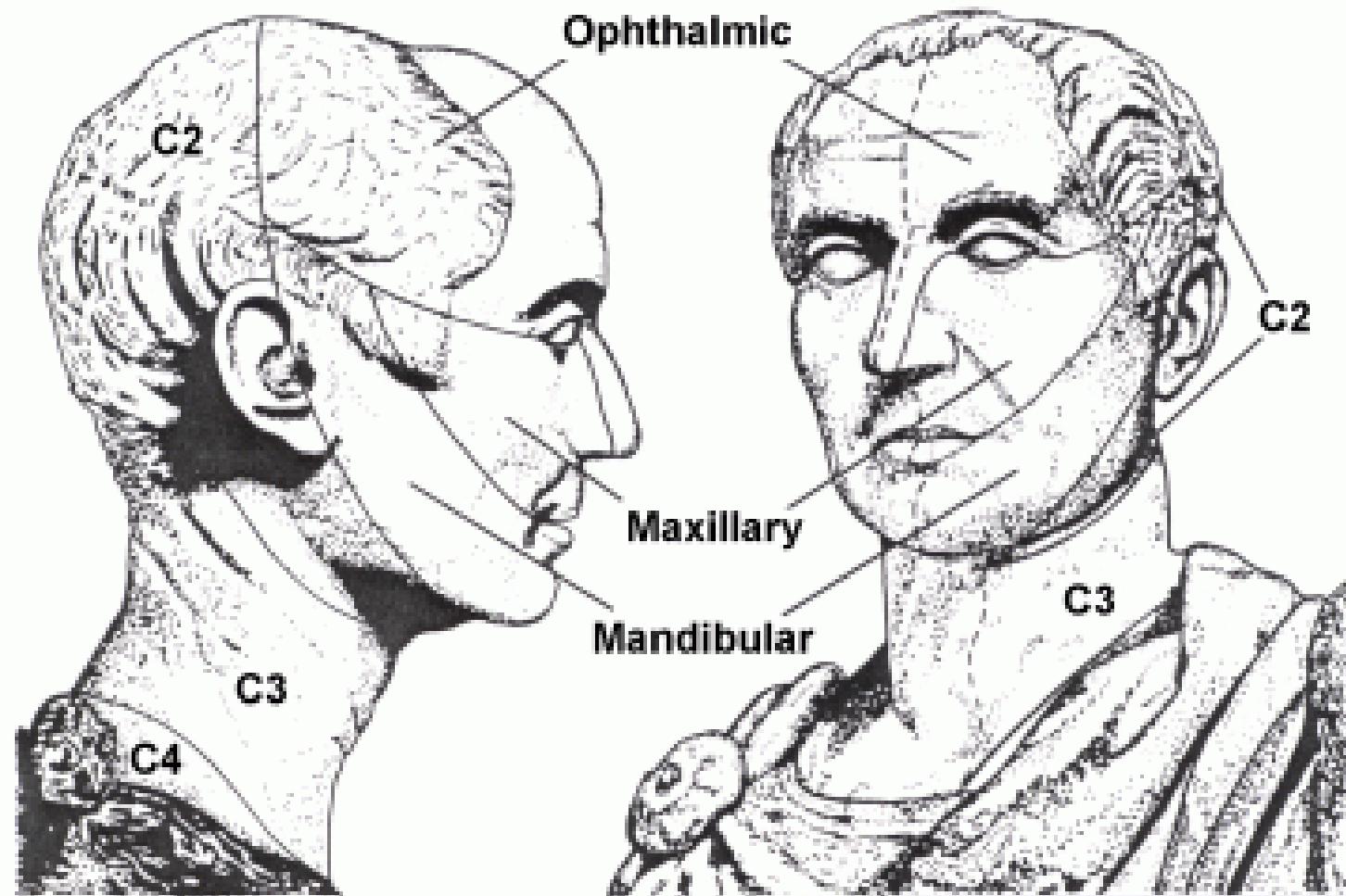


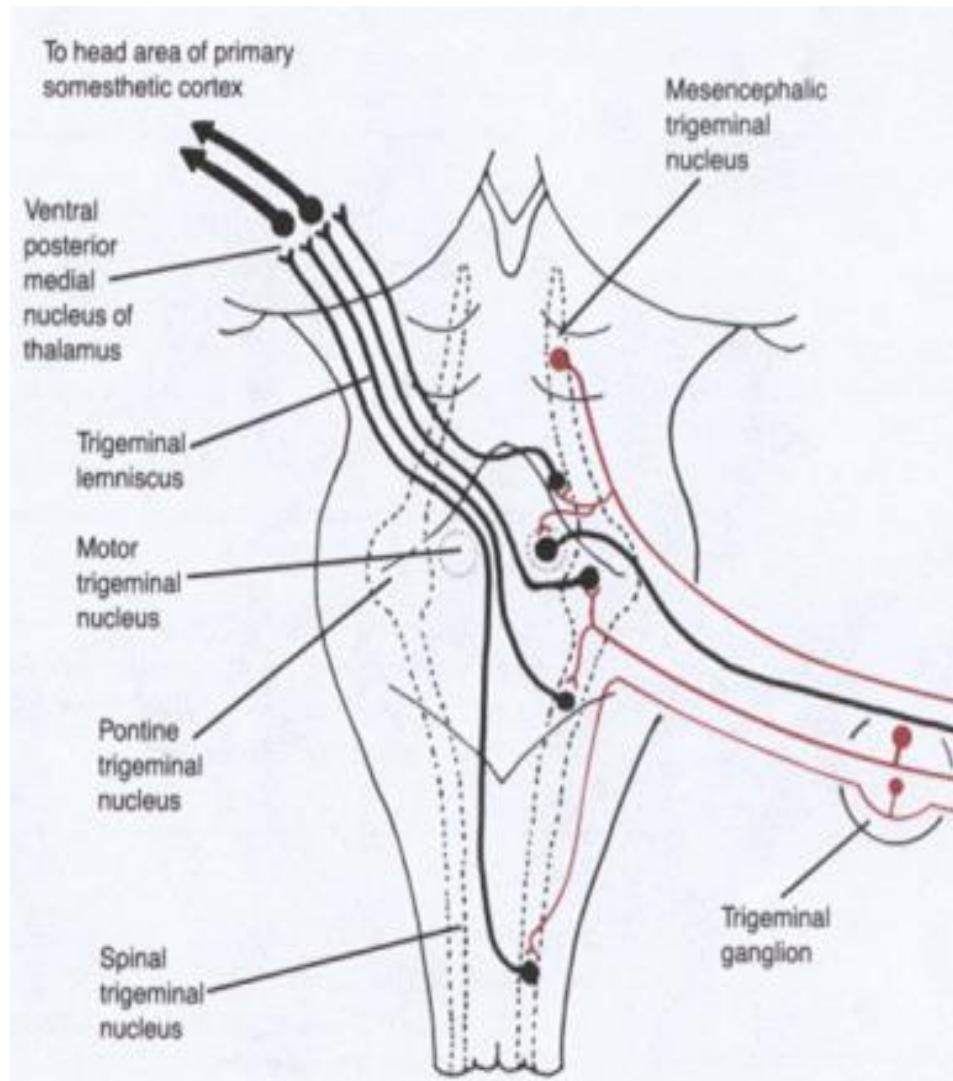
Trigeminal Nerve (Cranial Nerve V)

The trigeminal nerve (fifth nerve) is the largest of the cranial nerves and contains both sensory and motor fibres.

