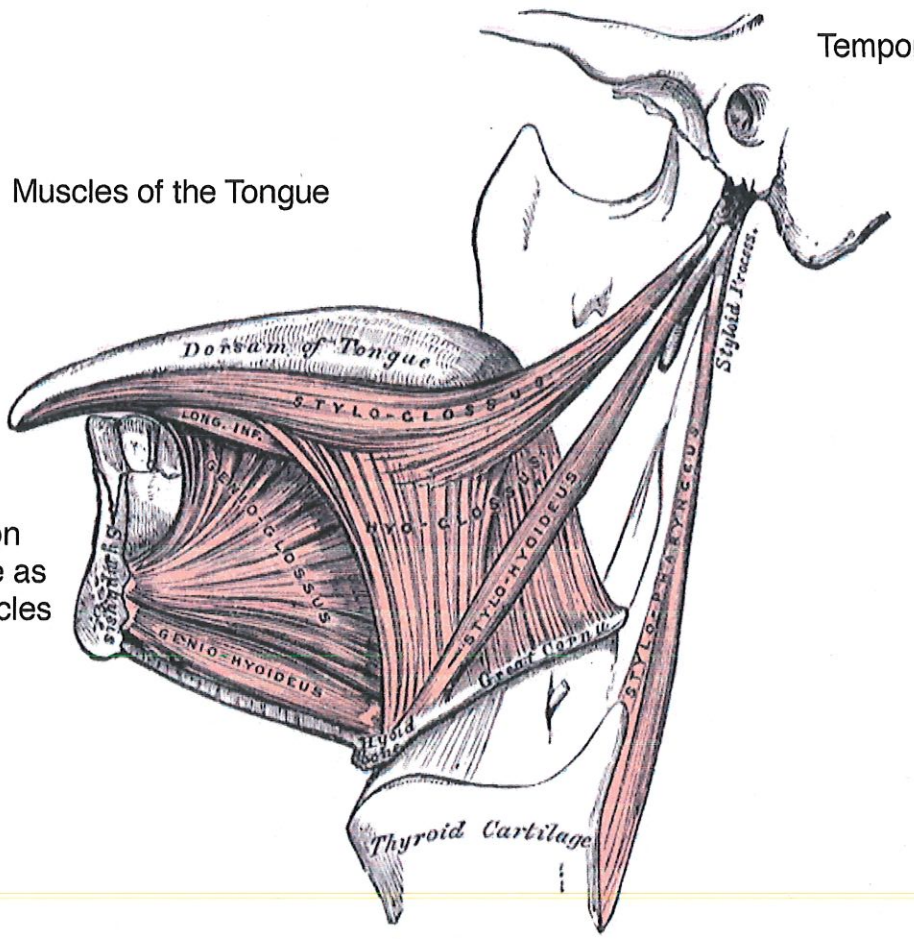
Extrinsic Muscles of the Larynx

Compiled by Nick Miguel

Temporal Bone (skull)

Muscles of the Tongue



"Mental Spine" ridges on the mandible that serve as points of origin for muscles

http://www.stritch.luc.edu/lumen/MedEd/GrossAnatomy/dissector/muscles/mus_hn.html

http://newvoicenewcareer.blogspot.com/2011/07/anatomy-and-physiology-series-muscles.html

1 **Stylo-glossus:** Origin: Anterior surface and apex of styloid process and upper quarter of stylohyoid ligament. Insertion: Superolateral sides of tongue. Action Retracts and elevates tongue, aids initiation of swallowing. Nerve: Hypoglossal nerve (XII). Effect on Larynx: Indirect laryngeal elevator via connection to hyoid bone through hyo-glossus.

