Know Your Face: A Journey Through Facial Anatomy

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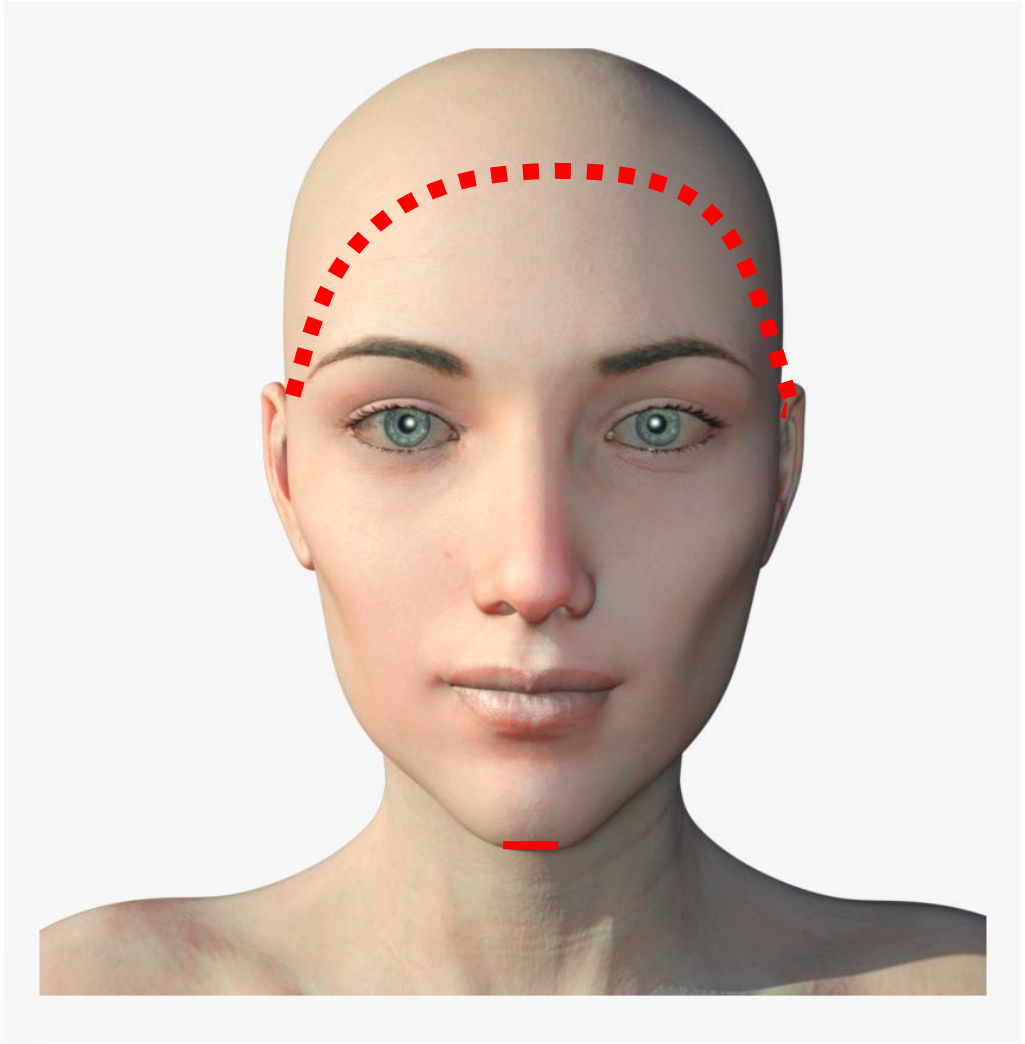
Learning objectives

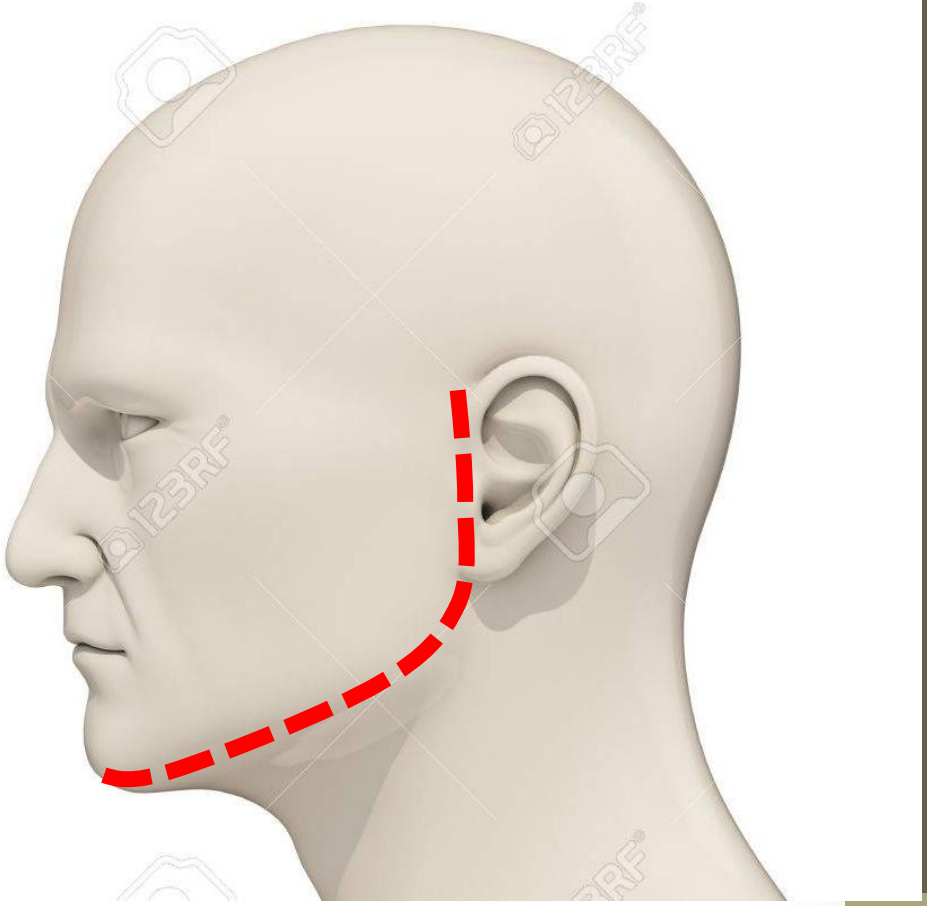
At the end of session audience will be able to discuss about:

- **Describe the boundaries of face**
- **Mention the function of the face**
- **Demonstrate the structure of face**
- **List the muscles of facial expression**
- **Describe blood supply of face**
- **Explain the lymphatic drainage of face**
- **Understand the innervation of face**
- **List the developmental anomalies of face**
- **Understand the clinical significance of facial anatomy**
- **Apply anatomical knowledge in clinical contexts**

"The face is a canvas,
emotions are its hues."

Boundary of face

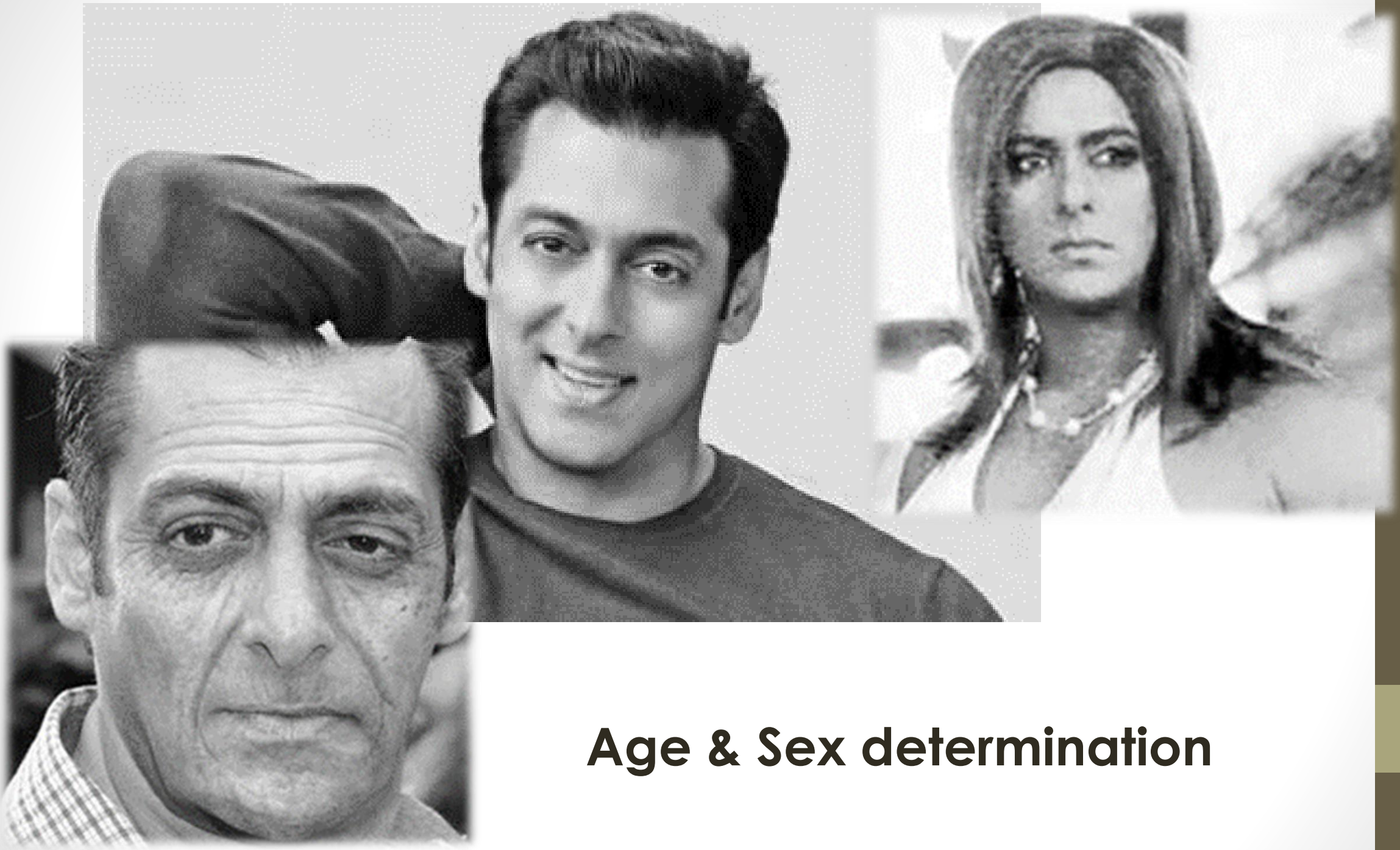




Function of face

- A face-to-face meeting is an important initial contact between individuals
- Part of this exchange is the use of facial expressions to convey emotions
- A physician can gain important information about an individual's general health by observing a patient's face

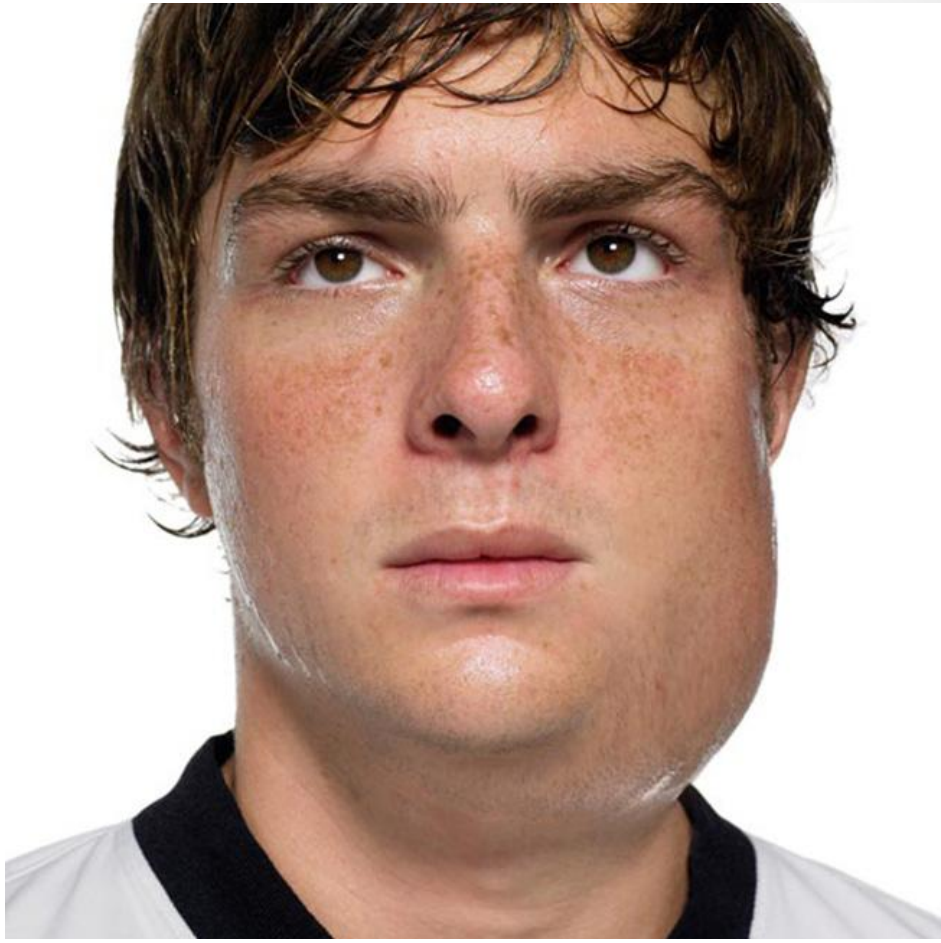
The face, therefore, is called an index of mind.