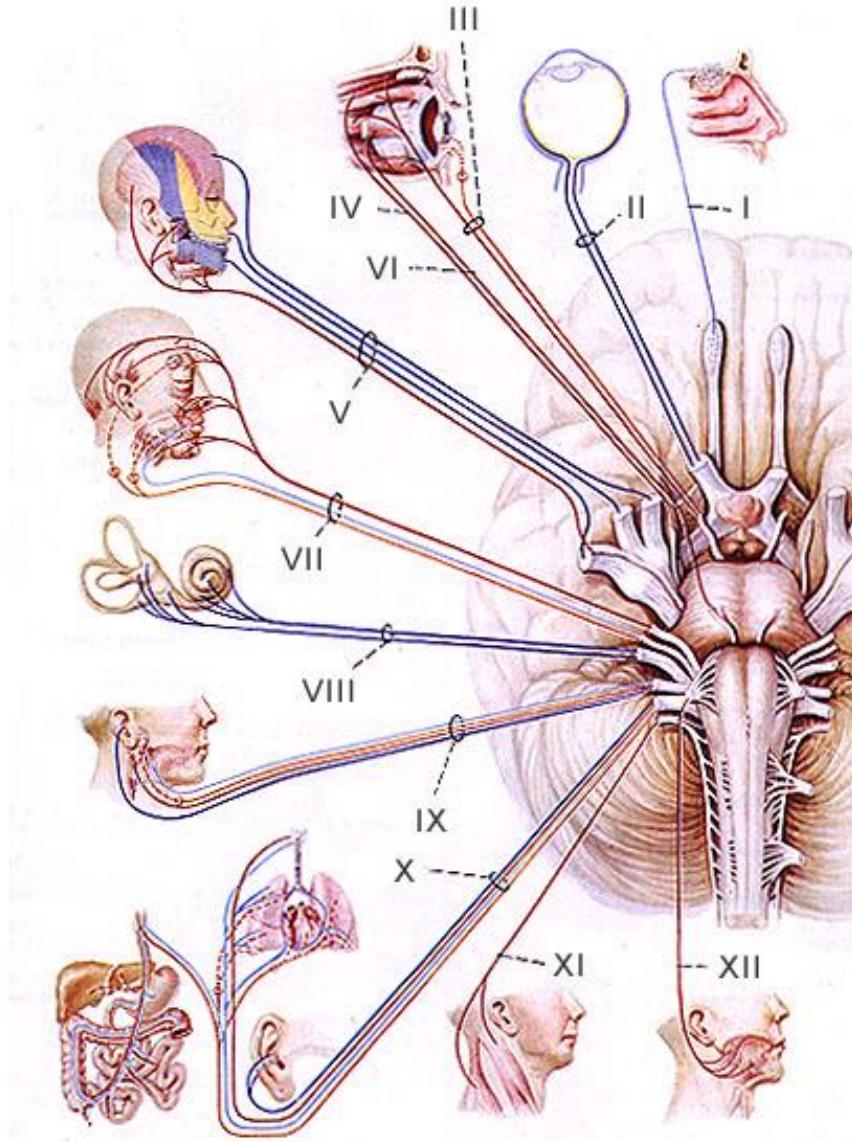


Trigeminal nerve nuclei

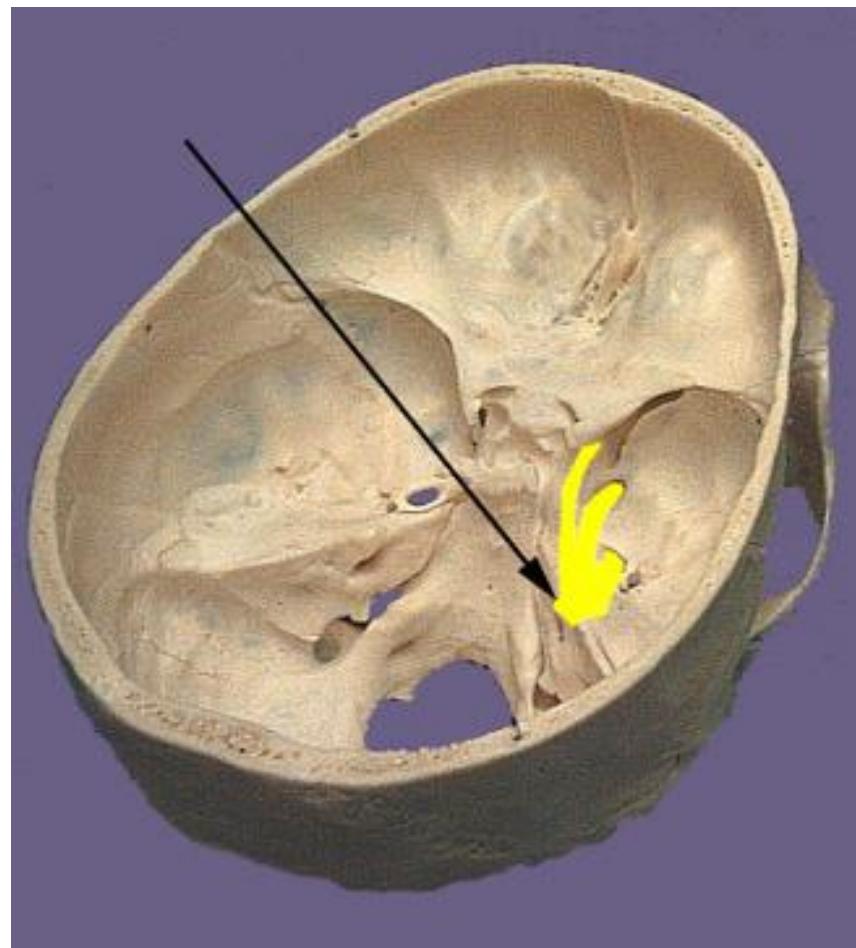
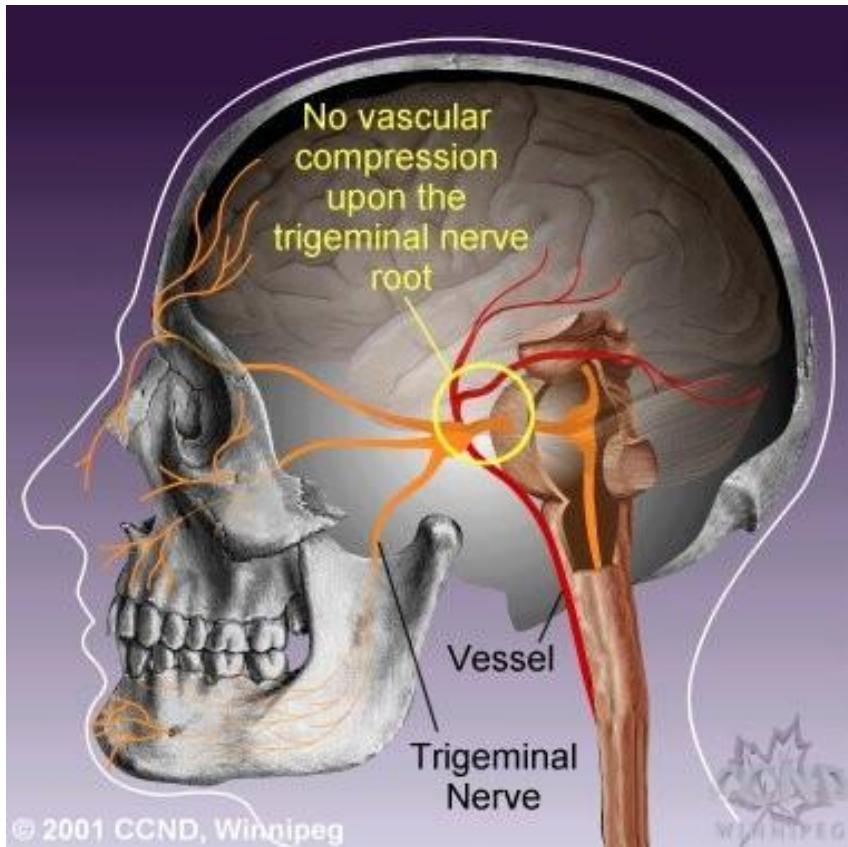
- **The main sensory nucleus.** Found in the posterior part of the **pons** located laterally to the motor nucleus.
- **The spinal nucleus.** Continues superiorly with the main nucleus in the pons and extends inferiorly through the whole length of the medulla oblongata and into the upper part of the spinal cord.
- **The mesencephalic nucleus.** Consists of a column of nerve cells situated in the lateral part of the grey matter around the cerebral aqueduct.
- **The motor nucleus.** Situated medially to the sensory nucleus in the **pons**.



- The trigeminal nerve arises from the brain at the side of the pons by a motor and a sensory root.

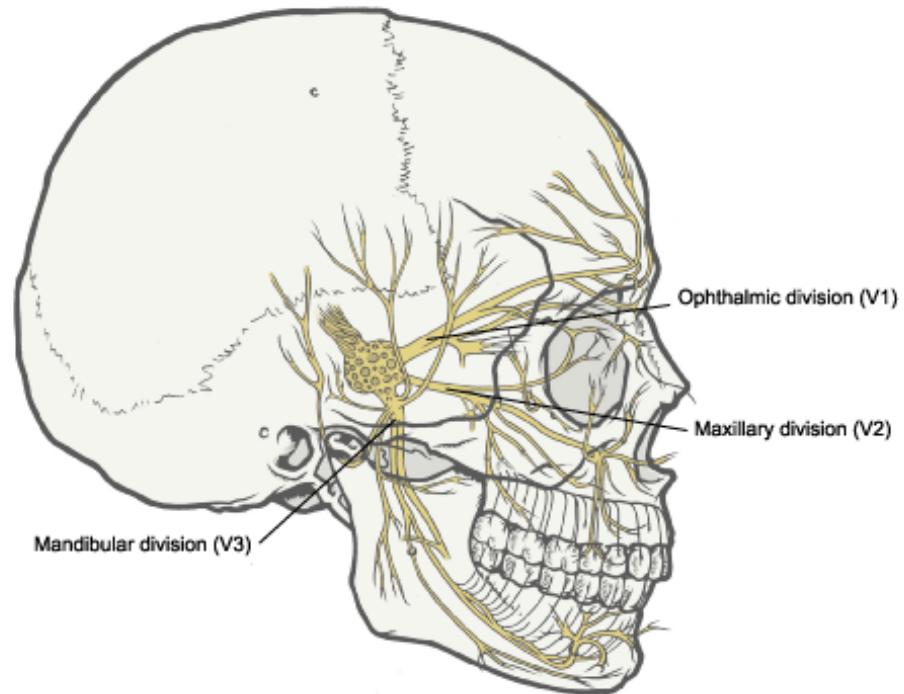


The sensory root carries the trigeminal ganglion which consists of the cell bodies of the sensory axons and lies in a depression on the petrous part of temporal bone.

