The University of Jordan
Faculty Of Medicine

Nerves in the Infratemporal fossa

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1. The mandibular Nerve
2. Chorda tympani .
3. Otic ganglion.

1-Mandibular Nerve

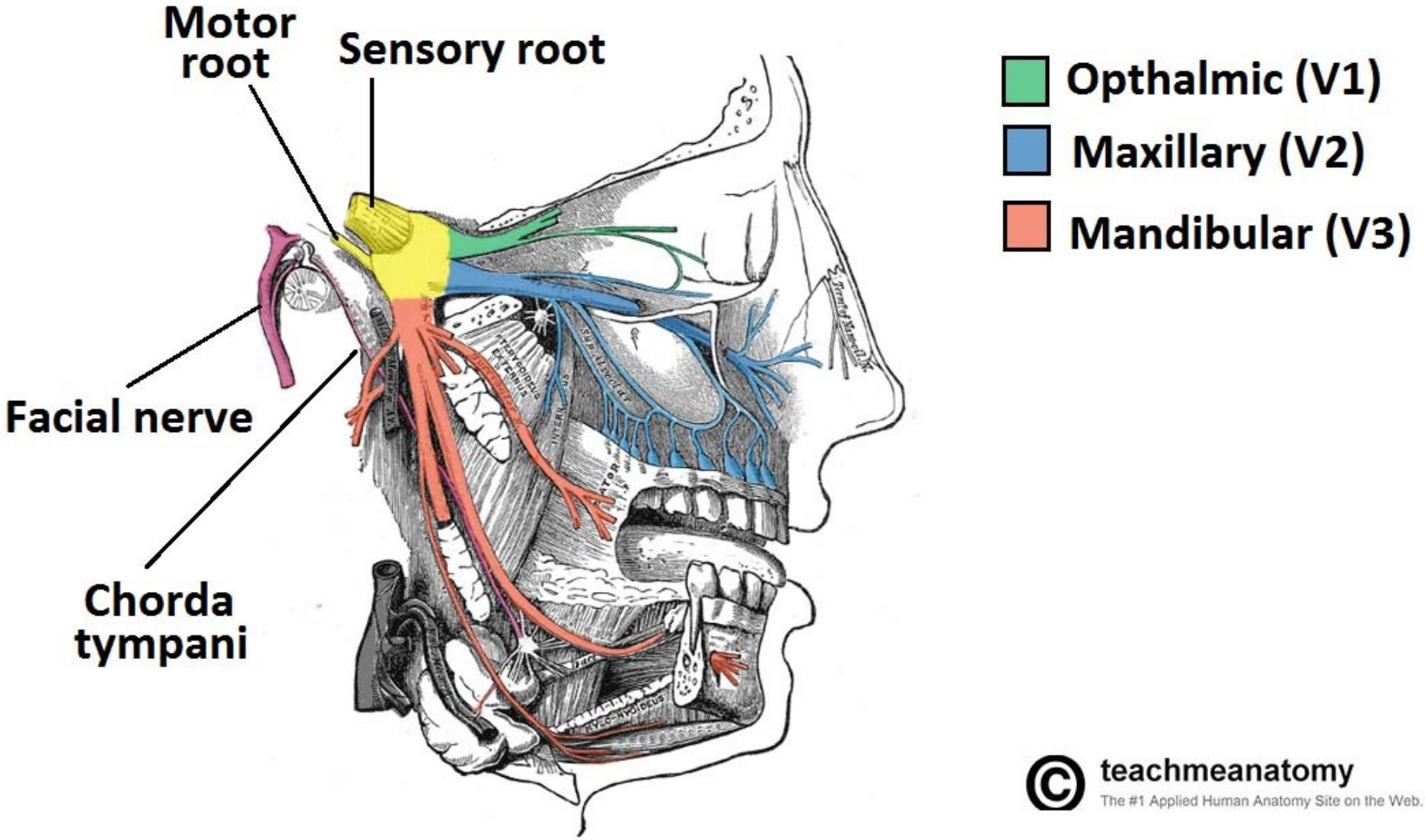
It is third division (V3) of the trigeminal nerve

It is a *mixed* sensory and motor nerve

The **sensory fibers** supplies the ***lower* zone** of the face

Its **motor root** supplies *8* muscles :

- **4 muscles of mastication** (Temporalis ,masseter, medial and lateral pterygoid)
- **2 tensor muscles :** Tensor palati and tensor tympani
- **2 adjacent muscles:** Mylohyoid and anterior belly of the digastric .


Motor root
Sensory root
Facial nerve
Chorda tympani
Opthalmic (V1)
Maxillary (V2)
Mandibular (V3)
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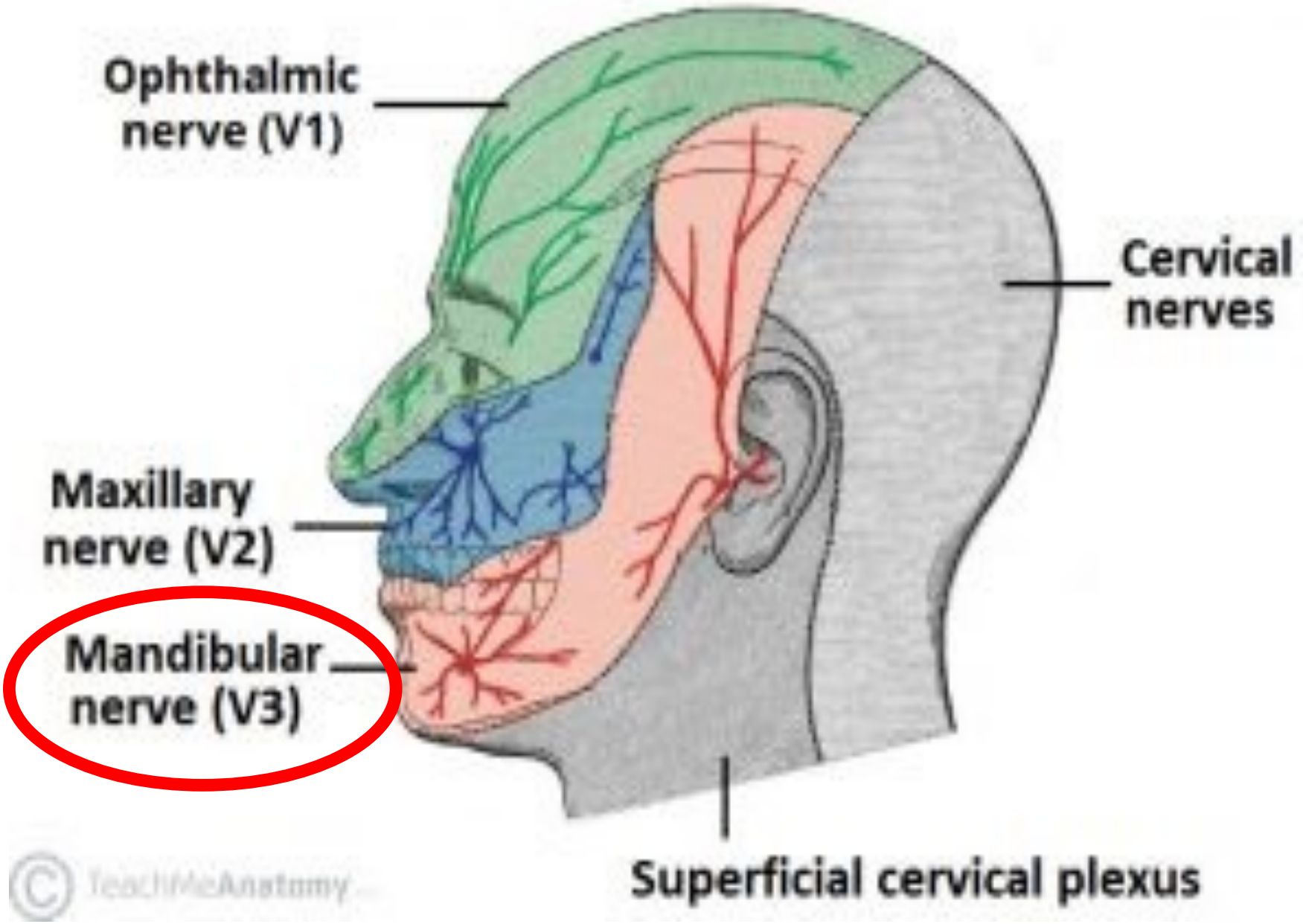
Ophthalmic nerve (V1)
Maxillary nerve (V2)
Mandibular nerve (V3)
Cervical nerves
Superficial cervical plexus
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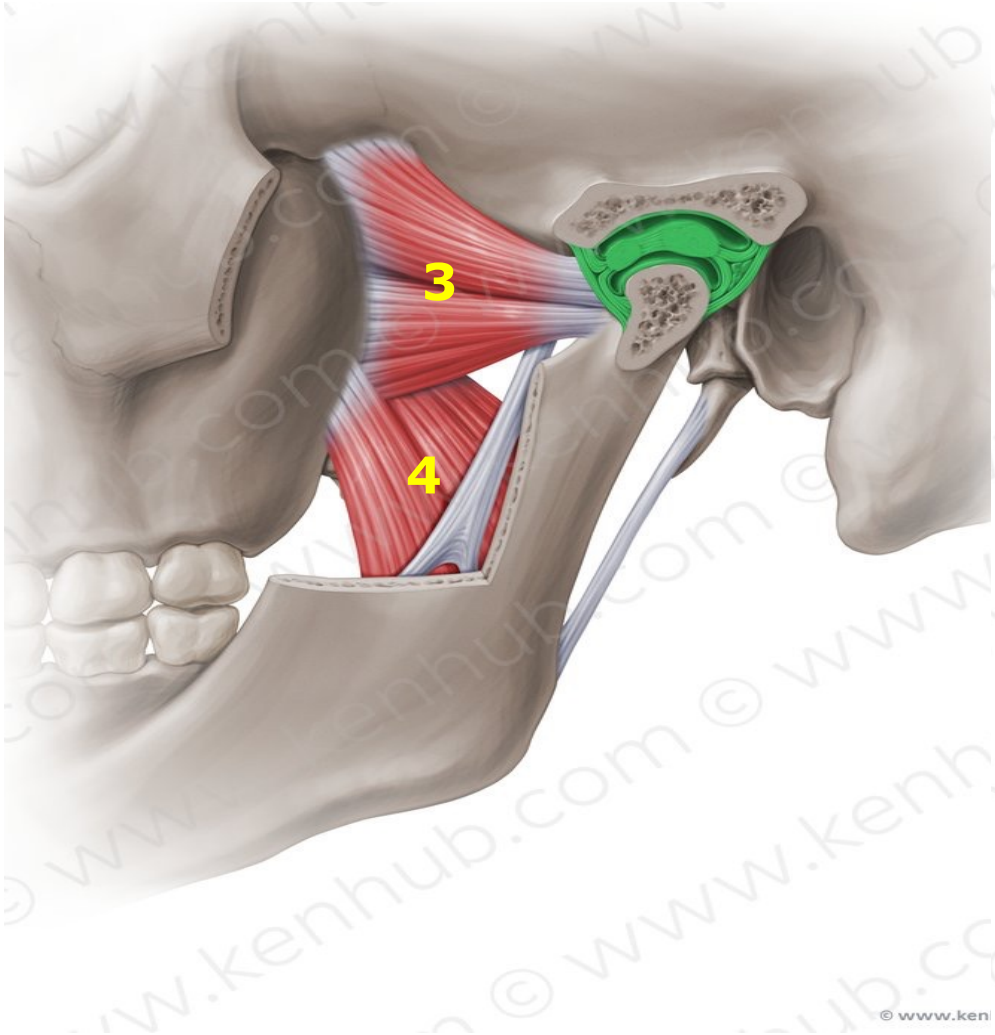
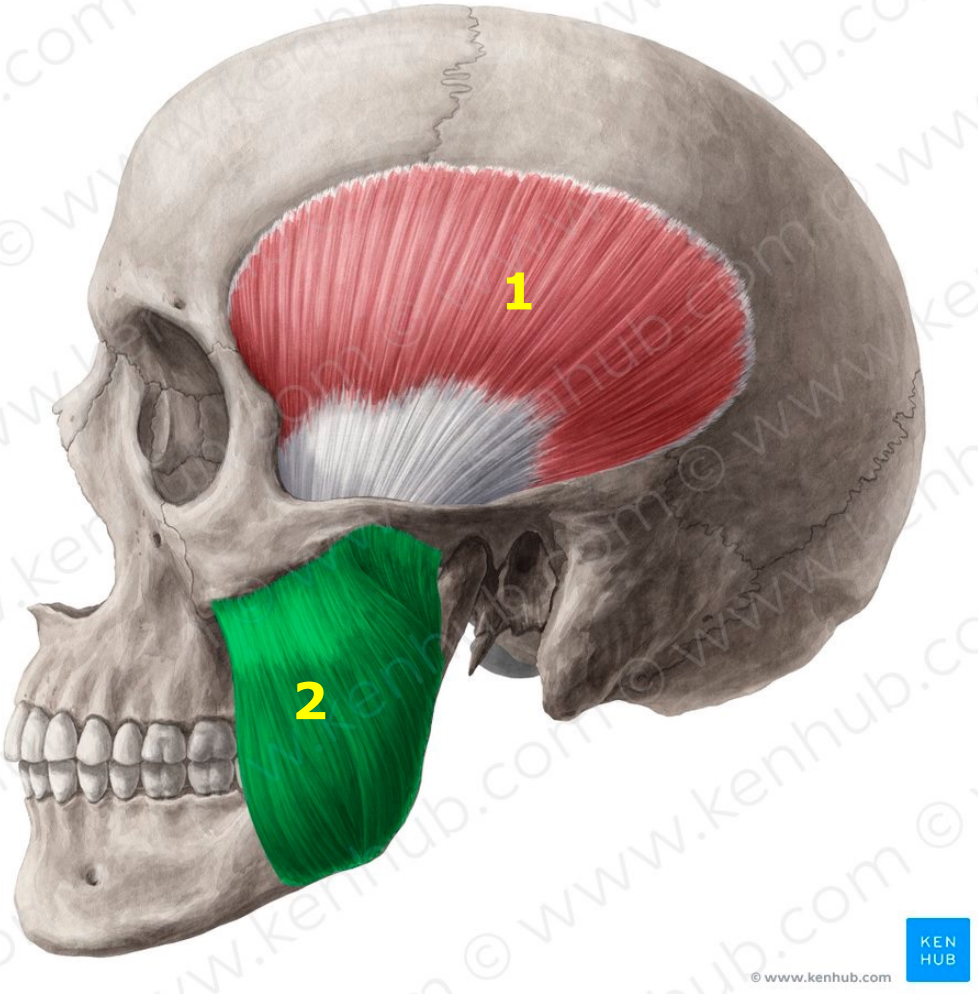
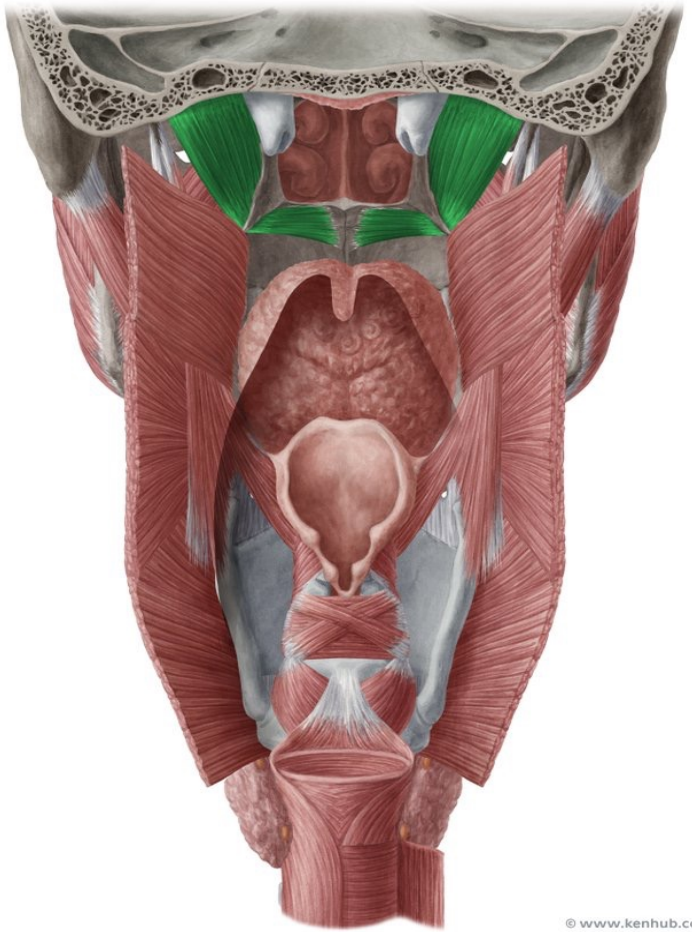
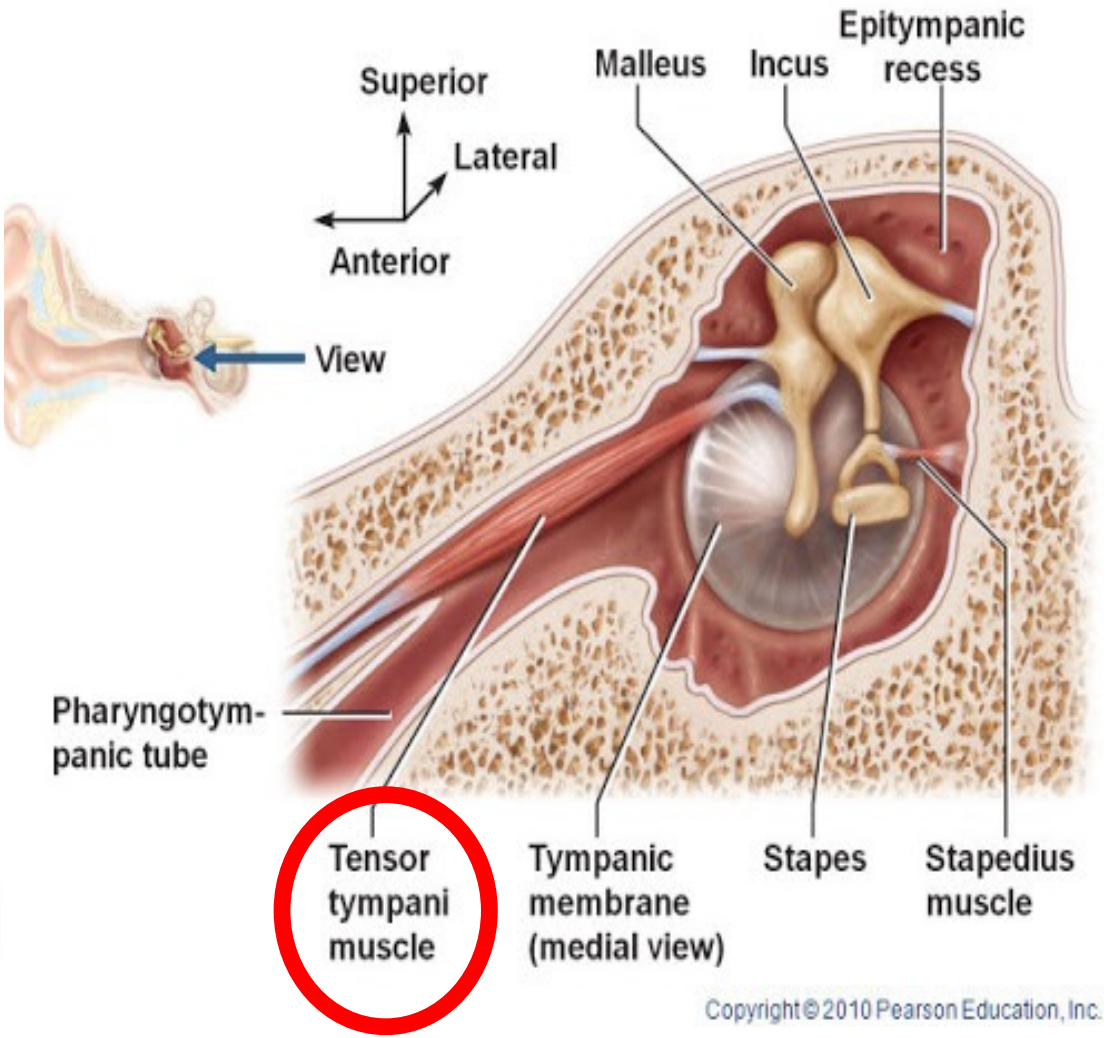


