

ANATOMY

ANATOMY

HEAD

HEAD

<u>AREAS</u>	<u>BONES</u>	<u>MUSCLES</u>	<u>NERVES</u>	<u>ORGANS</u>	<u>JOINTS</u>	<u>VESSELS</u>	<u>OTHER</u>
<ul style="list-style-type: none">• <u>Scalp</u>• <u>Pterygopalatine Fossa</u>• <u>Infratemporal Fossa</u>• <u>Cranial Fossae</u>	<ul style="list-style-type: none">• <u>Skull</u>• <u>Bony Orbit</u>• <u>Sphenoid Bone</u>• <u>Ethmoid Bone</u>• <u>Temporal Bone</u>• <u>Mandible</u>• <u>Nasal Skeleton</u>• <u>Cranial Foramina</u>	<ul style="list-style-type: none">• <u>The Tongue</u>• <u>Facial Expression</u>• <u>Extraocular</u>• <u>Mastication</u>	<ul style="list-style-type: none">• <u>Sympathetic Innervation</u>• <u>Parasympathetic Innervation</u>• <u>Ophthalmic Nerve</u>• <u>Mandibular Nerve</u>• <u>Maxillary Nerve</u>	<ul style="list-style-type: none">• <u>The Ear</u>• <u>The Eye</u>• <u>Nose and Sinuses</u>• <u>Salivary Glands</u>• <u>Oral Cavity</u>	<ul style="list-style-type: none">• <u>TMJ</u>	<ul style="list-style-type: none">• <u>Arterial Supply</u>• <u>Venous Drainage</u>• <u>Lymphatics</u>	<ul style="list-style-type: none">• <u>Lacrimal Gland</u>• <u>Eyelids</u>• <u>Teeth</u>• <u>Palate</u>

THE MUSCLES OF FACIAL EXPRESSION

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• 3 Oral Group

- 3.1 Clinical Relevance: Paralysis to the Oral Muscles

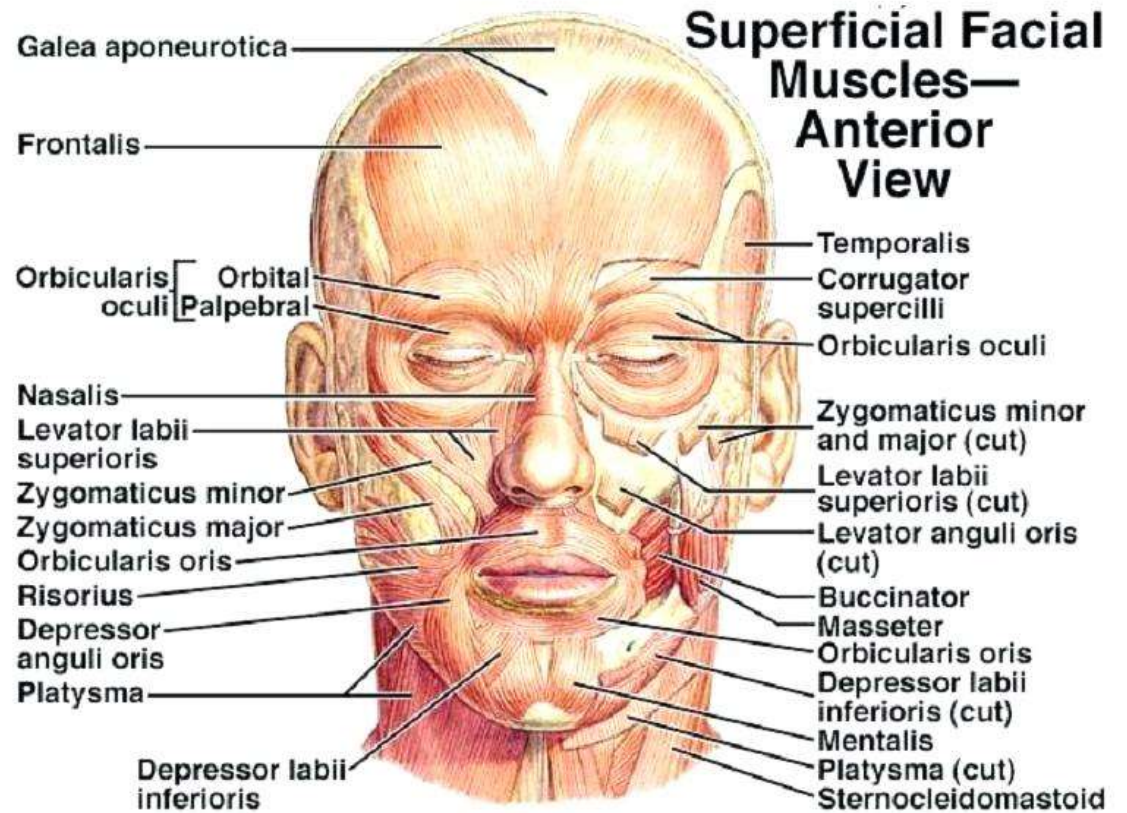
HEAD

Muscle of Facial Expression

THE MUSCLES OF FACIAL EXPRESSION

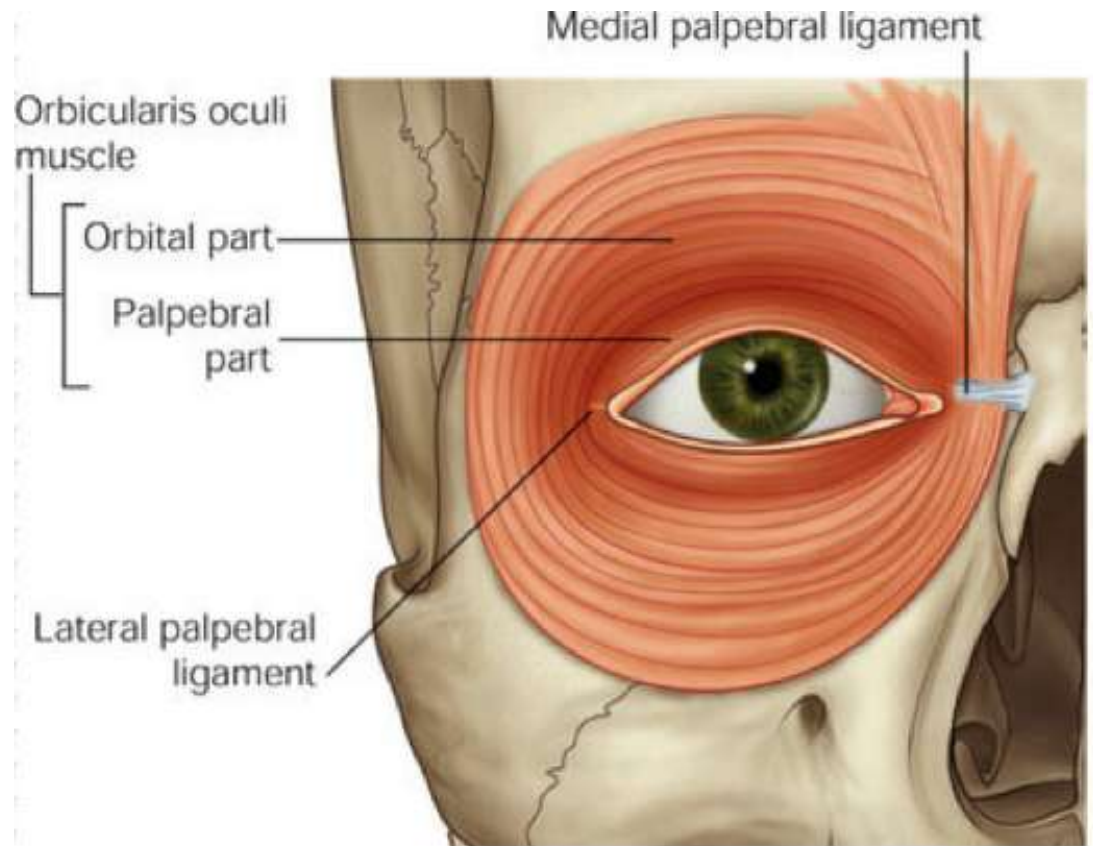
- The muscles of facial expression are located in the **Subcutaneous tissue**, originating from bone or fascia, and inserting onto the skin. By contracting, the muscles pull on the skin and exert their effects. They are the only group of muscles that insert into skin.
- These muscles have a common embryonic origin – The 2nd **pharyngeal arch**. They migrate from the arch, taking their nerve supply with them. As such, all the muscles of facial expression are innervated by the **Facial Nerve**.
- The facial muscles can broadly be split into three groups; **orbital, nasal and oral**.

Muscles of Facial Expression



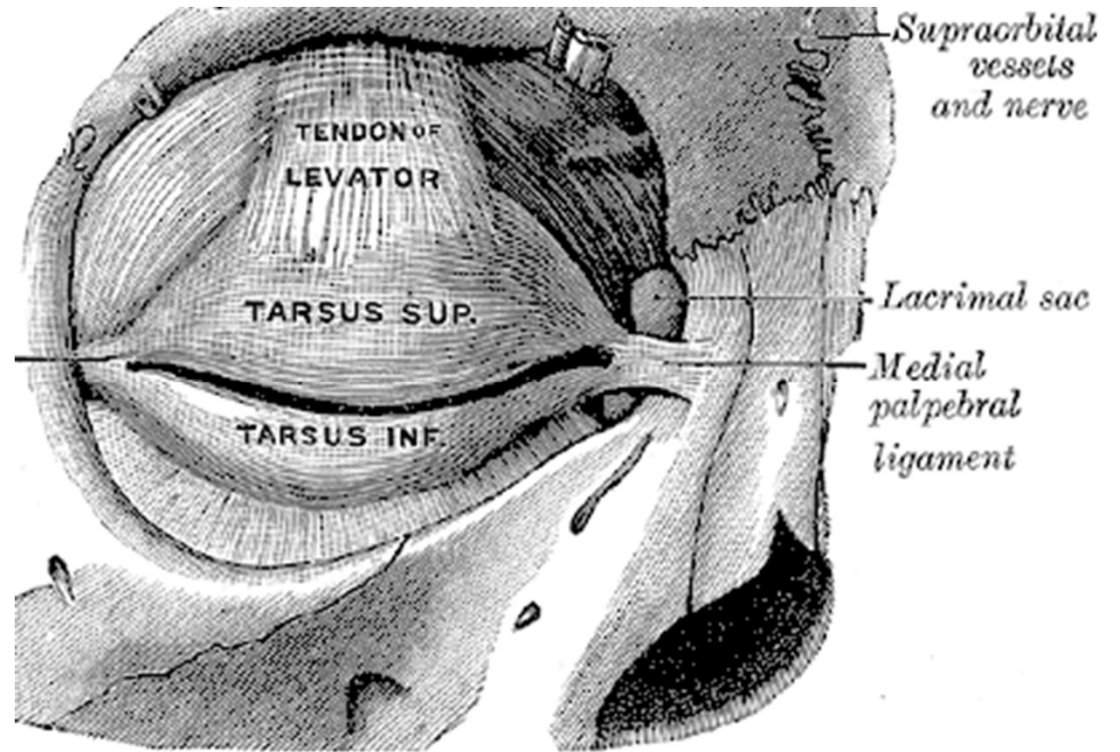
Muscle Of facial Expression

Orbicularis Oculi



Muscle of Facial Expression

Orbicularis Oculi



THE MUSCLES OF FACIAL EXPRESSION

Orbital Group

- The orbital group of facial muscles contains two muscles associated with the **eye socket**. These muscles control the movements of the **eyelids**, important in protecting the **cornea** from damage. They are both innervated by the **facial nerve**.

Orbicularis Oculi

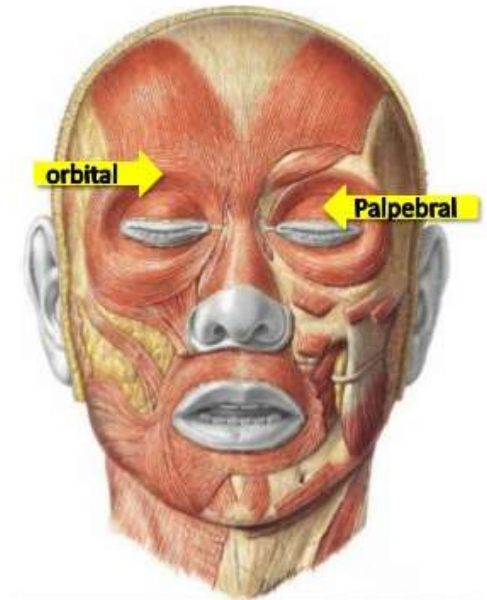
- The **orbicularis oculi** muscle surrounds the eye socket and extends into the eyelid. It has three distinct parts – Palpebral, Lacrimal and Orbital.
- **Attachments** – Originates from the medial orbital margin, the medial palpebral ligament, and the lacrimal bone. It then inserts into the skin around the margin of the orbit, and the superior and inferior tarsal plates.
- **Actions:**
 - Palpebral part – gently closes the eyelids.
 - Lacrimal part – involved in the drainage of tears.
 - Orbital part – tightly closes the eyelids.
- **Innervation** – [Facial nerve](#) (CN VII, Temporal and Zygomatic branches)

Muscle of Facial Expression

Orbicularis Oculi

Orbicularis oculi

- The orbicularis oculi is a large muscle that completely surrounds each orbital orifice and extends into each eyelid.
- It closes the eyelids
- The orbital and palpebral parts have specific roles to play during eyelid closure. The palpebral part closes the eye gently, whereas the orbital part closes the eye more forcefully and produces some wrinkling on the forehead.
- An additional small lacrimal part of the orbicularis oculi muscle is deep, medial in position, and attaches to bone posterior to the lacrimal sac of the lacrimal apparatus in the orbit.



