

Muscles of Facial Expression

Introduction

- ✓ The facial muscles are the skeletal muscles that are embedded in the superficial fascia of the face in a single fibromuscular layer known as SMAS (Superficial Musculo Aponeurotic System).
- ✓ There is no deep fascia in the face.
- ✓ The facial muscles arise from the bones of the skull and all insert into the skin or other facial muscles.
- ✓ The primary role of the facial muscles is to regulate (constrict or dilate) the facial orifices (i.e., the orbits, nostrils, and mouth), thus producing various expressions (secondary function) which are essential for non verbal communication.
- ✓ All the facial muscles develop from the **second pharyngeal arch (hyoid arch)**, this arch is innervated by the **facial nerve**, therefore all the muscles derived from this arch is supplied by facial nerve
- ✓ Injury to facial nerve leads to (paralyzed face), Bell's palsy is the most common type of facial paralysis.
- ✓ The auricular muscles that control the movement of the auricle are essentially a group of vestigial muscles in humans, but they are very active in animals.
- ✓ Clinically on aging or due to hyperactive muscles; rhytids or wrinkles (lines on skin) are formed in the face in a direction perpendicular to the direction of muscle fibers.

Orbital group of muscles

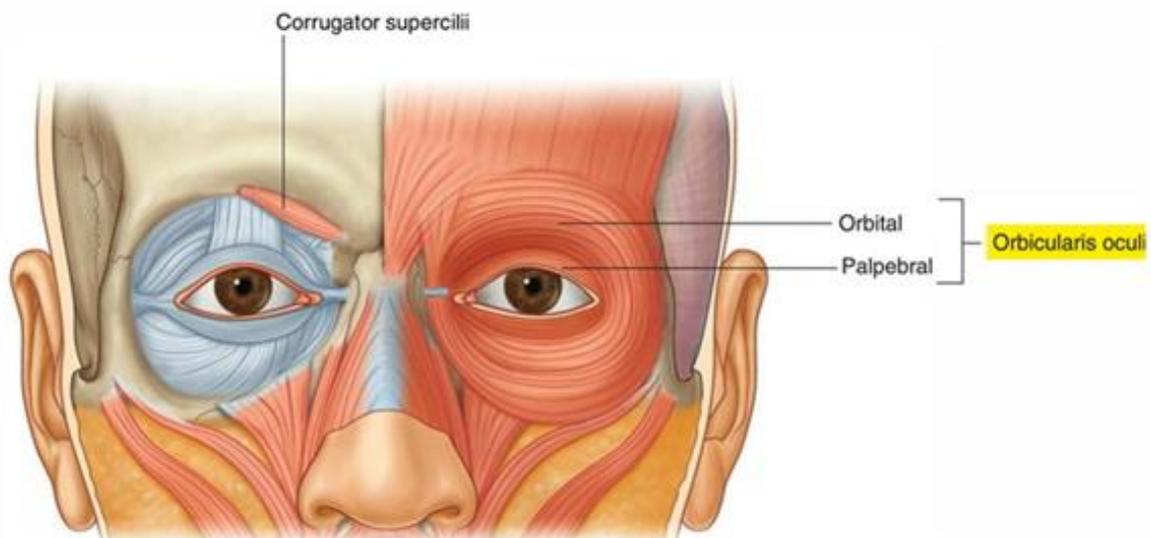
i. Muscles of the eyelids:

The sphincter muscle of the eyelids is the orbicularis oculi, and the dilator muscles are the levator palpebrae superioris and the occipitofrontalis.

The orbicularis oculi is a flat muscle that encircles the palpebral fissure. The muscle originates from the medial orbital rim and medial palpebral ligament. The muscle consists of two parts:

- The thicker orbital part; which is the outer circle which runs over the orbit and forms loops return to the origin.
- The thinner, palpebral part which encircles the palpebral fissure and forms the upper and lower lids. The palpebral part inserts to the lateral palpebral ligament.

Contraction of palpebral part alone results in gentle closure of the lids while contraction of both palpebral and orbital parts results in forceful closure of the lids. Hyperactivity can cause “crow’s feet” rhytids at the lateral orbital margin.



ii. Corrugator supercillii:

This muscle attaches to superciliary arch and inserts to the skin of eye brow. The muscle lies deep to O.Oculi muscle. Contraction of this muscle draws the eyebrows medially and inferiorly to produces vertical wrinkles known as “frown lines or Glabellar lines” in the glabellar region (which lies between the eyebrows).

