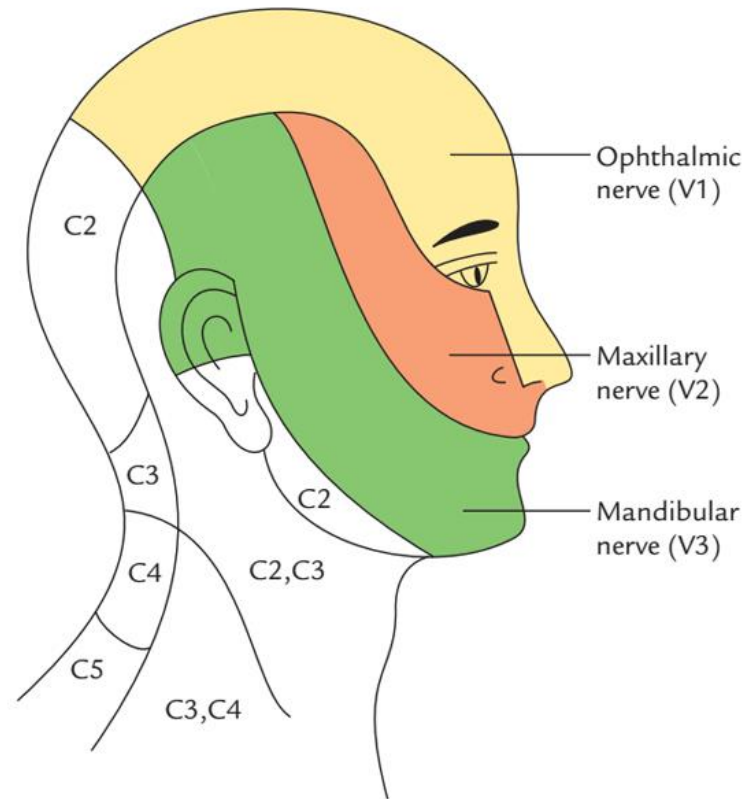
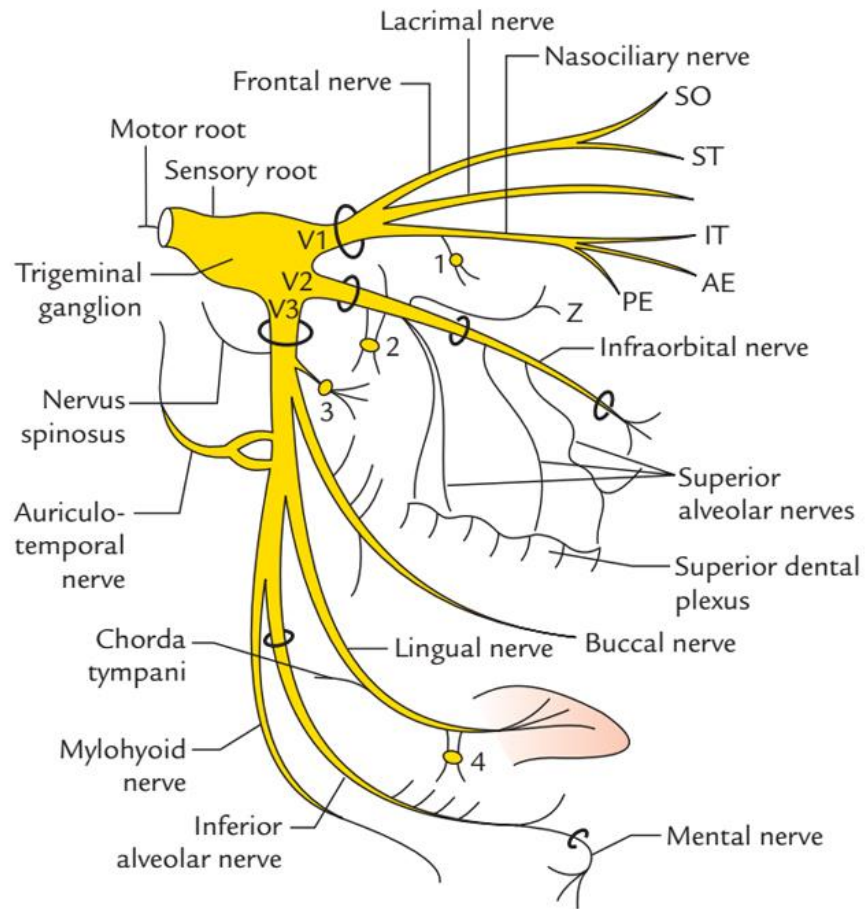
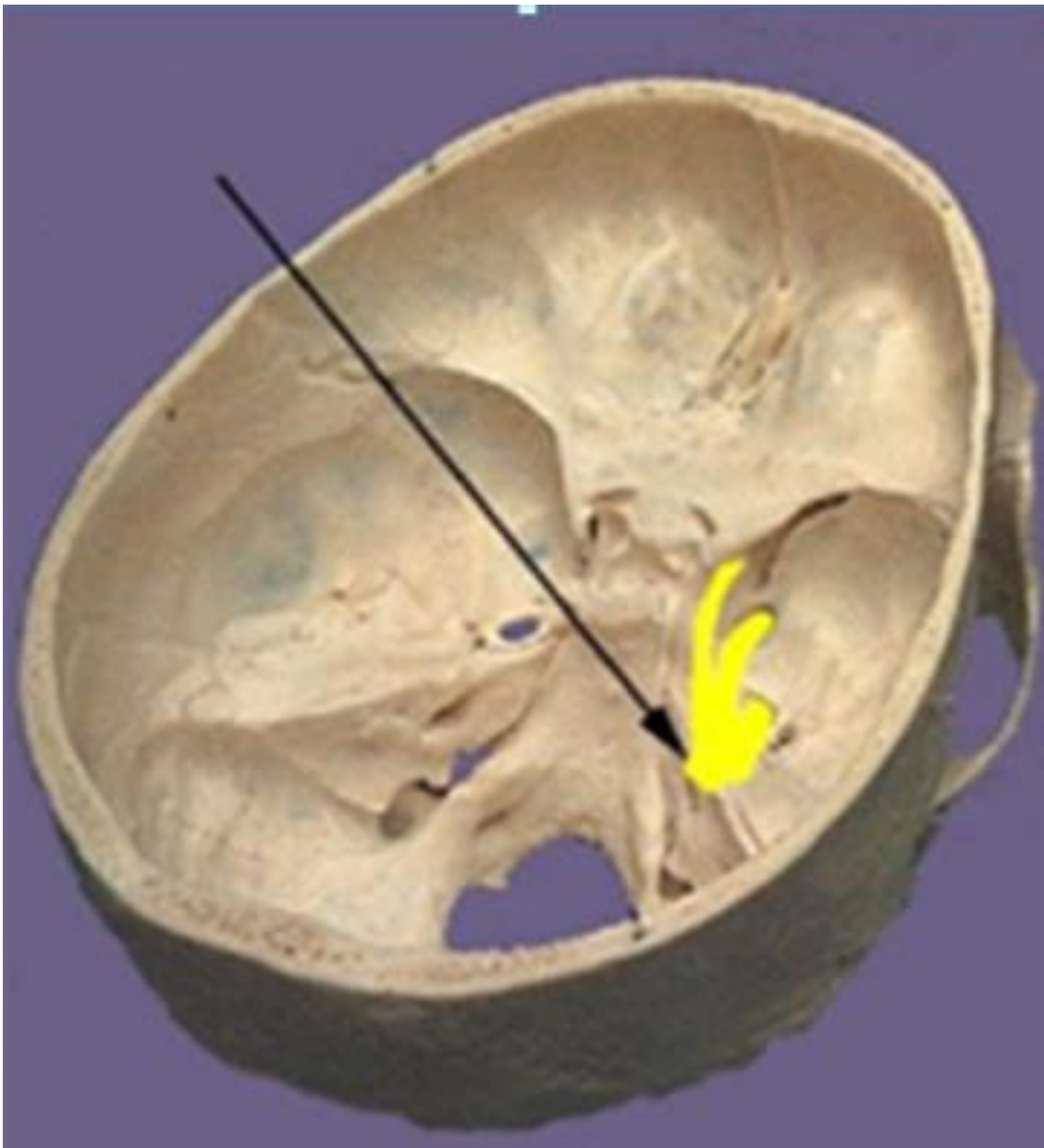


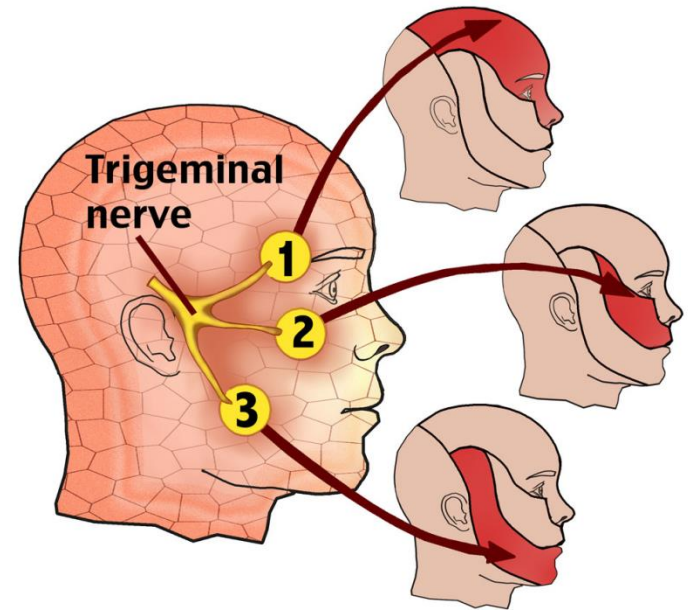
Trigeminal nerve





it divides into three smaller branches, controlling sensations throughout the face:

- [Ophthalmic Nerve](#) (V1): The first branch controls sensation in a person's eye, upper eyelid and forehead.
- [Maxillary Nerve](#) (V2): The second branch controls sensation in the lower eyelid, cheek, nostril, upper lip and upper gum.
- [Mandibular Nerve](#) (V3): The third branch controls sensations in the jaw, lower lip, lower gum and some of the muscles used for chewing.