Age & Sex determination

Face for beutification

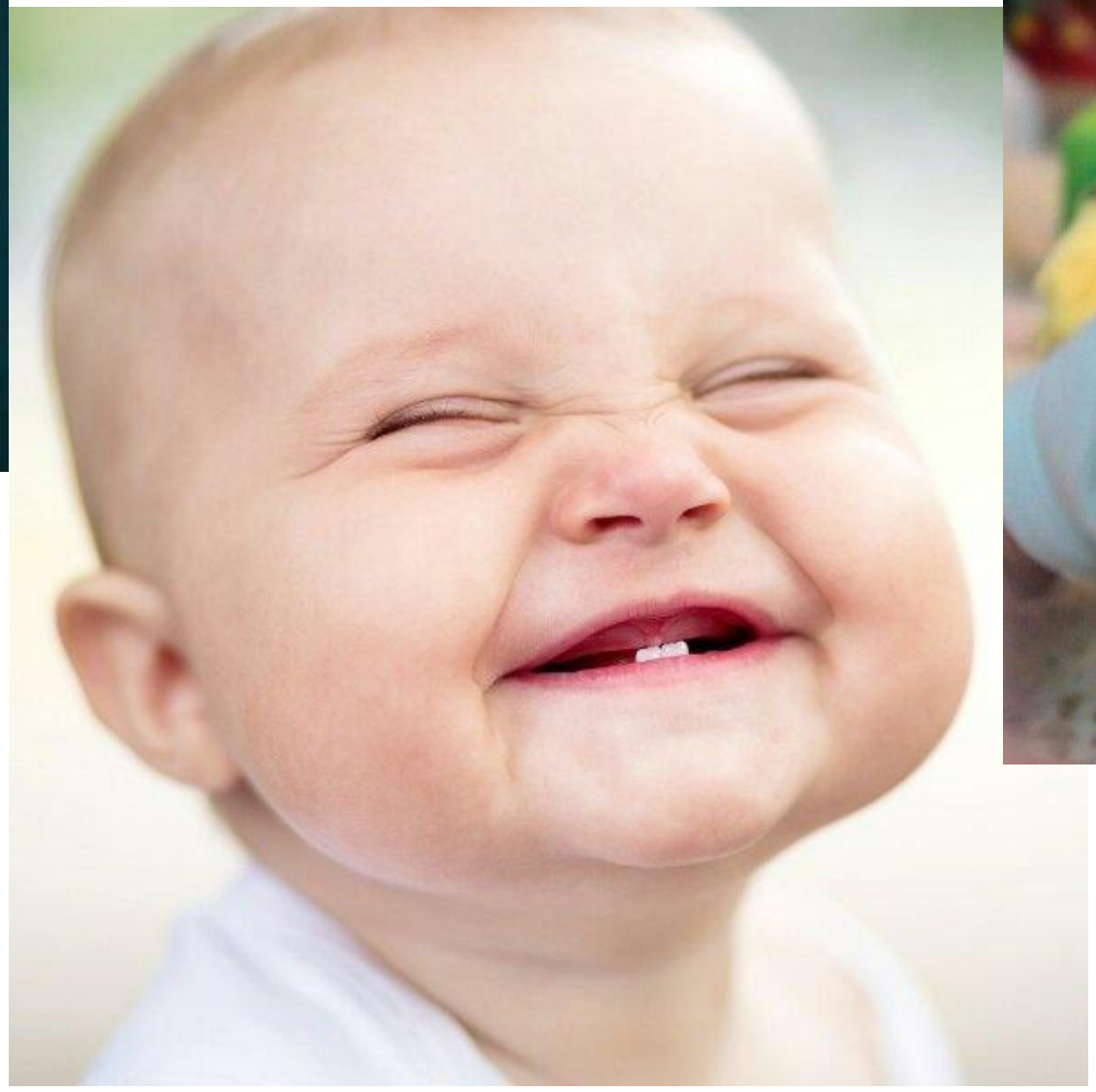
- Face for beautification

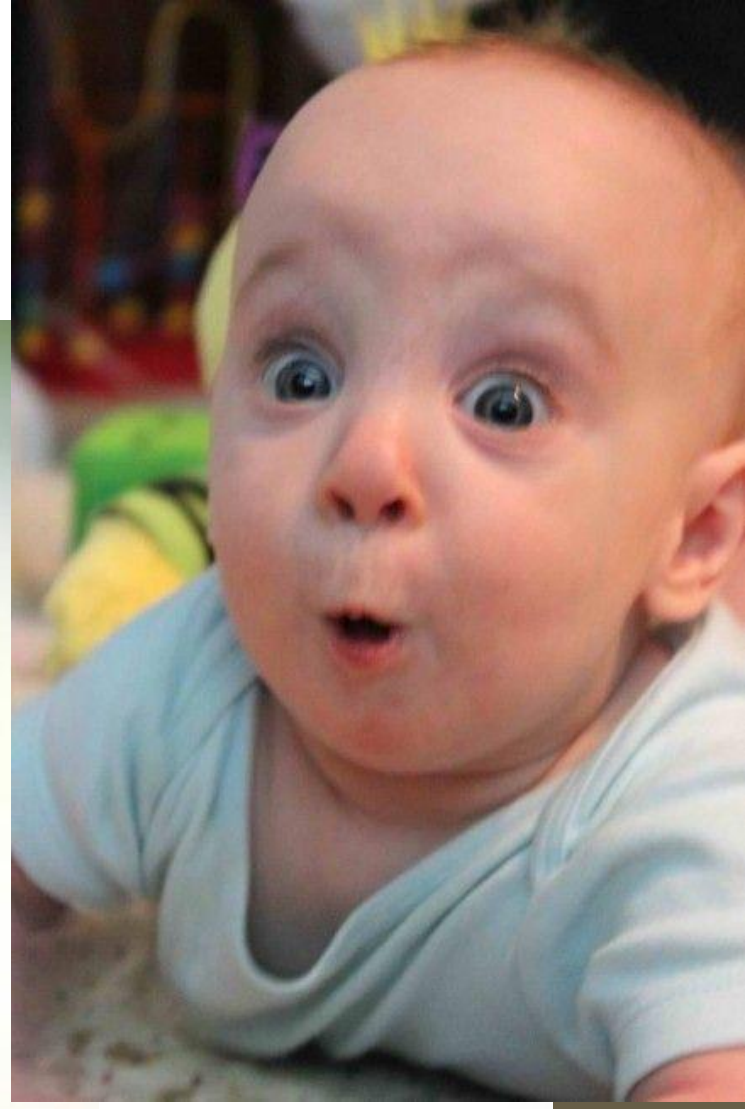


Sign of Disease

Sign of Disease

Emotion Expression





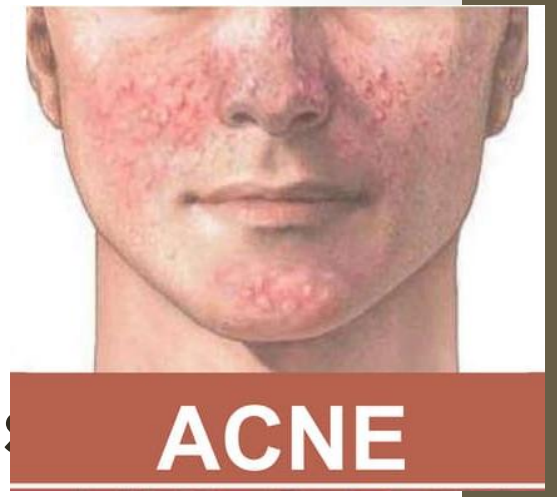
Structure of Face

Layers of Face

3 layers from outer to inner-

- **Skin**
- **Superficial fascia with muscles**
- **Deep fascia**

Specialities



- Highly vascular
- Is connected to the underlying bones by loos connective tissue in which are embedded the muscles of facial expression
- Rich in sweat & sebaceous glands
- No deep fascia is present in the face except parotid fascia & buccopharyngeal fascia

?

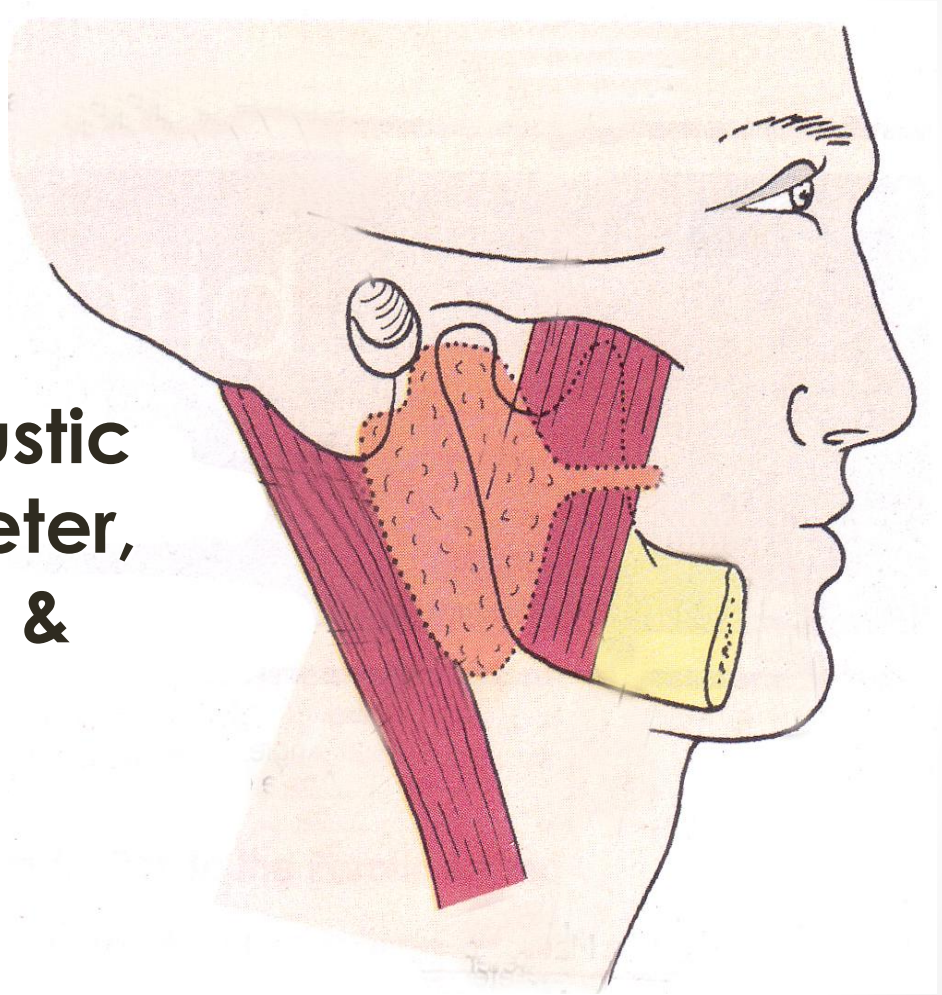
Mumps

Mumps is a highly contagious viral infection that primarily affects the salivary glands, especially parotid glands.

In male orchitis (can lead to infertility) & in female oophoritis may occur.

Parotid gland

- Largest salivary (serous) gland
- Weight- 15 g.
- Situation- below the external acoustic meatus, superficially over the masseter, between the ramus of the mandible & sternocleidomastoid m.

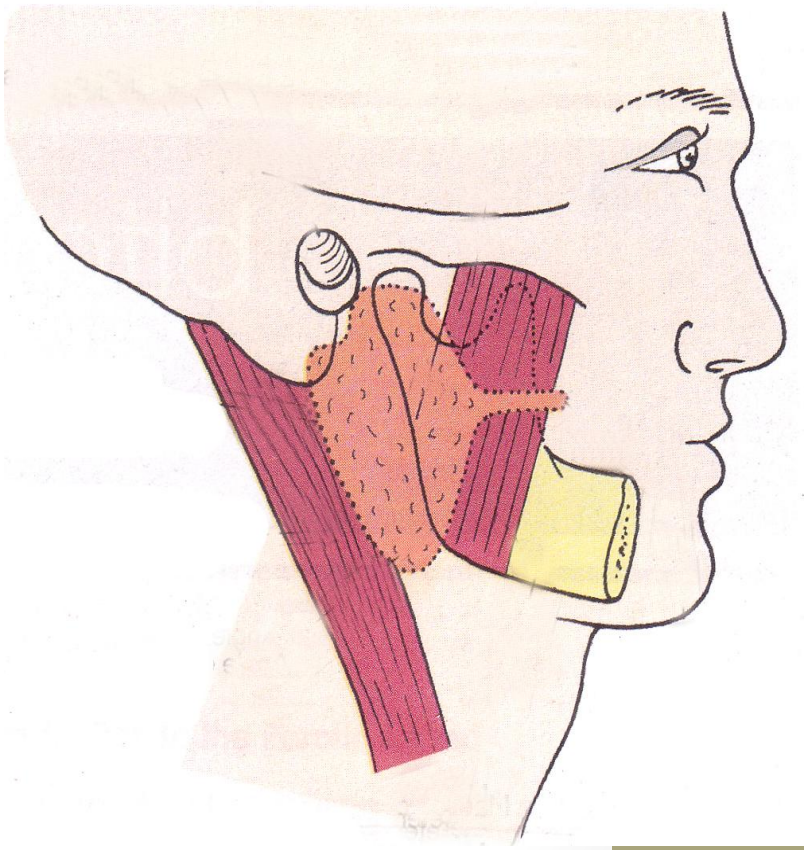


Parotid capsule

The investing layer of the deep cervical fascia.

2 laminae:

- **superficial lamina thick adherent to the gland, attached to the zygomatic arch.**
- **deep lamina thin & attached to the styloid process.**



Why parotid swelling is so painful?

