Glossary of terms

alphabetical

Aesthetic values

The characteristics of a piece of art or an art form combined with our perceptions of those characteristics. Our judgment of a given characteristic, based on our perceptions, is the basis of a value.

(the) Four types of body tissue

(The larynx is made up of all four of these.)

Muscle: Muscle tissue is composed of cells that have the special ability to shorten or contract in order to produce movement of the body parts. These cells are sometimes called muscle fibers, and these are usually arranged in bundles or layers that are surrounded by connective tissue.

Connective: Connective tissue supports and connects internal organs, forms bones and the walls of blood vessels, attaches muscles to bones, and replaces tissues of other types following injury. Some familiar types of connective tissue are tendons, ligaments, facia, bone, cartilage, and scar tissue.. Even blood is considered a “fluid connective tissue”!

Nerve: Nerve, or nervous, tissue is the primary tissue of our nervous system. It monitors and controls the body's functions. Nervous tissue consists of two cells: neurons (or nerve cells) and glial cells, which help to transmit nerve impulses and also provide nutrients to neurons.

Epithelial: Epithelial tissues are thin tissues that cover and form a protective layer for all the exposed surfaces of the body. They form the external skin, the inner lining of the mouth, digestive tract, secretory glands, and the lining of hollow parts of every organ such as the heart, lungs, eyes, and ears.

The cells that make up epithelia are closely bound to one another through specialized structures called *tight junctions*. They are also free from blood vessels and nerves.

A single organ can have different types of epithelial tissue based on the substances to which different surfaces are exposed. Protective tissue tends to be thicker, and made of multiple layers of cells.

Glottis

The vocal folds and the opening between them. The glottis controls airflow in and out of the respiratory passages.

Hyoid bone

The hyoid bone is a small horseshoe-shaped bone located between the jaw and the clavicle. It is classified as a freely floating bone. However, it is anything but freely floating! The hyoid bone is attached to the base of the skull, the mandible, the tongue, the larynx, and the scapular belt.

Laryngeal cartilage *(images below)*

Thyroid cartilage: The largest of the cartilages of the larynx.

The thyroid cartilage is formed of two plates (called laminae) that are joined in the front to create the laryngeal prominence (or, familiarly, Adam's apple).

The thyroid cartilage has nothing to do with the thyroid gland, except for proximity.

Cricoid cartilage: Also called the cricoid ring, is the only complete ring of cartilage around the trachea and is considered the base of the larynx. It functions as an attachment site for muscles, cartilages, and ligaments involved in opening and closing the glottis and in producing speech.

Arytenoid cartilage: A pair of pyramid-shaped cartilage located on the back side of the larynx. Each cartilage has two processes (an outgrowth of tissue where other things attach).

1. The vocal process. This is attached to the vocal ligament, also called the 'true' vocal cord.

2. The muscular process. This is attached to the TA (thyroarytenoid) and CA (cricoarytenoid) muscles

Epiglottis: Attached to the entrance of the larynx, the epiglottis is a leaf-shaped valve that closes during swallowing, diverting food and liquids to the esophagus and preventing aspiration.

Lamina propria

This is a thin layer of connective tissue which covers the vocal folds. The superficial layer, or basement membrane, together with the epithelium, comprise what can be referred to as the mucosa. The intermediate and deep layers together make up what can be referred to as the vocal ligament.

Laryngeal muscles *(images below)*

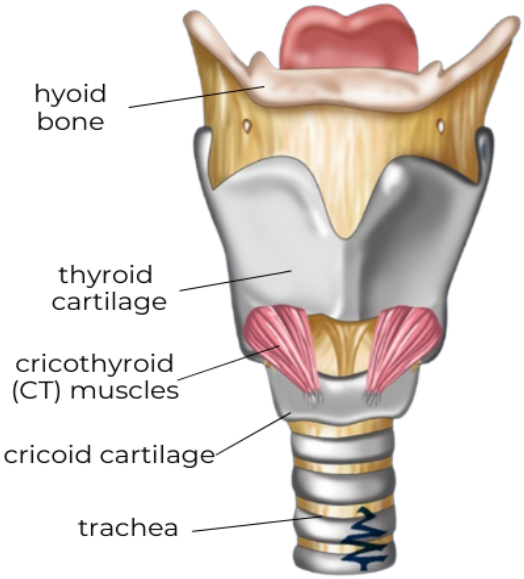
TA (thyroarytenoid): An intrinsic laryngeal **muscle** that forms the body of the vocal folds, regulating their length and tension.

CT (cricothyroid): One of the intrinsic muscle pairs of the larynx, and the pair most important in creating pitch. Attaching from the cricoid cartilage to the thyroid cartilage, the contracting of these muscles pulls the cricoid cartilage up, the thyroid cartilage

forward, and the arytenoid cartilage backward, making the vocal folds longer and tighter.

