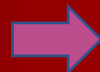
A man with a beard and glasses, wearing a dark tank top, is singing into a vintage-style microphone. He is holding the microphone with his right hand and has his left hand clenched in a fist. The background is a warm, orange-red gradient with soft bokeh light effects.

Harmonizing Health: The Role of VOCAL PHYSIOTHERAPY in Optimizing Voice Function

Pooja Verma

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Physiotherapist
Physio Asia
Therapy Centre



What is Performing Arts Medicine?

Performing Arts Medicine focuses on the health needs of performing artists – dancers, circus artists instrumentalists, actors and singers.

It deals with conditions that impact a performing artist's ability to perform at their highest level, for example, injuries or psychological issues, with the aim of helping the artist optimise their performance potential.





THE VOICE

The voice – How do we produce sound

- “Voice” typically refers to the sound produced by the vocal cords, allowing for speech or other vocalizations.
- The vocal cords, located within the larynx, are essential for sound production. As air passes through the larynx, the vocal cords vibrate, creating sound. The manipulation of tension and position of the vocal cords contributes to variations in pitch and tone.
- Pitch refers to the perceived frequency of the sound, while tone describes the character or quality of the sound.



The voice – What influences it?

1. Physiological Factors:

- **Vocal Cord Health:** The condition of the vocal cords plays a crucial role in voice production. Disorders or abnormalities, such as nodules, polyps, or inflammation, can affect the quality of the voice.
- **Respiratory System:** The efficiency of the respiratory system, including lung capacity and control of airflow, is essential for sustaining and modulating the voice.

2. Anatomical Factors:

- **Laryngeal Structure:** The structure of the larynx, including the size and shape of the vocal cords, can impact the pitch and quality of the voice.
- **Oral and Nasal Cavities:** The shape and size of the oral and nasal cavities can influence resonance and the overall timbre of the voice.

3. Environmental Factors:

- **Humidity and Temperature:** The environment's humidity and temperature can affect the vocal cords. Dry or cold air may lead to irritation, while warm and humid conditions may be more favourable for vocal health.
- **Air Quality:** Exposure to pollutants, smoke, or allergens in the air can impact vocal cord function.

4. Behavioral Factors:

- **Vocal Habits:** Speaking loudly, yelling, or using improper vocal techniques can strain the vocal cords and contribute to voice problems.
- **Hydration and Diet:** Adequate hydration is crucial for maintaining vocal cord lubrication. Certain foods and drinks, such as caffeine and alcohol, can dehydrate the body and affect the voice

5. Psychological Factors:

- **Emotional State:** Stress, anxiety, and emotional well-being can influence the voice. Tension or nervousness may manifest as vocal tension, affecting the sound.
- **Psychosocial Factors:** Cultural and social influences, including language patterns and accents, can contribute to variations in vocal expression.

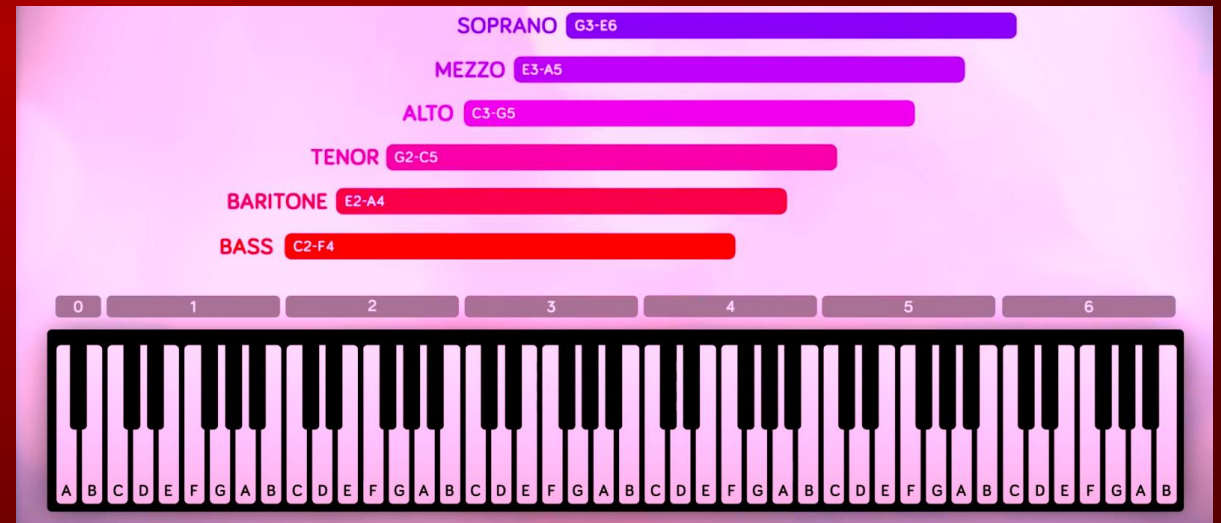
6. Age and Hormonal Changes:

- As individuals age, the vocal cords may undergo changes, affecting pitch and tone. Hormonal changes, such as those during puberty, can also impact the voice (deepening of the voice in males) and an increased pitch in females with menopause.

VOICE CLASSIFICATION

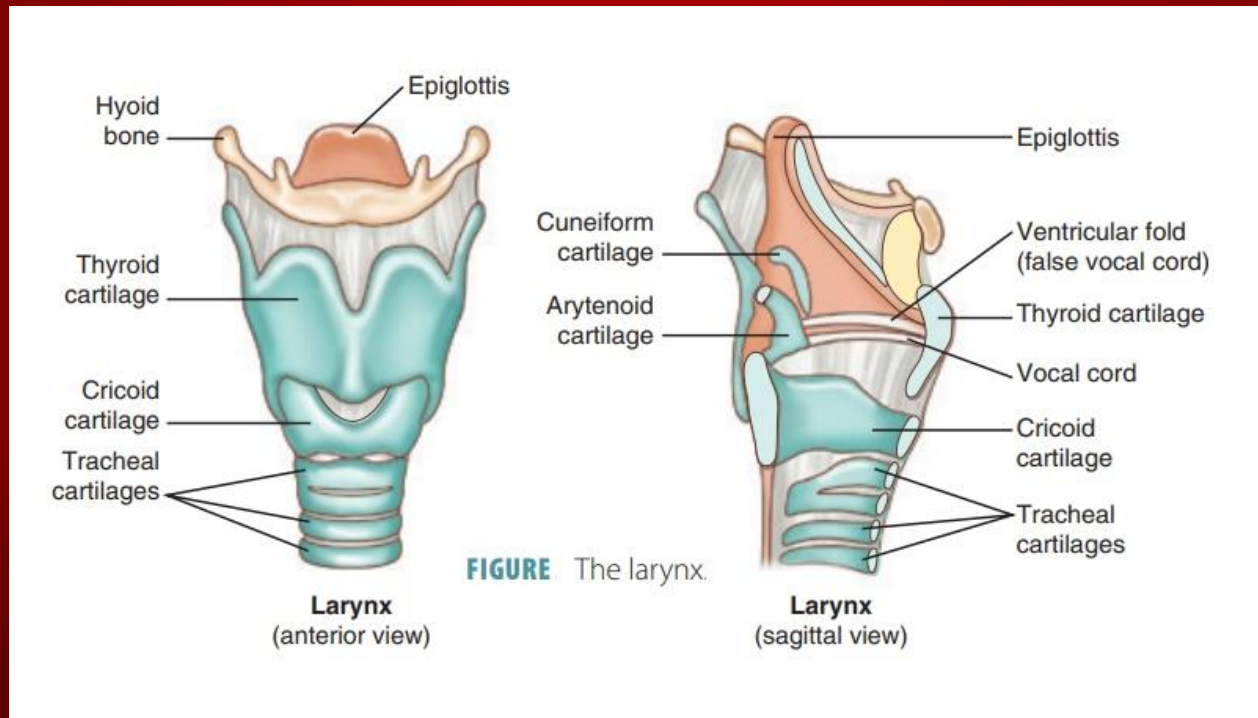
Common voice classifications include:

- **Soprano:** High female voice.
- **Mezzo-Soprano:** Medium-range female voice.
- **Contralto (or Alto):** Low female voice.
- **Tenor:** High male voice.
- **Baritone:** Medium-range male voice.
- **Bass:** Low male voice.