Parotid gland swells

↓ Inflammation

tight parotid fascia restricts expansion

↓

increased pressure inside the gland

↓

chewing or opening the mouth

↓

pain

Referred pain

Parotid gland swells

↓

Stretches gland & capsule

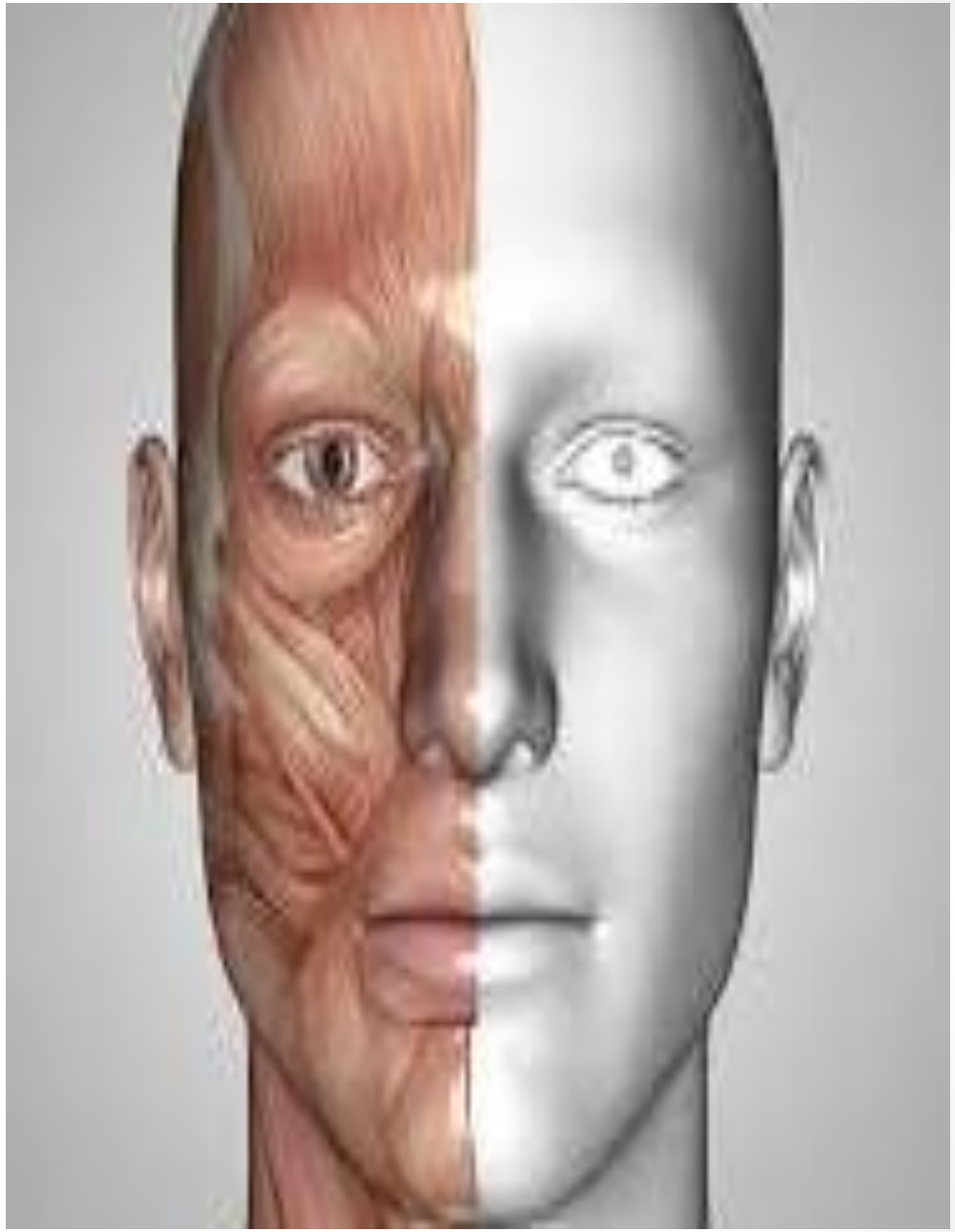
↓ Sensory fibers irritate

Auriculotemporal nerve

↓

Pain radiates to ear & jaw

Muscles of Facial Expression

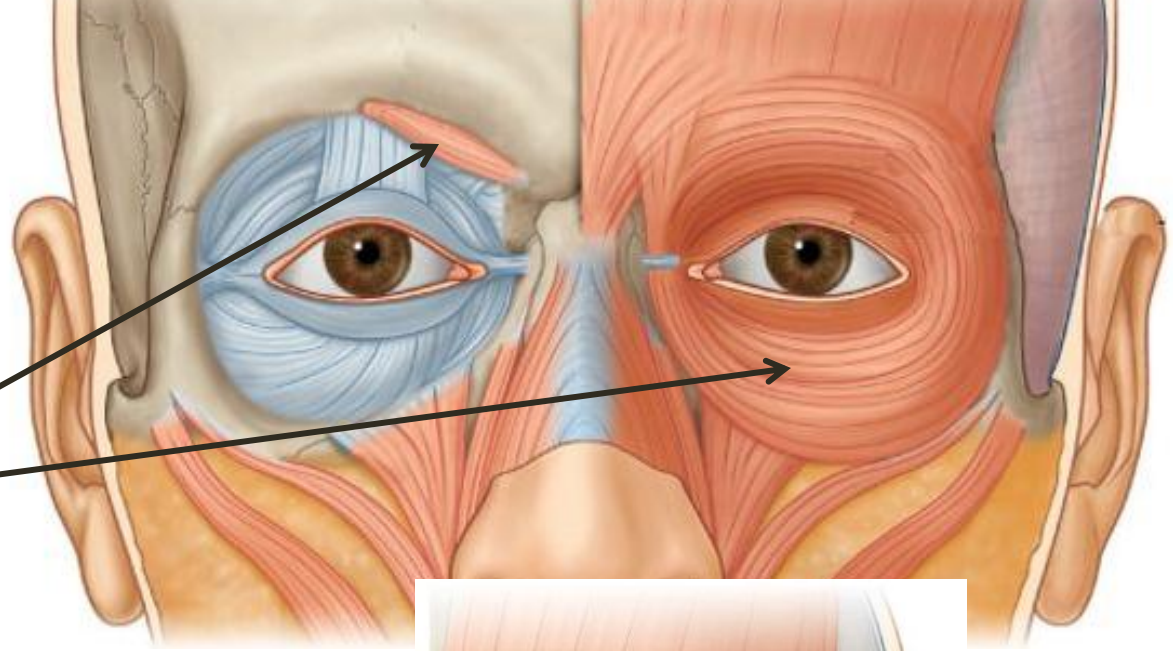


Muscles of the face:

Orbital group:

Corrugator supercilii

Orbicularis oculi



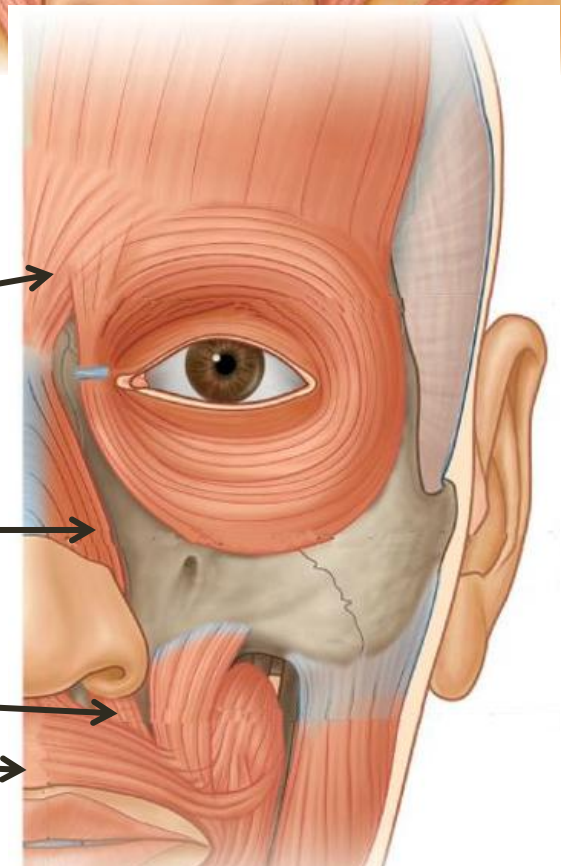
Nasal group:

Procerus

Compressor naris

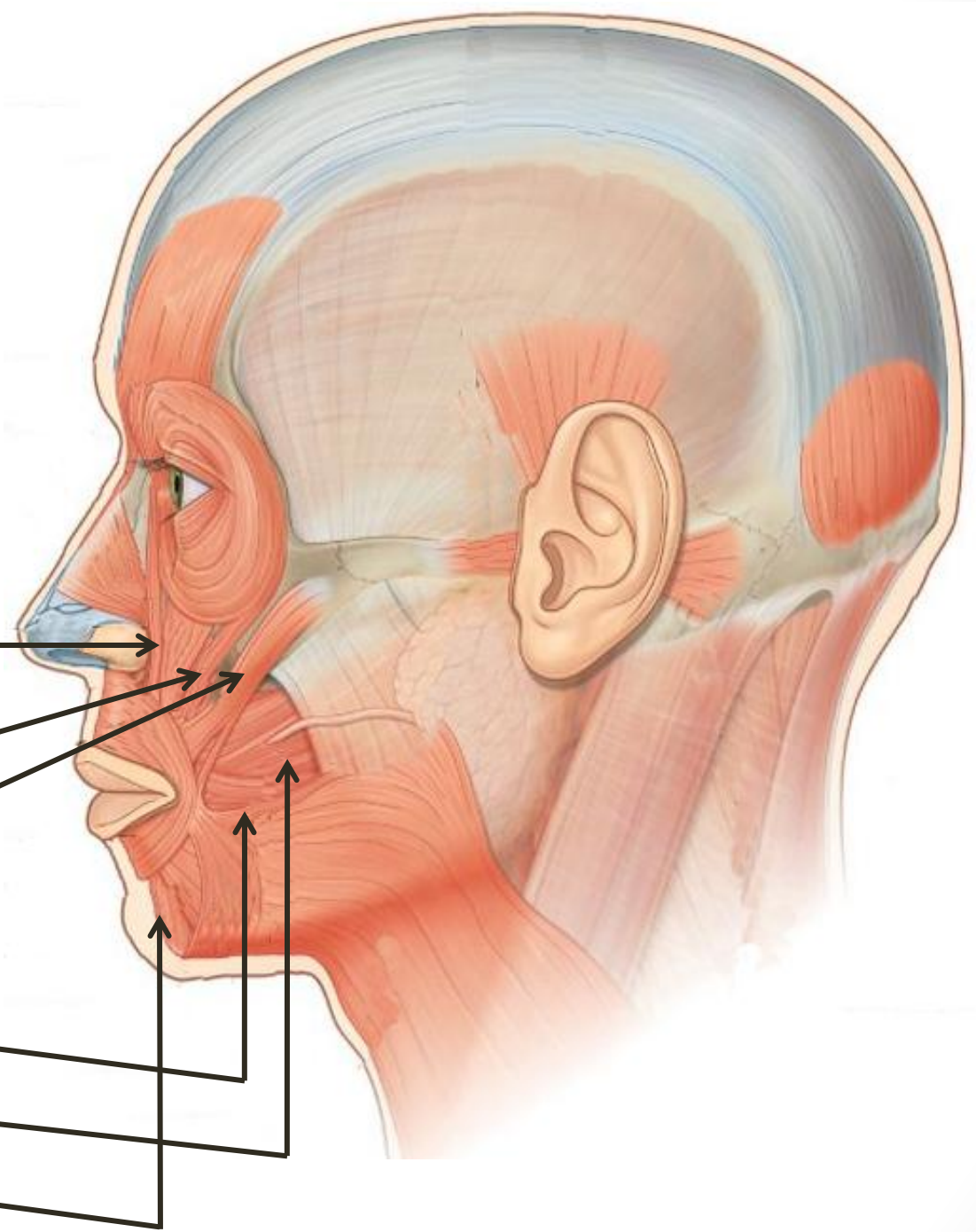
Dilators naris

Depressor septi



Oral group:

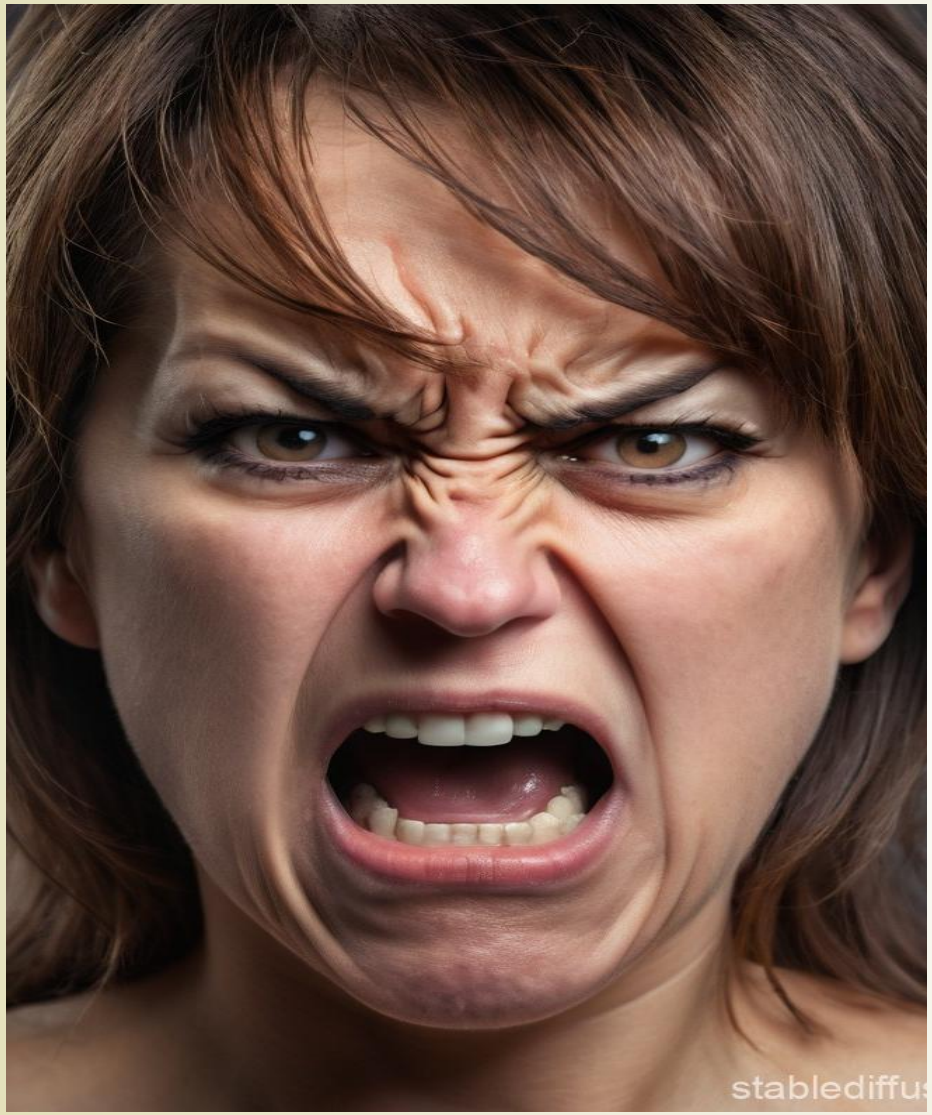
- Orbicularis oris
- Levator labii superioris
- Levator anguli oris
- Depressor labiiinferioris
- Depressor anguli oris
- Levator labiisuperioris alaeque nasi
- Zygomaticus minor
- Zygomaticus major
- Risorius
- Buccinator
- Mentalis



