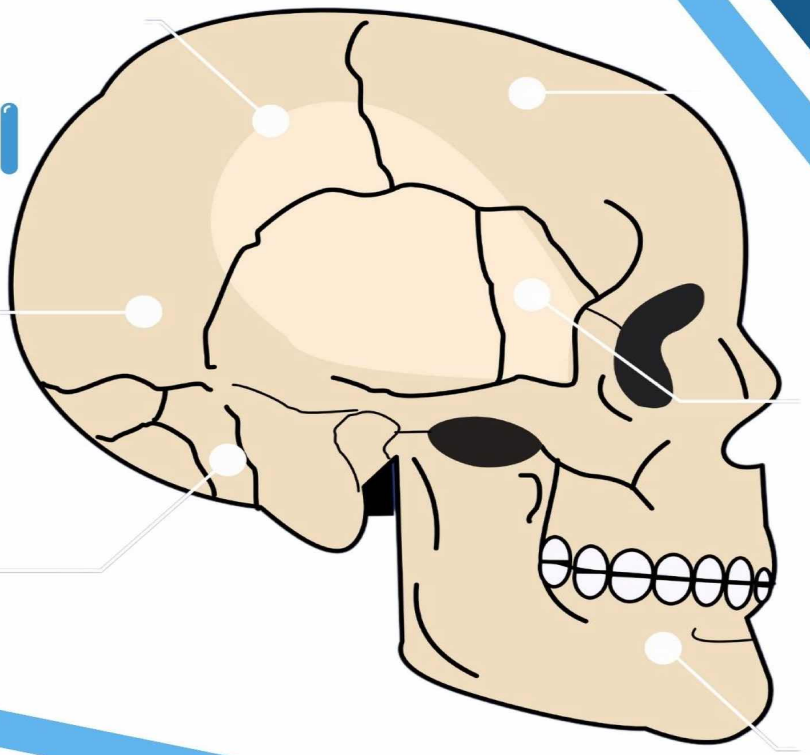
ANATOMY
SUMMARY

FOR FILE 3

Every single detail in file 3 is included in this summary

شامل لجميع المعلومات

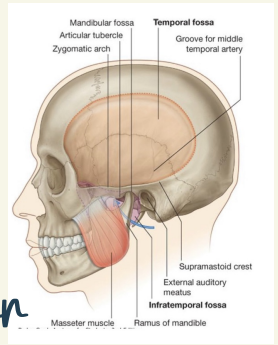


By : Hemmeh Asnan

هذا الملخص شامل الفايل الثالث

Temporal fossa

Narrow fan-shaped space



Temporal fossa borders:

Superior

Pair of temporal lines

Lateral

Temporal fascia

Anterior

Posterior surface of the frontal and zygomatic bones.

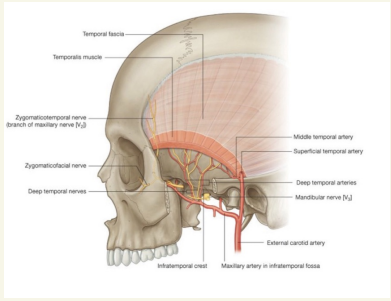
Inferior

Laterally:
zygomatic arch

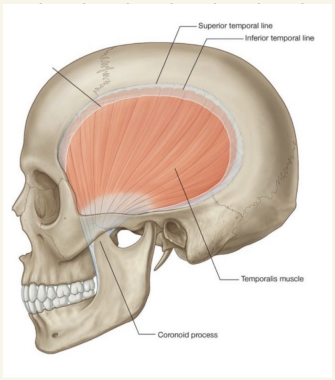
Medially:
infratemporal crest of the greater wing of the sphenoid

Contents of the temporal fossa

- Temporalis muscle
- Zygomaticotemporal nerve
- Deep temporal nerves
- Deep temporal arteries
- Middle temporal artery



