



# Anatomy & Embryology

## Lecture 9:

# Muscles of Head & Neck

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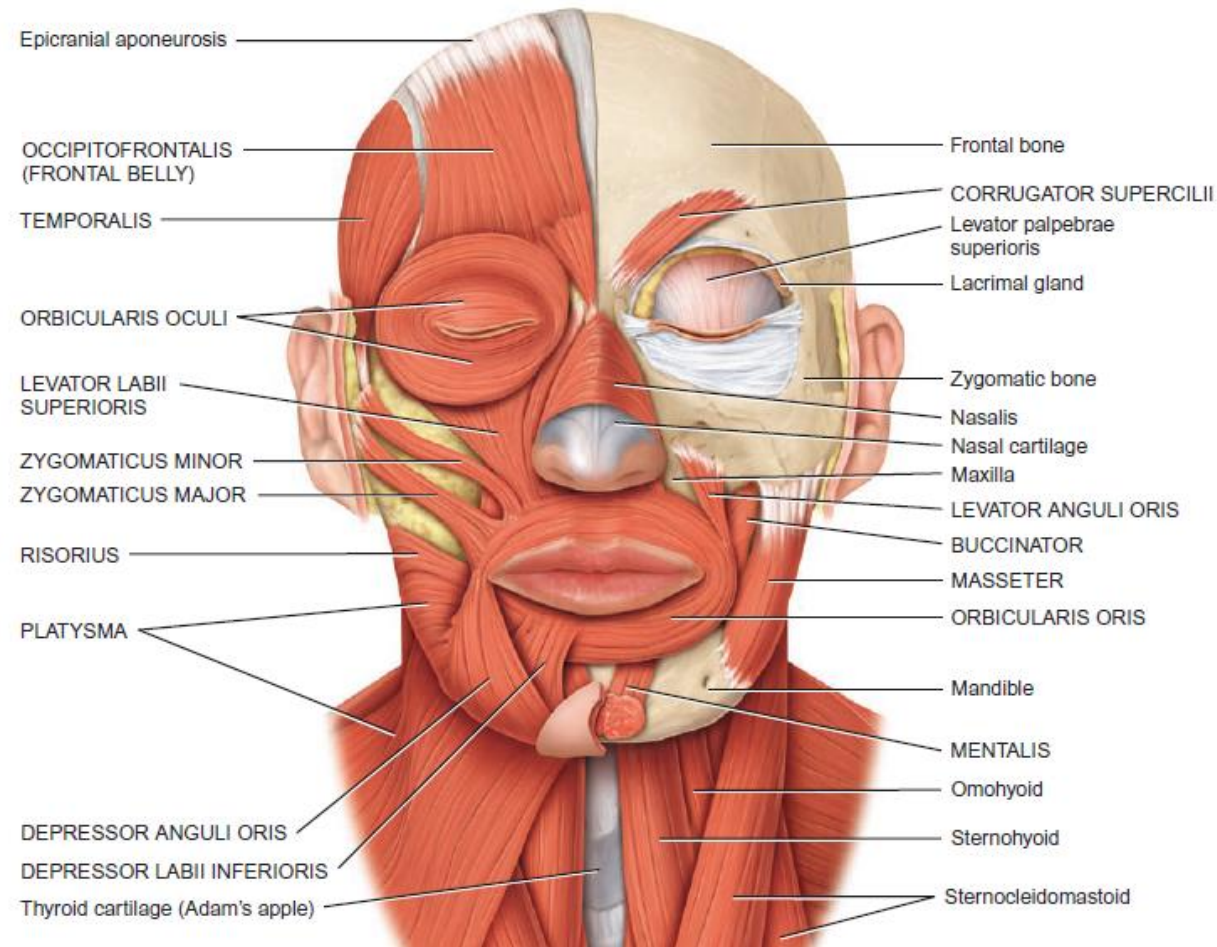
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- Muscles of facial expression
- Muscles of mastication
- Extrinsic eye muscles
- Muscles of neck
- Lateral Vertebral Muscles
- Muscles of tongue

# Muscles Of Facial Expression

## General characteristics :

1. All the muscles : arise from the bones of the skull or subcutaneous tissue.
2. All the muscles : are inserted into the skin (not bone!).
3. Action : they move the skin of face **rather than a joint** in the different facial expressions (therefore called **muscles of facial expressions**).
4. Nerve supply : all are supplied by the **Facial Nerve**
5. **Main function**: serve as sphincters or dilators of face orifices



# Occipito-frontalis Muscle

Scalp has only ONE muscle which is the **occipito-frontalis muscle**.

It is formed of **2 frontal bellies** and **2 occipital bellies** which are inserted in the epicranial aponeurosis.

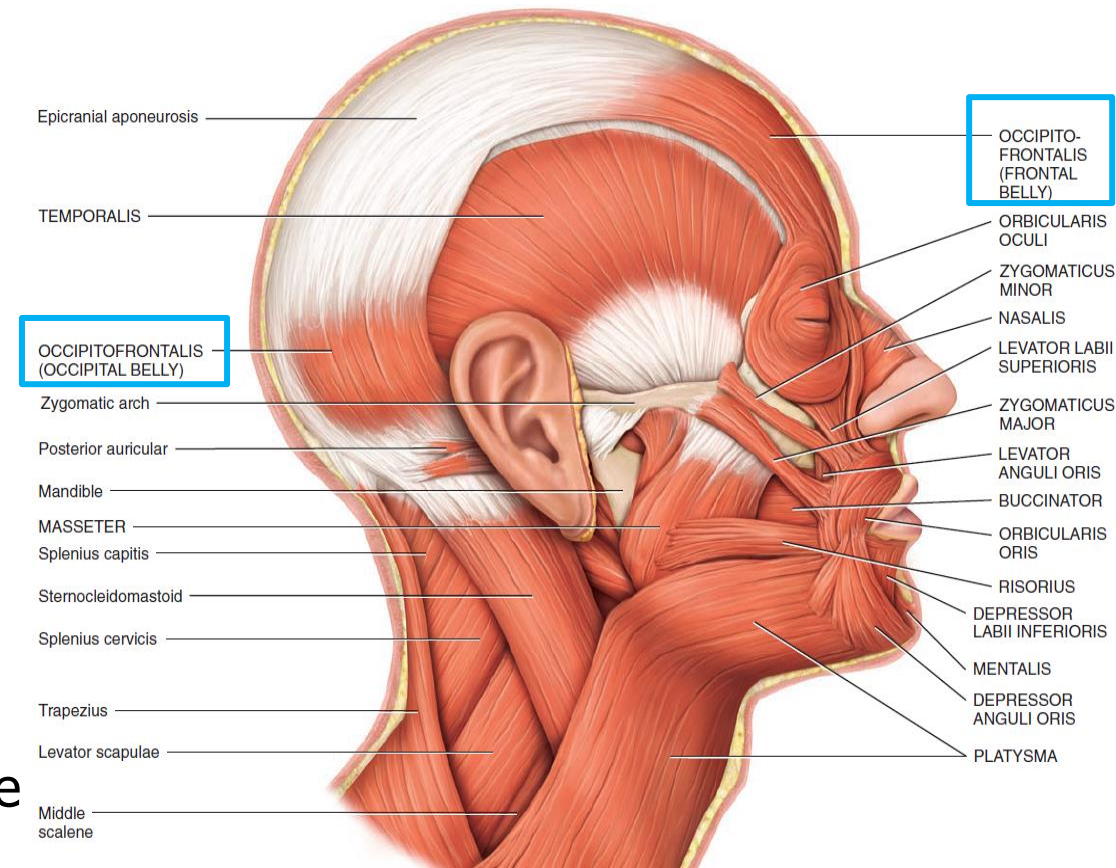
## Epicranial Aponeurosis:

A sheet of strong fibrous tissue on the skull cap.

**Frontal bellies** → take origin from eyebrows & are inserted in epicranial aponeurosis.

**Occipital bellies** → take origin from occipital bone & are inserted in epicranial aponeurosis.

**Action of muscle:** Pull the scalp backwards and raise the eyebrows thus causing the transverse wrinkles of forehead (**giving expression of fear or surprise**).



# Orbicularis Oculi

This is the sphincter of the eyelids (i.e. closes the eyes).

It encircles the orbital opening.

It consists of 3 parts :

## **a. Palpebral part:**

Action: gentle closure of eyelids (during sleeping & blinking → helps in flow of tears).

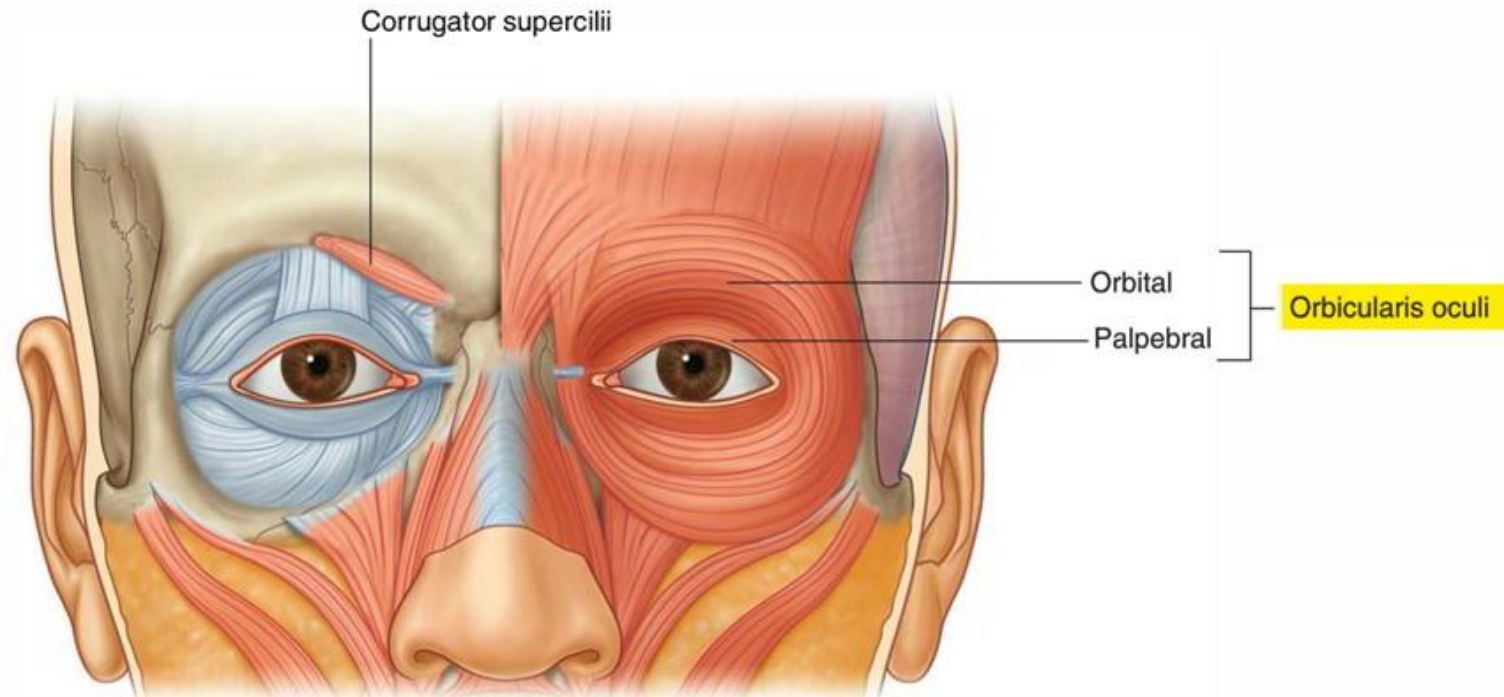
## **b. Orbital part:**

Action : firm closure of eyelids (for protection from dust & light).