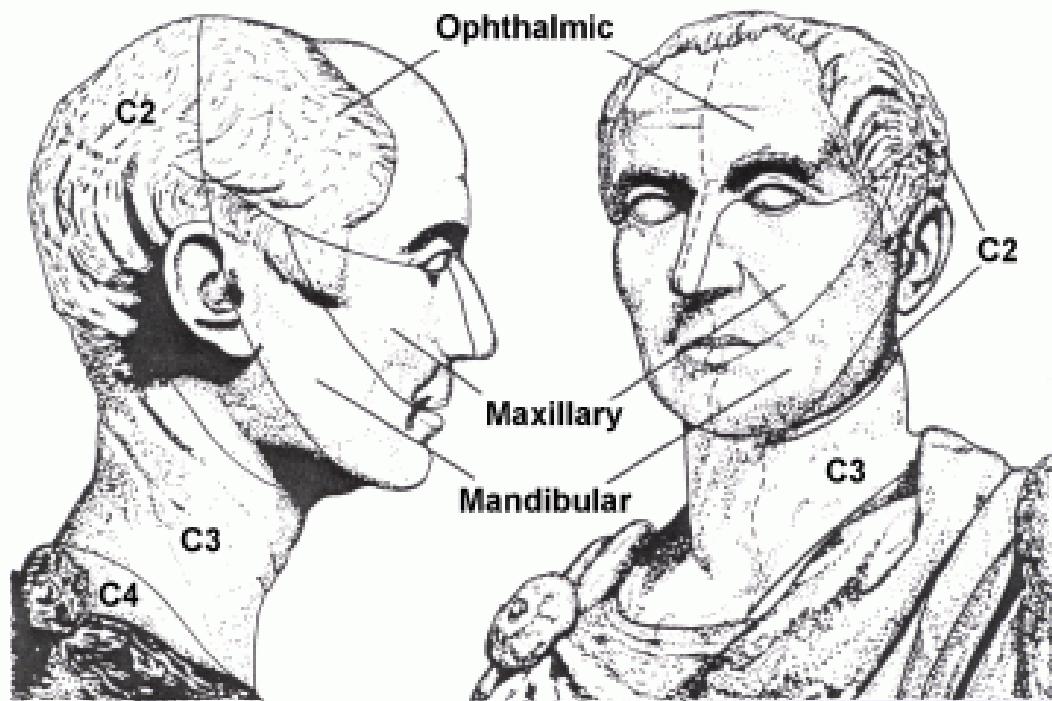
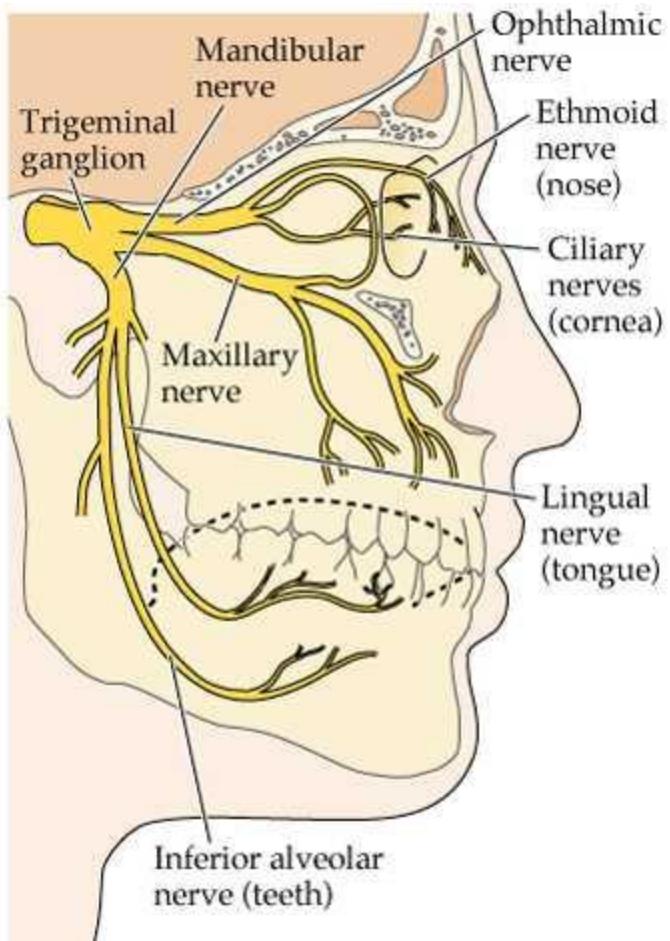


The sensory root divides into three large branches:

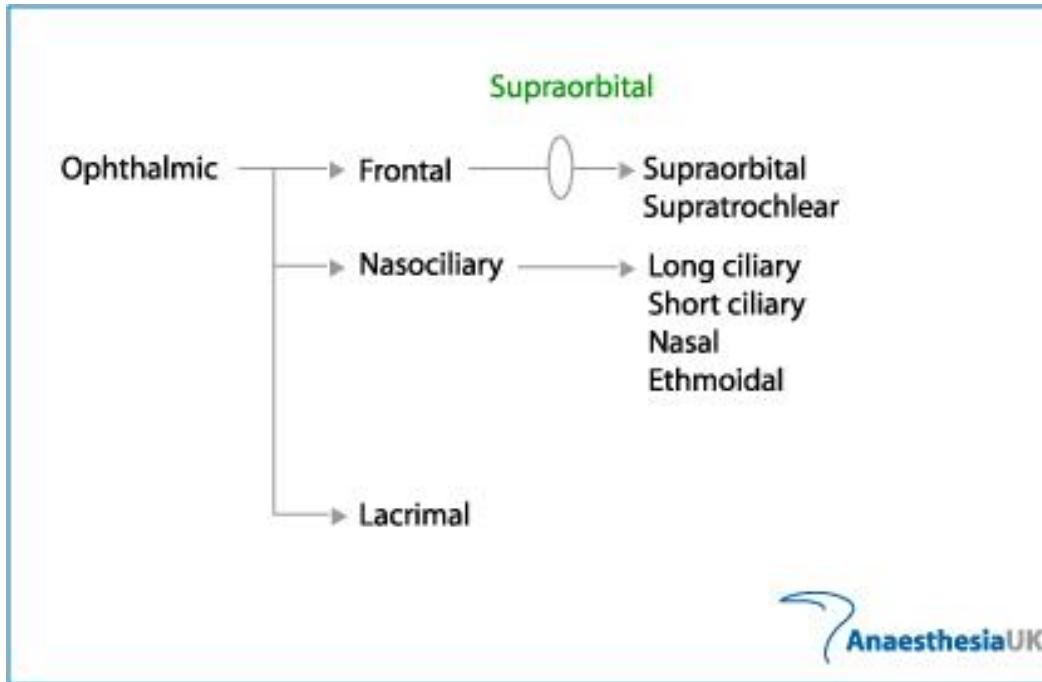
- **The Ophthalmic (V1)** is the smallest division of the trigeminal nerve and is entirely sensory.
- **Maxillary (V2)** is sensory
- **Mandibular (V3)** is both sensory and motor.