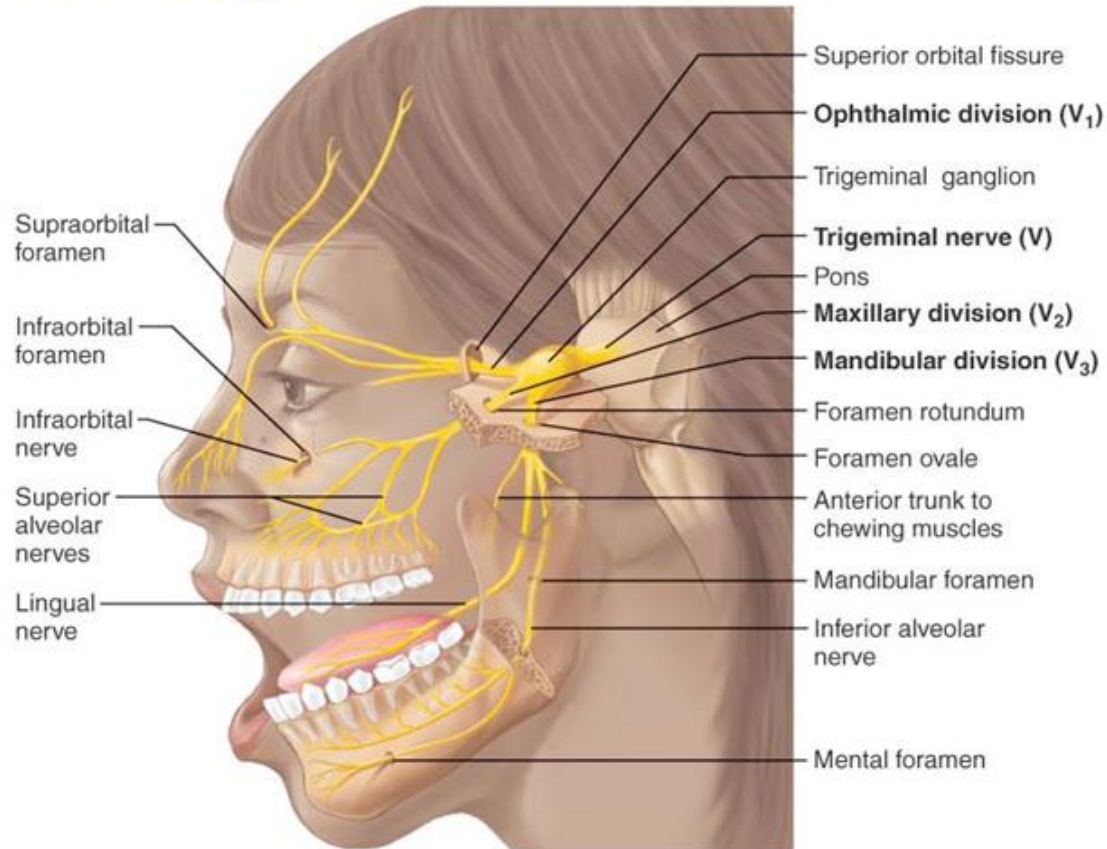


[Trigeminal Neuralgia – Causes, Symptoms and Treatments \(aans.org\)](#)

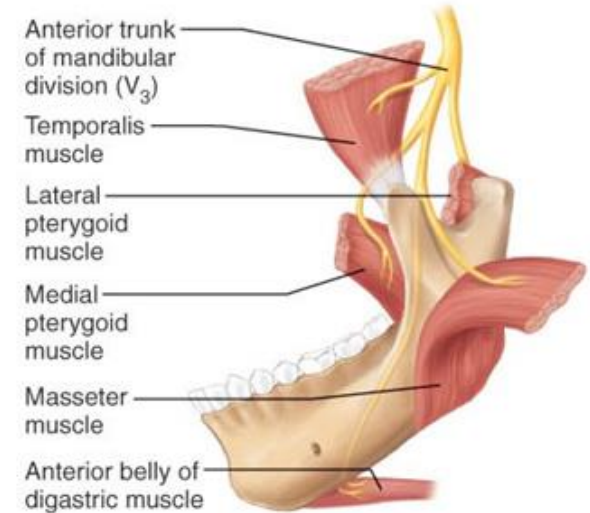
The trigeminal nerve is one set of the **cranial nerves** in the head. It is the nerve responsible for providing sensation to the face.

Trigeminal neuralgia (TN), also known as **tic douloureux**, is sometimes described as the most excruciating pain known to humanity. **اكثر الاعصاب ايلاما للبشر**. The pain typically involves the lower face and jaw, although sometimes it affects the area around the nose and above the eye

The Trigeminal Nerves – V –

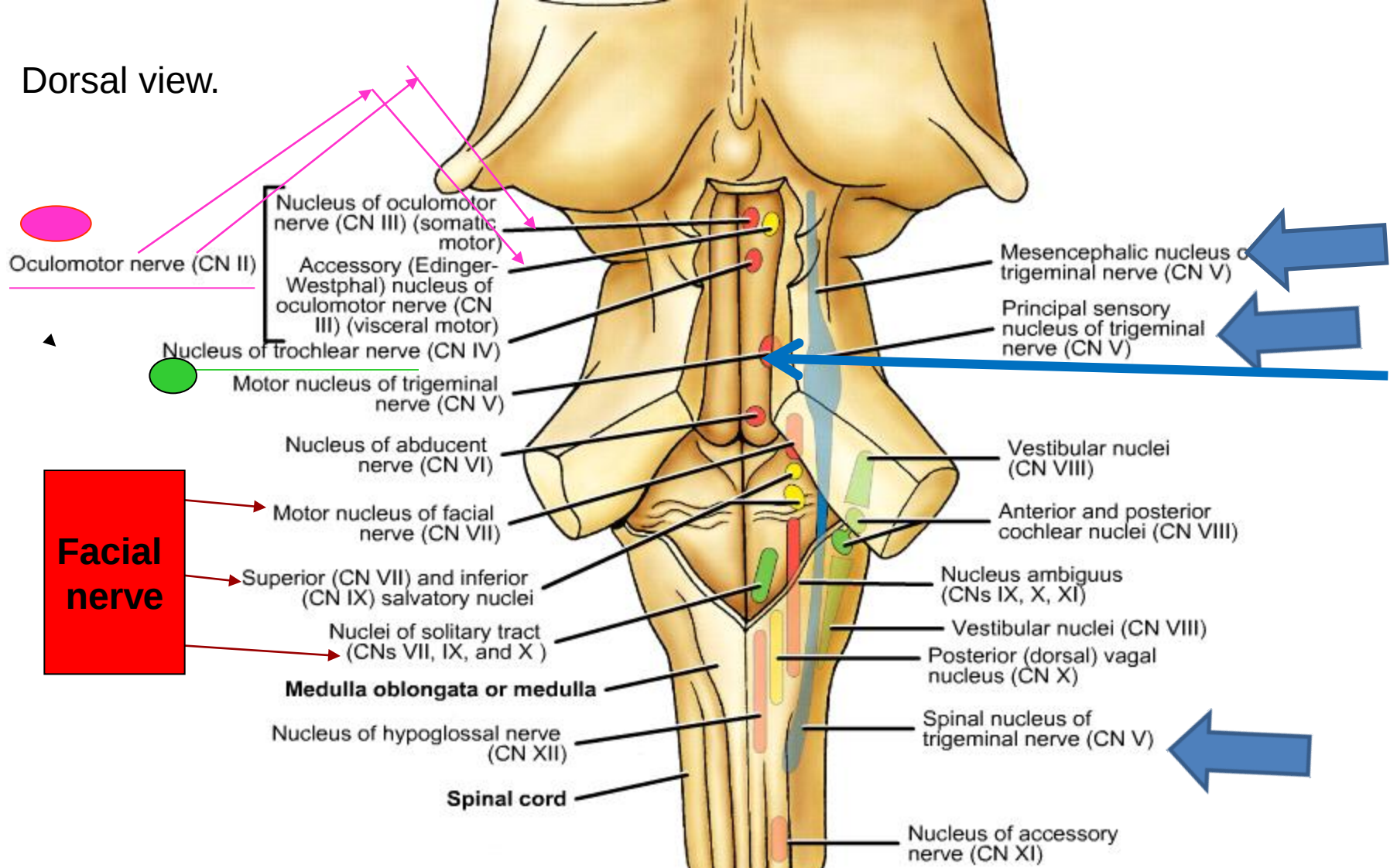


(a) Distribution of the trigeminal nerve



(c) Motor branches of the mandibular division (V_3)

Dorsal view.