## **c. Lacrimal part:**

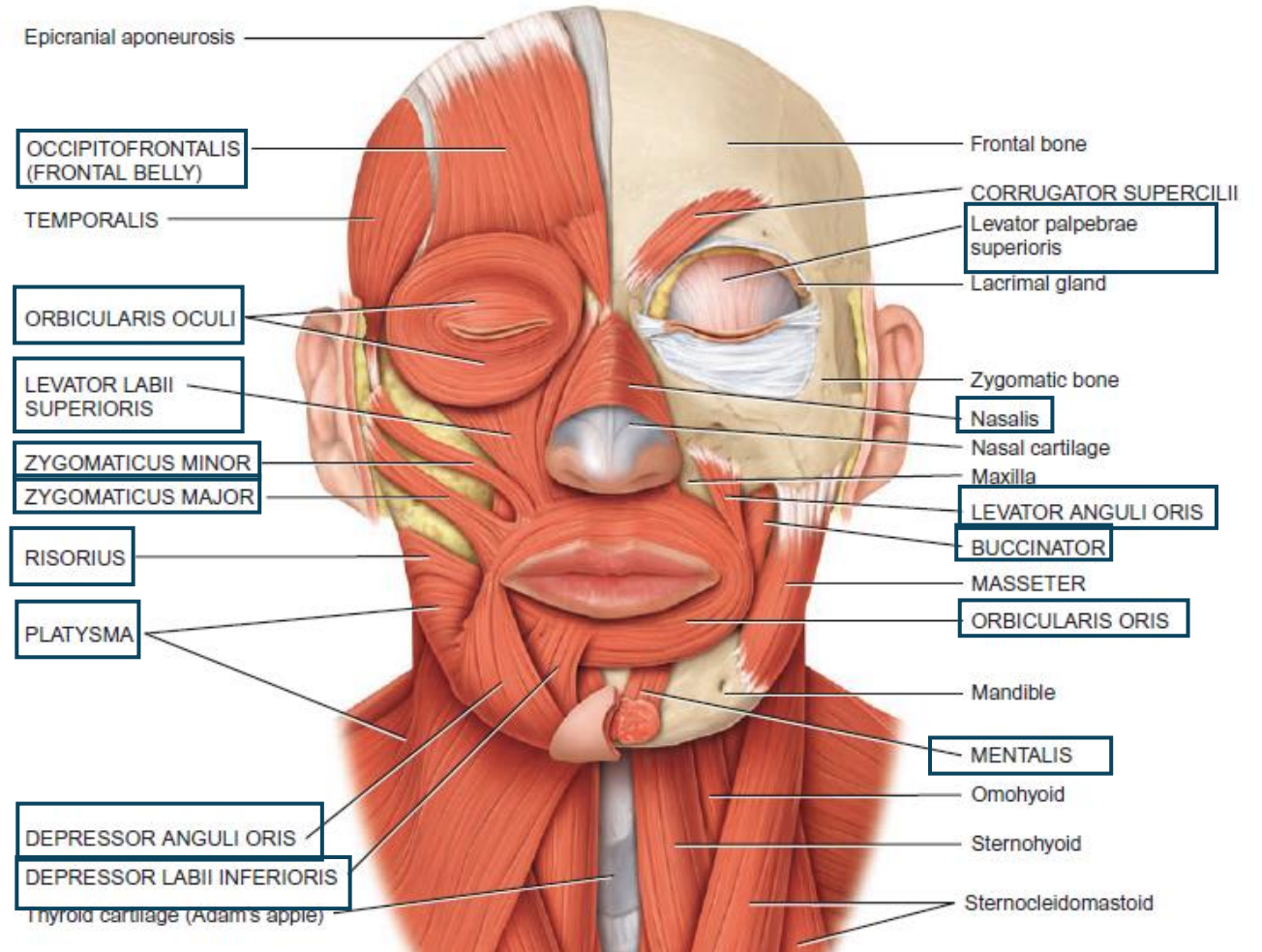
A small part which lies medially.

Action: Dilates the lacrimal sac to help drainage of tears.



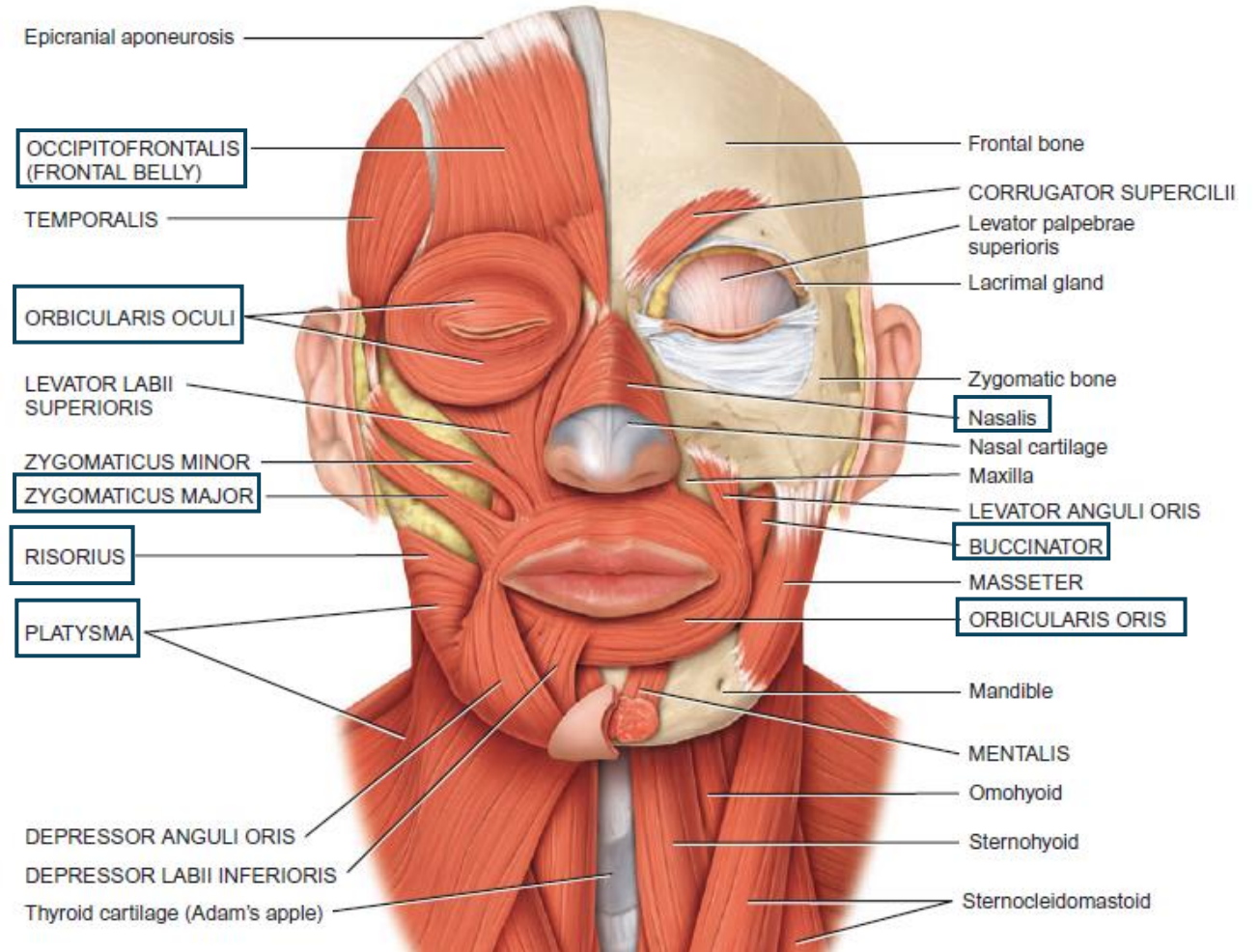
# Muscles of Lips and Cheeks


- **Orbicularis oris** (sphincter muscle of the lips) approaches lips together & help in whistling & speech
- **Buccinator** (pressing cheeks against teeth, Whistling (buccina = trumpet), blowing of air, and Suckling (in babies
- **Levator labii superioris**
- **Levator anguli oris**
- **Depressor labii inferioris**
- **Depressor anguli oris**



# Muscles of Lips and Cheeks

- **Zygomaticus major** (angle of mouth sup. & lat. smiling)
- **Zygomaticus minor**
- **Mentalis** (elevates and protrude lower lip)
- **Risorius** (grimacing)

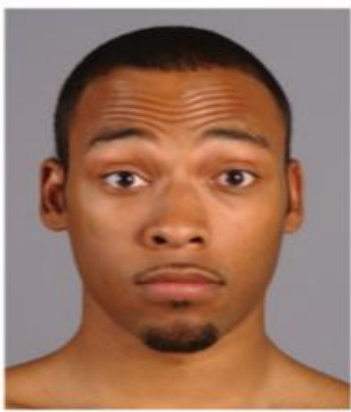


Muscle	Nerve Supply	Main Action
Occipitofrontalis (Surprise!!) <b>SCALP muscle</b>	Facial (VII) nerve	Raises <b>eyebrow</b> Produce wrinkles in forehead
Orbicularis oculi (Blinking)		Closes eyelids gently and forcibly
Elevators of upper lip*		Elevates the upper lip
Depressors of lower lip		Depresses the lower lip
Platysma (pouting)		Depresses out angle of lower lip
Risorius (Grimacing) 		Pulls angles of mouth laterally
Orbicularis oris (Kissing)		Brings lips together – closes mouth
Buccinator (Whistling)		<b>Presses cheek on teeth</b> as in blowing, sucking and <b>chewing</b>
*Zygomaticus major <b>Smiling</b> muscle		Draws angle of mouth superior & lateral