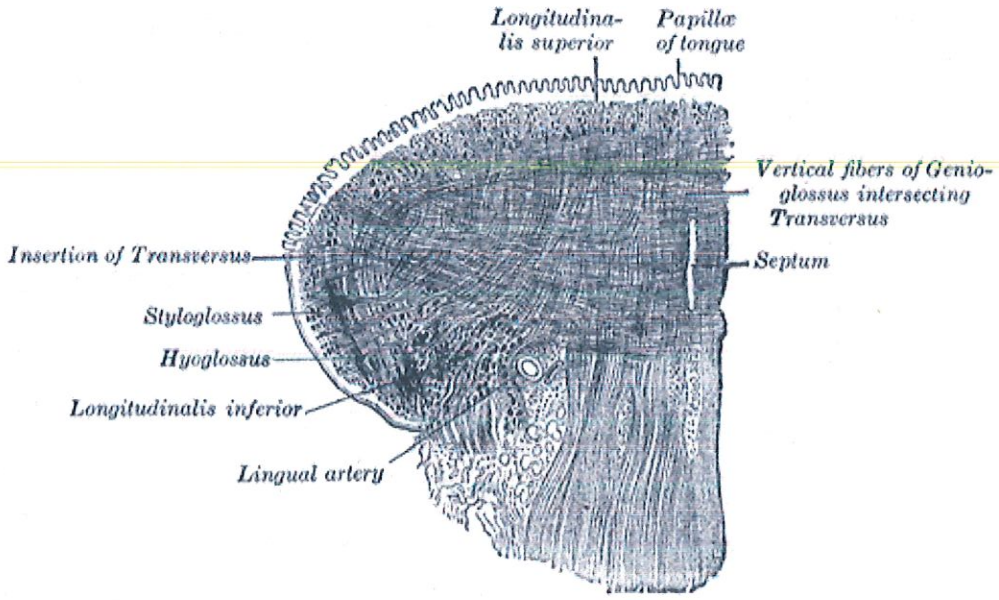
2 **Hyo-glossus:** Superior Border of Greater Cornu of Hyoid Bone. Insertion: Lateral Sides of Tongue. Action: Depresses Tongue. Nerve: Hypoglossal Nerve (XII). Effect on Larynx: Indirect laryngeal elevator via connection to hyoid bone. Although may be used in conjuction with extrinsic infrahyoid laryngeal depressor muscles to retract tongue and depress larynx simultaneously.

3 **Genio-glossus:** Origin: Superior Mental Spine on the Posterior surface of the Symphysis Menti. Insertion: Central mass of tongue and mucous membrane. Action: protracts (extend forward or outward) the tongue. Nerve: Hypoglossal Nerve (XII). Effect on larynx: Indirect larngeal elevator via connection to the tongue and thereby the hyoid.

4 **Genio-hyoid:** Origin: Inferior mental Spine on posterior surface of symphysis menti. Insertion: Superior border of body of hyoid bone. Action: Elevates and protracts hyoid bone. Depresses mandible. Nerve: C1 fibres carried by hypoglossal Nerve (XII). Effect on Larynx: Indirect laryngeal elevator via connection to hyoid bone.

5 **Stylo-hyoid:** Origin: Base of styloid process. Insertion: Base of greater cornu of hyoid bone. Action: Elevates and retracts hyoid bone. Aids swallowing and elevates larynx. Nerve: Mandibular branch of facial Nerve (VII). Effect on Larynx. Indirect Laryngeal elevator via connection to hyoid bone.