The Trigeminal Nerve Distribution

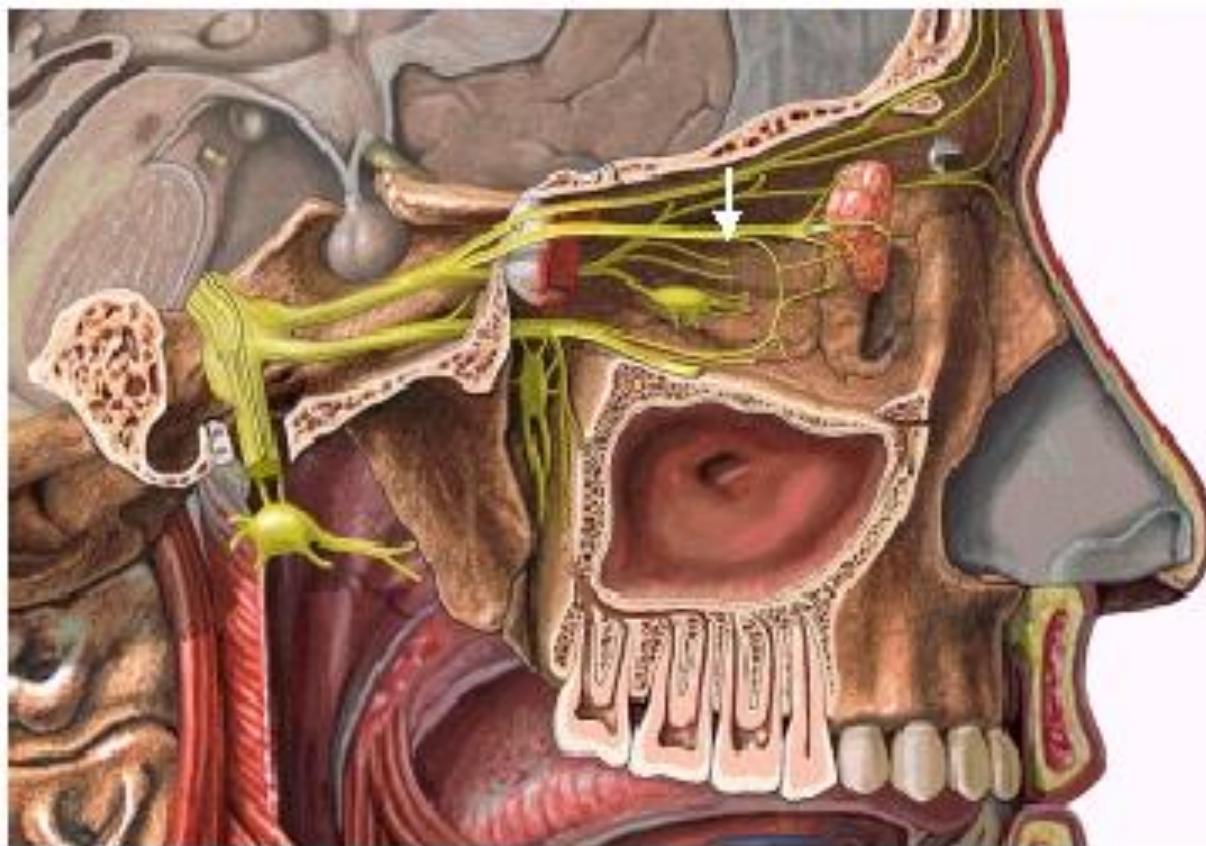


THE OPHTHALMIC DIVISIONS



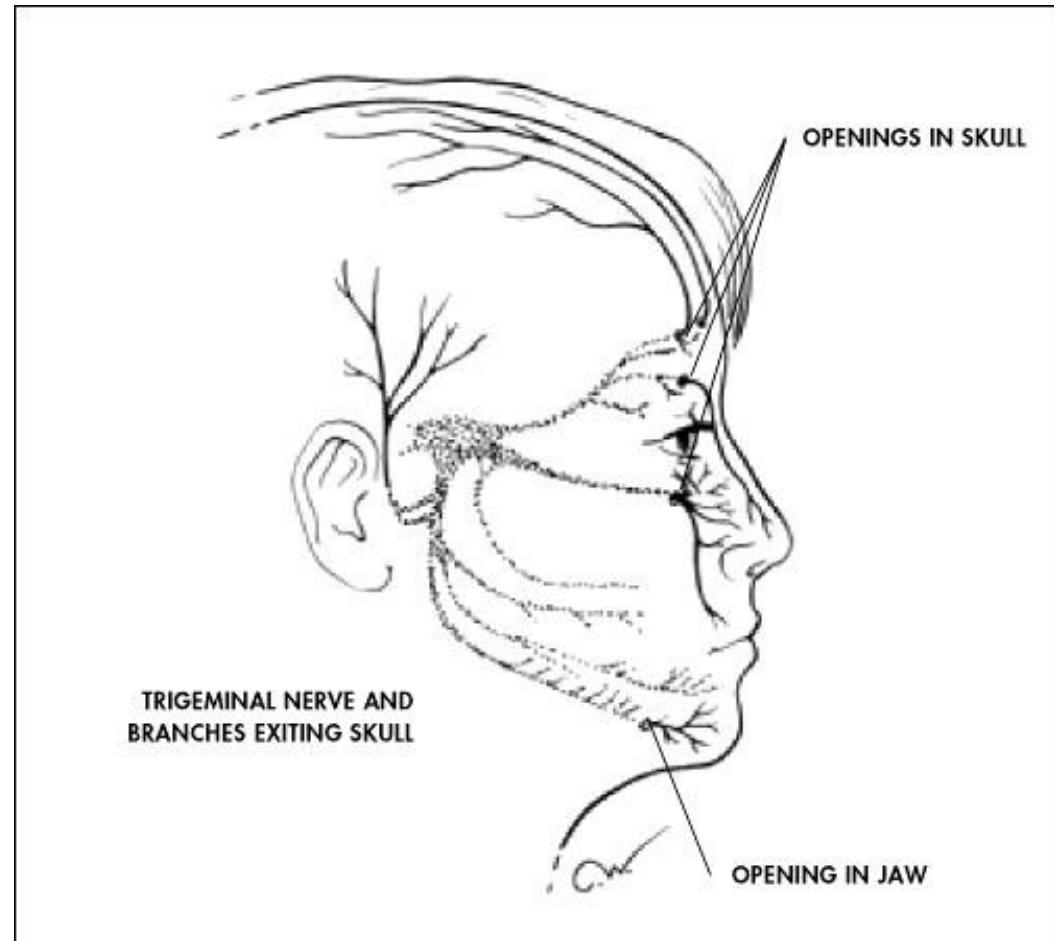
- This traverses the cavernous sinus and enters the orbit via the *superior orbital fissure* where it divides into ***frontal, lacrimal and nasociliary branches***.

TRIGEMINAL NERVE - Ophthalmic branch



The **ophthalmic branch** (arrow) of the **trigeminal nerve** innervates the **tear gland** (**motor**) and is responsible for picking up **sensory** messages from the **upper eyelid**, the **mucosa of the nasal cavity** and the **cornea**.

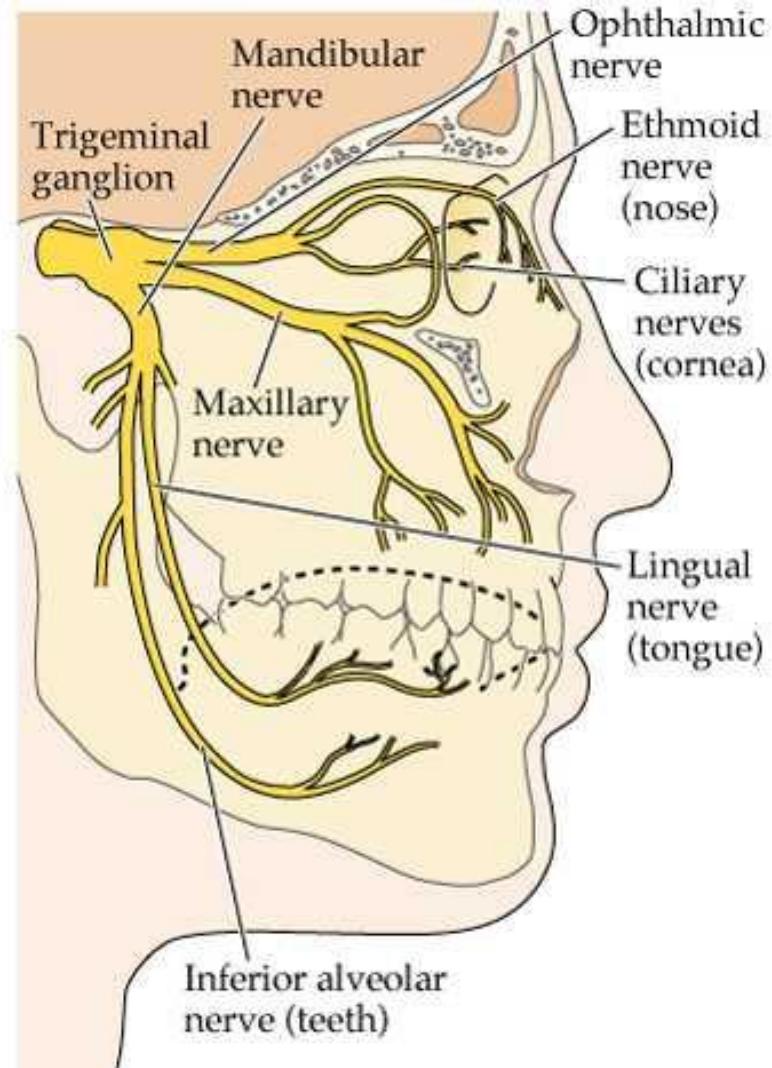
- ***The frontal nerve*** lies just under the roof of the orbit and divides into supraorbital and supratrochlear nerves which emerge from the orbit and supply the front of the scalp.



- *The lacrimal nerve lies laterally and supplies the of the eyelids and face.*
 - *It also carries parasympathetic fibres from the pterygopalatine ganglion to the lacrimal gland.*

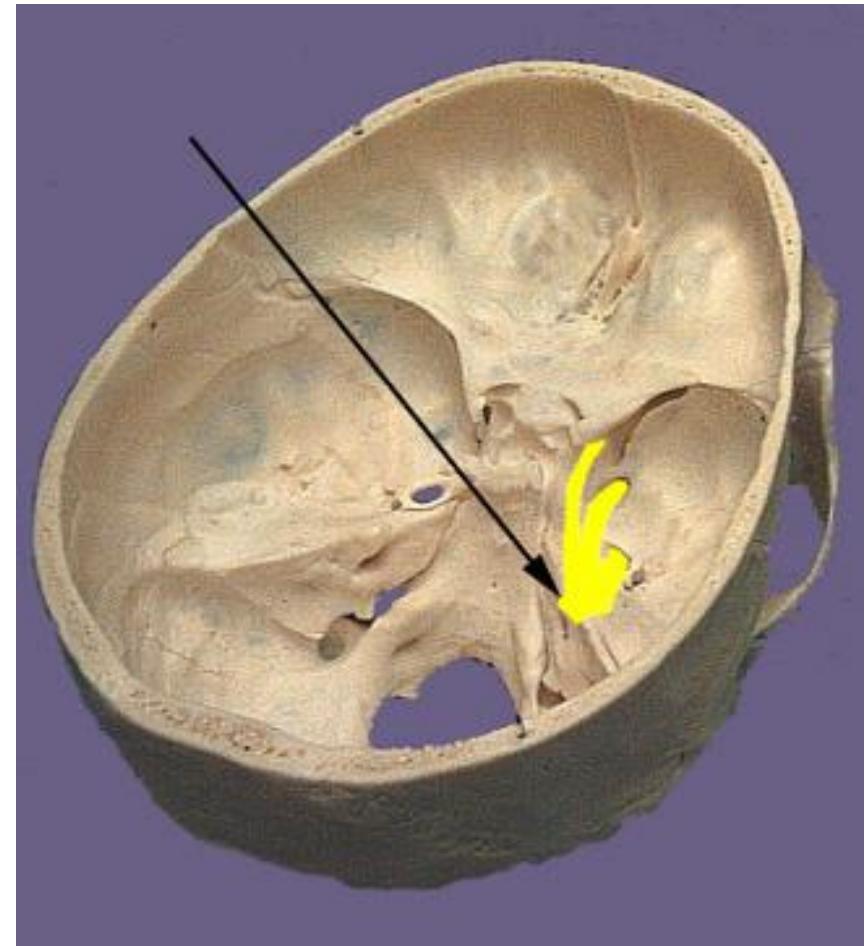


- ***The nasociliary nerve***
crosses the optic nerve
and runs along the medial
wall of the orbit to emerge
onto the face as the
infratrochlear nerve.
 - It gives off the ***ethmoidal nerves*** to the ethmoidal sinuses and
 - the ***long ciliary nerves*** to the eye which carry sensory fibres from the cornea and sympathetic fibres to the dilatator pupillae.