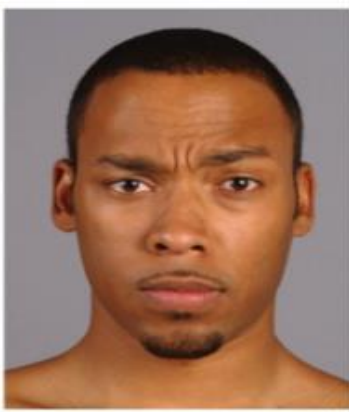


MUSCLE	ORIGIN	INSERTION	ACTION	INNERVATION
<b>SCALP MUSCLES</b>				
<b>Occipitofrontalis</b> (ok-sip'-i-tō-frun-TĀ-lis) Frontal belly (frontalis)	Epicranial aponeurosis	Skin superior to supraorbital margin	Draws scalp anteriorly, raises eyebrows, and wrinkles skin of forehead horizontally as in a look of surprise	Facial (VII) nerve
Occipital belly (occipitalis) ( <i>occipit</i> -=back of the head)	Occipital bone and mastoid process of temporal bone	Epicranial aponeurosis	Draws scalp posteriorly	Facial (VII) nerve
<b>MOUTH MUSCLES</b>				
<b>Orbicularis oris</b> (or-bi'-kū-LAR-is OR-is; <i>orb</i> -=circular; <i>oris</i> =of the mouth)	Muscle fibers surrounding opening of mouth	Skin at corner of mouth	Closes and protrudes lips, as in kissing; compresses lips against teeth; and shapes lips during speech	Facial (VII) nerve
<b>Zygomaticus major</b> (zī-gō-MA-tī-kus; <i>zygomatic</i> =cheek bone; <i>major</i> =greater)	Zygomatic bone	Skin at angle of mouth and blends with fibers of orbicularis oris	Draws angle of mouth superiorly and laterally, as in smiling	Facial (VII) nerve
<b>Zygomaticus minor</b> ( <i>minor</i> =lesser)	Zygomatic bone	Upper lip	Raises (elevates) upper lip, exposing maxillary (upper) teeth	Facial (VII) nerve
<b>Levator labii superioris</b> (le-VĀ-tor LĀ-bē-ī soo-per'-ē-OR-is; <i>levator</i> =raises or elevates; <i>labii</i> =lip; <i>superioris</i> =upper)	Maxilla superior to infraorbital foramen	Skin at angle of mouth and blends with fibers of orbicularis oris	Raises upper lip	Facial (VII) nerve

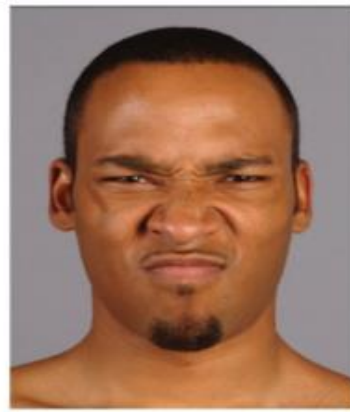
MUSCLE	ORIGIN	INSERTION	ACTION	INNERVATION
<b>Depressor labii inferioris</b> (de-PRE-sor LĀ-bē-ī; <i>depressor</i> =depresses or lowers; <i>inferioris</i> =lower)	Mandible	Skin of lower lip	Depresses (lowers) lower lip	Facial (VII) nerve
<b>Depressor anguli oris</b> (ANG-ū-lī; <i>angul</i> =angle or corner; <i>oris</i> =of the mouth)	Mandible	Angle of mouth	Draws angle of mouth laterally and inferiorly, as in opening mouth	Facial (VII) nerve
<b>Levator anguli oris</b>	Maxilla inferior to infraorbital foramen	Skin of lower lip	Draws angle of mouth laterally and superiorly	Facial (VII) nerve
<b>Buccinator</b> (BUK-si-nā'-tor; <i>bucc</i> =cheek)	Alveolar processes of maxilla and mandible and pterygomandibular raphe	Blends with fibers of orbicularis oris	Presses cheeks against teeth and lips, as in <b>whistling, blowing,</b> and sucking; draws corner of mouth laterally	Facial (VII) nerve
<b>Risorius</b> (ri-ZOR-ē-us; <i>risor</i> =laughter)	Fascia over parotid (salivary) gland	Skin at the angle of mouth	Draws angle of mouth laterally, as in <b>grimacing</b>	Facial (VII) nerve
<b>Mentalis</b> (men-TĀ-lis; <i>ment</i> =the chin)	Mandible	Skin of chin	Elevates and protrudes lower lip and pulls skin of chin up as in pouting	Facial (VII) nerve
<b>Platysma</b> (pla-TIZ-ma; <i>platys</i> =flat, broad)	Fascia over deltoid and pectoralis major muscles	Mandible, blends with muscles around angle of mouth, and skin of lower face	Draws outer part of lower lip inferiorly and posteriorly as in <b>pouting;</b> depresses mandible	Facial (VII) nerve



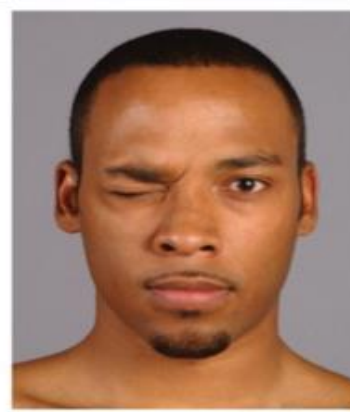
**Occipitofrontalis**



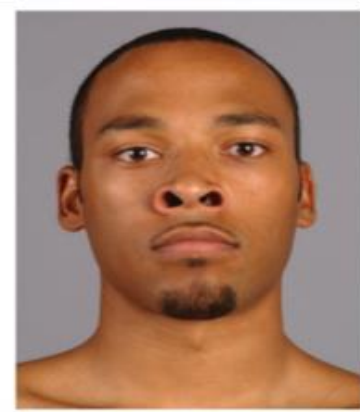
Corrugator supercilii



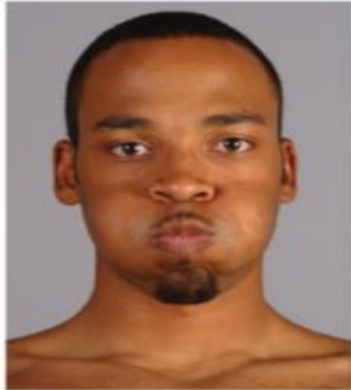
**Procerus**



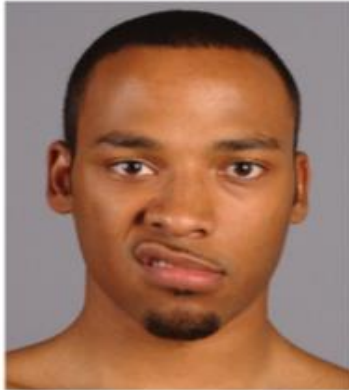
**Orbicularis oculi**



Nasalis (alar part)



**Buccinator**



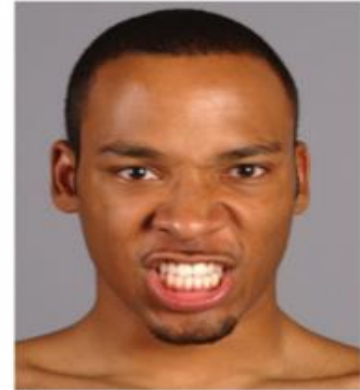
**Zygomaticus major**



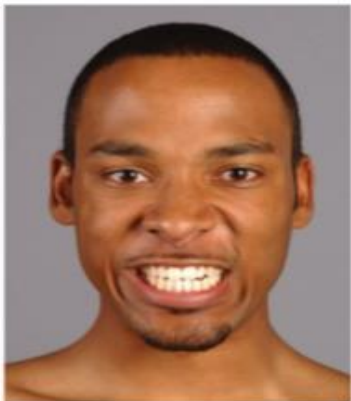
**Risorius**



Risorius +DLI



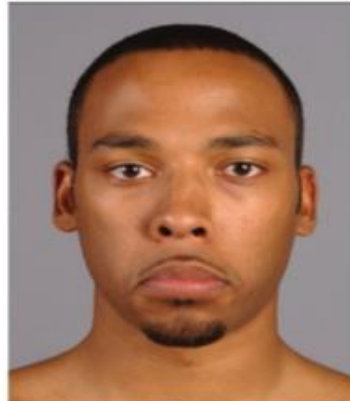
LLS + DLI



Risorius+LLS+DLI



**Orbicularis oris**



Depressor anguli oris

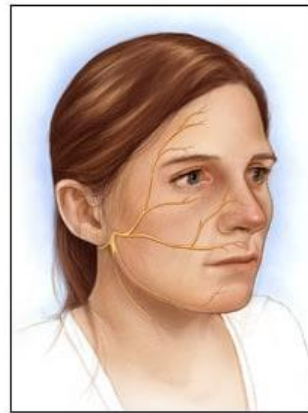


**Mentalis**



**Platysma**

- **Bell's palsy**, also known as facial paralysis, is a unilateral paralysis of the muscles of facial expression.