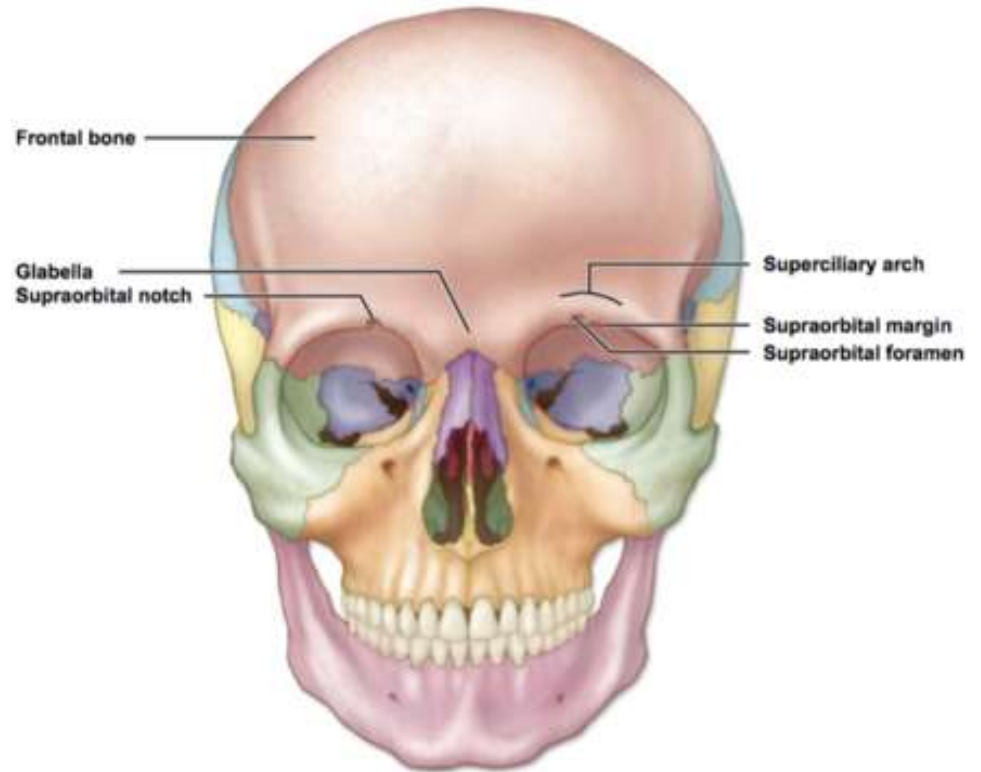
THE MUSCLES OF FACIAL EXPRESSION

Corrugator Supercilii

- The corrugator supercilii is a much smaller muscle, and is located **posteriorly** to the orbicularis oculi muscle.
- **Attachments** – Originates from the Superciliary arch, running in a superolateral direction. Inserts into the skin of the eyebrow.
- **Actions** – Acts to draw the eyebrows together, creating vertical wrinkles on the bridge of the nose.
- **Innervation** – Facial nerve.

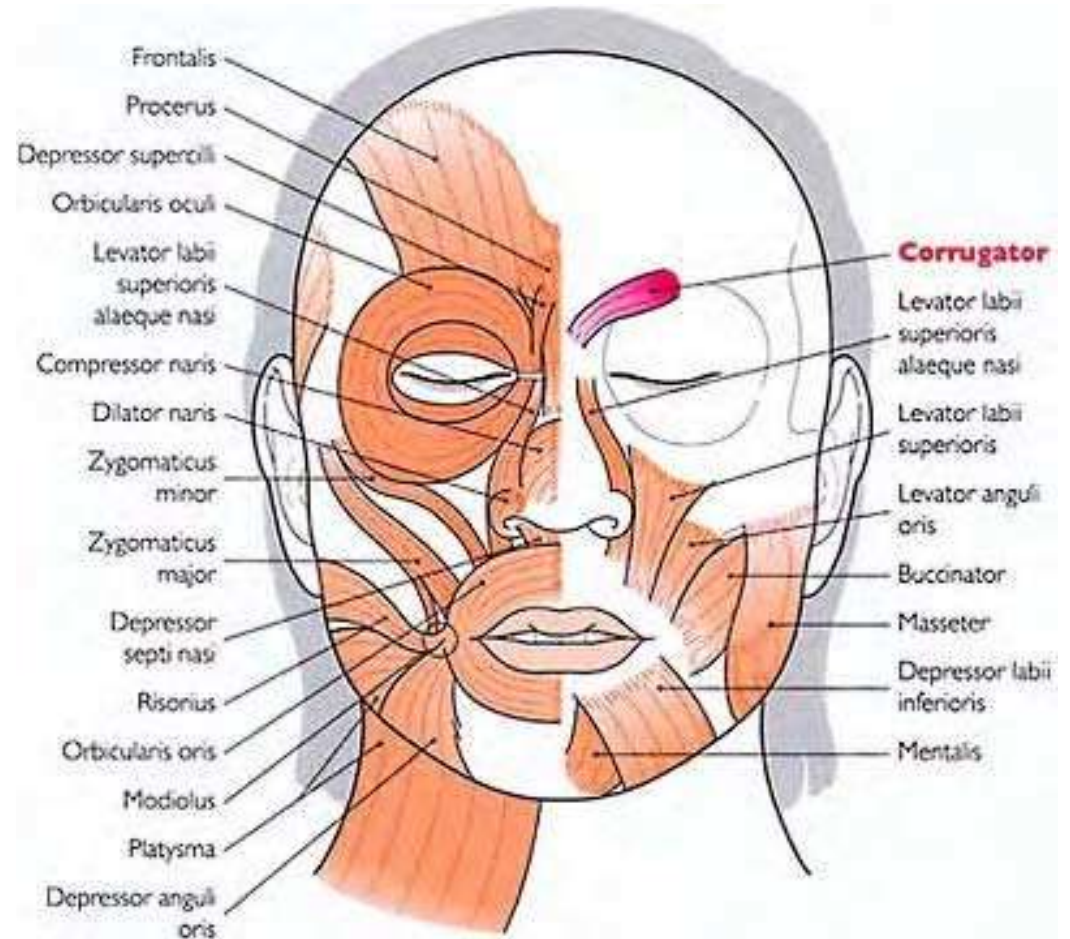
Muscle of Facial Expression

Super ciliary Arch



Muscle of Facial Expression

Corrugator Supercilli

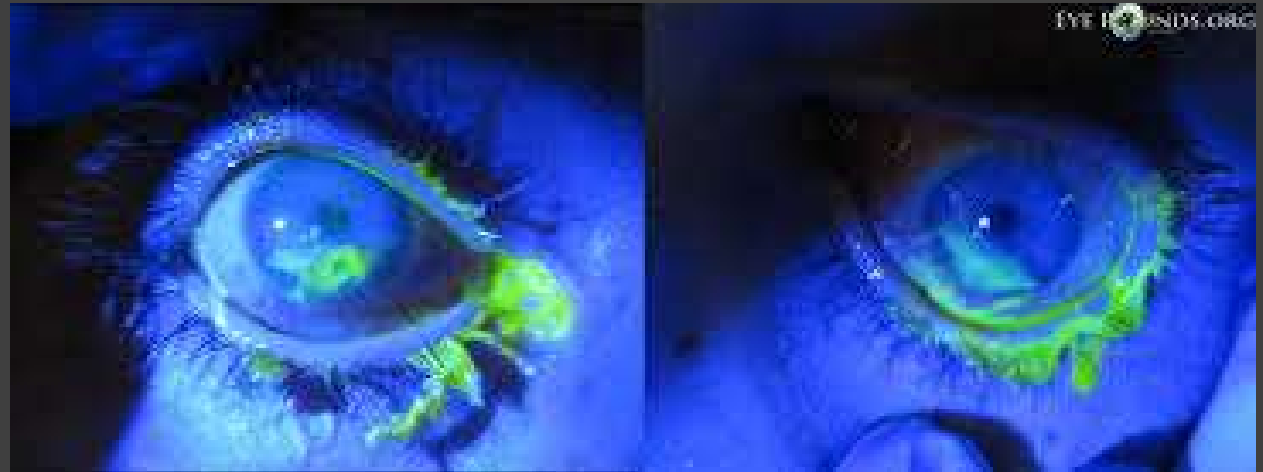


THE MUSCLES OF FACIAL EXPRESSION

Clinical Relevance: Paralysis to the Orbital Muscles

- If the **facial nerve** becomes damaged, the orbital muscles will cease to function. As they are the only muscles that can close the eyelids, this has some serious clinical consequences.
- The eye cannot shut – this can cause the cornea to dry out. This is known as **exposure keratitis**.
- The lower eyelid droops, called **ectropion**. Lacrimal fluid pools in the lower eyelid, and cannot be spread across the surface of the eye. This can result in a failure to remove debris, and ulceration of the corneal surface.
- The test for facial nerve palsy involves raising the eyebrows and closing the eyelids

Muscle of
Facial
Expression



Exposure Keratitis

Muscle of Facial Expression

Ectropion



THE MUSCLES OF FACIAL EXPRESSION

Nasal Group

- The nasal group of facial muscles are associated with movements of the **nose**, and the skin around it. There are three muscles in this group, and they are all innervated by the **facial nerve**. They serve little importance in humans.

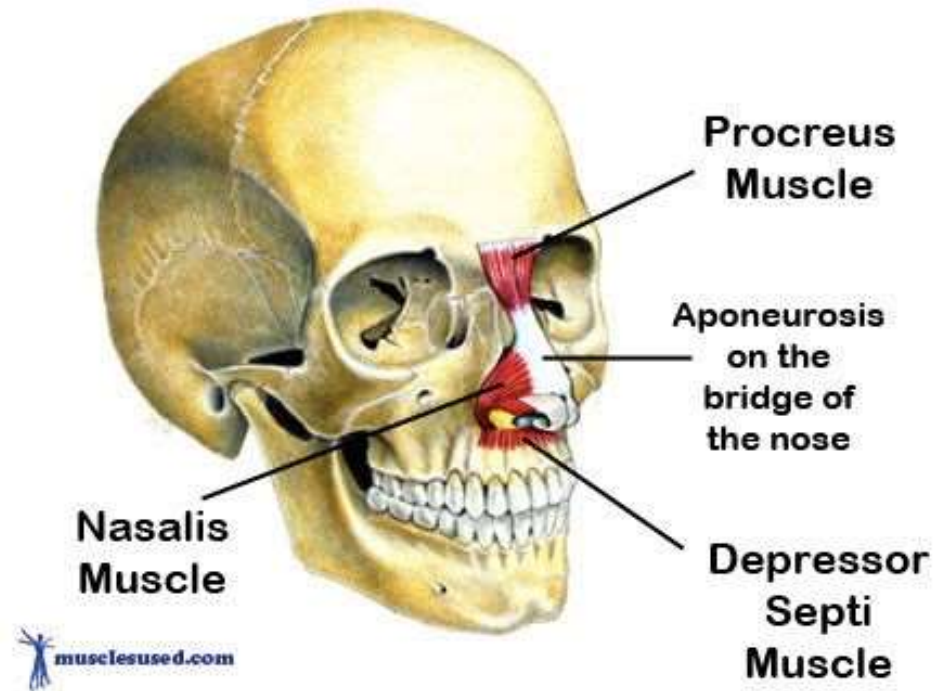
THE MUSCLES OF FACIAL EXPRESSION

Nasalis

- The nasalis is the **largest** of the nasal muscles. It is split into two parts; Transverse and Alar.
- **Attachments:** Both portions of the muscle originate from the maxilla. The transverse part attaches to an aponeurosis across the dorsum of the nose. The alar portion of the muscle attaches to the alar cartilage of the nasal skeleton.
- **Actions:** The two parts have opposing functions. The transverse part compresses the nares, and the alar part opens the nares.
- **Innervation:** Facial nerve.
-

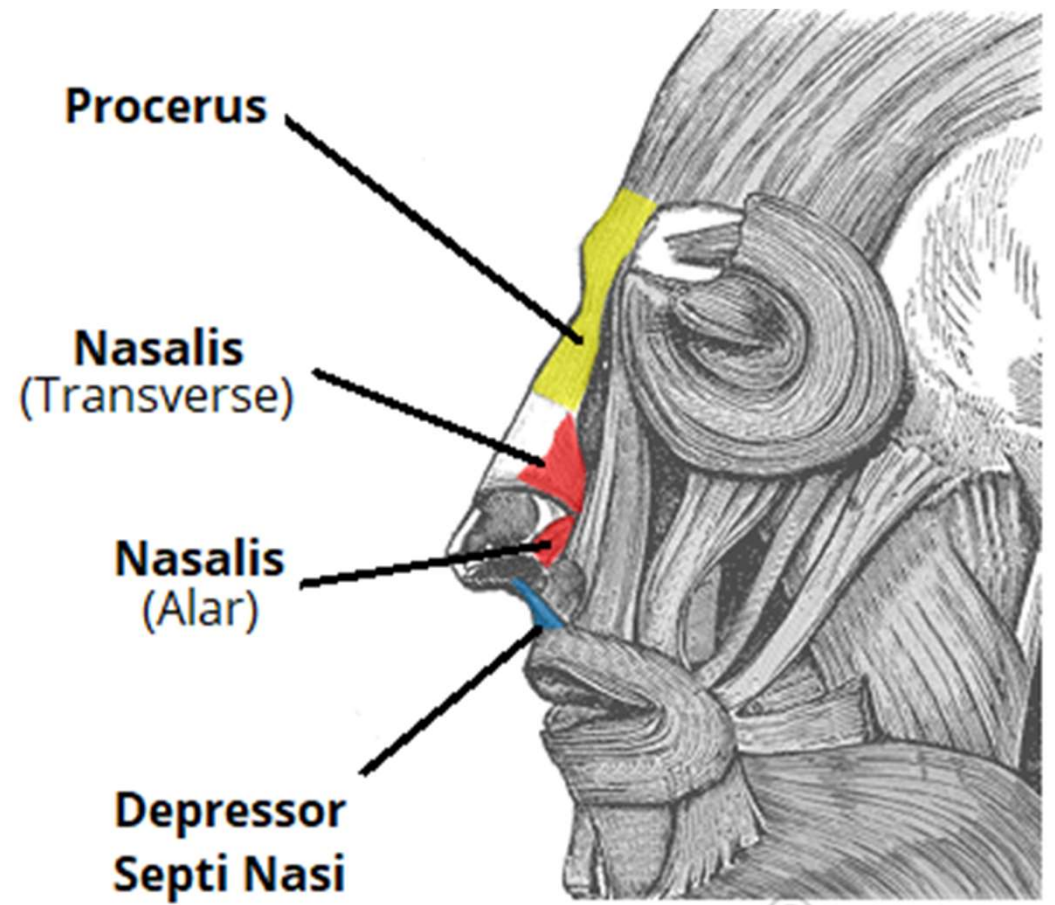
Muscle of Facial Expression

Nasalis



Muscle of Facial Expression

Nasalis



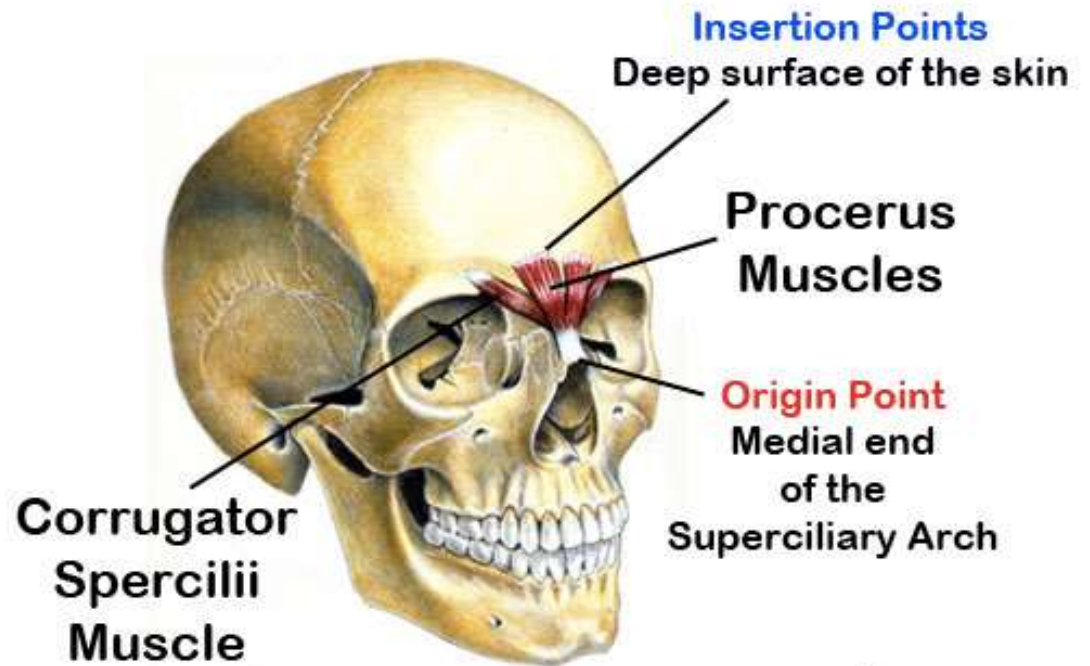
THE MUSCLES OF FACIAL EXPRESSION

Procerus

- The procerus is the most **superior** of the nasal muscles. It also lies **superficially** to the other muscles of facial expression.
- **Attachments:** It originates from the nasal bone, inserting into the lower medial forehead.
- **Actions:** Contraction of this muscle pulls the eyebrows downward to produce transverse wrinkles over the nose.
- **Innervation:** Facial nerve.