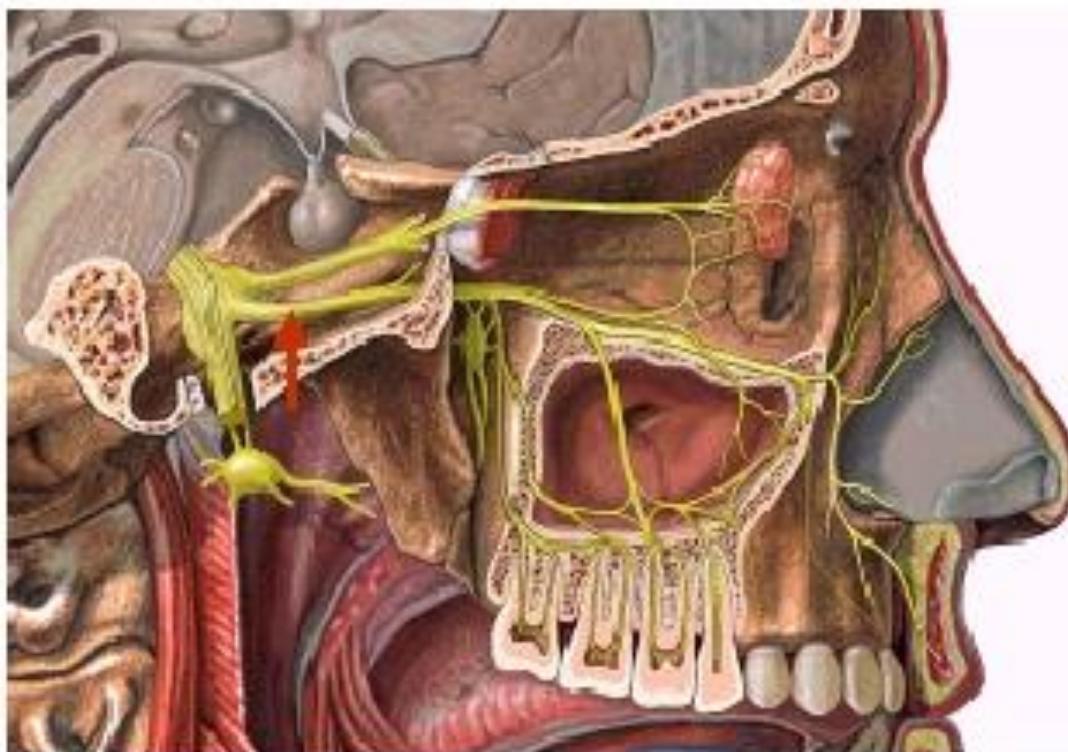


THE MAXILLARY DIVISION

This leaves the cranial cavity through the foramen rotundum and enters the pterygopalatine fossa.

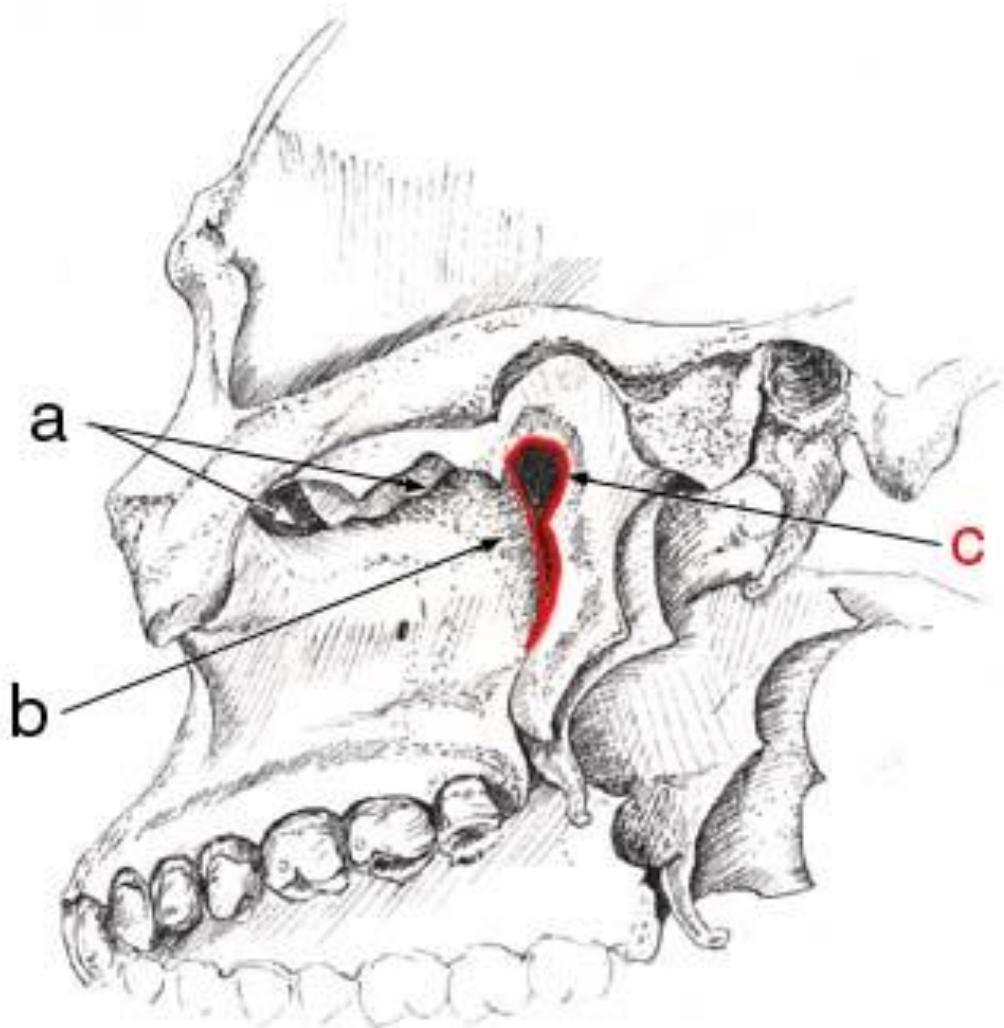


TRIGEMINAL NERVE - Maxillary branch



Maxillary Branch

Receives sensory messages from the upper jaw, nose and lower eye lid.



Fissures

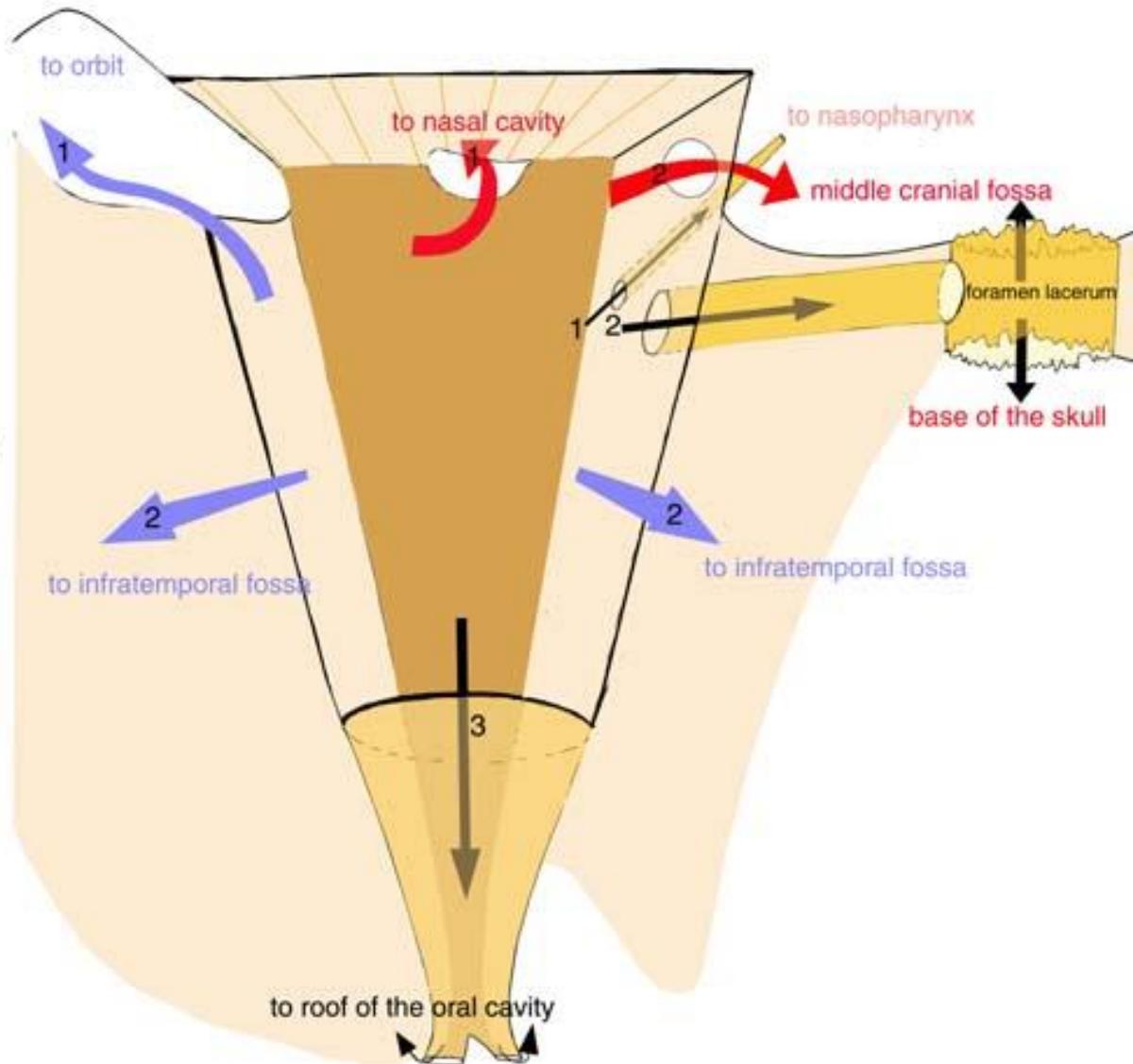
- 1- inferior orbital fissure
- 2- pterygomaxillary fissure