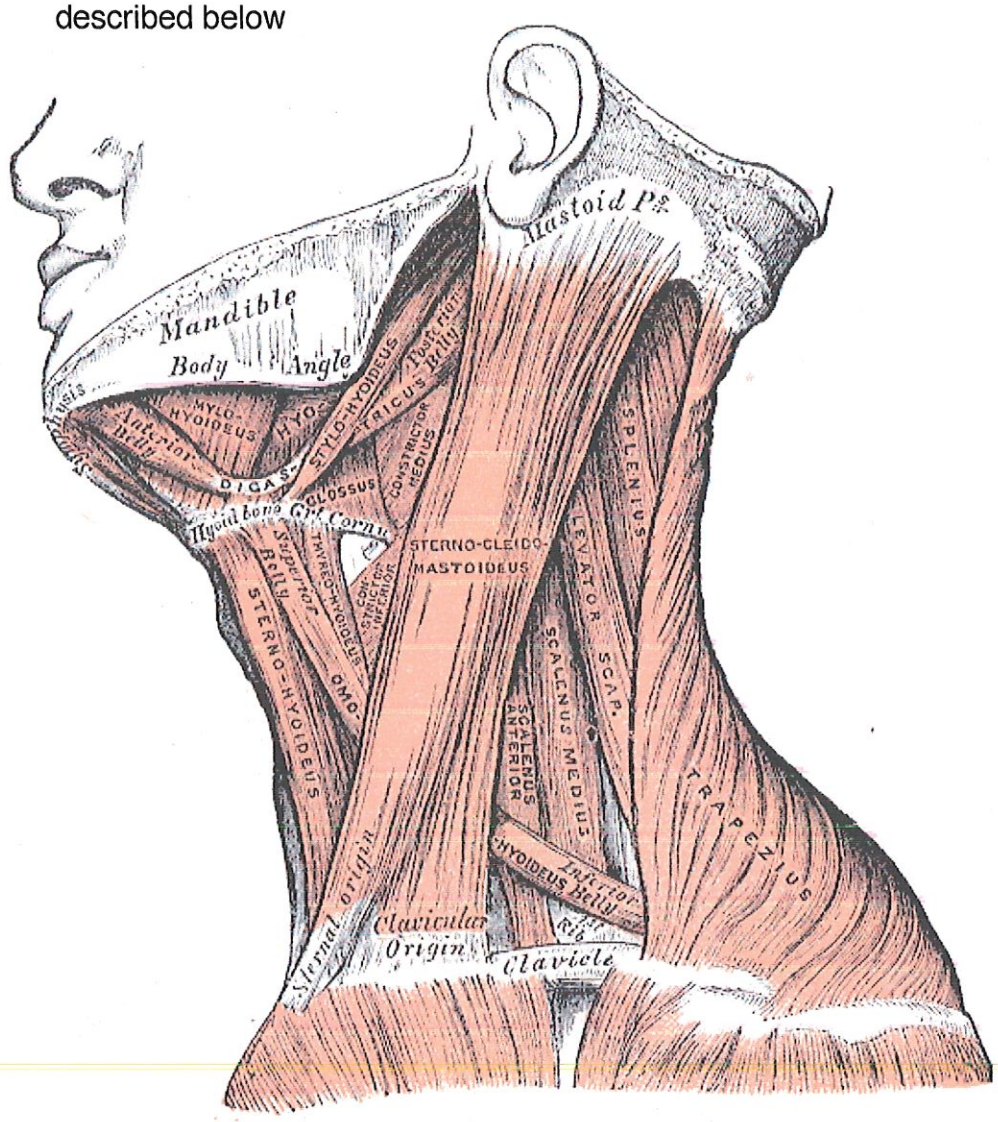
6 **Stylo-pharyngeus:** Origin: medial aspect of styloid process. Insertion: Lateral border of thyroid. Action: Elevates larynx and pharynx. Aids in swallowing. Nerve: Muscular branch of glossopharyngeal Nerve (IX). Effect on larynx: Direct Larngeal elevator via connection to thyroid.



7 **Intrinsic muscles of tongue (Superior, Inferior Longitudinal, Transverse, Vertical):** Insertion: Membrane, septum and other muscles of tongue. Action: Alter shape of tongue and so aid in mastication, speech and swallowing. Nerve: Hypoglossal Nerve: (XII). Effect on laryx: probably indirect elevator upon protraction, but may depress by retraction and crowding area above hyoid bone.