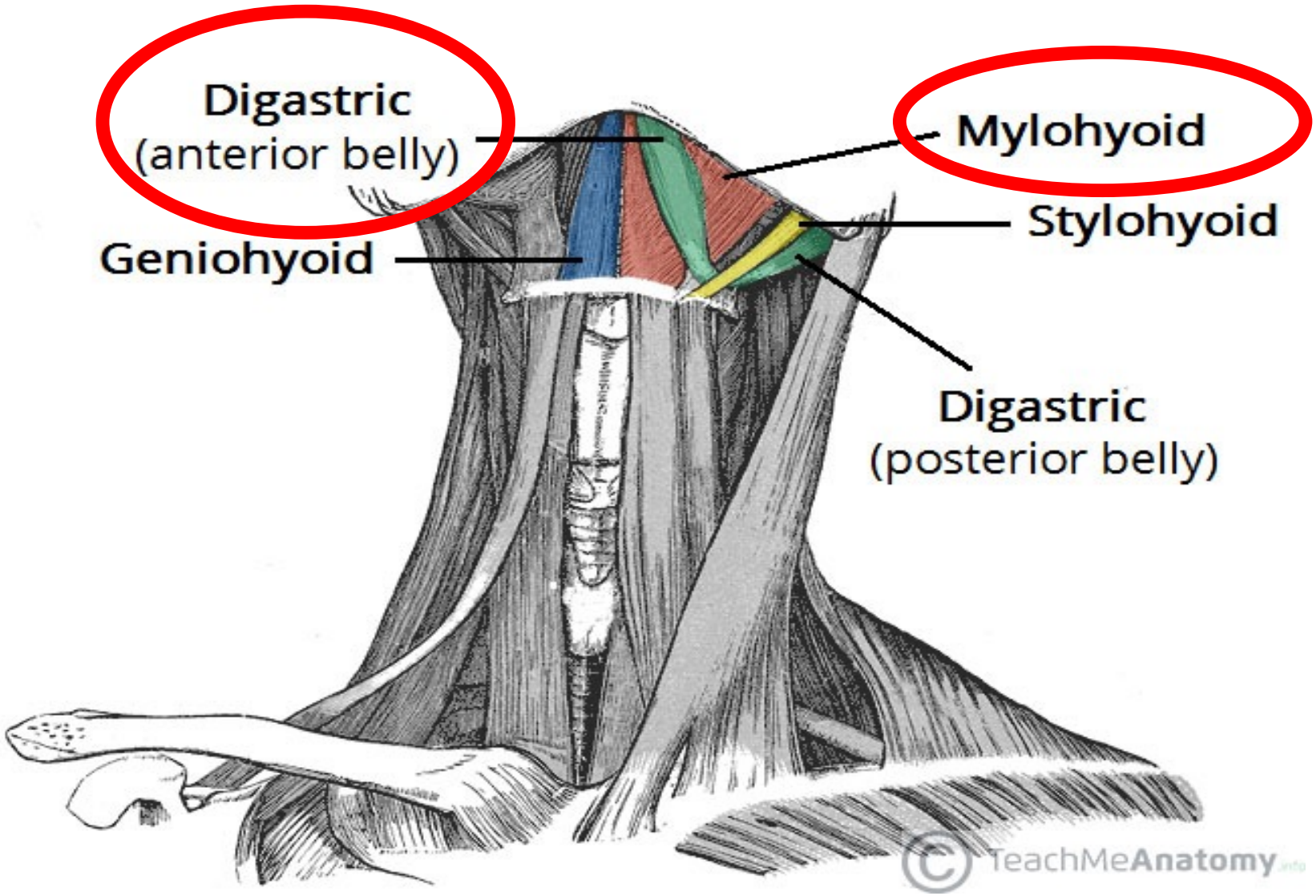


1. Temporalis
2. Masseter
3. Lateral pterygoid
4. Medial pterygoid





Tensor palati

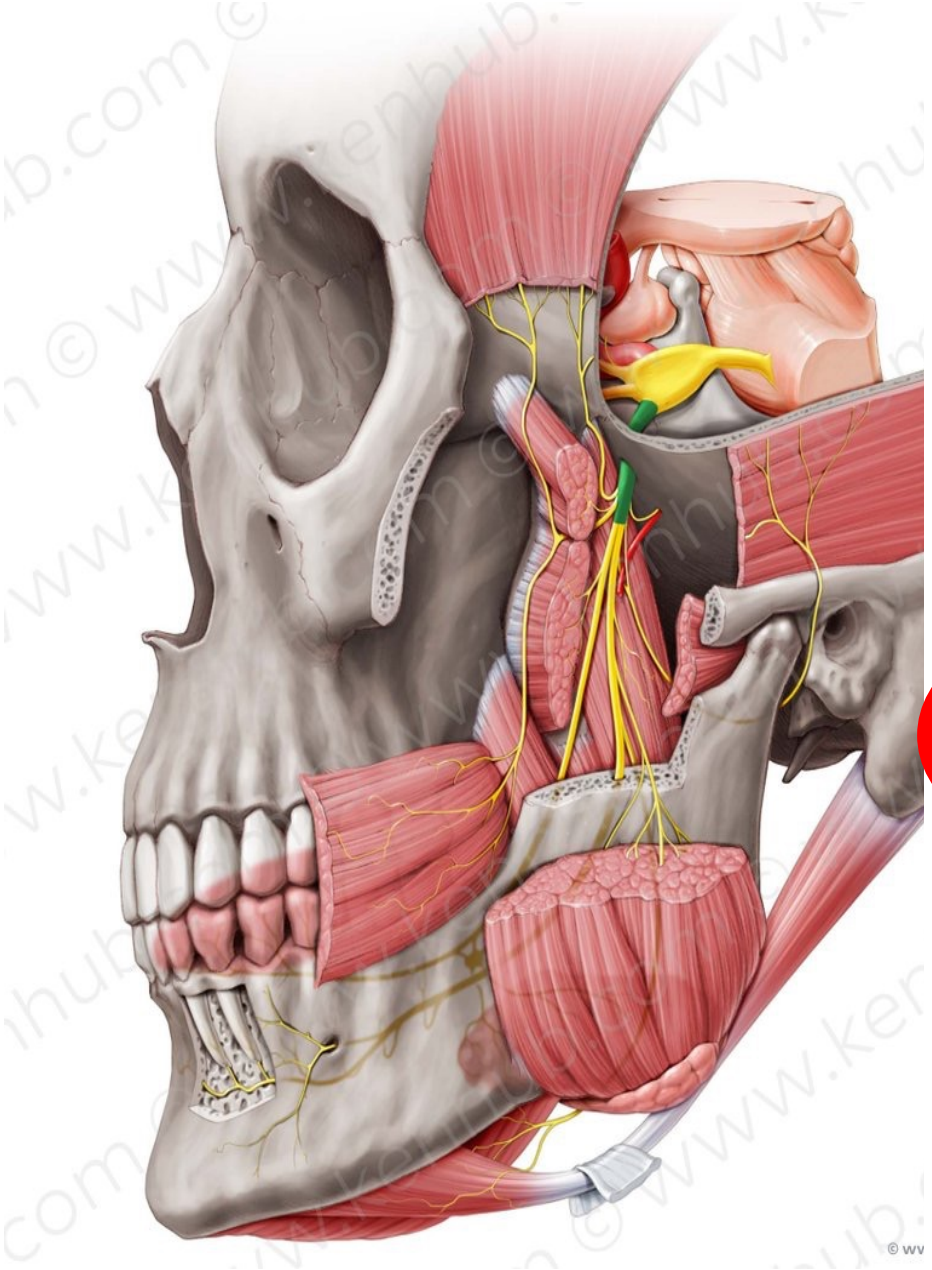

Digastric
(anterior belly)
Mylohyoid
Stylohyoid
Geniohyoid
Digastric
(posterior belly)
TeachMeAnatomy

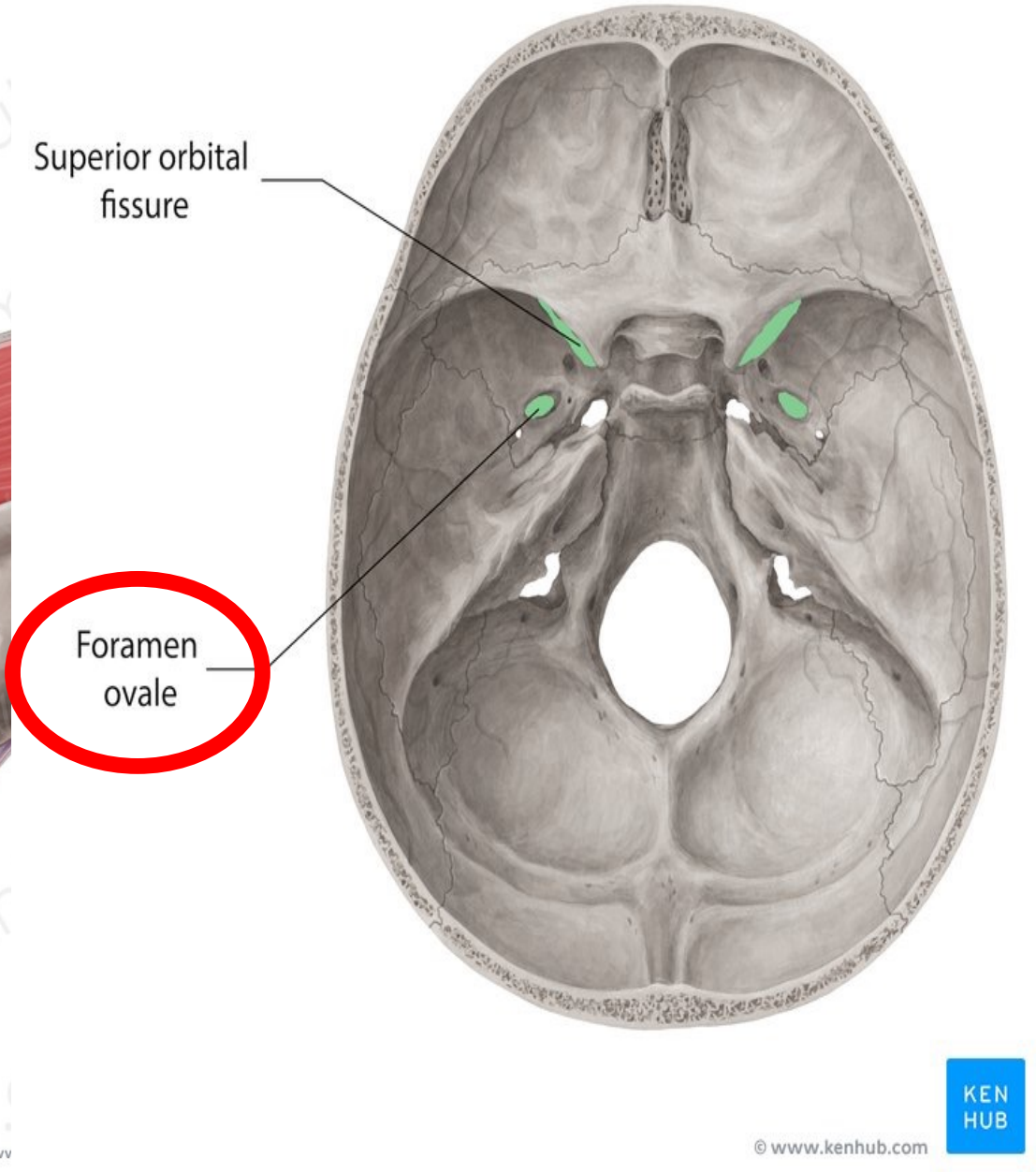
Exit from skull : foramen ovale to infratemporal fossa

- ✓ The nerve trunk divides into a small **anterior** division *(**mainly motor**)* and a large **posterio**r division *(**mainly sensory**)*

Branches :-

From the trunk	From the anterior division	From the posterior division
1. Nervous spinosus 2. Nerve to the M. Pterygoid,tensor palati and tensor tympani)	1. Nerves to L. pterygoid 2. Masseteric nerve 3. Deep temporal nerves 4. Buccal N. (sensory)	1. Auriculotemporal nerve 2. Lingual nerve 3. Inferior alveolar nerve ,it gives mylohyoid N.