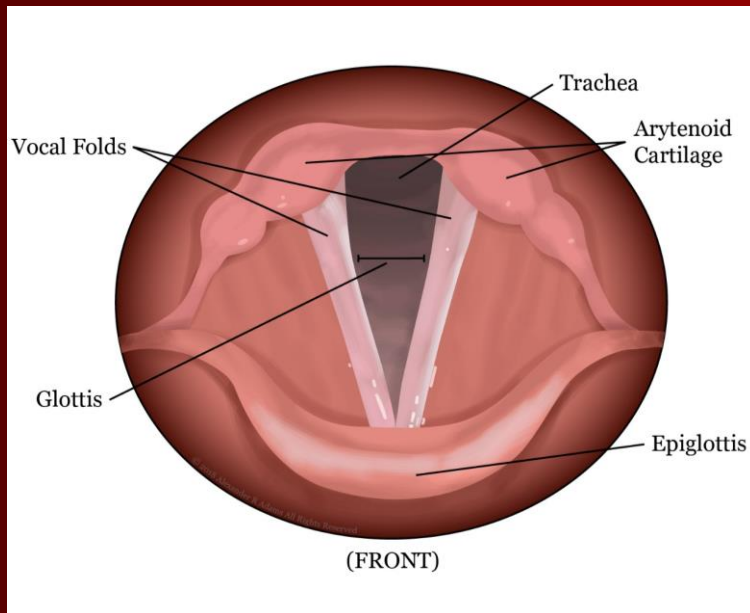
ANATOMY – THE LARYNX

- The larynx, commonly known as the voice box, is a cartilaginous structure located in the neck.
- It houses the vocal folds (cords), which are composed of layers of muscle and connective tissue.
- The larynx functions as a valve, controlling the passage of air between the trachea and the pharynx.



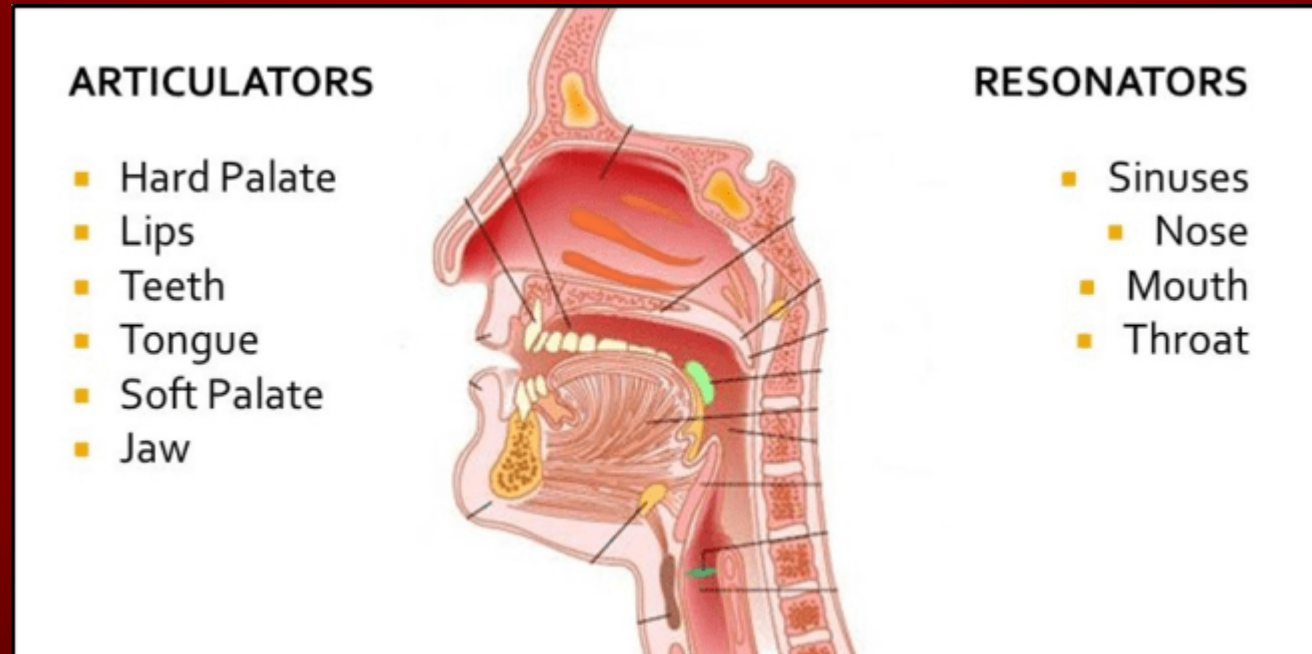
ANATOMY – THE VOCAL FOLDS

- The vocal folds are a pair of elastic structures within the larynx that vibrate to produce sound.
- Sound production occurs when air from the lungs passes through the opening between the vocal folds, causing them to vibrate.



ANATOMY – THE ARTICULATORS

- The tongue, lips, soft palate (velum), and jaw act as articulators that modify the sound produced by the vocal folds to create speech sounds.



ANATOMY – SUPPORTING MUSCLES

- Muscles around the larynx, such as those in the neck and abdomen, provide support for breathing and voice production.



Common vocal conditions

- Muscle Tension Dysphonia
- Spasmodic Dysphonia
- Vocal Nodules/ Polyps/ Cysts
- Reinke's Oedema
- Laryngitis
- Aphonia
- Vocal Fold Haemorrhage

What is Muscle Tension Dysphonia?

Muscle tension dysphonia (MTD) is one of the most common voice disorders. It occurs when the muscles around the larynx (voice box) are so tight during speaking that the voice box does not work efficiently. It is a general term for an imbalance in the coordination of the muscles and breathing patterns needed to create voice.

There are two types of MTD:

- **Primary MTD** — In this type, the muscles in your neck are tense when you use your voice but there is no abnormality in the larynx (voice box).
- **Secondary MTD** — In this type, there is an abnormality in the voice box that causes you to over-use other muscles to help produce your voice.

What causes muscle tension dysphonia?

There are usually a number of factors involved in the development of a MTD. The most common ones include:

- Long-term patterns of ineffective voice use
- Sudden changes in voice production associated with a period of vocal overuse, an infection or emotional stress
- Compensation for an underlying vocal fold problem such as a cyst, paresis, or fatigue in the vocal muscles
- A 'guarding' response to acid reflux or some other irritant
- A combination of some or all of the above factors

What are the symptoms/ presentation of muscular tension dysphonia?

- Vocal fatigue
- Loss of resonance
- Breathy tone
- Constriction whilst voicing
- Loss of vocal range
- Neck / jaw tension
- Muscular pain in extrinsic muscles
- Effortful/ difficulty swallowing

What is Laryngeal Manual Therapy?

LMT is a non-invasive treatment that addresses the muscular tension in the perilaryngeal region that may affect one's ability to vocalise/phonate.

This form of manual therapy involves manipulating the larynx and surrounding soft tissues that control movement of the larynx.



NOT...



OR



INSTEAD,

I work WITH:

ENTs

SLTs

VOCAL COACHES/SINGING TEACHERS

Why is Vocal Physiotherapy important?



The Impact of Vocal and Laryngeal Pathologies Among Professional Singers: A Meta-analysis

Michelle Kwok, Guy D. Eslick  

Objective

Professional singers are more likely to develop laryngeal pathologies and symptoms associated with misuse and overuse of the voice. However, different studies have shown conflicting evidence. We aim to perform a systematic review and quantitative meta-analysis to determine the prevalence and risk of laryngeal pathologies and symptoms among professional singers.

Methods

Four electronic databases (MEDLINE, PubMed, EMBASE, and CINAHL) were searched, with no language restrictions. From 3368 potential studies, a total of 21 studies met our inclusion criteria. A systematic review of the literature was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines. All cohort, case-control, or cross-sectional studies that reported the risk of laryngeal pathologies in singers were included. Data were pooled by a random effects model and the pooled odds ratios (ORs) and 95% confidence intervals (CIs) were calculated.