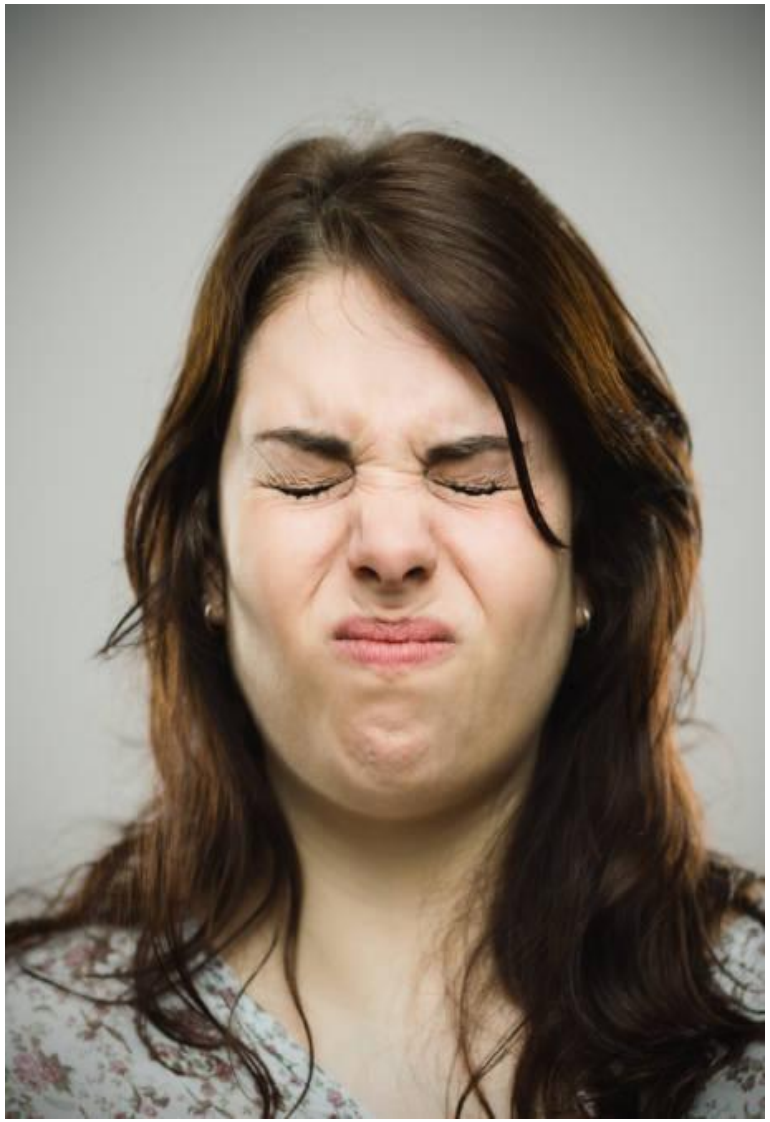
COMMON FACIAL EXPRESSIONS

Sadness

Anger



Frowning

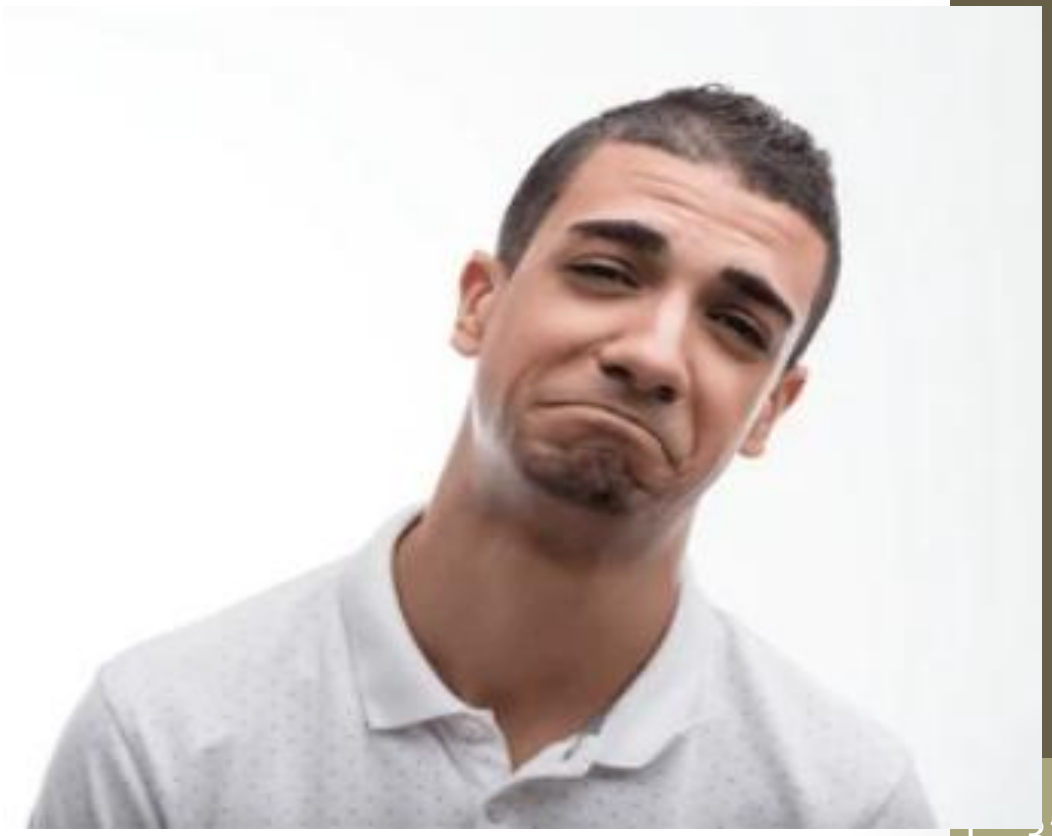


Grinning

Surprise, horror or fright

Laughing

Irony



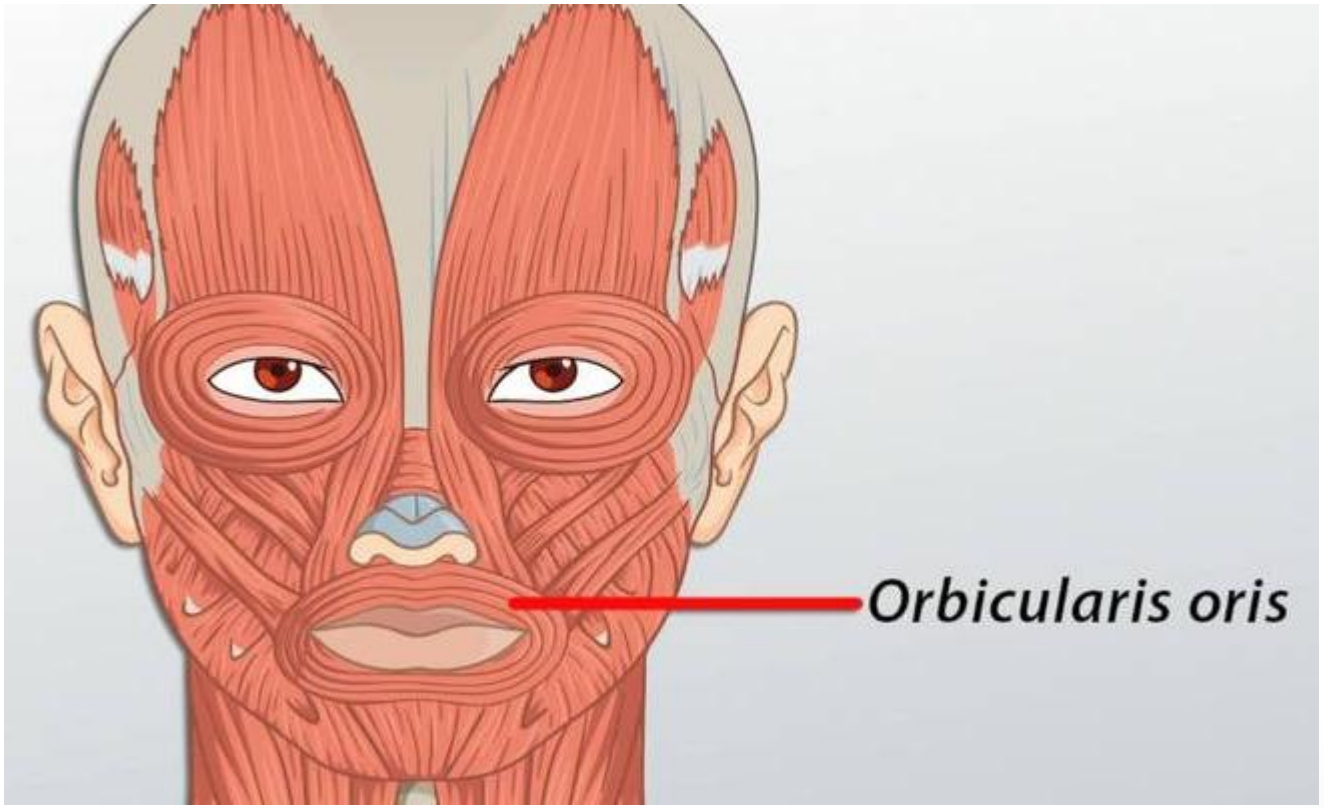
Disdain

Doubt

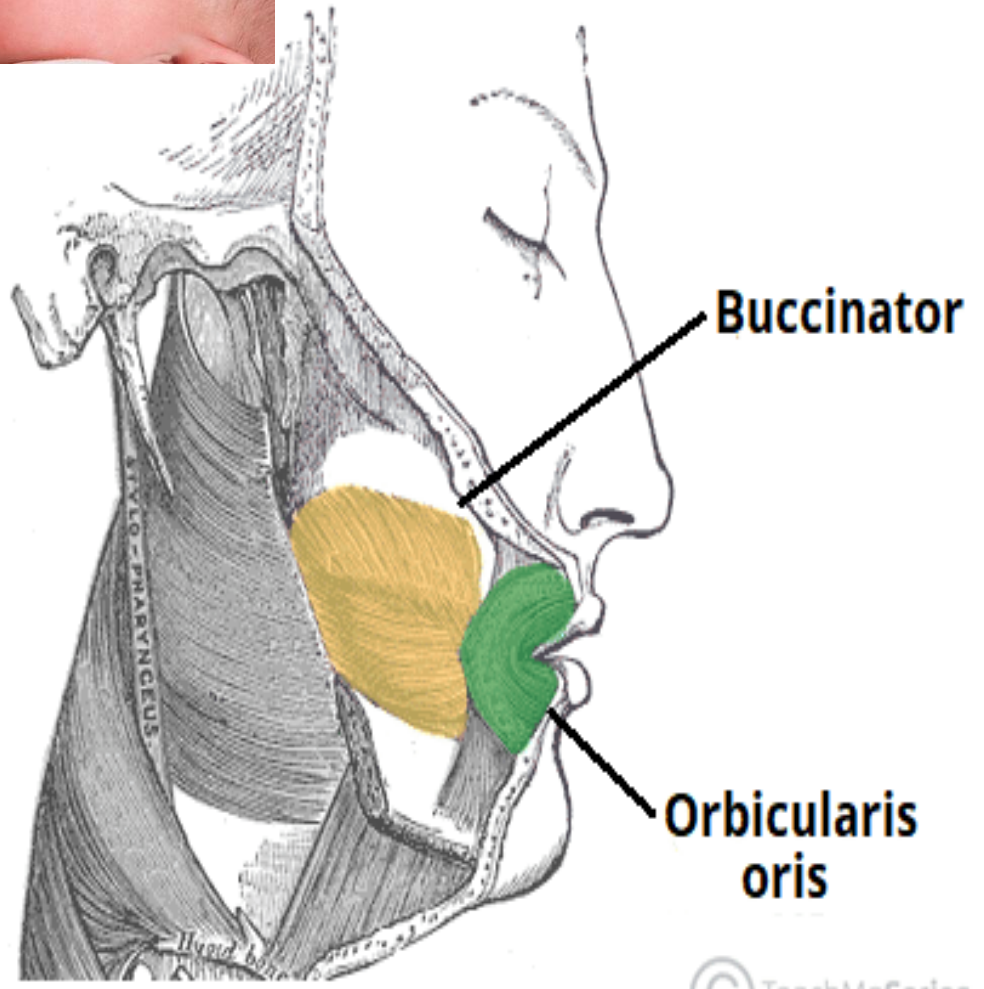
Daily activity

Kissing face

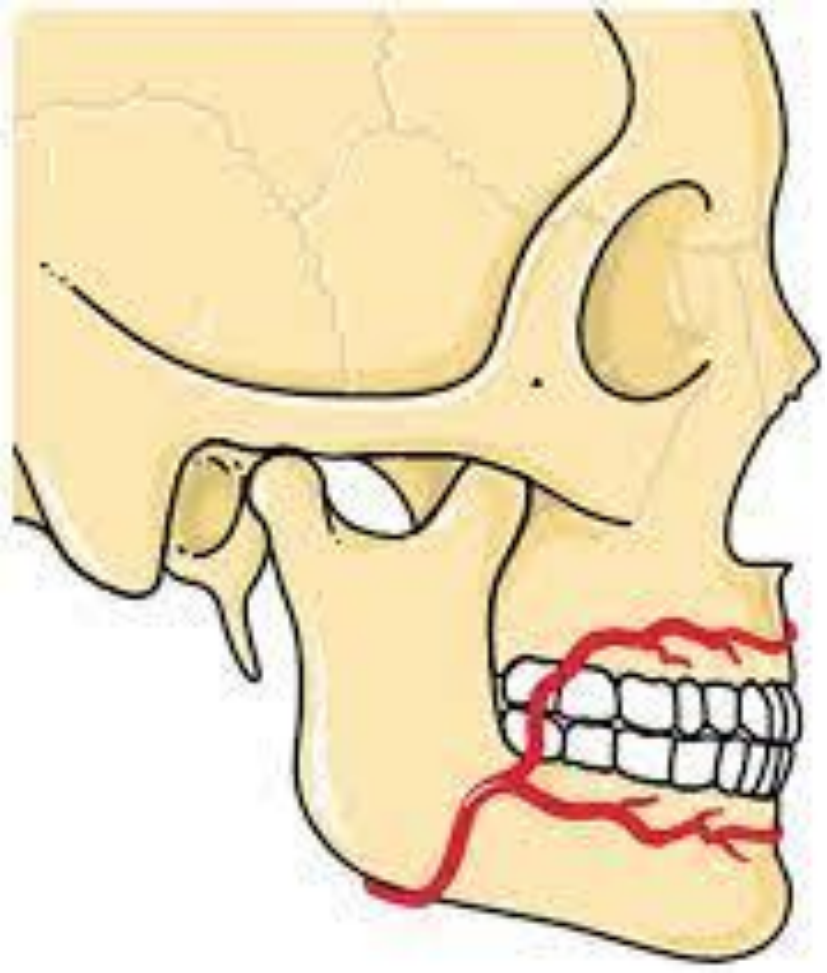
Orbicularis oris



Blowing of Air



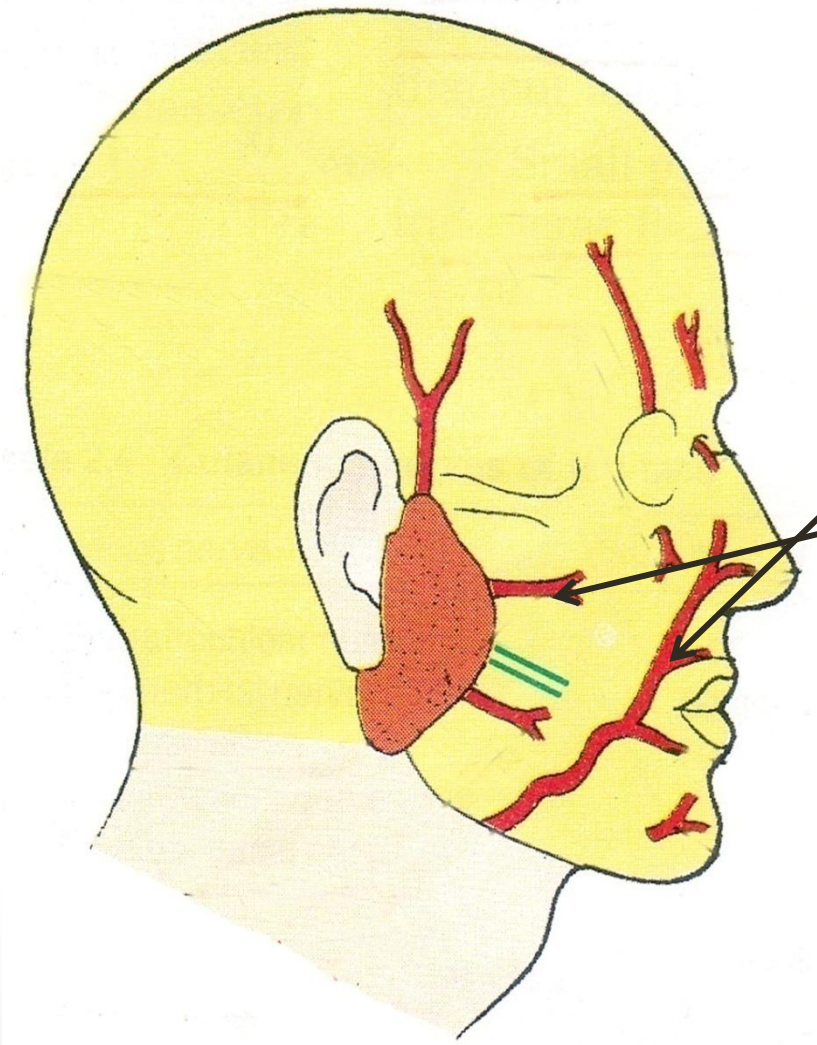
Buccinator+orbicularis oris



Blood supply of face

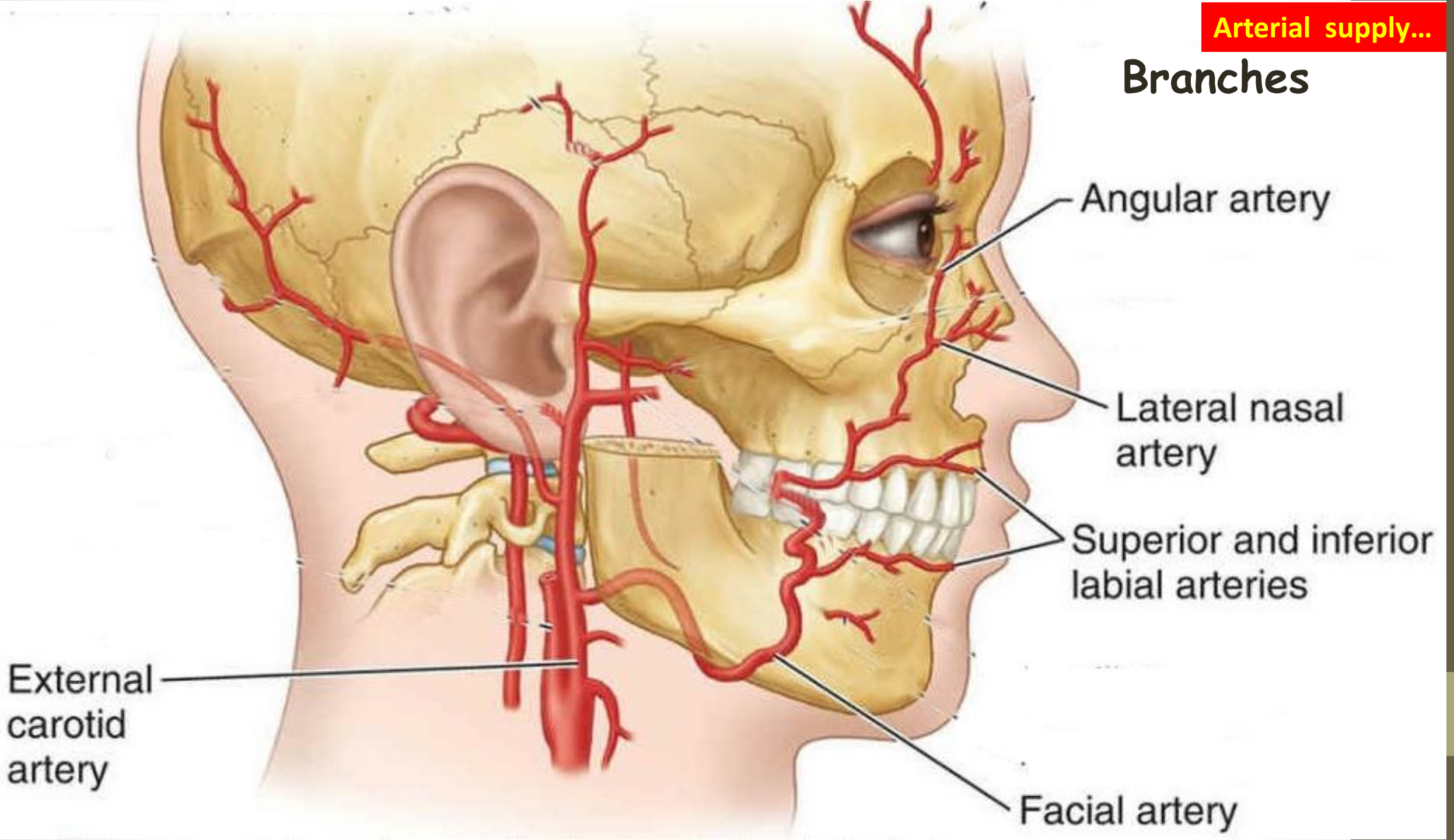
Which artery ?

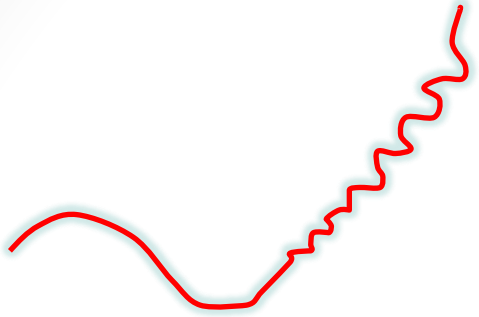
Arterial supply



1. Facial artery br. of ECA
2. Transverse facial artery br. of superficial temporal artery
3. Arteries that accompany the cutaneous n.

Branches


Angular artery
Lateral nasal artery