Temporalis muscle

Origin	Bone of temporal fossa and temporal fascia
Insertion	Coronoid process of the mandible and anterior margin of the ramus of mandible almost to the last molar tooth
Nerve supply	Deep temporal nerves from the anterior trunk of mandibular nerve
Action	Elevation & retraction of the mandible
Figure	

Infratemporal fossa

Infratemporal fossa borders

Roof

* inferior surfaces of the greater wing of Sphenoid bone and temporal bone
* Contains: ① foramen spinosum ② foramen ovale ③ petrotympanic fissure

Lateral wall

* medial surface of the ramus of the mandible
* contains. opening to the mandibular canal

Medial wall

* Anteriorly: lateral plate of pterygoid process.
* Posteriorly: pharynx and 2 muscles of the soft palate (tensor and levator veli palatini)
* contains: pteryomaxillary fissure anteriorly

↓

allows structures to pass between the infratemporal and pterygopalatine fossae

Anterior wall

* posterior surface of the maxilla
* contains: alveolar foramen
* the upper part opens as the inferior orbital fissure into the orbit.

Infratemporal fossa contents

Sphenomandibular ligament

Medial pterygoid muscle
Lateral pterygoid muscle

- Mandibular nerve (V3) branches
- Chorda tympani of the facial nerve [VII]
- Lesser petrosal (glossopharangeal nerve)
- Otic ganglion

Maxillary artery
Pterygoid plexus of veins

Infratemporal fossa contents

Sphenomandibular ligament

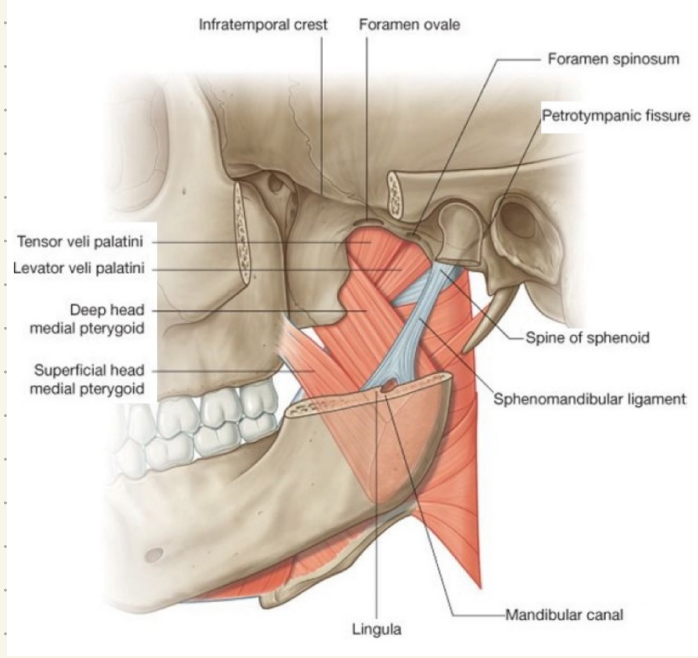
↓ is

Extracapsular ligament of the temporomandibular joint (TMJ)

* Attachments

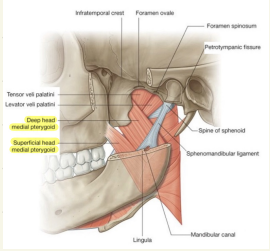
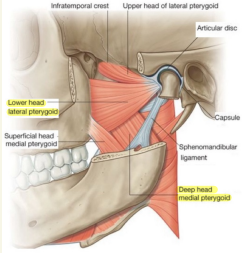
- Superiorly:
  spine of sphenoid bone

- Inferiorly:
  attaches to the lingula of the mandible



Infratemporal fossa contents

Muscles

Muscle	Medial Pterygoid muscle	Lateral Pterygoid muscle
Origin	Deep Head → medial surface of lateral plate of pterygoid process. Superficial head → tuberosity of maxilla & pyramidal process of palatine	Upper head → roof of infratemporal fossa Lower head → lateral surface of lateral plate of the pterygoid
Insertion	medial surface of the angle of mandible	Capsule of temporomandibular joint in the region of attachment to the articular disc
Nerve Supply	Nerve to medial pterygoid from mandibular nerve	Nerve to lateral pterygoid from the anterior trunk of the mandibular nerve
Action	Elevation side-to-side movement.	Protrusion and side-to-side movement
Figure		