- Red, motor nuclei; blue, sensory nuclei; yellow, parasympathetic nuclei; green, special sensory nuclei.

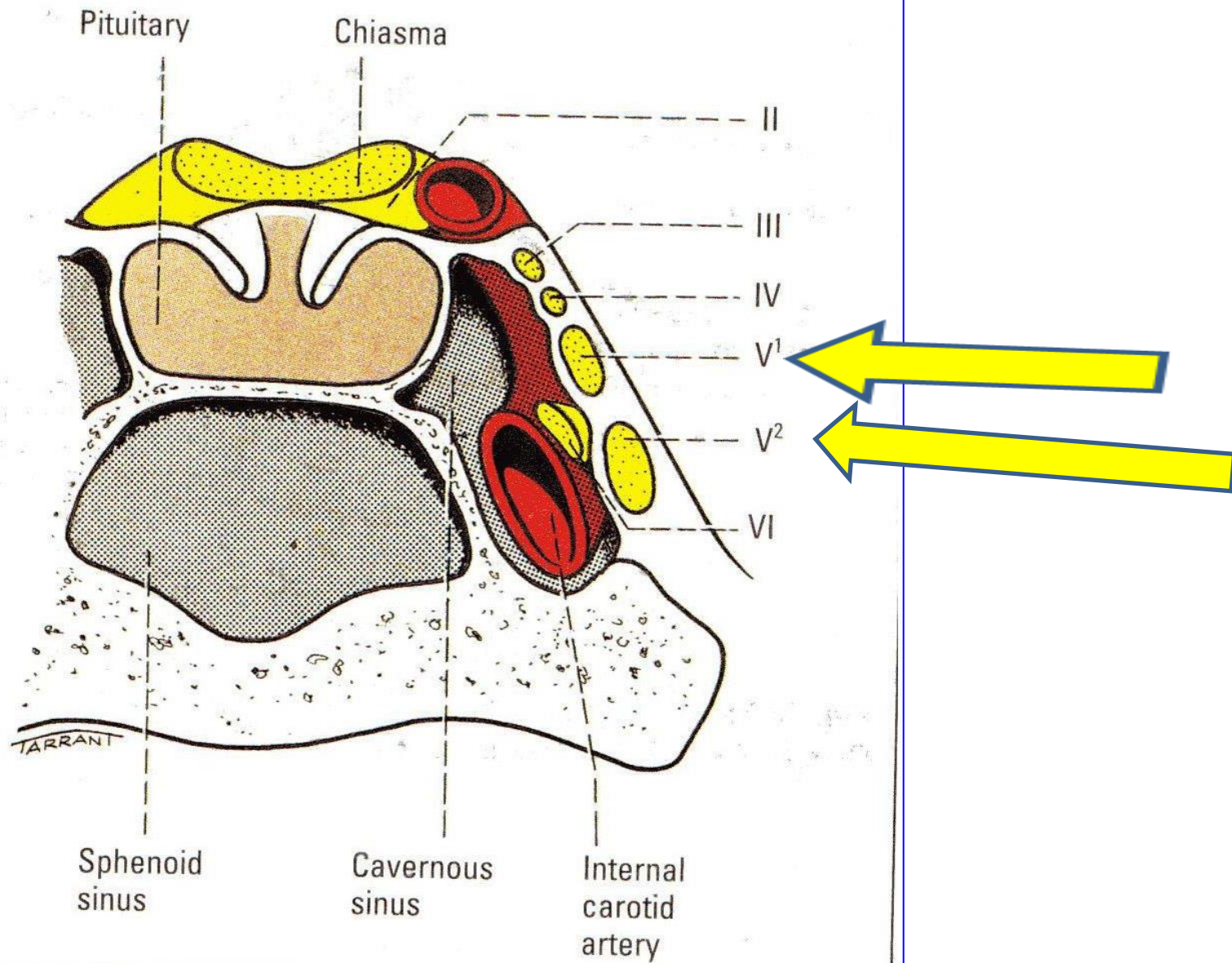
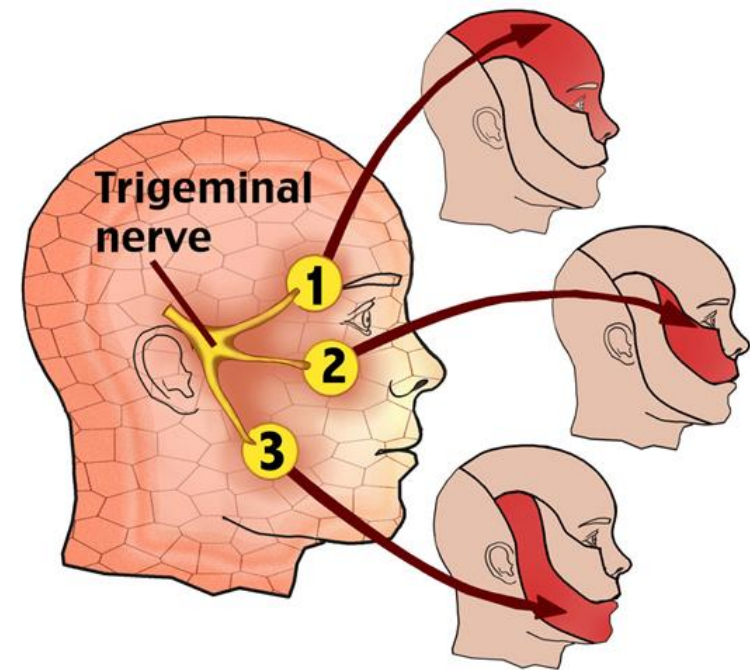
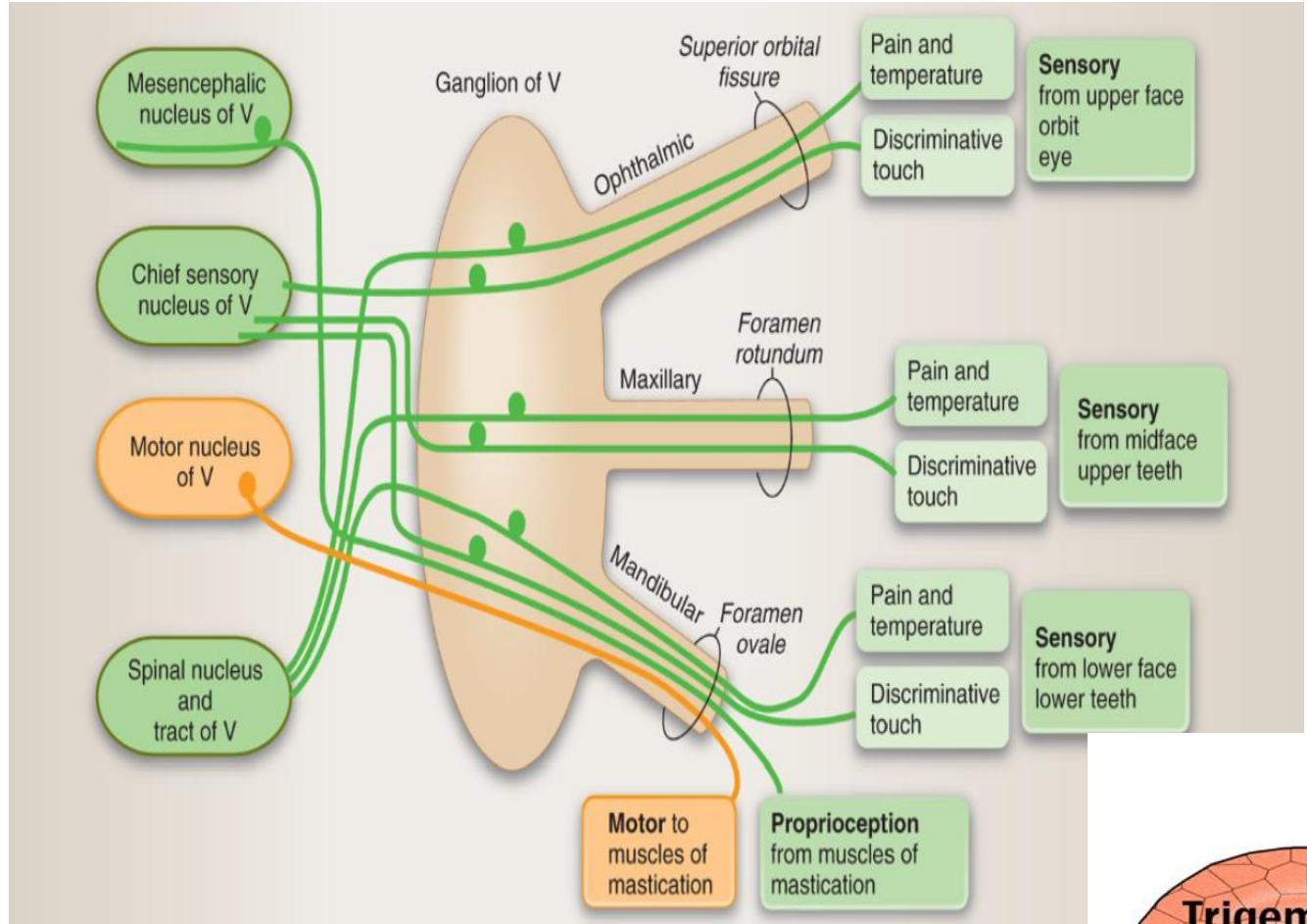