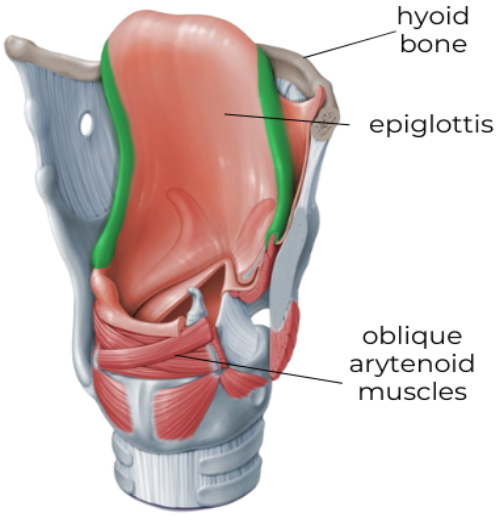
Vocalis muscle: Some anatomists disagree on whether this is a distinct muscle or part of the TA muscle. It's attached to the arytenoid and thyroid cartilages and sits parallel to the vocal ligament. Along with the TA muscle, it's considered the main component of the vocal folds.

Like a rubber binder that thins when stretched, and is thicker when relaxed, the stretching and relaxing action of the vocalis changes the tonal quality of the voice.

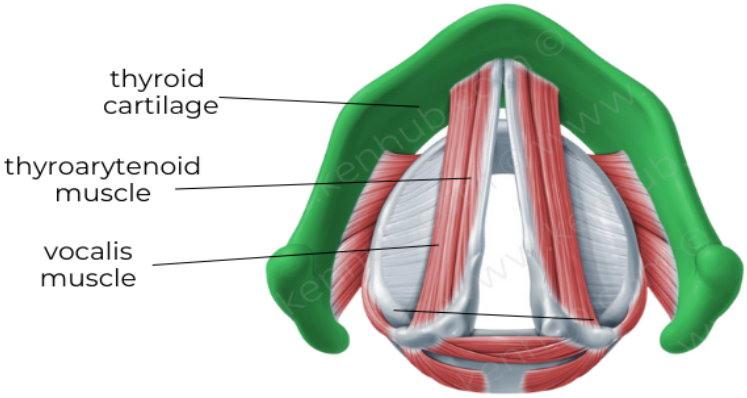


Front view of larynx

(front)



View of larynx from behind your right shoulder



Top view of larynx

Layers of vocal folds

The vocal folds are divided (overall) into three layers: the cover (see *epithelium*), transition (see *lamina propria*), and body (see *TA muscle*).

Motor action plan

A motor memory combined with the interoceptive "trigger" of that motor memory; the brain preparing for a predicted outcome.

Motor memory

Motor memory is the result of motor learning, or developing new muscular coordination. This allows us to recall the motor coordination we have learned. Playing the piano, catching a ball, and riding a bike are all examples of motor memory.

Motor memory, like any form of memory, has both short and long-term components.

Short-term memory only encompasses the temporary stage of memory storage. In order to create a procedural, or long-term memory for a task, the task must be repeated with enough frequency and over enough time to move the memory from short-term to long-term memory. Actions

rehearsed in short-term memory eventually consolidate and are “moved” into long-term memory.

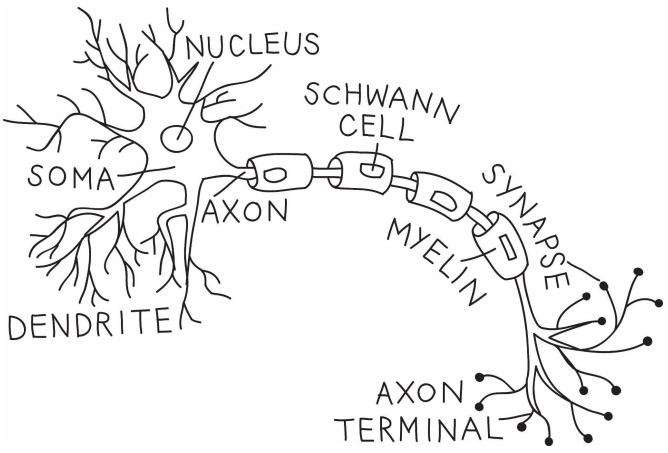
Mucosa

See lamina propria

Neuron

A nerve cell. These cells make up the brain the nervous system. They send and receive electrochemical signals to move our bodies, feel, think, form memories, and more. Different types of neurons have specific names based on their function.

The typical neuron is comprised of a cell body, the axon (along which the electrical signal travels) dentrites, and axons, which meet together to transmit chemical signals.