Infratemporal fossa contents

Mandibular nerve

General info:

- Largest division of trigeminal nerve
- Passes through foramen ovale
- All branches of mandibular nerve originate in the infratemporal fossa
- Mixed nerve:

Sensory root	Motor root
between tensor veli palatini muscle and the upper head of the lateral pterygoid muscle	Passes through foramen ovale and immediately joins the sensory part of the mandibular nerve

- 2 trunks: anterior and posterior
- Branches directly from the mandibular nerve (medial aspect).

① Meningeal branch	② Nerve to medial pterygoid muscle
- Passes through foramen spinosum - Supplies Dura Mater of the middle cranial fossa	③ Nerve to tensor veli palatini
	④ Nerve to tensor tympani muscle - through bony canal in temporal bone

Infratemporal fossa contents

Mandibular nerve

- Mandibular nerve branches from anterior trunk

Buccal Nerve	→ between the upper and lower heads of lateral pterygoid → lateral to the buccinator, supply the adjacent skin and mucosa and the buccal gingiva of the lower molars
Masseteric Nerve	→ Pass laterally over the lateral pterygoid muscle and through the mandibular notch, on the deep surface of the masseter muscle
Deep temporal Nerves	→ above the lateral pterygoid muscle → temporal fossa to supply the temporalis muscle
Nerve to lateral pterygoid	→ directly to deep surface of the lateral pterygoid muscle.

Infratemporal fossa contents

Mandibular nerve

- Mandibular nerve branches from posterior trunk

Auriculotemporal Nerve	→ between the tensor veli palatini and the upper head of lateral pterygoid → between the sphenomandibular ligament and the neck of mandible → curves around the neck of the mandible Supplies area over the temple, external auditory meatus, tympanic membrane, TMJ → delivers postganglionic parasympathetic nerves from the glossopharangeal nerve to the parotid gland
Inferior Alveolar Nerve	→ originates deep to the lateral pterygoid muscle → between sphenomandibular ligament and the ramus of the mandible → Passes through mandibular foramen and canal → before entering mandibular foramen it gives "nerve to mylohoid" that gives → incisive nerve → mental nerve → Motor nerve to mylohoid ⇒ supplies mylohoid and anterior belly of digastric → Sensory * Main trunk: molar teeth + 2nd premolar * Incisive branch: rest of the lower teeth * mental branch: mucosa + skin of the lower lip + skin of the chin

Infratemporal fossa contents

Mandibular nerve

- Mandibular nerve branches from posterior trunk

Lingual Nerve	→ between the tensor veli palatini and the lateral pterygoid muscle → joins chorda tympani nerve → lateral surface of the medial pterygoid → between posterior attachment of the mylohoid muscle to the mylohoid line and the attachment of the superior constrictor of the pharynx → enters the floor of oral cavity → groove on the medial surface of the mandible immediately inferior to the last molar → At risk when operating on the molar teeth. → Passes into the tongue on the lateral surface of the hypoglossus muscle → Attached to submandibular ganglion → General sensation from the anterior 2/3 of the tongue, oral mucosa on the floor of the oral cavity, and lingual gingivae associated with the lower teeth.