Alternate image of the tongue

Muscles of the neck
described below

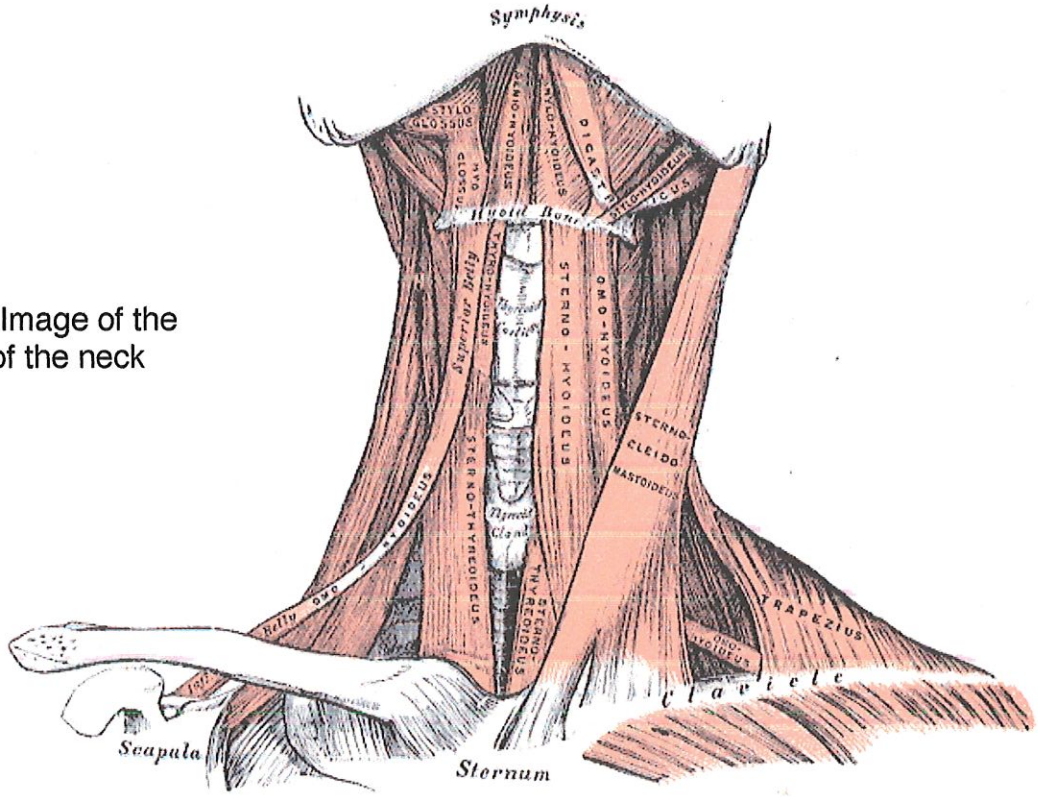


8 **Digastric (Anterior and Posterior Belly):** Origin: Anterior Belly–Digatric fossa on surface of symphysis menti. Posterior Belly: Base of medial aspect of mastoid process. Insertion: Fibrous loop to lesser cornu of hyoid bone. Action: Elevates hyoid bone. Aids swallosing and depresses mandible. Nerve: Anterior belly: mylohyoid Nerve (Vc). Posterior belly: facial Nerve (VII). Effect on Larynx: Indirect larygeal elevator via connection to hyoid bone.

Stylo-Hyoid: See above

9 **Mylo-Hyoid:** Origin: Mylohyoid line on interior aspect of mandible. Insertion: Anterior three quarters: Midline raphe. Posterior quarter; Superior border of body of hyoid bone. Action: Elevates hyoid bone, supports and raises floor of mouth. Aids in mastication and swallowing. Nerve: Mylohyoid Nerve (Vc). Effect on Larynx: Indirect Laryngeal Elevator via connection to the hyoid bone.

Alternate Image of the muscles of the neck



Hyo-Glossus: See above

Omo-Hyoid: Origin: Suprascapular ligament and adjacent scapula. Insertion: Inferior boder of body of hyoid bone. Action: Depresses hyoid bone and hence larynx. Nerve: Ansa cervicalis Nerve (C1,2,3). Effect on Larynx: Indirect laryngeal depressor via connection to hyoid bone.

Sterno-Hyoid: Origin: Superior Lateral Posterior aspect of manubrium. Insertion: Inferior border of body of hyoid bone. Action: Depress hyoid bond and hence larynx. Nerve: Ansa cervicalis Nerve (C1,2,3). Effect on Larynx: Indirect Larygeal depressor via connection to hyoid bone.

Thyro-hyoid: Origin: Oblique line of lamina of thyroid cartilage. Insertion: Inferior border of body of hyoid bone. Action: Elevates larynx or depresses hyoid bone. Nerve: C1 fibres carried by hypoglossal Nerve (XII). Effect on larynx: Indirect laryngeal depressor via connection to hyoid bone.

