

The impact of vocal care and oral health on laryngeal function and voice

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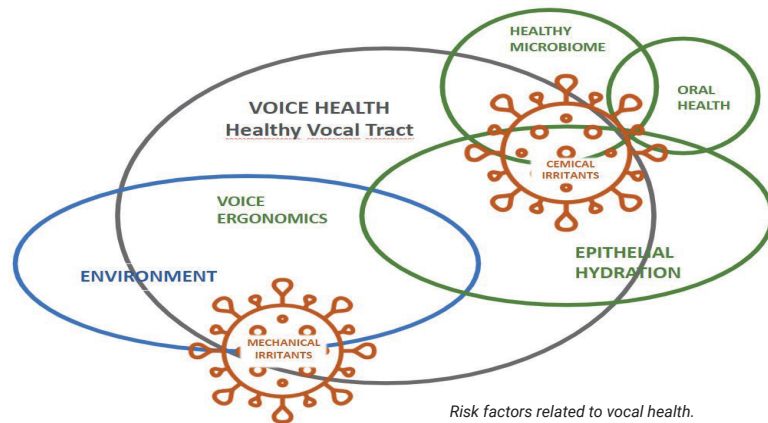
Maintenance of epithelial health relies on a number of measures. We hear about hydration, irritants and biofilms from a team in Helsinki.

Oropharyngeal health

Vocal hygiene is a commonly used term that refers to the personal daily habits contributing to maintaining vocal health. This includes avoiding harmful behaviours and habits, as well as maintaining practices that support efficient voice production, meeting the speaker’s vocal needs and withstanding the demands placed upon it.

Voice problems are frequent among occupational voice users. Individual vocal habits influence vocal function but, in addition, voice problems usually occur because of exposure to environmental factors which increase the loading of the voice organ when speaking in unfavourable conditions, whatever the primary cause of voice disorder. Since many risk factors for voice disorders are found in the work environment, it is useful to assess the work environment in the case of voice problems.

Voice ergonomics has been developed for improving voice and speech as tools for communication. It is a broader field than the well-known term of ‘vocal hygiene’, but vocal hygiene is included as a part of ergonomics. Voice ergonomics consists of all factors and measures that increase the possibilities for good voice and speech production, and hearing (perception). This includes maintaining healthy vocal habits to ensure healthy vocal folds, adopting fewer loading activities or changing working practices. It also includes assessments and interventions regarding noise sources, room



Risk factors related to vocal health.

acoustics, activity and working practices, indoor air quality, air temperature, voice amplification and work stress. When voice ergonomics is understood in its broader context, it not only addresses reduction of risk factors for voice problems, but includes speech perception and the cognitive functions of listeners such as attention, memory and learning [1].

Oral health refers to the condition of the mouth, teeth and orofacial structures, allowing individuals to eat, breathe and speak effectively. It also impacts self-confidence and social interactions and evolves throughout life. So far, scientifically proven links between oral and vocal health primarily stem from their shared reliance on proper hydration and maintaining a healthy epithelium [2]. The condition of the mucosa in the respiratory tract and the upper digestive tract is of great importance for vocal function.

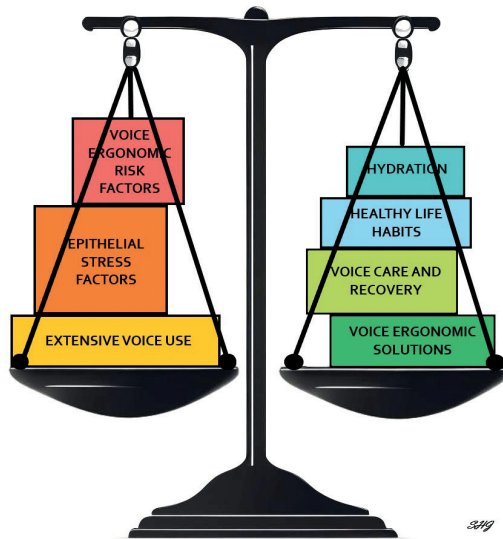
Unhealthy epithelium: chronic inflammation, aetiological factors and course of the disease

Chronic laryngitis broadly refers to any prolonged irritation of the larynx. Acute viral laryngitis or other acute inflammation of the larynx can be the trigger for chronic laryngitis. Mechanical and chemical irritants are major contributors to chronic laryngitis, while dehydration and epithelial

atrophy – natural parts of the ageing process – can significantly impact voice-related quality of life. Epithelial elasticity and pliability are extremely dependent on tissue hydration and are essential for a well-functioning larynx. However, the water content of the human body decreases with age, from 75% in infants to 55% in the elderly. Age-related dehydration is more prominent among females as decreasing oestrogen levels affect salivary gland function. Furthermore, females are at higher risk for Sjogren’s syndrome-related drying. Other typical sources for dehydration and laryngeal dryness are anticholinergic and diuretic medication and mouth breathing, especially snoring. Drying of the mucous membranes facilitates the inflammation and provokes throat clearing which exacerbates symptoms. Vocal folds are negatively affected by dehydration, leading to increasing vocal effort and reduced voice quality.