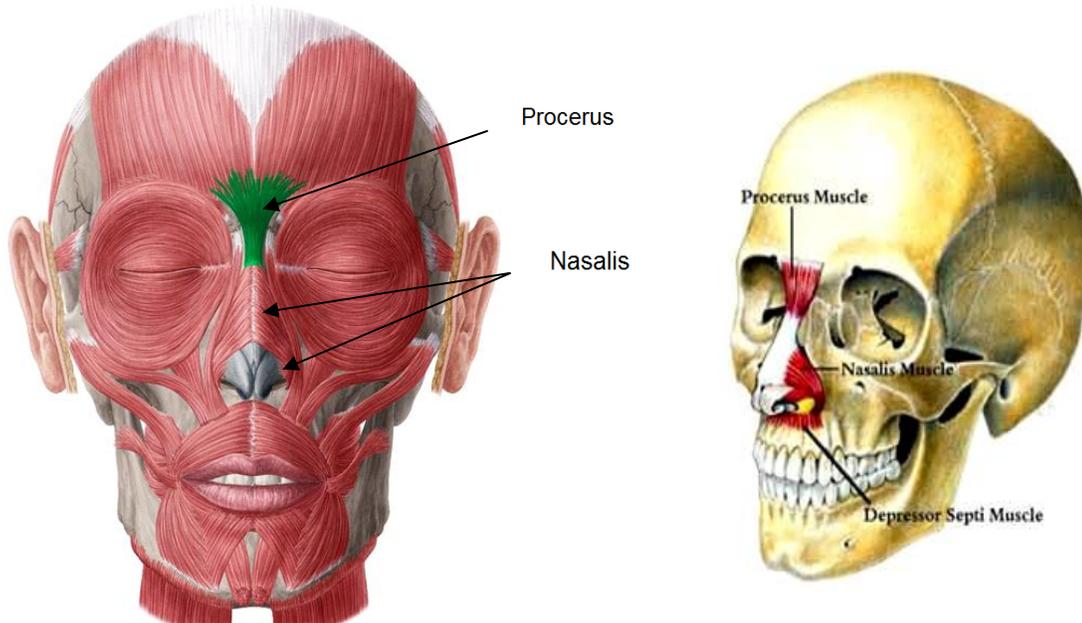
**Nasal group of muscles****a) Procerus:**

The procerus muscle is overlying the nasal bones and inserting on the skin between the eyebrows. It draws down the medial part of brow. Contraction of this muscle produces horizontal rhytids over the nasal dorsum.

b) Nasalis: (Muscle of the nostrils)

Nasalis is a paired muscle that covers the dorsum of the nose. It consists of two parts; compressor naris and dilator naris.

Contraction of compressor naris muscle causes the “bunny lines” on the nasal dorsum, while the dilator naris and levator labii superioris alaeque nasi are the dilator muscles of nasal apertures which cause widening of nostrils openings.



Oral group of Muscles

Sphincter Muscle of the Lips (Orbicularis Oris):

The orbicularis oris forms the bulk of upper and lower lips. The muscle is a circular sphincter of the mouth and originates from the midline of maxilla and mandible to be inserted in the skin of upper and lower lips.

Innervated by buccal and mandibular branches of facial nerve.

Dilator Muscles of the Lips:

A series of muscles that blend with O. Oris muscle and radiate out from the lips **make up the dilator muscles**, their action is to separate the lips. These muscles are:

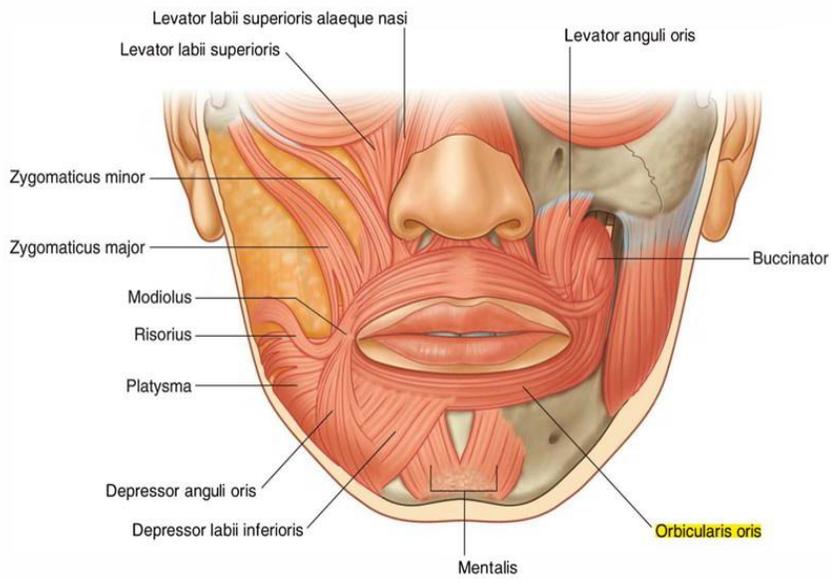
1_ Levator labii superioris alaeque nasi (this also dilates the nostril)

