

وسهلا



أهلا

يُمنع أخذ السلايدات بدون  
إذن المحرر واي اجراء  
يخالف ذلك يقع تحت طائلة  
المسؤولية القانونية  
جميع المعلومات للاستخدام  
التعليمي فقط

الأستاذ الدكتور يوسف حسين

كلية الطب - جامعة مؤتة - الأردن

دكتورة من جامعة كولونيا المانيا

Prof. Dr. Youssef Hussein Anatomy - YouTube

الواتس (أي استفسار)  
00201224904207

[dr\\_youssefhussein@yahoo.com](mailto:dr_youssefhussein@yahoo.com)

# Trigeminal nerve

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**Mesencephalic nucleus (GSA)**: receives proprioceptive sensations from the face and scalp, jaw, mandibular teeth, and anterior two-thirds of the tongue

**Main sensory nucleus (GSA)**: receives crude touch from the face and scalp

Trigeminal Ganglia

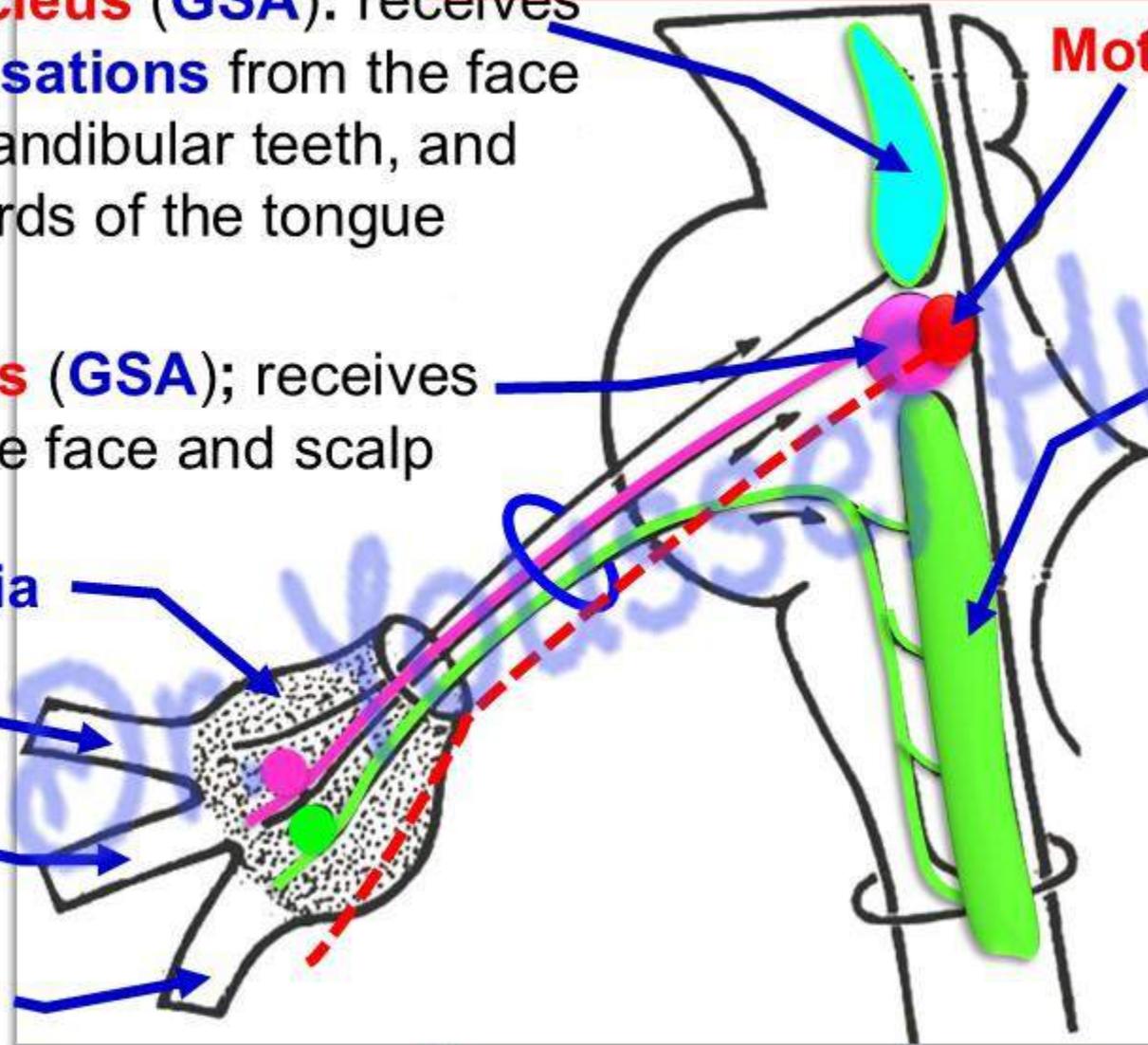
Ophthalmic nerve

Maxillary nerve

Mandibular nerve

**Motor nucleus (SVE)**: for muscles the first pharyngeal arch

**Spinal nucleus of trigeminal (GSA)**: receives pain and temperature sensations from the face and scalp



**Nuclei of trigeminal nerve**

It is the thickest cranial nerve.  
Type: mixed nerve

[dr\\_youssefhussein@yahoo.com](mailto:dr_youssefhussein@yahoo.com)

# Mandibular nerve

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- **Mandibular nerve**

- It is the 3<sup>rd</sup> division of trigeminal nerve.

- **Origin (root):** It is a mixed nerve formed of 2 roots:

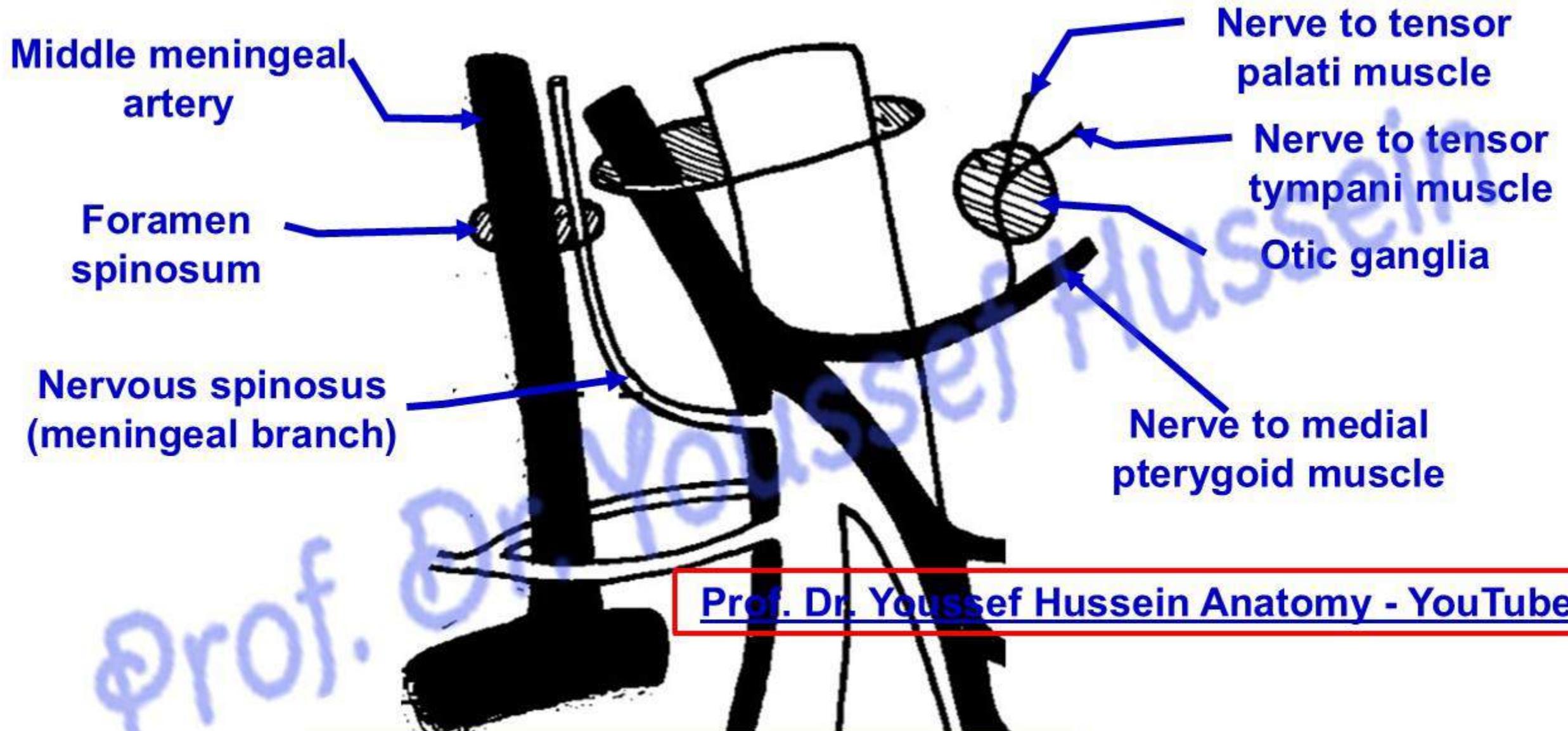
- a- **Sensory root** (large): arises from the trigeminal ganglion.

- b- **Motor root** (small): arises from the motor nucleus of the trigeminal nerve in the pons. It supplies the **muscles of the 1<sup>st</sup> pharyngeal arch**.

- **Course :**

- The 2 roots unite together to form the main trunk of mandibular nerve (mixed)

- The mandibular nerve descends through the **foramen ovale** to the infratemporal fossa, divided into **anterior and posterior divisions**



**Branches of the trunk**  
(2N; one sensory and one motor)

## Branches of Anterior division

Temporalis muscle

Two deep temporal branches

Masseteric branch to master M

Nerve to lateral pterygoid M

**Buccal nerve** (sensory) supply skin on outer surface of buccinator muscle, then pierces buccinator muscle to supply Mucosa of the cheek and gum.