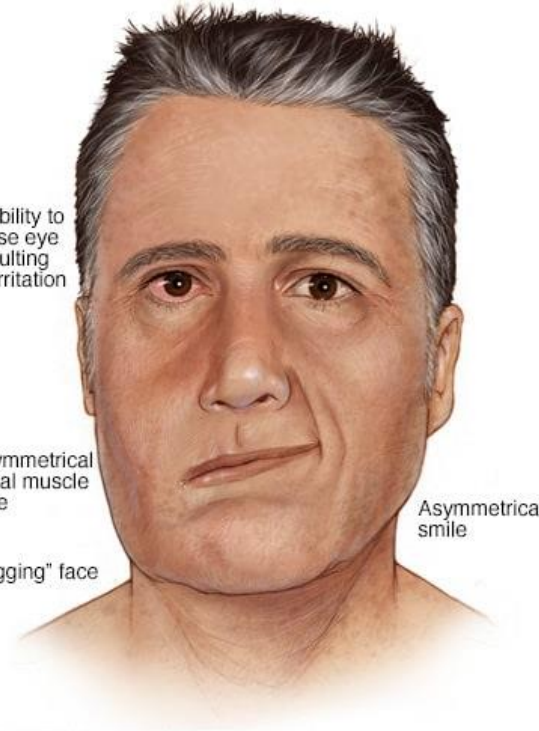


Location of facial nerve

Inability to close eye resulting in irritation

Asymmetrical facial muscle tone

"Sagging" face



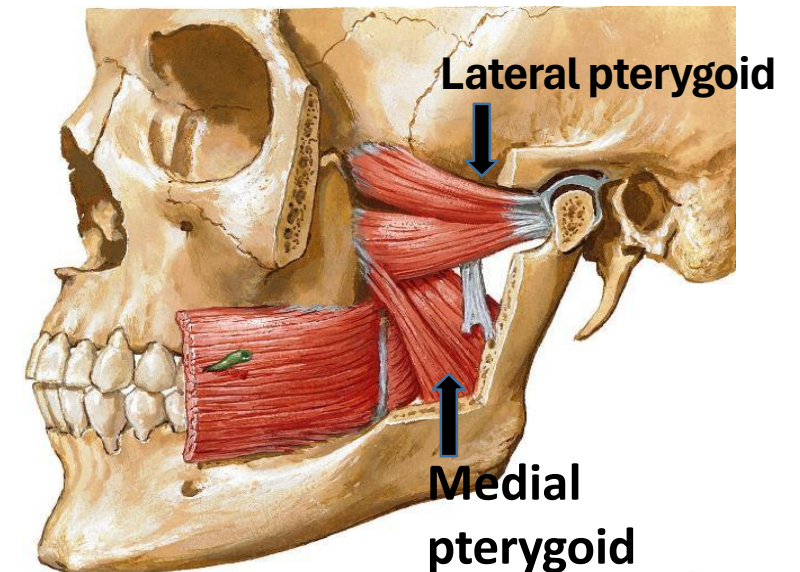
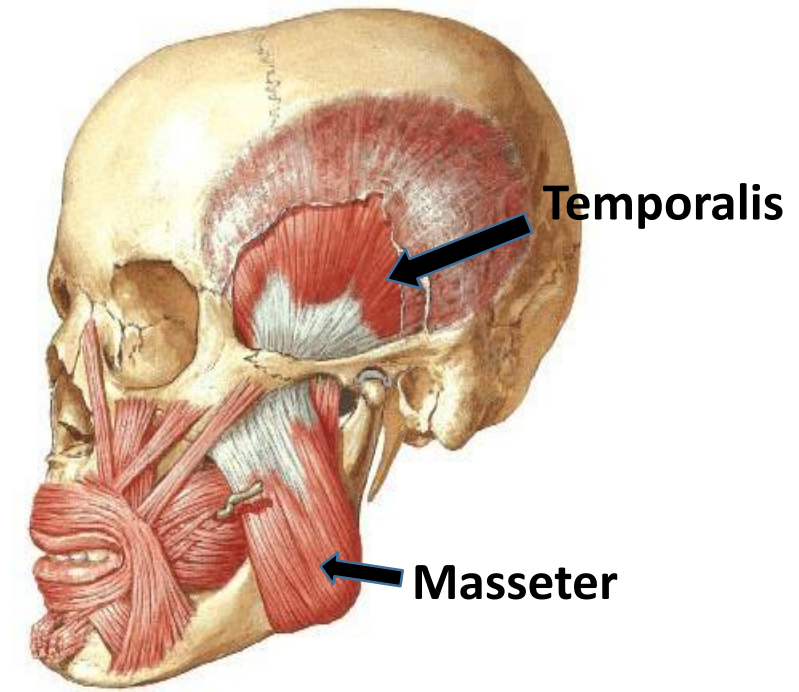
Asymmetrical smile

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# Muscles of Mastication

- Four pairs of muscles move the mandible and are known as ‘muscles of mastication’.
- They are all supplied by the **mandibular branch of the trigeminal nerve (cranial nerve V)**
- **The masseter, temporalis, and medial pterygoid** close the mouth and account for the strength of the bite.
- **The medial and lateral pterygoid muscles** help to chew by moving the mandible from side to side.



MUSCLE	ORIGIN	INSERTION	NERVE SUPPLY	ACTION
Masseter	Zygomatic arch	Lateral surface of ramus of mandible	Mandibular division of the trigeminal nerve	<u>Elevates</u> the mandible to <u>occlude</u> teeth
Temporalis	Floor of temporal fossa	Coronoid process of the mandible	Mandibular division of the trigeminal nerve	Anterior and superior fibers <u>elevate</u> mandible; posterior fibers retract mandible
Lateral pterygoid (two heads)	Greater wing of the sphenoid and lateral pterygoid plate	Neck of mandible and articular disc	Mandibular division of the trigeminal nerve	Pulls neck of mandible forward (protraction)
Medial pterygoid (two heads)	Tuberosity of maxilla and lateral pterygoid plate	Medial surface of angle of mandible	Mandibular division of the trigeminal nerve	<u>Elevates</u> mandible

## Extraocular muscles:

They lie outside the eyeball.

They are responsible for the movements of the eyeball.

They include:

### A. 4 recti muscles:

1. Superior rectus.
2. Inferior rectus.
3. Medial Rectus.
4. Lateral rectus.

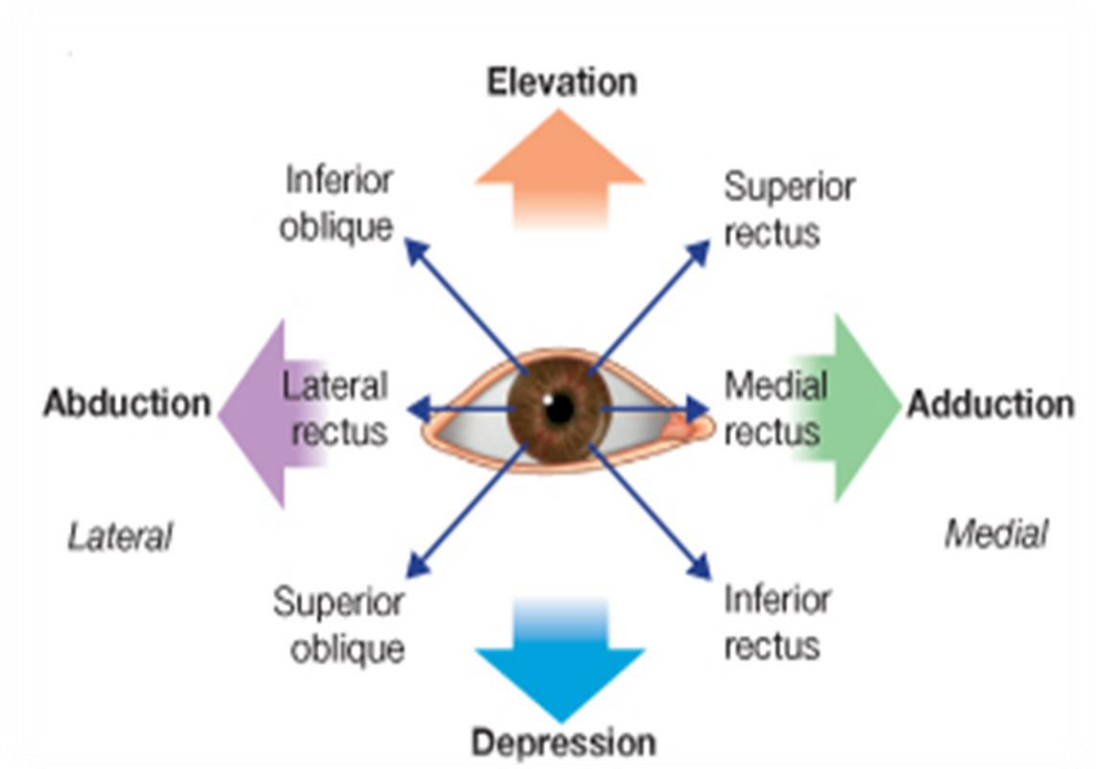
### B. 2 oblique muscles:

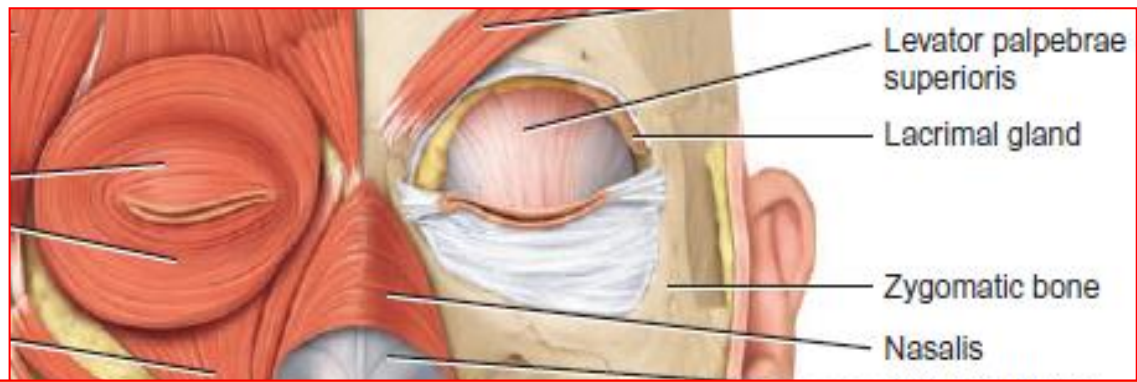
1. Superior oblique.
2. Inferior oblique.

### C. Levator palpebrae superioris.

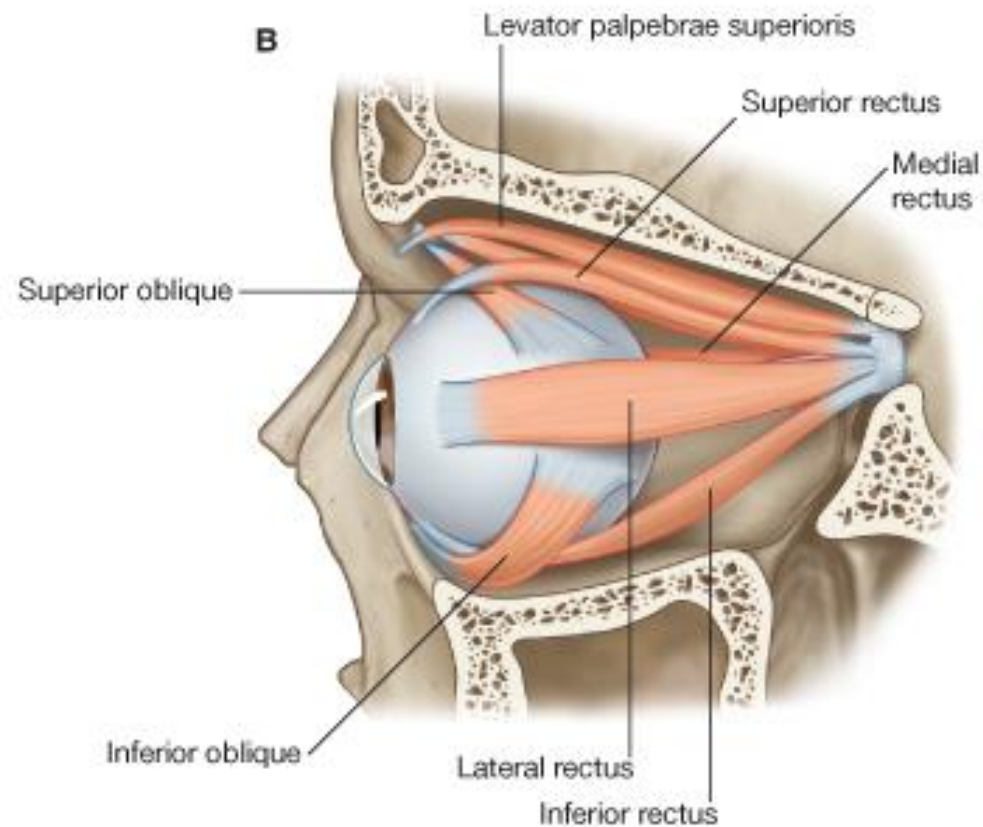
**N.B.: All the 7 extraocular muscles are supplied by the Oculomotor N. (3<sup>rd</sup> cranial nerve) EXCEPT:**

1. Lateral rectus (**LR6**) : Abducent N. (6<sup>th</sup> cranial nerve).
2. Superior oblique (**SO4**): Trochlear N. (4<sup>th</sup> cranial nerve).