Muscle of Facial Expression

Procerus



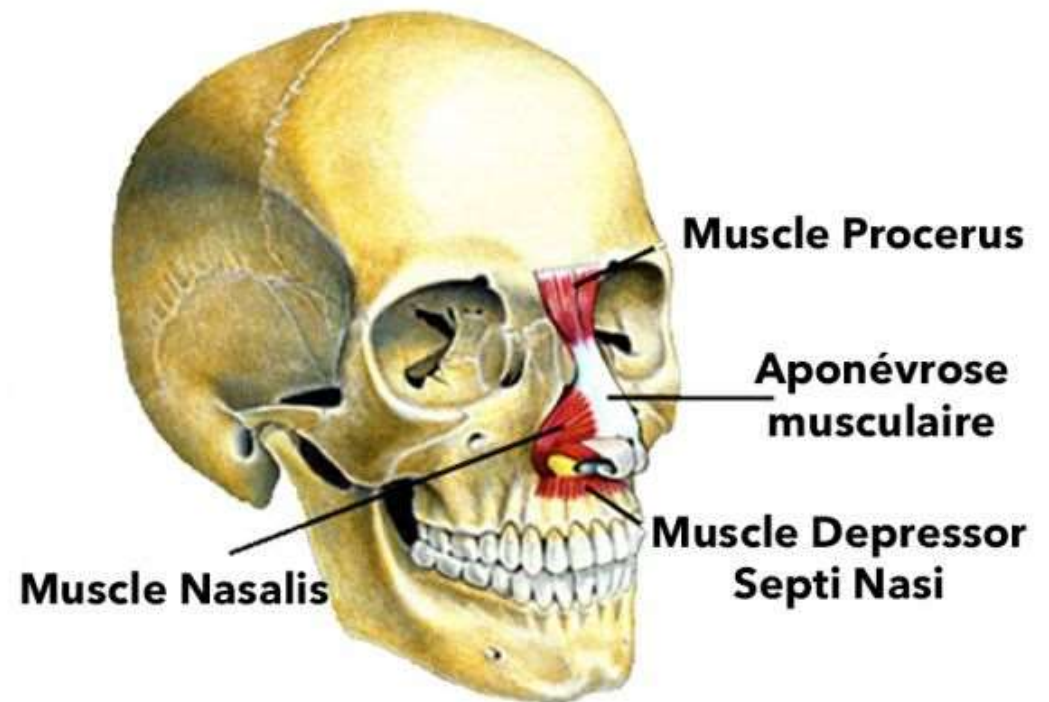
THE MUSCLES OF FACIAL EXPRESSION

Depressor Septi Nasi

- This muscle assists the alar part of the nasali in opening the nostrils.
- **Attachments:** It runs from the maxilla (above the medial incisor tooth) to the nasal septum.
- **Actions:** It pulls the nose inferiorly, opening the nares.
- **Innervation:** Facial nerve.

Muscle of Facial Expression

Depressor Septi Nasi



THE MUSCLES OF FACIAL EXPRESSION

Oral Group

- These are the most important group of the facial expressors – they are responsible for movements of the **mouth** and **lips**. Such movements are required in singing and whistling, and add emphasis to vocal communication. The oral group of muscles consists of the **Orbicularis Oris, Buccinator, and various smaller muscles**.

THE MUSCLES OF FACIAL EXPRESSION

Orbicularis Oris

- The fibres of the Orbicularis Oris enclose the opening to the oral cavity.
- **Attachments:** Arises from the maxilla and from the other muscles of the cheek. It inserts into the skin and mucous membranes of the lips.
- **Action:** Purses the lips.
- **Innervation:** Facial nerve.

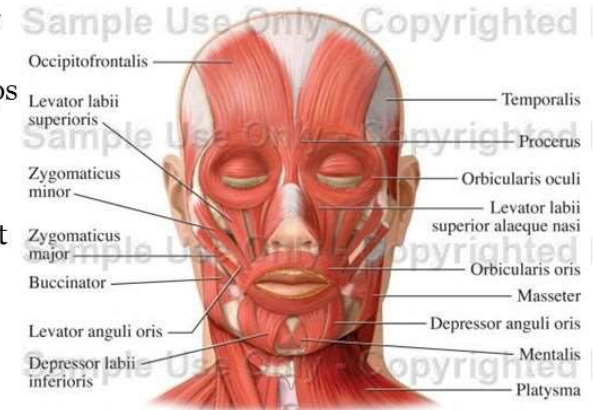
Muscle of Facial Expression

Orbicularis Oris

Muscles of the Face

– 1. Orbicularis Oris

- Superior (OOS) and inferior (OOI)
- Muscle that surround the lips
- Functional difference between the upper and the lower muscles
- Pull the lips closer and effect labial seal
- OOS-lowers the upper lip
- OOI- elevates the lower lip
- Also active when we round and protrude lips.
- Innervated by the VII nerve



THE MUSCLES OF FACIAL EXPRESSION

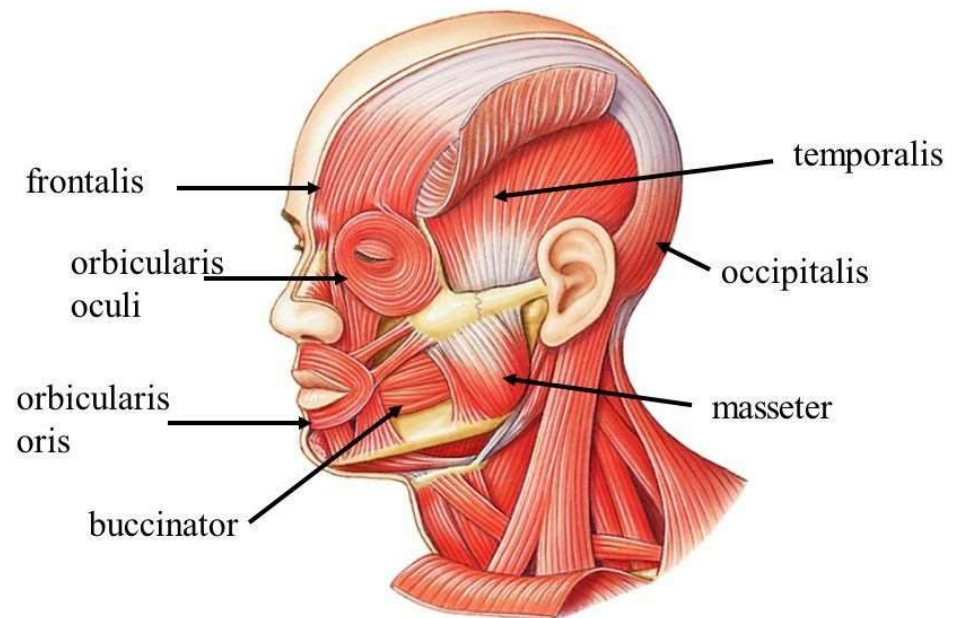
Buccinator

- This muscle is located between the mandible and maxilla, deep to the other muscles of the face.
- **Attachments:** It originates from the maxilla and mandible. The fibres run in an inferomedial medial direction, blending with the orbicularis oris and the skin of the lips.
- **Actions:** The buccinator pulls the cheek inwards against the teeth, preventing accumulation of food in that area.
- **Innervation:** Facial nerve.

Muscle of Facial Expression

Buccinator

Muscles of the Head



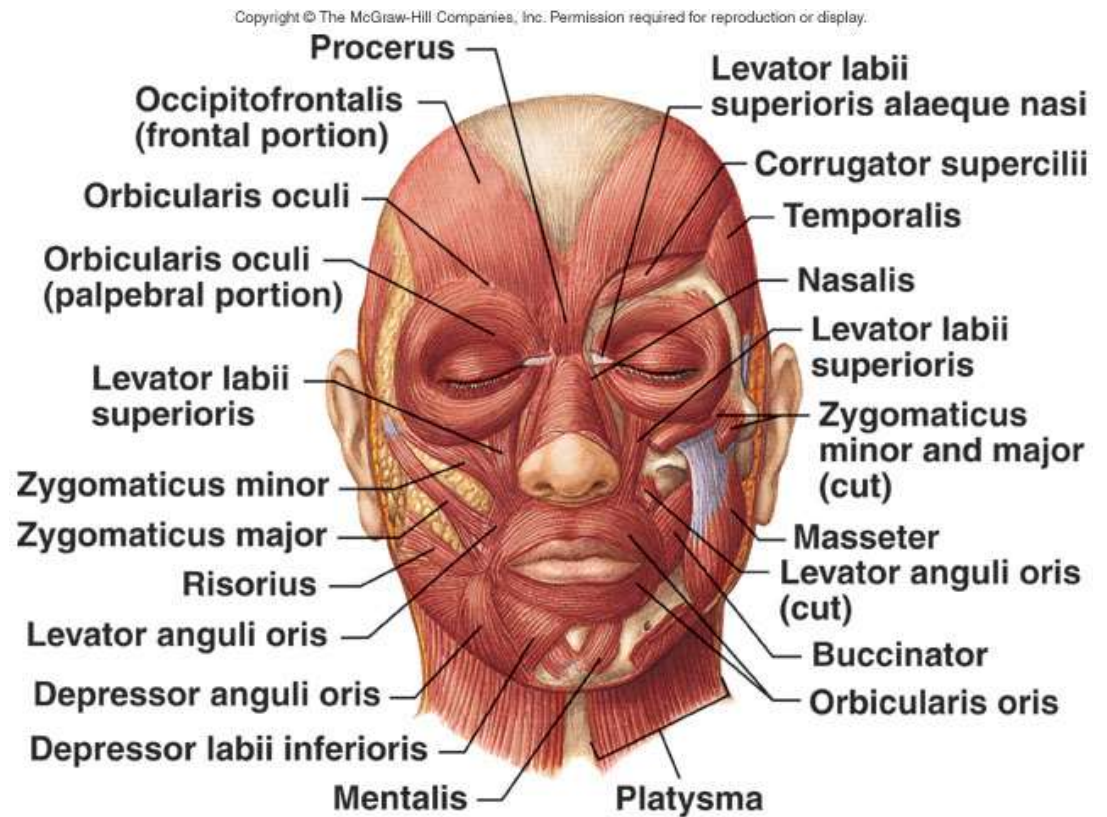
THE MUSCLES OF FACIAL EXPRESSION

Other Oral Muscles

- There are other muscles that act of the lips and mouth. Anatomically, they can be divided into upper and lower groups:
- The **lower group** contains the Depressor Anguli Oris, Depressor labii inferioris and the Mentalis.
- The **upper group** contains the Risorius, Zygomaticus major, Zygomaticus minor, Levator Labii Superioris, levator labii superioris alaeque nasi and Levator anguli oris.

Muscle of Facial Expression

Other Muscles



THE MUSCLES OF FACIAL EXPRESSION

Clinical Relevance: Paralysis to the Oral Muscles

- If the facial nerve is dysfunctional, the oral muscles can become paralysed. The patient may present with **difficulty eating**, with food collecting between the teeth and cheeks. In addition, the tissue around the mouth and cheeks sags, and is drawn across to the opposite side while smiling.

ANATOMY

Head

Head

Muscles Of Mastication

MUSCLES OF MASTICATION

Contents

- 1 Masseter
- 2 Temporalis
- 3 Medial Pterygoid
- 4 Lateral Pterygoid

Muscles Of Mastication

The **muscles of mastication** are associated with movements of the jaw ([temporomandibular joint](#)). They are one of the major muscle groups in the head – the other being the muscles of facial expression. There are four muscles:

- Masseter
- Temporalis
- Medial pterygoid
- Lateral pterygoid
- Embryologically, the muscles of mastication develop from the **first pharyngeal arch**. Consequently they are innervated by a branch of the trigeminal nerve (CN V), the mandibular nerve.
- In this article, we shall look at the anatomy of the muscles of mastication – their attachments, actions and innervation.

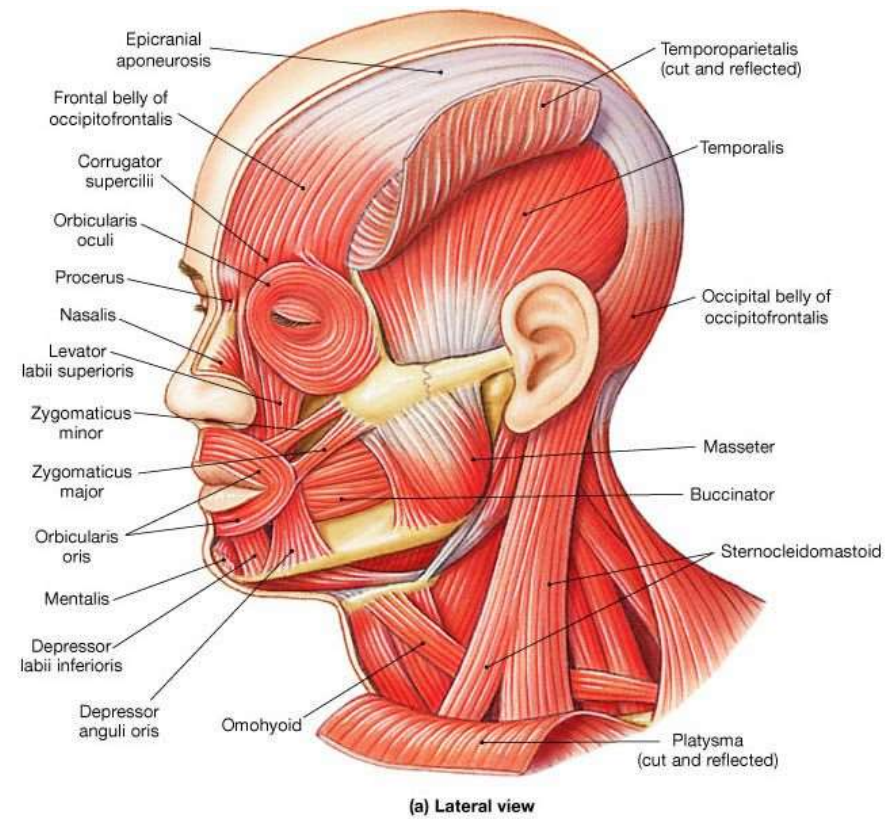
Muscles of Mastication

Masseter

- The masseter muscle is the most powerful muscle of mastication. It is quadrangular in shape, and can be split into two parts; deep and superficial.
- The entirety of the muscle lies superficially to the pterygoids and temporalis, covering them.
- **Attachments:** The superficial part originates from maxillary process of the zygomatic bone. The deep part originates from the zygomatic arch of the [temporal bone](#). Both parts attach to the ramus of the mandible.
- **Actions:** Elevates the mandible, closing the mouth.
- **Innervation:** Mandibular nerve (V_3).

