

Care for the Professional Voice – The Human Instrument

Over the past 30 years, our understanding of and ability to treat voice problems have increased dramatically largely due to the interdisciplinary collaboration of otolaryngologists, speech language and voice pathologists, singing and acting teachers, and performers. A new medical subspecialty emerged, laryngology, to raise the level of care for voice patients. The laryngologist and voice pathologist work together as a “voice team” to provide sophisticated voice care.

The production of voice is complex, involving the coordinated action of many systems throughout the body. The larynx is composed of a cartilaginous skeleton, muscles, and a soft-tissue lining. The muscles and their attachments alter the shape and tension of the vocal folds (cords), affecting vibration. The mucosal lining of the vocal folds is made up of distinct layers which contribute to the vibratory characteristics of the vocal fold mucosal wave. If this wave is impaired, by a mass, for example, hoarseness may occur. The term “vocal fold” reflects the importance of the layered structure essential for normal voice production and this term has largely replaced the term “vocal cord”.

When the vocal folds vibrate, they produce a buzzing sound which then resonates throughout the supraglottic vocal tract (including the pharynx, nose, and oral cavity) to produce much of the character of the voice. The lungs, rib cage, and muscles of respiration comprise the infraglottic vocal tract which provides the power source or “support” for the voice. Problems involving any of these components of vocal production, may impair voice quality.

Although the skilled laryngologist and voice pathologist can infer much about the voice by listening, more sophisticated diagnostic measures are available in the voice laboratory.

Stroboscovideolaryngoscopy uses a microphone placed near the larynx to trigger a stroboscope to illuminate the vocal folds under high magnification. This enables the examiner to evaluate small irregularities of the vocal fold edge, such as scar or masses, which interfere with vocal fold vibration. Masses may be benign, such as nodules, cysts, or polyps, or malignant, such as laryngeal cancer. Other instrumentation within the voice laboratory is used to obtain computerized assessment of the voice and to assess aerodynamic function to provide a detailed evaluation of the voice and to follow the effectiveness of treatment. Laryngeal electromyography is also used to assess the neuromuscular function of the larynx. Lastly, quality-of-life measures obtained using patient questionnaires are an effective way to quantify the detrimental effects of a voice disturbance for individual patients and to assess the impact of subsequent treatment.

We often misuse or even abuse our voices in our daily activities. Such abuse may be obvious, such as when we scream at our favorite sports team. Frequently, however, we are unaware that we are misusing our voice. We may use our voices incorrectly because we never learned appropriate vocal technique. Improper breathing or posture can have a damaging effect on the voice box. Singing overly challenging or inappropriate voice parts may cause damage to the vocal folds. Smoke-filled rooms, smog, and other pollutants may irritate the voice, and conversation in the setting of loud background noise can be harmful.

Voice problems are often multifactorial. For example, although a cyst or fibrotic mass on the vocal fold may be an obvious finding, one must determine why the patient developed such a mass. Benign masses are often the result of acute or chronic trauma. Such trauma may occur due to excessive muscle tension used to compensate for an underlying compromising issue. Laryngopharyngeal reflux and allergies cause irritation and swelling of the vocal folds impairing

vocal fold vibration. Vocal fold paresis may result from a nerve injury suffered after an upper respiratory infection or from another cause. These problems are commonly found in patients with vocal problems and must be addressed to evaluate and treat the patient adequately.

Other underlying medical problems may contribute to voice problems, or initially present themselves through the voice. Such problems may affect the larynx directly, or affect vocal support or resonance. Lung problems, such as asthma and chronic obstructive pulmonary disease, neurologic diseases, such as tremor, Parkinson's disease, myasthenia gravis, or amyotrophic lateral sclerosis, and sinus and allergy problems may all affect the voice.

Frequently, voice therapy is sufficient to treat compensatory hyperfunction and provide enough improvement to satisfy a patient's vocal needs. Sometimes surgery is warranted. Most voice surgery is performed through a rigid endoscope placed in the mouth, using a microscope and delicate microinstruments. Such surgery is highly specialized, and care must be taken to remove only abnormal tissue so as not to further traumatize the vocal folds.

Chronic hoarseness may be a sign of a serious problem, such as laryngeal cancer. Acute voice changes may be the result of a vocal fold hemorrhage or tear, which may lead to scarring and mass formation. Many problems, if recognized and addressed early, can be managed nonsurgically. Repeated trauma, however, may lead to more severe problems less likely to respond adequately to voice therapy and more difficult to treat surgically.