Foramina

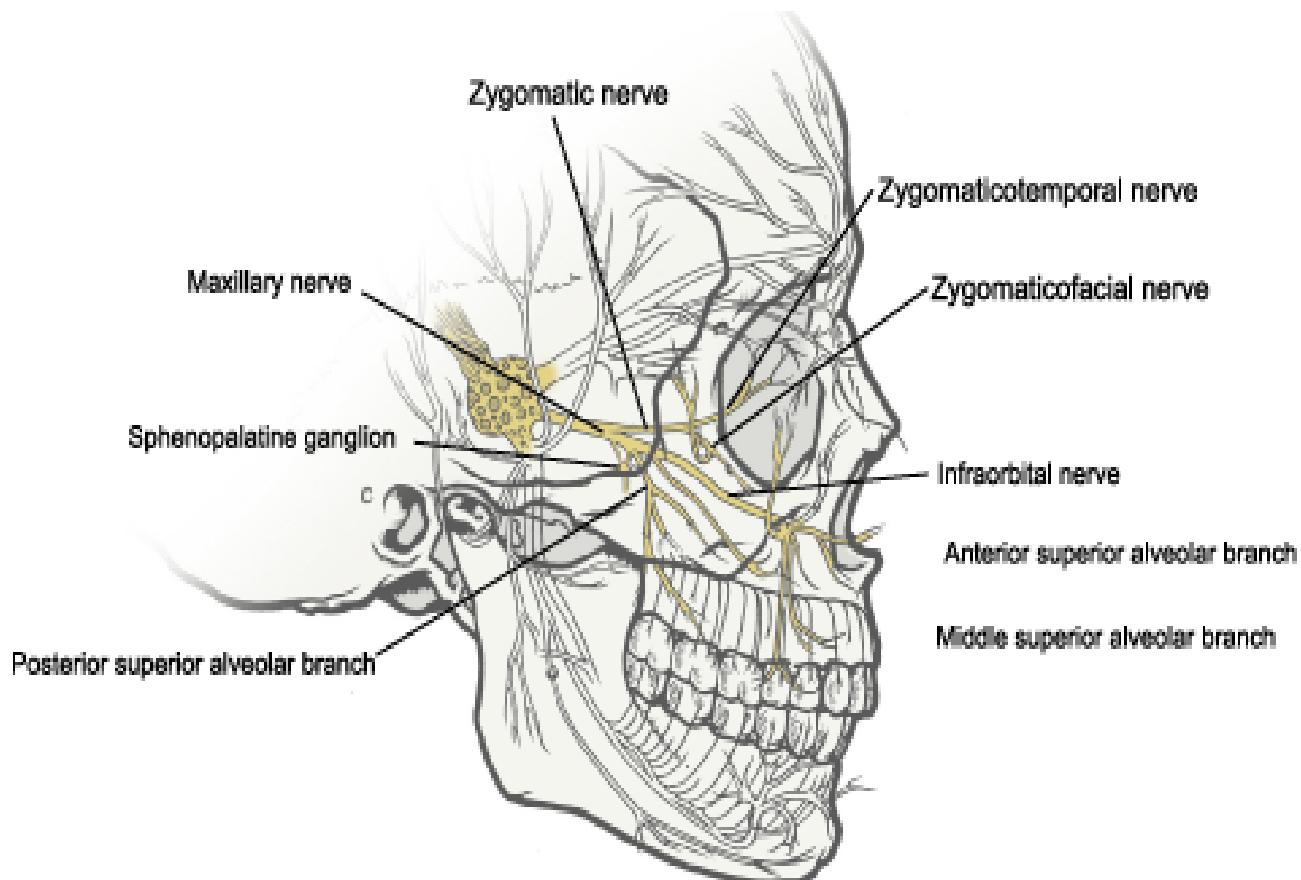
- 1- spheno-palatine foramen
- 2- foramen rotundum