Muscles of Mastication

Masseter



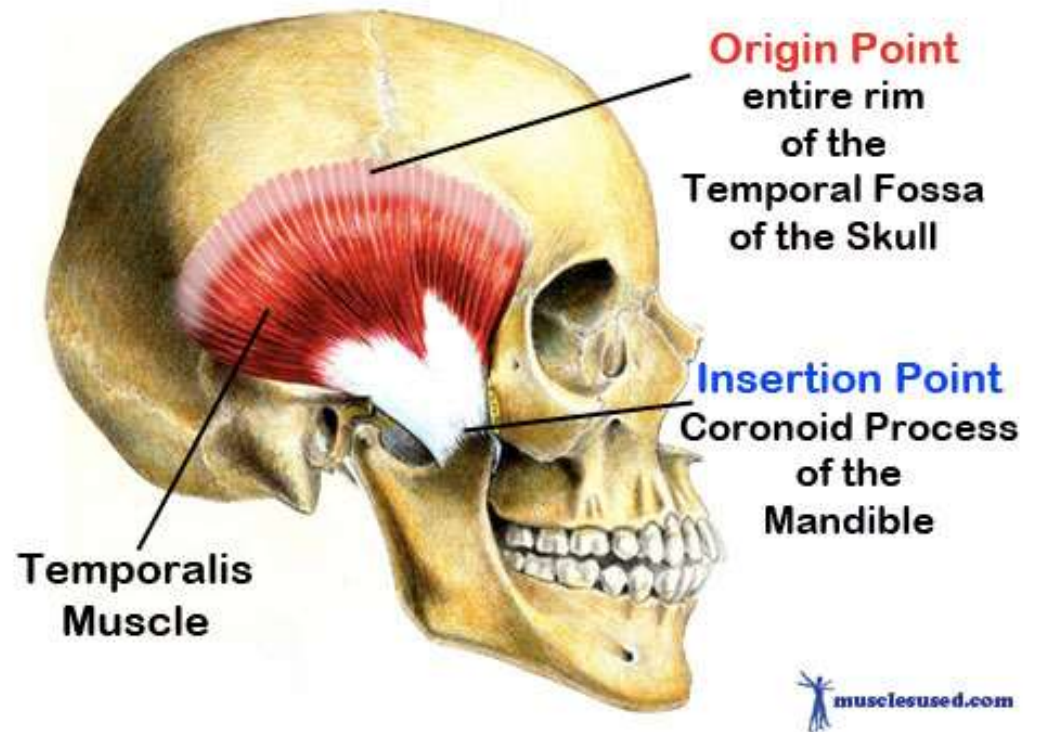
Muscles of Mastication

Temporalis

- The temporalis muscle originates from the temporal fossa – a shallow depression on the lateral aspect of the skull. The muscle is covered by tough fascia which can be harvested surgically and used to repair a perforated tympanic membrane (an operation known as a myringoplasty).
- **Attachments:** Originates from the temporal fossa. It condenses into a tendon, which inserts onto the coronoid process of the mandible.
- **Actions:** Elevates the mandible, closing the mouth. Also retracts the mandible, pulling the jaw posteriorly.
- **Innervation:** Mandibular nerve (V_3).

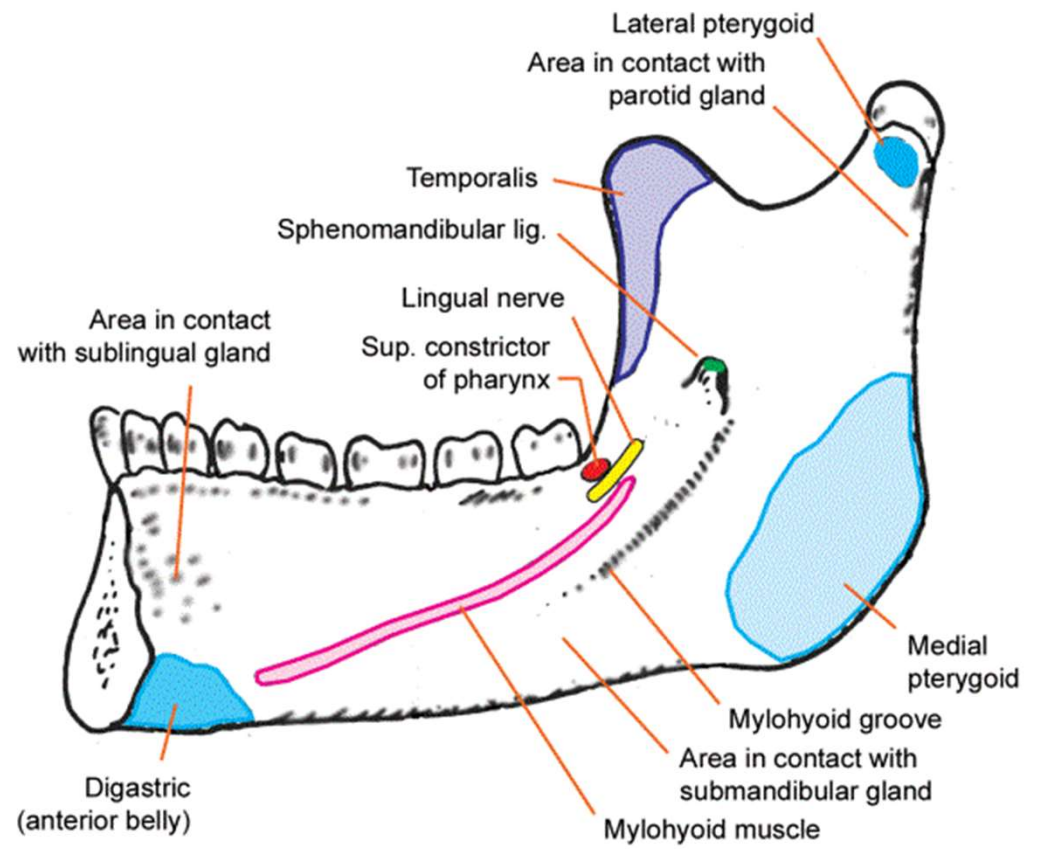
Muscles of Mastication

Temporalis



Muscle of Mastication

Temporalis



Muscles of Mastication

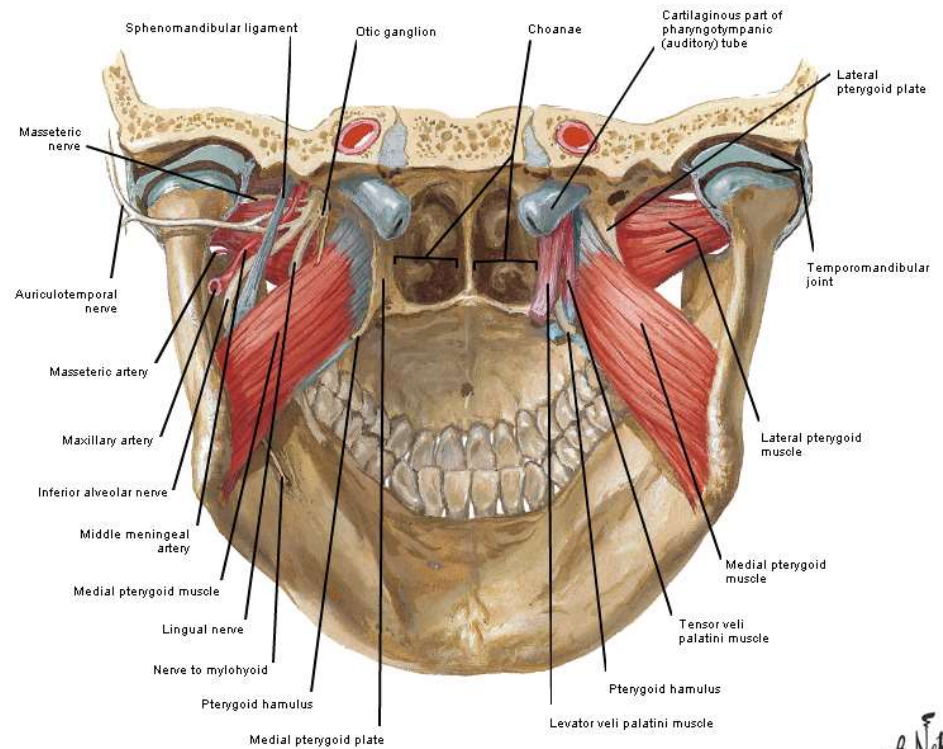
Medial Pterygoid

- The medial pterygoid muscle has a quadrangular shape, with two heads; deep and superficial. It is located inferiorly to the lateral pterygoid.
- **Attachments:** The superficial head originates from the maxillary tuberosity and the pyramidal process of palatine bone. The deep head originates from the lateral pterygoid plate of the sphenoid bone. Both parts attach to the ramus of the mandible, near the angle of mandible.
- **Actions:** Elevates the mandible, closing the mouth.
- **Innervation:** Mandibular nerve (V_3).

Muscle of Mastication

Medial Pterygoid

Muscles Involved in Mastication (Deep)
Posterior View



F. Netter M.D.
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Muscle Of Mastication

Lateral Pterygoid

- The lateral pterygoid muscle has a triangular shape, with two heads; superior and inferior. It has horizontally orientated muscle fibres, and thus is the major protractor of the mandible.
- **Attachments:** The superior head originates from the greater wing of the sphenoid. The inferior head originates from the lateral pterygoid plate of the sphenoid. The two heads converge into a tendon, which attaches to the neck of the mandible.
- **Actions:** Acting bilaterally, the lateral pterygoids protract the mandible, pushing the jaw forwards. Unilateral action produces the 'side to side' movement of the jaw.
- **Innervation:** Mandibular nerve (V_3).

ANATOMY

HEAD

HEAD

Extra Ocular Muscle

EXTRA OCULAR MUSCLES

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- 2 Muscles of Eye Movement
 - 2.1 Recti Muscles
 - 2.2 Oblique Muscles
 - 2.3 Clinical Relevance: Cranial Nerve Palsies
 - 2.4 Clinical Relevance: Horner's Syndrome

Extra Ocular Muscle

- The **extraocular muscles** are located within the orbit, but are extrinsic and separate from the eyeball itself. They act to control the movements of the **eyeball** and the **superior eyelid**.
- There are seven extraocular muscles – **the levator palpebrae superioris, superior rectus, inferior rectus, medial rectus, lateral rectus, inferior oblique and superior oblique**. Functionally, they can be divided into two groups:
 - **Responsible for eye movement** – Recti and oblique muscles.
 - **Responsible for superior eyelid movement** – Levator palpebrae superioris.
- In this article, we shall look at the anatomy of the extraocular muscles – their attachments, innervation and actions.

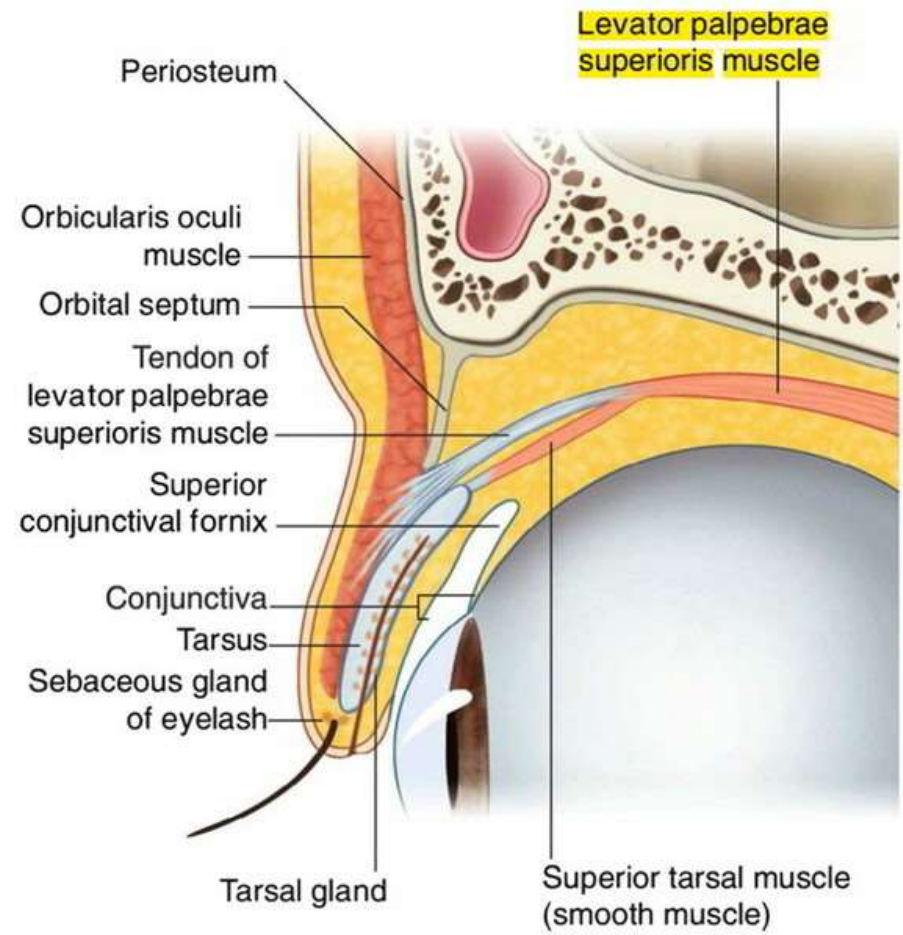
Extra Ocular Muscle

Levator Palpebrae Superioris

- The levator palpebrae superioris (LPS) is the only muscle involved in raising the superior eyelid. A small portion of this muscle contains a collection of smooth muscle fibres – known as the superior tarsal muscle. In contrast to the LPS, the superior tarsal muscle is innervated by the sympathetic nervous system.
- **Attachments:** Originates from the lesser wing of the [sphenoid](#) bone, immediately above the optic foramen. It attaches to the superior tarsal plate of the upper eyelid (a thick plate of connective tissue).
- **Actions:** Elevates the upper eyelid.
- **Innervation:** The levator palpebrae superioris is innervated by the [oculomotor nerve](#) (CN III). The superior tarsal muscle (located within the LPS) is innervated by the sympathetic nervous system.