Results

There was a positive relationship between singing and laryngeal pathologies. There was an increased risk of hoarseness (OR: 2.00, 95% CI: 1.61–2.49), gastroesophageal reflux disease (GERD) (OR: 1.45, 95% CI: 1.19–1.77), Reinke edema (OR: 2.15, 95% CI: 1.08–4.30), and polyps (OR: 2.10, 95% CI: 1.06–4.14) in professional singers.

Conclusion

Professional singers are at an increased risk of laryngeal pathologies and symptoms associated with vocal misuse and overuse, particularly hoarseness, GERD, edema, and polyps.

ABSTRACT

Introduction:

Pansori is a traditional Korean dramatic art form, which likely appeared in the mid-eighteenth century in the southern region of Korea. In *pansori* there is a strong inclination toward preserving tradition, especially in regard to training, which is generally considered particularly demanding in terms of risks to vocal health. Nevertheless -as highlighted by recent studies- some innovations took place in *pansori* characteristics and performances in the last few decades.

Objective:

We hypothesize that these innovations have impacted the attitudes of singers and teachers towards *pansori* training and vocal health issues, and that a new approach to voice training in *pansori* might be recommended.

Method:

Starting with recent evolutions of *pansori* and considering previous studies, we discuss how these changes might produce innovations -or at least a demand for innovation- in *pansori*'s training. We also try to capture the viewpoint of *pansori* students and performers, through an anonymous survey.

Results:

Although further investigation is required, the results suggest that a new approach in teaching *pansori* is emerging and it is increasingly requested by the trainee performers, despite some criticisms from traditionalists.

Conclusion:

Unlike previously thought, perhaps a more scientific and health-conscious approach to *pansori* voice training will be something from which many *pansori* singers can benefit.

OBJECTIVES:

There have been no systematic studies addressing the voice problems among Korean classical singers. The purpose of this study was to analyze the voice problems in Korean classical singers and provide a guide in the management of their voice problems. MATERIALS AND

METHODS:

The voice problems in 222 classical singers who visited Ewha woman's university hospital with dysphonia were analyzed, using laryngovideostroboscopy, aerodynamic and acoustic analyzer.

RESULTS:

The most common voice symptom in Korean classical singers was hoarseness (62.1%) and their most common lesion in the vocal folds was vocal nodule (42.8%). In classical singers who had vocal nodule, there was no significant reduction of expiratory pressure ($p < 0.05$), but the mean air flow rate was increased ($p < 0.05$). There were no significant differences between classical singers who had vocal nodule and normal adults in jitter, shimmer and noise to harmonic ratio (NHR).

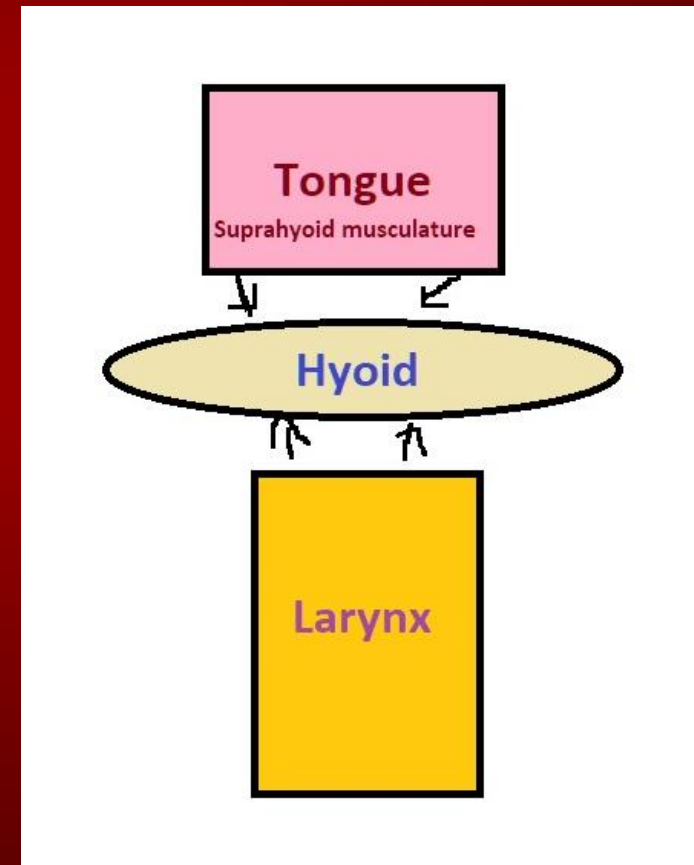
CONCLUSION:

This study reveals that numerous voice problems can be present even in trained classical singers. Also, we recognized the fact that normal voice may occur even in the presence of abnormal laryngeal findings in trained professional classical singers because of their training to protect and refine their vocal skills. Therefore, in future studies, it may be useful for laryngologists to obtain a baseline assessment of laryngeal function in trained classical singers to permit accurate diagnosis of the causes of voice dysfunction in voice professionals whose baseline laryngeal behavior may be unusual.

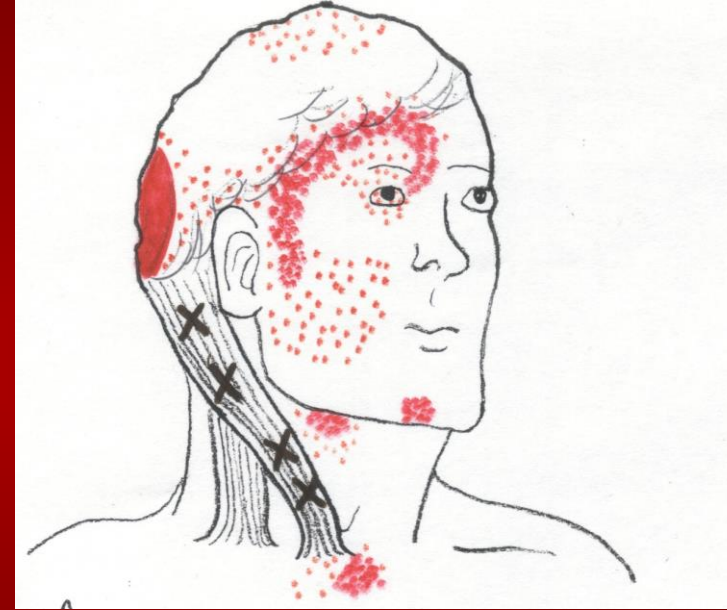
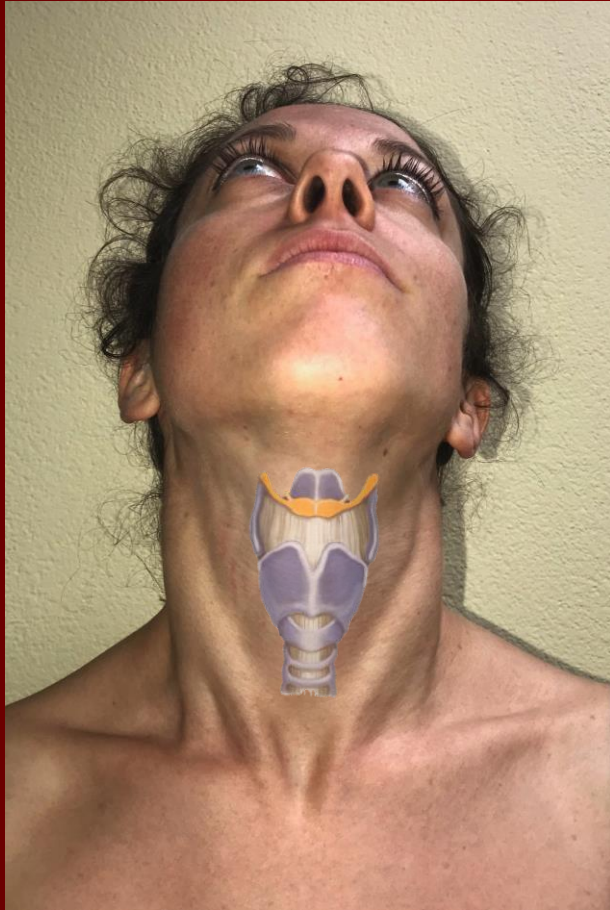
So what do we actually do?