10 Pharygeal Constrictors (Superior, Medial, Inferior)

Superior Pharygeal Constrictor (pictured below): Origin: Lower two thirds of medial pterygoid plate, pterygomandibular raphe and posterior end of mylohyoid line on mandible. Insertion: Upper midline pharyngeal raphe and pharyngeal tubercle of clivus of occiput. Action: Aids in swallowing. Nerve: Pharyngeal plexus (IX, X and

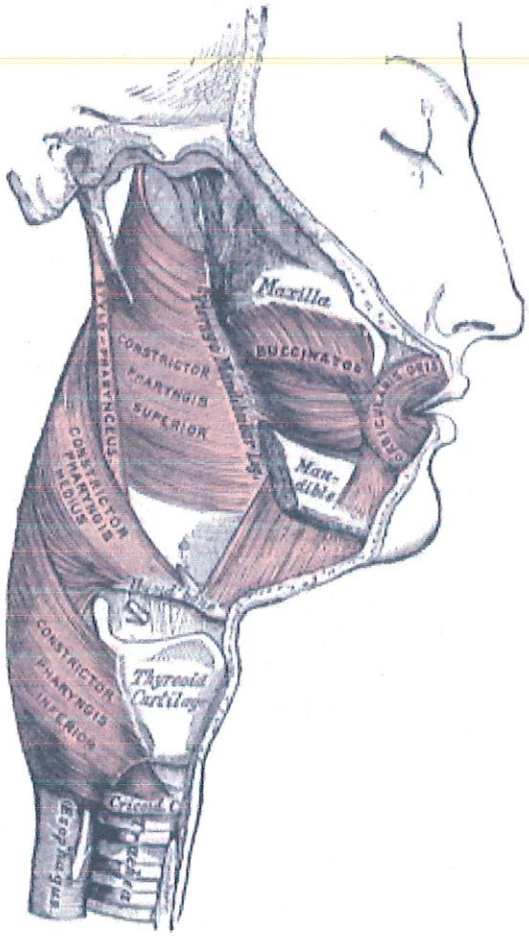
sympathetic) via pharyngeal br of X with its motor fibres from cranial accessory (XI). Effect on Larynx possibly indirect laryngeal elevator via connective tissue from the pharynx.