Extra Ocular Muscle

LPS



Extra Ocular Muscle

Muscles of Eye Movement

- There are six muscles involved in the control of the eyeball itself. They can be divided into two groups; the four recti muscles, and the two oblique muscles.

Extra Ocular Muscle

Recti Muscles

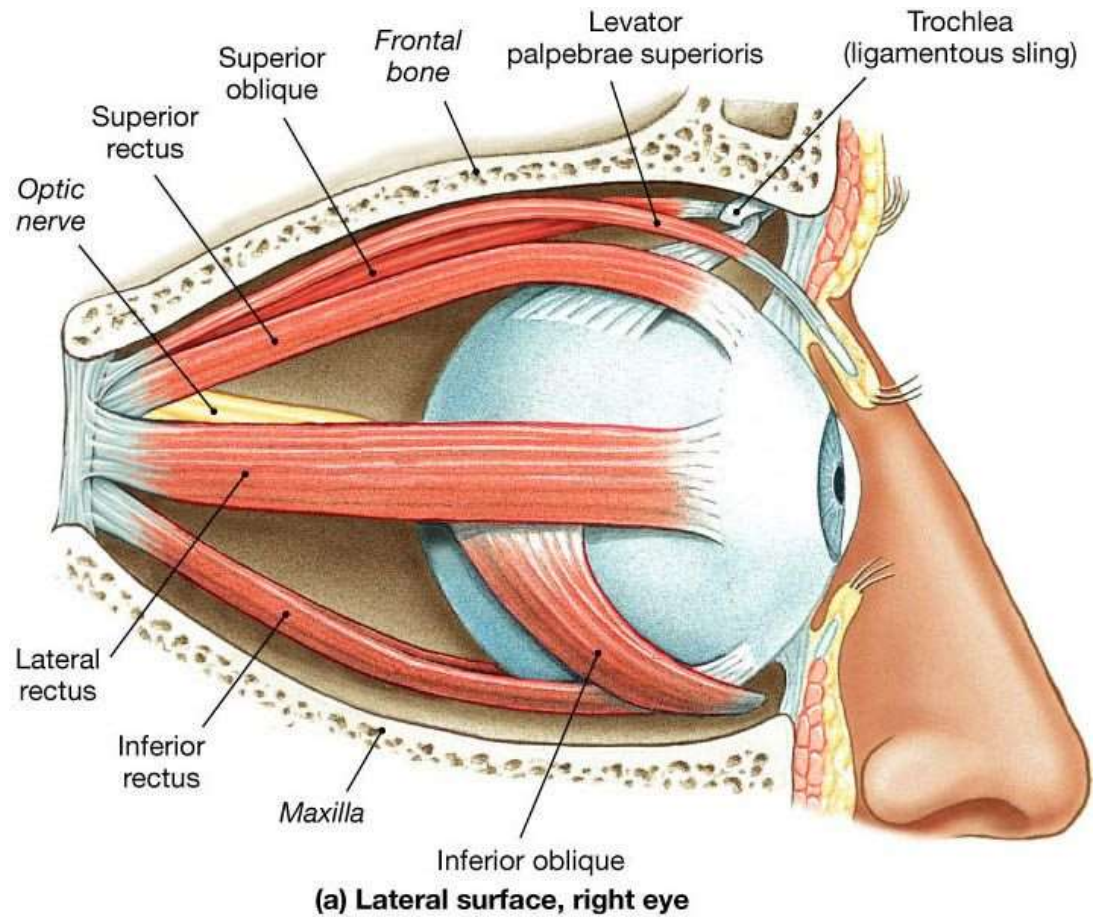
- There are four recti muscles; superior rectus, inferior rectus, medial rectus and lateral rectus.
- These muscles characteristically originate from the **common tendinous ring**. This is a ring of fibrous tissue, which surrounds the optic canal at the back of the [orbit](#). From their origin, the muscles pass anteriorly to attach to the sclera of the eyeball.
- The name recti is derived from the **latin** for 'straight' – this represents the fact that the recti muscles have a direct path from origin to attachment. This is in contrast with the oblique eye muscles, which have an angular approach to the eyeball.

Extra Ocular Muscle

Superior Rectus

- **Attachments:** Originates from the superior part of the common tendinous ring, and attaches to the superior and anterior aspect of the sclera.
- **Actions:** Main movement is elevation. Also contributes to adduction and medial rotation of the eyeball.
- **Innervation:** [Oculomotor nerve](#) (CN III).

Superior Rectus



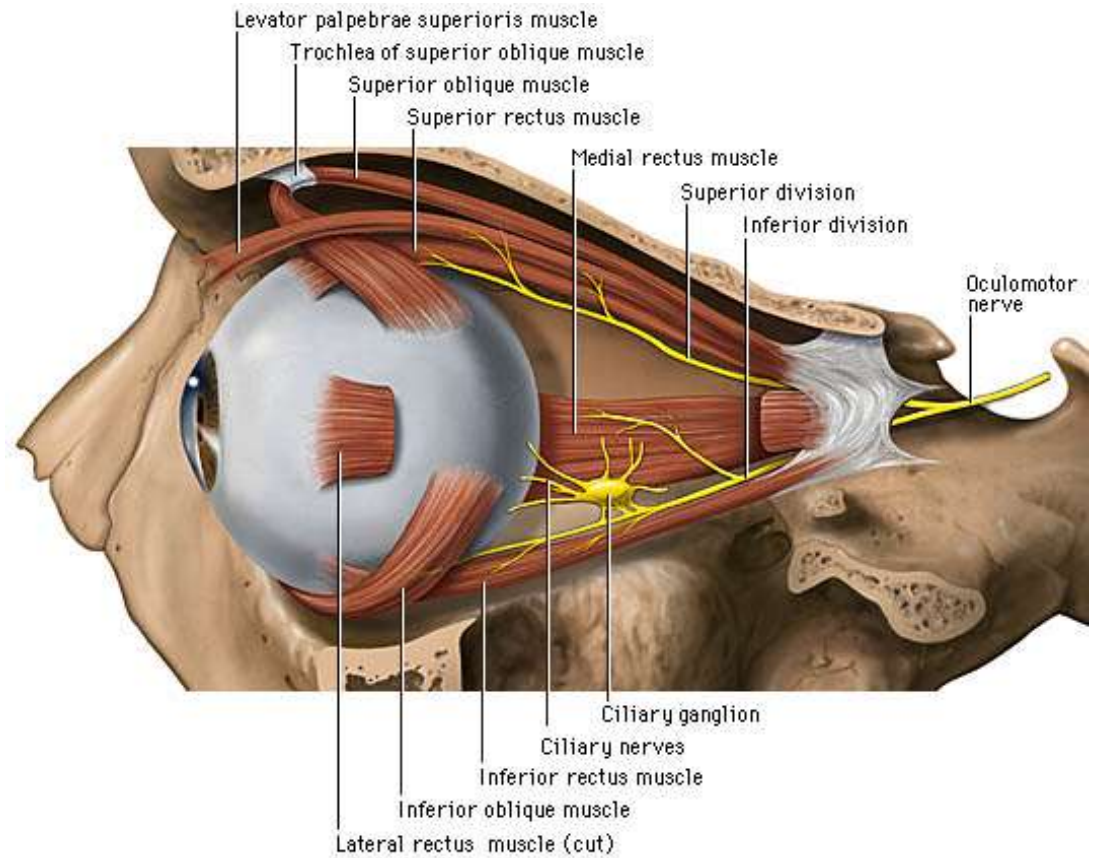
Extra Ocular Muscle

Inferior Rectus

- **Attachments:** Originates from the inferior part of the common tendinous ring, and attaches to the inferior and anterior aspect of the sclera.
- **Actions:** Main movement is depression. Also contributes to adduction and lateral rotation of the eyeball.
- **Innervation:** [Oculomotor nerve](#) (CN III).

Extra ocular Muscle

Inferior Rectus



Extra Ocular Muscle

Medial Rectus

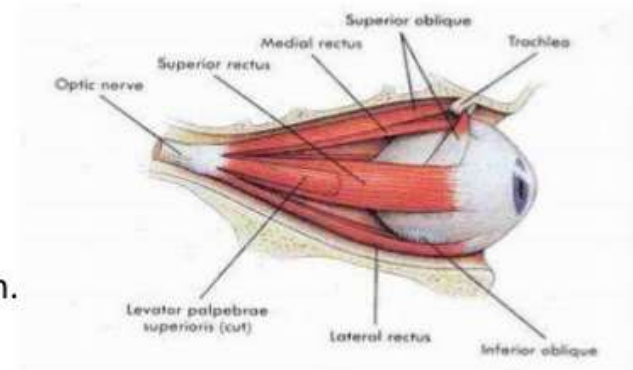
- **Attachments:** Originates from the medial part of the common tendinous ring, and attaches to the anteromedial aspect of the sclera.
- **Actions:** Adducts the eyeball.
- **Innervation:** [Oculomotor nerve](#) (CN III).

Extra ocular Muscle

Medial Rectus

MEDIAL RECTUS

- Origin-annulus of zinn and from optic nerve sheath.
- Insertion-in sclera 5.5mm behind sclero-corneal junction.
- Nerve supply-lower division of oculomotor nerve.
- ACTION-
Primary adductor of the eye.



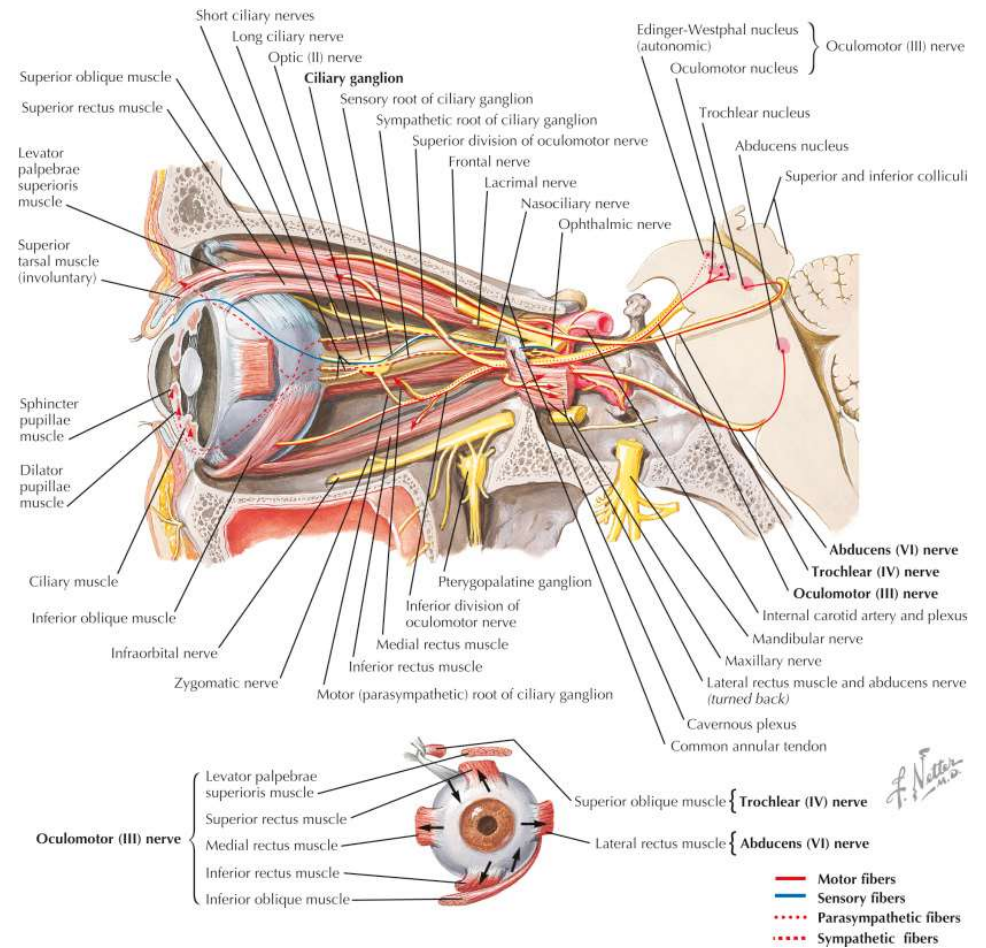
Extra Ocular Muscle

Lateral Rectus

- **Attachments:** Originates from the lateral part of the common tendinous ring, and attaches to the anterolateral aspect of the sclera.
- **Actions:** Abducts the eyeball.
- **Innervation:** [Abducens nerve](#) (CN VI).

Extra ocular Muscle

Lateral Rectus



Extra Ocular Muscle

Oblique Muscles

- There are two oblique muscles – the superior and inferior obliques. Unlike the recti group of muscles, they do not originate from the common tendinous ring.
- From their origin, the oblique muscles take an **angular** approach to the eyeball (in contrast to the straight approach of the recti muscles). They attach to the posterior surface of the sclera.

Extra Ocular Muscle

Superior Oblique

- **Attachments:** Originates from the body of the [sphenoid](#) bone. Its tendon passes through a trochlear, and then attaches to the sclera of the eye, posterior to the superior rectus.
- **Actions:** Depresses, and medially rotates the eyeball.
- **Innervation:** [Trochlear nerve](#) (CN IV).

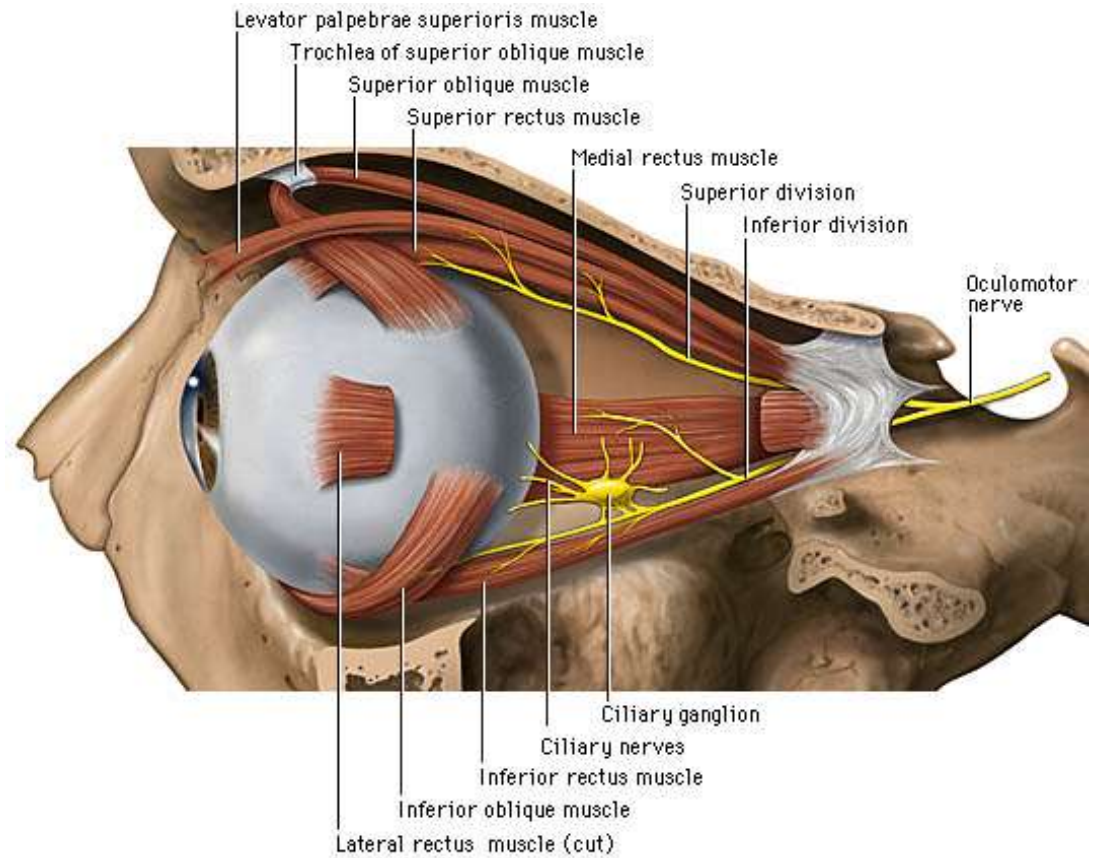
Extra Ocular Muscle

Inferior Oblique

- **Attachments:** Originates from the anterior aspect of the orbital floor. Attaches to the sclera of the eye, posterior to the lateral rectus
- **Actions:** Elevates, abducts and laterally rotates the eyeball.
- **Innervation:** [Oculomotor nerve](#) (CN III).

