomplete vocal fold closure**

Sapienza & Hoffman, 2022
Childs et al. 2023

Common Vocal Fold Lesions



Video from Sapienza & Hoffman, 2022. Companion Website.

Common Vocal Fold Lesions

Pseudocyst



Image from Zhukhovitskaya et al. 2015

Common Vocal Fold Lesions

Pseudocyst: translucent lesion with a blister-like appearance

- **More common in singers than non-singers. Specifically, more common in female opera singers**
- **Hypothesized to be the result of slow, accumulative phonotrauma**
- **Significance: Similar to vocal fold nodules. Singers may experience voice breaks and range limitations due to impaired vocal fold stretch, inconsistent vibration, and incomplete closure.**

Sapienza & Hoffman, 2022
Childs et al. 2023

Common Vocal Fold Lesions

Polyp



Image from Zhukhovitskaya et al. 2015

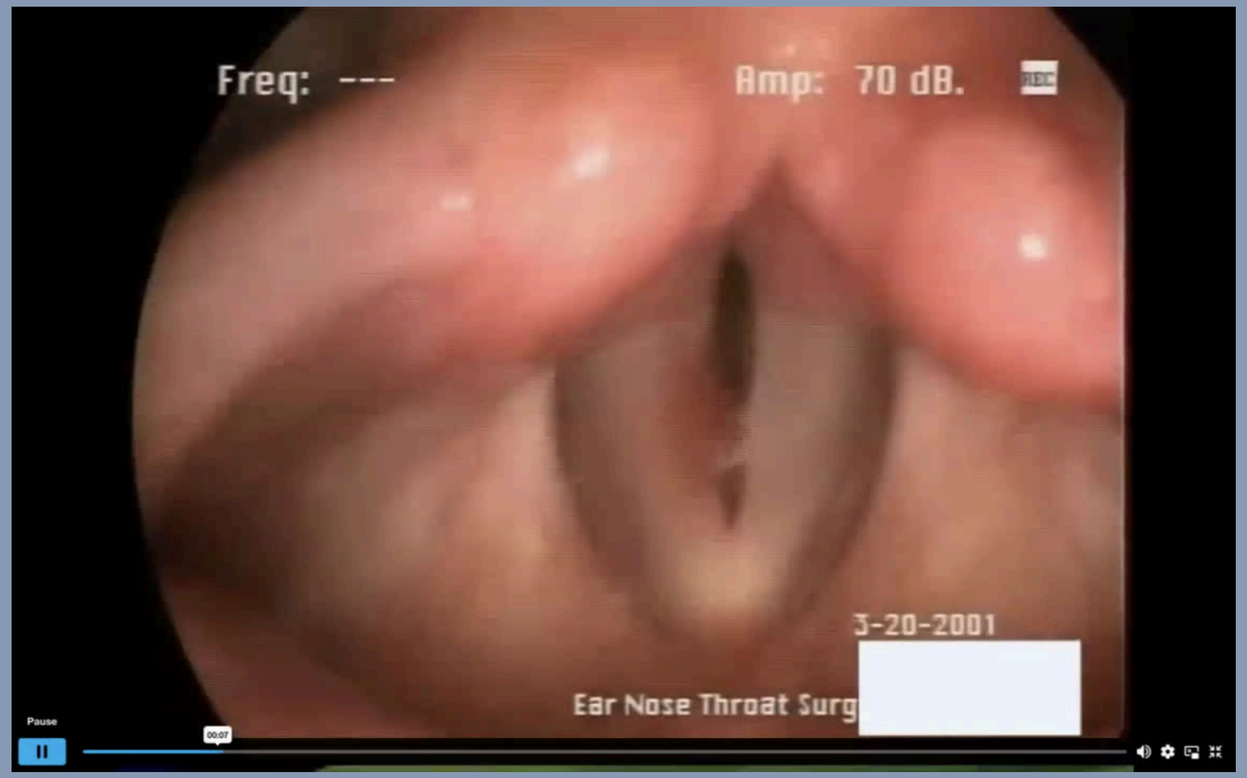
Common Vocal Fold Lesions

Polyp: a well-defined lesion underneath the epithelium that may be hemorrhagic (injured blood vessel) or fibrotic (general stiffness)

- **Hypothesized to be the result of sudden phonotrauma**
- **More common in praise/worship performers**
- **Signifiance: A very abrupt change in voice quality that can impact speaking and singing.**

Sapienza & Hoffman, 2022
Childs et al. 2023

Common Vocal Fold Lesions



Video from Sapienza & Hoffman, 2022. Companion Website.

Myth Busters

“Only contemporary singers develop lesions.”

“All lesions need to be removed surgically.”

“If you have a lesion, it’s the end of your career.”

What does the research tell us?

1.) Phonotraumatic lesions may develop in singers across many genres (Childs et al., 2023).

TABLE II.
Singer Genre Classification (Study 1—Prevalence of Phonotraumatic Lesions by Genre).

Phonotraumatic lesions present?	Choral	Country	Gospel	Musical theater	Opera	Pop	Praise/worship	Folk	Jazz	Total
Yes	60	5	12	43	21	30	12	7	1	191
No	276	4	3	56	35	99	44	0	4	521
Total	336	9	15	99	56	129	56	7	5	712
% with lesions	17.9	55.6	80.0	43.4	37.5	23.3	21.4	100	20.0	26.8

What does the research tell us?