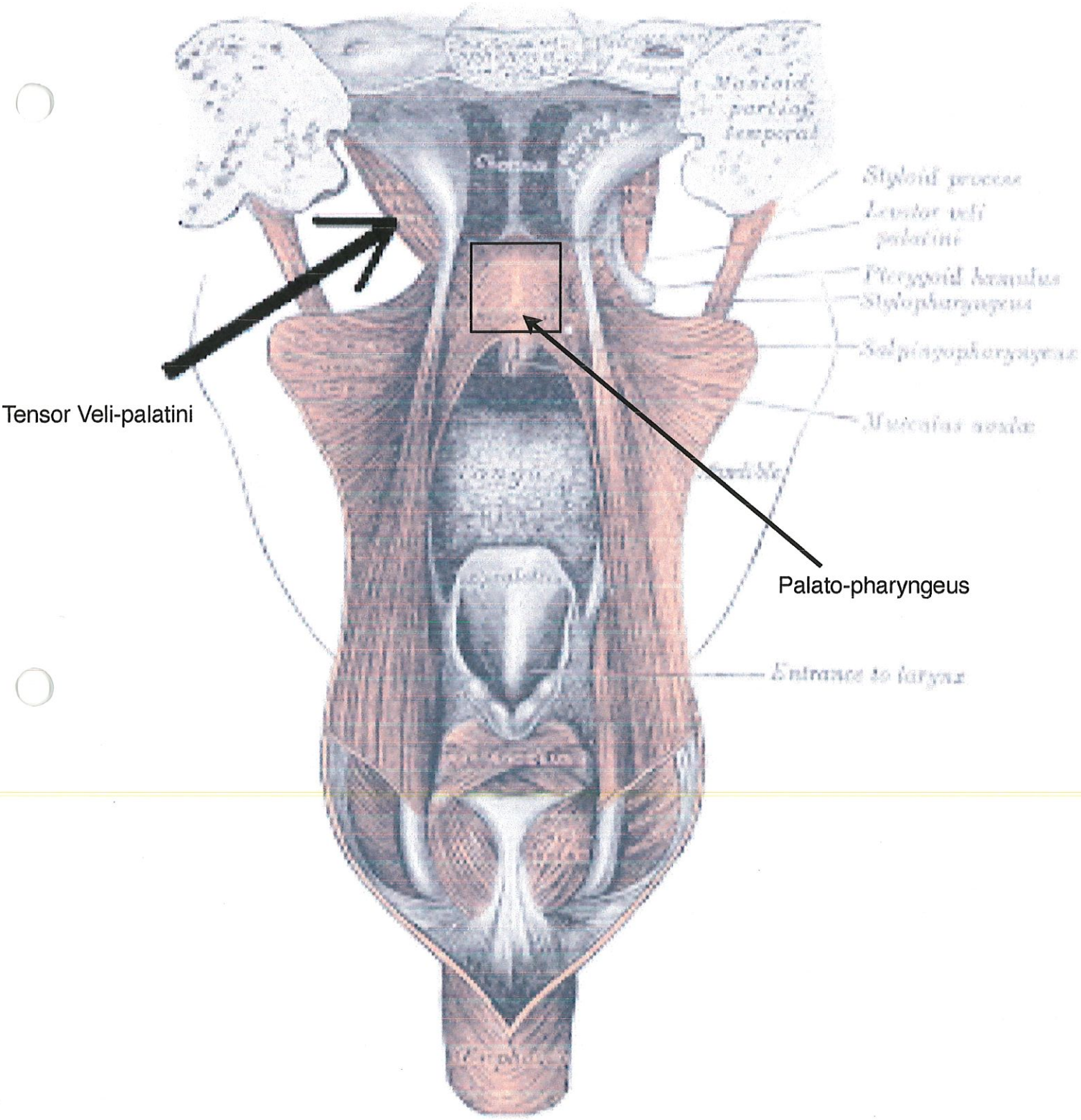
Medial Pharygeal Constrictor (Constrictor medius): Origin: Lower third of stylohyoid ligament, lesser cornu and superior border of greater cornu of hyoid bone. Insertion: Middle portion of pharyngeal raphe. Action: Aids in swallowing. Nerve: Pharyngeal plexus (IX, X and sympathetic) via pharyngeal br of X with its motor fibres from cranial accessory N (XI). Effect on larynx: indirect laryngeal elevator.

Inferior Pharygeal Constrictor (Constrictor inferius) Cricopharyngeus and Thyropharyngeus: Origin: Cricopharyngeus: lateral aspect of arch of cricoid cartilage. Thyropharyngeus: oblique line of laminar of thyroid cartilage and fibrous cricothyroid arch. Insertion: Cricopharyngeus: continuous with muscle of opposite side, behind pharynx. Thyropharyngeus : lower pharyngeal raphe (seamlike connnection resulting in ridge externally and fibrous septum internally. Pronounced ['rei.fi]). Action: Aids swallowing . Cricopharyngeus acts as upper oesophageal sphincter. Nerve: Pharyngeal plexus (IX, X and sympathetic) via pharyngeal br of X with its motor fibres from cranial accessory (XI). Effect on Larynx: draws larynx posteriorly and downward.

Additional Image of Pharyngeal muscles

Sterno-cleido Mastoid: not related
Levator Scapula: Not related
Splenius: Not related
Scalenus Medius: not related
Scalenus Anterior: not related





11 **Salpingo-Pharyngeus:** Origin: Inferior cartilage and mucosa of pharyngeal orifice of auditory tube. Insertion: Upper border of thyroid cartilage and inferior constrictor muscle fibres. Action: Elevates pharynx and larynx and aids swallowing. Opens auditory canal during swallowing. Nerve: Pharyngeal branch of vagus Nerve (X) with its motor fibres from cranial accessory Nerve (XI). Effect on Larynx: Direct Laryngeal elevator.