Superior and inferior labial arteries
External carotid artery
Facial artery



Facial artery is tortuous

Loop formation – for accommodation of Sub-mandibular gland
Body of mandible

Tortuosity allows

- **cervical part-expansion of pharynx during deglutition**
- **facial part- movements of mandible, lips, check**

Facial wounds bleed freely and heal quickly

So, the result of plastic surgery on the face are excellent

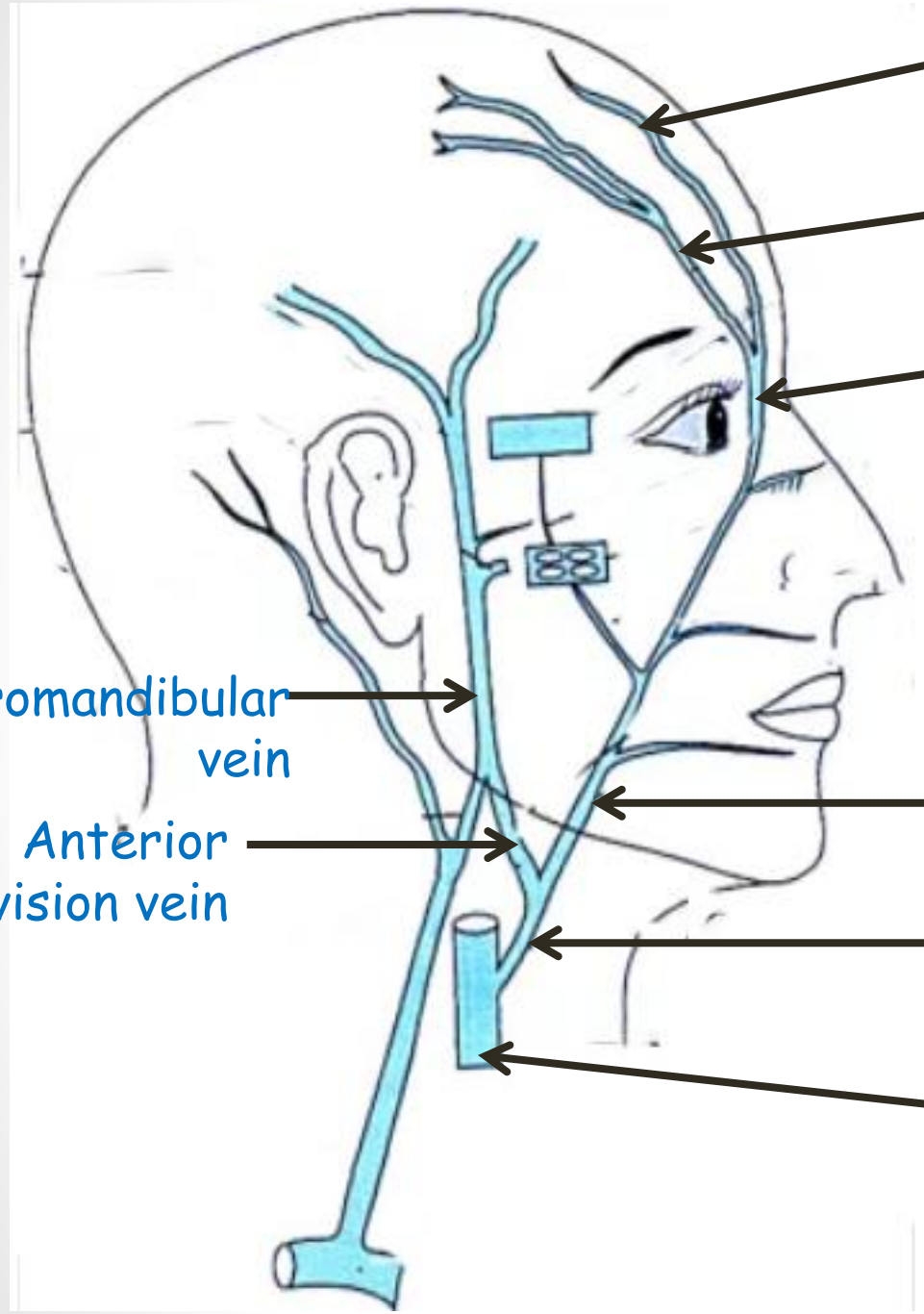
compression of the facial artery on one side does not stop all bleeding from a lacerated facial artery

--- having lots of anastomosis

Clench your teeth and palpate the facial pulse as the facial artery crosses the inferior border of the mandible immediately anterior to the masseter muscle and is called ‘anaesthetist’s artery’.