Extra ocular Muscle

Inferior Oblique



Extra Ocular Muscle

Clinical Relevance: Cranial Nerve Palsies

- The extraocular muscles are innervated by three cranial nerves. Damage to one of the cranial nerves will cause paralysis of its respective muscles. This will alter the resting gaze of the affected eye. Thus, a lesion of each cranial nerve has its own characteristic appearance:
- [Oculomotor nerve \(CN III\)](#) – A lesion of the oculomotor nerve affects most of the extraocular muscles. The affected eye is displaced laterally by the lateral rectus and inferiorly by the superior oblique. The eye adopts a position known as ‘down and out’.
- [Trochlear nerve \(CN IV\)](#) – A lesion of CN IV will paralyse the superior oblique muscle. There is no obvious affect of the resting orientation of the eyeball. However, the patient will complain of diplopia (double vision), and may develop a head tilt away from the site of the lesion.
- [Abducens nerve \(CN VI\)](#) – A lesion of CN VI will paralyse the lateral rectus muscle. The affected eye will adducted by the resting tone of the medial rectus.
- LR6SO4O3

Clinical Relevance: Horner's Syndrome

- Horner's syndrome refers to a triad of symptoms produced by damage to the **sympathetic trunk** in the neck:
- **Partial ptosis** (drooping of the upper eyelid) – Due to denervation of the superior tarsal muscle.
- **Miosis** (pupillary constriction) – Due to denervation of the dilator pupillae muscle.
- **Anhydrosis** (absence of sweating) on the ipsilateral side of the face – Due to denervation of the sweat glands.
- Horner's syndrome can represent serious pathology, such as a tumour of the apex of the lung (Pancoast tumour), aortic aneurysm or thyroid carcinoma.

ANATOMY

HEAD

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TONGUE



TONGUE

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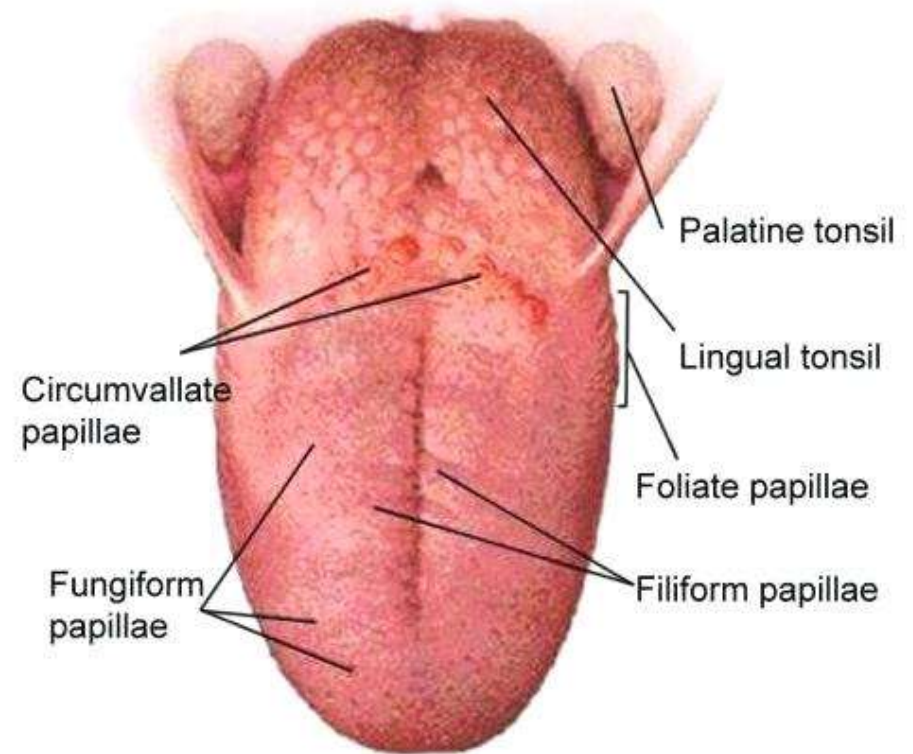
5 Lymphatic Drainage

6 Embryological Development

7 Clinical Relevance – A Bit Tongue Tied?

Tongue

Papillae of Tongue



Tongue

Most muscles serve to attach one bone, usually via a tendon, to another. There are a few places where that is not entirely true: the [ocular muscles](#), the **scapulothoracic joint**, the [diaphragm](#) and [perineum](#) are all good exceptions. However, the tongue is extraordinary. A boneless mass that you can protrude at will, fold, invert, lay flat or fill the mouth. In this article, we shall look at the structure of the tongue, its vasculature and innervation.

Tongue

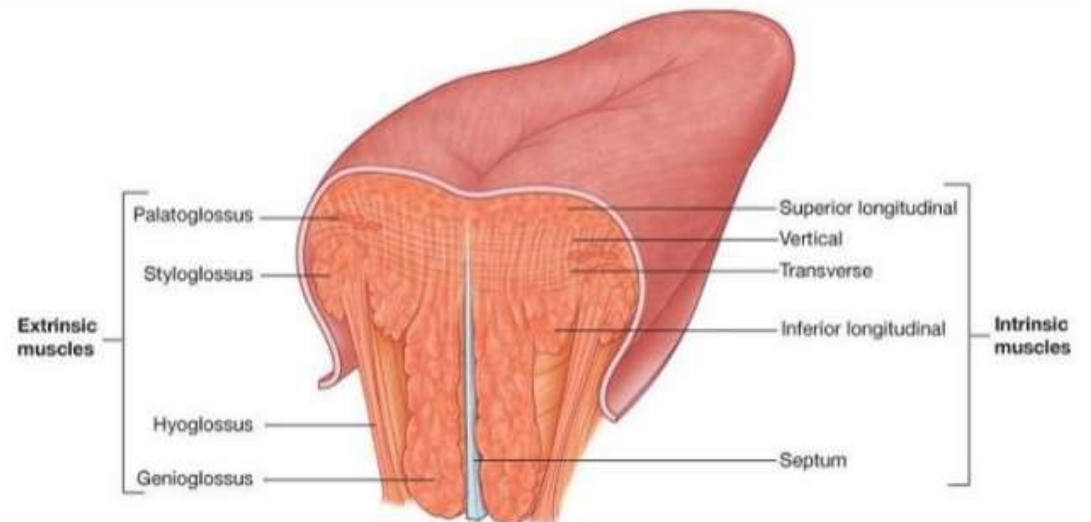
Intrinsic Muscles

- The **intrinsic** muscles only attach to other structures in the tongue. There are four paired intrinsic muscles of the tongue and they are named by the direction in which they travel: the **superior longitudinal, inferior longitudinal, transverse** and **vertical** muscles of the tongue. These muscles affect the shape and size of the tongue – for example, in tongue rolling – and have a role in facilitating speech, eating and swallowing.
- Motor innervation for the intrinsic muscles of the tongue is via the [hypoglossal nerve](#) (CNXII).

Tongue

Intrinsic Muscle

Muscles of Tongue





Tongue

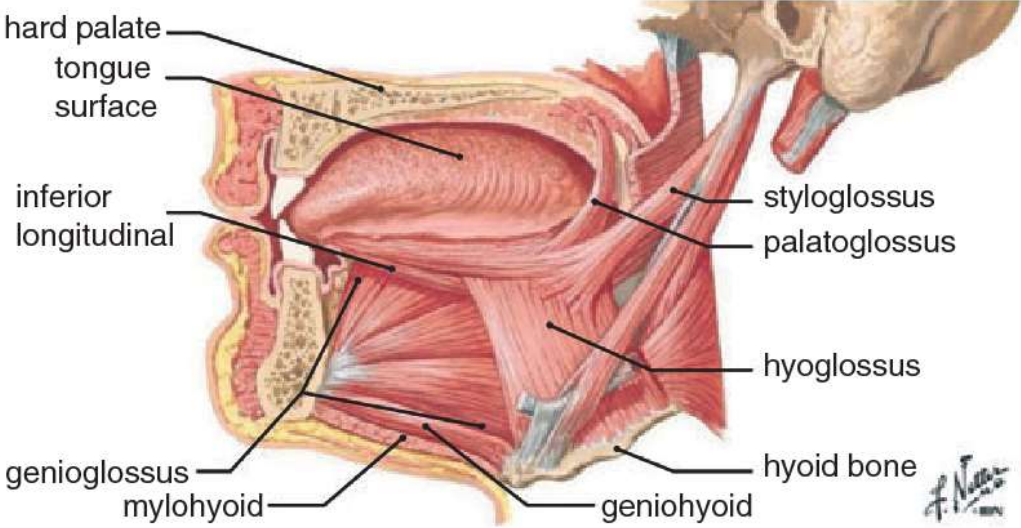
Extrinsic Muscles

- The **extrinsic** muscles are as follows:

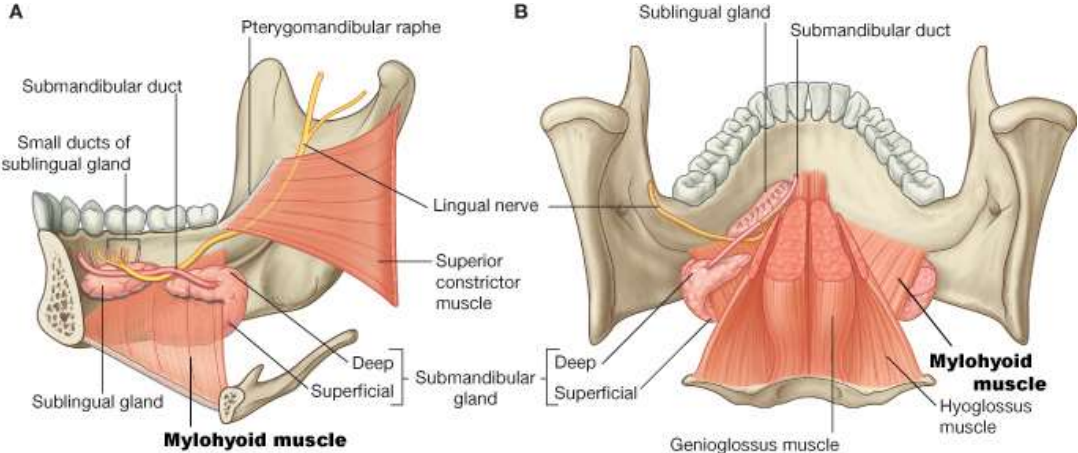
Genioglossus

- Attachments: Arises from the mental symphysis and inserts into the dorsum of the tongue
- Function: Inferior fibres protrude the tongue, middle fibres depress the tongue, and superior fibres draw the tip back and down
- Innervation: Motor innervation via the [hypoglossal nerve](#) (CNXII).

Genioglossus



Genioglossus



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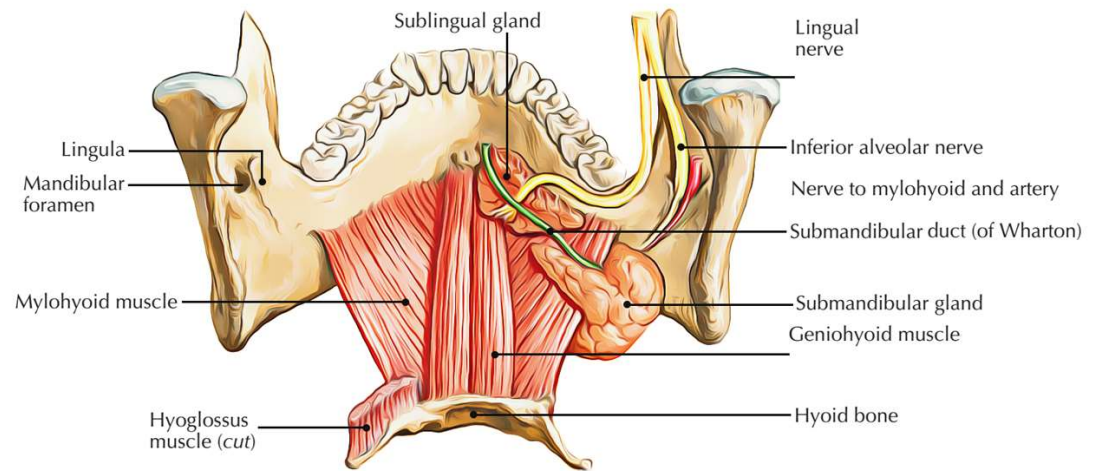


Tongue

Hyoglossus

- Attachments: Arises from the hyoid bone and inserts into the side of the tongue
- Function: Depresses and retracts the tongue
- Innervation: Motor innervation via the [hypoglossal nerve](#) (CNXII)