Fig. 18.79

Location of the cranial nerves in the cavernous sinus viewed from behind



1-Ophthalmic division of trigeminal nerve

Origin, Course and distribution:-

Arise from anteromedial aspect of the pones :5th N ganglia. Pass forward to enter the lateral wall of cavernous sinus .Her the nerve lies below oculomotor and trochlear and above **maxillary nerves** the N. pass forward it **joined by fine branches of the sympathetic of interval carotid plexus** and **proprioceptive sensory branch from oculomotor ,trochlear, and abducent nerves**. Just before ophthalmic nerve enter orbit through the superior orbital fissure, it divides into three main branches:-

Lacrimal.
Frontal.
Nasociliary.

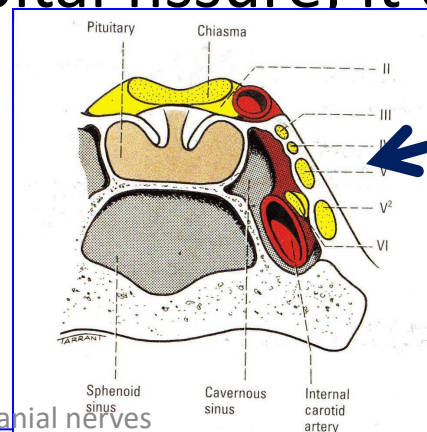


Fig. 18.79
Location of the cranial nerves in the cavernous sinus viewed

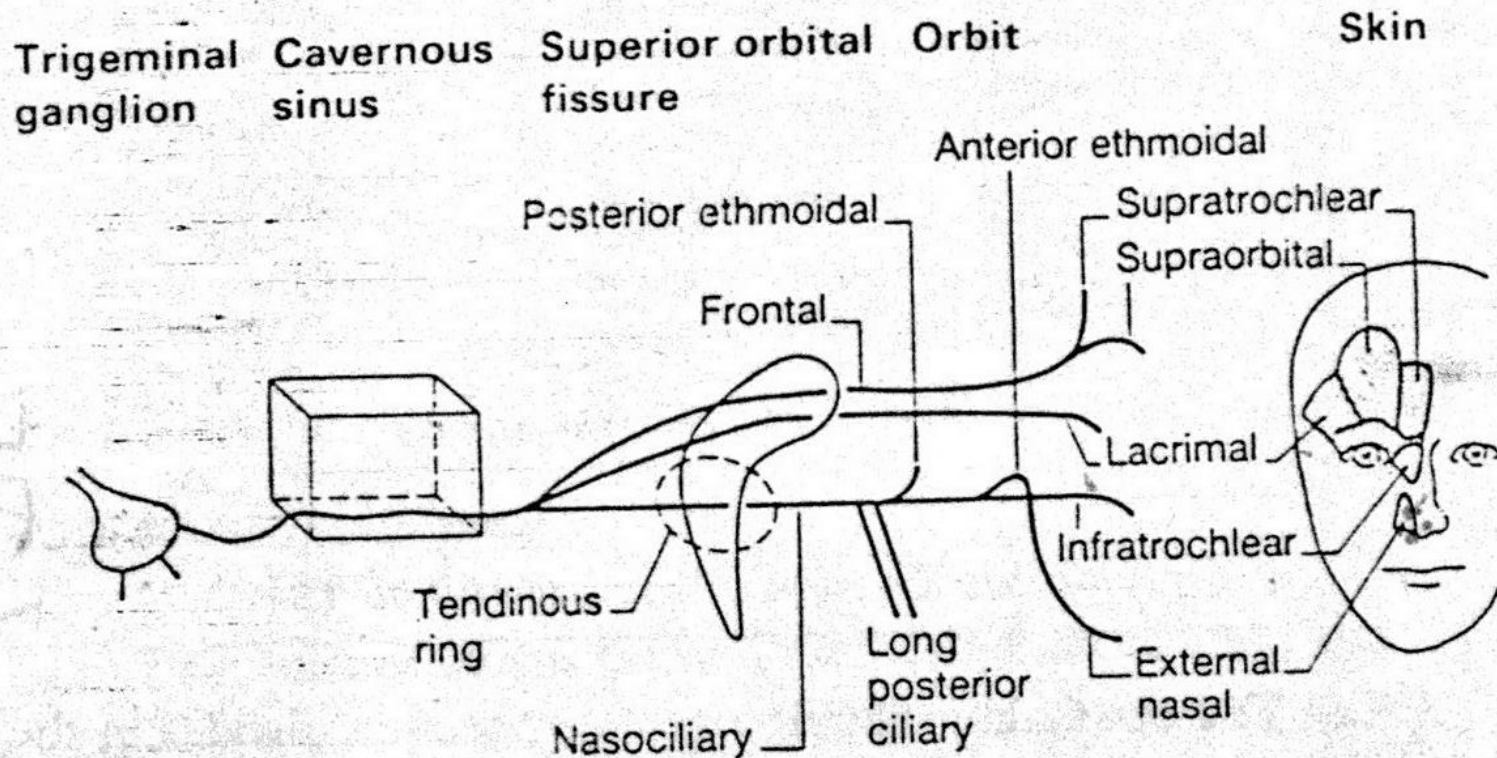
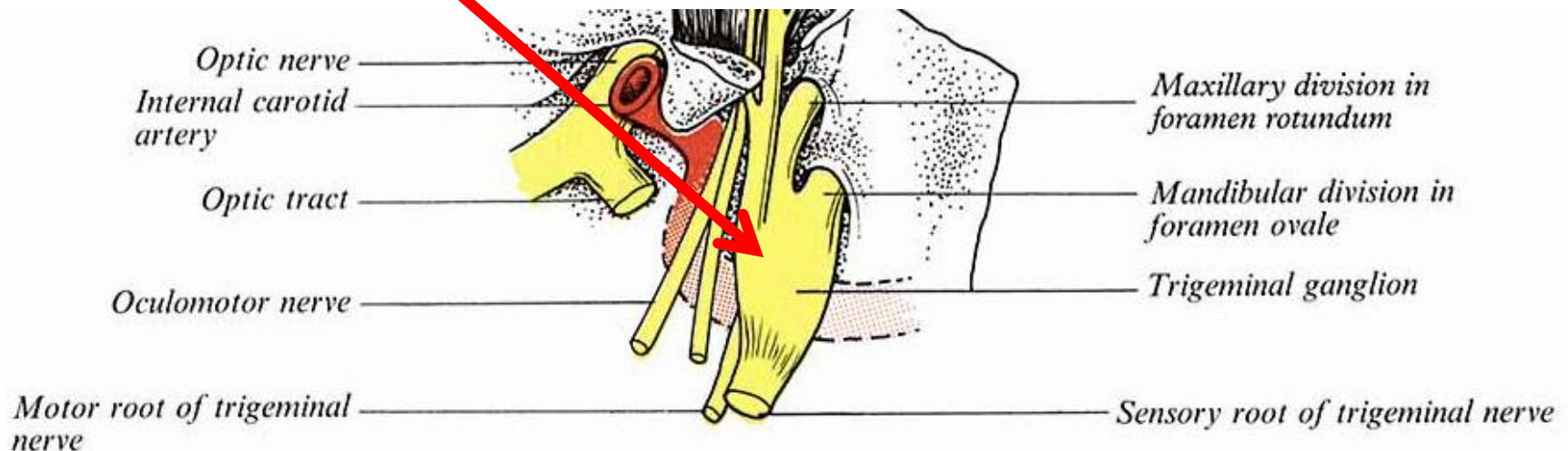
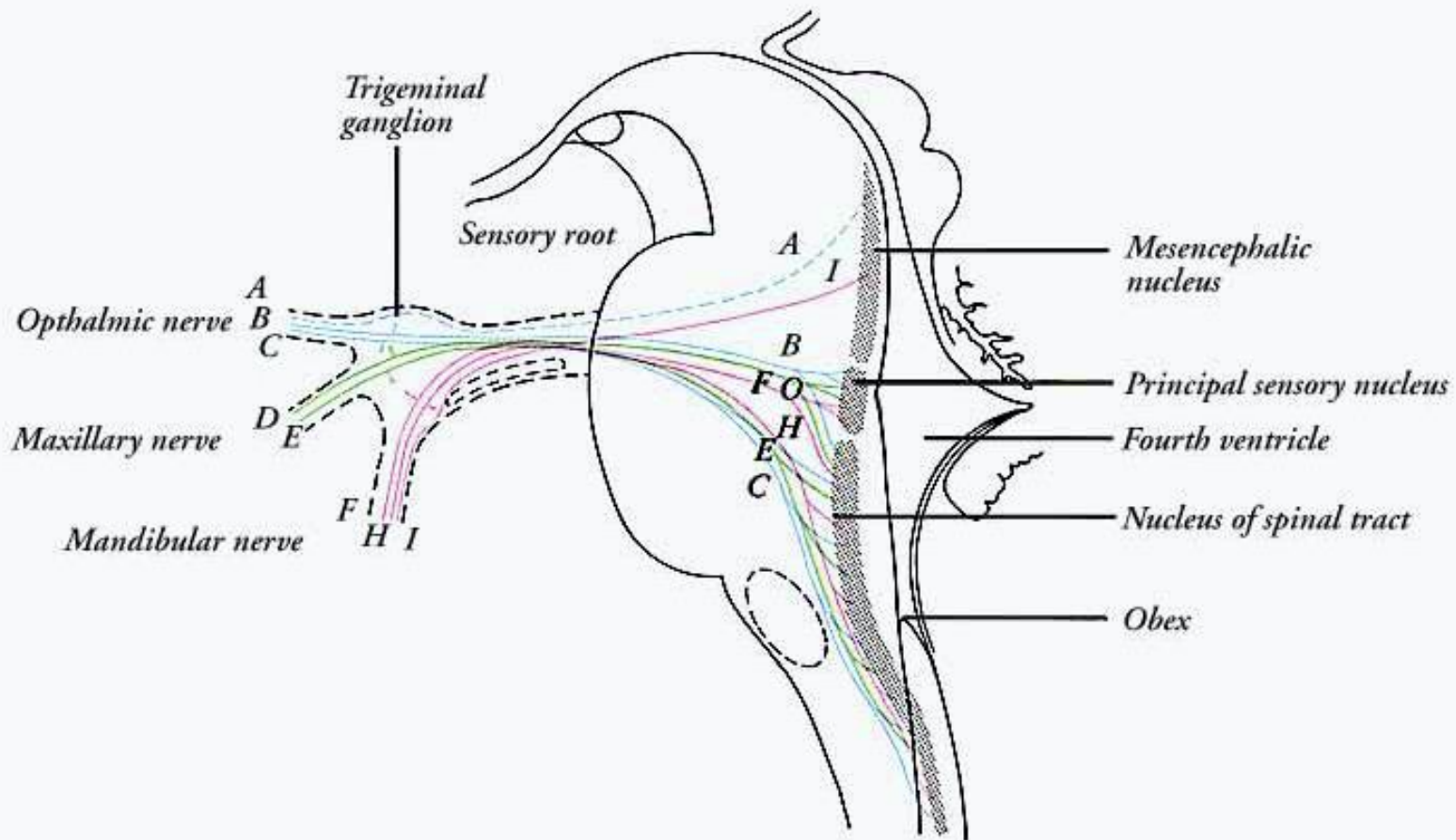