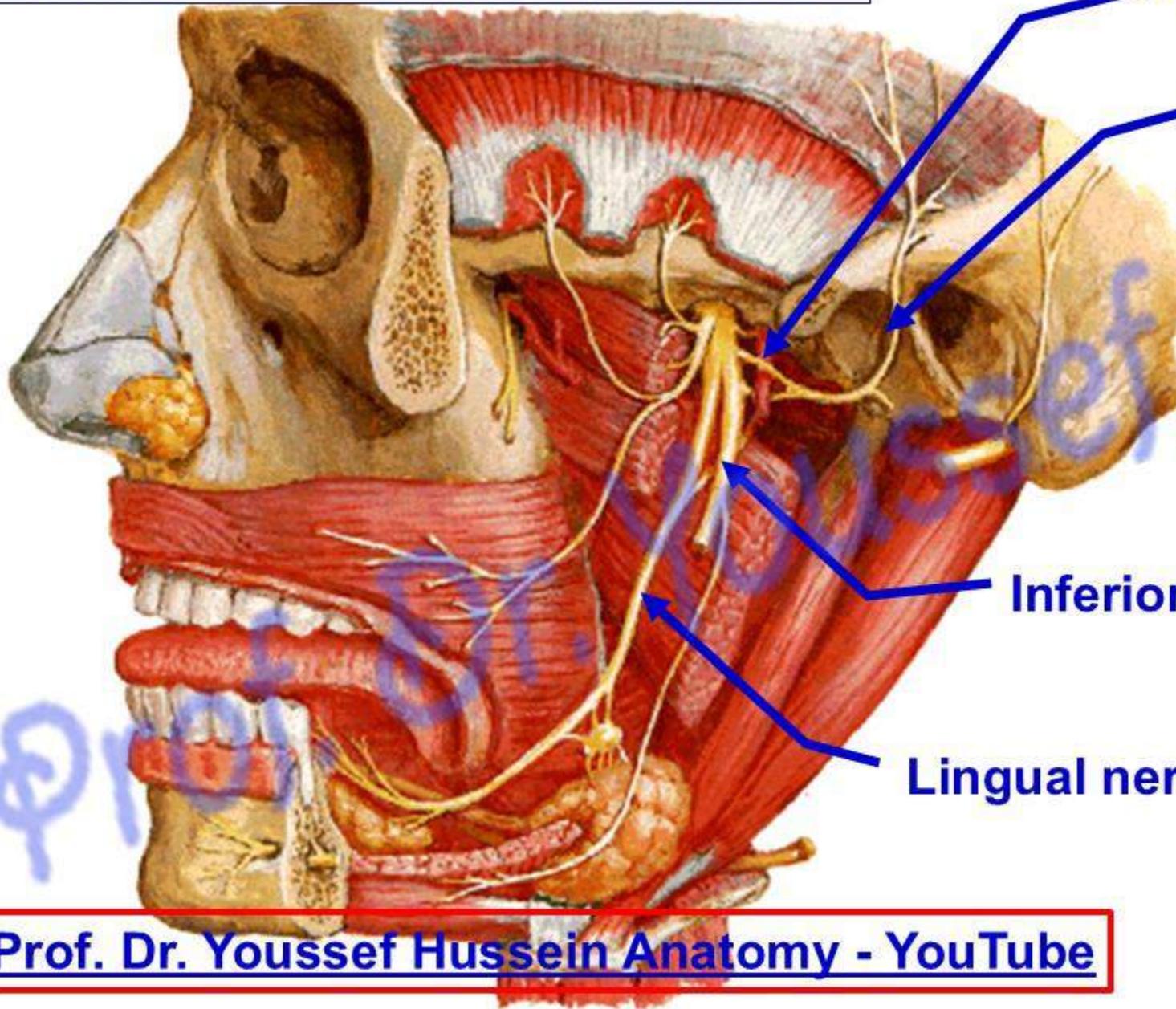
Buccinator

Lateral pterygoid

Medial pterygoid

**3 motors +  
1 sensory**

## Branches of Posterior division



Middle meningeal artery

Auriculotemporal nerve

- It arises by 2 roots which surround the middle meningeal artery deep to the lateral pterygoid muscle.

Inferior alveolar nerve

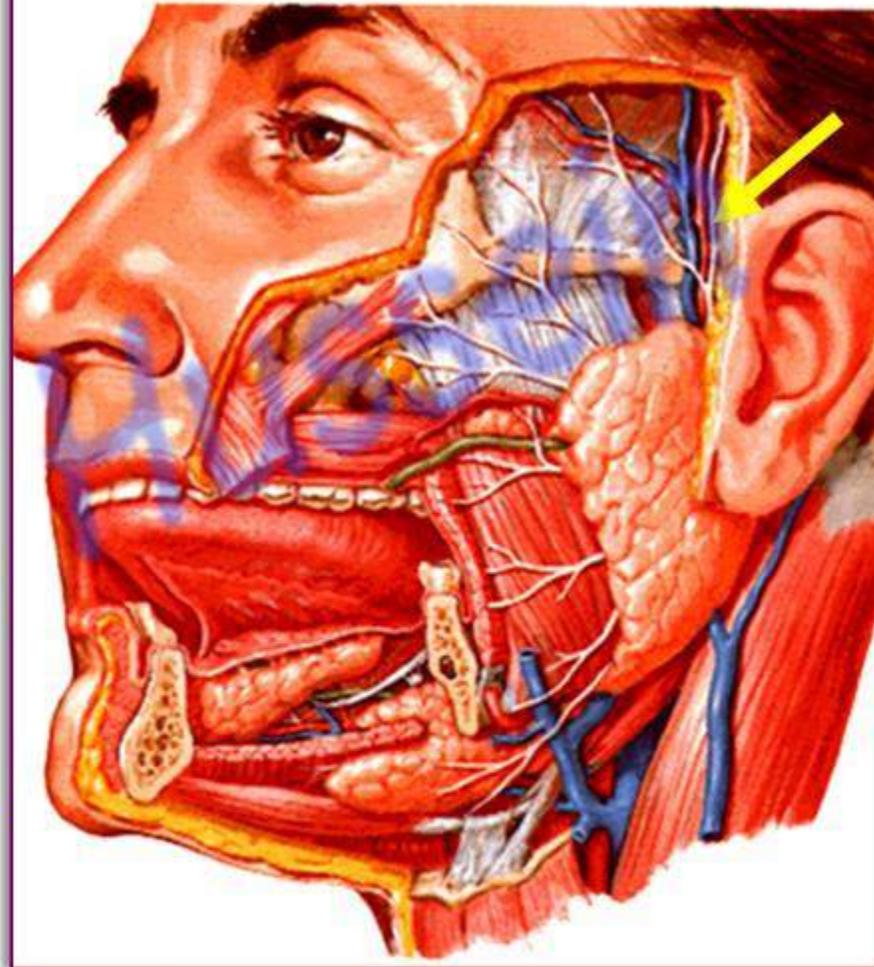
Lingual nerve

❖ **Auriculotemporal nerve: (sensory)**

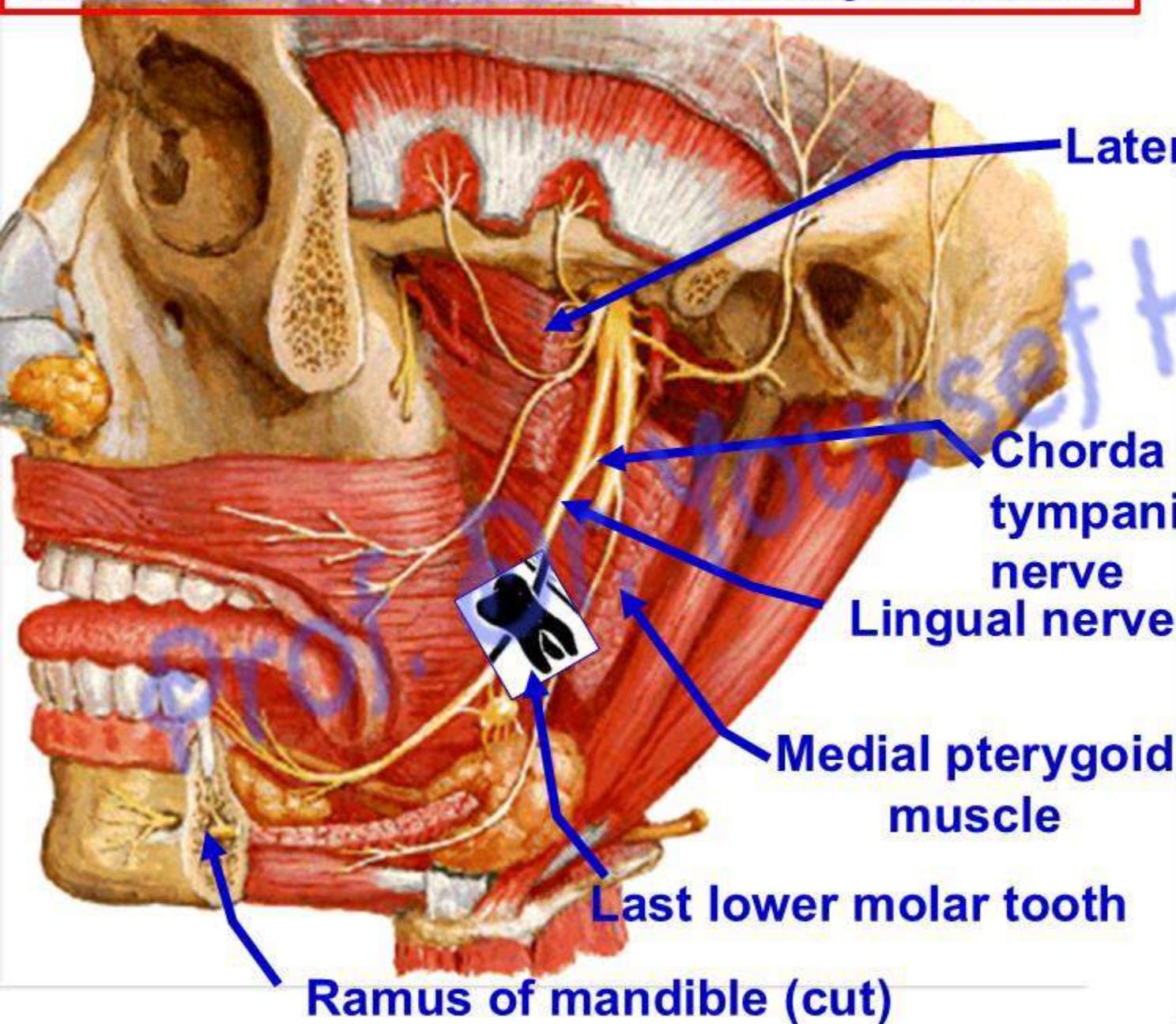
- It passes backwards and enters the **parotid gland**.
- It exits at its upper pole **behind the superficial temporal vessels (VAN)**.
- It ascends in front of auricle to the temporal fossa.