- **Venous drainage of the face**

Through facial vein, which is **valveless**



Supra-trochlear vein

+

Supra-orbital vein

↓

Angular vein

Retromandibular vein

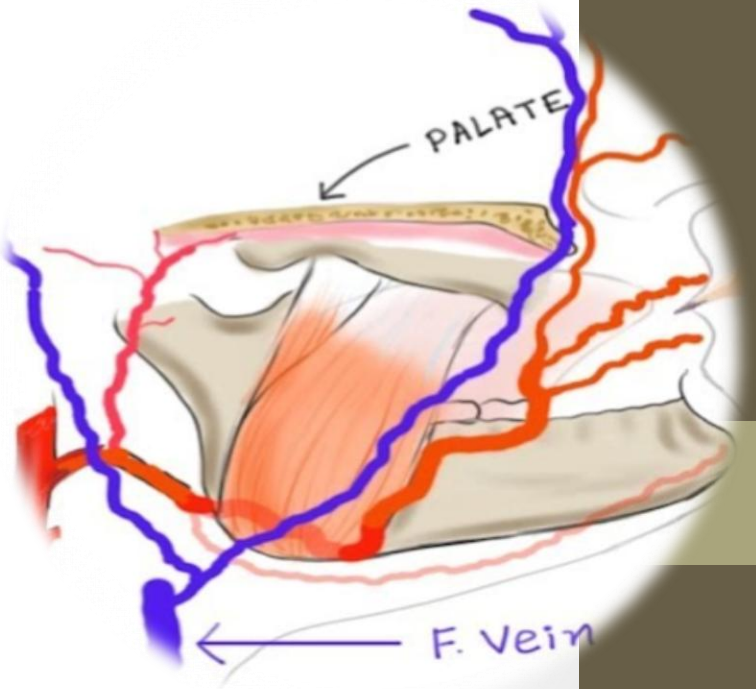
Anterior division vein

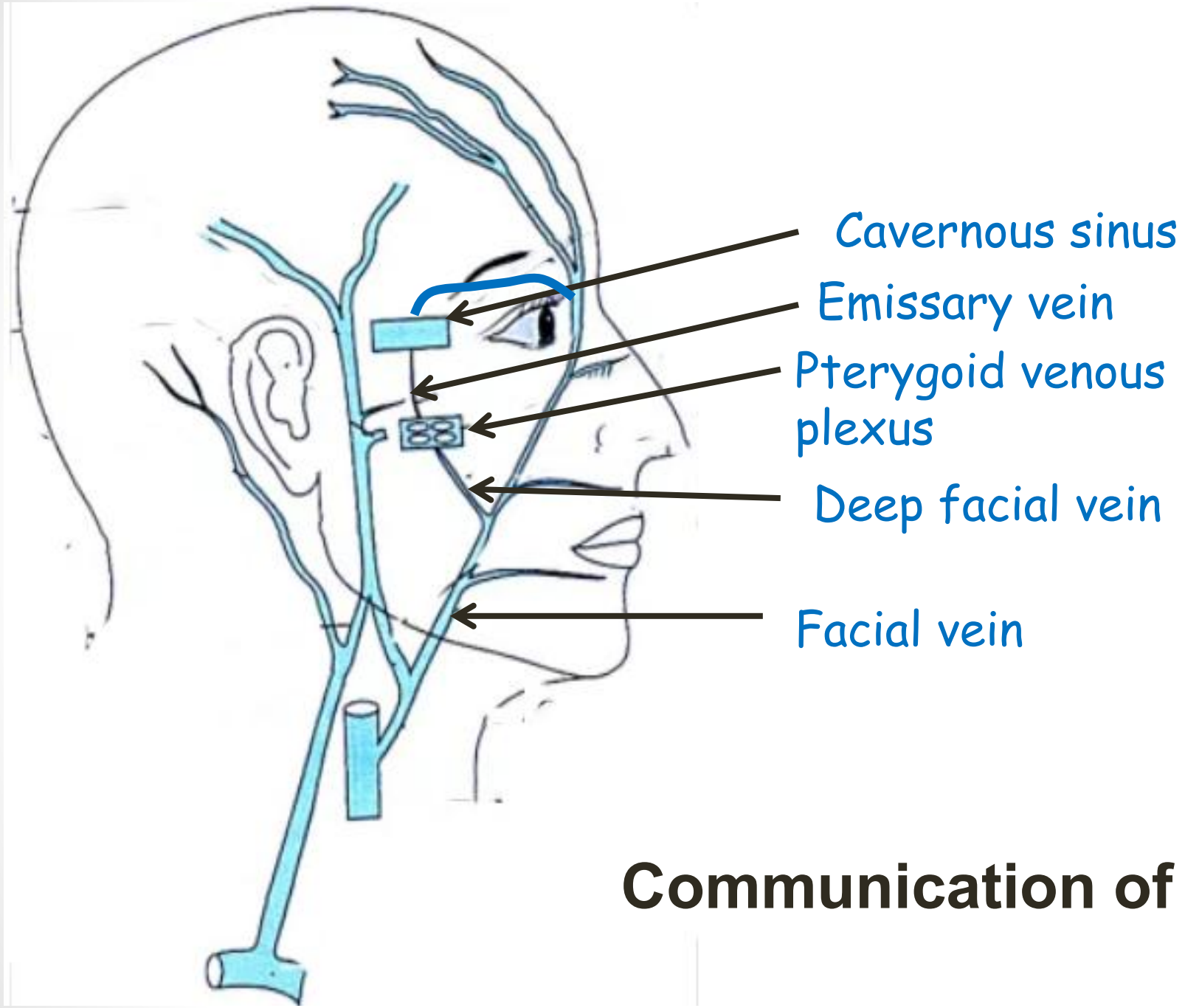
Facial vein

Common facial vein

Internal jugular vein

Formation & Termination of Facial Vein





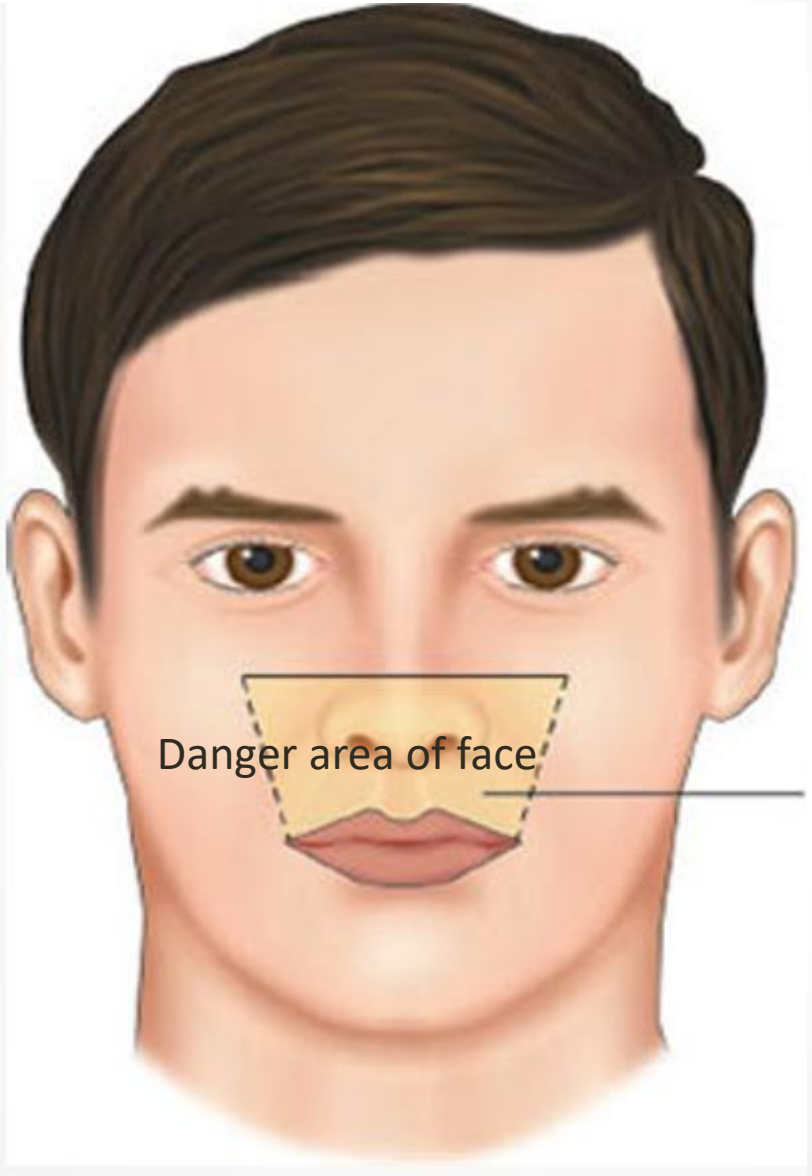
Communication of Facial vein

- **Danger area of face**

also known as "triangle of death" or "danger triangle

is defined by-

- upper lip
- lower part of the nose
- adjacent area



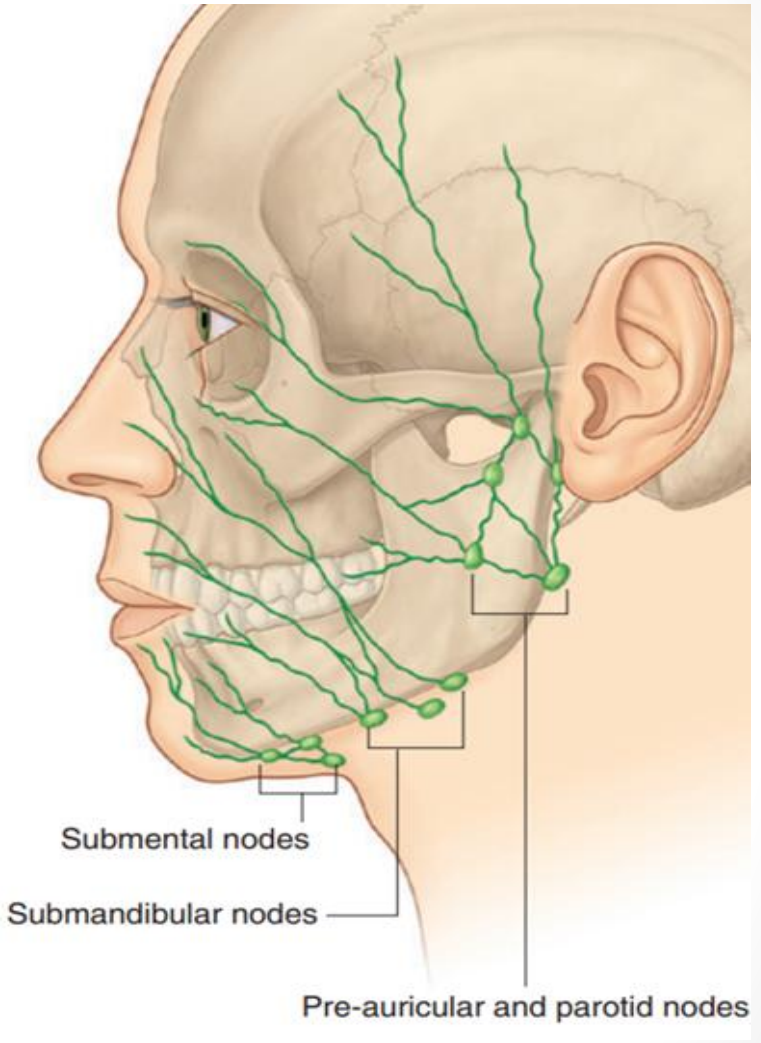
➢ Infections from this area can spread in retrograde directions and cause **thrombosis of cavernous sinus**

This area is, therefore called the dangerous area of face.

- Lymphatic drainage of face

Drain into

1. Preauricular parotid nodes- lateral part of face
2. Sub mandibular node- cheek, upper lip
3. Submental nodes- lower lip & chin



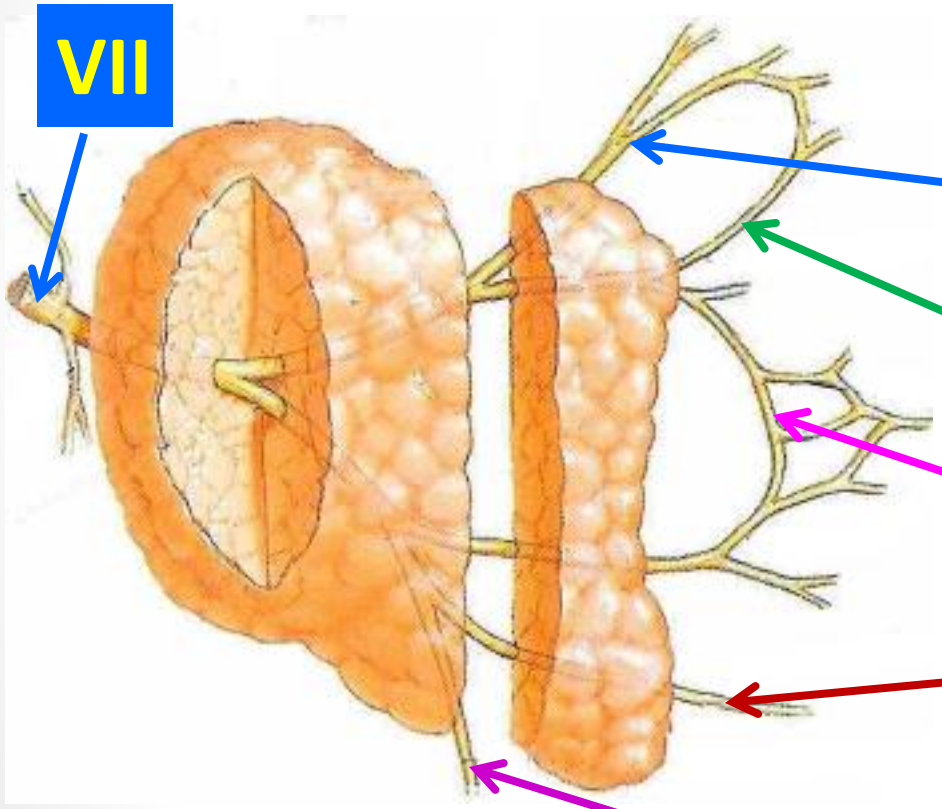
Clinical importance of lymphatic drainage of face