Stylo-pharyngeus: See above

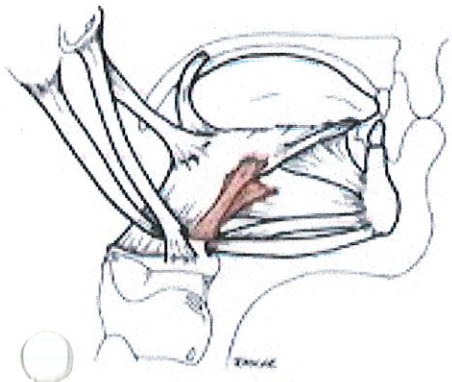
12 **Levator veli palatini:** Origin: Apex of inferior surface of petrous temporal bone and medial rim of auditory tube. Insertion: Palatine aponeurosis. Action: Elevates, retracts and laterally deviates soft palate. May open auditory tube on swallowing. Nerve: Pharyngeal br of vagus N (X) with its motor fibres from cranial accessory N (XI). Effect on Larynx: unclear.

13 **Uvula muscles (Muscularis uvulae):** Origin: Posterior border of the hard palate. Insertion: Palatine aponeurosis. Action: Shapes uvula. Nerve: Pharyngeal br of vagus N (X) with its motor fibres from cranial accessory N (XI). Effect on Larynx: little if any.

14 **Tensor veli- palatini:** Origin: Scaphoid fossa and medial aspect of spine of sphenoid bone. Insertion: Palatine aponeurosis (via pulley of pterygoid hamulus). Action: Tenses soft palate prior to elevation (and opens eustacian tubes?) Nerve: N to med pterygoid (main trunk of mandibular N (Vc)). Effect on larynx: unclear, but maybe indirect laryngeal elevator.

15 **Palato-pharyngeus:** Origin: Palatine aponeurosis and post margin of hard palate. Insertion: Upper border of thyroid cartilage and blends with constrictor fibres. Upper fibres interdigitate with opposite side (Passavant's ridge). Action: Elevates pharynx and larynx . Passavant's muscle closes nasopharyngeal isthmus in swallowing. Nerve: Pharyngeal br of vagus N (X) with its motor fibres from cranial accessory N (XI). Effect on Larynx: Direct Laryngeal Elevator.

16 **Chondro-glossus:** origin: medial side and base of lesser cornu of hyoid bone. insertion: substance of tongue; Nerve: hypoglossal. Action depresses, retracts tongue. Effect on Larynx: indirect laryngeal elevator via connection to hyoid bone. Sometimes considered part of the Hyo-glossus.