2.) Relatively few singers who develop phonotraumatic lesions undergo surgery (Childs et al., 2022).

- Generally, vocal fold nodules do not warrant surgery (Childs et al., 2022)
- Most performers with pseudocysts can return to baseline abilites with behavioral management (Estes & Sulica, 2015)
- Surgery may be recommended in cases of vocal fold polyps (Agarlwal et al., 2019; Childs et al., 2022)

What does the research tell us?

3.) In many cases, lesion development and vocal injury are not career enders. Early identification and prevention are key.

- 88% of patients with a pseudocyst did not experience functional voice limitations following combined surgery and behavioral voice management (Estes & Sulica, 2015)
- Patients with a history of vocal fold hemorrhage reported adequate job stability, voice quality, and perceived vocal function 3+ years after injury (Kerwin et al., 2022)

Cultivating Vocal Health

- Adequate hydration
- Limit substances that dehydrate or irritate the throat
- Implement semi-occluded vocal tract techniques into warm-ups, cool-downs, resets, and repertoire practice
- Know when to seek a medical evaluation

Sapienza & Hoffman, 2022

Cultivating Vocal Health

- Systemic Hydration:
  - General hydration that keeps tissue healthy
  - Drink plenty of water
- Topical Hydration:
  - Hydrating the delicate top surface of the vocal folds
  - Inhalation of humidified air, nebulization, avoid dry environments
- Rationale: Keep vocal folds pliable, decrease risk of injury, optimize voice effort, efficiency, and sound quality



Alves et al. 2019

Cultivating Vocal Health

Laryngeal Irritants

- Smoking
- Alcohol
- Caffeine
- Reflux
- Menthol
- Excessive voice use
    - Consider amplification, voice breaks, vocal pacing

Cultivating Vocal Health

Cough Drop Alternatives

- Choose glycerin or pectin-based lozenges over menthol







Liu et al. 2015

Cultivating Vocal Health

Semi-occluded vocal tract (SOVT) techniques

- Position and shape the vocal folds for efficient voicing
- Prevent hyperadduction and/or pressed vocal quality
- Provide a sensation of having had a laryngeal massage
- Create stability in laryngeal height (neither too high nor too low)
- Generate vibrations in facial tissues
- Aid in expanding vocal range

Ragan, 2020

Cultivating Vocal Health

Semi-occluded vocal tract (SOVT) techniques

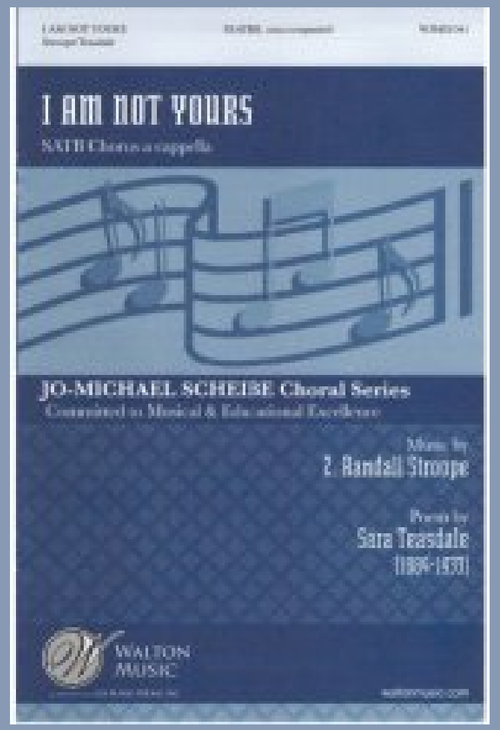
- **How to use?**
  - **Warm-ups, cool-downs, resets, and training gestures into repertoire**
- **Examples**
  - **Lip trills, tongue-out trills, puffy-check/blowfish, nasal and fricative facilitators, straw phonation with free end in air or water**

Ragan, 2020

Cultivating Vocal Health

Live Demonstration

- Use of straw phonation with free end in air to address pressed phonation
- Use of straw phonation with free end in water to address breathy phonation



Cultivating Vocal Health

When to Seek a Medical Evaluation

- Consider baseline evaluation
- Recommended if unwanted voice changes last longer than 2 weeks
  - Unwanted voice changes may include:
    - A change in quality (roughness, breathiness, strain)
    - Reduced endurance or power
    - Increased effort to speak or sing
    - Voice breaks or new difficulty transitioning across passagi
    - Pain while speaking or singing
  - Recommended if very sudden and major vocal change (e.g., sudden roughness, breathiness, voice loss, or pain)

Community Healthcare System
Professional Voice Care

If you or someone you know is struggling with a voice-related issue, the Professional Voice team within Community Healthcare System is here for you.

- Our team consists of a fellowship-trained laryngologist and speech-language pathologist who work collaboratively to provide timely and comprehensive evaluations and care plans.

Services provided:

- Emergency appointments
- Expert evaluation with high-definition videostroboscopy
- State-of-the-art treatment via medical/surgical and/or behavioral management

Thank You!

Contact Information
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