The larynx is suspended by muscles which in turn are affected by vocal workload and certain voice qualities, abdominal muscle patterns, postural influences, reflux and illness and injury.

The aim of laryngeal manual therapy treatment is to identify and treat any areas of restriction and address the reasons behind them.

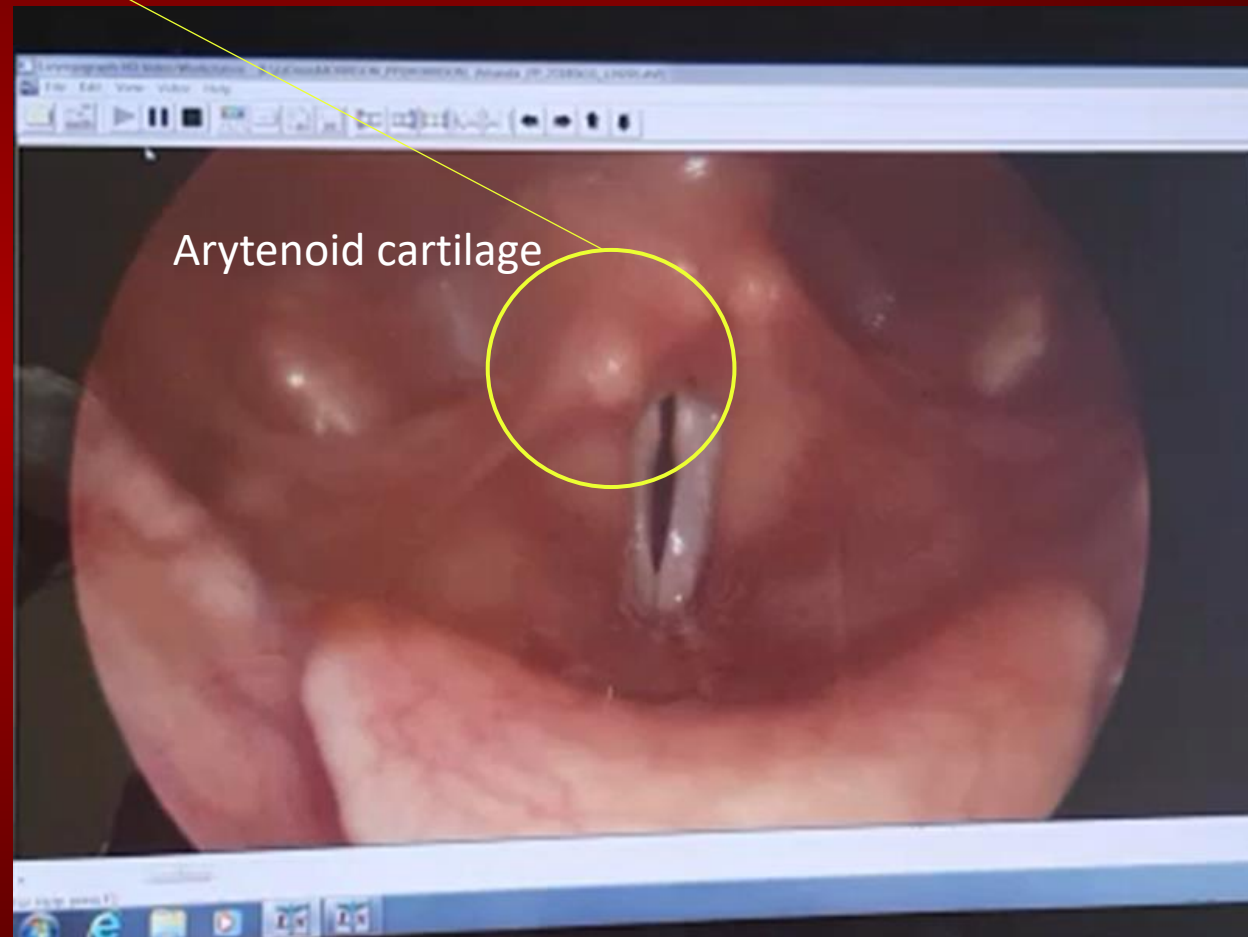
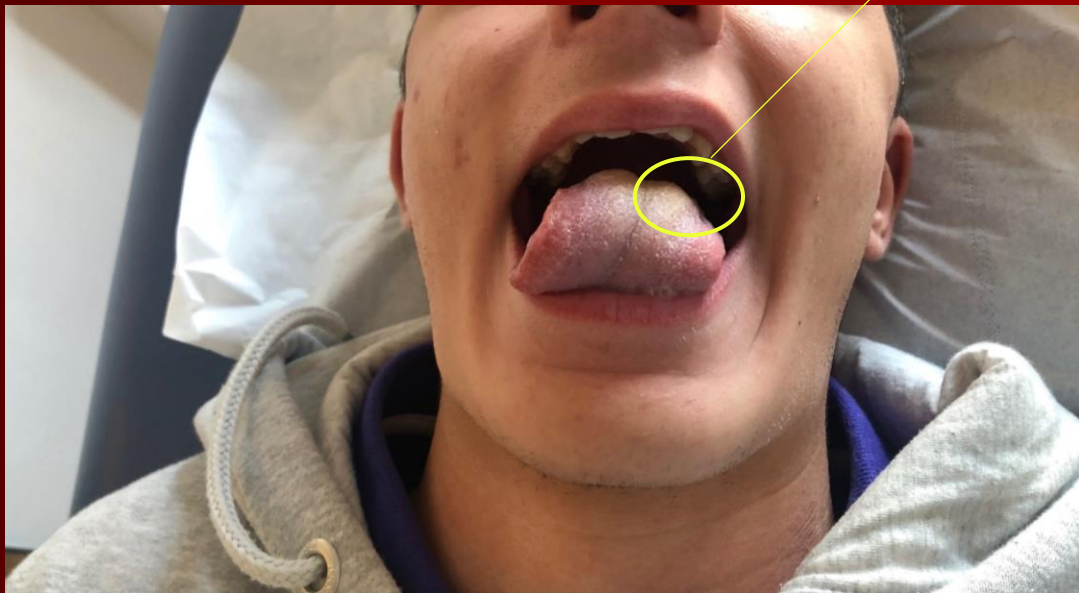