**Levator palpebrae superioris:** Raises the upper eyelids, opens the eyes





# Muscles of Neck

# A: Sternocleidomastoid

## Origin :

**Sternal head** : front of manubrium sterni.

**Clavicular head**: medial 1/3 of clavicle.

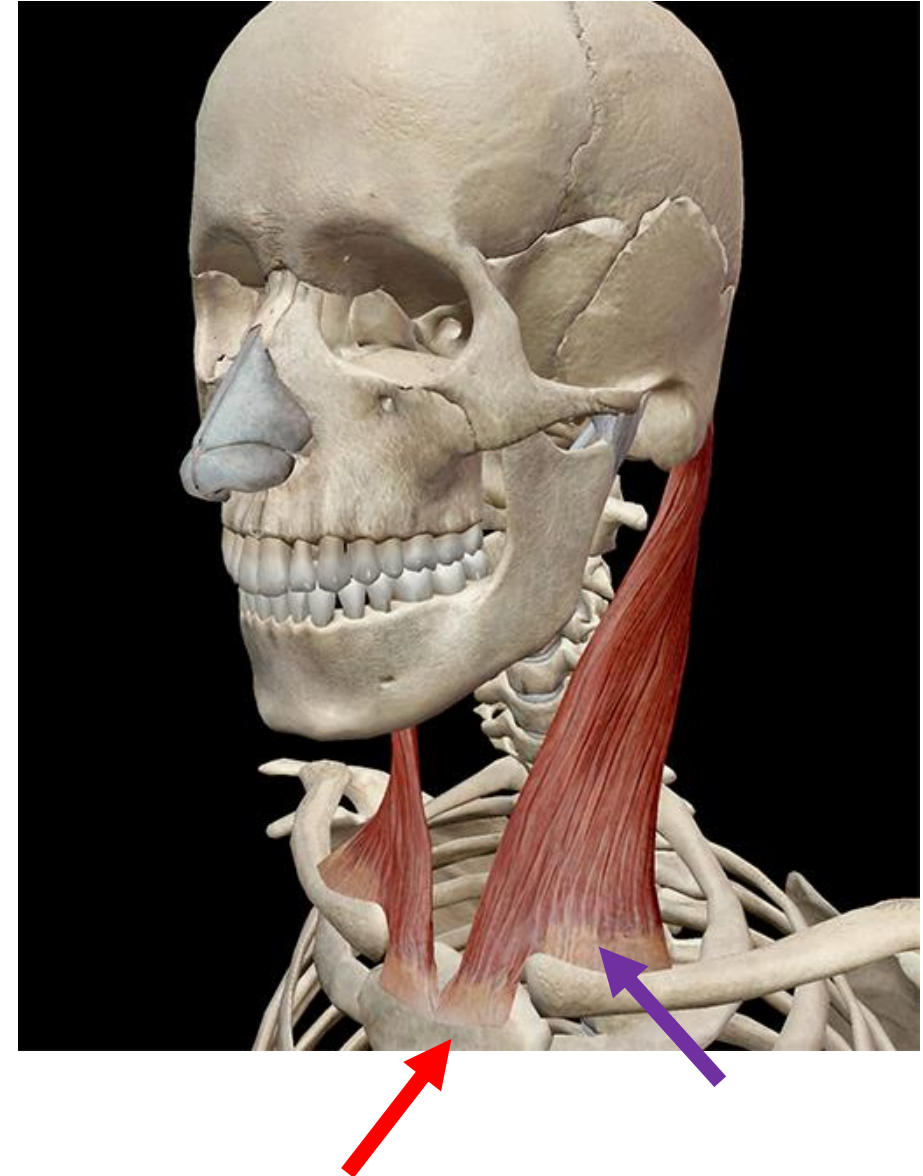
## Insertion:

mastoid process.

**Nerve supply:** Spinal accessory N. (11th cranial nerve).

**Action:** One muscle bends the head to its own side & turns the face to the opposite side.

Both muscles acting together pull the head forwards & flex the neck



# Sternocleidomastoid

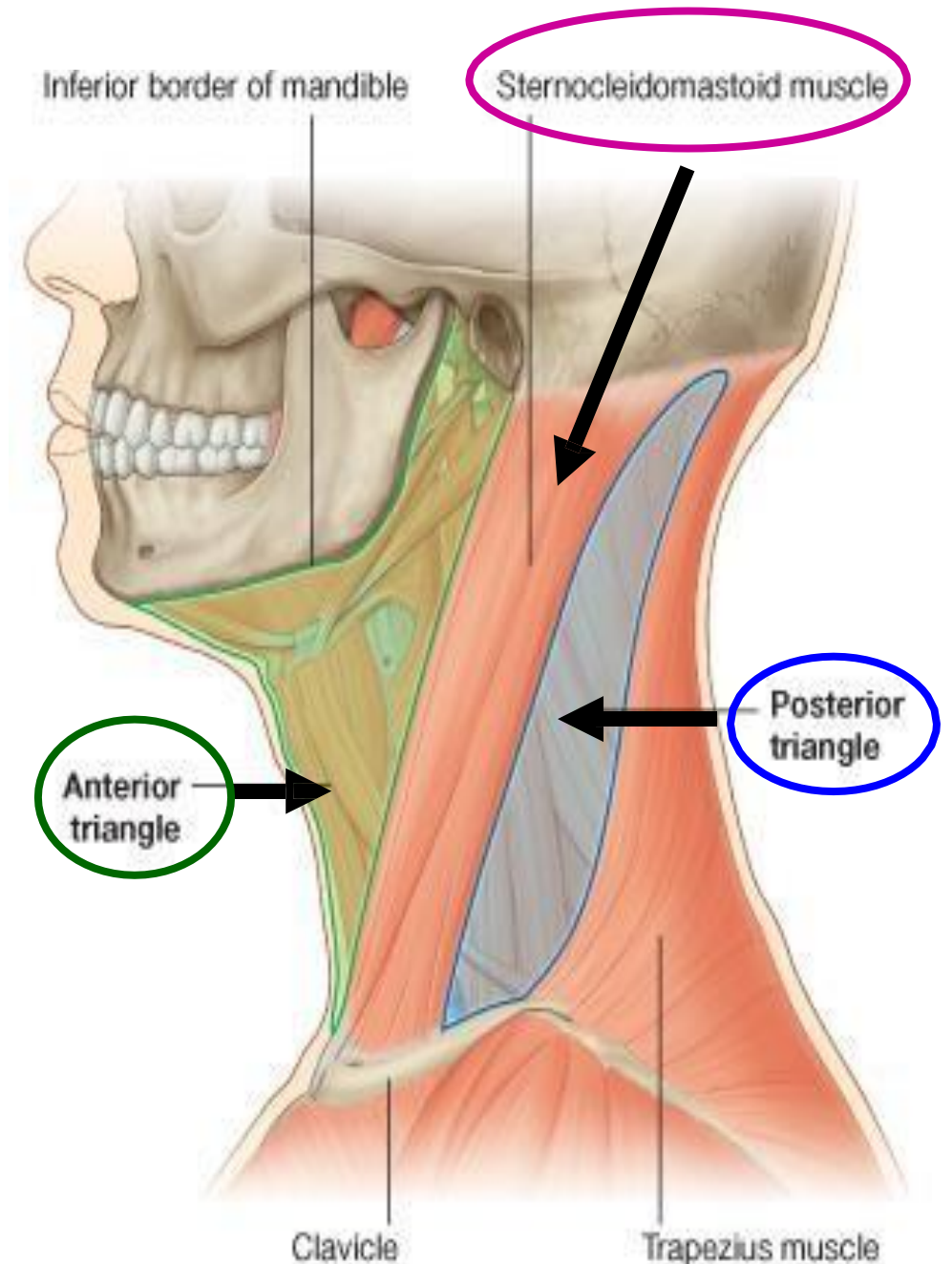
- **Sternomastoid** divides the side of the neck into 2 triangles:

## 1. **Anterior triangle**

→ in front of the sternomastoid.

## 2. **Posterior triangle**

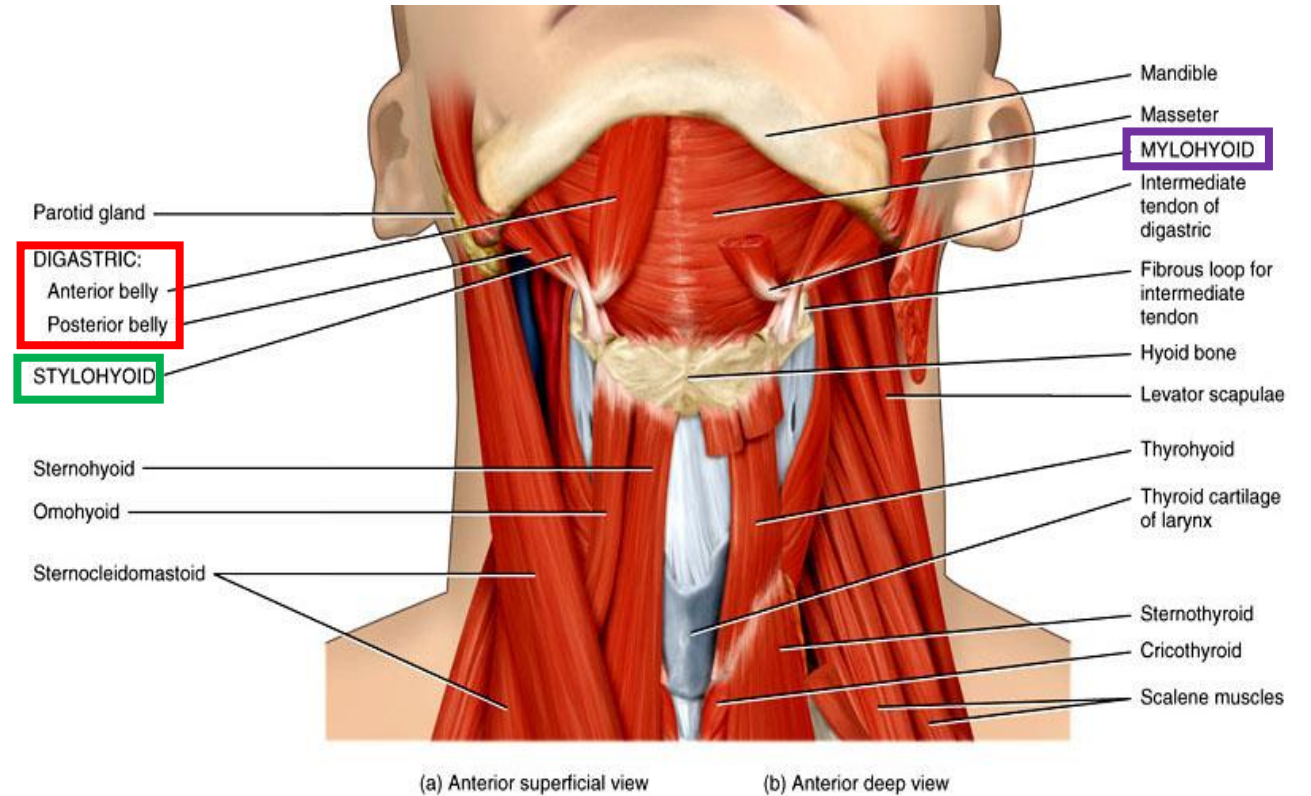
→ behind the sternomastoid.