- Chorda Tympani Nerve (from Facial Nerve)

* mastoid wall of the middle ear → passes through small canal → seperated from tympanic membrane by handle of malleus.
* continues through petrotympanic fissure it emerges from the skull into the infratemporal fossa → and combines with the lingual nerve
* Taste anterior 2/3 of the tongue
* Preganglionic parasympathetic fibers to submandibular ganglion

Infratemporal fossa contents

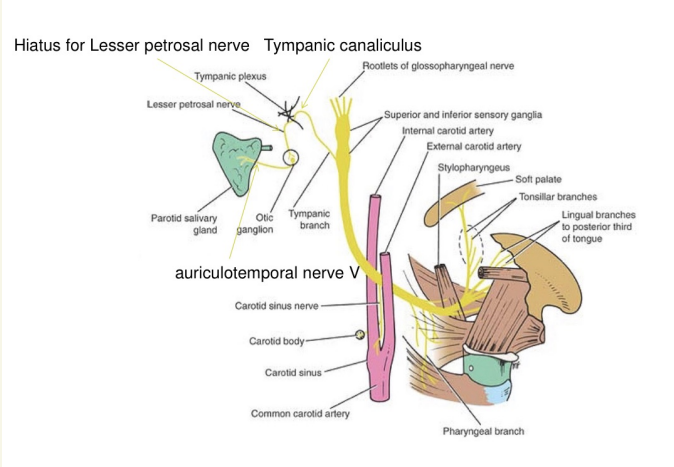
Lesser petrosal nerve

Glossopharangeal nerve (IX) → tympanic branch → tympanic plexus

→ lesser petrosal nerve → Otic ganglion → auriculotemporal nerve

- small stellate-shaped ganglion inferior to foramen ovale and medial to mandibular division of trigeminal nerve

* middle cranial fossa → through foramen ovale → infratemporal fossa
* Postganglionic fibers pass to the parotid salivary gland
* contains mainly preganglionic parasympathetic fibers for parotid gland



Infratemporal fossa contents

Maxillary artery

General info:

- enters between the neck of the mandible and the sphenomandibular ligament
- Leaves through pterygmaxillary fissure
- it has 3 parts: next page

1st Part

between the neck of the mandible and the sphenomandibular ligament

Anterior tympanic Art.

- Passes through petrotympanic fissure
- Supplies deep surface of the tympanic membrane

Deep Auricular Art

- External acoustic meatus

Accessory meningeal Art.

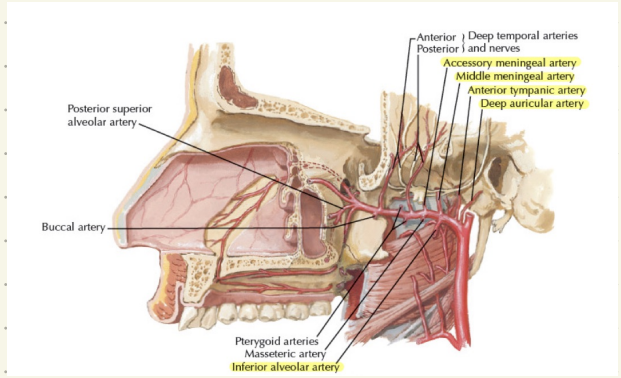
- Passes through foramen ovale
- Supplies: Dura mater

Middle meningeal Art.

- between the sphenomandibular ligament and the lateral pterygoid
- between the roots of the auriculotemporal nerve
- Enters through the foramen spinosum

Inferior Alveolar Art.

- Enters the mandibular foramen
- Supplies: all lower teeth + buccal gingiva + chin + lower lip
- Gives mental artery



2nd Part

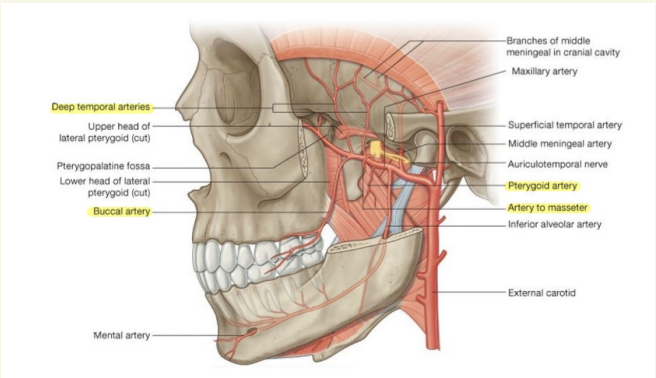
related to the lateral pterygoid muscle

Masseteric Art.