1. Sternocleidomastoid



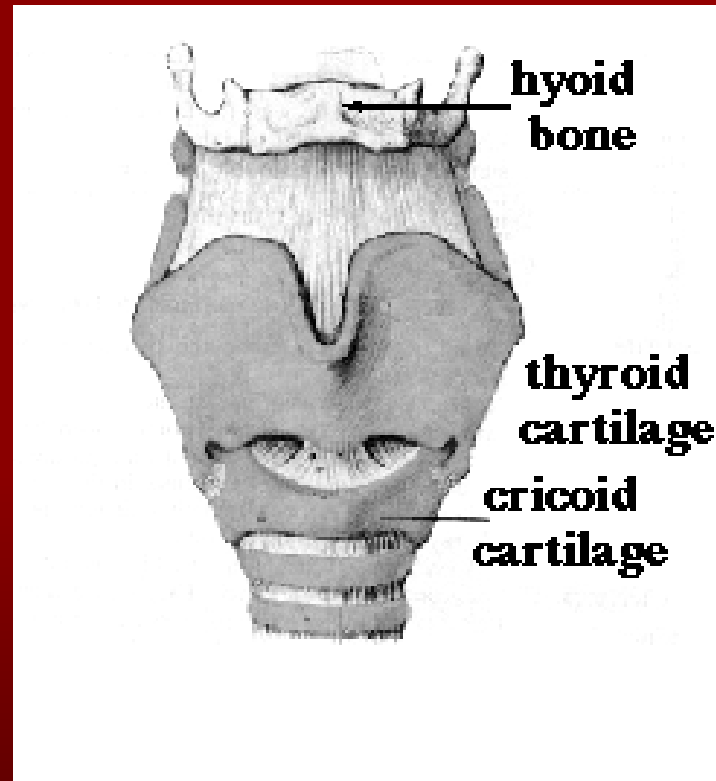
2. Asymmetries

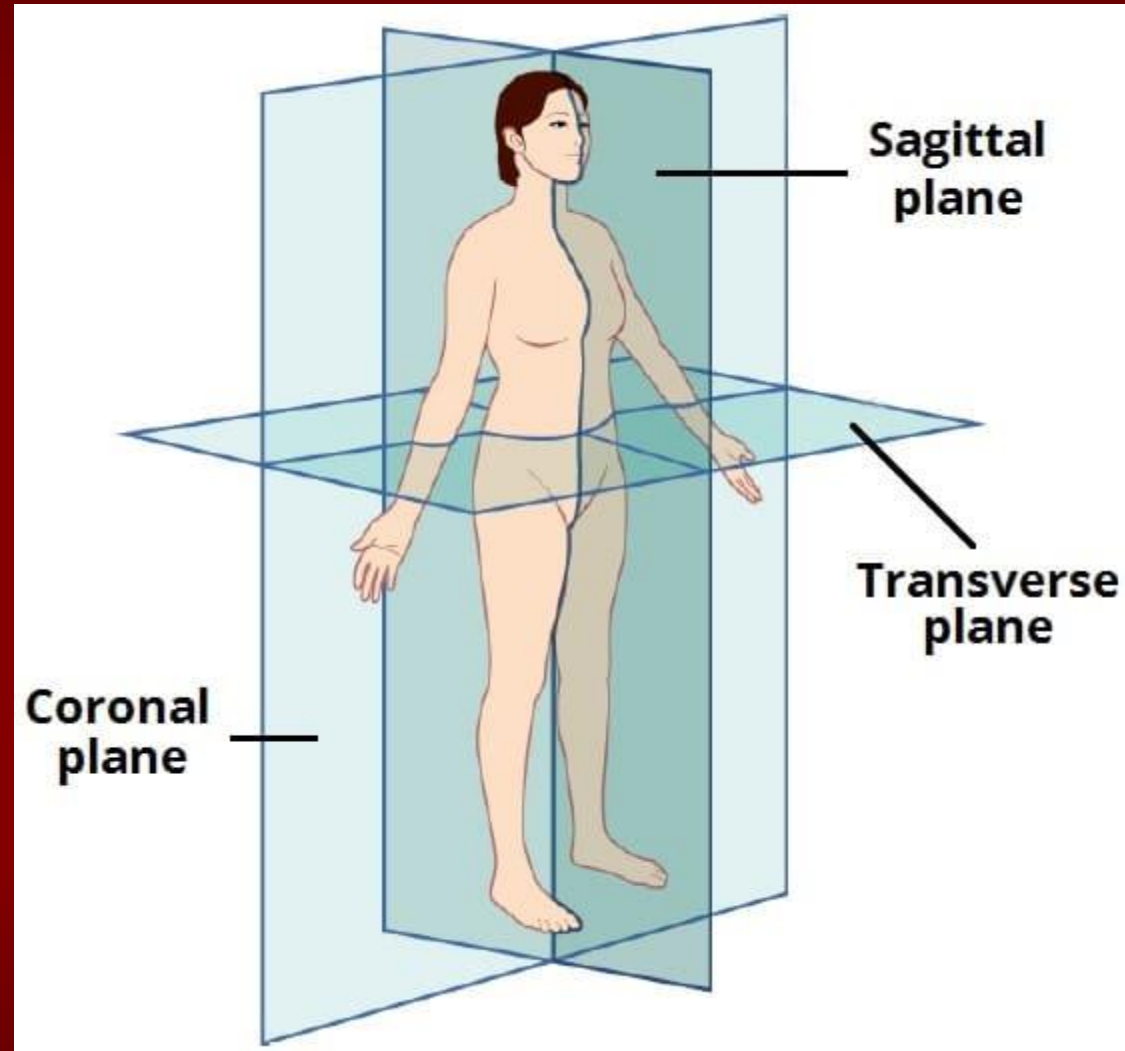