# B: Suprahyoid Muscles

- 4 muscles that lie **above** the hyoid bone.

- **Digastric Muscle**
- **Mylohyoid Muscle**
- **Geniohyoid Muscle**
- **Stylohyoid Muscle**



# Digastric Muscle

## Origin :

- **Anterior belly** : lower border of mandible.
- **Posterior belly** : mastoid process.

## Insertion :

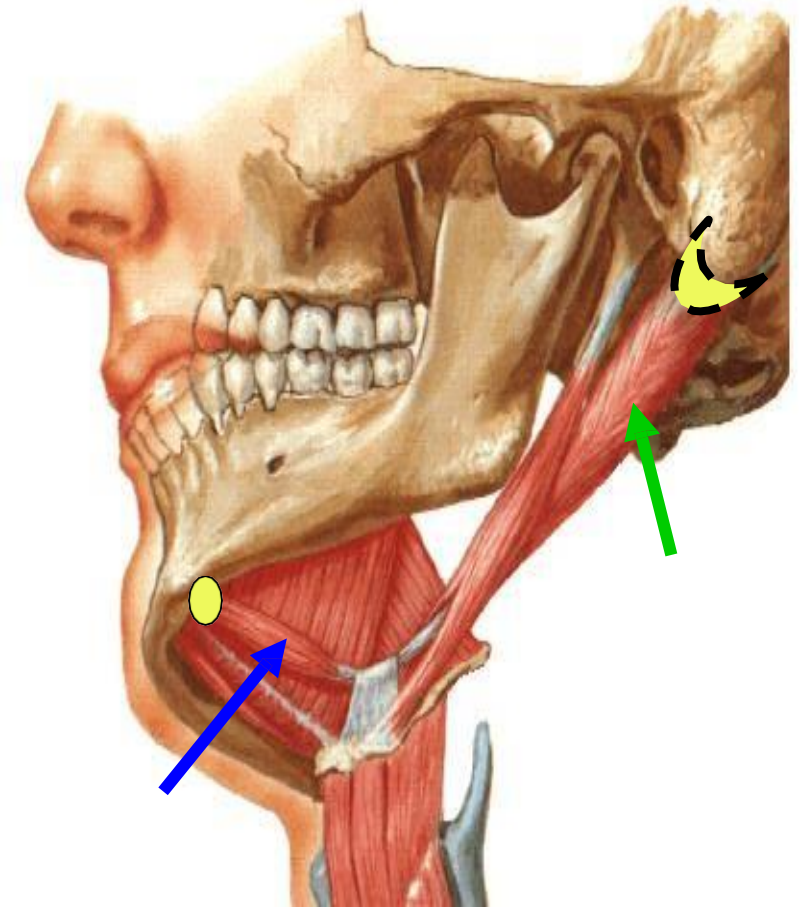
- Both bellies meet at an **intermediate tendon** attached to Hyoid bone.

## Action :

- Raises hyoid bone (during swallowing).
- Depresses mandible (if the hyoid bone is fixed)

## Nerve supply:

- Anterior belly mylohyoid N. (from mandibular N.).
- Posterior belly : facial nerve.



# Mylohyoid Muscle

## Origin :

Mylohyoid line of mandible

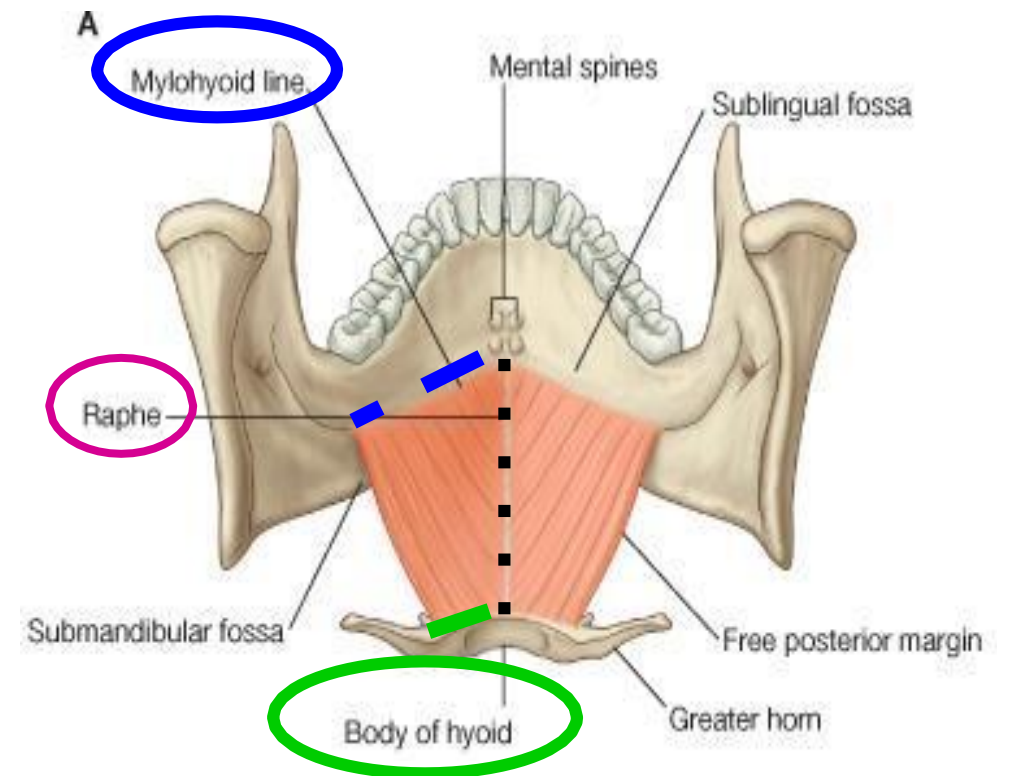
## Insertion :

Mylohyoid raphe ( between symphysis menti & hyoid bone)

**Nerve supply :** Mylohyoid nerve (from mandibular nerve).

## Action:

1. Elevates hyoid bone during swallowing
2. Support the floor of the mouth
3. Depresses mandible



# Geniohyoid Muscle

It lies deep to mylohyoid (above it )

**Origin :**

Genial tubercle of mandible

**Insertion:**

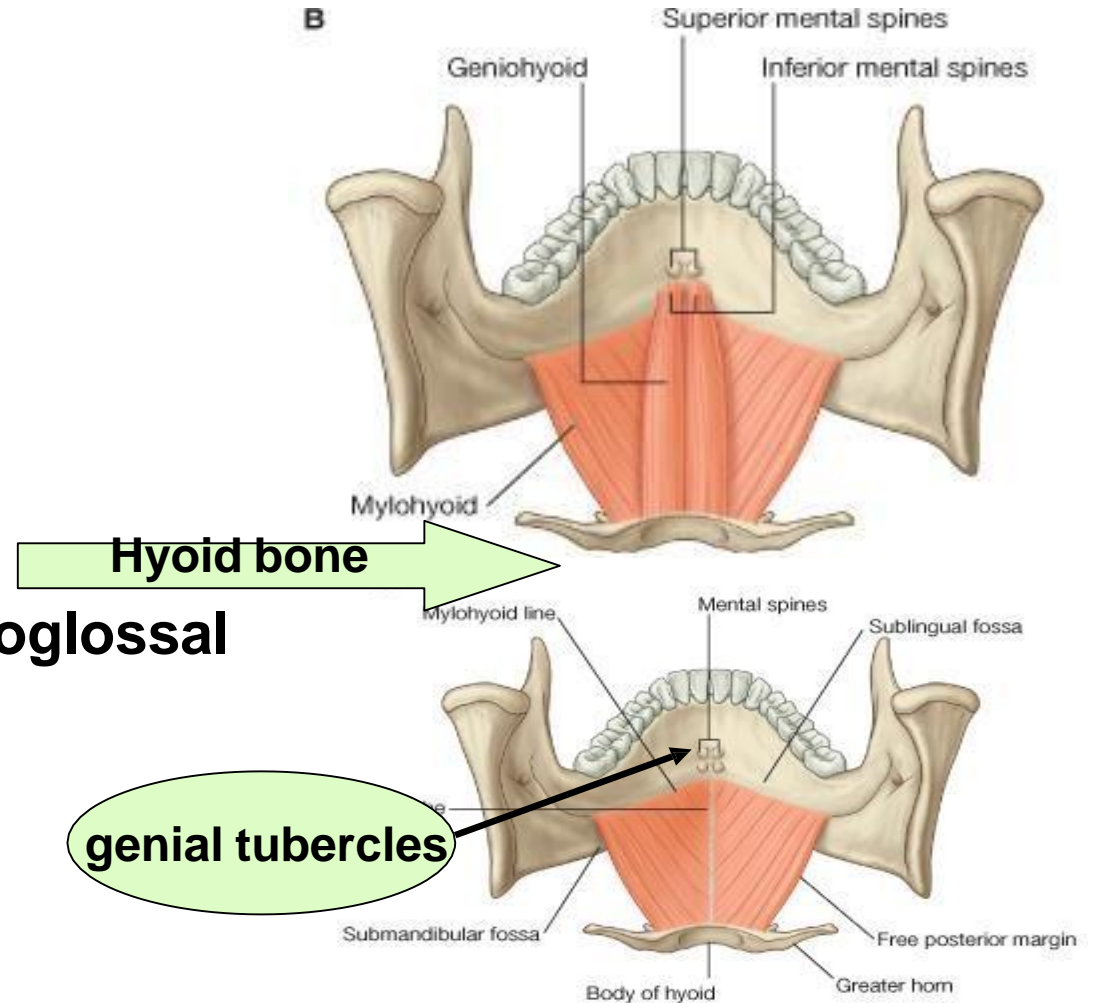
Body of Hyoid bone

**Nerve supply:**

C1 fibers (1<sup>st</sup> spinal nerve) (through hypoglossal nerve)