Figure 1.25 The ophthalmic division of the trigeminal nerve (V1)

Fibers in the **sensory root** are mainly axons of cells in the trigeminal (semilunar) ganglion, which occupies a recess in the **trigeminal** cave (of **Meckel**), in the dura mater covering the trigeminal impression near the apex of the petrous temporal bone.



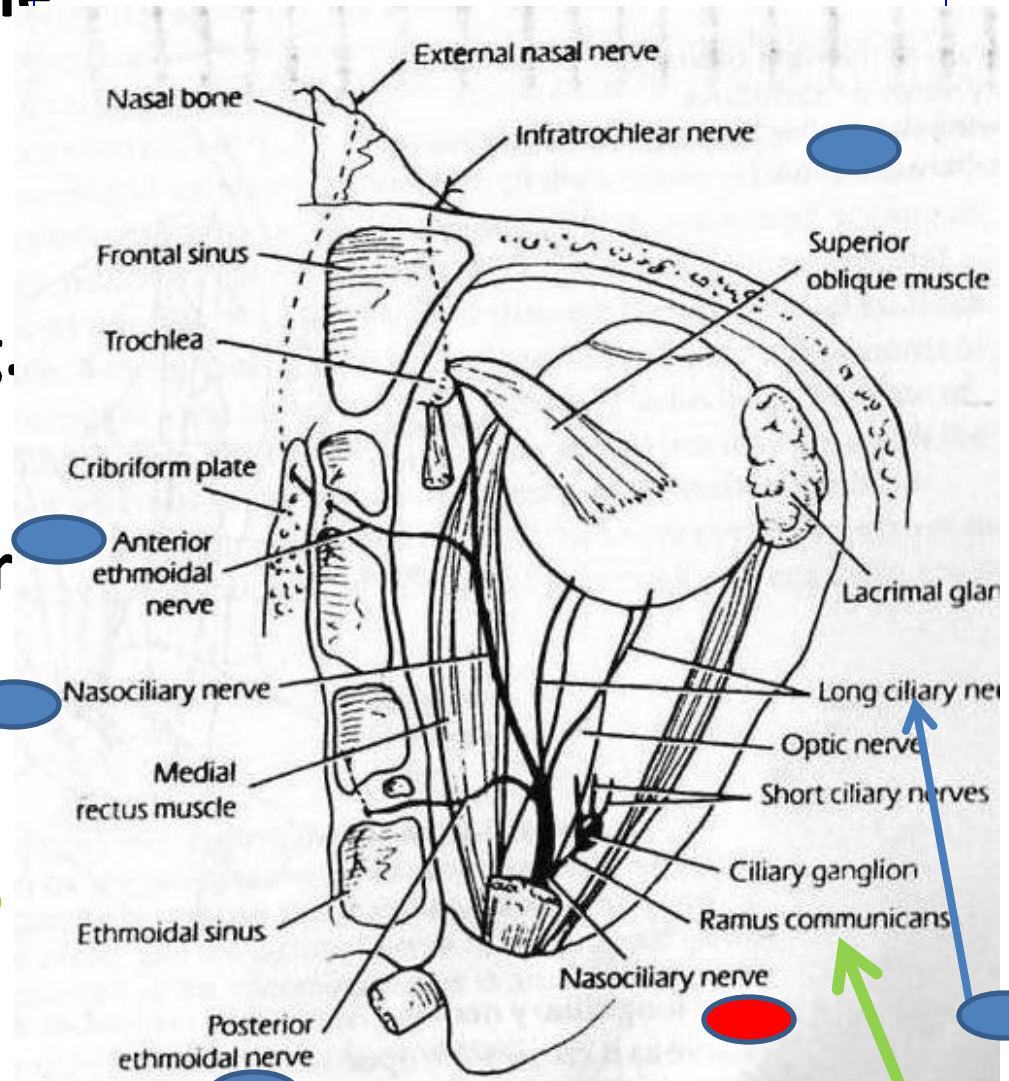


Nasociliary N: -

It enters the orbit through the medial part of the sup. Orbital fissure between two divisions of the oculomotor nerve lies within the tendinous ring. the N. ends by passing through the anterior ethmoidal foramen, where it became known as anterior ethmoidal N.