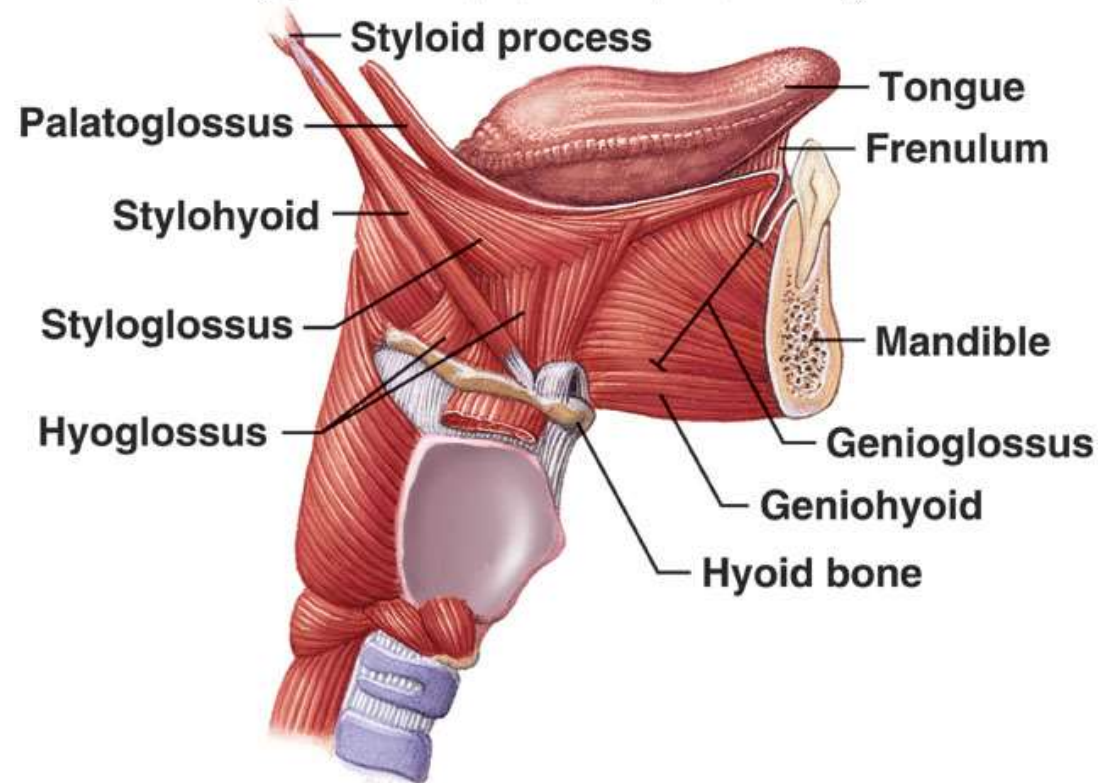
Hyoglossus





Hyoglossus

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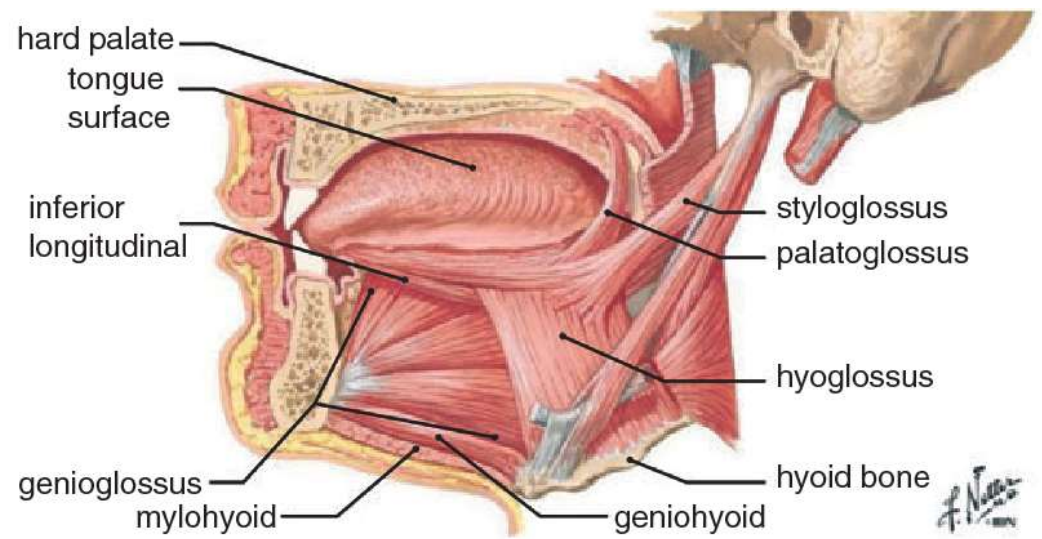


Tongue

Styloglossus

- Attachments: Originates at the styloid process of the temporal bone and inserts into the side of the tongue
- Function: Retracts and elevates the tongue
- Innervation: Motor innervation via the [hypoglossal nerve](#) (CNXII).

Styloglossus

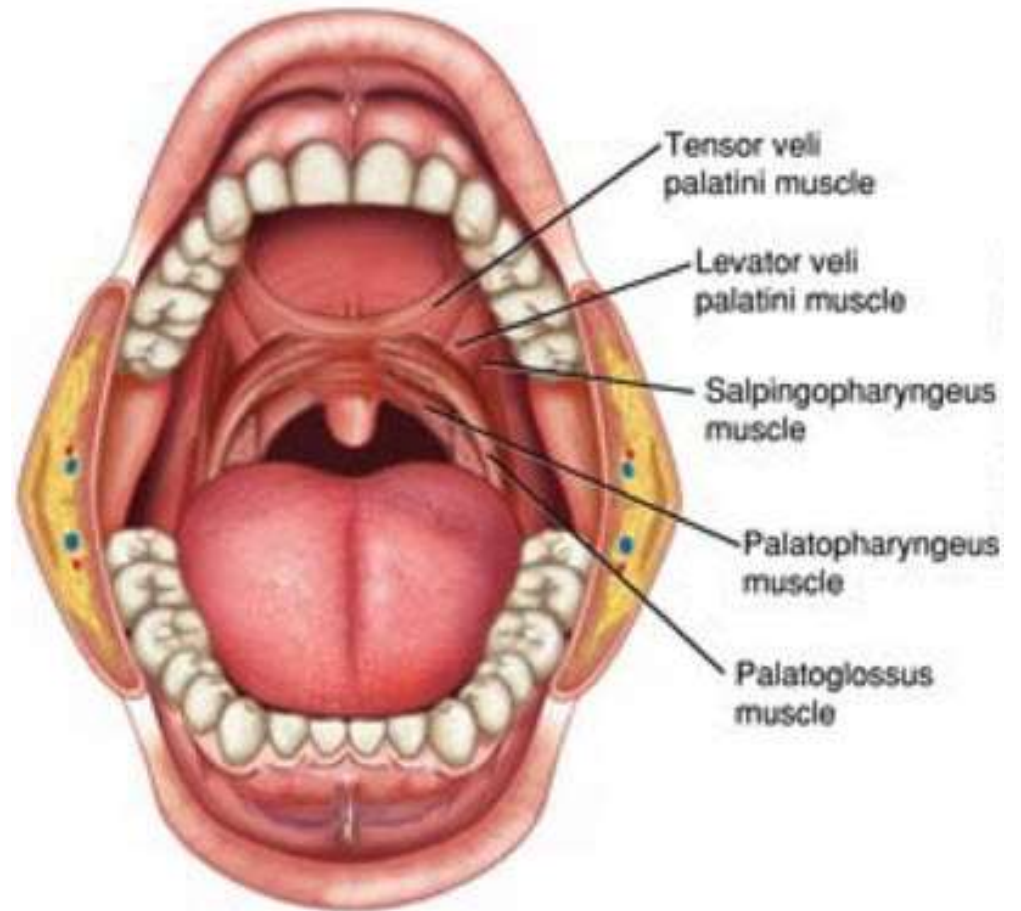


Tongue

Palatoglossus

- Attachments: Arises from the palatine aponeurosis and inserts broadly across the tongue
- Function: Elevates the posterior aspect of the tongue
- Innervation: Motor innervation via the [Vagus nerve](#) (CN X).
- All of the intrinsic and extrinsic muscles are innervated by the [hypoglossal nerve](#) (CN XII), except palatoglossus, which has [vagal](#) innervation (CN X).

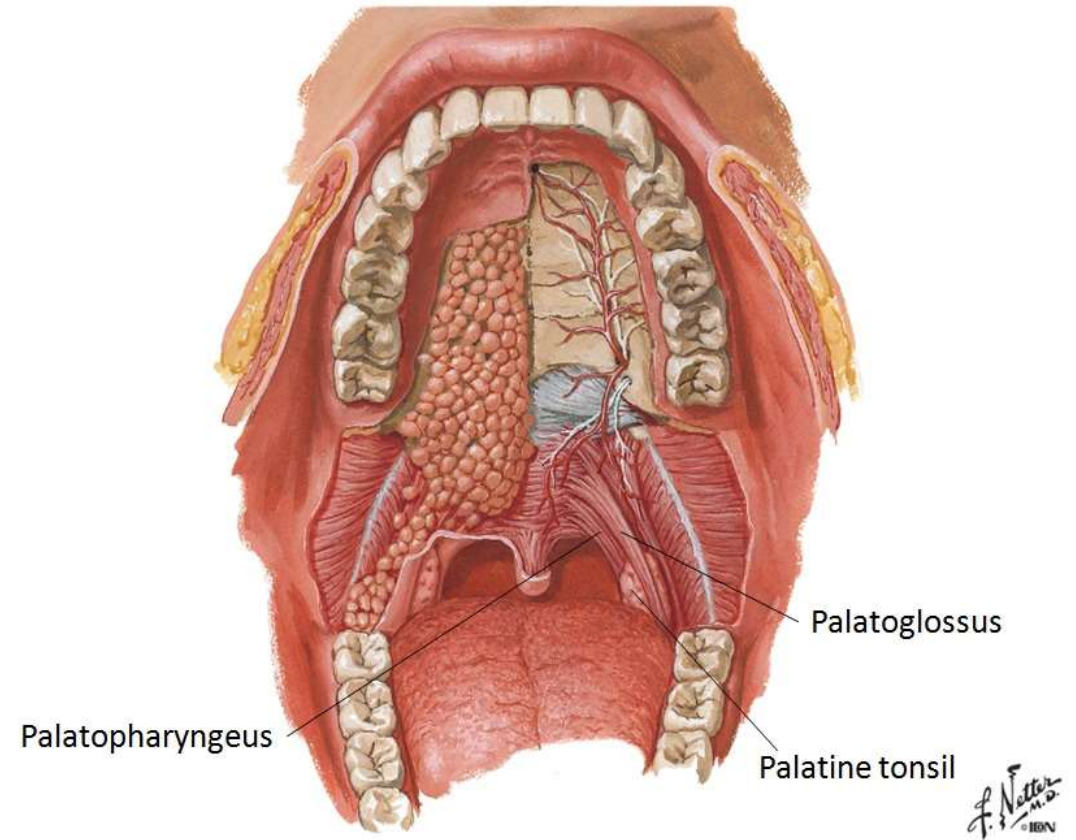
Palatoglossus





Palatpglossus

Roof of Mouth - Hard and Soft Palates Anterior View



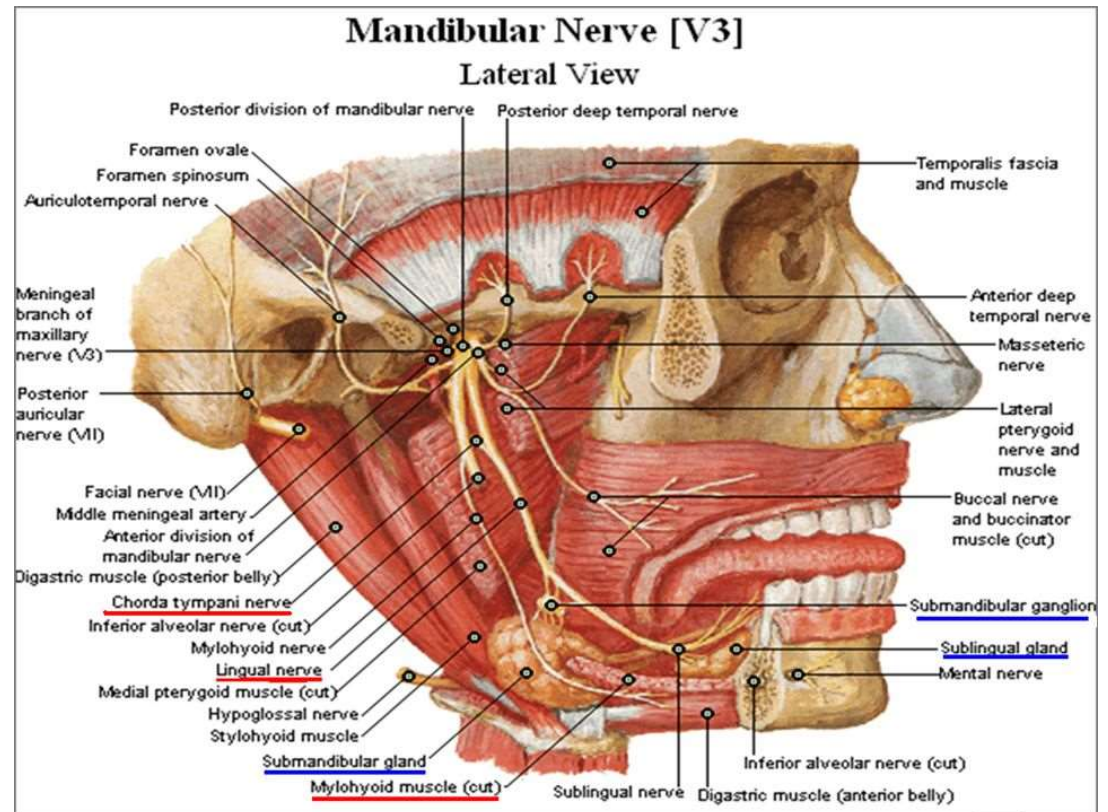
Tongue

Innervation

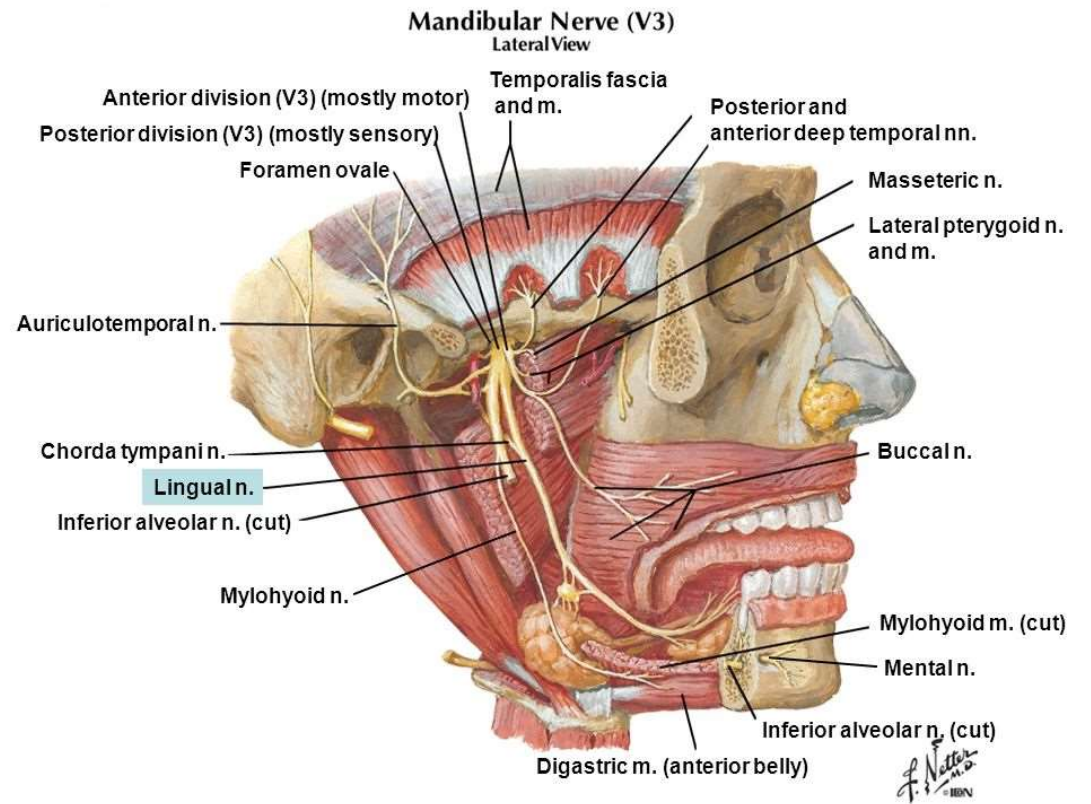
- Once we start examining the sensory supply of the tongue, we need to start looking at its division into an anterior $\frac{2}{3}$, and a posterior $\frac{1}{3}$.
- In the anterior $\frac{2}{3}$, general sensation is supplied by the [trigeminal nerve](#) (CNV). Specifically the [lingual nerve](#), a branch of the [mandibular nerve](#) (CN V3).
- On the other hand, taste in the anterior $\frac{2}{3}$ is supplied from the [facial nerve](#) (CNVII). In the petrous part of the [temporal bone](#), the [facial nerve](#) gives off three branches, one of which is [chorda tympani](#). This travels through the [middle ear](#), and continues on to the tongue.
- The posterior $\frac{1}{3}$ of the tongue is slightly easier. Both touch and taste are supplied by the [glossopharyngeal nerve](#) (CNIX).