**Action :**

1. Elevates hyoid bone
2. Depresses mandible



# Stylohyoid Muscle

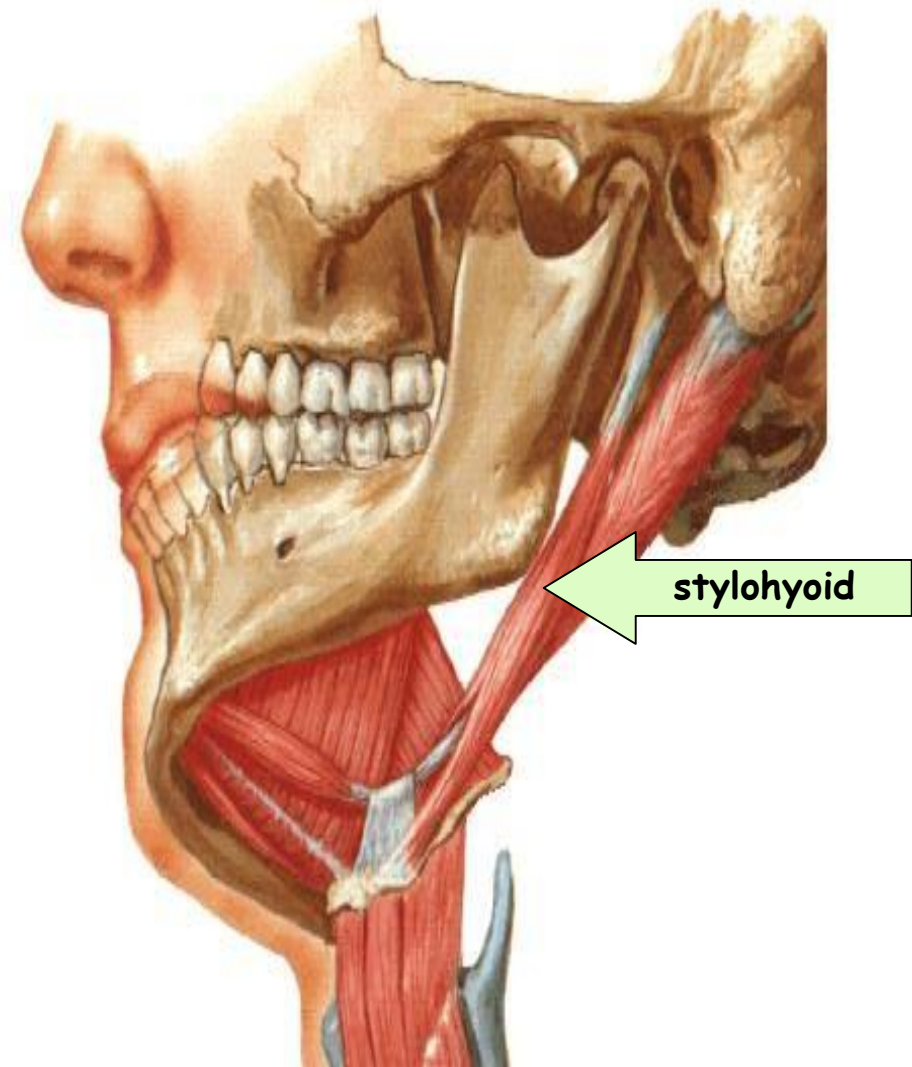
A small muscle that lies along upper border of posterior belly of digastric

**Origin** → styloid process

**Insertion** → hyoid bone

**Nerve supply** → facial nerve

**Action** → elevates hyoid bone





# C. Infrahyoid Muscles

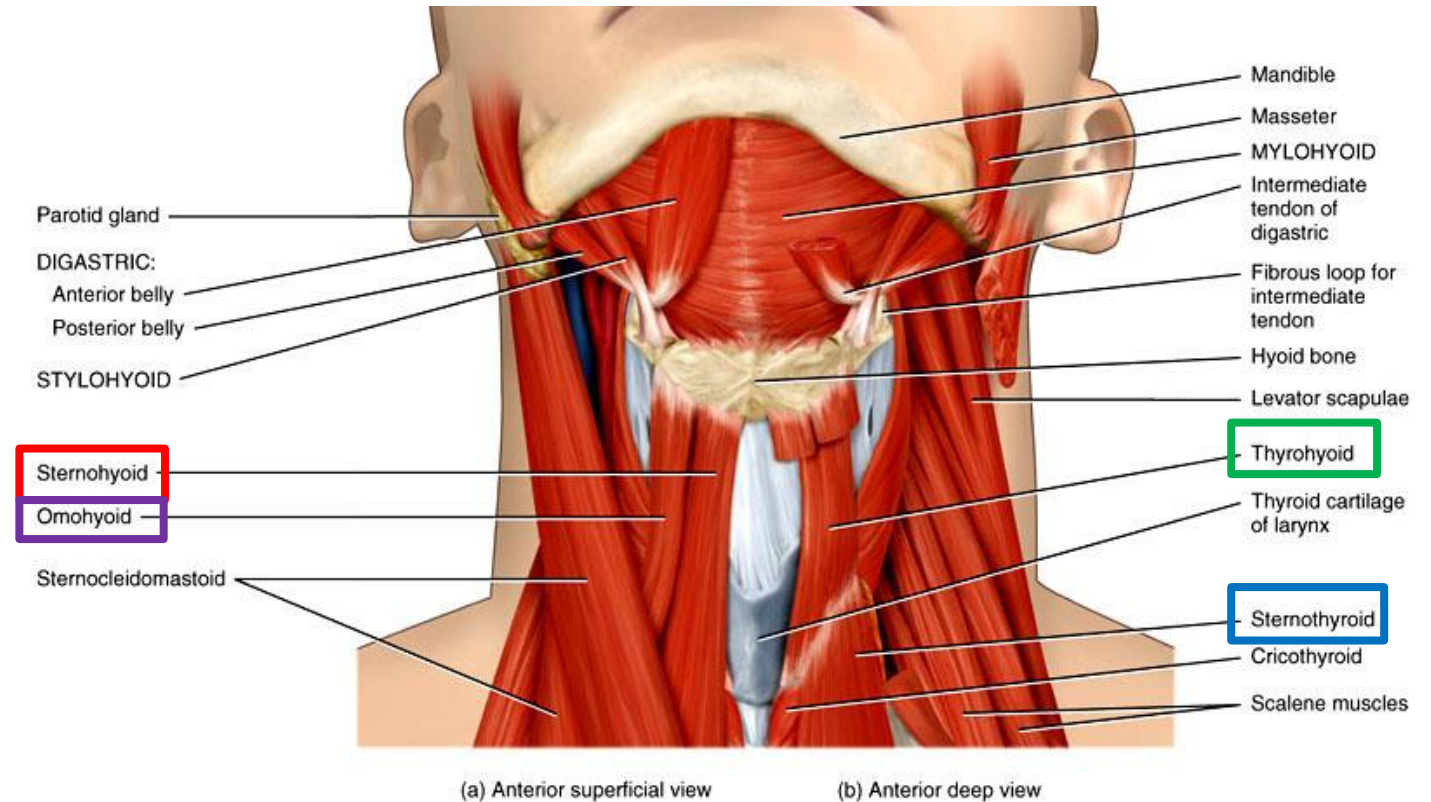
- 4 muscles that lie **below** the hyoid bone.

Include:

- **Sternohyoid.**
- **Omohyoid.**
- **Sternothyroid.**
- **Thyrohyoid.**

All infrahyoid muscles are supplied by **Ansa Cervicalis** (C1,2,3) except Thyrohyoid which is supplied directly by C1 (through hypoglossal N.).

All infrahyoid muscles **depress** hyoid bone



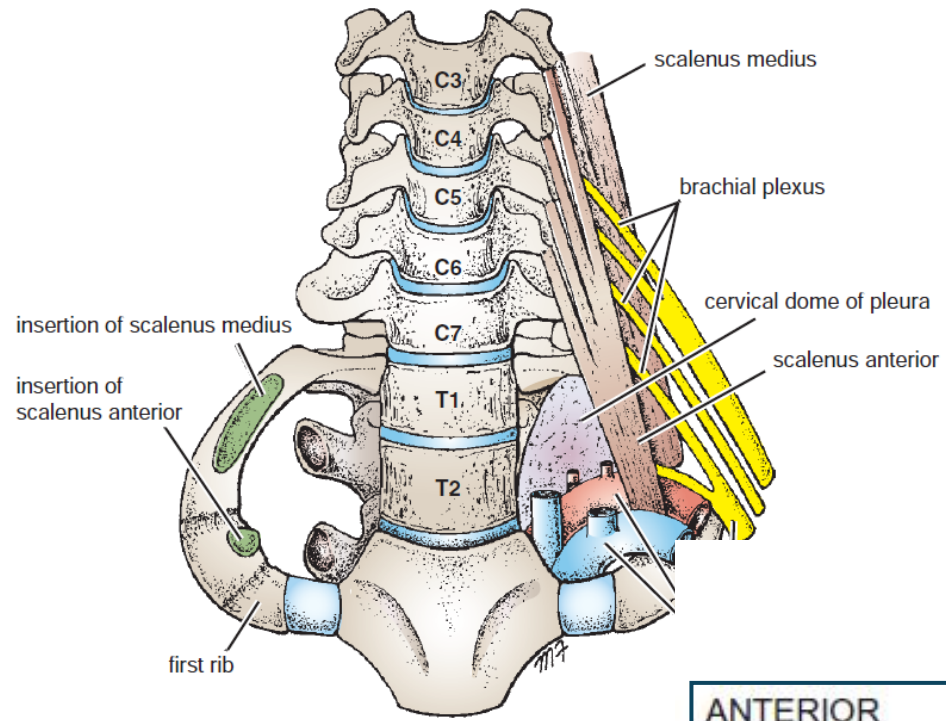
## Lateral Vertebral Muscles – The Scaleni:

These are attached to the cervical part of the vertebral column and pass laterally – attached to 1<sup>st</sup> and 2<sup>nd</sup> ribs

**Scalenus anterior** is an important landmark in the neck with several important relations

- **V ---- Subclavian vein**
- **A ---- Subclavian artery**
- **N ---- Trunks of the brachial plexus nerves**

Muscle	Action
Scalenus Anterior (1 <sup>st</sup> rib)	1. Lateral flexion and rotation of cervical part of vertebral column 2. Assist in <b>respiration</b>
Scalenus Medius (1 <sup>st</sup> rib)	
Scalenus Posterior (2 <sup>nd</sup> rib)	



