



Larynx

Anatomy

- Divided into 3 subsites:
 - Glottis: True vocal folds.
 - Supraglottis: Structures above the true vocal folds
 - Subglottis: Area between true vocal folds and trachea
- Housed in a bony-cartilaginous framework
 - Hyoid bone: superiorly suspends the thyroid cartilage
 - Thyroid cartilage: Shield-like cartilage that creates framework; houses true vocal folds, false vocal folds
 - Cricoid cartilage: Only complete ring in the upper airway; houses subglottic area
 - Arytenoid cartilage: Paired cartilages responsible for vocal fold motion
- True vocal folds
 - Multi-layered structure
 - Body: Vocalis muscle, deep and intermediate lamina propria (ligament)
 - Cover: Superficial lamina propria, epithelial lining
 - Intrinsic muscles act on the arytenoid cartilage to move vocal folds
 - Adductors = Muscles that move vocal folds medially to close the glottis [Thyroarytenoid (TA, bilateral); Lateral cricoarytenoid (LCA, bilateral); interarytenoid (IA)]
 - Abductor = Muscles that move vocal fold laterally to open the glottis. [Posterior cricoarytenoid (PCA, bilateral)]
 - Tension: Cricothyroid (CT), Bilateral, elongates and increases tension of the vocal folds
- Nerve supply
 - Recurrent laryngeal nerve: Branch of Vagus Nerve (Cranial Nerve X)
 - Supplies motor input to TA, LCA, PCA, IA muscles
 - Supplies sensation to the subglottis
 - Superior laryngeal nerve: Branch of Vagus Nerve (Cranial Nerve X)
 - External branch supplies motor input to CT muscle
 - Internal branch supplies sensation to the glottis and supraglottis



Physiology and Function

- The larynx is responsive for a complicated balance between breathing, lower airway protection/swallowing, and voice production
- **Lower airway protection:** Most primitive function of larynx. Coordinated function during swallowing (closure of true and false vocal folds, aryepiglottic folds, and retroflexion of the epiglottis over the larynx) protects lower airways. Cough reflex respond to chemical and mechanical stimuli (such as smoke, food or liquid) to produce rapid closure of the vocal folds and expel material to avoid material entering the lungs. Failure of this function can lead to lung infection (i.e. aspiration pneumonia) and pulmonary compromise.
- **Breathing:** Requires coordination of vocal folds to remain open during breathing. Loss of normal motion can lead to restricted or dysfunctional breathing patterns.
- **Voice Production:** Highly coordinated neuromuscular function that requires sufficient airflow from the lungs, correctly timed closure of the vocal folds, and vibration of the vocal fold cover to produce voice and speech.
- Intact vocal fold motion and sensation is imperative for airway protection and voice production.

References

- Woodson GE. Laryngeal and Pharyngeal Function. In Flint PW et al, eds. Cummings Otolaryngology - Head and Neck Surgery: 5th ed. Philadelphia, PA: Mosby Elsevier 2010:805-812.
- Otto KJ. Anatomy and physiology of the larynx. In Rosen CA and Simpson CB, eds. Operative Techniques in Laryngology. Springer-Verlag Berlin Heidelberg 2008:3-8