2_ Levator labii superioris 3_ Zygomaticus minor 4_ Zygomaticus major

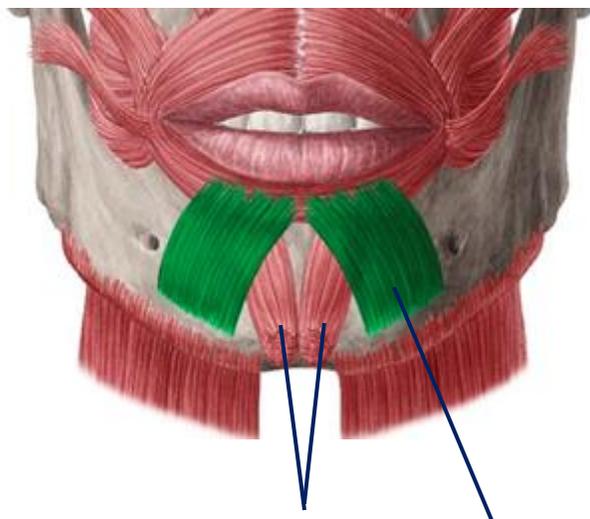
5_ Levator anguli oris (deep to the zygomatic muscles) 6_ Risorius

7_ Depressor anguli oris 8_ Depressor labii inferioris 9_ Mentalis

Innervated by buccal and mandibular branches of facial nerve.

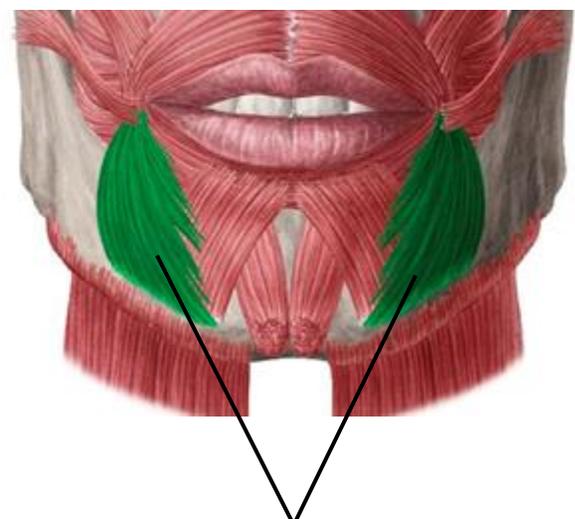


Levator Anguli Oris Muscle



Mentalis

Depressor Labii Inferioris

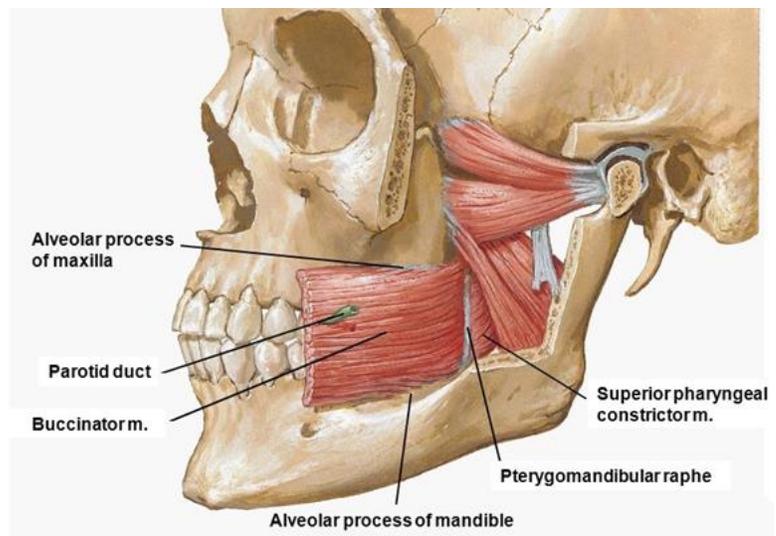
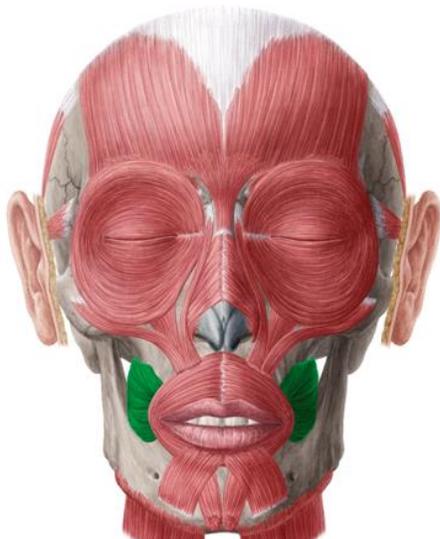