Superior orbital fissure
Foramen ovale
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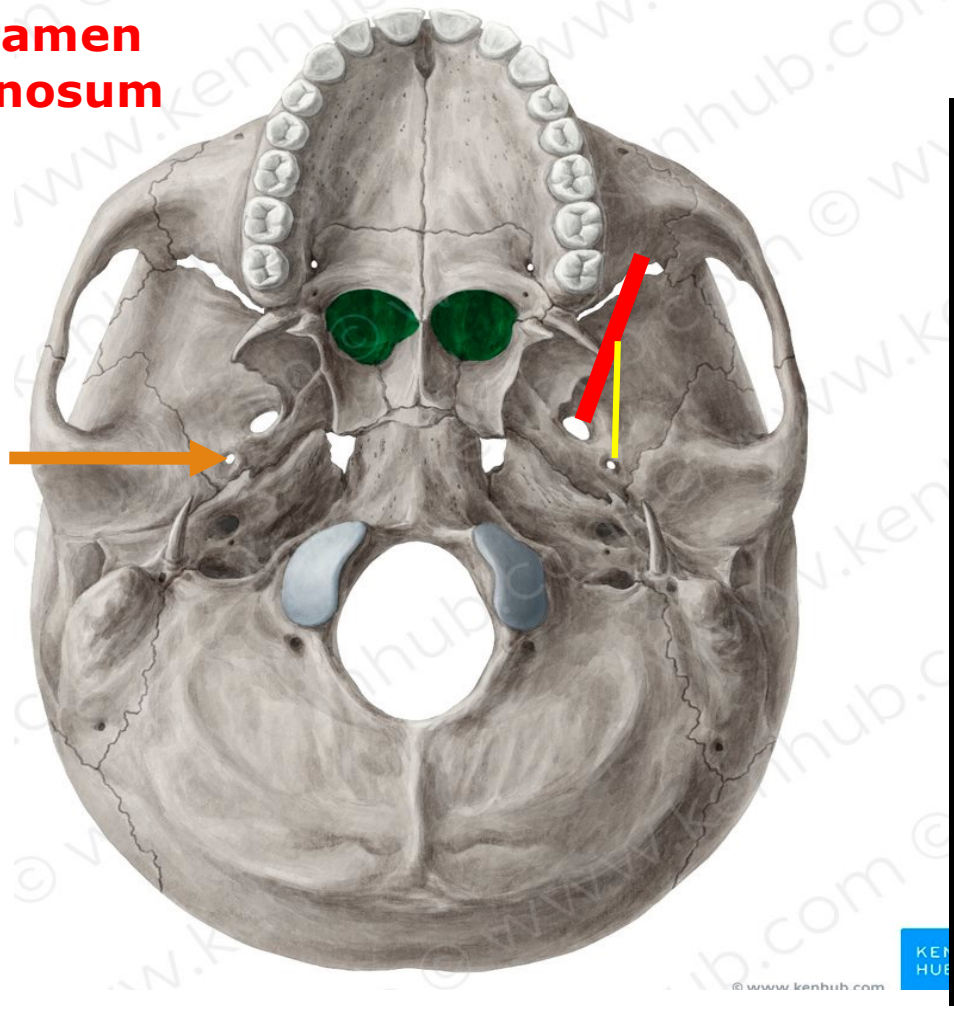
A. Branches from the Trunk:

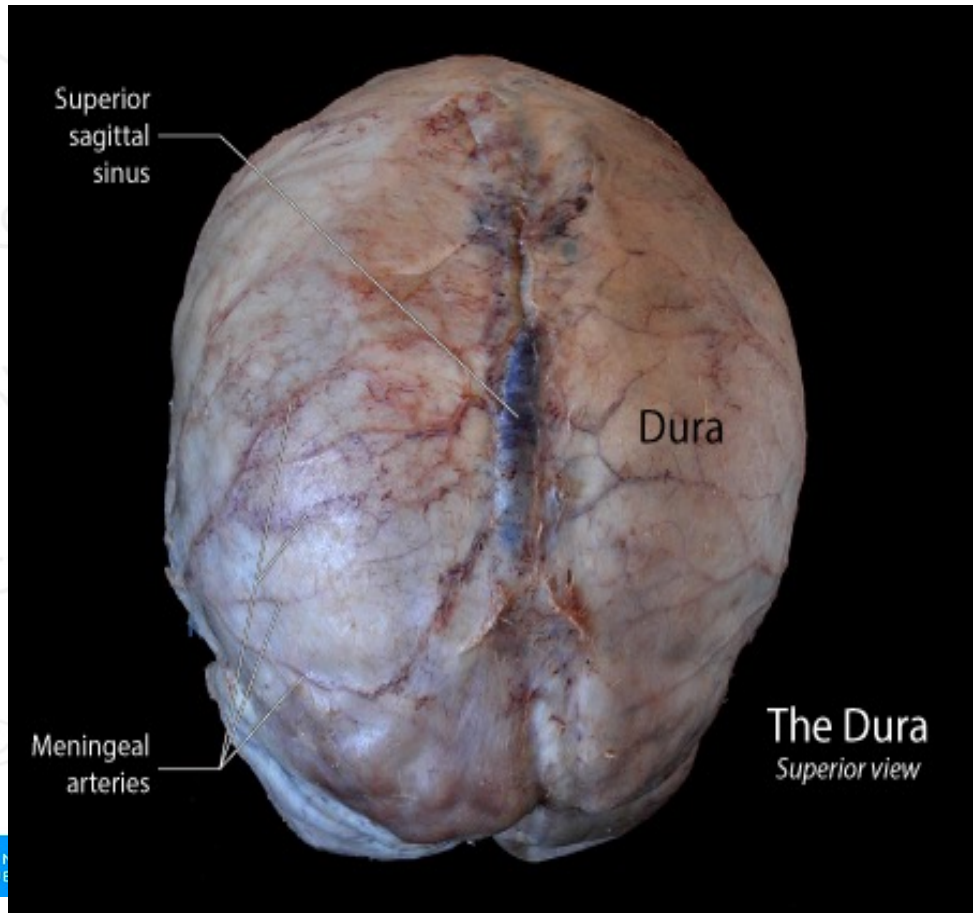
1. Nervus spinosus (sensory) enters the skull via the foramen spinosum to supply the dura matter .

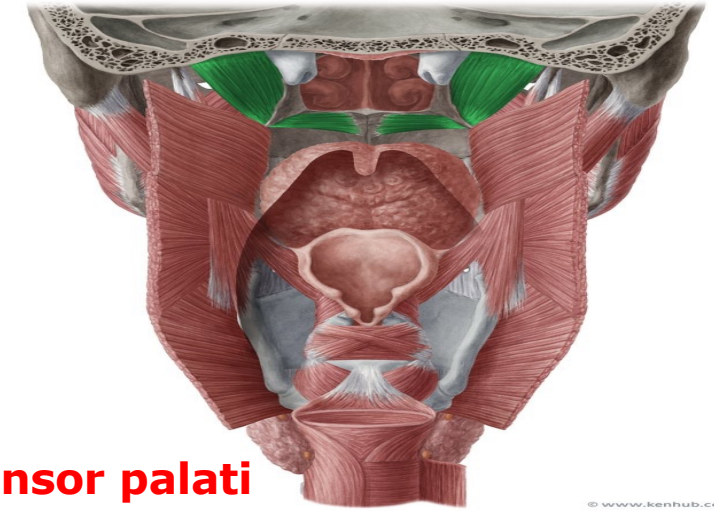
2. Nerve to the medial pterygoid muscle **(motor to 3 muscles)** :

it supplies M. pterygoid tensor palati and tensor tympani muscles.

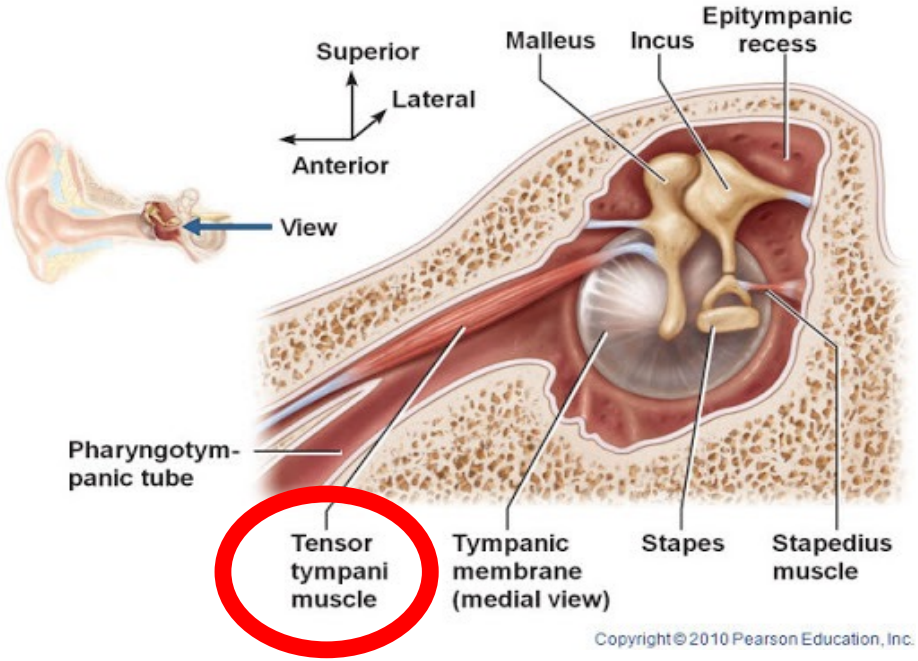
Foramen spinosum

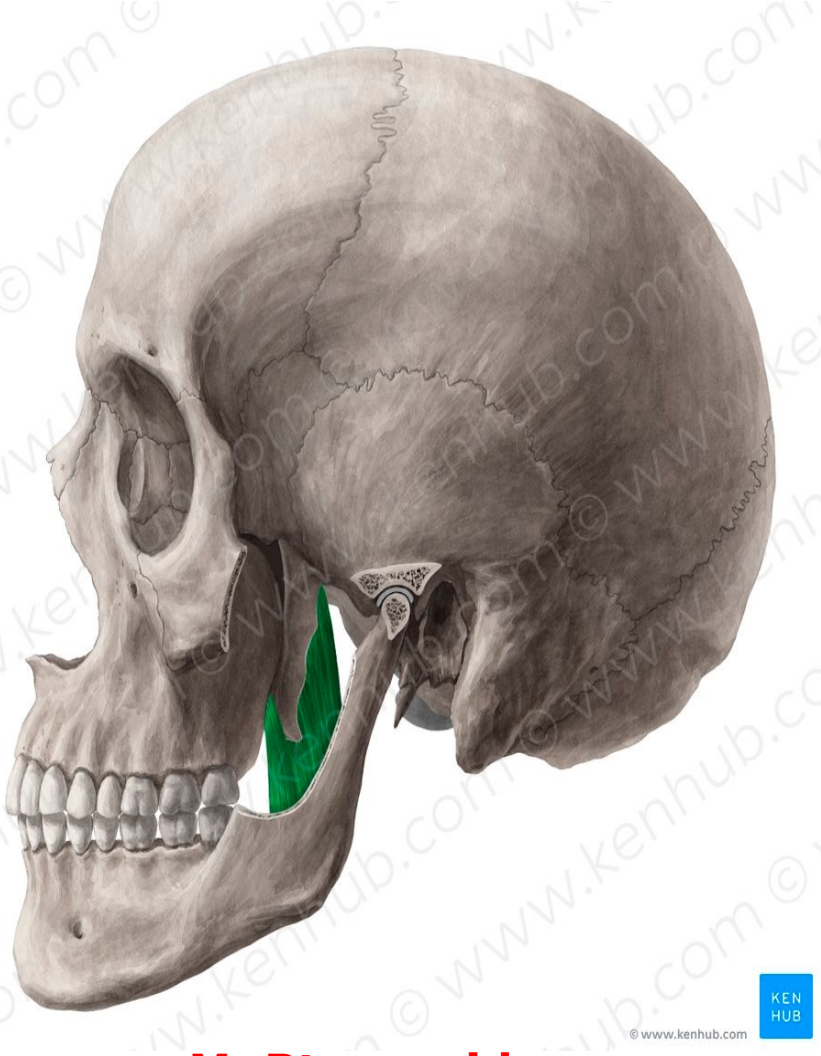






Tensor palati





M. Pterygoid

Trunk Mandibular Nerve

Anterior division (mainly motor)