- **Diagnosis & staging of infections (e.g., acne, boils, cellulitis) often drain into specific lymph nodes**
- **Facial skin cancers (squamous cell carcinoma, melanoma) spread via lymphatics**

Innervation of face

- Innervated by
  - Motor- facial nerve and
  - Sensory- trigeminal nerve

Five terminal branches of facial nerve



Temporal

Zygomatic

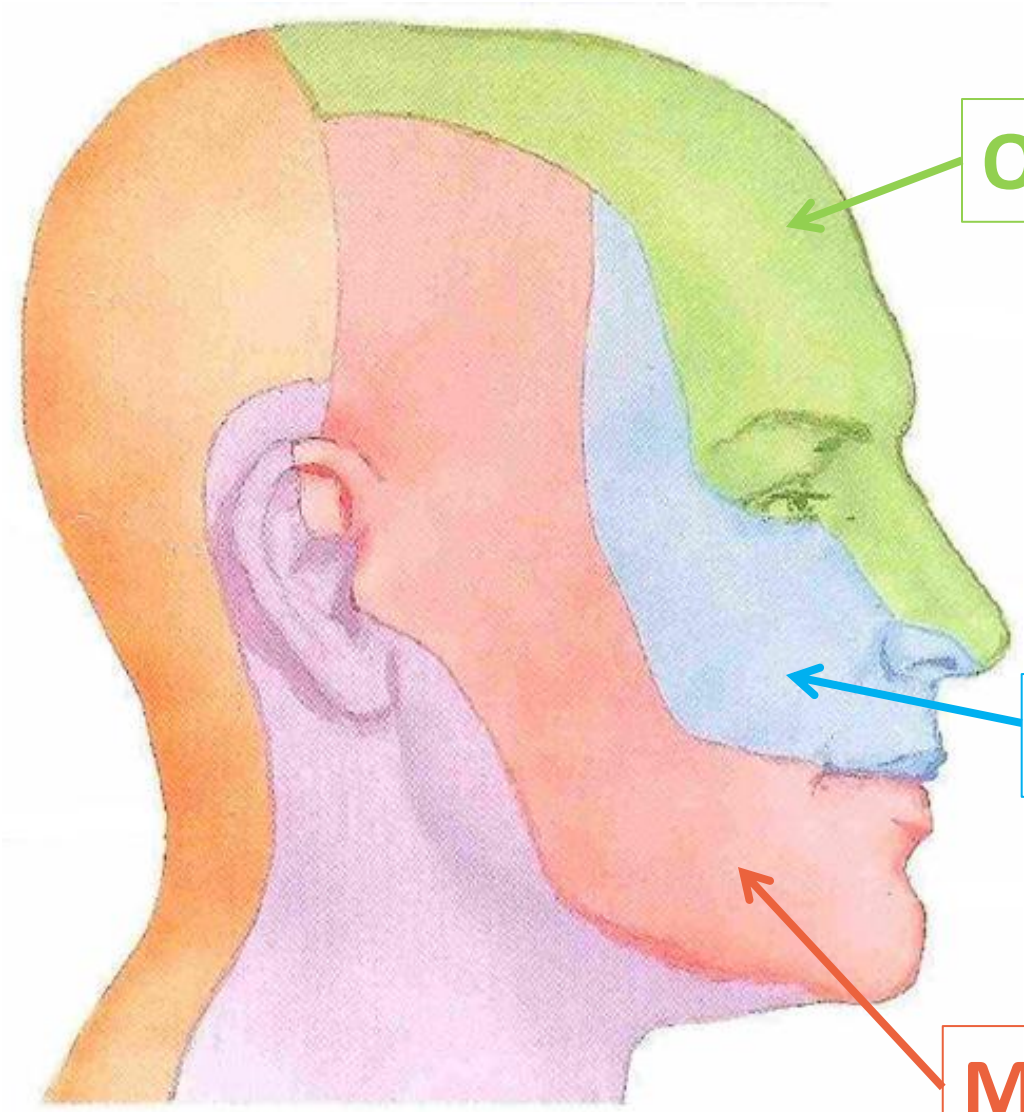
Buccal

Mandibular

Cervical

Trigeminal nerve

Three division of trigeminal nerve



Ophthalmic Nerve (V_1)

Maxillary Nerve (V_2)

Mandibular Nerve (V_3)

- **Trigeminal neuralgia or tic douloureux**
  - may involve one or more of the three divisions of trigeminal nerve
  - causes very severe burning and scalding pain along the distribution of affected nerve
  - demyelination of axons in the sensory root occurs.
  - most often in middle-aged and elderly persons
  - *paroxysm* (sudden sharp pain) can last for 15 minutes or more
  - In some cases, the pain may be so severe that psychological changes occur, leading to depression and even suicide attempts.
  - *herpes zoster virus infection* may produce a lesion in the trigeminal ganglia

- **Treatment**
  - pain is relieved either:

    (a) by **injecting 90% alcohol** into the affected division of the trigeminal ganglion, or

    (b) by **sectioning the affected nerve**, the main sensory root, or the spinal tract of the trigeminal nerve, which is situated superficially in the medulla.

    this procedure is called **medullary tractotomy**

Testing Sensory Function of CN V

Scenario

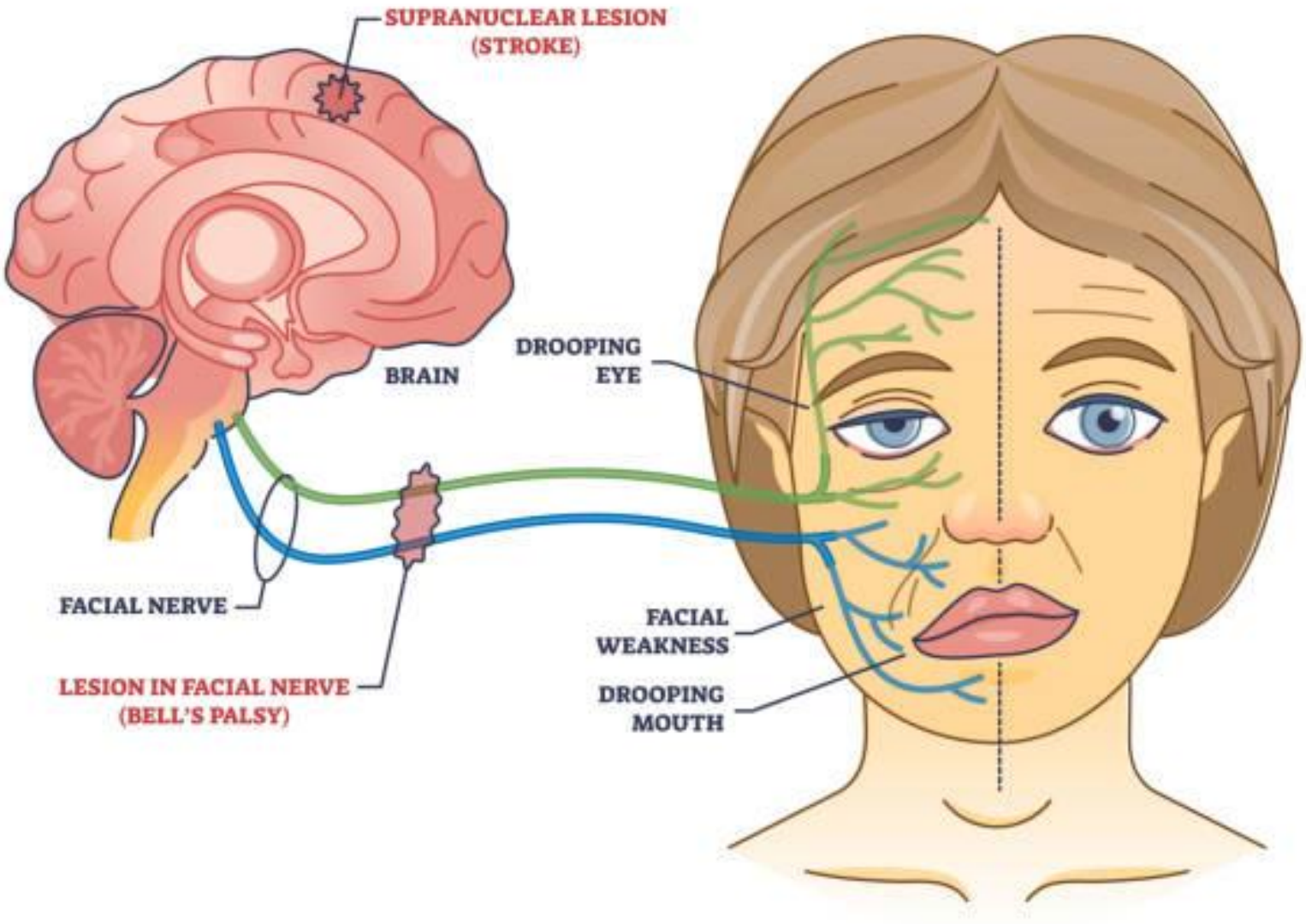
- A 58-year-old man presents with **sudden-onset facial drooping on the left side, inability to close his left eye, and difficulty smiling.** He denies limb weakness, trauma, or rash. No other neurological deficits are found.

  - What might be your diagnosis?

Diagnosis?

Most likely is Bell's Palsy

FACIAL PALSY



BELL'S PALSY VS STROKE

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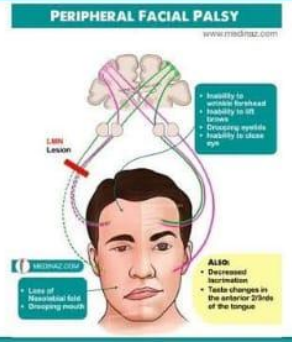
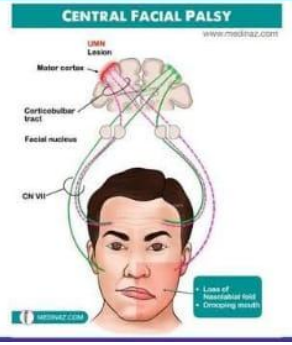
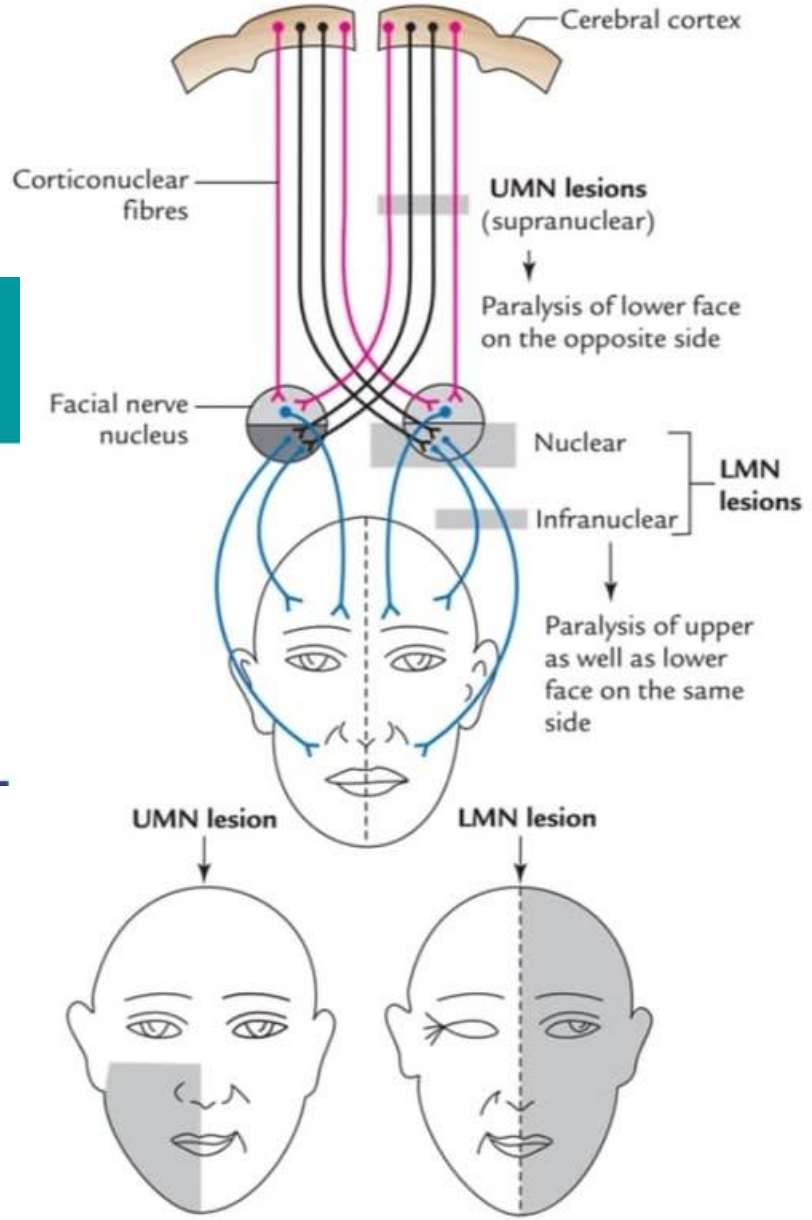
- **Bell's Palsy** = Peripheral LMN lesion → entire half of face affected, including forehead
- **Stroke** = Central UMN lesion → forehead sparing, often with other deficits





LESIONS OF FACIAL NERVE



- **Bell's palsy**
  - Facial nerve (cranial nerve VII) is involved
  - Causes
    - ✓ Often unknown (Idiopathic)

      It's thought to be caused by
    - ✓ Inflammation affecting the body's immune system
    - ✓ Other conditions, such as diabetes

- **Key features**
  - Sudden onset
  - Unilateral weakness
  - Inability to close the eye
  - Difficulty with smiling
  - Absence of other neurological deficits

Symptoms of facial weakness or paralysis get worse over the first few days and start to improve in about 2 weeks