Branches: -

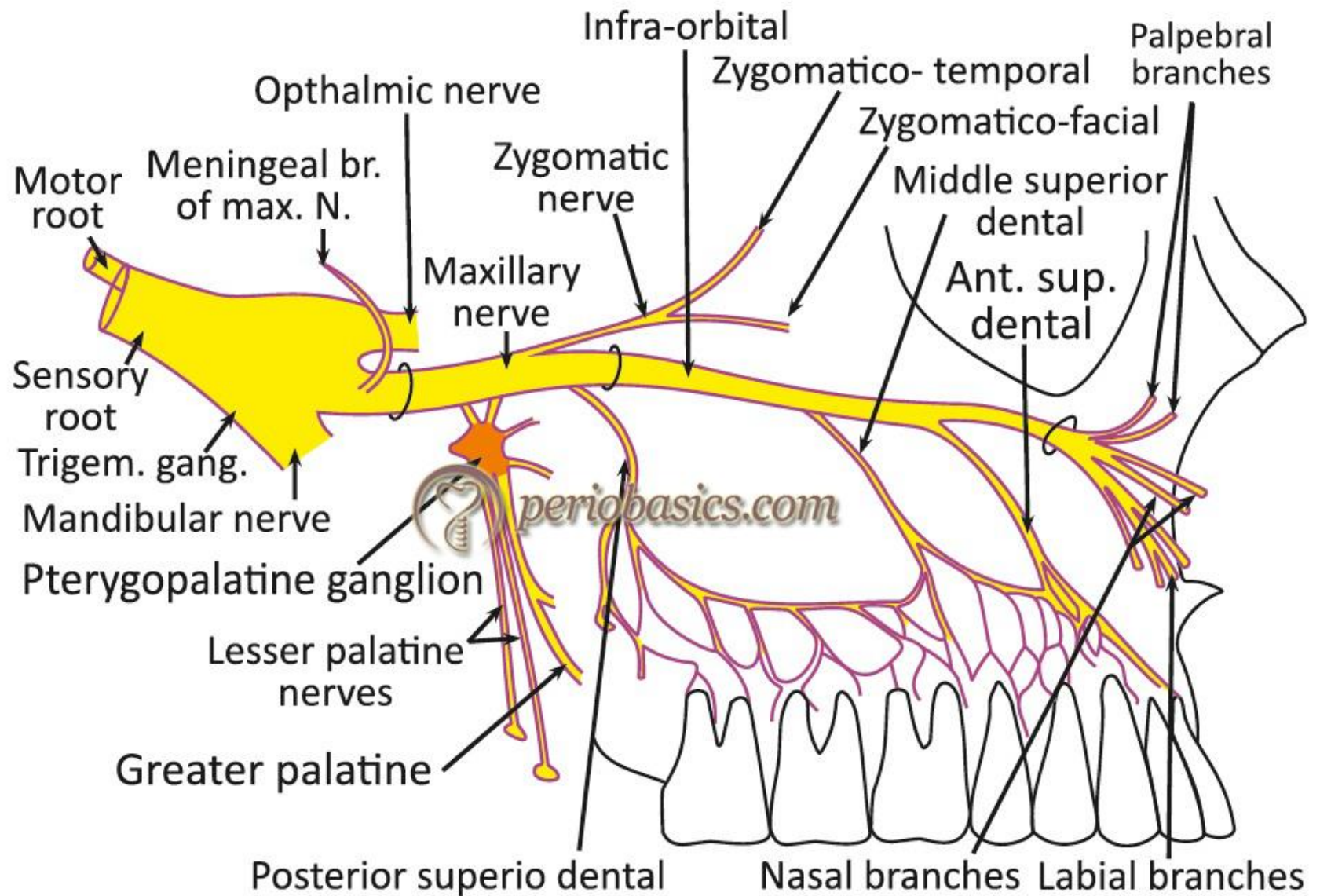
- 1-The ramus communicans to the ciliary ganglion.
- 2-Long ciliary nerves.
- 3-Infratrochlear nerve.
- 4-Posterior ethmoidal nerve.



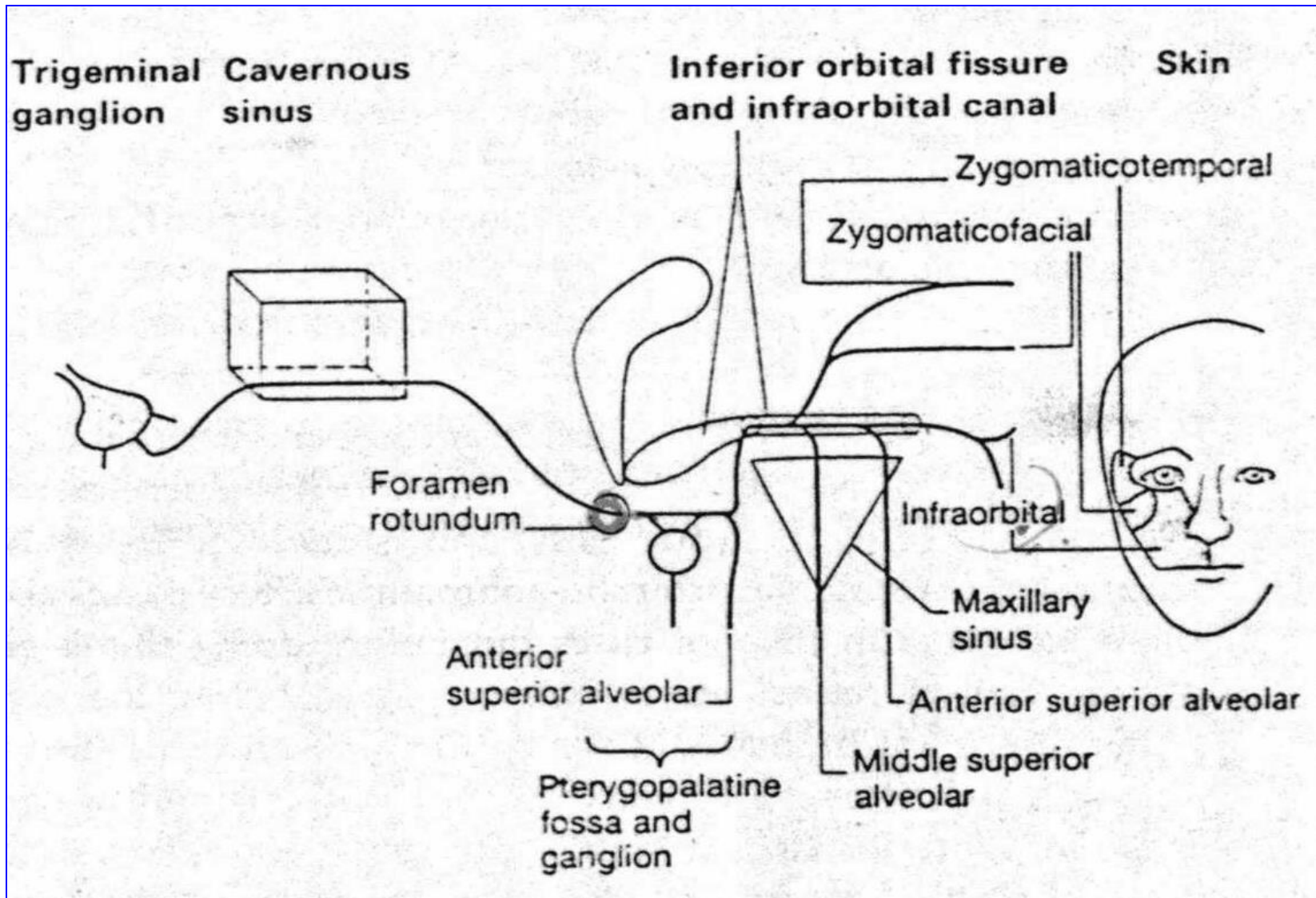
2– Maxillary division of trigeminal nerve: –

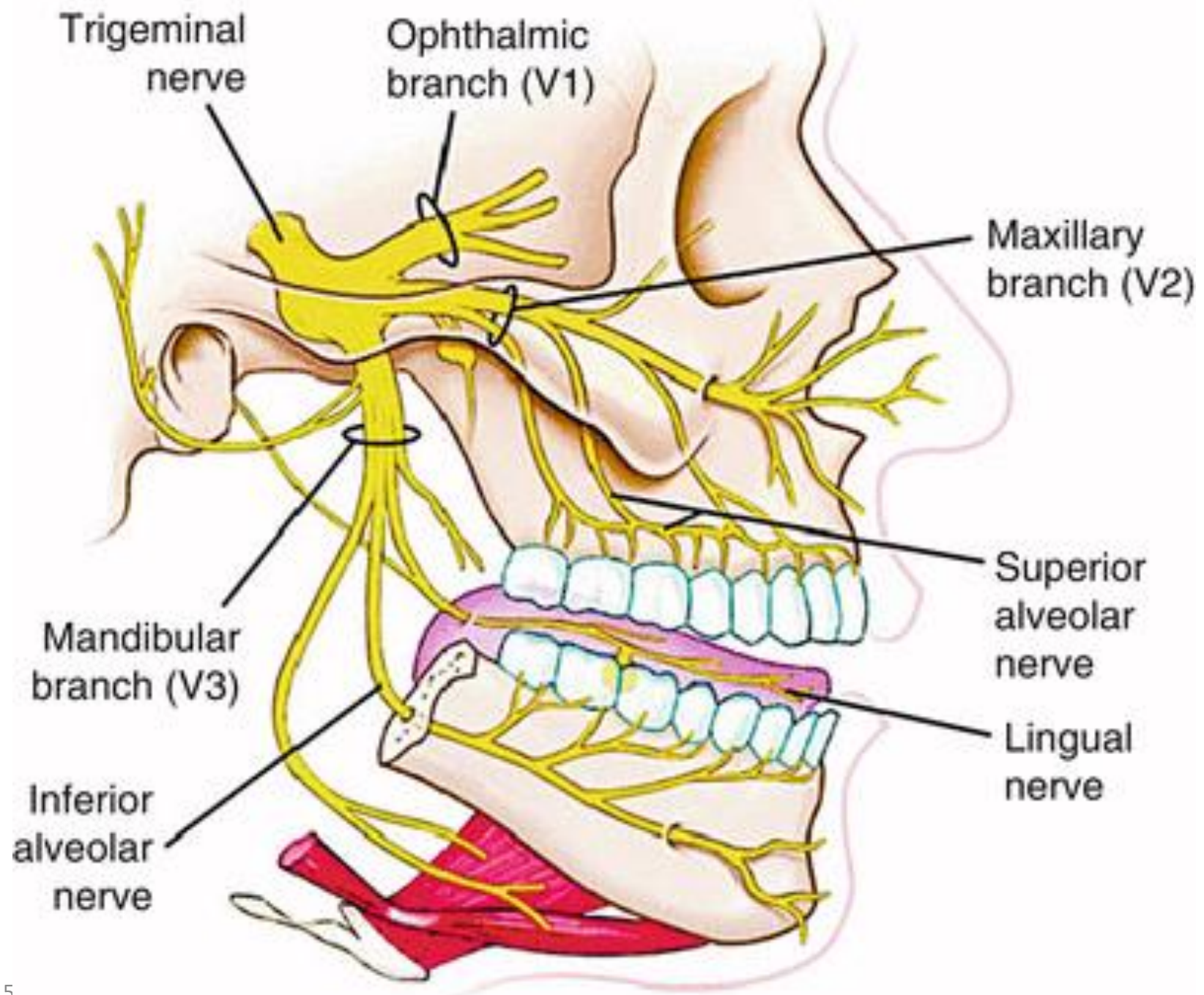
Origin, Course, and distribution:-

The N. leaves the anterior border of the trigeminal ganglion and enter lower part of the cavernous sinus. the N. leaves the skull through the foramen rotundum to enter upper part of the pterygopalatine fossa.