Posterior division *(mainly sensory)*

Anterior division

B. Branches from the Anterior Division : **(3 motor + 1 sensory)**

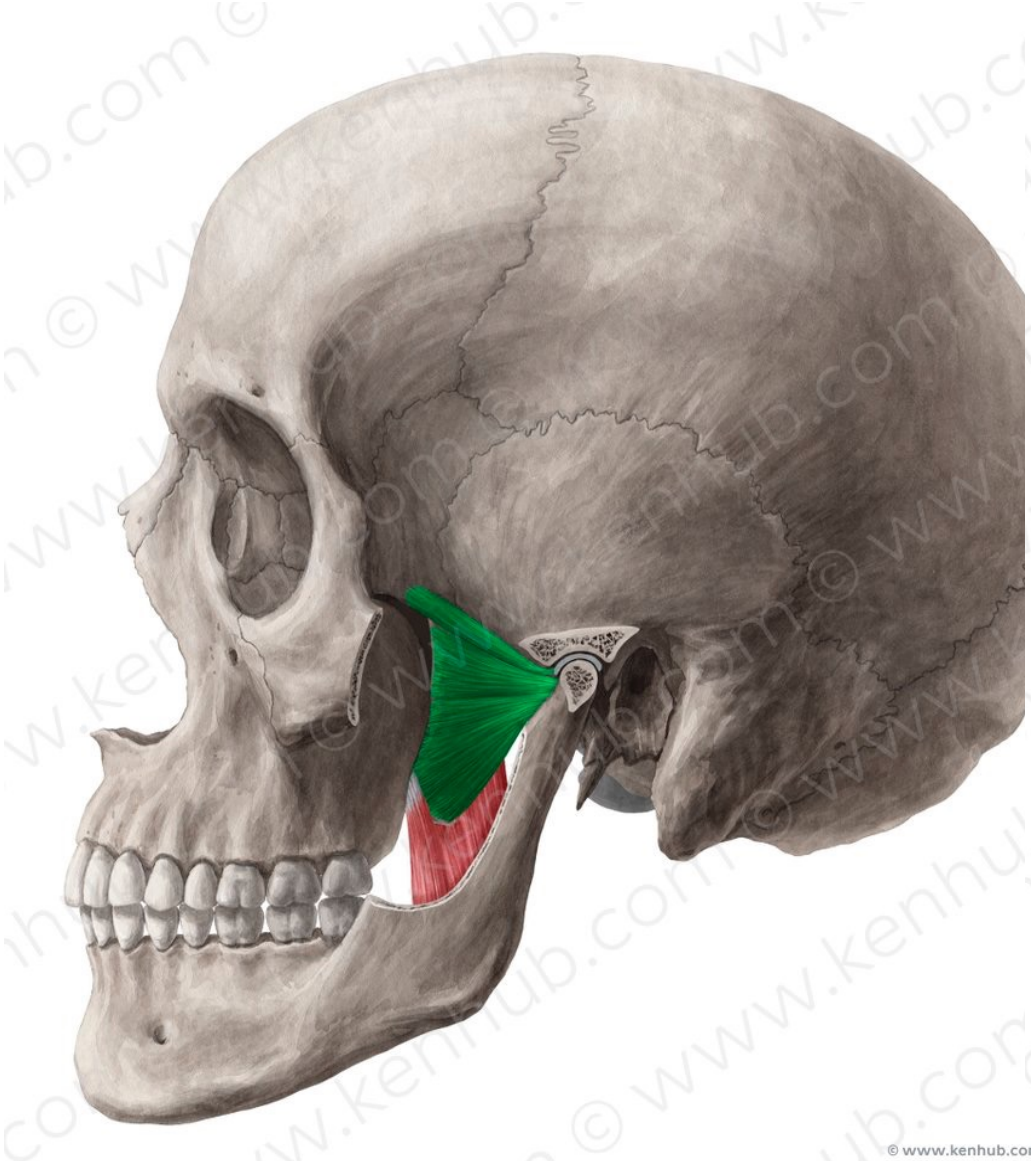
1. Nerve to lateral pterygoid

2. Masseteric nerve : it traverses the mandibular notch to enter the ***deep*** surface of masseter.

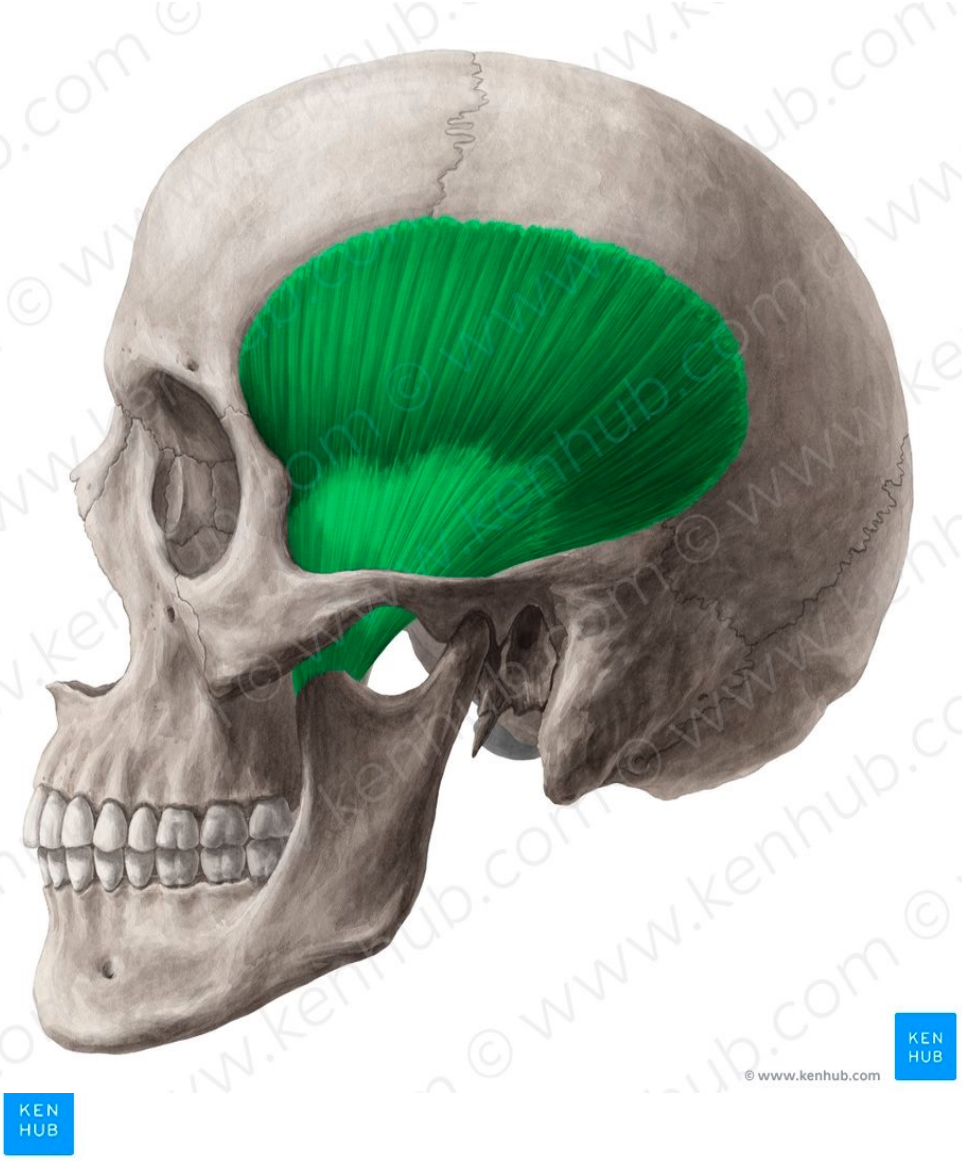
3. Deep temporal nerves (two) : ascending ***deep*** to zygomatic arch to enter the ***deep*** surface of the temporalis

4. Buccal N. (sensory) : it runs on the buccinators muscle.

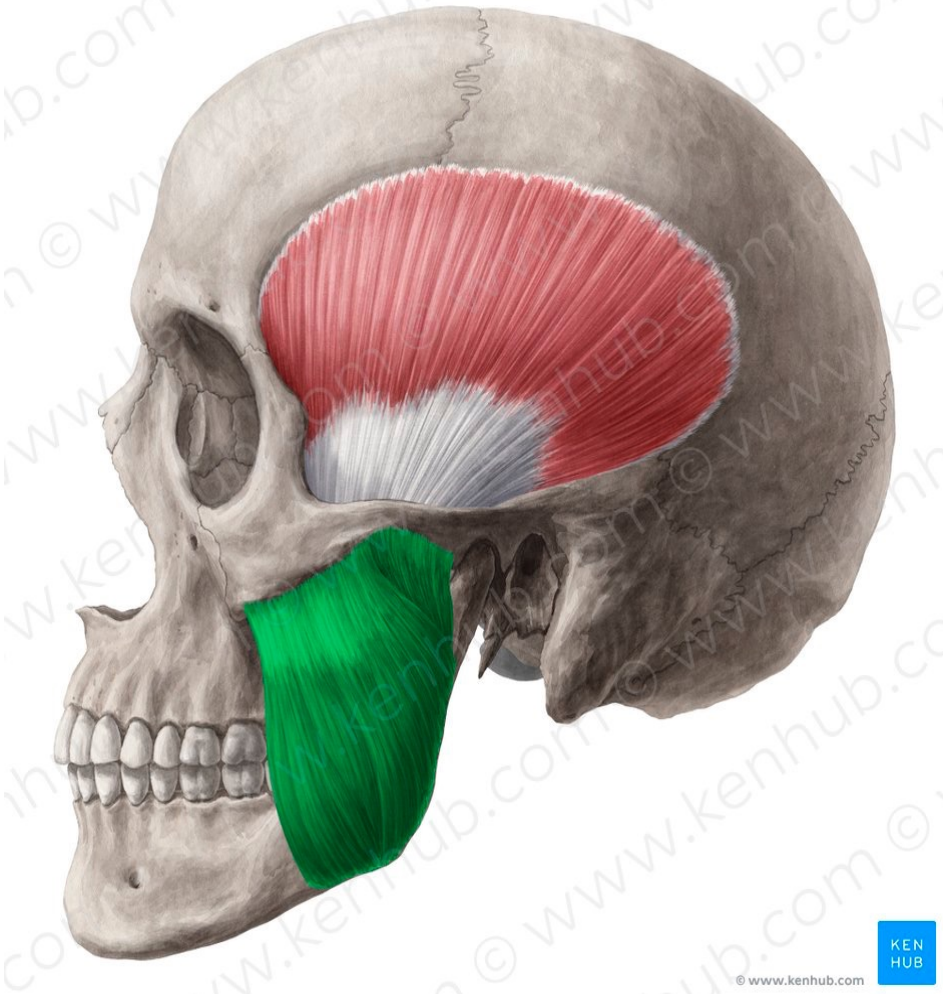
It supplies skin and mucous membrane of the cheek over and inside buccinators respectively



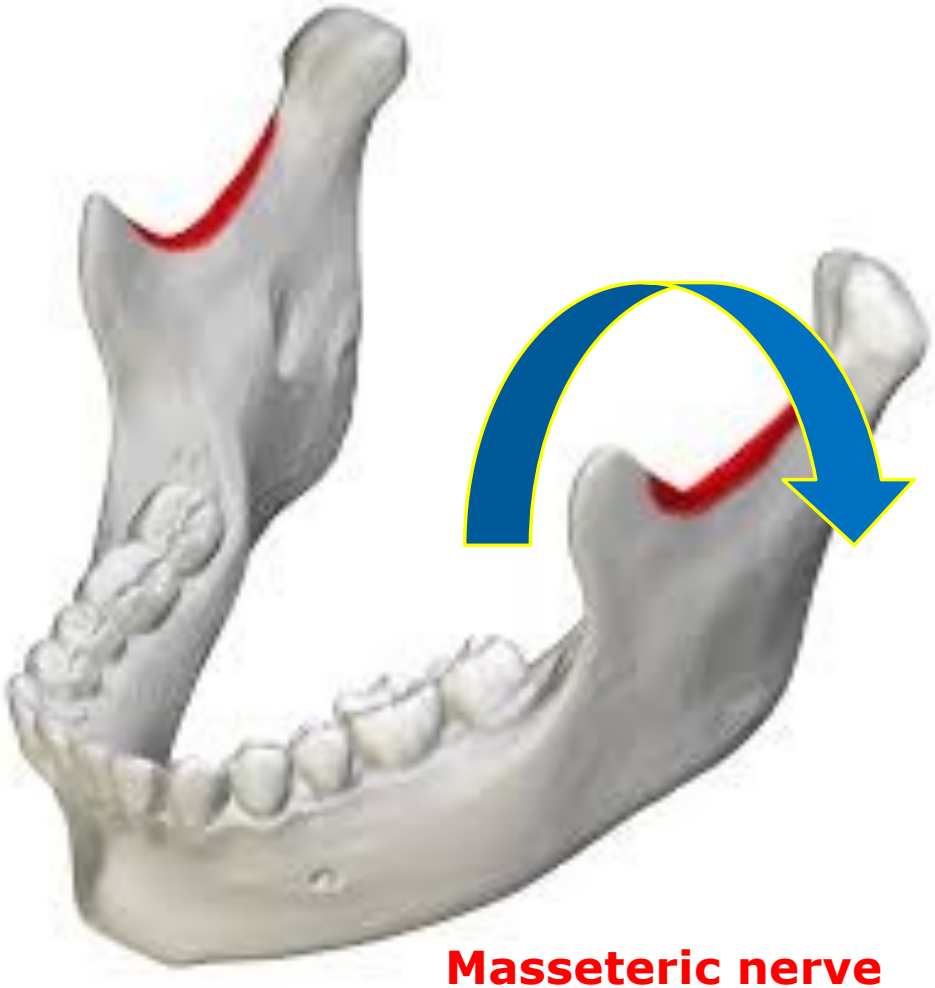
L. pterygoid



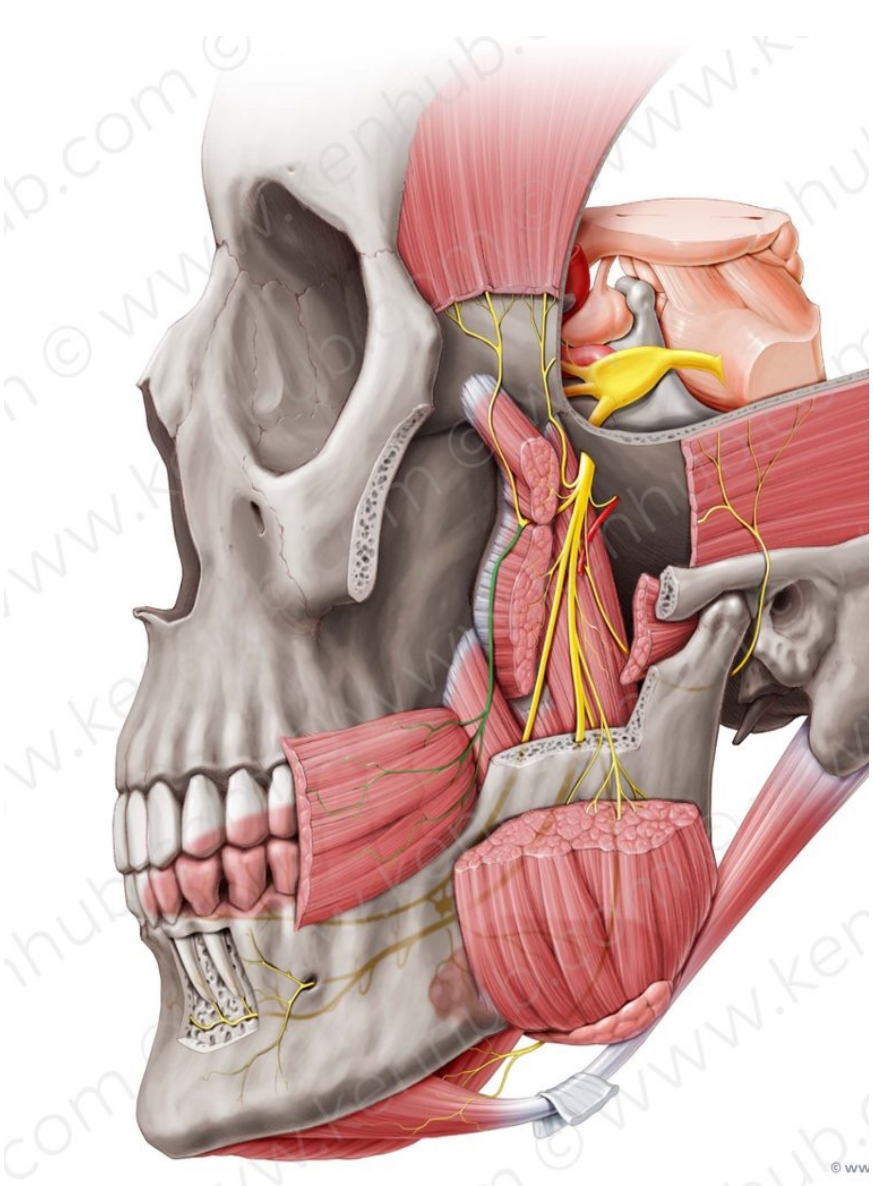
Temporalis



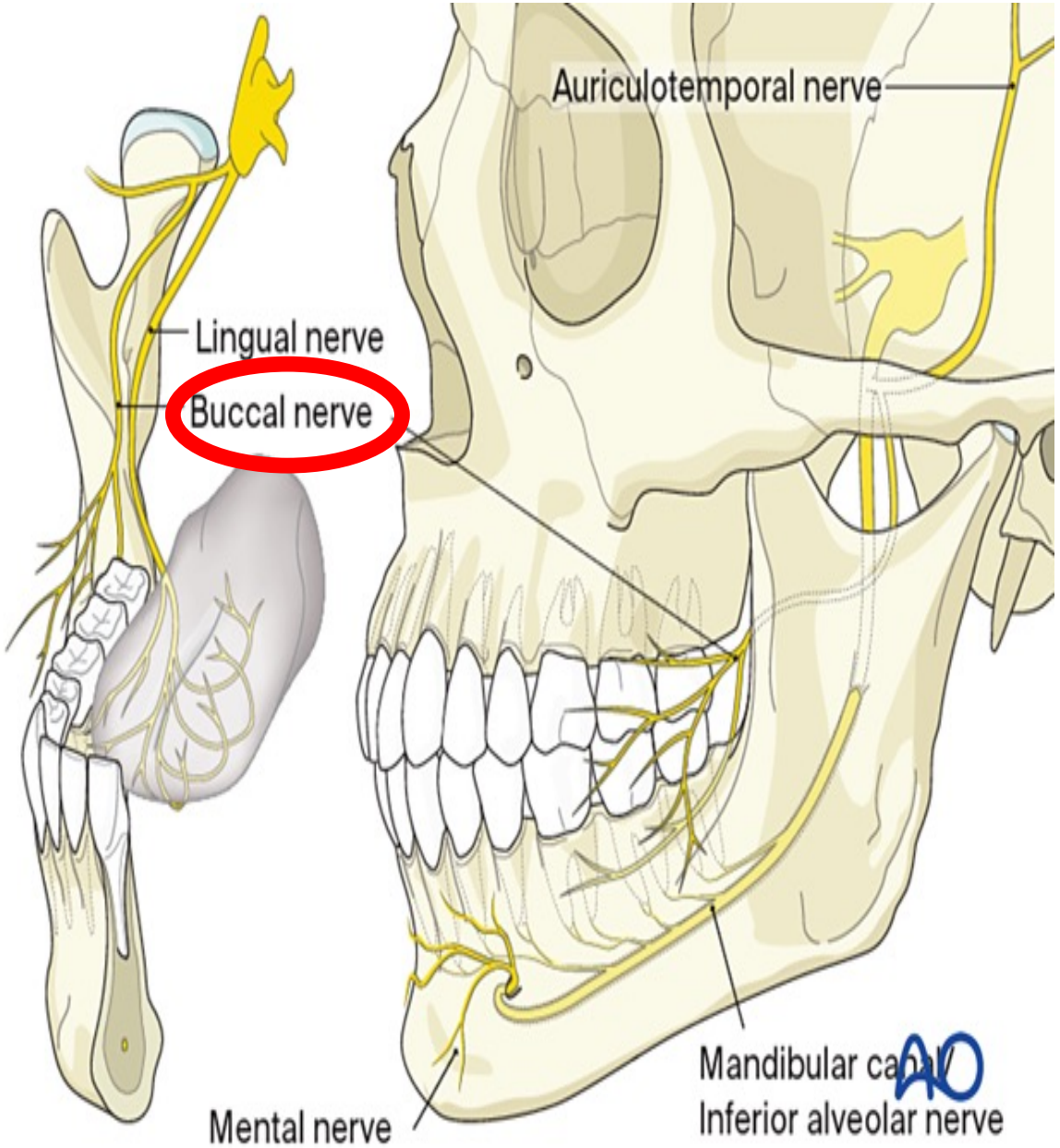
Masseter Muscle



Masseteric nerve



Buccal N. (green)