**\*\* Branches,**

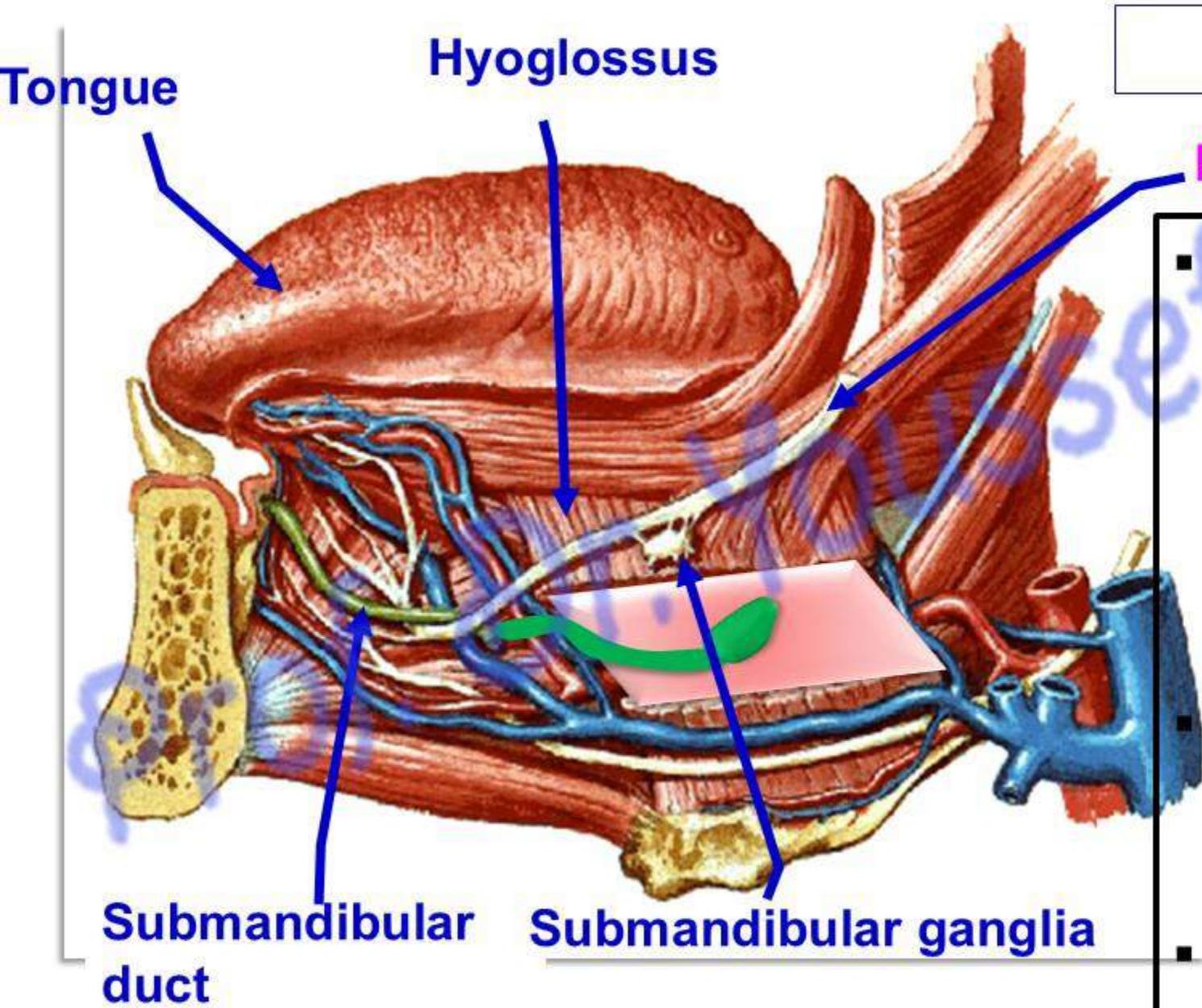
- 1) **Temporal** branches to the temporal region (temple)..
- 2) **Auricular** branches to the auricle
- 3) Branches to Skin of the **external auditory meatus** and **outer surface of the ear drum**.
- 4) **Articular branch** to the temporo-mandibular joint.
- 5) Sensory branches to the **parotid gland**.
- 6) **Postganglionic Parasympathetic** to **parotid gland** from otic ganglion.



## Lingual Nerve from posterior division



- It lies **deep to lateral pterygoid muscle**. Here it is **joined by chorda tympani nerve** (branch of **facial nerve** carrying taste sensation and parasympathetic fibers to submandibular Ganglia).
- Then, it descends between ramus of the mandible (**laterally**) and the medial pterygoid muscle (**medially**).
- It passes along a **groove on the inner surface of the socket** of the **last lower molar tooth** just undercover of the mucosa of the gum (**dangerous position**) during last molar tooth extraction)



## Lingual Nerve

### Lingual nerve

- Then, it enters the **submandibular triangle**, crosses superficial to the hyoglossus muscle. Here, the **submandibular ganglion** hangs from it.
- The nerve has a triple relation with **submandibular duct** (lateral, below, medial)
- Both nerve and duct pass forwards and upward to tongue.

- **Types of fibres of lingual nerve:**

- (1) It carries **general sensations (GSA)** from anterior 2/3 of the tongue to the trigeminal ganglia.
  - (2) It carries **taste sensations (SVA)** from anterior 2/3 of the tongue to the **solitary nucleus** through chorda tympani branch of facial nerve (**CARRIER**).
  - (3) **Parasympathetic fibers (GVE)** → the facial nerve → chorda tympani (join the lingual nerve) to relay in the **submandibular ganglion** → postganglionic fibres supply the submandibular and sublingual glands (**CARRIER**).
- **Applied anatomy; Injury** of the lingual nerve leading to
    - 1) Loss of the general and taste sensation from the corresponding 1/2 of the anterior 2/3 of the tongue.
    - 2) Loss of the secretion from submandibular and sublingual salivary glands of the same side.



## ❖ Inferior alveolar nerve (Mixed nerve)

- It is the largest branch of the posterior division of mandibular nerve.
- **Course and relations** : [Prof. Dr. Youssef Hussein Anatomy - YouTube](#)
- It begins deep to lateral pterygoid muscle, It descends between ramus of mandible (laterally) and medial pterygoid muscle (medially).
- It enters the mandibular foramen and runs in the mandibular canal. It ends in the mandibular canal by dividing into 2 branches (**mental and incisive nerves**).

### Branches;

#### 1- Nerve to mylohyoid (only motor branch of the posterior division):

- It arises before entering the mandibular foramen to supply mylohyoid and anterior belly of digastric muscles.

#### 2- Dental branches to the lower molar and premolar teeth.

#### 3- Incisive nerve: to the lower incisor and canine teeth.

#### 4- Mental nerve: exits from the mental foramen and supplies the skin of the chin and lower lip.

[dr\\_youssefhussein@yahoo.com](mailto:dr_youssefhussein@yahoo.com)

# Maxillary nerve

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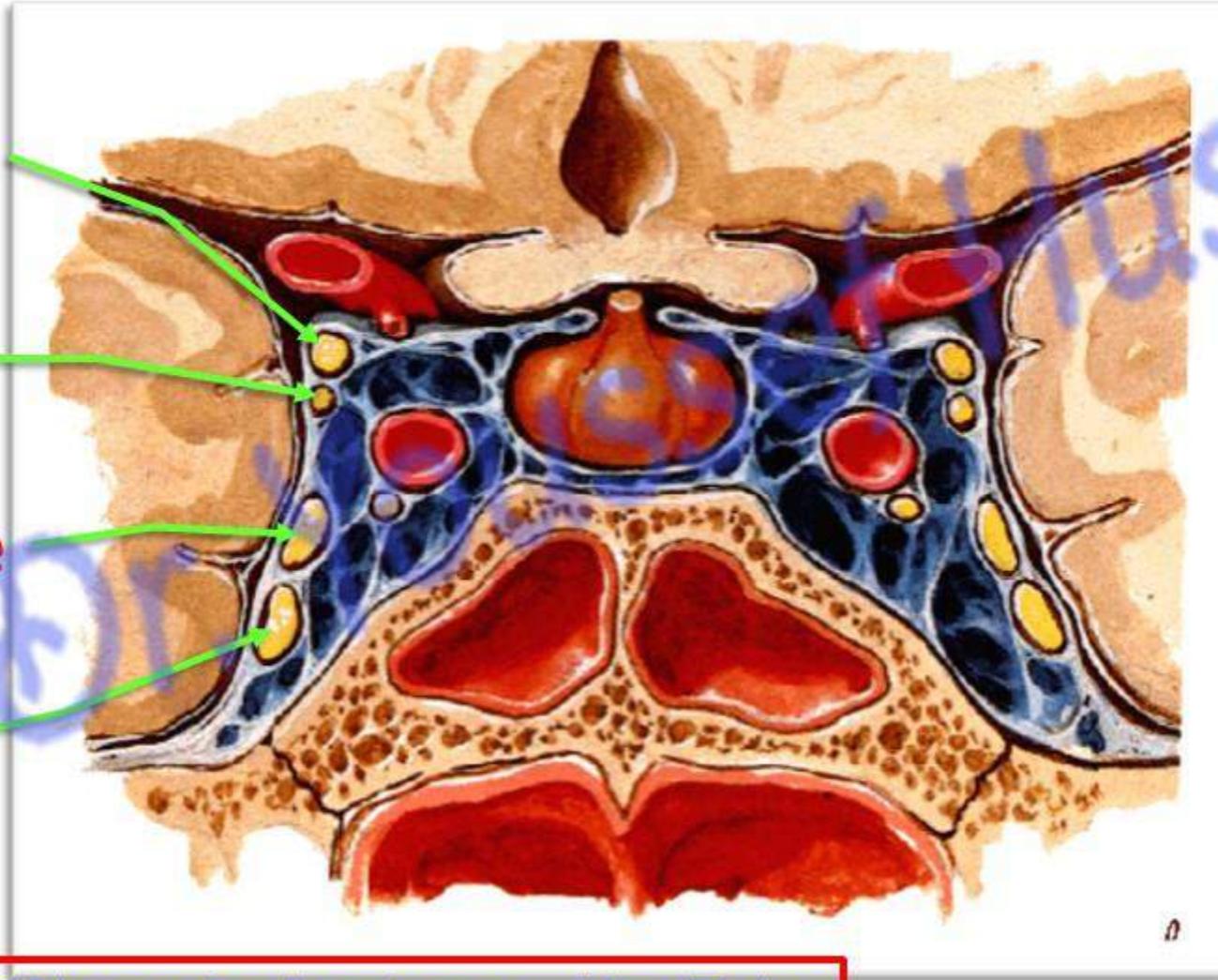
- It passes in the lateral wall of the cavernous sinus