Hypermobile side

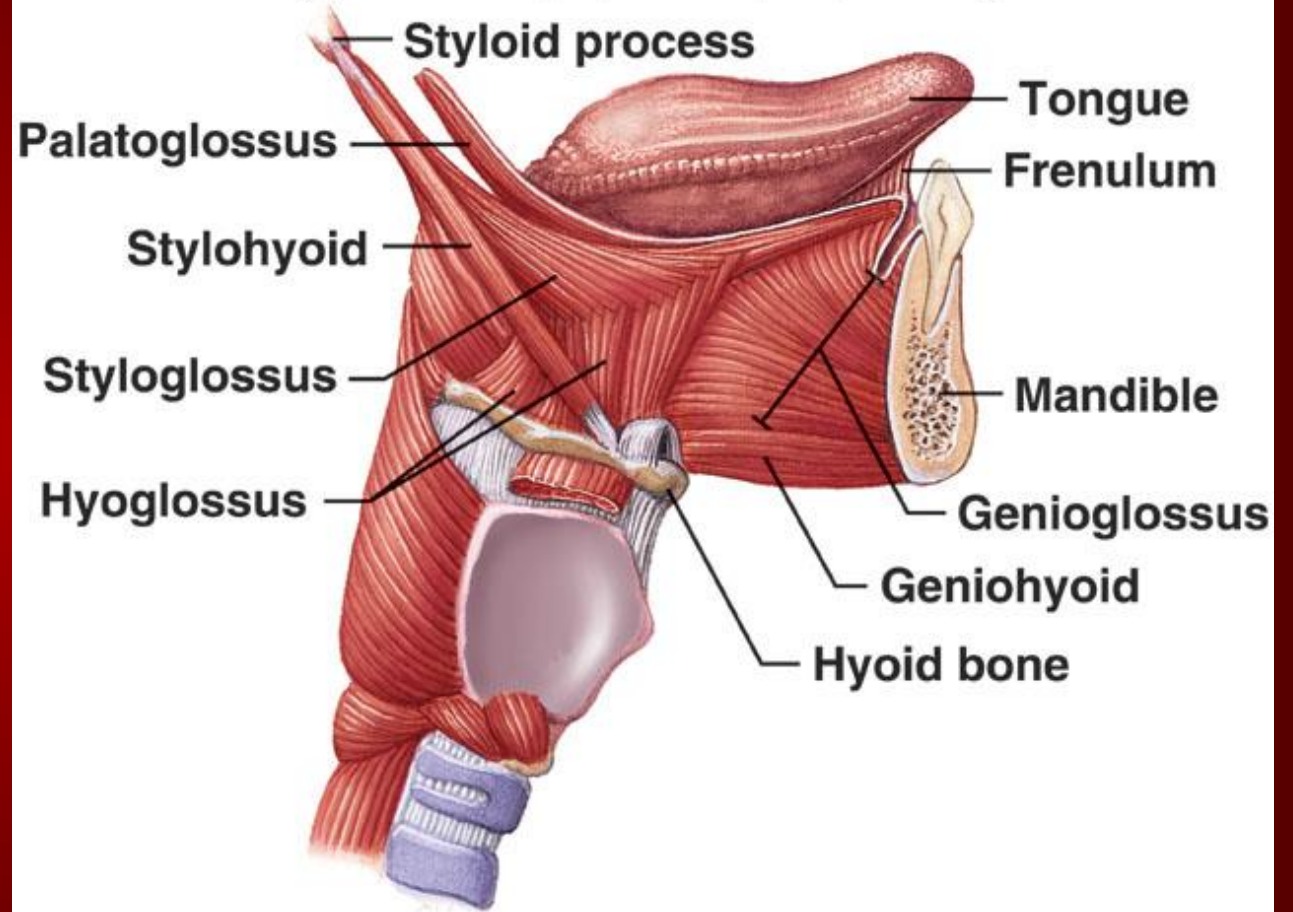
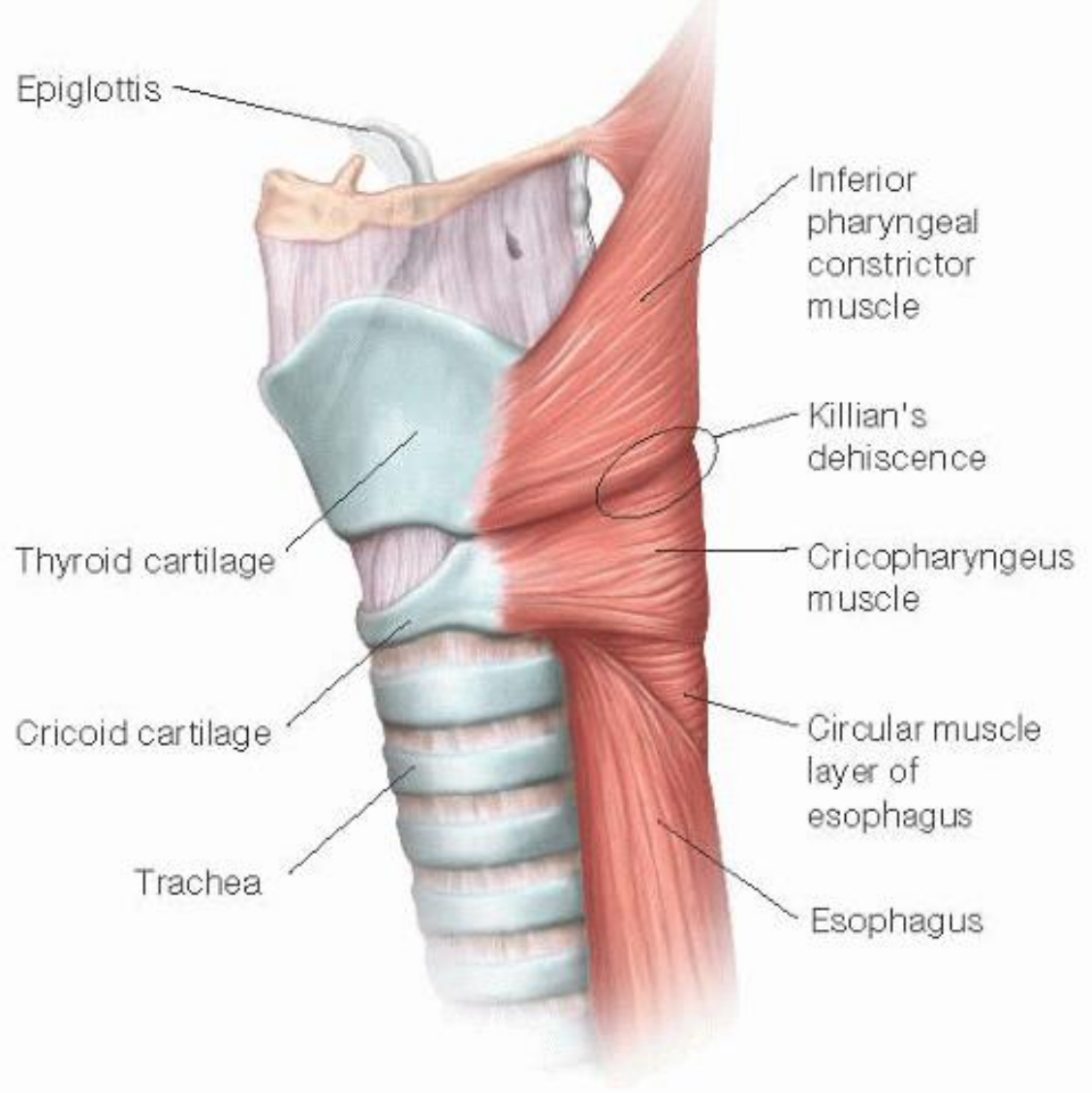