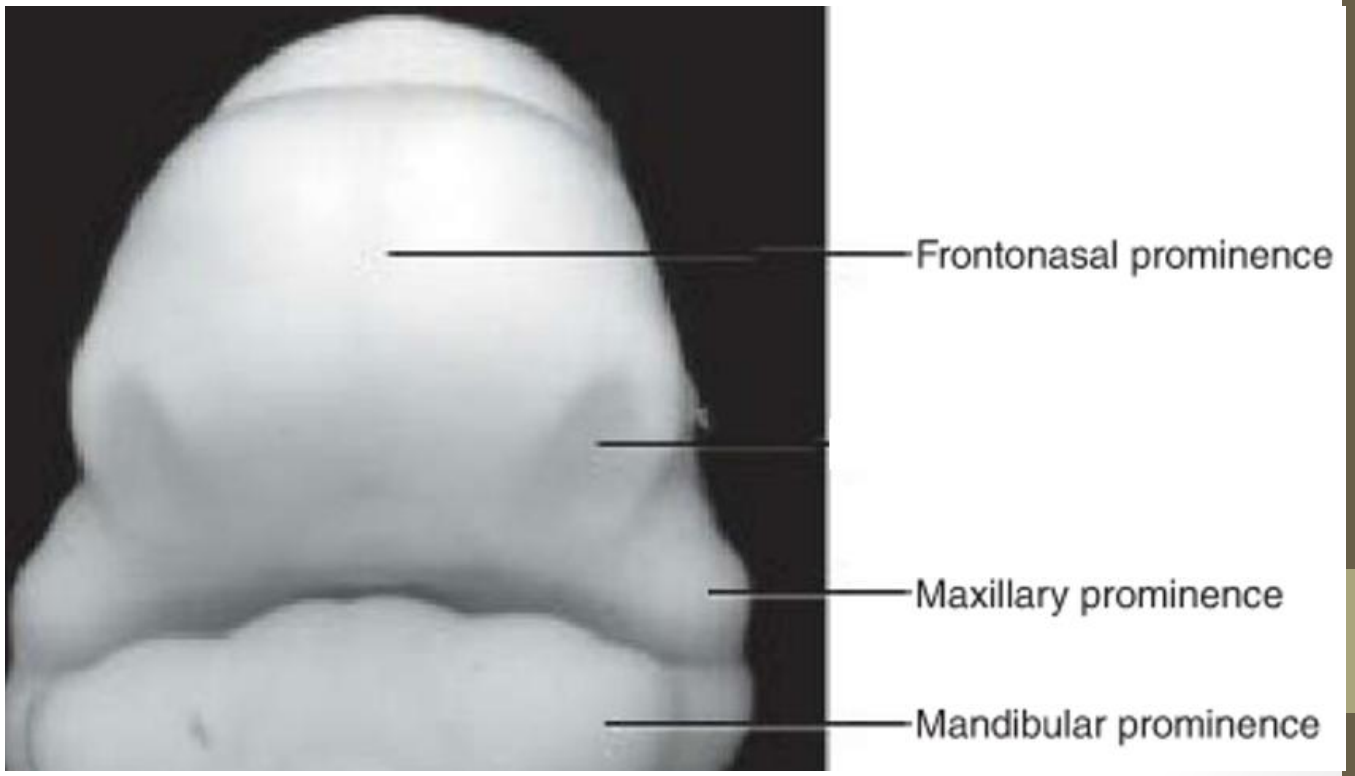
Treatment

- Administration of corticosteroids (e.g., prednisone) is often recommended ideally within 72 hours of symptom onset
- Antiviral medications may be considered if a viral cause (e.g., herpes simplex) is suspected
- Eye care to protect the cornea due to the inability to close the eye

- Development of face

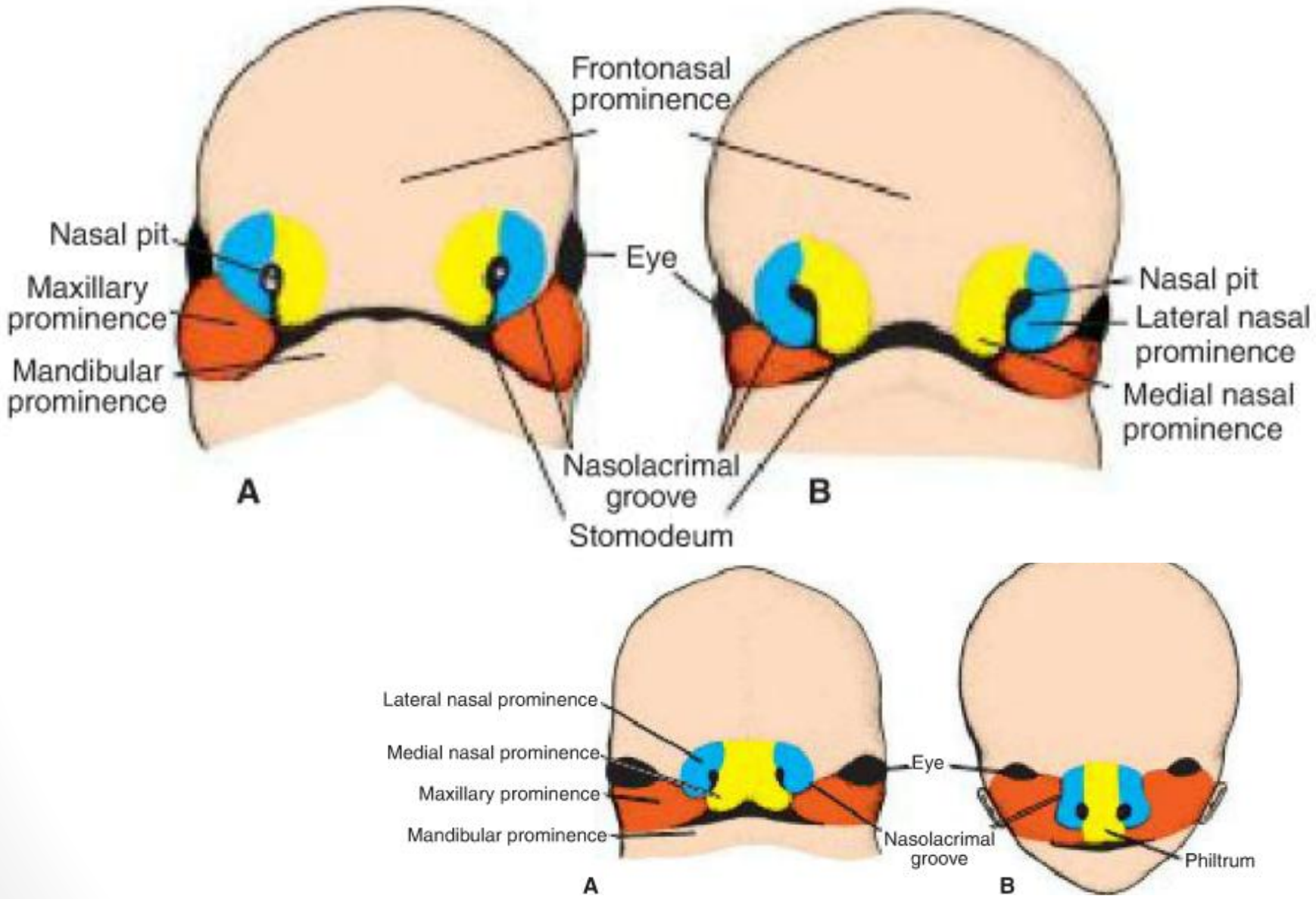
Developed from three processes

- Fronto-nasal
- Maxillary
- Mandibular



Prominence	Formed Structures
Frontonasal	Forehead, bridge of nose, and medial and lateral nasal prominences
Maxillary	Cheeks, lateral portion of upper lip
Medial nasal	Philtrum of upper lip, crest, and tip of nose
Lateral nasal	Alae of nose
Mandibular	Lower lip

The frontonasal prominence is a single unpaired structure; the other prominences are paired


Frontonasal prominence
Nasal pit
Maxillary prominence
Mandibular prominence
Eye
Nasal pit
Lateral nasal prominence
Medial nasal prominence
Nasolacrimal groove
Stomodeum
A
B
Lateral nasal prominence
Medial nasal prominence
Maxillary prominence
Mandibular prominence
Eye
Nasolacrimal groove
Philtrum
A
B

Developmental anomalies of face

- Unilateral cleft lip
- Bilateral cleft lip
- Median cleft lip
- Cleft palate
- Oblique Facial Cleft
- Unilateral macrostomia
- Microstomia

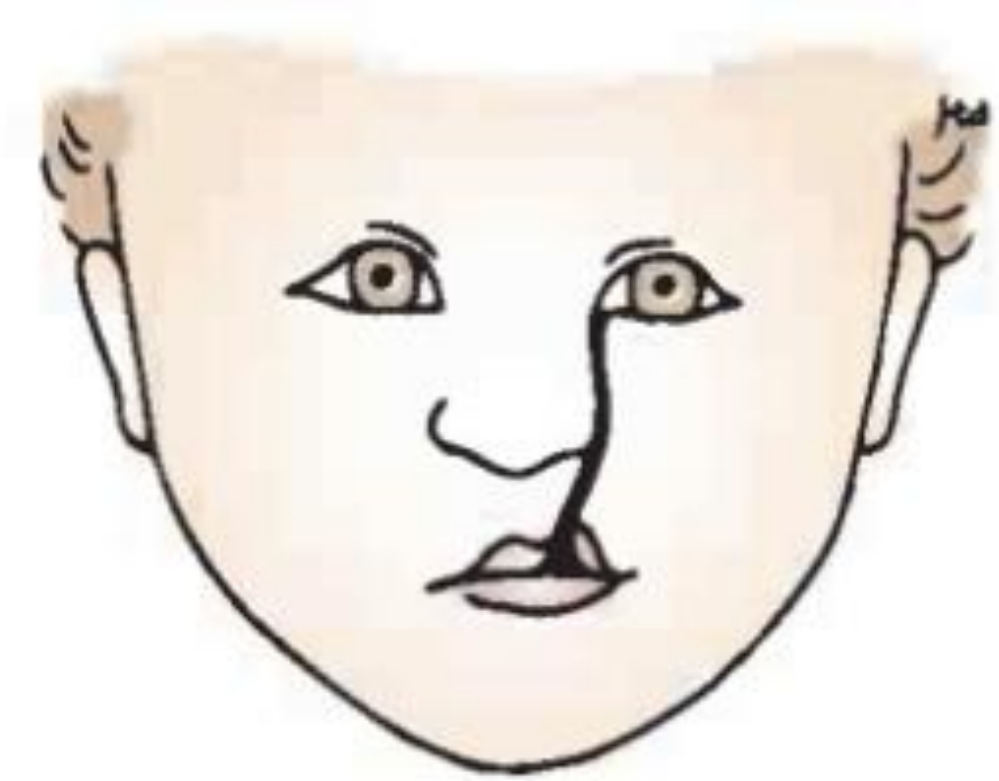
- **Unilateral cleft lip**

- **Bilateral cleft lip**

- **Median cleft lip**

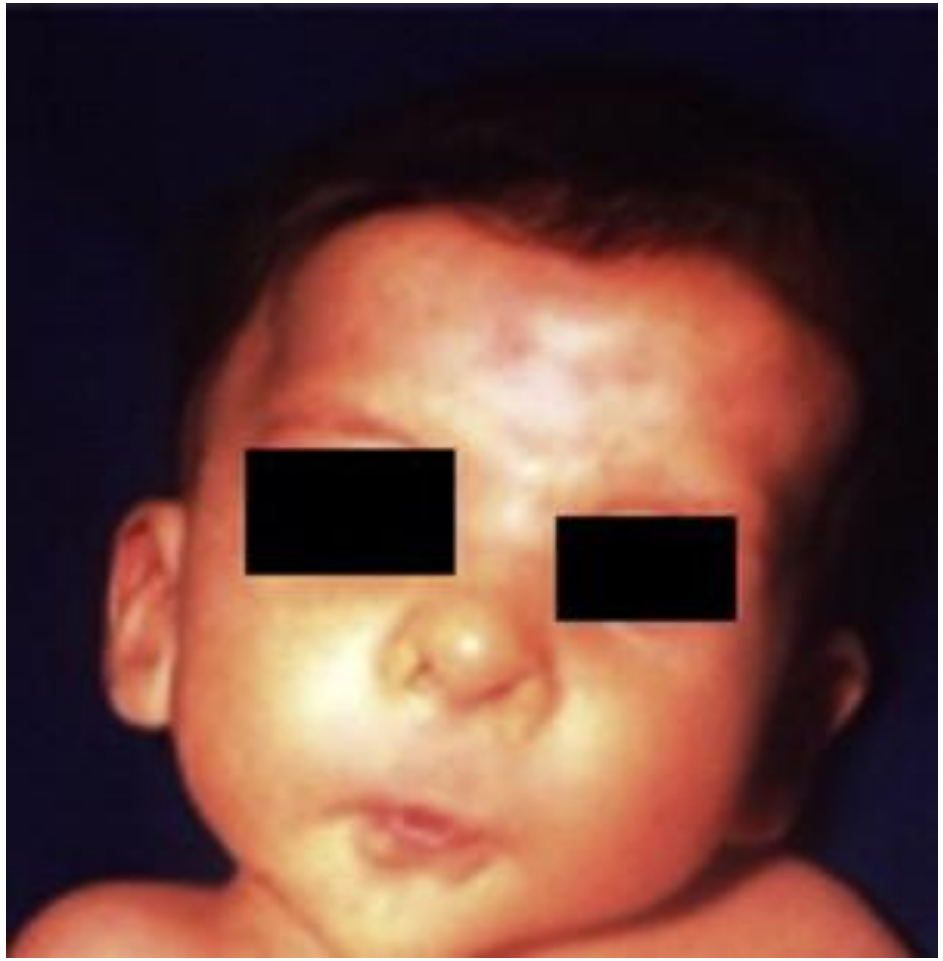
- Cleft lower lip

- **Oblique facial cleft**



- **Macrostomia**

- Microstomia



Management of developmental anomalies of face

- Involves a multidisciplinary approach, often include
  - Surgery
  - Orthodontics
  - Speech therapy
  - Genetic counseling

  Early diagnosis and intervention are crucial for optimal outcomes.


Thank You!