Oculomotor nerve

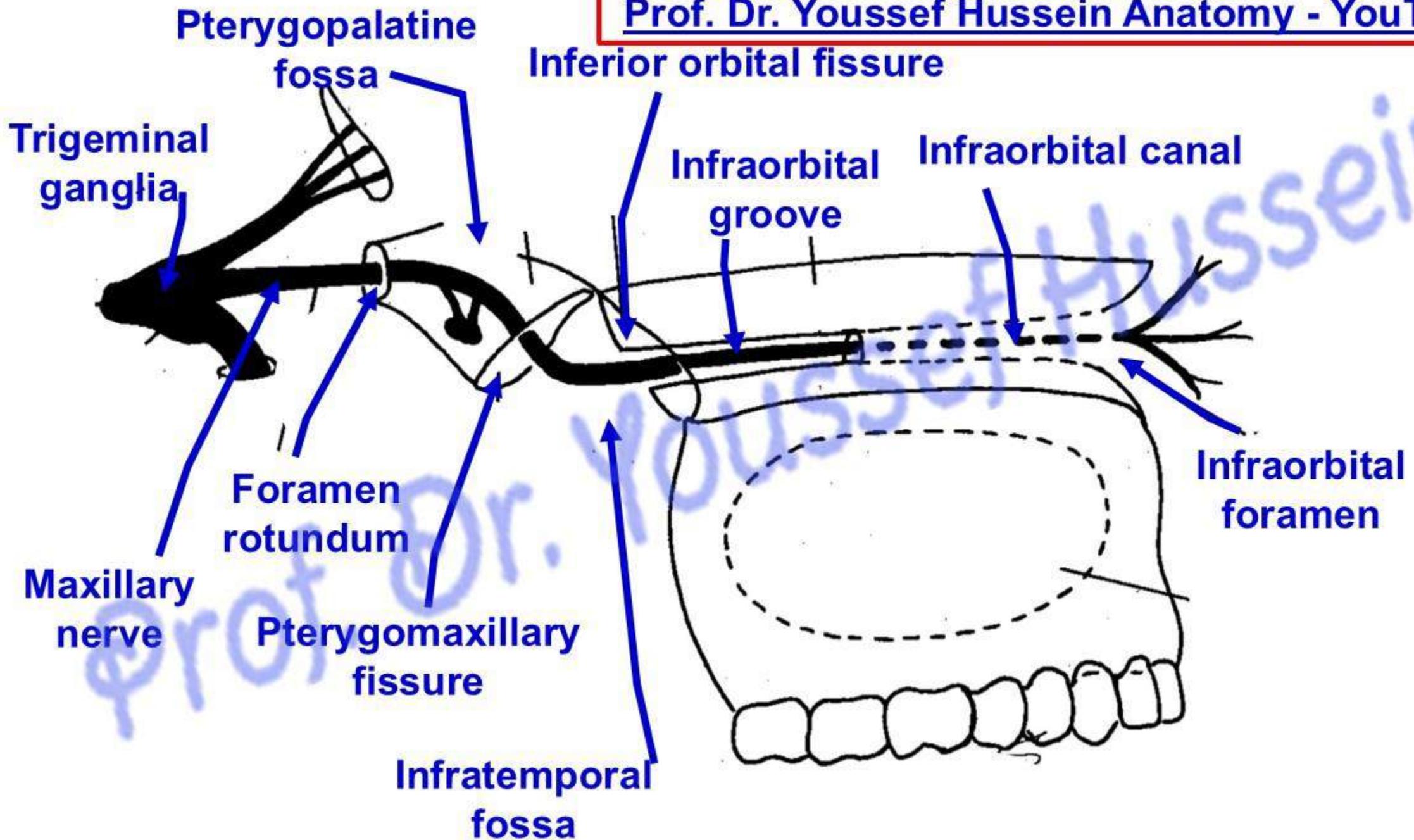
Trochlear nerve

Ophthalmic nerve

Maxillary nerve



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## • MAXILLARY NERVE

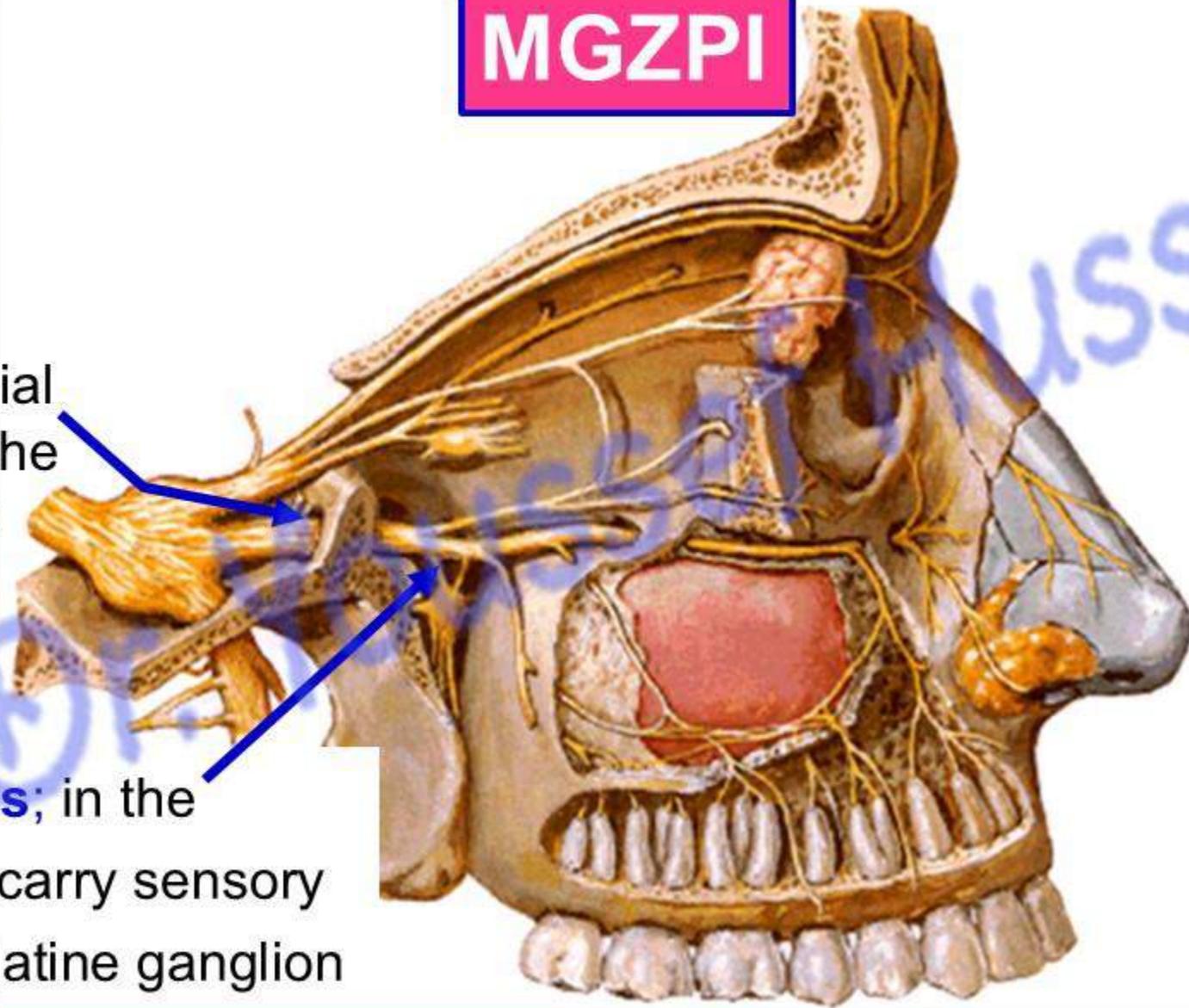
- **Origin:** it arises as the 2<sup>nd</sup> division of the trigeminal ganglion.
- **Type:** purely sensory nerve.
- **Course and Relations:**
  - (1) It passes forwards in the lower part of lateral wall of the **cavernous sinus**.
  - (2) Then it leaves the cranial cavity by passing through the **foramen rotundum** to the pterygopalatine fossa, Here, **Pterygopalatine ganglion** hangs from it.
  - (3) It passes through the **pterygomaxillary fissure** to the infratemporal fossa.
  - (4) Finally, it enters the orbit through the **inferior orbital fissure** to become the Infraorbital nerve (**continuation of the maxillary nerve**).
  - (5) The Infraorbital nerve traverses the floor of the orbit
    - Infraorbital groove → canal → foramen to the face.