3. Position of the larynx

- Freedom of movement
- Higher? Posterior?
- Rotated?



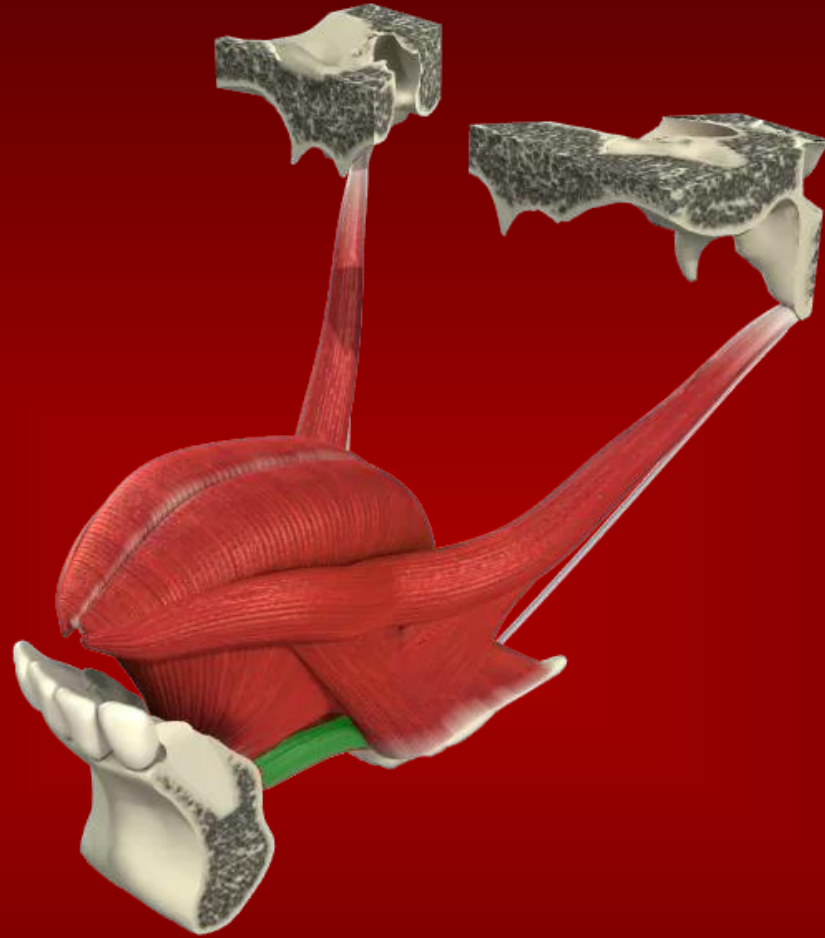




4. Tongue tension

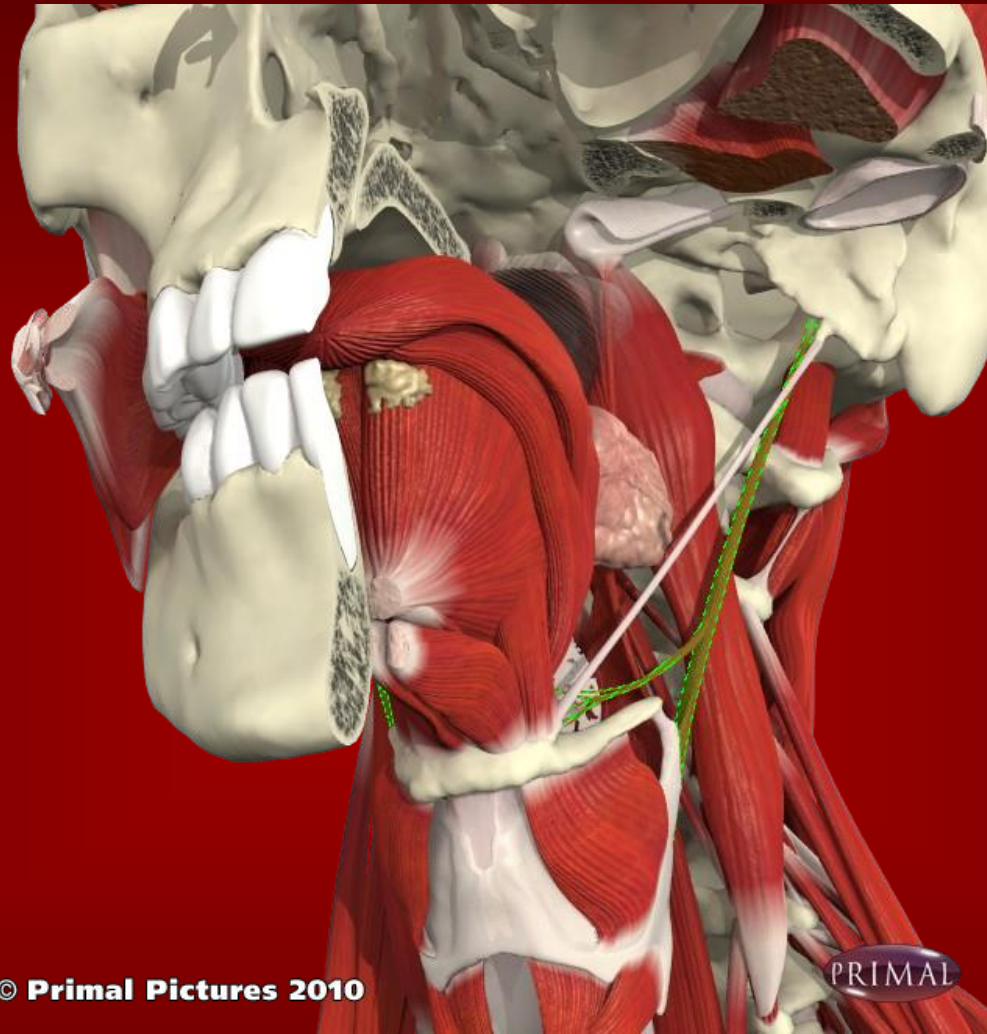


Hyoglossus

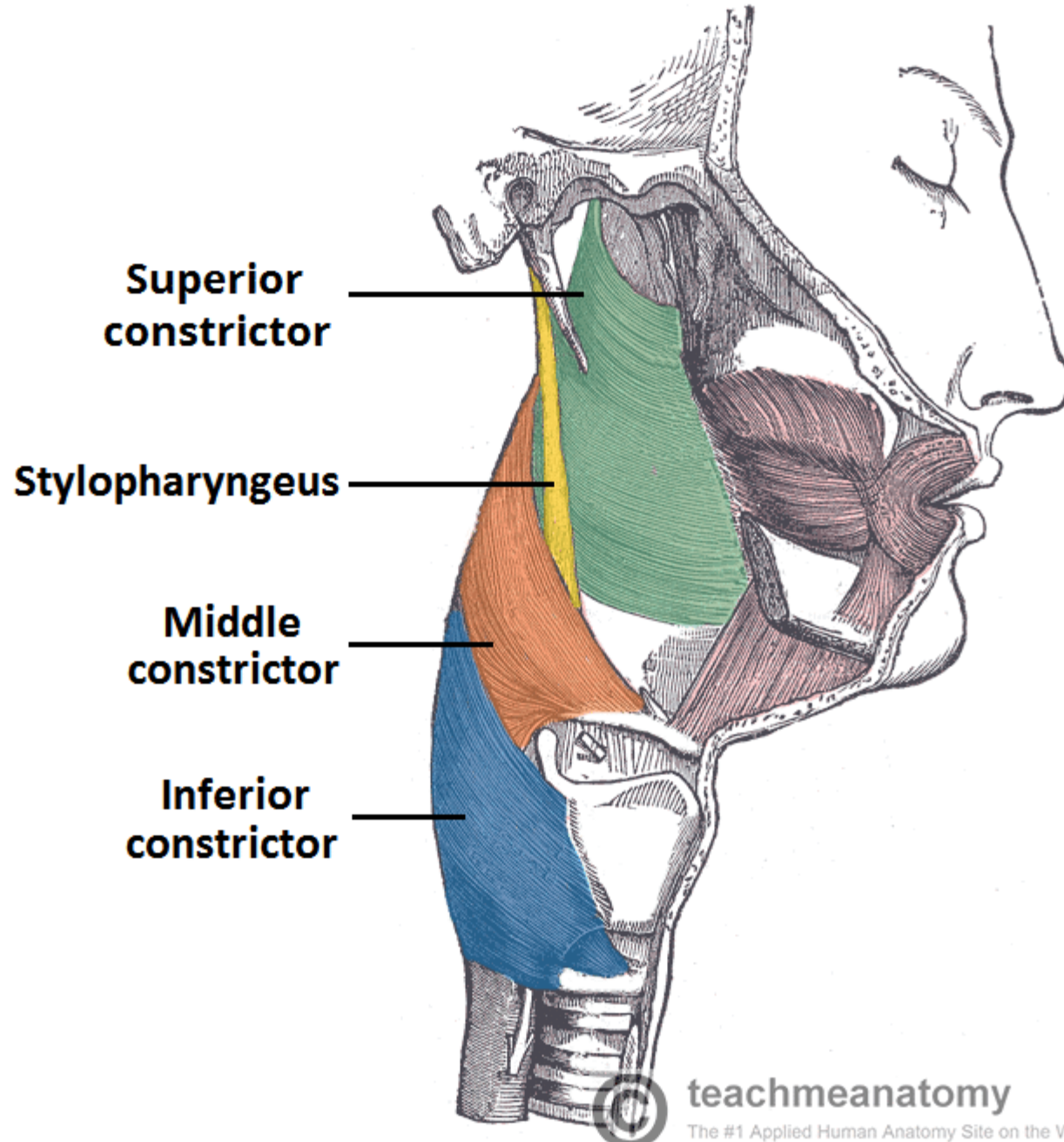


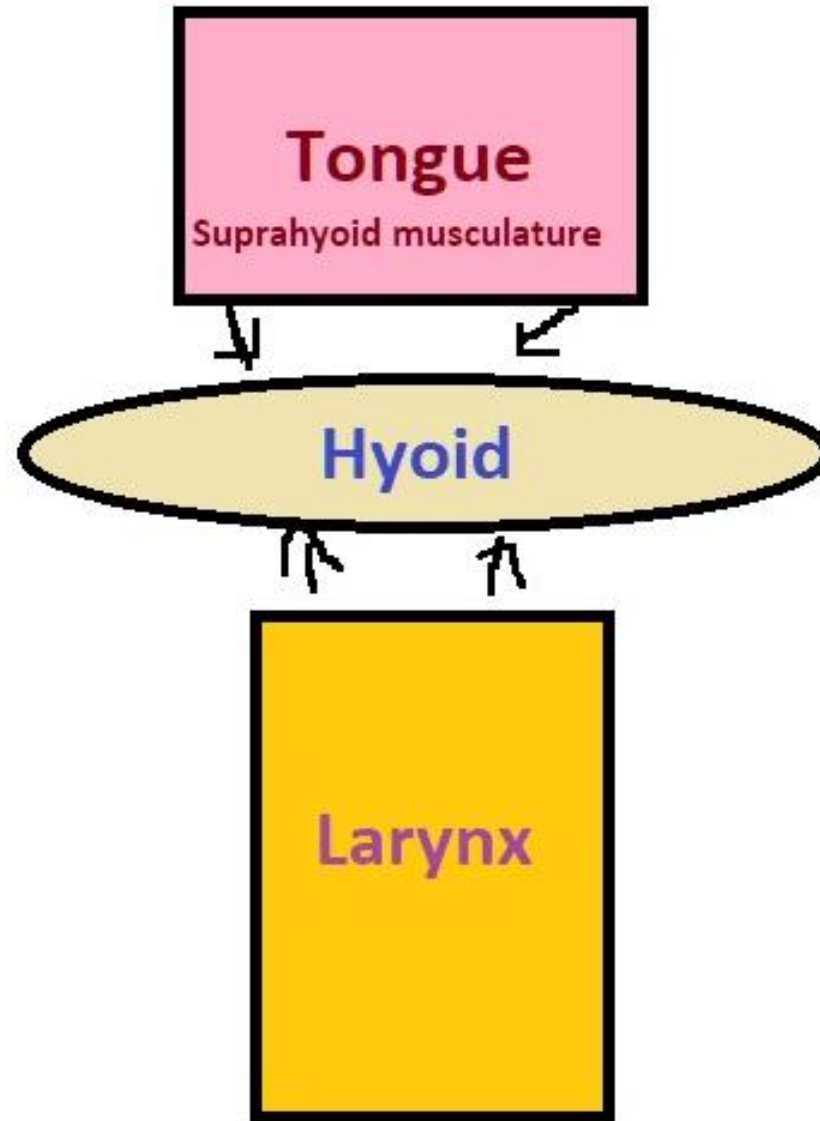
PRIMAL PICTURES 

Styloglossus



Stylopharyngeus





What else affects the voice?