Chemical and mechanical irritants are important contributing factors related to chronic inflammation. Typical irritants include tobacco smoke, alcohol, inhaled medications and laryngeal reflux. Typical mechanical irritants are chronic cough and improper or excessive voice use.

“Epithelial elasticity and pliability are extremely dependent on tissue hydration and are essential for a well-functioning larynx”



Vocal health requires balance between factors that increase vocal load and those providing recovery.

Chronic laryngitis and laryngitis sicca as a pathway to dysplasia?

Chronic laryngitis is a condition where prolonged inflammation caused by the aforementioned factors leads to tissue changes, swelling, hyperaemia and minor tissue damage in the mucous membrane. Irritants and inflammation disrupt the delicate balance of the microbial flora, also known as microbiome, resulting in a narrowed microbial diversity. Microbial diversity is an important factor in resistance, and limited diversity may allow pathogen proliferation, leading to chronic purulent inflammation, such as laryngitis sicca. Based on clinical experience, laryngitis is rarely associated with bacterial infection. However, in laryngitis sicca, pathogenic bacteria, fungi, or their combinations can form biofilm colonies that are highly resistant to antimicrobial treatment and local immunity [3].

Prolonged exposure to irritants, particularly tobacco smoke, is considered a cause of dysplastic changes such as laryngeal leukoplakia that possess 2–20% risk of malignant transformation. Recent studies have shown a pathway leading from microbiome changes and chronic biofilm infections to dysplasia [4].

The symptoms of chronic laryngitis can vary, but common ones include hoarseness, laryngeal irritation, a tendency to clear the throat and a dry or sticky feeling that leads to swallowing discomfort and a sensation of a lump in the throat. Alongside these symptoms, there may be dryness of the mouth and mucous membranes, as well as heartburn. Chronic laryngitis typically causes prolonged discomfort with occasional exacerbations.

Maintaining vocal health and preventing oral and vocal problems

- 1) Avoid harmful substances. Avoid smoking and limit alcohol and caffeine.
- 2) Avoid speaking in noisy settings and reduce background noise.
- 3) Rest your voice. Avoid unnecessary throat clearing. If ill, rest your voice and avoid whispering. Allow voice breaks for recovery.
- 4) Stay aware. Be aware of your voice, be aware of changes in your vocal function and have routine dental check-ups to maintain oral health.
- 5) Seek medical help when needed. If hoarseness or voice issues persist for more than three weeks, consult a doctor. Voice recovery post-cold should occur within a few weeks.
- 6) Manage laryngopharyngeal acid reflux.
- 7) Stay hydrated and maintain humidity. Drink plenty of water, use a humidifier or medical steam water inhaler to add moisture.
- 8) Maintain good posture to support optimal breathing, minimise tension, enhance vocal resonance and efficient voice production.
- 9) Be conscious of your breathing technique and breathe through your nose.
- 10) Take care of yourself, be physically active and maintain a healthy lifestyle and diet.
- 11) Practise stress management and mental health awareness.
- 12) Practise vocal warm-up and prepare your voice and body for speaking or singing.

Summary

Chronic laryngitis significantly reduces quality of life and work capacity. Findings are often mild or non-existent. Objective evaluation of the mouth, pharynx, and larynx can be challenging, and assessing diffuse mucosal changes is difficult. The same applies to diagnosing the underlying aetiological factors, which should guide treatment.

Based on current knowledge, treating chronic laryngitis and, in particular, addressing its underlying aetiological factors, can reduce the risk of dysplasia and carcinoma development. The effectiveness of voice ergonomic assessment and intervention is evident, particularly among voice professionals. The positive outcomes highlight the importance of tailored voice health education to meet different needs. Patients should be encouraged to adhere to treatment which, in most cases, is based on significant lifestyle changes and persistent self-help against longstanding and fluctuating symptoms.

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