Depressor Anguli Oris

Orbicularis Oris and the dilator muscle of the lips

Muscle of the Cheek (Buccinator):

- The buccinator muscle originates from the outer surface of the alveolar margins of the maxilla superiorly and mandible inferiorly opposite the molar teeth and from the pterygomandibular ligament posteriorly. The muscle fibers pass forward, forming the muscle layer of the cheek.
- The parotid duct pierces the muscle to open in oral buccal mucosa.
- The buccinator muscle blends with the orbicularis oris muscle.
- The buccinator compresses the cheeks and lips against the teeth, thus positioning the food for efficient chewing. The compression action also is important in producing sucking as in neonates feeding. Cheek compression is also important in producing blowing action.
- Innervated by buccal branch of facial nerve.



Summary :

- **Elevating the upper lip:** levator labii superioris alaeque nasi , levator labii superioris, zygomaticus minor, zygomaticus major, risorius, and levator anguli oris muscles.
- **Depressing and protruding the lower lip:** depressor labii inferioris, depressor anguli oris and mentalis muscles.
- **Closing the lips:** orbicularis oris muscle.
- **Compressing the cheek:** buccinator muscle.

Muscles of Facial Expression	Origin	Insertion	Nerve s.	Action
Orbicularis oculi				
Palpebral part	Medial palpebral ligament	Lateral palpebral raphe	Facial nerve	Closes eyelids and dilates lacrimal sac
Orbital part	Medial palpebral ligament and adjoining bone	Loops return to origin	Facial nerve	Throws skin around orbit into folds to protect eyeball
Corrugator supercillii	Superciliary arch	Skin of eyebrow	Facial nerve	Vertical wrinkles of forehead, as in frowning
Compressor nasi	Frontal process of maxilla	Aponeurosis of bridge of nose	Facial nerve	Compresses mobile nasal cartilages
Dilator naris	Maxilla	Ala of nose	Facial nerve	Widens nasal aperture
Procerus	Nasal bone	Skin between eyebrows	Facial nerve	Wrinkles skin of nose
Orbicularis oris	Maxilla, mandible, and skin	Encircles oral orifice	Facial nerve	Compresses lips together
Dilator Muscles of Lips				
Levator labii superioris alaeque nasi	Arise from bones and fascia around oral aperture and insert into substance of lips		Facial nerve	Separate lips
Levator labii superioris				
Zygomaticus minor				
Zygomaticus major				
Levator anguli oris				
Risorius				
Depressor anguli oris				
Depressor labii inferioris	Outer surface of alveolar margins of maxilla and mandible and pterygomandibular ligament		Facial nerve	Compresses cheeks and lips against teeth
Mentalis				
Buccinator				

Facial Nerve (CN VII)

- The facial nerve is a mixed nerve (motor and sensory), it has somatic and autonomic functions, including innervating all of the muscles of facial expression, muscles of scalp, causing tearing of the eye, salivation from the salivary glands beneath the tongue and taste sensation for the anterior two thirds of the tongue.
- The facial nerve does not innervate the skin, but its branches communicate with the branches of trigeminal nerve.
- Damage to the facial nerve is possible in maxillofacial injuries or operations and would result in ipsilateral paralysis of the muscles of facial expression.
- Facial nerve anatomy is categorized in terms of its relationship to the cranium or temporal bone into intracranial (no branches in this part), intratemporal, and extracranial parts