POSTURE



COSTUMES



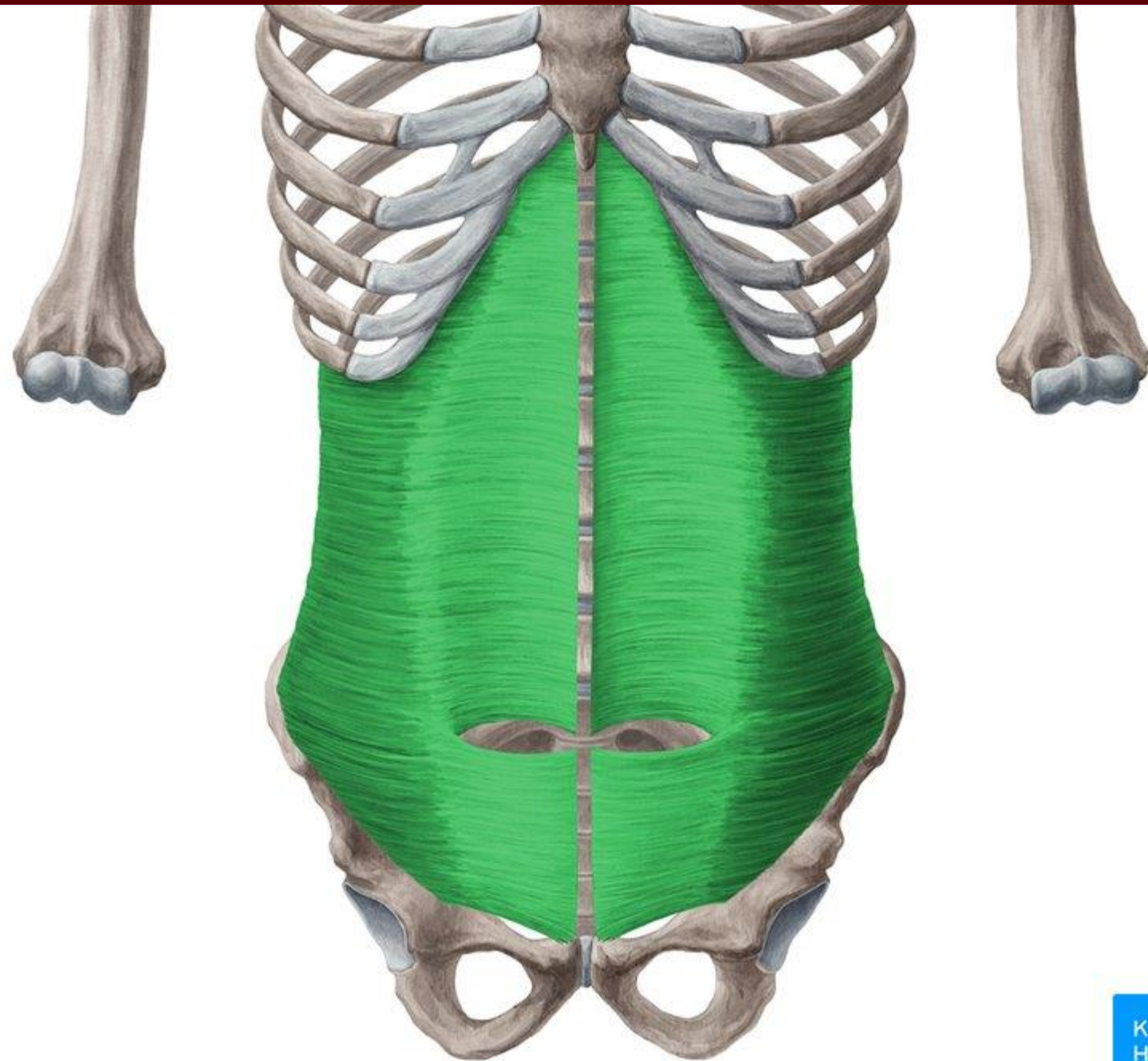
CHOREOGRAPHY



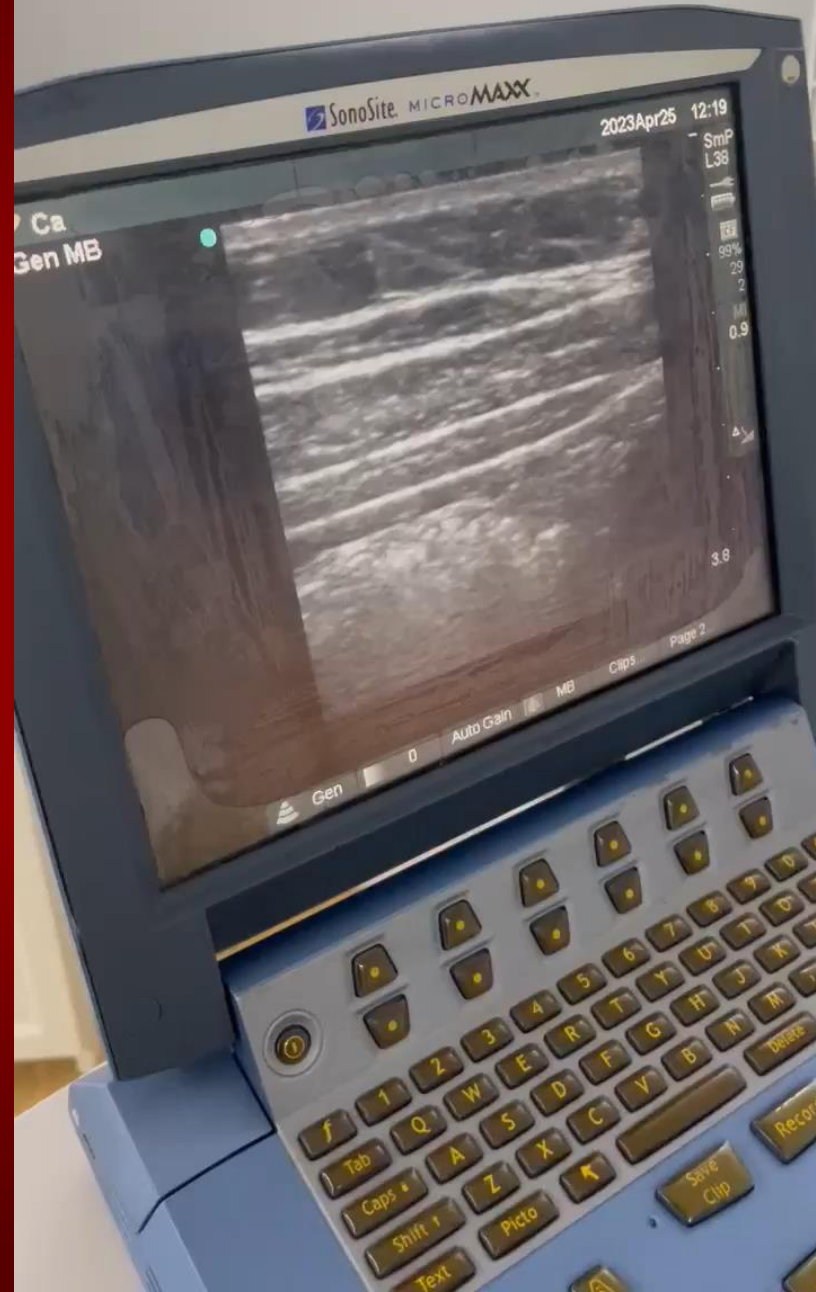
DANCE BACKGROUND



CORE



- “restricted at the top of the range”
- “can’t go any further”
- “voice doesn’t feel strong at the top”



- “More resonant”
- “No more restriction”
- “Voice feels smoother”



When should a vocal physio be consulted?

- Any of the symptoms mentioned before – fatigue, hoarseness, breathiness, pain, difficulty swallowing/ lump in throat, loss of resonance, changes in range
- Maintenance during busy show/ rehearsal periods

In summary,

Vocal Physiotherapy = Addressing **muscular tension** surrounding the larynx + **mobilization** of the larynx and hyoid +/- addressing **posture** and **core**



RESOURCES IF YOU ARE INTERESTED IN THE VOICE AND PERFORMING ARTS MEDICINE:





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Thank you!



Acknowledgements:

- Ed Blake
- Stefan Holmström – core videos

How to get in-touch:



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QUESTIONS?