Posterior division

C. Branches from the Posterior Division : (2 sensory + 1 Mixed)

1- **A**uriculotemporal nerve **(sensory)**

2- **L**ingual nerve **(sensory)**

3-**I**nferior Alveolar nerve **(mixed)**

(ALI)

1. Auriculotemporal nerve (sensory)

It passes backwards deep to the neck of the mandible above the maxillary vessels and appears at the **upper end of the parotid gland.**

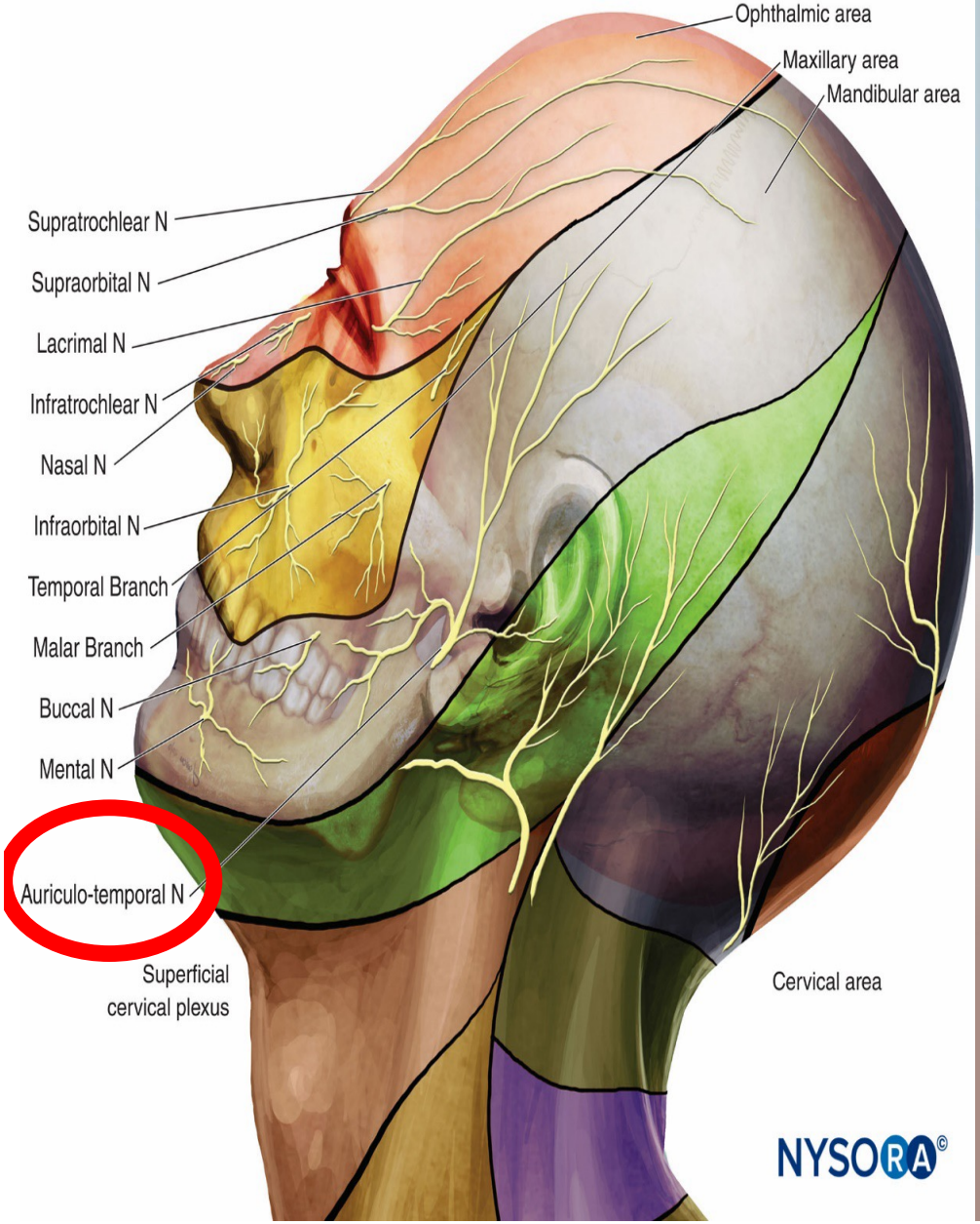
Branches:

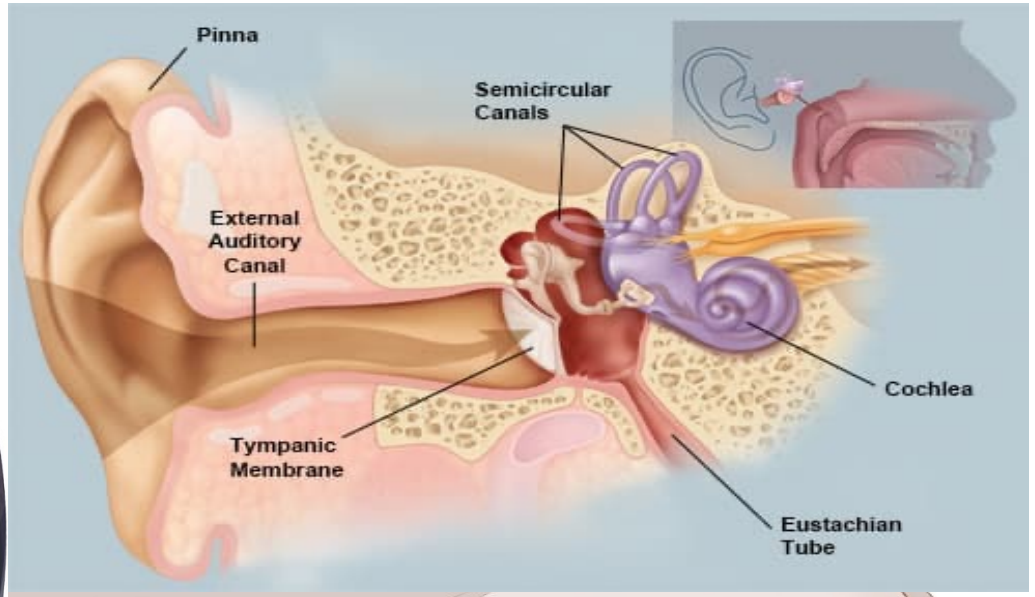
A. Articular branches to T.M.J.

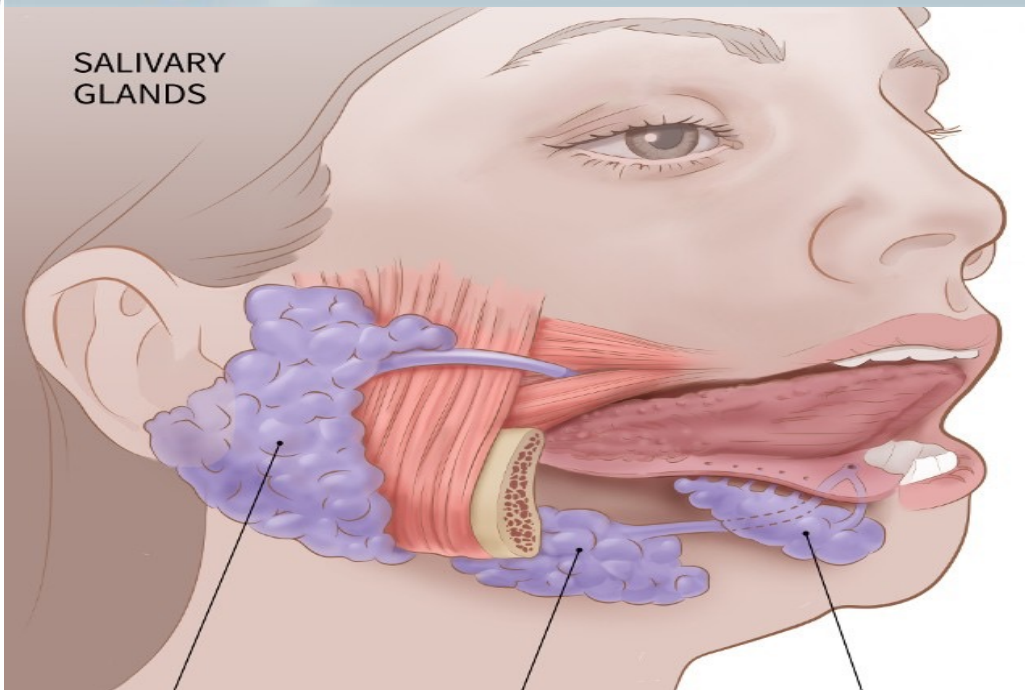
B. Cutaneous branches : supplies

- External surface of the auricle
- External auditory meatus
- Outer surface of tympanic membrane
- Hairy area of the temple
- Parenchyma of the parotid gland

C. It **carries and conducts** postganglionic **parasympathetic** secretmotor nerve fibers from the **Otic** ganglion to the **parotid gland**.


Ophthalmic area
Maxillary area
Mandibular area
Supratrochlear N
Supraorbital N
Lacrimal N
Infratrochlear N
Nasal N
Infraorbital N
Temporal Branch
Malar Branch
Buccal N
Mental N
Auriculo-temporal N
Superficial cervical plexus
Cervical area
NYSORA©


Pinna
Semicircular Canals
External Auditory Canal
Cochlea
Tympanic Membrane
Eustachian Tube


SALIVARY GLANDS

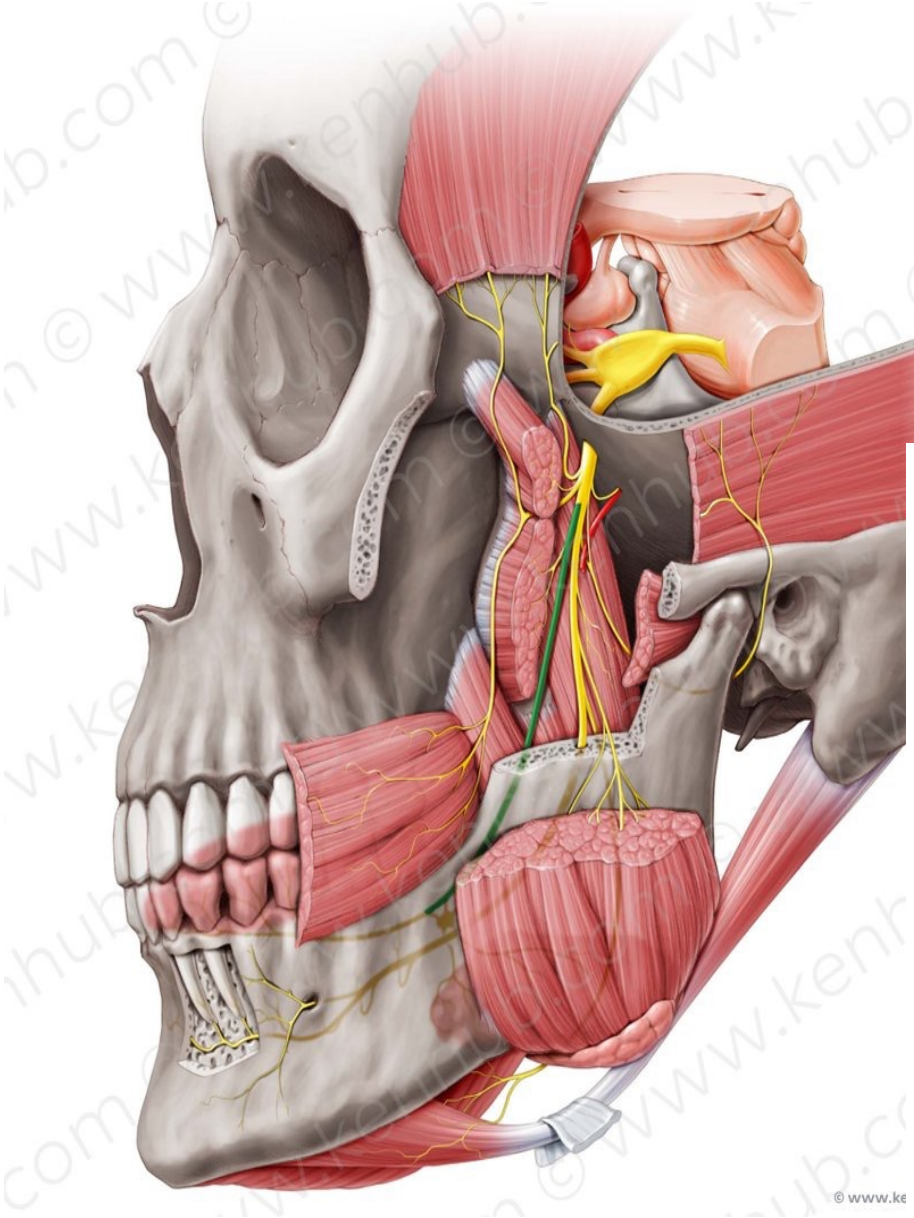
2- Lingual Nerve (sensory)

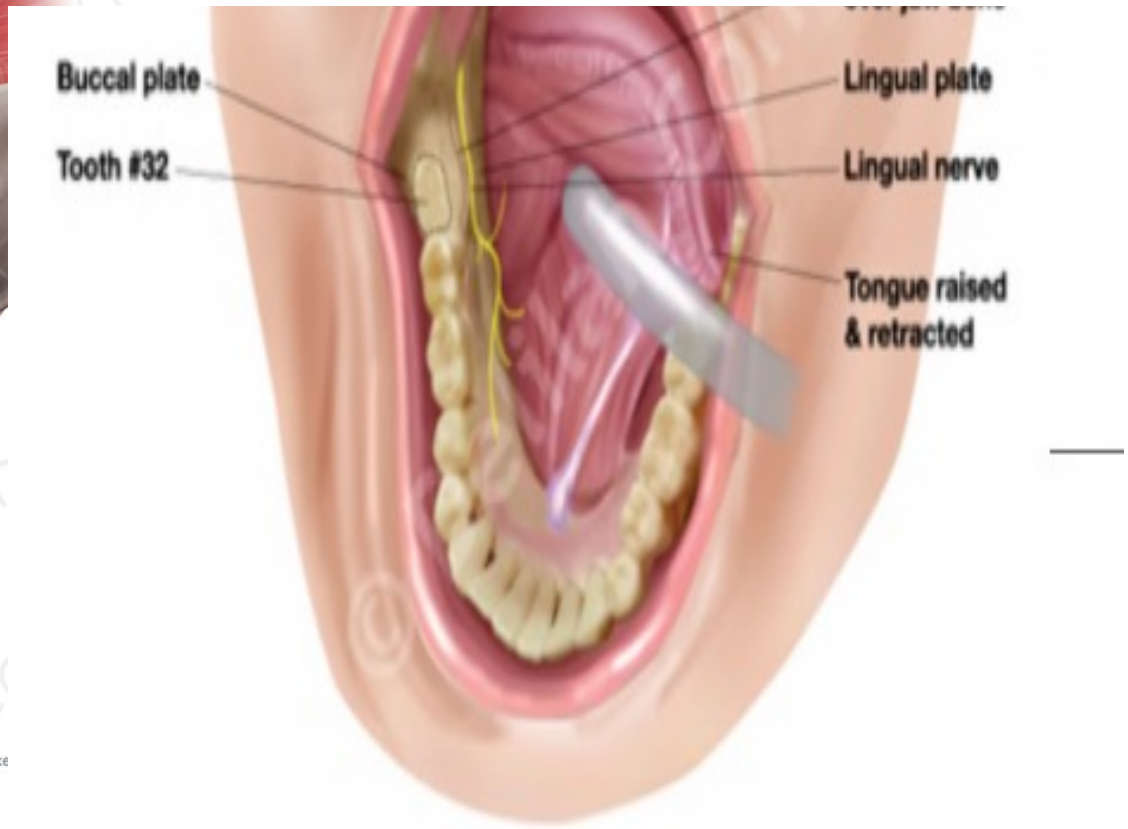
- This nerve is joined by the chorda tympani (branch of the facial nerve) deep to L. pterygoid muscle
- It appears ***below*** the L. pterygoid, descends anterior to the inferior alveolar N.
- It enters ***the floor*** of the mouth in contact with the mandible below and medial to the root of the **third molar tooth**, being covered ***only*** by the gingival mucous membrane **(dangerous site).**

- In the floor of the mouth, the nerve ***crosses 3* (glossus)** muscles: **styloglossus, hyopglossus and genioglossus** muscles before dividing into its terminal branches.
- On the hyopglossus, the nerve suspends the ***submandibular*** parasympathetic ganglion and hooks round the ***submandibular*** duct, crossing it from lateral to medial side.