Tongue

- Innervation



Innervation





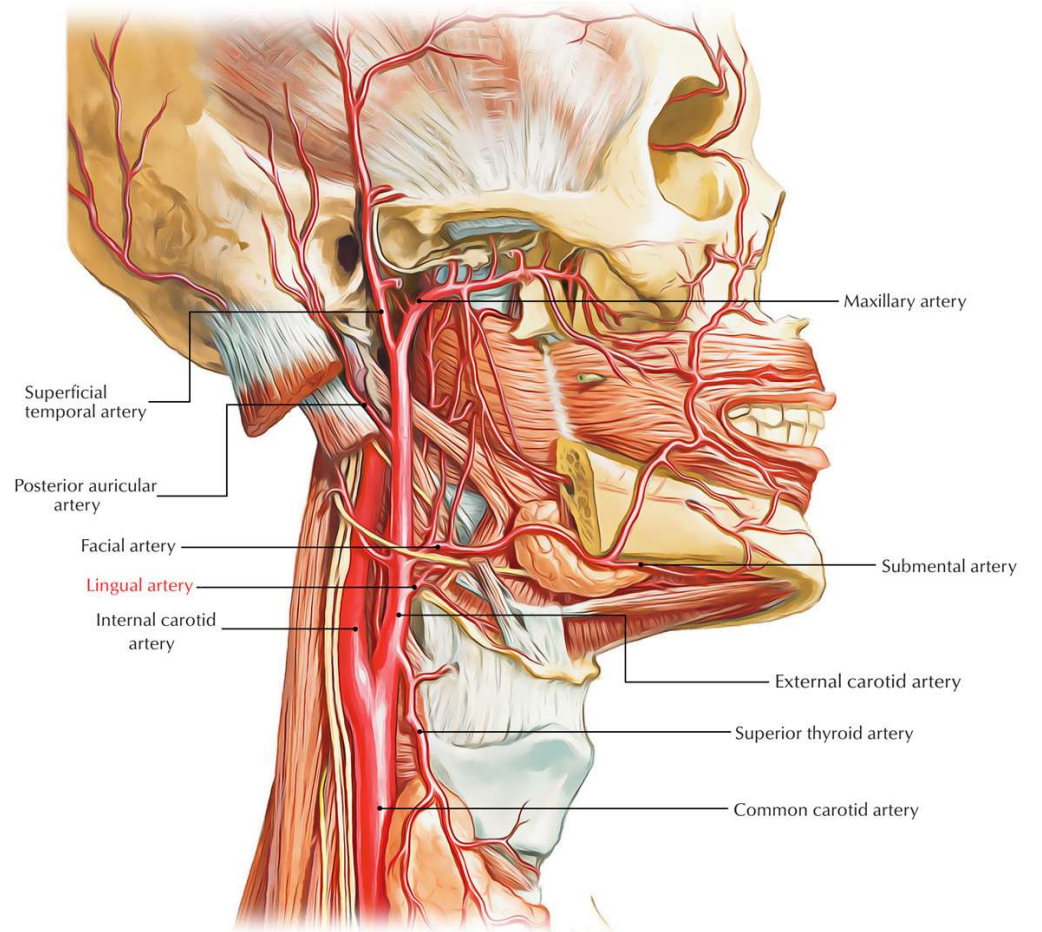
Tongue

Vasculature

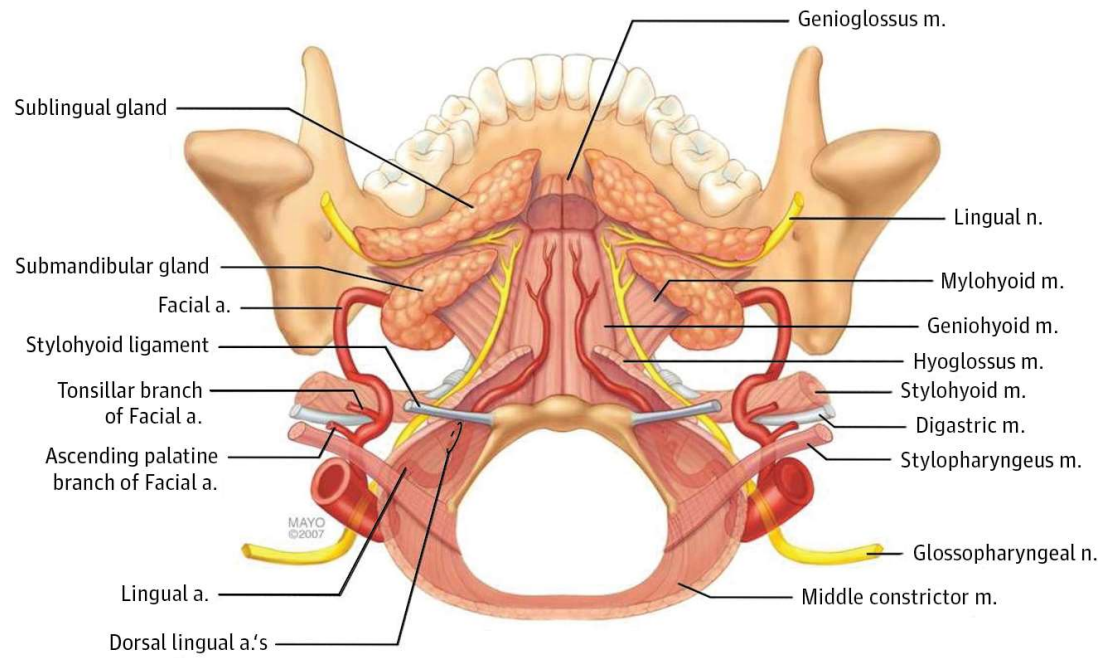
- The **lingual artery** (branch of the external carotid) does most of the supply, but there is a branch from the facial artery, called the **tonsillar artery**, which can provide some collateral circulation. Drainage is by the **lingual vein**.



Lingual Artery



Lingual Artery



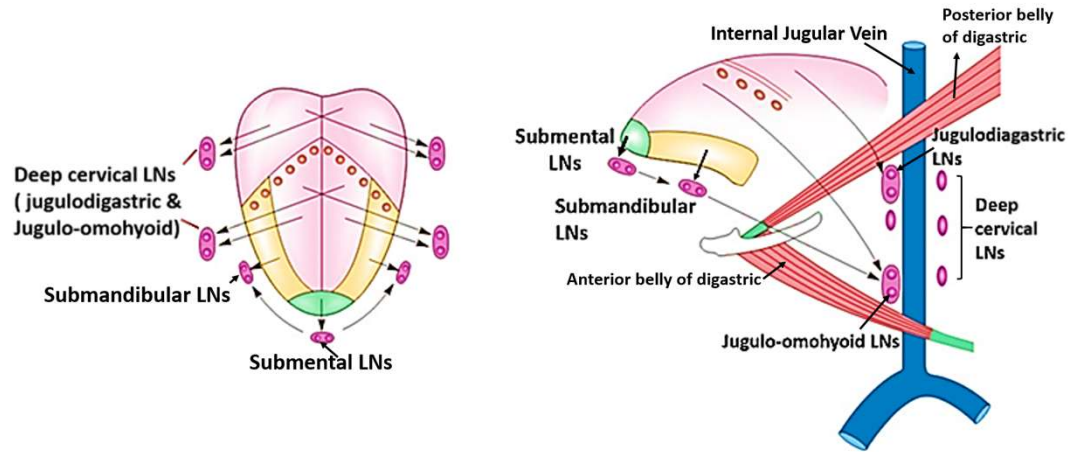


Tongue

Lymphatic Drainage

- The lymphatic drainage of the tongue is as follows:
- **Anterior two thirds** – initially into the submental and submandibular nodes, which empty into the deep cervical lymph nodes
- **Posterior third** – directly into the deep cervical lymph nodes

Lymphatics



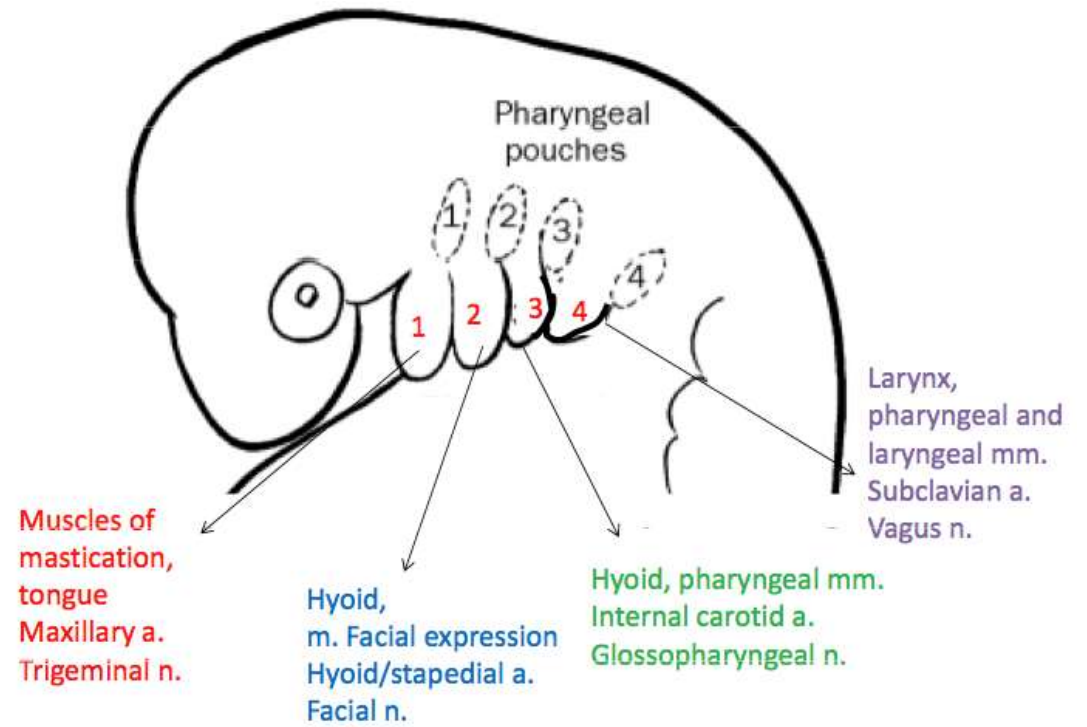
Tongue

Embryological Development

- A good understanding of the tongue's embryological development greatly simplifies the complex innervation to the structure. One of the central points is that the first branchial arch is supplied by the [trigeminal](#) nerve, the second by the [facial](#), the third by the [glossopharyngeal](#), and the fourth and sixth by the [vagus](#).
- When the tongue is developing, it starts as a two longitudinal bulbous ridges, with contribution from the first four branchial arches. These ridges join, giving rise to the longitudinal line (**median sulcus**) down the centre of your tongue. The contribution from the second branchial arch is grown over by that of the third arch, but the nerve supply remains. Using this information, we can understand why the majority of the tongue's innervation is by the [trigeminal nerve](#) (CN V) and the [glossopharyngeal nerve](#) CN IX.

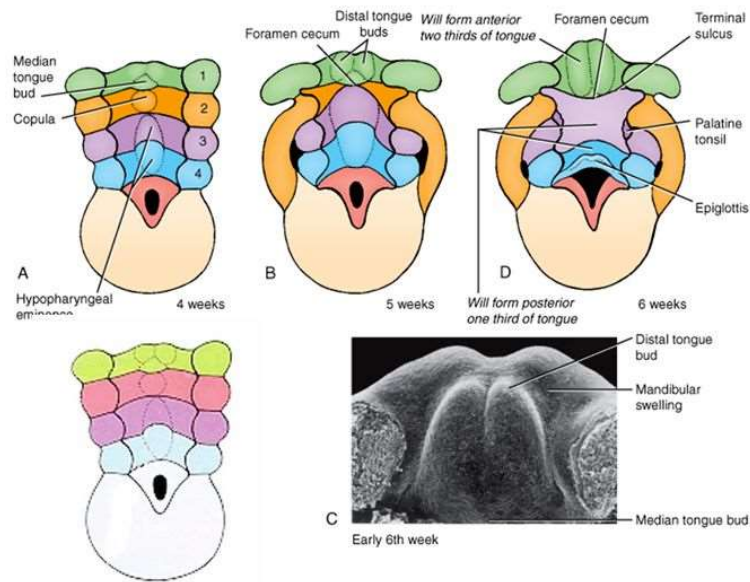


Development



Development

Development of the tongue



The tongue forms from ventral swellings in the floor of the pharynx at about the same time as the palate begins to form.

Lateral lingual swellings are first visible at about 5 wks, 1 medial swelling.

Growth of the tongue mostly by expansion of lateral lingual swellings, some contribution of tuberculum impar

Musculature derived from occipital myotomes

[\(QuickTime version\)](#)

Ant 2/3 of tongue is from 1st arch, posterior 1/3 mostly from 3rd arch

TONGUE

Clinical Relevance – A Bit Tongue Tied?

The tongue is attached anteroinferiorly by a piece of connective tissue called the **frenulum**, which lies in the midline. The process by which the frenulum is formed is the same by which your fingers are made, and is known as sculpting apoptosis. Just as some people may have webbed fingers if this process fails, it can result in excess frenulum. This is called being '**tongue-tied**', and presents in children. There are varying degrees of severity of tongue-tie and in some cases it can restrict the movement of the tongue causing difficulties with breast feeding. This can be managed with simple surgery