Images for the Chondroglossus

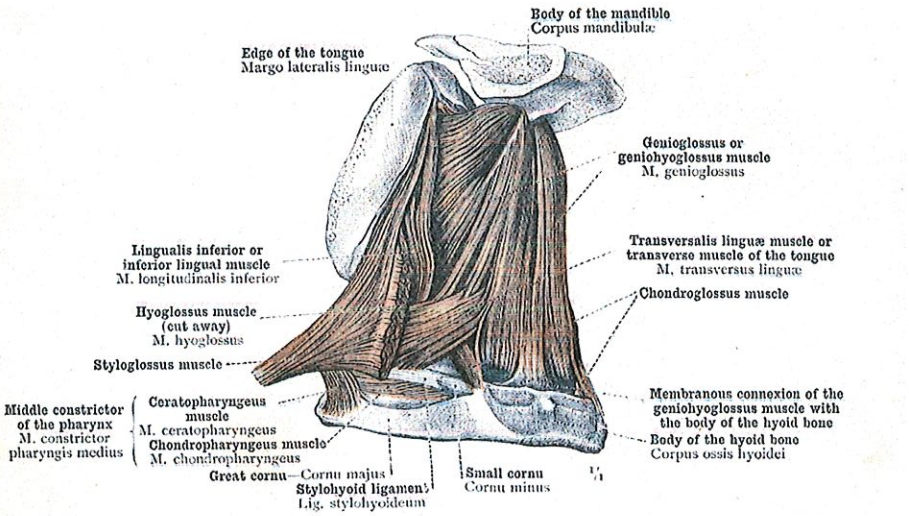
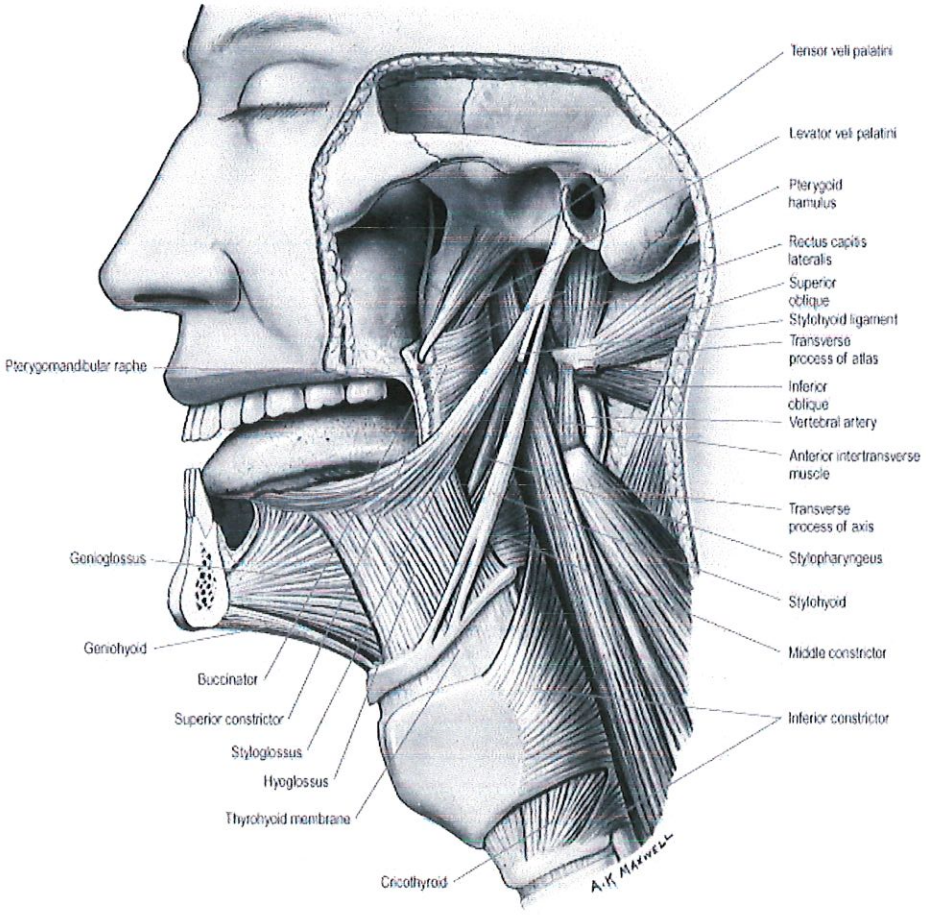


FIG. 540.—THE MUSCLES OF THE TONGUE SEEN FROM THE RIGHT SIDE AND BELOW, DISPLAYED BY THE REMOVAL OF THE HYOGLOSSUS MUSCLE: M. LONGITUDINALIS INFERIOR, THE INFERIOR LINGUAL MUSCLE; M. TRANSVERSUS (VEL TRANSVERSALIS) LINGUÆ, THE TRANSVERSE MUSCLE OF THE TONGUE, AND ITS RELATION TO THE GENIOHYOGLOSSUS MUSCLE; THE CHONDROGLOSSUS MUSCLE.

Alternate image of tongue and pharynx muscles



17 **Palato-glossus:** Origin: Palatine aponeurosis. Insertion: Posterolateral tongue. Action: Elevates post tongue and closes oropharyngeal isthmus and aids initiation of swallowing. Nerve: Pharyngeal br of vagus N (X) with its motor fibres from cranial accessory N (XI). Effect on Larynx: Inidrectly raises the larynx via connection to the tongue and thereby the hyoid bone.

Palato-glossus image