Pterygoid Arteries

Buccal Art.

Deep temporal arteries



3rd Part

→ In the pterygopalatine fossa
→ Anterior to pterygopalatine ganglion

Pharangeal Art.

- Passes through → palatovaginal canal
- Supplies: posterior roof of the nasal cavity + sphenoidal sinus + pharyngotympanic tube

Artery of pterygoid canal

- Passes into: pterygoid canal + foramen lacerum
- terminates in nasopharynx

Sphenopalatine Art.

- largest terminal branch of the maxillary artery
- Branches: posterior lateral nasal + posterior septal branches

Infraorbital Art

- Passes through: inferior orbital fissure + infraorbital foramen

Anterior Superior Alveolar Art.

- Supplies: Incisor + Canine teeth

Posterior superior Alveolar Art

- Supplies: molar + premolar

Greater palatine Art.

- Passes into: palatine canal & gives lesser palatine branch (soft palate) ↓
- Then superiorly through incisive canal.
- Supplies: Anterior aspect of the septal wall of the nasal cavity

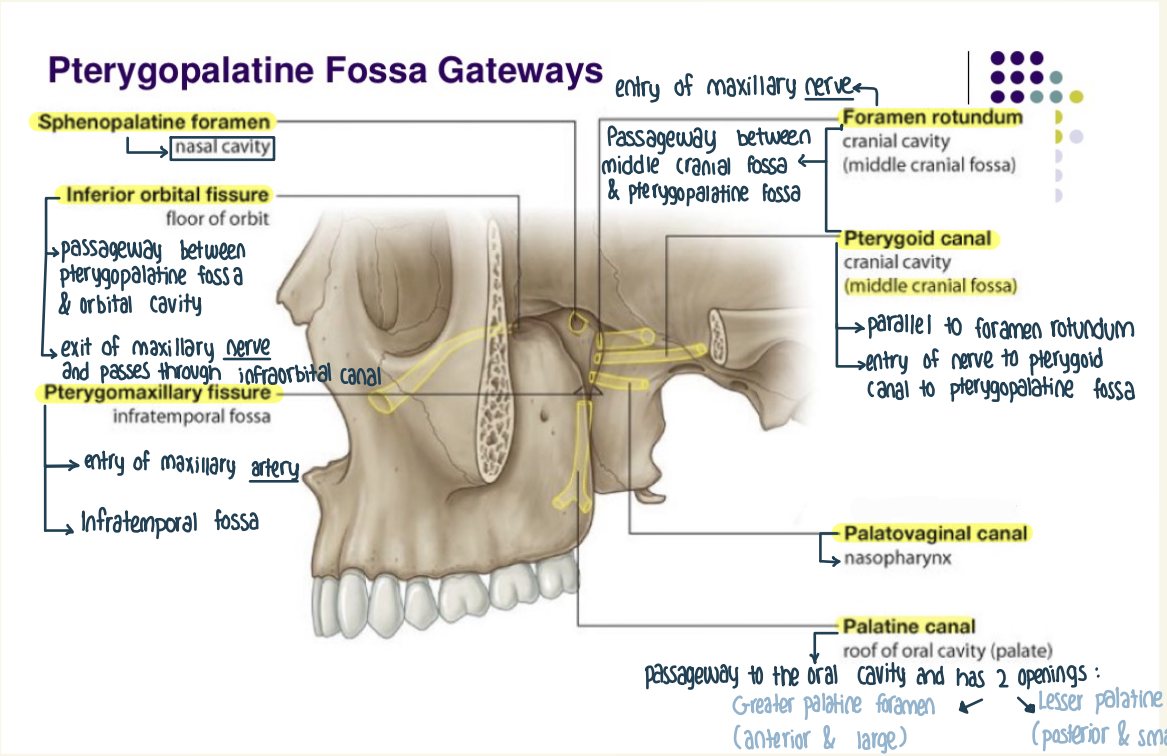
Lesser palatine Art

- Soft palate

Pterygopalatine Fossa

- Inverted teardrop- shaped space
- On lateral side of skull
- Pterygopalatine fossa walls :