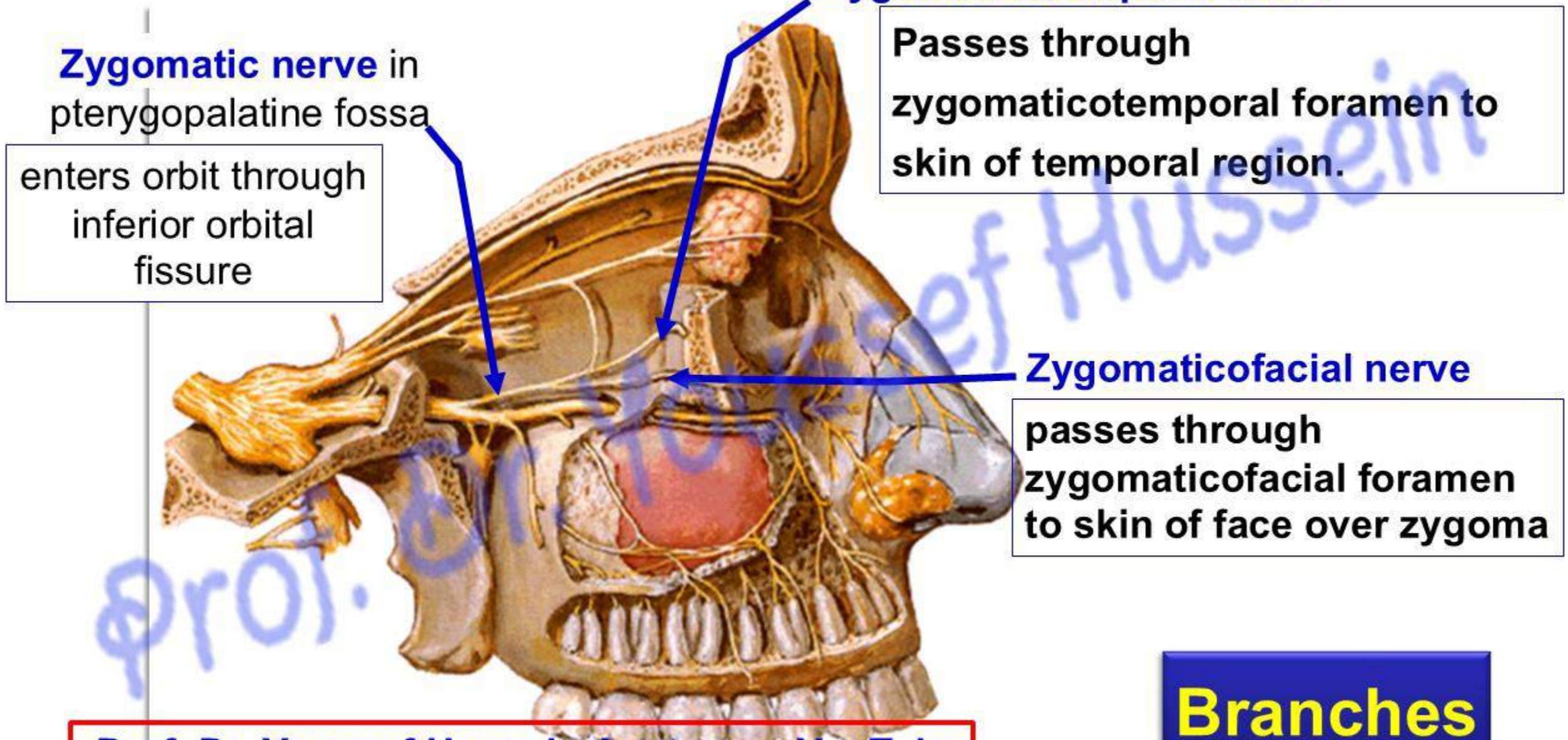
# Branches

MGZPI

**Meningeal** in the cranial cavity to meninges of the middle cranial fossa

**2 Ganglionic branches**; in the pterygopalatine fossa, carry sensory fibers to the pterygopalatine ganglion





**Zygomatic nerve** in pterygopalatine fossa

enters orbit through inferior orbital fissure

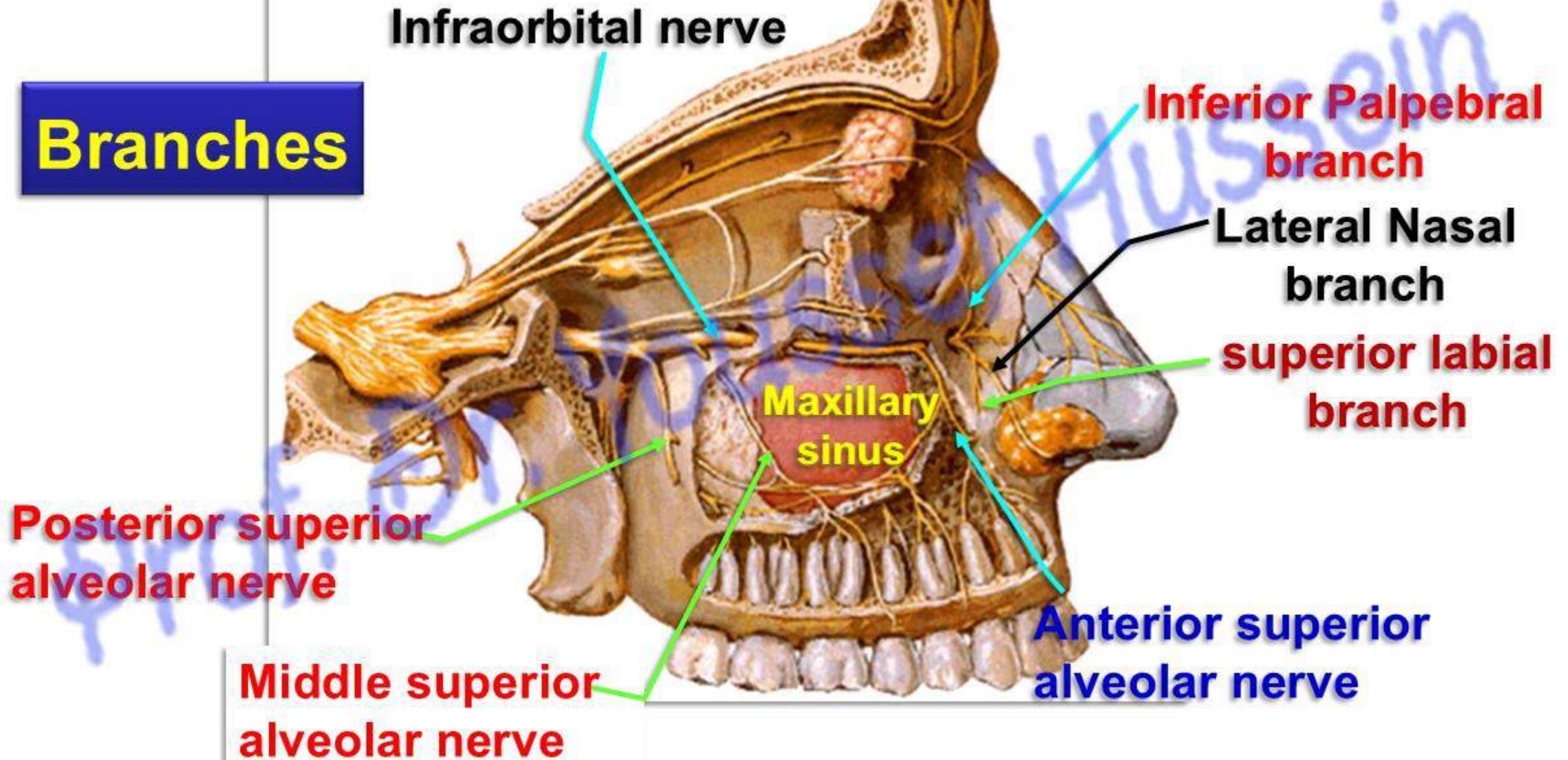
**Zygomaticotemporal nerve**

Passes through zygomaticotemporal foramen to skin of temporal region.

**Zygomaticofacial nerve**

passes through zygomaticofacial foramen to skin of face over zygoma

## Branches



- **BRANCHES OF MAXILLARY Nerve**

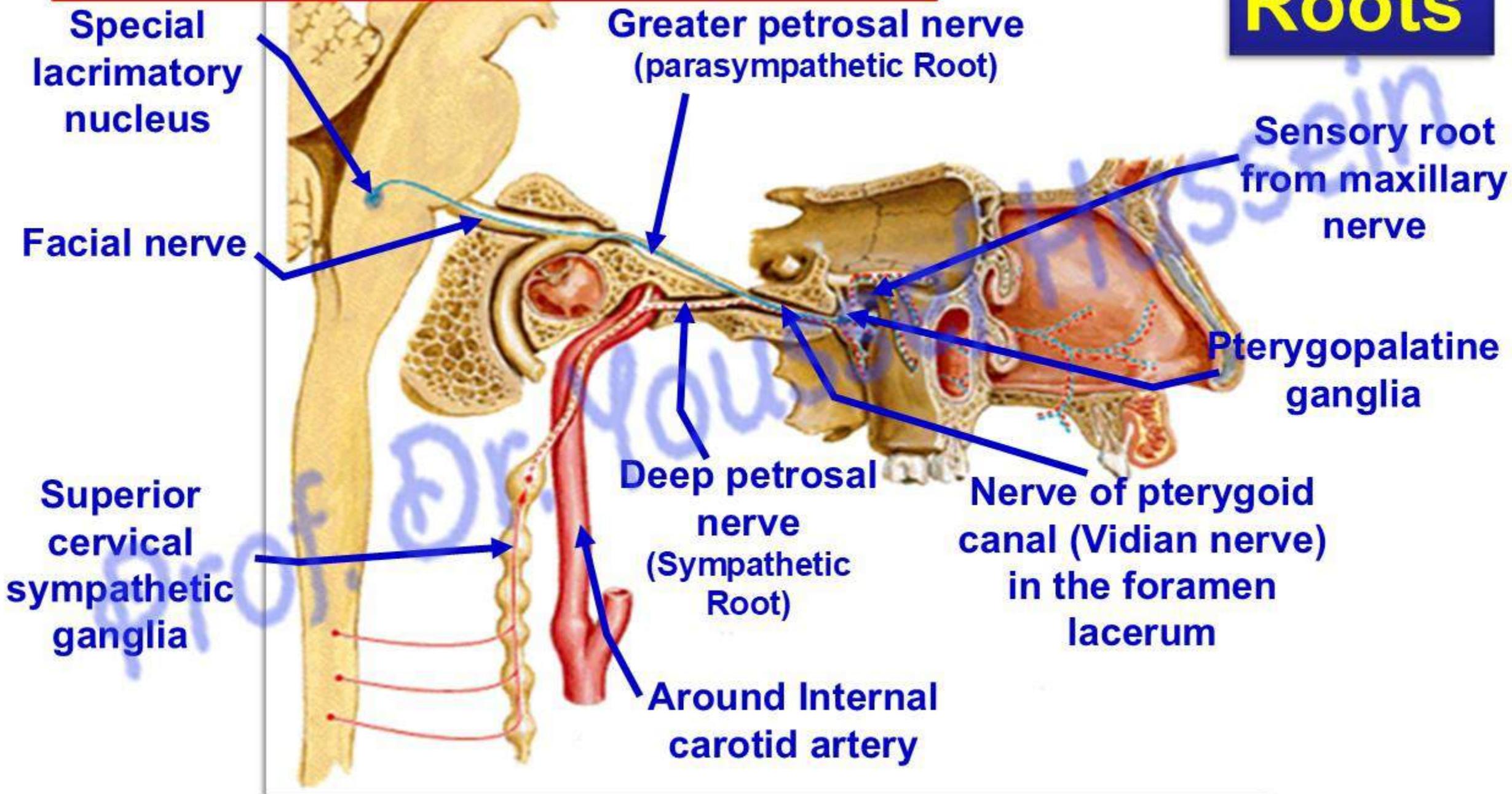
- **Posterior superior alveolar nerve** supplies maxillary air sinus, **upper molar** teeth and gum.
- **Infraorbital nerve (continuation of the maxillary nerve)** gives
  - a- **Middle superior Alveolar nerve** supplies maxillary sinus, **upper premolar teeth** and gum.
  - b- **Anterior superior Alveolar** supplies maxillary sinus, **upper canine, incisors** teeth and gum.
  - c- **Terminal branches of infraorbital nerve in the face:**
    - (1) Inferior palpebral to the lower eye lid.
    - (2) Lateral nasal to the side of the nose.
    - (3) Superior labial to the upper lip.