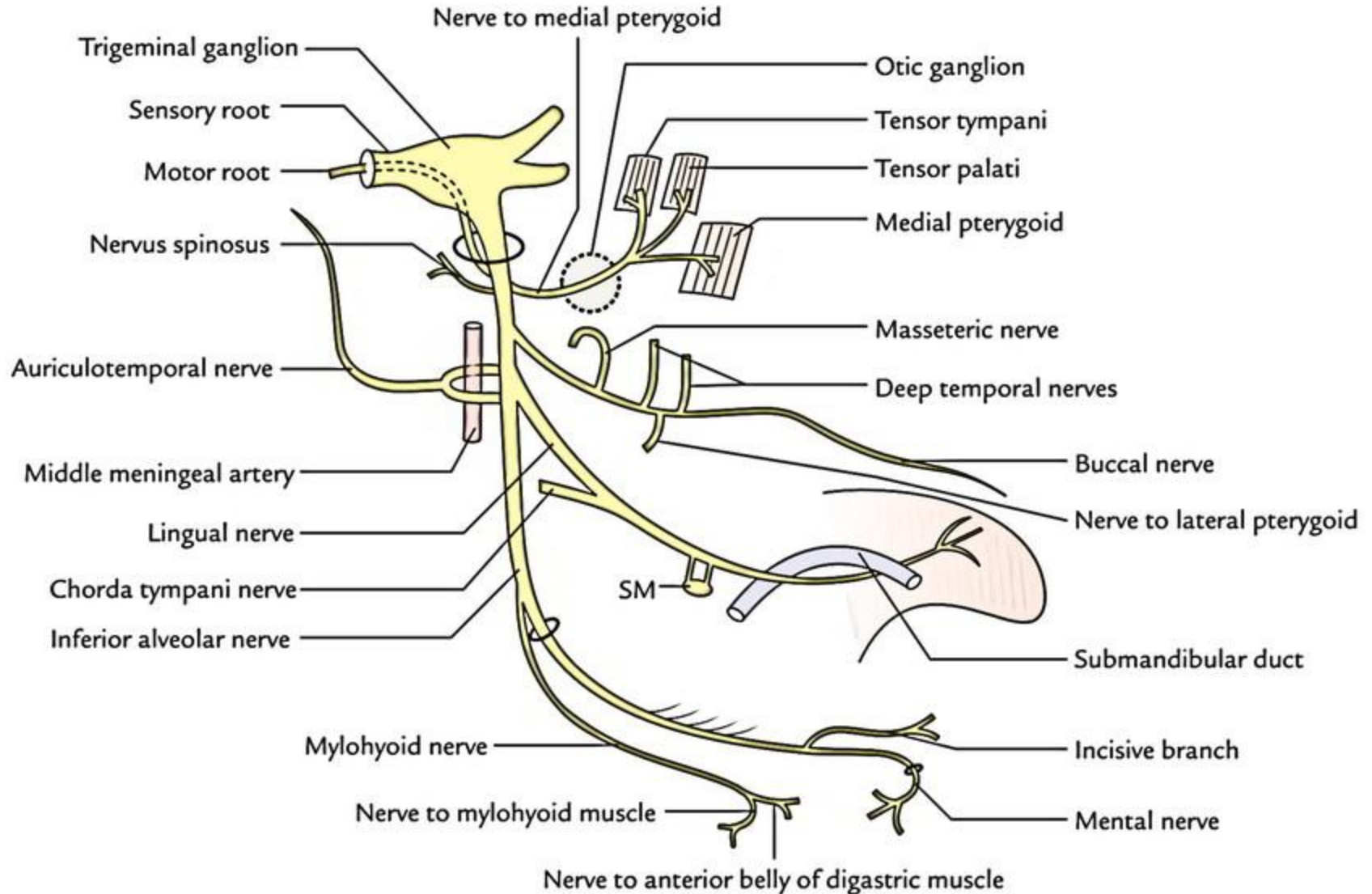


- ***The N. enter orbit through Infraorbital fissure and continues as the infraorbital nerve branches are :-***
 - 1-Middle superior alveolar nerve.***
 - 2-Anterior superior alveolar nerve .***
 - 3-Facial branches and accompanied by the infraorbital artery. it enter the face through infraorbital foramen,***
Meningeal branch, Ganglionic branches.