Procedural memory

A subset of implicit memory, procedural memory is a part of the long-term memory that is responsible for learned motor skills; skills that involve little or no conscious thought.

As the name implies, procedural memory stores information on how to perform certain procedures, such as walking, talking, and riding a bike.

Primary (inspiratory) respiratory muscles

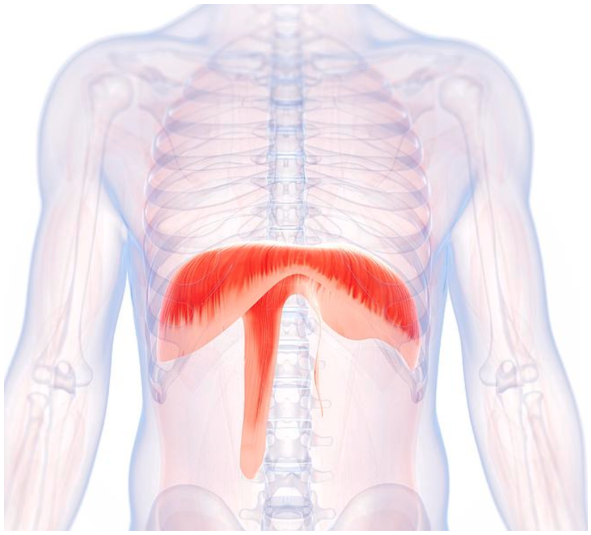
Diaphragm: A dome-shaped muscle that sits at the base of the thoracic (chest) cavity and separates the abdomen from the chest.

It's the muscle to which the bottom of the lungs are attached. When the diaphragm contracts it flattens, creating a vacuum effect that pulls air into the lungs. When it relaxes air is pushed out of the lungs either passively (as in sleep) or actively via the antagonistic relationship with the abdominal wall.

Many singers feel comfortable allowing the abdominal wall to relax to allow for the diaphragm to contract downwards. For some body types this feels unnatural; they will feel a more satisfying inhalation when focusing on the intercostal muscles.

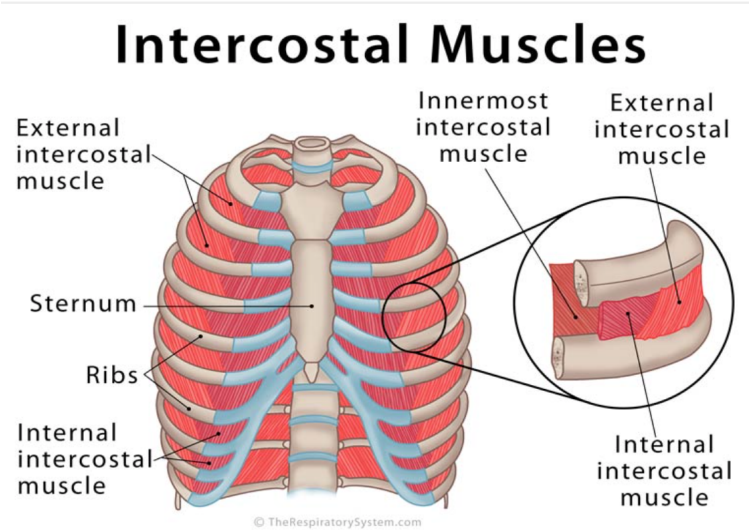
The diaphragm “cuts the body in half.” It extends from front to back and side to side; there are only three openings in the diaphragm:

- **Esophageal** opening for the esophagus and vagus nerve, which controls much of the digestive system.
- **Aortic** opening for the aorta, the body’s main artery that transports blood from the heart.
- **Caval** opening for the inferior vena cava, a large vein that transports blood to the heart.



External intercostal muscles: These muscles are used for inspiration. There are three layers of muscle that attach between the ribs. These muscles expand and shrink the chest cavity when you breathe. This action can be either passive or intentional.

Many singers feel a satisfying inhalation when focusing on the expansion of the lower or back ribs.



Intercostal Muscles

Registers

Changes in the voice through certain pitch ranges that are both objective - changes in vibratory patterns in the vocal folds - and subjective - changes in the physical feeling as well as the character of the sound.

Vocal Fry: Also called pulse register, glottal scrape, creaky voice, popcorn voice, and other things, this is the lowest of the registers. Here the vocal folds are very loose and the pattern of oscillation is irregular, accounting for the "popping" sound of this register.

This sound is commonly used in popular singing styles as a type of onset, but is used in other ways as well. It is a very quiet sound with an average volume of only about 70 Hz.

Chest register: The 'default' register for most popular singers, this register is also called modal register, Mode 1, TA dominant phonation, or chest voice. This is the most common speaking range. Here the vocal folds are thick, and large portions of their surfaces are brought into contact.