- **Intratemporal part**

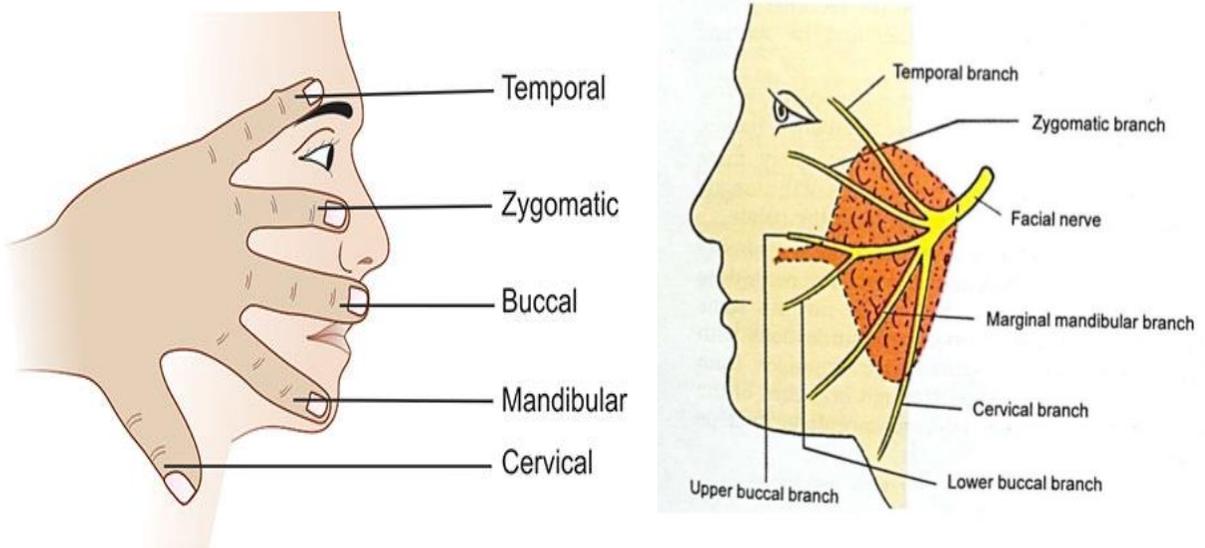
The facial nerve has tortuous course in its (facial canal or fallopian canal) within the temporal bone, in this canal; it gives off the following branches

- ✓ **Greater petrosal nerve**
- ✓ **Chorda tympani**
- ✓ **Nerve to stapedius muscle**

- **Extracranial part**

- The facial nerve emerges from the base of the skull through the stylomastoid foramen.
- It immediately gives off
 - The posterior auricular nerve which passes upwards behind the ear to supply auricularis posterior and the occipital belly of occipitofrontalis.

- A muscular branch is next given off to supply the posterior belly of digastric and stylohyoid.
- Then the nerve enters the parotid gland, within the gland it divides into an upper temporofacial and a lower cervicofacial divisions, each division divides to finally emerge from the parotid gland in five main branches. This plexiform arrangement is known as the pes anserinus (goose foot).



The five terminal branches of facial nerve are:

1. The Temporal (Frontal) Branch

It emerges from the upper border of parotid gland to supply the superior auricular muscle, frontal belly of the occipitofrontalis, the orbicularis oculi, and the corrugator supercilii.

Surgical Note: in surgery of the TMJ, damage to the nerve is possible. Weakness is apparent by inability of patient to elevate the eyebrow on the affected side

2. The Zygomatic Branch

It emerges from the anterior border of parotid gland to supply orbicularis oculi. Paralysis of this muscle prevents blinking and spread of tears to lubricate the eye. The dry cornea easily ulcerates and impairs the vision.

This is the most serious consequence of impaired facial nerve function.

3. The Buccal Branch

It emerges from the anterior border of the gland below the parotid duct and supplies the buccinator muscle and the muscles of the upper lip and nostril.

The paralysis of the buccinator prevents emptying of the cheek pouch; the bolus lodges there and cannot be returned to the molar teeth. Chewing has to be performed on the other side.

4. The Marginal Mandibular Branch

It emerges from the anterior border of parotid gland. It supplies the muscles of the lower lip. The nerve is in danger when an incision is made at or near the lower margin of the mandible.

The damage to the nerve invariably causes detectable paralysis of the depressors of the lower lip and mouth angle.

5. The Cervical Branch:

It emerges from the lower border of parotid gland into the neck to supply the platysma muscle in the neck. It may cross the body of the mandible to supply the depressor anguli oris.

This is the End of the Lecture – Good Luck