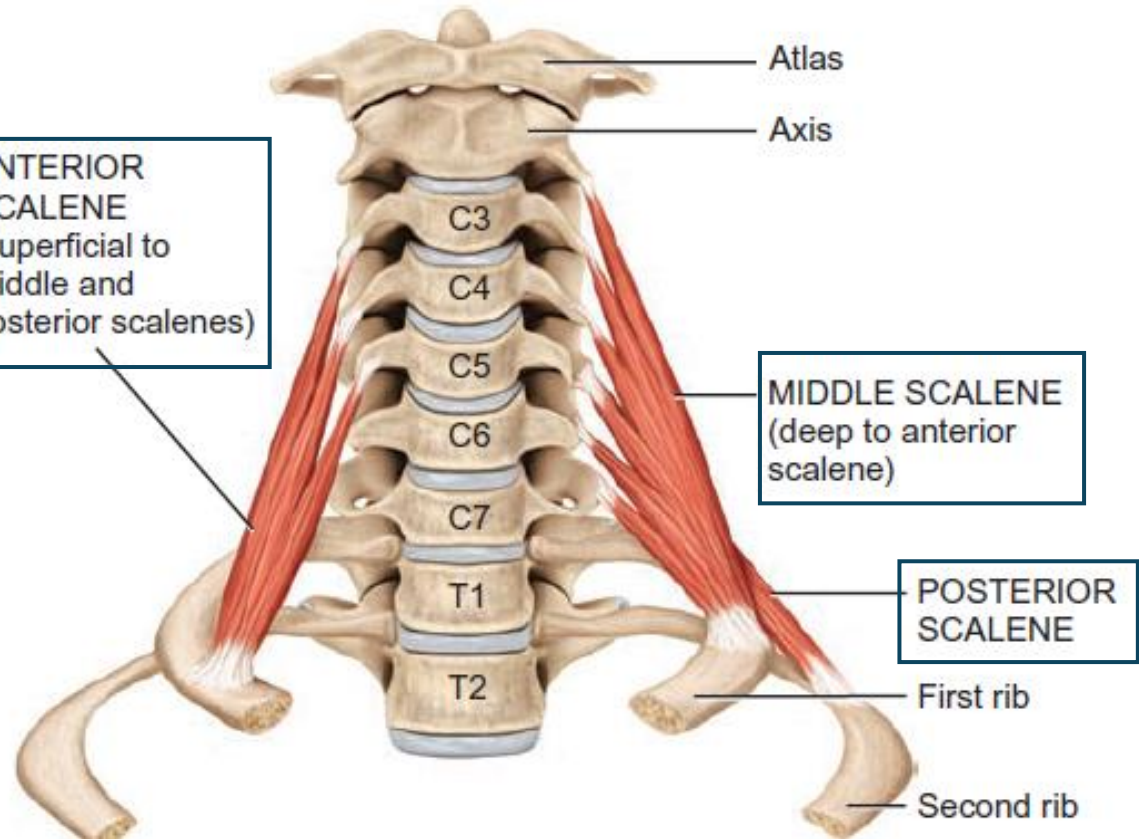
**N ---- nerves**

**A ---- artery**

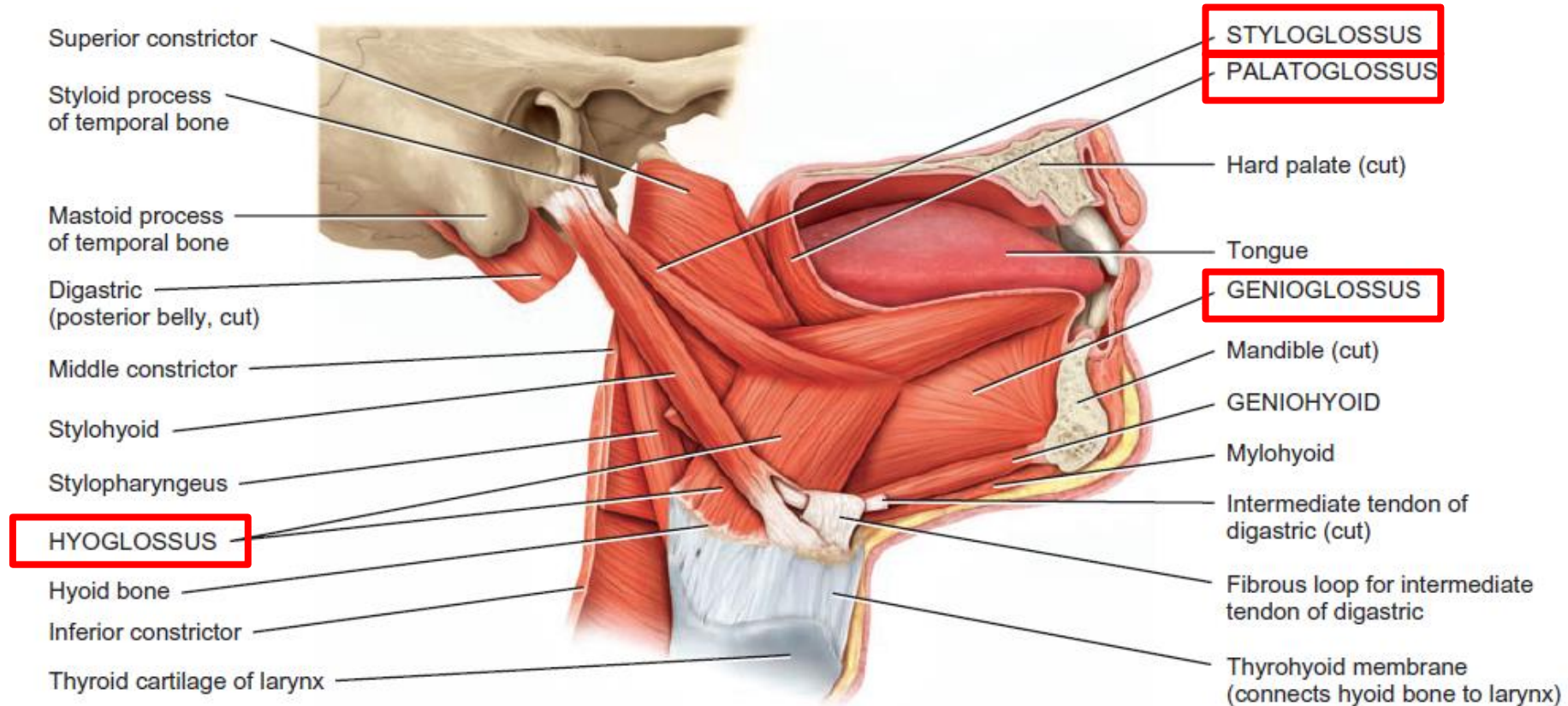


**V ---- vein**

**ANTERIOR SCALENE**  
(superficial to middle and posterior scalenes)



# Muscles of tongue




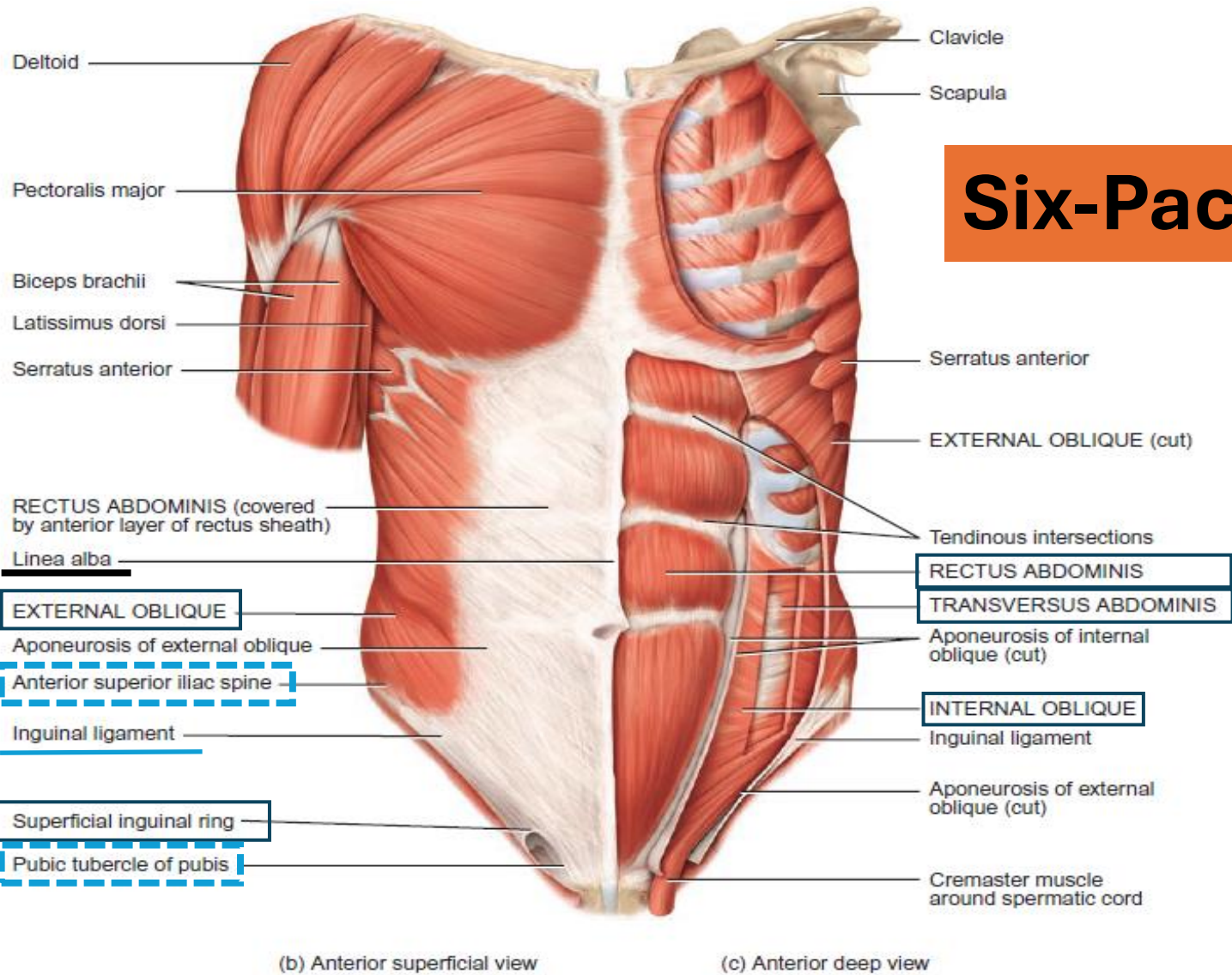
# Muscles Of The Tongue

Muscle		Action	Nerve Supply
Extrinsic Muscle (originate outside the tongue, insert into tongue)	Genioglossus	Tongue movements (protraction – retraction.....)	Most of them innervated by Hypoglossal (XII) nerve
	Hyoglossus		
	Styloglossus		
	Palatoglossus <b>(vagus nerve)</b>		
Intrinsic Muscles (originate and insert within tongue)		Change shape of tongue	

- Thanks!

# Anterior Abdominal Wall Muscles

- The anterolateral abdominal wall includes:
  1. **External oblique muscle** (inferiorly and medially)
  2. **Internal oblique muscle**
  3. **Transversus abdominis muscle**
  4. **Rectus abdominis muscle**
- The **aponeuroses** of #1+2+3 form the **rectus sheaths**.
- **Rectus sheath** encloses #4 **right and left Rectus abdominis**
- **Linea alba**: a median connective tissue band of the rectus sheath extending from the xiphoid process to the pubic symphysis.
- **Inguinal ligament**: Thick ligament formed of the aponeurosis of the external oblique extend from  
Anterior superior iliac spine  Pubic tubercle



# Six-Pack Abs

**Superficial inguinal ring, the outer opening of the inguinal canal an inguinal hernia**



## **Actions:**

1. They retain the organs within the abdominal cavity.
2. The oblique muscles laterally flex and rotate the trunk.
3. The rectus abdominis flexes the lumbar vertebrae.
4. By contracting simultaneously with the diaphragm, they increase intra-abdominal pressure and help in micturition, defecation, vomiting, and labor.
5. They may contract at the end of expiration, pushing the relaxed diaphragm further upwards into the thorax **(forced exhalation)**.

# Posterior Abdominal Wall Muscles

**Quadratus lumborum:** depresses 12<sup>th</sup> rib,  
lateral flexion of lumbar region spine

Flex thigh on trunk. If thigh  
is fixed, flexes trunk on  
thigh (Waking up muscle)

Psoas minor

Iliac crest

PSOAS MAJOR

ILIACUS

TENSOR  
FASCIAE LATAE

Sartorius

Rectus femoris

Pectineus

Adductor longus

Gracilis

(a) Anterior deep view