**Pterygopalatine  
(Sphenopalatine)  
ganglion**

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# Roots



Lacrimal nerve

Zygomaticotemporal nerve

- It communicates with lacrimal nerve of ophthalmic which conveys postganglionic parasympathetic fibers to lacrimal gland.

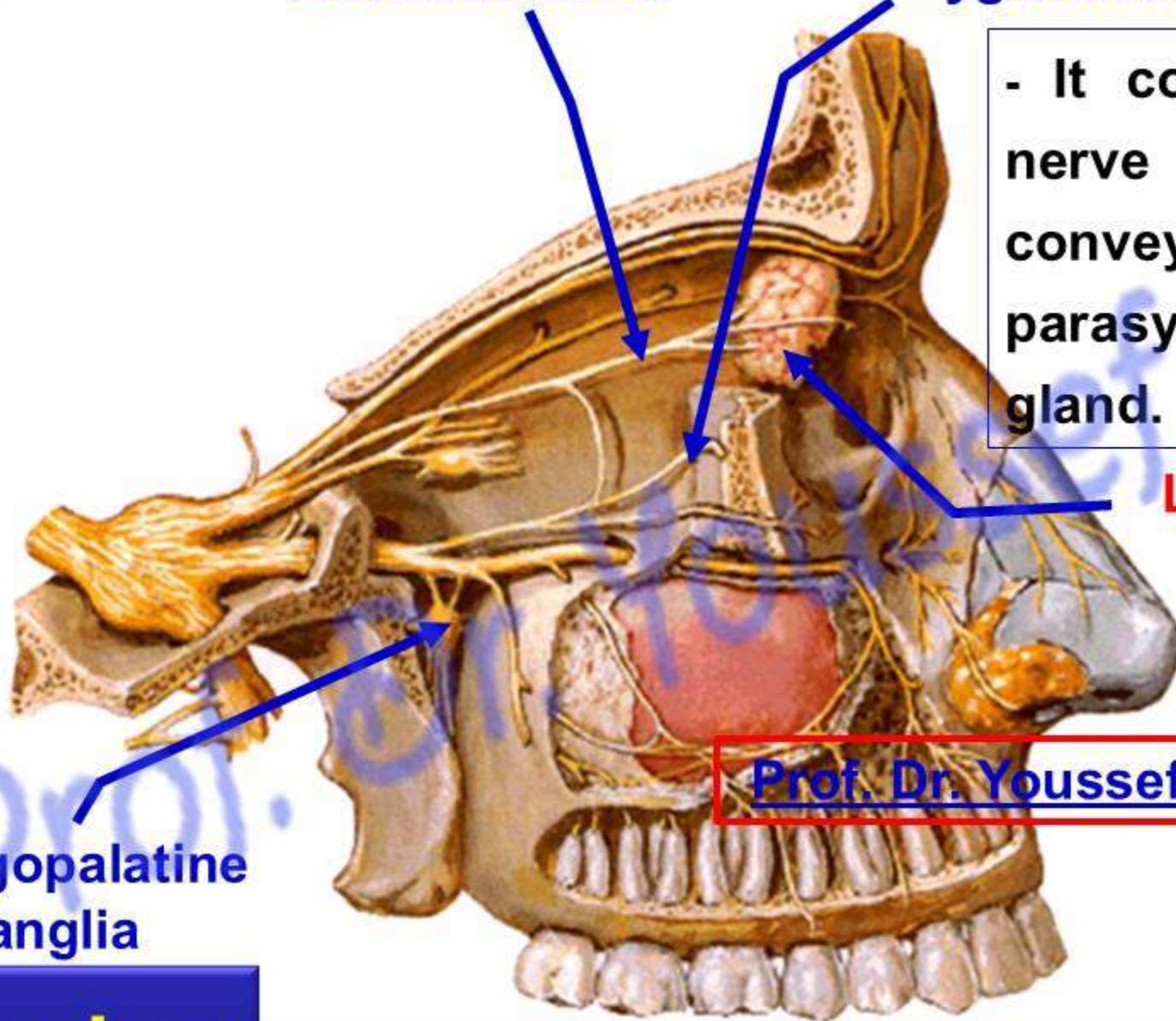
Lacrimal gland

Postganglionic fibres

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Pterygopalatine ganglia

Branches

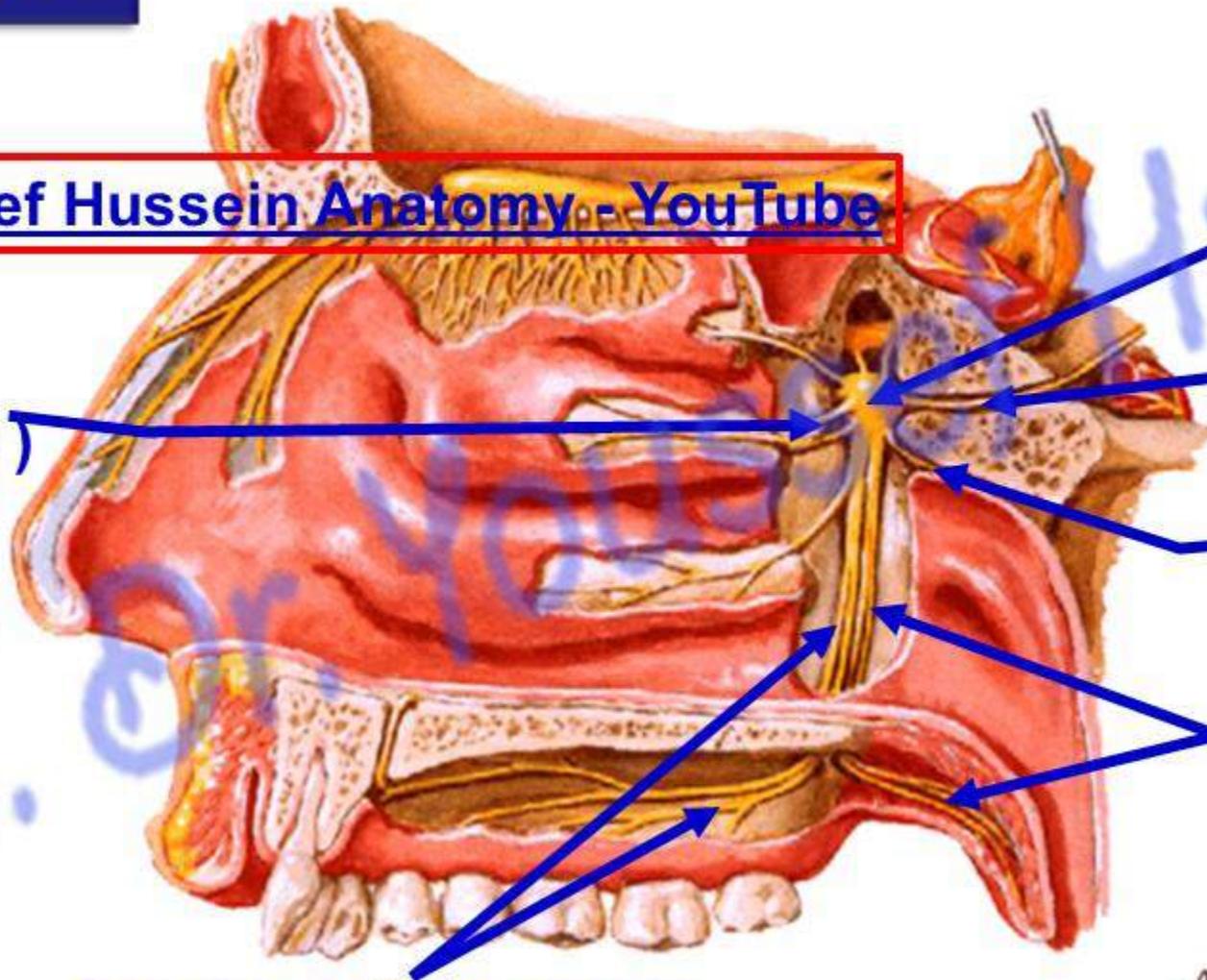


# Branches

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**Nasopalatine  
(Sphenopalatine)**

to the nasal  
cavity and palate



**Pterygopalatine  
ganglia**

**Vidian nerve**

**Pharyngeal to the  
nasopharynx**

**Lesser palatine nerve**

to soft palate and  
palatine tonsil

**Greater palatine nerve**

to **hard** palate

[dr\\_youssefhussein@yahoo.com](mailto:dr_youssefhussein@yahoo.com)

# Ophthalmic nerve

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- It passes in the lateral wall of the cavernous sinus