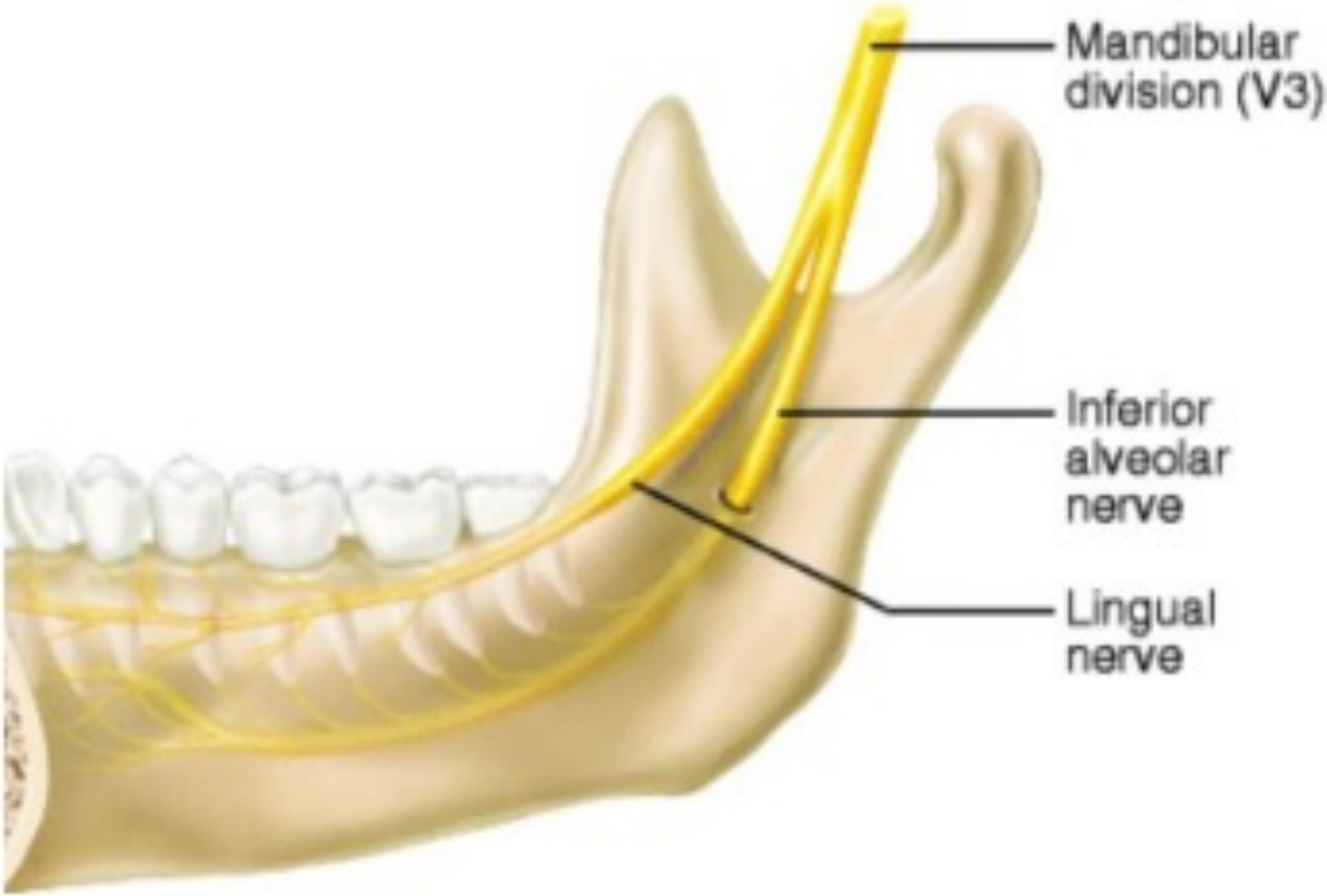
Branches:

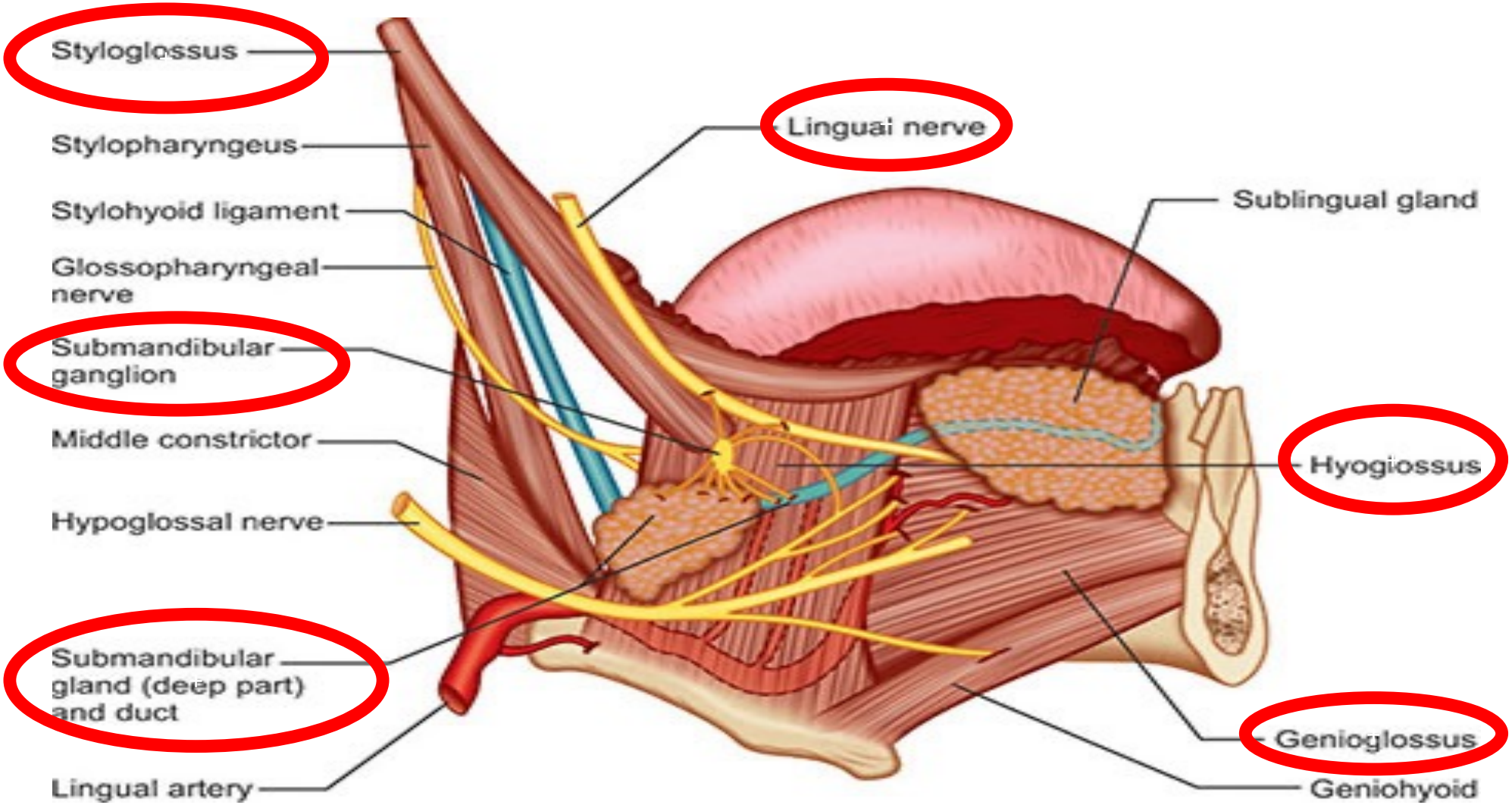
1. Two communicating branches to the submandibular ganglion.
2. Sensory branches to the anterior 2/3 of the tongue, mucosa of the floor of the mouth **(General sensation)** .

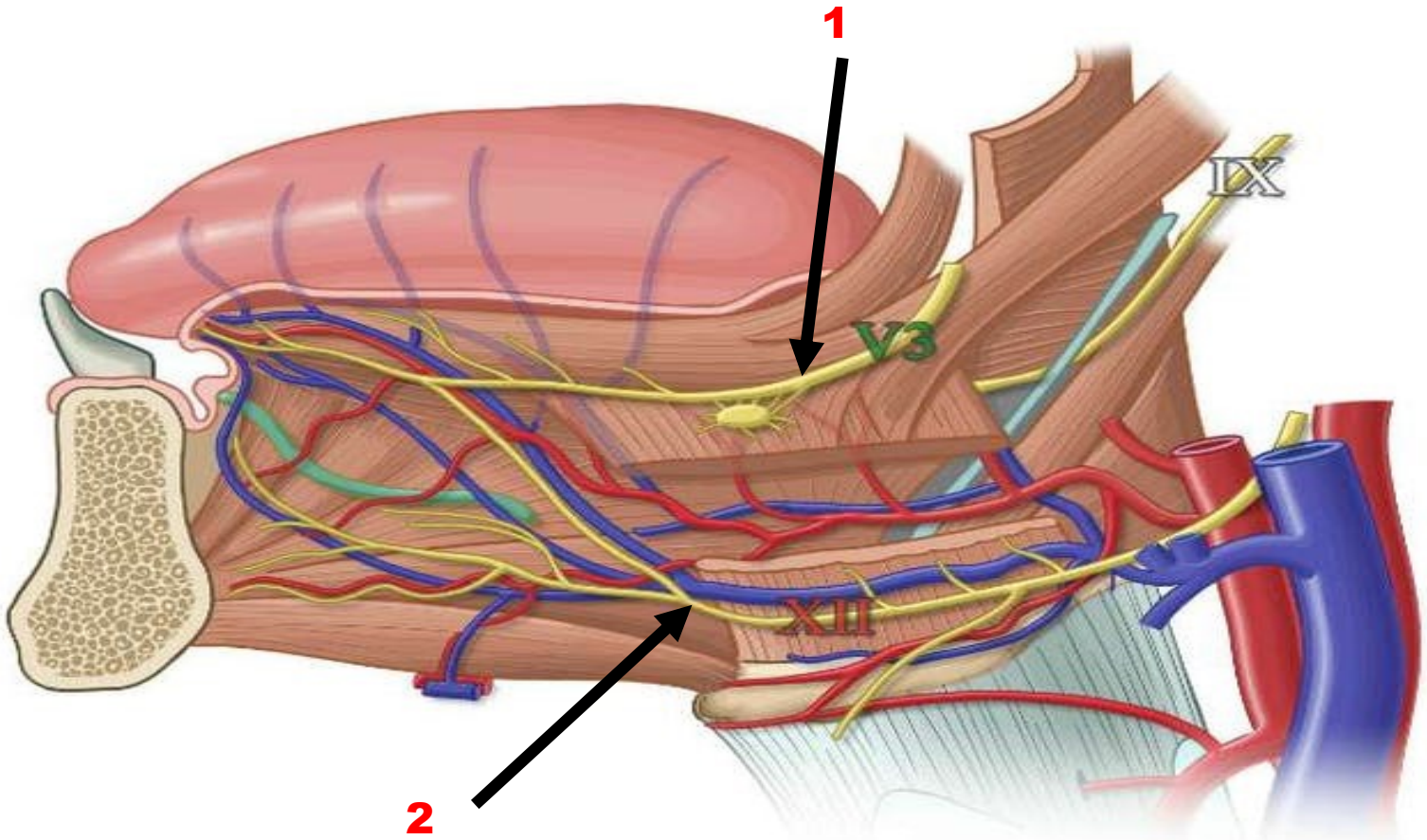


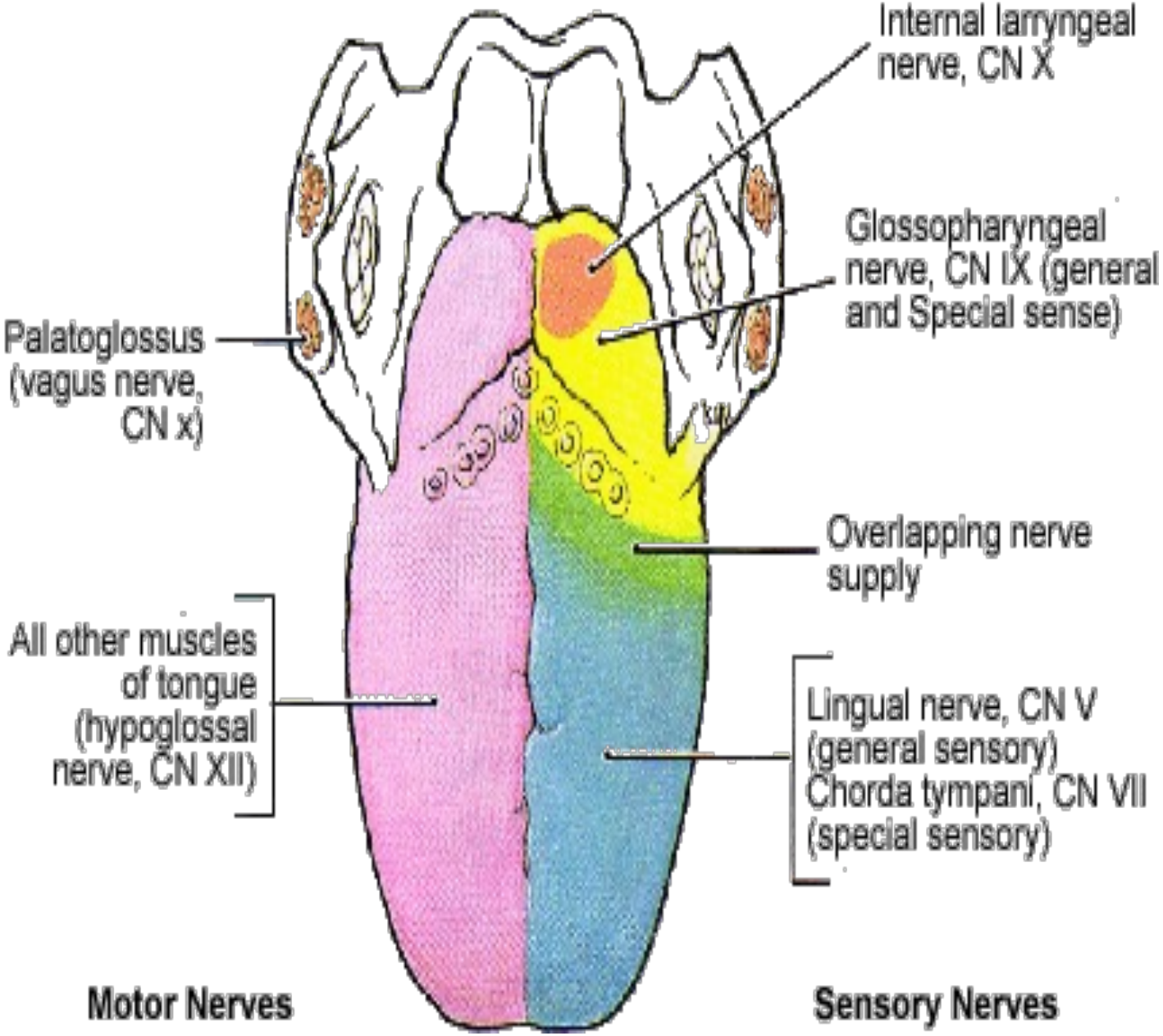


Lingual N. (green)