The vibration of the vocal folds in this register is complex; simultaneously from back to front and from bottom to top. This makes the chest register the loudest of the registers, with a broad harmonic spectrum.

Head Register: Also called falsetto, Mode 2, CT dominant phonation, or head voice, the vibration of this register involves only the ligamentous edges of the vocal folds; the vocal ligament, and the mucosal layer. This leaves the muscle

body, or TA muscles, relatively relaxed and creates a simpler, less complex vibration.

Although *falsetto* and *head voice* can sound different, and are typically labeled differently for cis-gendered men and women, the functionality is the same.

Whistle register: Also called whistle tones or flute register, this is the highest of the registers, typically starting at F#6 for women and F#5 for baritones.

This register has specific physiology that differs from the other registers - the adduction is created using only the back of the vocal folds creating a shorter vibrational length - but is not completely understood.

Soft Palate

Anatomical name: *velum palatinum*. The movable fold consisting of muscular fibers enclosed in a mucous membrane, that is suspended from the rear of the hard palate. The soft palate seals off the cavity of the nose (nasopharynx) from the mouth (oropharynx) during swallowing.

Somatosensory

(*soma*; greek “of the body) Physical sensory activity having its origin elsewhere than in the sense organs (eyes, ears, mouth) and conveying information about the state of the body proper as well as its immediate environment.

Interoception

Central to everything from thought or emotion, to decision-making or our sense of self, interoception is your brain’s representation of sensations from your own body — it’s the sensory result of your brain monitoring the systems of the body and its internal state.

Interoception can be both conscious and non-conscious. The brain integrates signals relayed from the body allowing for a nuanced representation of the physiological state of the body.

Interoception can also influence perception, as we consciously or unconsciously interpret what our interoception is telling us.

Proprioception

Proprioception is the sense of one’s body and movements. It’s one of the five *somatosensory* senses that together feed the brain with information about temperature (exteroception) vibration and pressure (mechanoreception) pain (nociception) and balance (equilibrioception).

Proprioception is the sense that lets us perceive the location, movement, and action of parts of the body. It includes perception and prediction of your physical self, muscle force, and effort. These sensations arise *externally* from sensory receptors in the muscle, skin, and joints, and also *internally* from brain signals related to body movement.

Vagus nerve

The vagus nerve is the sole source of innervation of the larynx.

Also called the 10th cranial nerve or CNX, the vagus nerve is parasympathetic and the longest and most complex of the cranial nerves. Vagus is Latin for the *wanderer,* and CNX wanders from its origin in the brain stem to innervate organs through the face, neck, thorax, and abdomen.

The vagus nerve is parasympathetic, and both a sensory and motor nerve. About 80% of the "messaging" of the vagus nerve travels from the body to the brain (*afferent* signals), so it is essential to interoception. For our purposes, it is important to know that the vagus nerve is also *efferent*, bringing messages from the brain to muscles.

SOVT *(semi-occluded vocal tract)*

In Neuro-Vocal, the SOVT is a foundation exercise that gives the singer a tool to be able to *feel* their sound and thus shift or add to their experience of voiced sound. This tool is especially important in situations where the singer's ability to hear themselves is compromised.

Originally developed for therapeutic reasons, the semi-occluded vocal tract exercises have gained popularity among voice professionals at large.

Semi-occlusion describes resistance to the escaping airflow; specifically during phonation.

SOVT exercises have three major effects on phonation:

1. The steady pressure created passively expands all the airways and lowers the laryngeal position in the airway.
2. The increase in air pressure needed for these exercises produces backpressure that can improve the efficiency of vocal fold vibration. The backpressure of acoustic energy is redirected from the vocal track back to the vocal folds, helping them generate more aerodynamic power, and thus more acoustic power.

3. Depending on the type of SOVT used, the action of the previous two phenomena results in an increased ability of the singer to physically sense the sound they are making. M, N, and NG sounds work for this. For some singers, Z or V sounds can accomplish this as well.

While it is not yet clear how SOVT adjustments carry over into phonation when the semi-occlusion is removed, voice professionals find distinct vocal differences after using SOVT exercises, for instance, an increase in efficient vocal fold adduction, helping minimize a breathy sound, or “resetting” a tired voice.

Velopharyngeal port

The passage between the nasopharynx (behind the nose, connects to the sinuses) and the oropharynx (behind the mouth). During swallowing it is closed off by the soft palate against the rear pharyngeal (throat) wall. This prevents food and water from entering the nasal passages.

Vocal ligament

See lamina propria.

Vocal tract

The vocal tract originates at the glottis and ends at the lips. It can refer to

1. just the throat above the larynx (laryngopharynx) and mouth (oropharynx) and the mouth, or
2. the whole pharynx including the part that goes behind the nose (nasopharynx) and the connecting nasal cavities.

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