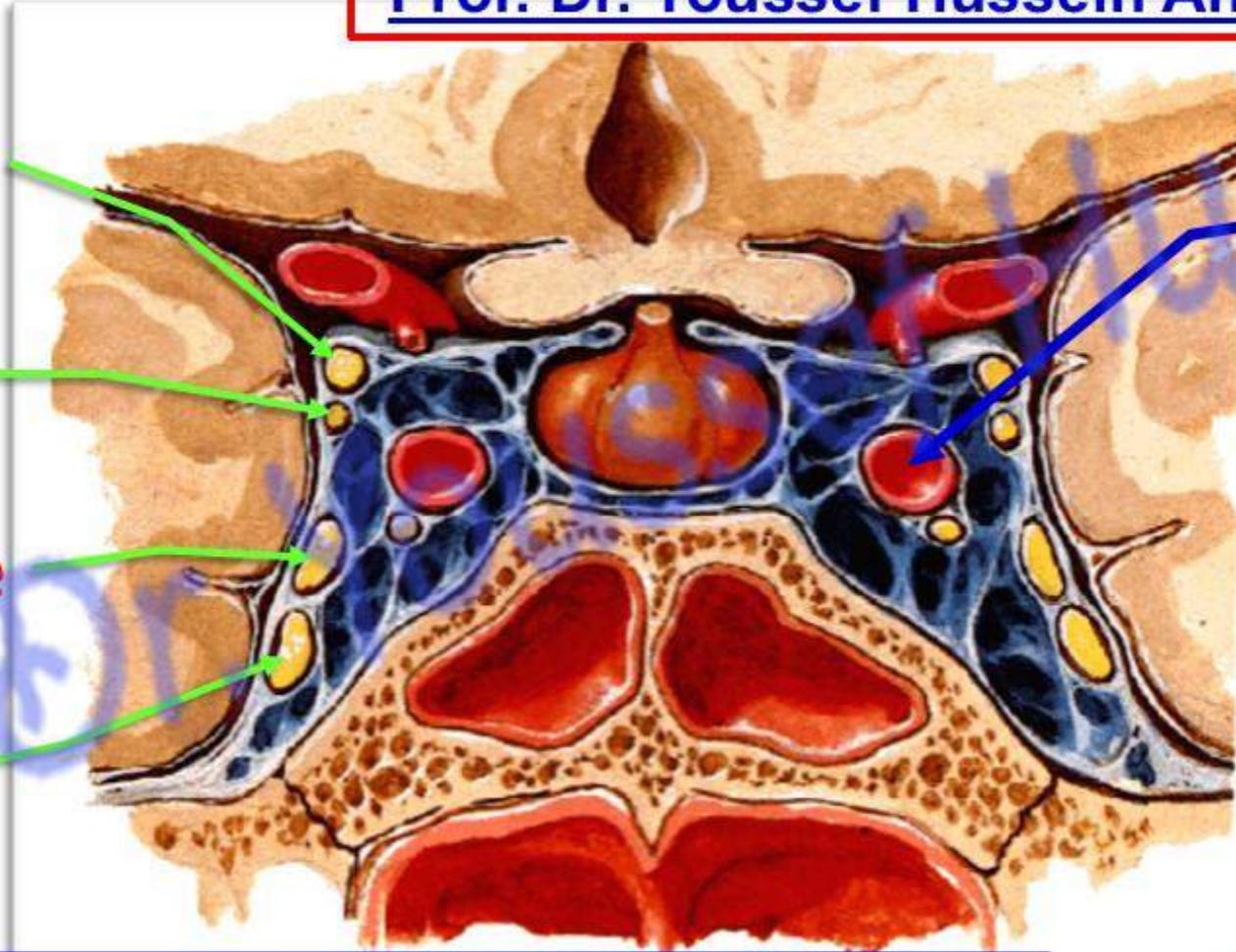
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Oculomotor nerve

Trochlear nerve

Ophthalmic nerve

Maxillary nerve



Internal carotid artery

Ophthalmic nerve receives a sympathetic branch from the plexus around the internal carotid artery

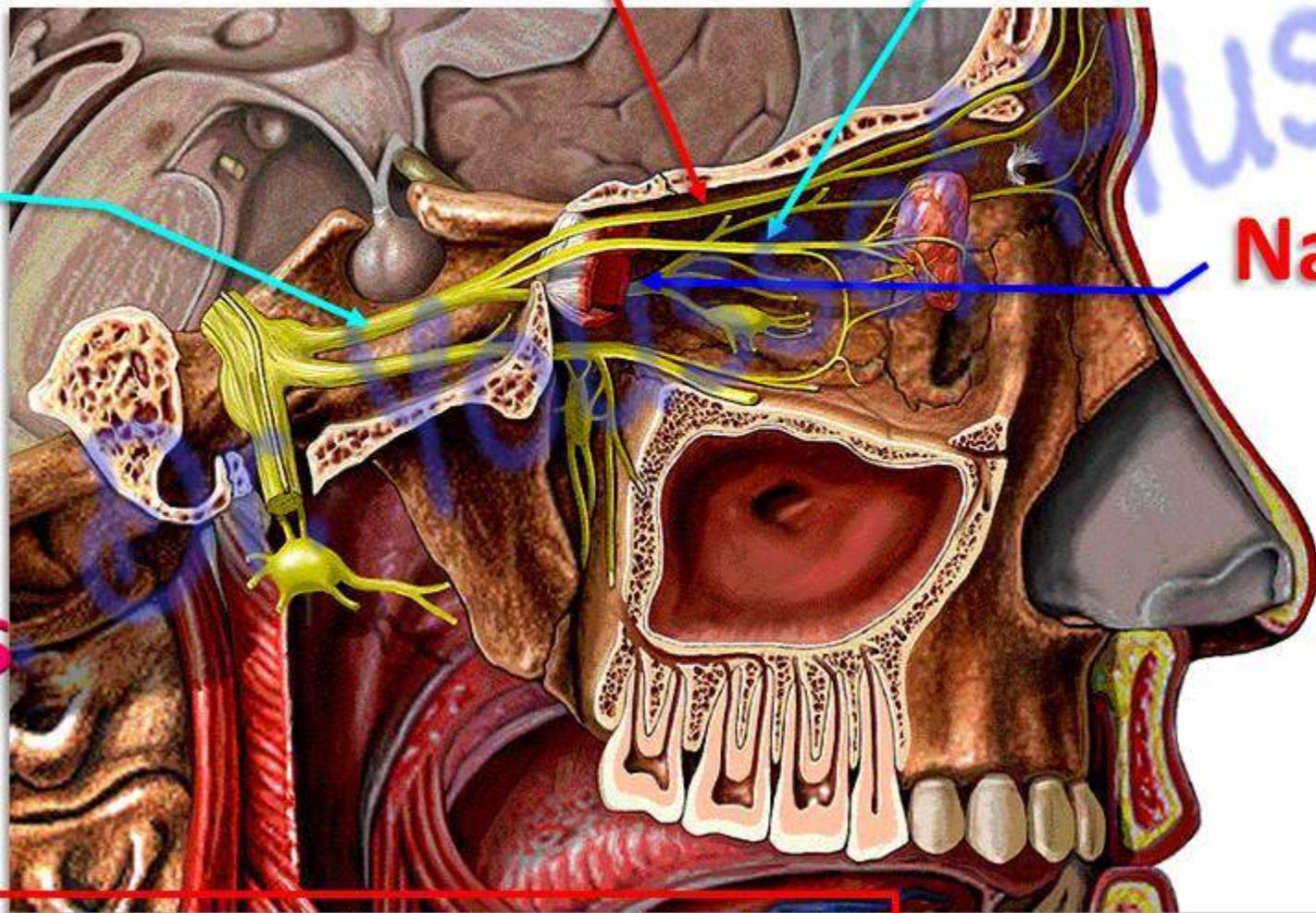
**Frontal nerve**

**Lacrimal nerve**

**Ophthalmic  
nerve**

**Nasociliary  
nerve**

**Three  
Branches**

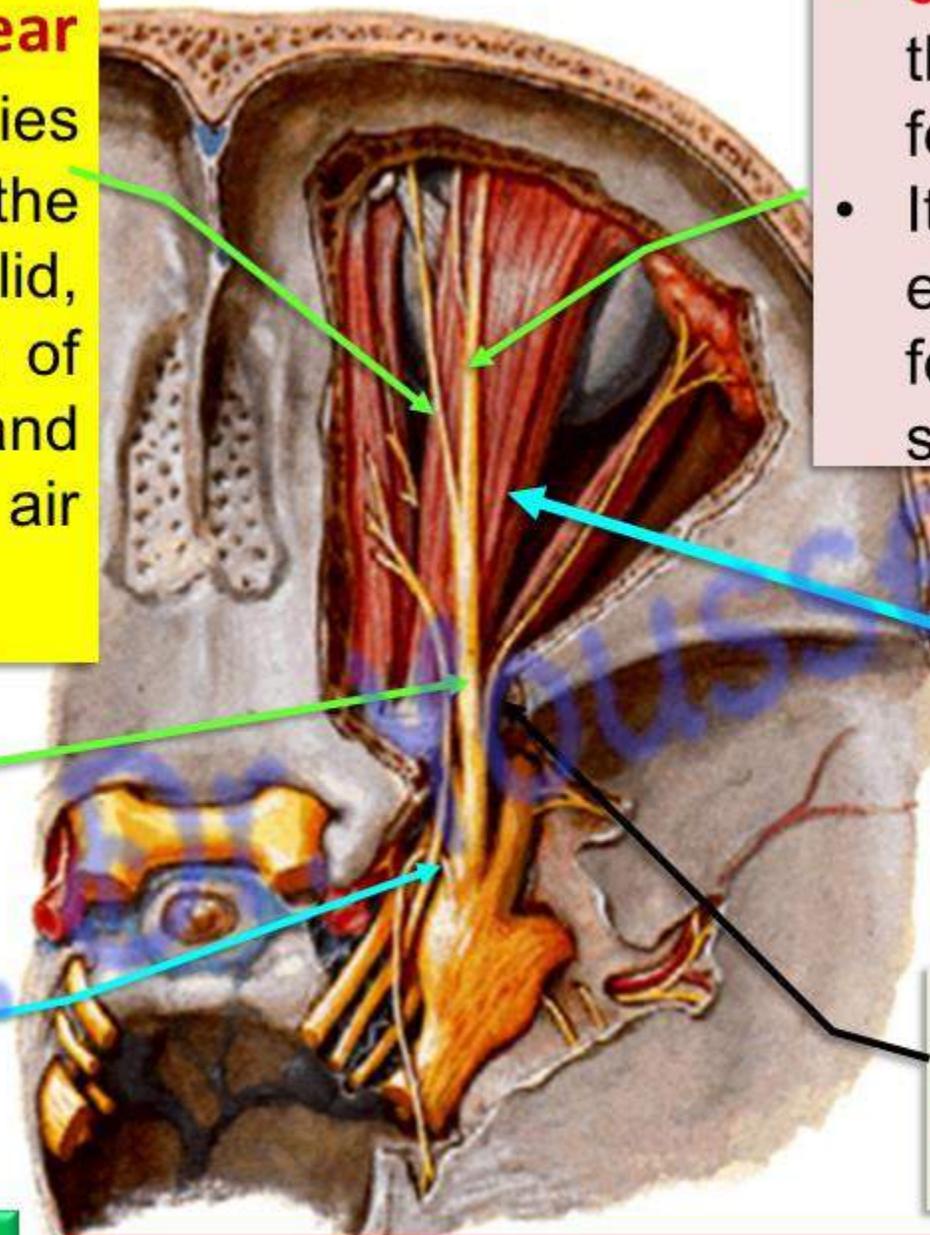


- **4. Supratrochlear nerve**, supplies medial part of the upper eye lid, conjunctiva, skin of the forehead and scalp and frontal air sinus.

**Frontal nerve**  
**the largest**  
**branch**

**Ophthalmic**  
**nerve**

**Frontal nerve**



- **3. Supraorbital nerve** passes through the supraorbital notch or foramen
- It supplies middle part of the upper eye lid, conjunctiva, skin of the forehead and scalp and frontal air sinus.