Canals

- 1- pharyngeal canal
- 2- Vidian canal
- 3- pterygopalatine canal



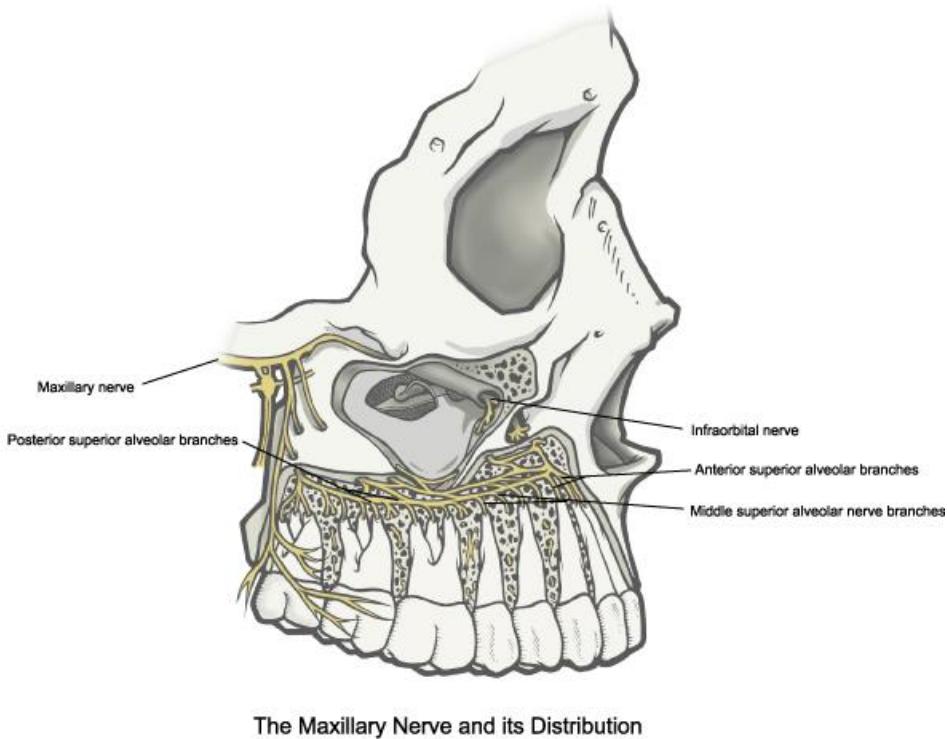
The branches of the maxillary nerve



The Maxillary Nerve

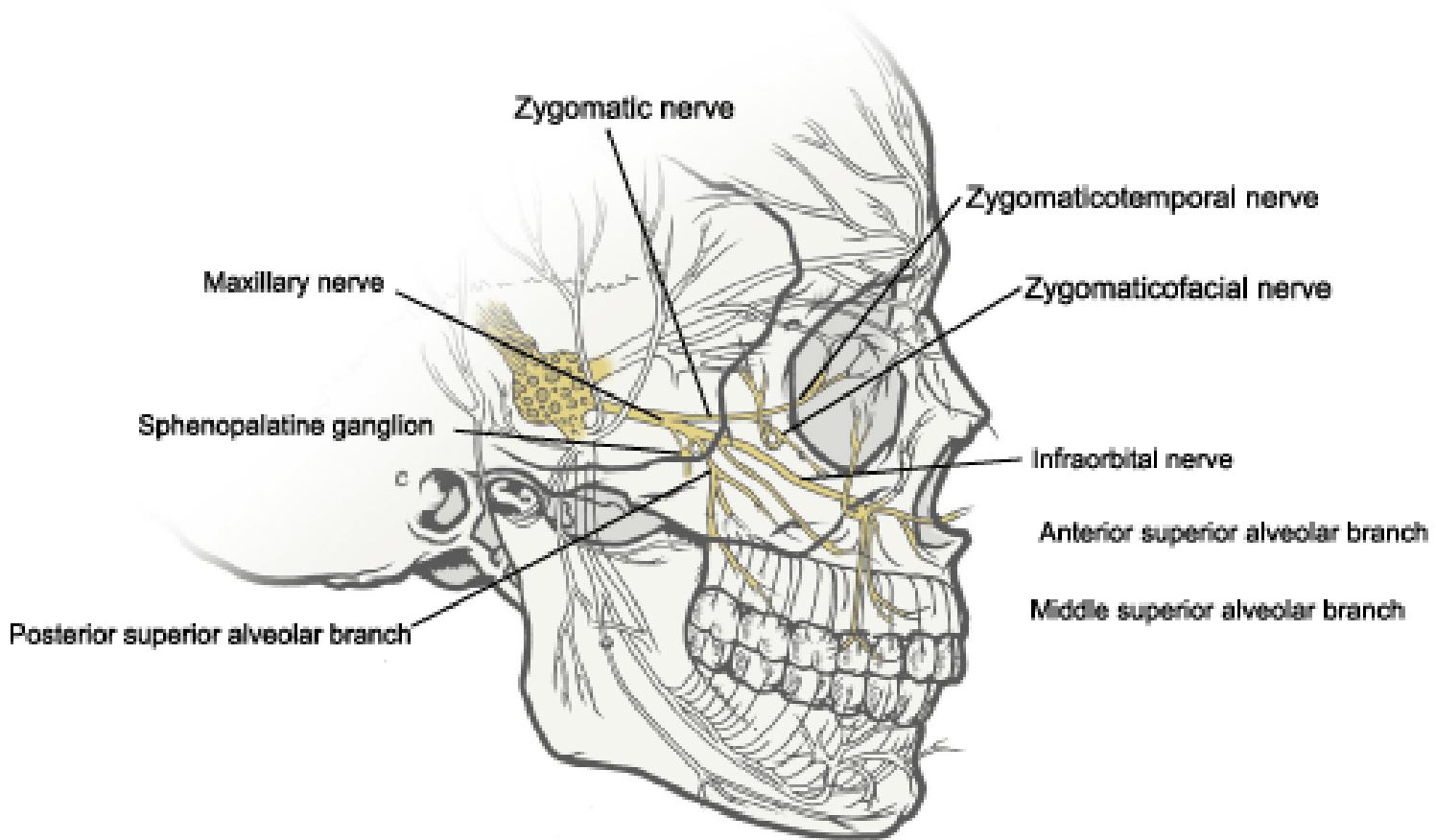
- ***the zygomatic nerve*** the pterygopalatine fossa via the inferior orbital fissure
- ***the great and lesser palatine nerves*** to the hard and soft palates,
- ***the sphenopalatine nerve*** to the nasal cavity and thence via the nasal septum, to the incisive fossa to supply the hard palate.
- ***The posterior superior dental nerve*** enters the back of the maxilla and supplies the teeth.

The branches of the maxillary nerve



- The maxillary nerve leaves the pterygopalatine fossa via the *inferior orbital fissure*, travels in the floor of the orbit where it gives ***the middle and anterior superior dental nerves***, and emerges onto the face through the *infraorbital foramen* as the ***infraorbital nerve***.

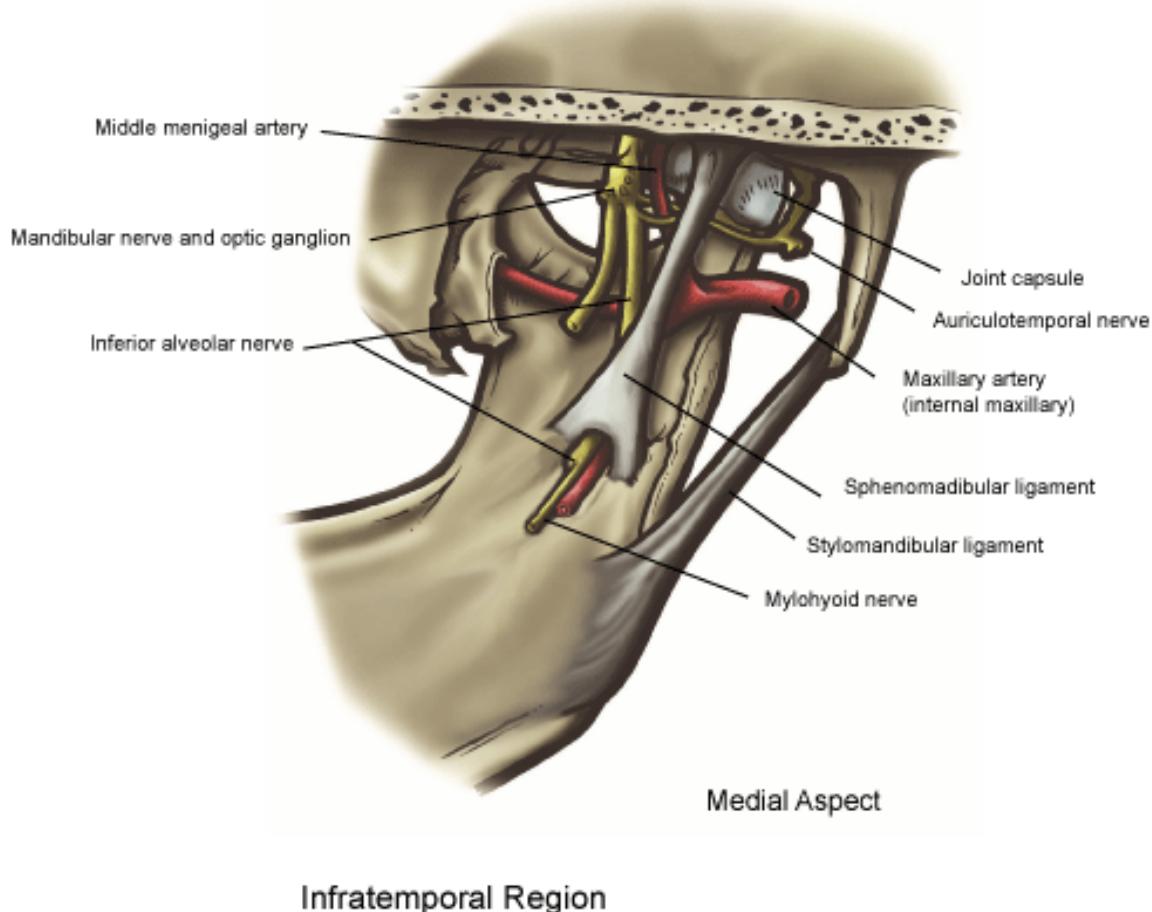
All branches of the maxillary division are sensory.



The Maxillary Nerve

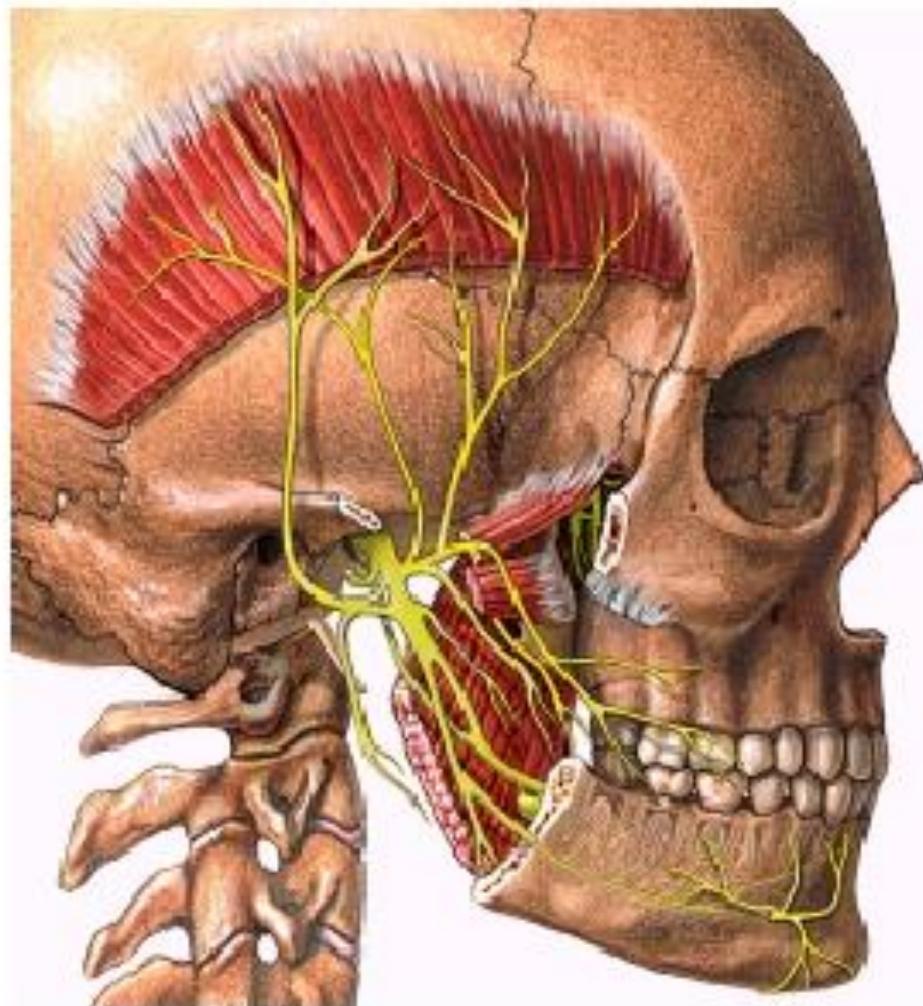
THE MANDIBULAR DIVISION

- This leaves the cranial cavity through the foramen ovale and immediately breaks up into branches.