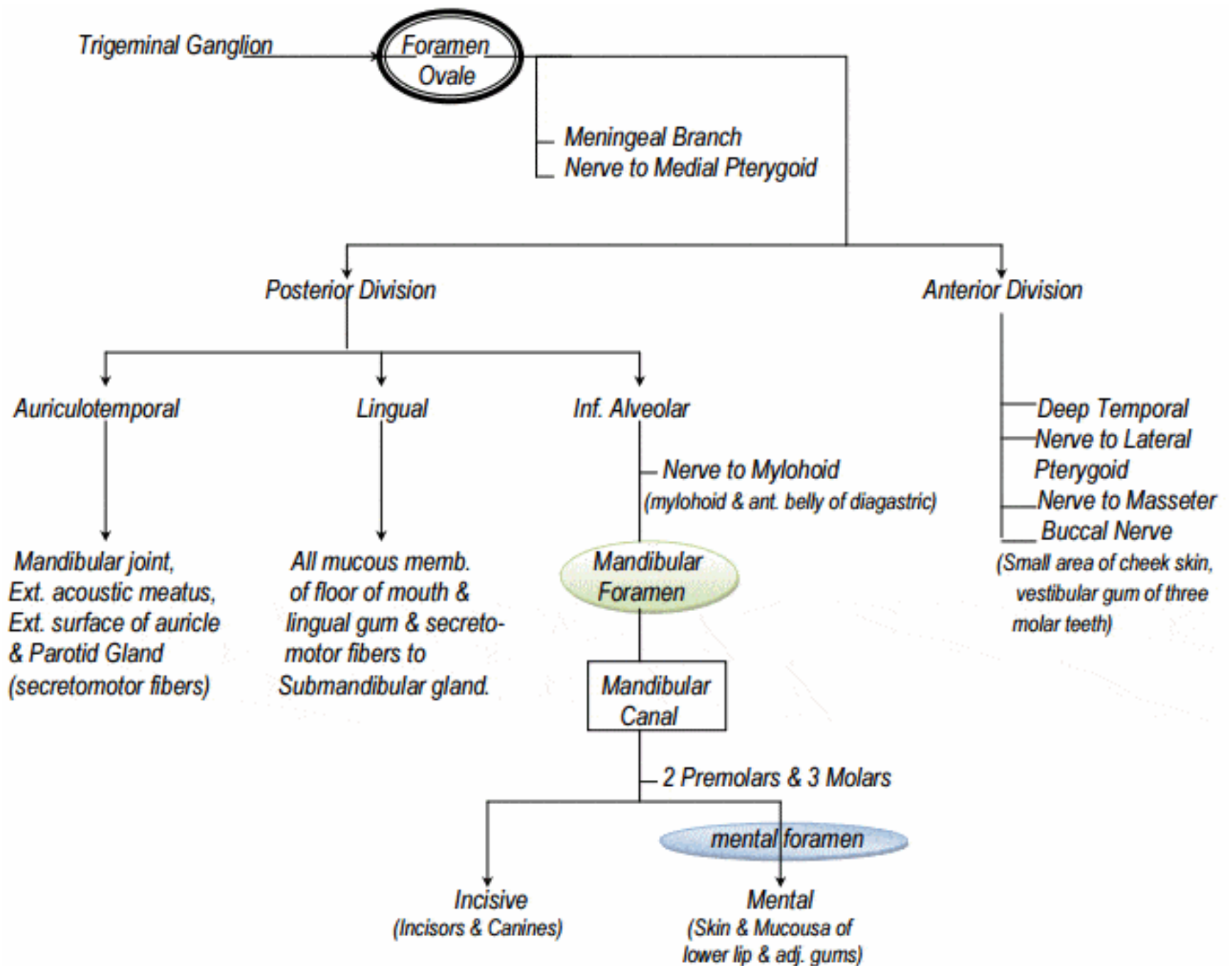


Mandibular nerve



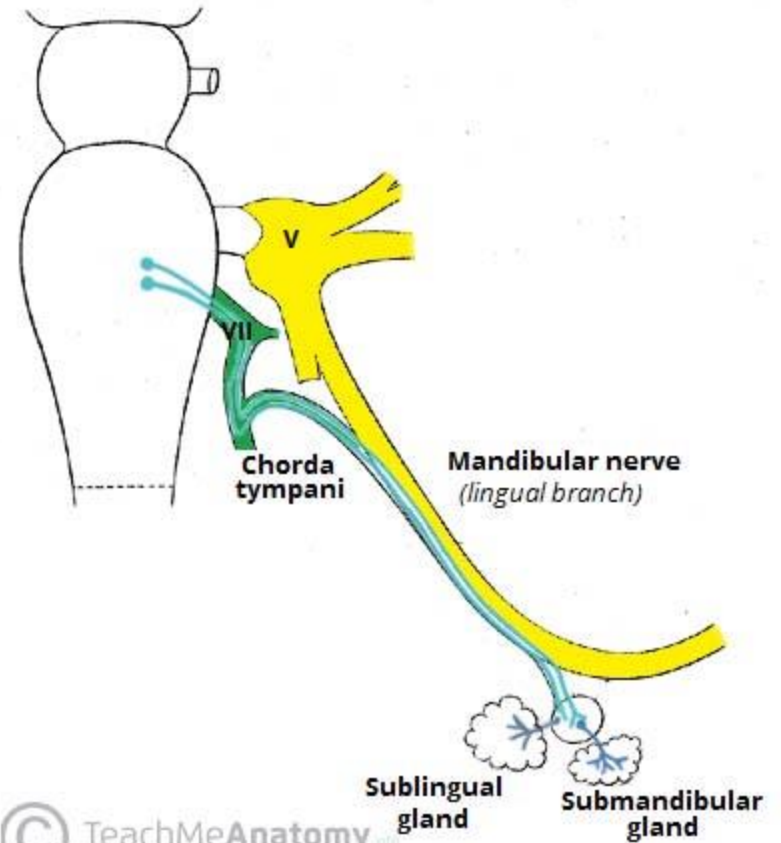
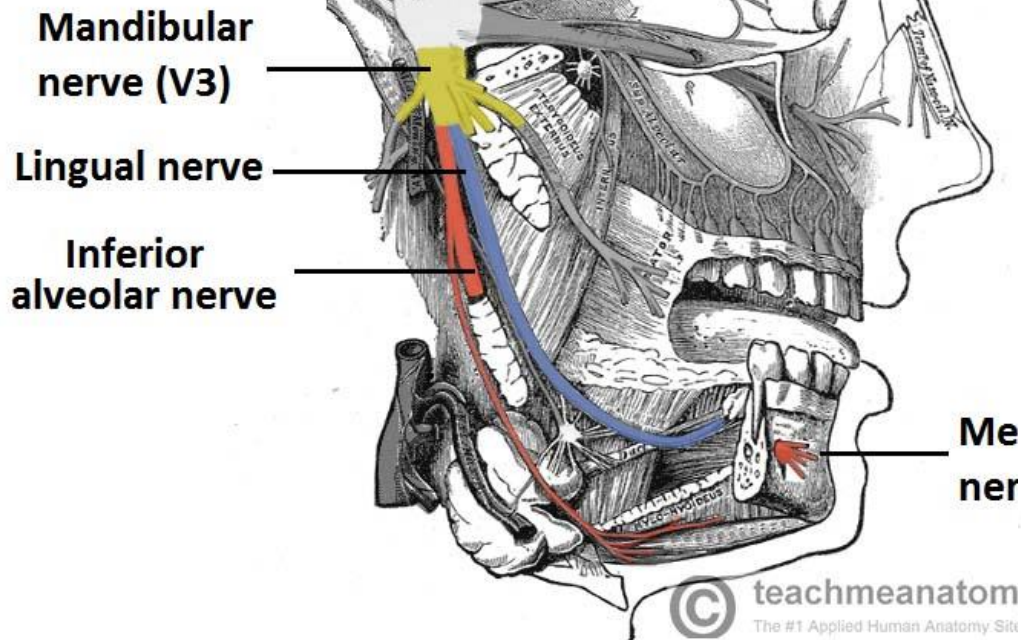
- **Auriculotemporal Nerve**
- The auriculotemporal branch arises from the trigeminal nerve as two roots:
- **Superior root** – comprises sensory fibers.
- **Inferior root** – carries secretory-motor parasympathetic fibers, originating from CN IX, to the parotid gland.
- The two roots converge in close proximity to the middle meningeal artery. After converging, the secretory-motor fibers run to synapse in the otic ganglion, while the sensory fibers pass through the ganglion without synapsing to eventually innervate:
 - Anterior part of the auricle
 - Lateral part of the temple
 - Anterior external meatus
 - Anterior tympanic membran

- **Buccal Nerve**
- The buccal branch of the mandibular nerve contains **sensory** fibres. As it emerges from the mandibular nerve, it passes between the two heads of the lateral pterygoid muscle before heading to its target sites.
- The nerve provides general sensory innervation to the **buccal membranes** of the mouth (i.e. the cheek). It also branches to supply the second and third molar teeth, which is important when performing dental work on those structures



- **Inferior Alveolar Nerve**

- The inferior alveolar nerve carries both **sensory** and **motor** axons to and from the respective trigeminal nuclei.
- After branching from its parent nerve it gives rise to the **mylohyoid nerve**, a motor nerve to the mylohyoid and anterior digastric muscles.
- The remaining sensory axons enter the **mandibular canal**, a narrow tunnel running through the mandible bone. Within this canal the nerve provides branches to the mandibular teeth.
- The nerve emerges through the **mental foramen** as the **mental nerve**. This provides sensory innervation to the lower lip and chin



- **Lingual nerve**
- This branch of the trigeminal nerve carries general **sensory** axons. It also acts as a conduit for **special sensory** and **autonomic** fibers belonging to the **chorda tympani**, a branch of the facial nerve (CN VII).
- General sensory fibers innervate the **anterior two-thirds** of the tongue, as well as the mucus membrane lining its undersides.
- The special sensory fibers carry on with the lingual nerve to provide taste to the **anterior two-thirds of the tongue**.
- The autonomic fibers branch to synapse in the **submandibular ganglion**, eventually innervating the submandibular and sublingual glands.

- **Sensory Functions**
- The sensory fibres associated with the mandibular branch of CN V provide innervation to:
- The facial skin in the lower third of the face, including the chin and lower lip
- Inferior row of teeth and gingiva
- The anterior two thirds of the [tongue](#)
- These functions are distributed between the four branches of the nerve, as described above.

- **Motor Functions**
- The mandibular nerve is the only branch of CN V to conduct motor axons to the muscles of the head and neck.
- The motor root of the trigeminal nerve joins the sensory component distal to the trigeminal ganglion and distributes its axons to the **muscles of mastication**:
 - Masseter
 - Medial and lateral pterygoids
 - Temporalis
- In addition to enabling mastication, the mandibular nerve also innervates muscles involved in several other processes:
- **Tensor tympani**: Dampens sounds, such as those created by chewing, by stabilizing the malleus bone in the middle ear
- **Tensor veli palatini**: helps elevate the soft palate to prevent regurgitation of food and liquid into the nasopharynx.
- **Anterior belly of digastric**: a suprahyoid muscle involved in elevation of the hyoid bone during swallowing
- **Mylohyoid**: a suprahyoid muscle involved in elevation of the hyoid bone during swallowing

- The autonomic function
- The trigeminal nerve **does not** have an autonomic nucleus and, as such, does not give rise to any autonomic axons directly. However, all three branches of CN **V** take on autonomic fibers of other cranial nerves to provide a passage to their respective targets.
- The mandibular nerve is associated with parasympathetic secretory-motor fibers from two other cranial nerves:

- **Facial Nerve**
- The **chorda tympani** nerve branches from the facial nerve in the region of the middle ear. It carries **pre-synaptic parasympathetic fibers** which join the **lingual branch** of the mandibular nerve, before branching to synapse in the **submandibular ganglion**. These fibers go on and innervate the submandibular and **sublingual salivary glands**.
- **Glossopharyngeal Nerve**
- Autonomic innervation of the parotid gland originates from CN IX, however the auriculotemporal nerve transmits the post-synaptic axons from the otic ganglion to the gland. They pass through the inferior of the two founding roots of the branch

- Which cranial foramina transmits the mandibular nerve from the cranial cavity to the infratemporal fossa?
- **Foramen spinosum**
- **Foramen rotundum**
- **Foramen ovale**
- **Foramen magnum**

- Which branch of the mandibular nerve passes through the mandibular canal to eventually become the mental nerve?
- **Buccal branch**
- **Inferior alveolar branch**
- **Auriculotemporal branch**
- **Lingual branch**

- Which of the following options most accurately describes the modality(s) of the mandibular branch of the trigeminal nerve?
- **Motor and sensation**
- **Motor**
- **Sensation and parasympathetic**
- **Sensation**