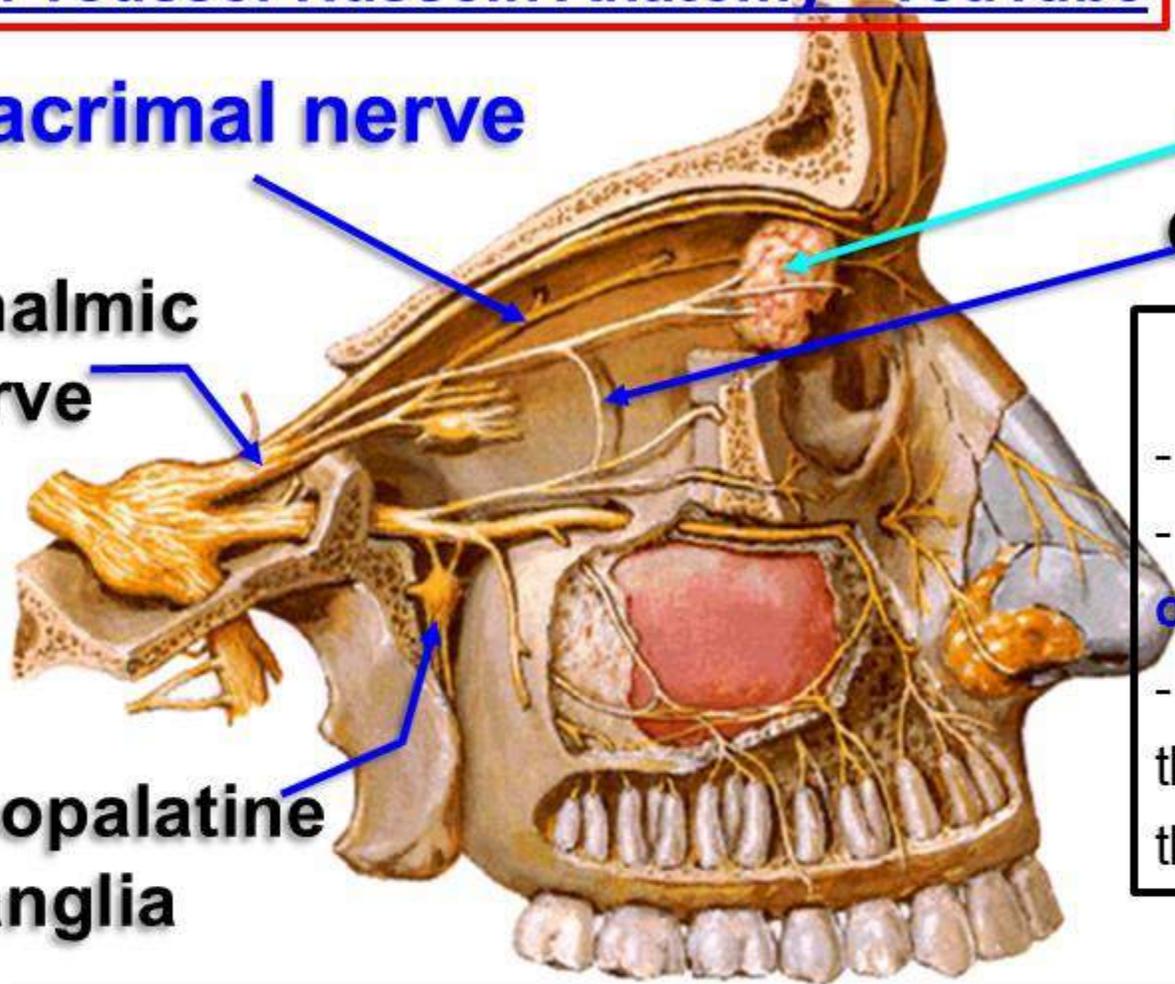
**2. runs** forwards above the levator palpebrae superioris.  
- It **ends** about the middle of the orbit by dividing into 2 terminal branches

**1. enters** the orbit through **superior orbital fissure** outside the tendinous ring

## Lacrimal nerve

Ophthalmic  
nerve

Pterygopalatine  
ganglia



## Lacrimal gland

Communicating branch

- **Lacrimal nerve**

- It is the smallest branch.
- It **enters** the orbit through **superior orbital fissure outside tendinous ring**.
- It **runs** forwards along the **lateral wall** of the orbit with the **lacrimal artery** above the **lateral rectus**.

- It **receives** a communicating branch from the **zygomaticotemporal nerve** that carries parasympathetic fibers to the lacrimal gland from the pterygopalatine (sphenopalatine) ganglion.

- **Branches**; 1) **Lateral part** of the upper eye lid and conjunctiva.  
2) Carries Parasympathetic fibers to the **lacrimal gland**.

- It **enters** orbit through **superior orbital fissure** **inside** tendinous ring.
- It **runs** obliquely (**with ophthalmic artery**) crossing **Infront** of the optic nerve **from lateral to medial side**.
- It passes along the medial wall of the orbit on the **medial rectus**.
- It ends by dividing into **anterior ethmoidal** and **infratrochlear** nerves.

**Anterior ethmoidal nerve**

**Medial rectus**

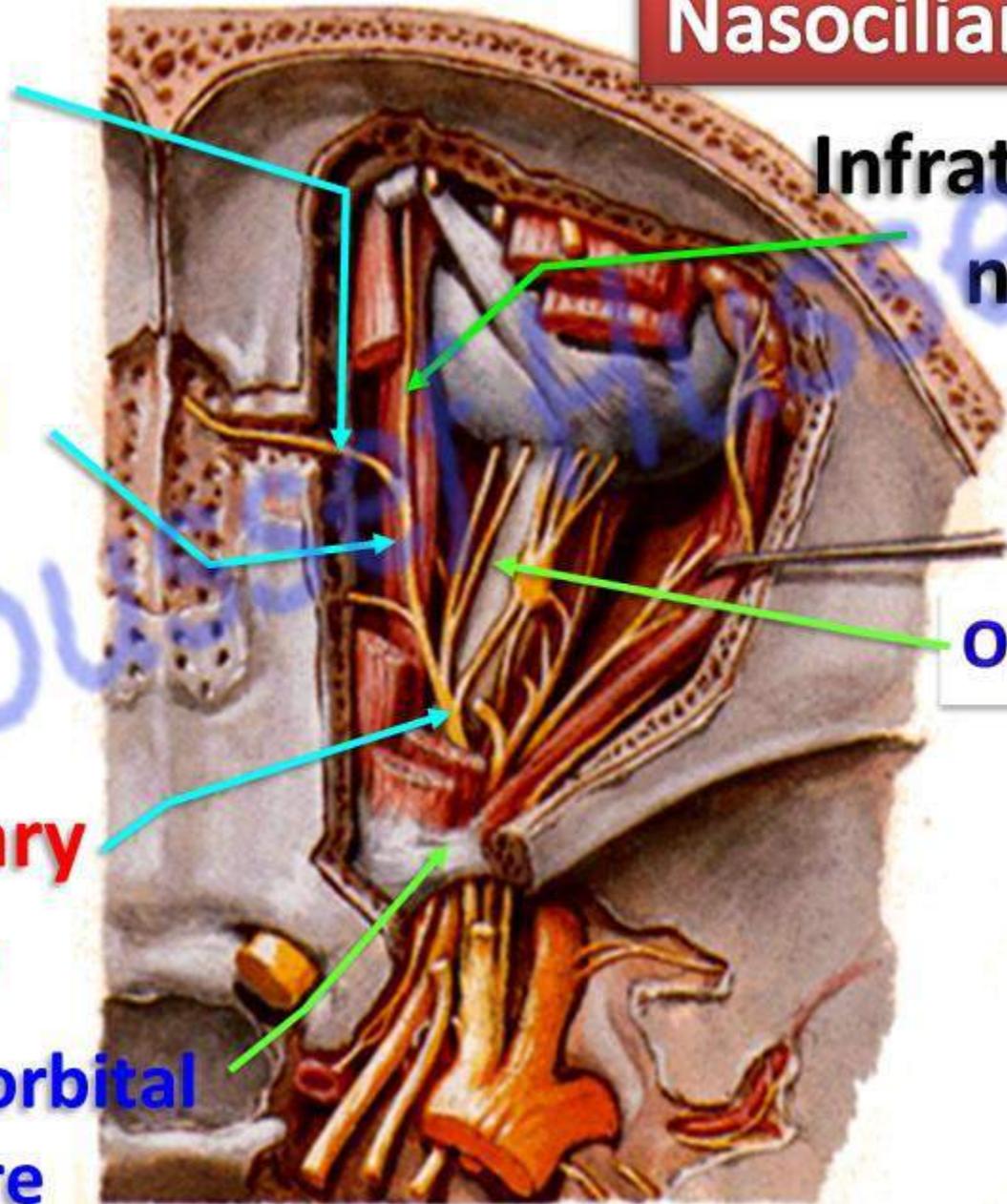
**Nasociliary nerve**

**Superior orbital fissure**

**Nasociliary nerve**

**Infratrochlear nerve**

**Optic nerve**



## Branches of NC

Infratrochlear nerve

Anterior ethmoidal nerve

Posterior ethmoidal nerve

Nasociliary nerve

Ophthalmic nerve

long ciliary nerves

Short ciliary nerves

Ciliary ganglion

Sensory root to Ciliary ganglion

## • NASO-CILIARY NERVE

### ▪ Branches:

1) **Sensory root:** to the ciliary ganglion.

2) **Long ciliary nerves:** carry sensory to cornea, iris and choroid and sympathetic fibers to the dilator pupillae muscle.

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3) **Posterior ethmoidal nerve:** supplies **posterior** ethmoidal and **sphenoidal** air sinuses.

4) **Anterior ethmoidal nerve:** supplies the **anterior** and **middle** ethmoidal sinuses. It ends in the nose by:

(a) **Internal nasal** nerve divides into lateral and medial branches to supply nasal cavity.

(b) **External nasal** nerve supplies skin over the cartilaginous part of nose.

5) **Infratrochlear nerve:** one of the 2 terminal branches:

- It passes forwards below the trochlea to reach the face.
- It supplies the skin of the medial part of the lower eye lid,
- conjunctiva and skin over the bony part of the nose.

[https://www.youtube.com/channel/UCVSNqbibj9UWYaJdd\\_cn0PQ](https://www.youtube.com/channel/UCVSNqbibj9UWYaJdd_cn0PQ)

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Questions

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