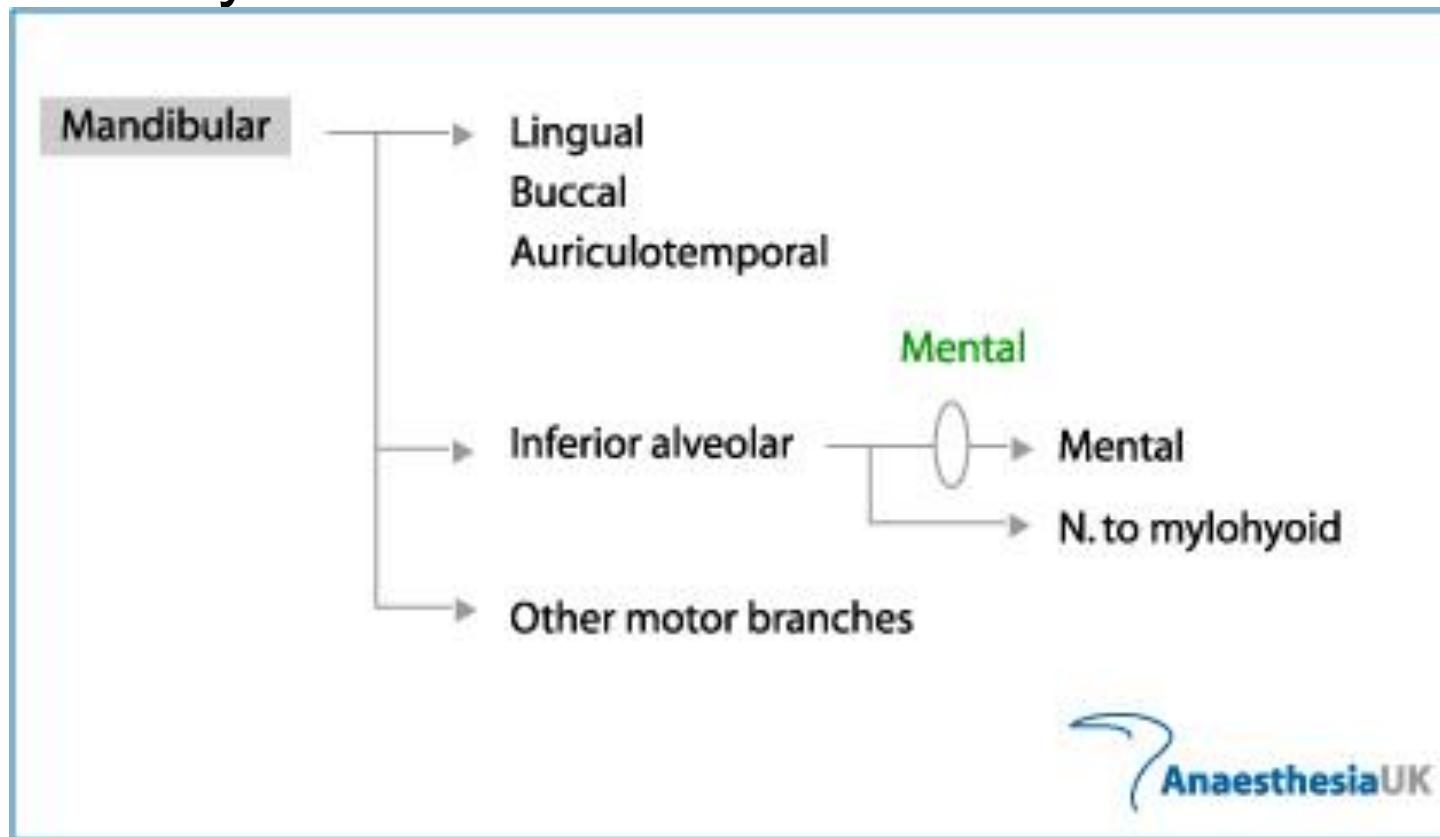
TRIGEMINAL - Mandibular branch

The **mandibular branch** innervates the skin and teeth of the lower jaw for sensation. It also supplies motor impulses to the **temporal** and **masseter** muscles for chewing.

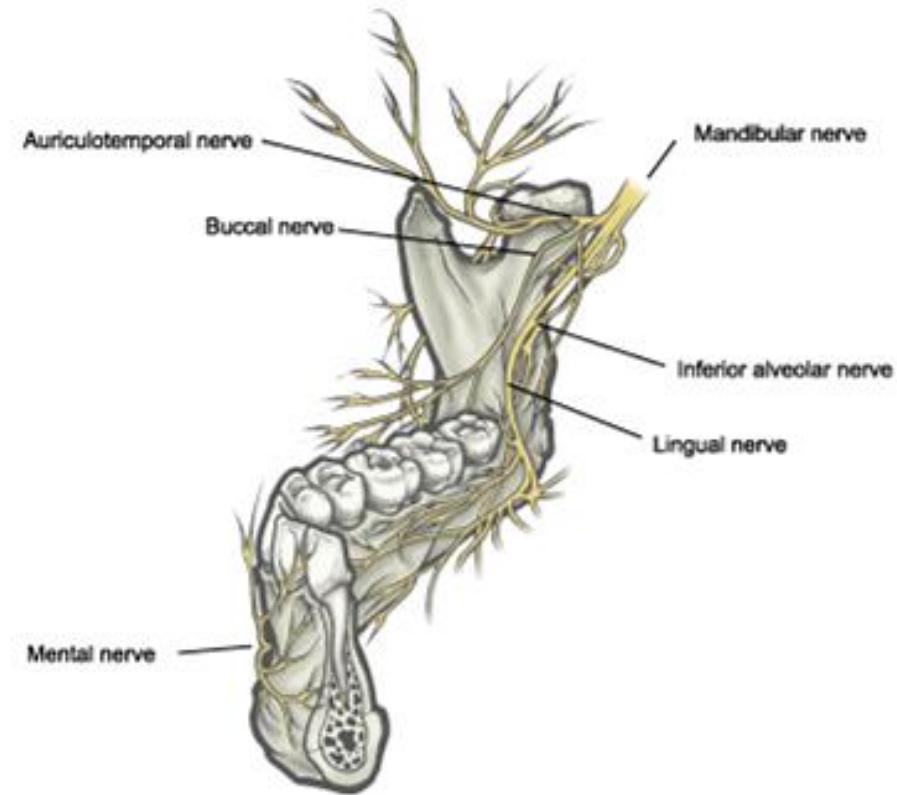


THE MANDIBULAR DIVISION

- The mandibular division contains both motor and sensory branches.



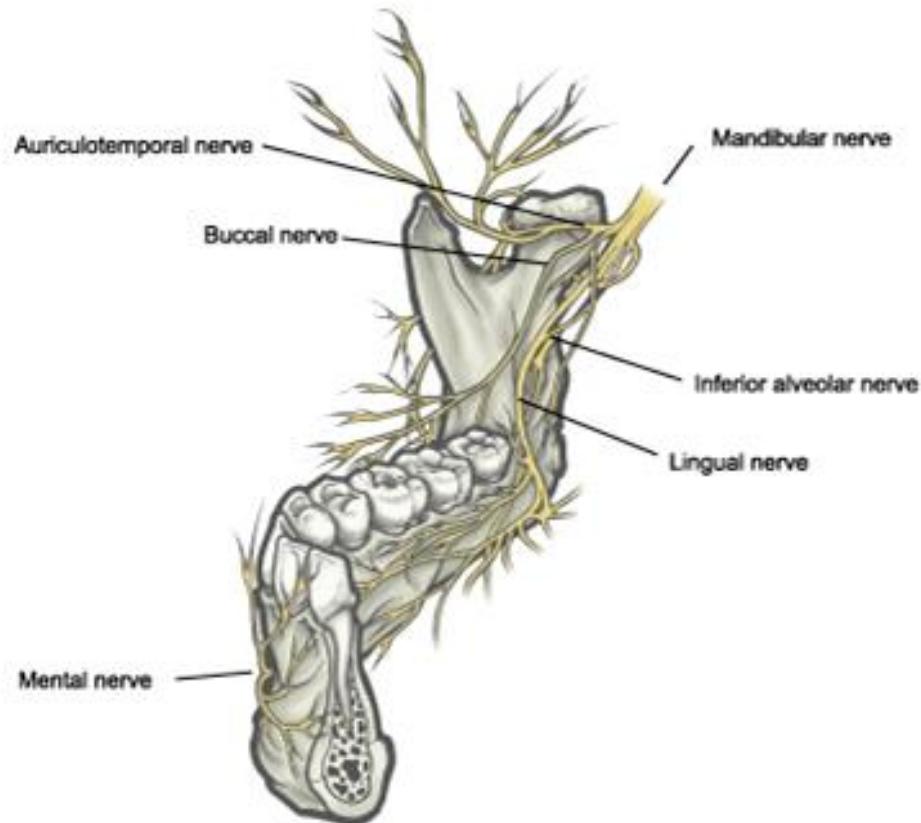
- the mainly sensory ***inferior alveolar nerve***, which enters the mandibular foramen to supply the teeth before emerging onto the face as ***the mental nerve***.
- This nerve does have one motor branch, ***the mylohyoid nerve***, which supplies the mylohyoid and anterior belly of the digastric.



The Mandibular Nerve and its Distributions

The lingual nerve

- ***The lingual nerve*** lies close to the mandible just behind the third molar and then passes forwards to supply the tongue.
- It is joined by the *chorda tympani* which carries taste fibres from the anterior two-thirds of the tongue and parasympathetic secretomotor fibres to the submandibular and sublingual salivary glands. These synapse in the submandibular ganglion which is attached to the lingual nerve



- ***The auriculotemporal nerve*** supplies sensory fibres to the side of the scalp.
 - It also carries parasympathetic secretomotor fibres, which have synapsed in the otic ganglion, to the parotid gland.
- ***The buccal nerve*** carries sensory fibres from the face.
- There are ***muscular branches*** to the muscles of mastication, including the deep temporal nerve which supply temporalis.