Mandibular division (V3)
Inferior alveolar nerve
Lingual nerve


Styloglossus
Stylopharyngeus
Stylohyoid ligament
Glossopharyngeal nerve
Submandibular ganglion
Middle constrictor
Hypoglossal nerve
Submandibular gland (deep part) and duct
Lingual artery
Lingual nerve
Sublingual gland
Hyoglossus
Genioglossus
Geniohyoid

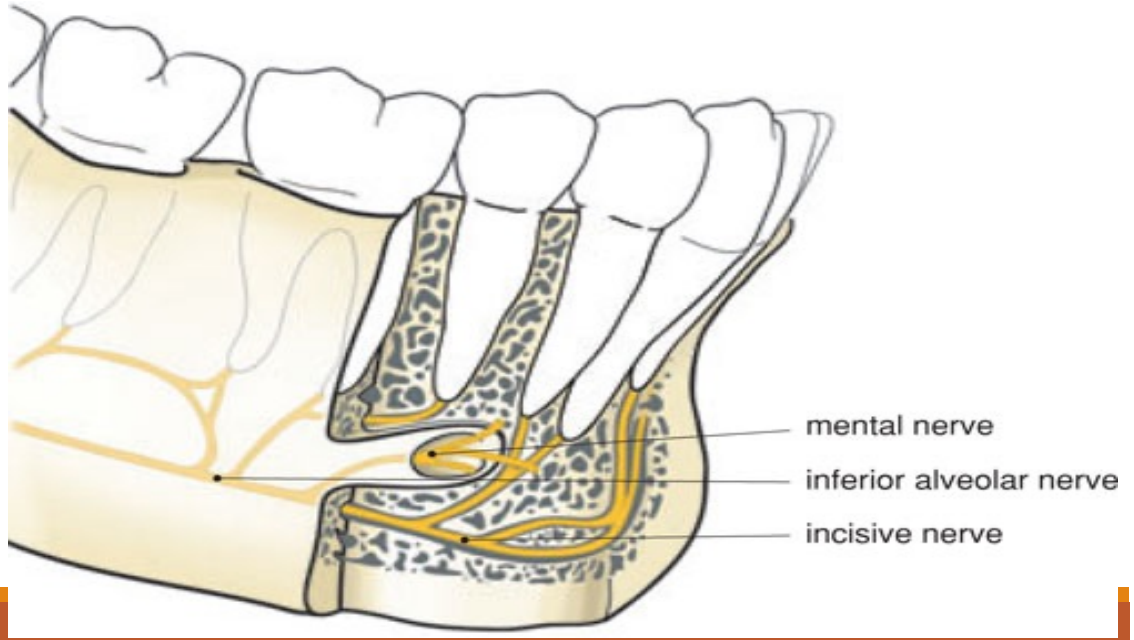

1
IX
V3
XII
2


Internal larryngeal nerve, CN X
Glossopharyngeal nerve, CN IX (general and Special sense)
Palatoglossus (vagus nerve, CN x)
Overlapping nerve supply
All other muscles of tongue (hypoglossal nerve, CN XII)
Lingual nerve, CN V (general sensory)
Chorda tympani, CN VII (special sensory)
Motor Nerves
Sensory Nerves

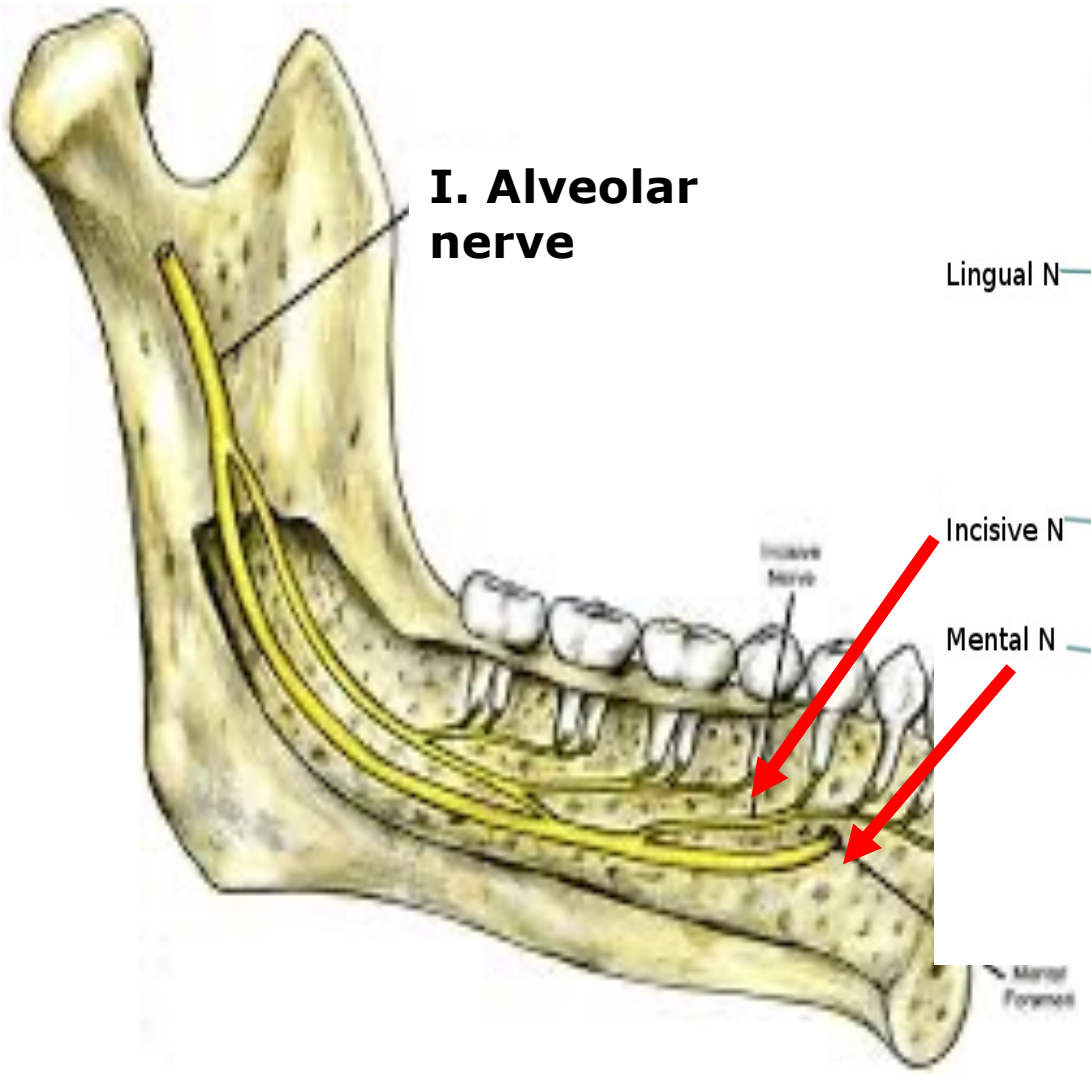
3-Inferior Alveolar N. (mixed)

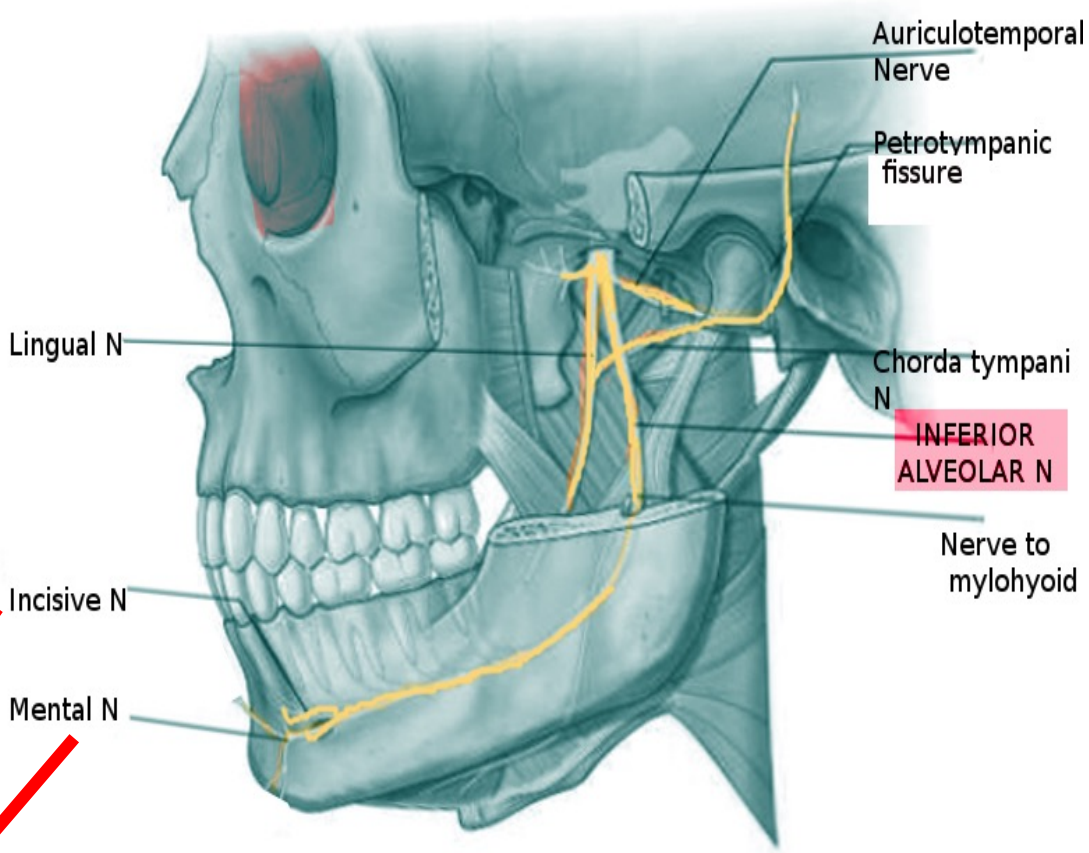
- It gives mylohyoid nerve before it enters the mandibular foramen
- Then it enters mandibular foramen
- It descends downwards within the mandibular canal (with the inferior alveolar A) .
- The mandibular canal and its contents are inferior to the roots of the molar teeth, and the roots can sometimes curve around the canal making extraction of these teeth difficult
- It gives branches to the three molar teeth and the second premolar tooth and associated labial gingivae.
- Then it divides into its two terminal branches ; incisive and mental

- **Incisive nerve**
- which continues in the mandibular canal to supply the first premolar, incisor, and canine teeth, and related gingiva.
- **Mental nerve**
- which exits the mandible through the mental foramen and supplies the lower lip and chin.
- The mental nerve is palpable and sometimes visible through the oral mucosa adjacent to the roots of the premolar teeth.



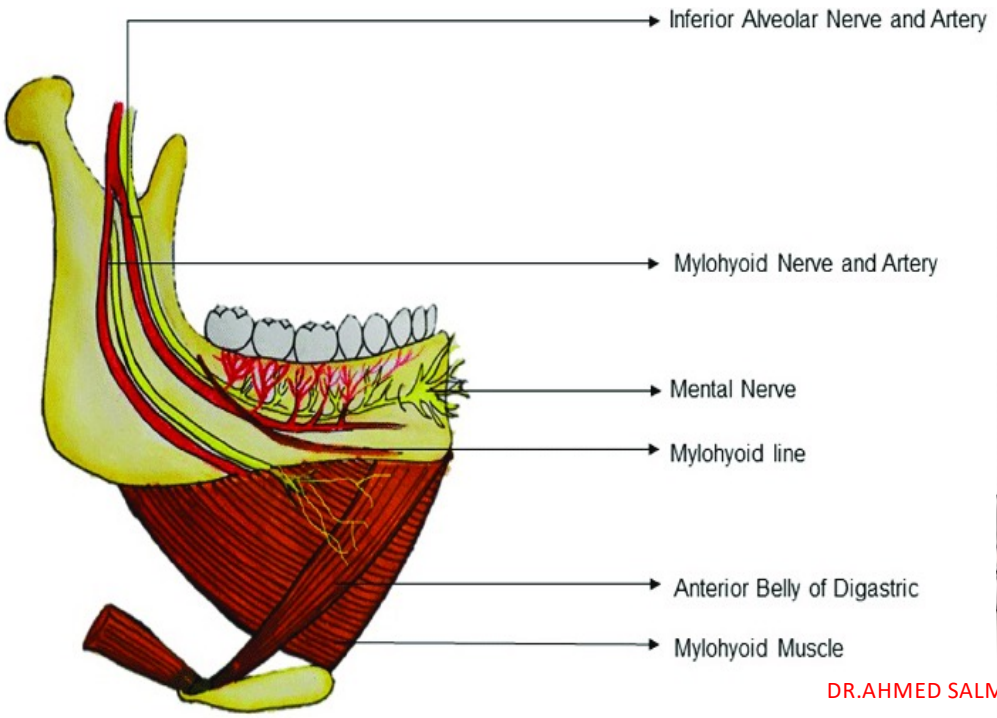
I. Alveolar nerve

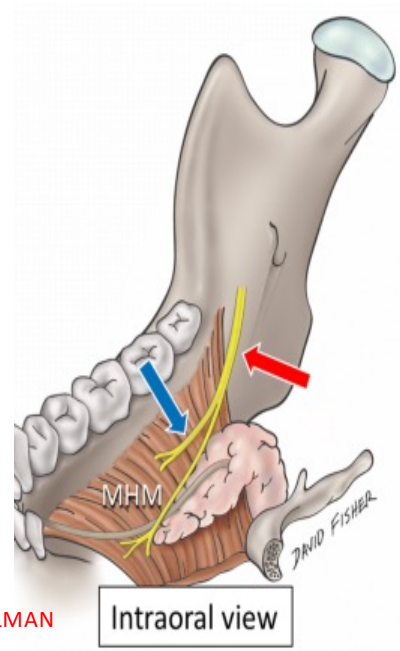




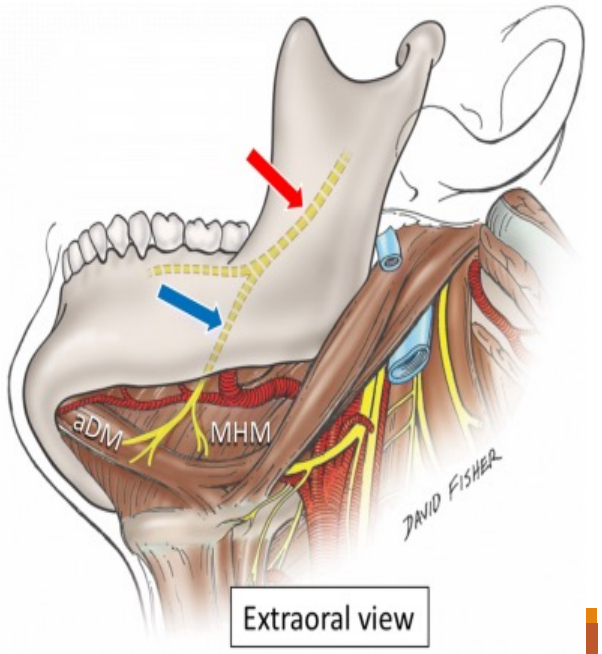
Mylohyoid Nerve:

- It is a branch of Inferior Alveolar nerve
- Contains all motor fibers in the posterior division
- It runs in the mylohyoid groove of the mandible to reach the digastric triangle where it supplies the mylohyoid and the anterior belly of digastric muscles.