Anterior	Medial	Posterior	Roof
posterior surface of the maxilla	Perpendicular plate of the palatine bone	Pterygoid process of sphenoid bone	Sphenoid bone



Maxillary nerve

Exits the middle cranial fossa through the foramen rotundum

Exits pterygopalatine fossa as the infra-orbital nerve through the inferior orbital fissure

Maxillary nerve branches

Orbital branches			
Greater and lesser palatine nerves	They pass inferior from pterygopalative ganglion through palatine canal (through foramina) greater palatine nerve supplies: roof of the oral cavity (mucosa) + premolars. Lesser palatine nerve supplies: sensory supply of the soft palate		
Posterior superior lateral nasal nerves	Through sphenopalatine foreman to supply lateral wall of nasal cavity		
Posterior superior medial nasal nerves	Supplies the roof of the nasal septum		
Nasopalatine nerve	((largest)) → passes forward and down the medial wall of the nasal cavity → incisive canal sto of of the oral cavity and terminates by supplying the oral mucosa posterior to incisor teeth		
Pharyngeal nerve	Passes posteriorly from pterygopolatine ganglion → palatovaginal canal → supplies mucosa of glands of nasopharynx		
Zygomatic nerve	Pterygopulative fossa / inferior orbital fissure	Zygomaticotemporal nerve → skin over the temple Zygomaticofacial nerve → skin over the prominence of the cheeks.	
Posterior superior alveolar nerve	Through the pterygomaxillary fissure / through a small alveolar foreman		supplies the molar teeth and adjacent buccal gingivae and maxillary sinus
Infraorbital nerve	Direct continuation of the maxillary nerve through the inferior orbital fissure infra-orbital canal	Branches before infraorbital foramen Middle superior alveolar Anterior superior alveolar	Exits through the infraorbital foramen and gives Inferior palpebralskin of the lower eyelid and cheek Nasal: theside of the nose (ala) Superior labial: upper lip

Nerve of the pterygoid canal

Facial Nerve

Greater Petrosal Nerve
preganglionic parasympathetic

* Branch of the Facial nerve in the middle ear cavity
* Medial wall of the tympanic cavity from geniculate ganglion
* Leave to middle cranial fossa through the greater petrosal foramen.
* Passes over foramen lacerum → joins deep petrosal nerve → forms nerve to pterygoid canal → pterygopalatine ganglion → maxillary nerve
* it leaves from the posterior margin of the middle cranial fossa, under the internal carotid artery.
* Superior surface of the cartilage filling the foramen lacerum

internal carotid plexus

Deep Petrosal Nerve
postganglionic sympathetic

* originates in the superior cervical sympathetic ganglion in the neck.
* Leave the ganglion (superior cervical) as the internal carotid nerve
* fibers from pterygopalatine ganglion join the main trunk of maxillary nerve and distribute with : zygomatic – post. super. alveolar - infraorbital
* Fibers leave zygomaticotemporal branch of the zygomatic nerve travel up the lateral orbital wall to join the lacrimal nerve

Nerve of pterygoid canal

Formed in the middle cranial fossa
Enters through pterygoid canal

↓ joins

pterygopalatine ganglion

- largest of the 4 parasympathetic ganglia in the head.
- postganglionic parasympathetic fibers originate in it
- postganglionic sympathetic fibers pass through it.
- Distribute with: orbital - palatine - nasal - pharangeal branches

-Supplies . ① mucous glands in the nasal cavity
② salivary glands in the upper 1/2 of the oral cavity
③ lacrimal gland in the orbit