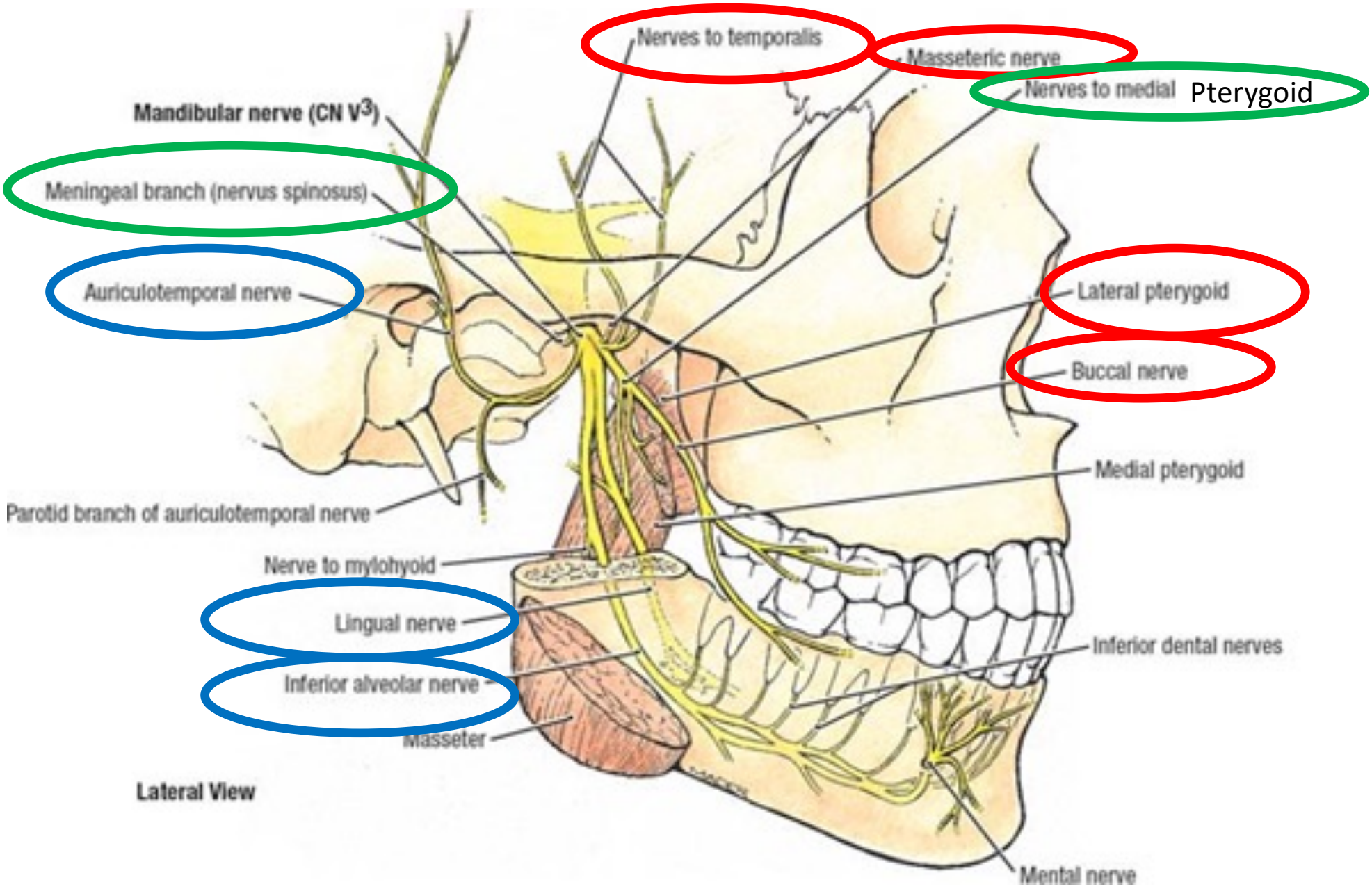




Intraoral view

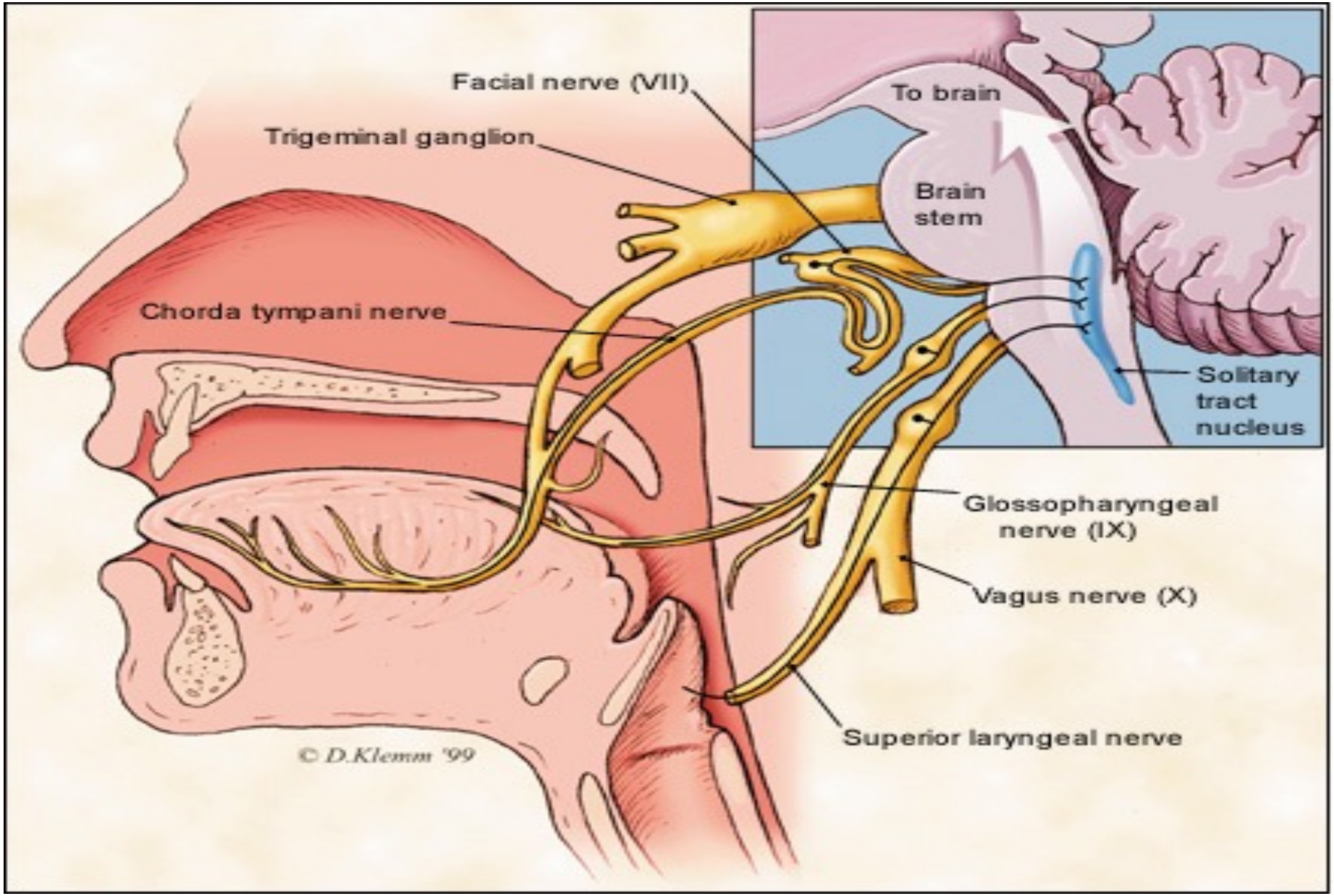


Extraoral view


Nerves to temporalis
Masseteric nerve
Nerves to medial Pterygoid
Mandibular nerve (CN V3)
Meningeal branch (nervus spinosus)
Auriculotemporal nerve
Lateral pterygoid
Buccal nerve
Medial pterygoid
Parotid branch of auriculotemporal nerve
Nerve to mylohyoid
Lingual nerve
Inferior dental nerves
Inferior alveolar nerve
Masseter
Mental nerve
Lateral View

2- Chorda tympani

- It carries taste from the anterior two-thirds of the tongue and parasympathetic innervation to all submandibular and sublingual salivary glands
- It is a branch from the facial nerve within the temporal bone
- It leaves the middle ear through the **petrotympanic fissure** and enters the infratemporal fossa
- It joins the lingual nerve.
- Preganglionic parasympathetic fibers carried in the chorda tympani synapse with postganglionic parasympathetic fibers in the submandibular ganglion.
- The taste fibers do not pass through the ganglion and are distributed with terminal branches of the lingual nerve


Facial nerve (VII)
Trigeminal ganglion
Chorda tympani nerve
To brain
Brain stem
Solitary tract nucleus
Glossopharyngeal nerve (IX)
Vagus nerve (X)
Superior laryngeal nerve
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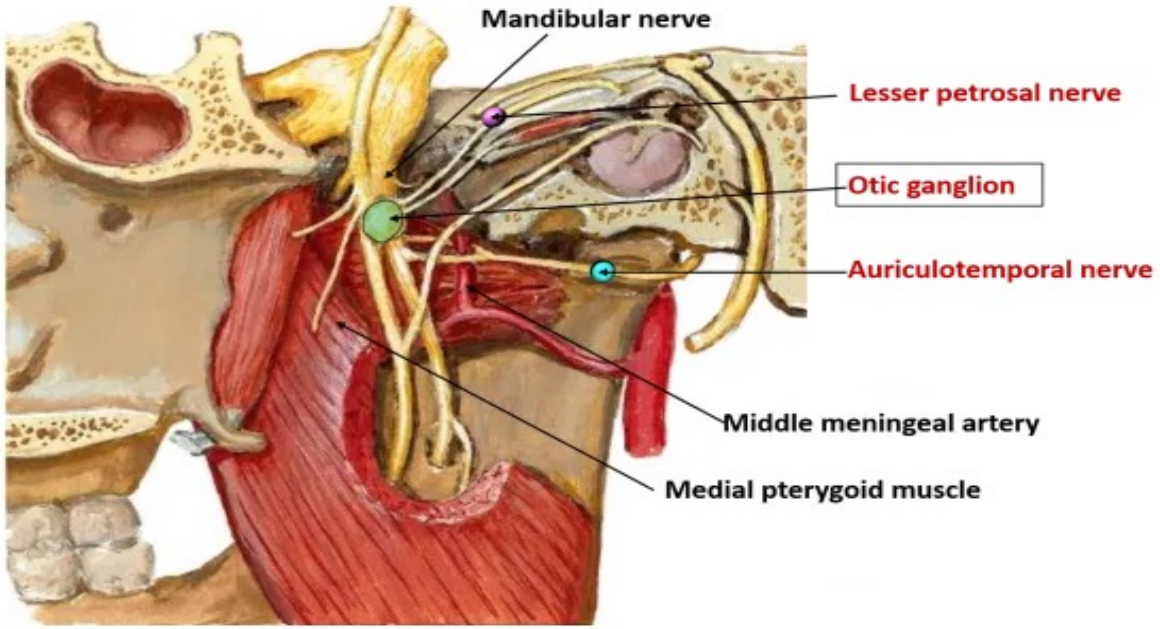
3- Otic ganglion

It is a peripheral parasympathetic ganglion which lies below foramen ovale

It is connected ***anatomically*** to the **mandibular nerve (5th Cranial N)**

It is connected ***functionally*** with the **glossopharyngeal nerve (9th CN)**



Roots : (only the parasympathetic root *relays* in the ganglion)

Parasympathetic root : is the lesser petrosal nerve of the glossopharyngeal (9th Cranial nerve)

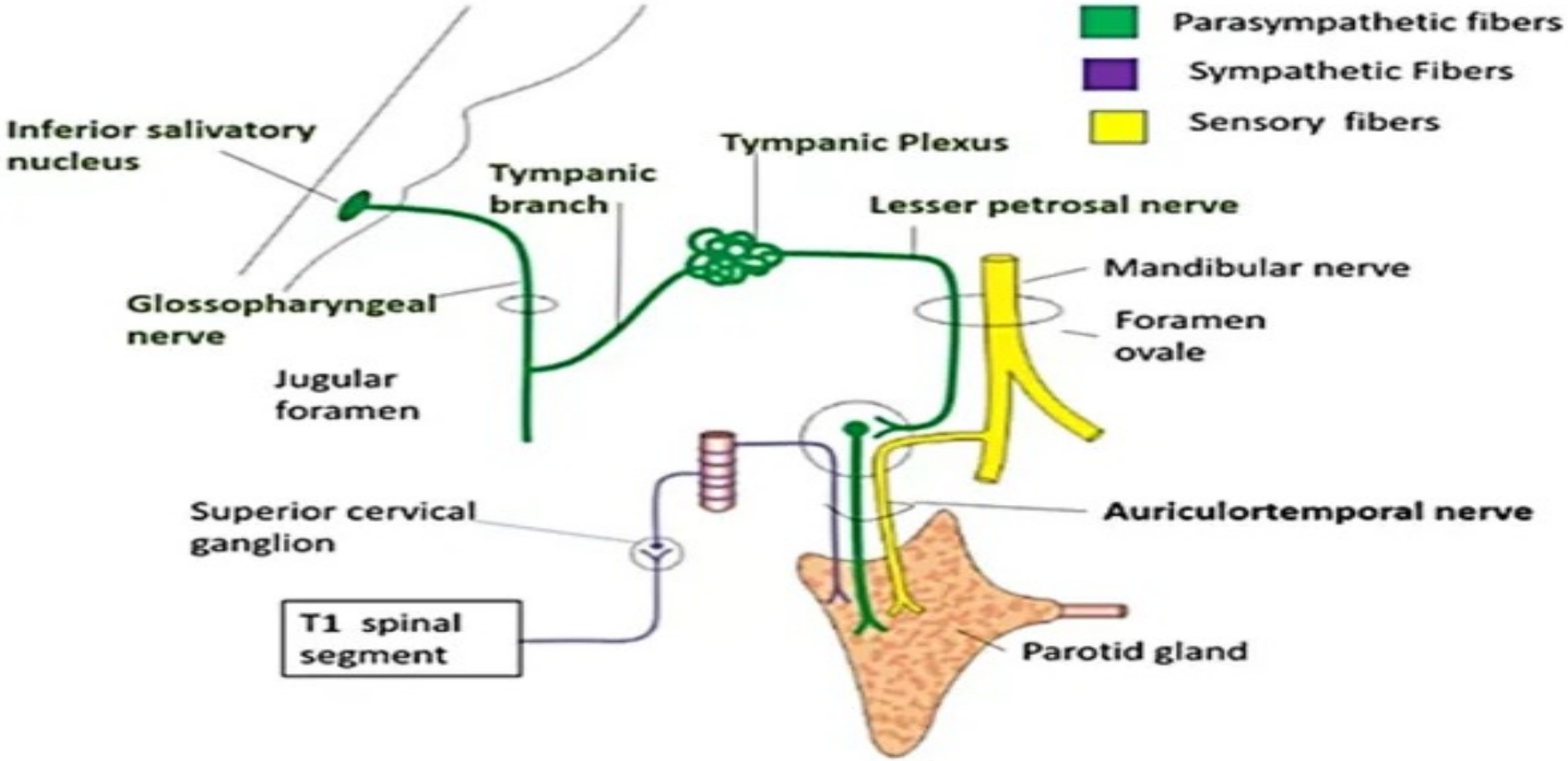
Inferior salivatory nucleus in the medulla → glossopharyngeal nerve → tympanic N. → Tympanic plexus of middle ear → lesser petrosal N. → middle cranial fossa → foramen ovale relay in the otic ganglion

Sympathetic root : from a plexus around the **middle meningeal Artery**

Motor root :

- Is a branch from the Nerve to medial pterygoid (From trunk of Mandibular nerve)
- It traverses the ganglion without relay to supply tensor palati and tensor tympani.

Distribution : Postganglionic parasympathetic secretomotor and postganglionic sympathetic vasomotor fibres join the **auriculotemporal** nerve to supply the **parotid gland.**

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