Nerve supply of the lacrimal gland

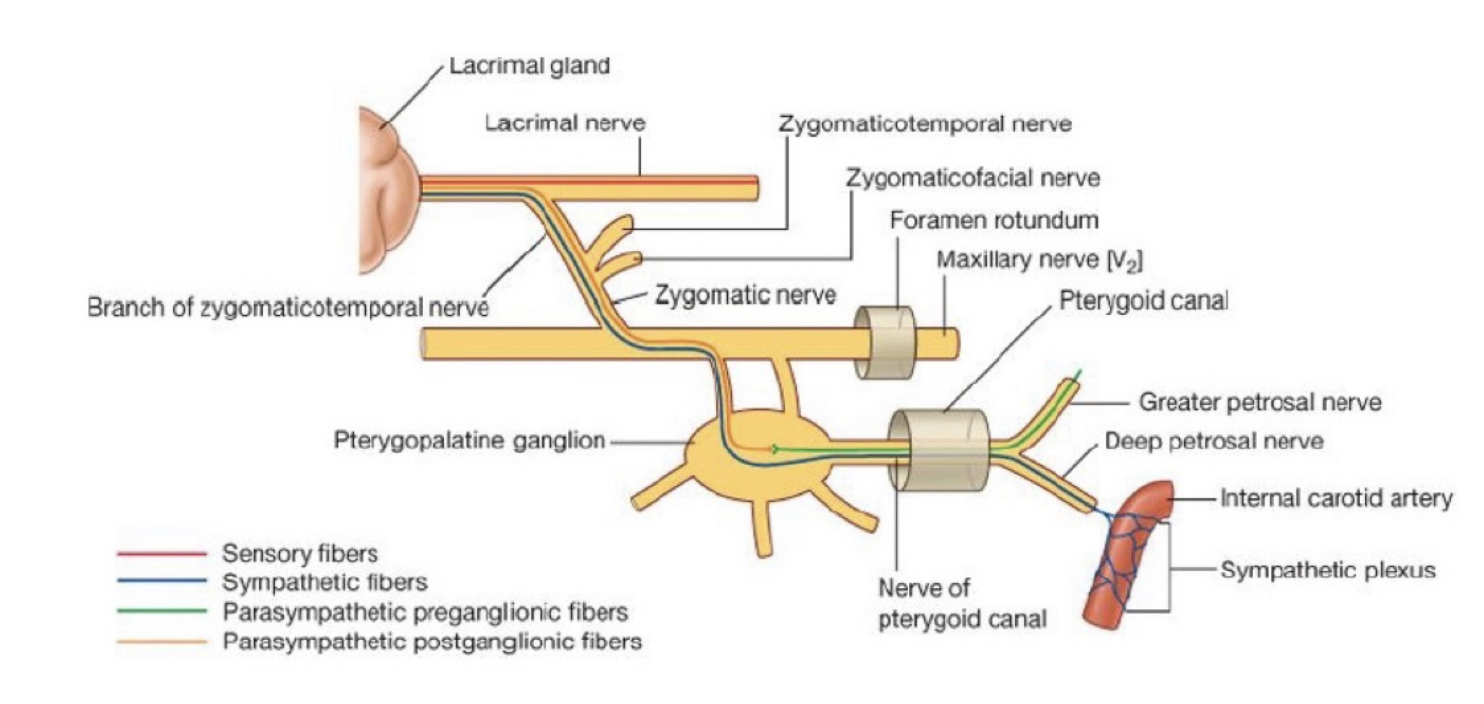
lacrimal nerve : is a major general sensory branch of the ophthalmic nerve

Parasympathetic innervation:

→ From the great petrosal nerve branch of facial nerve

Sympathetic innervation

→ From deep petrosal nerve from carotid plexus, superior cervical ganglia



TMJ

Type	Synovial (hinge & sliding).
Articulation	Articular tubercle and the anterior portion of the mandibular fossa above and the head (condyloid process) of the mandible below. The articular surfaces are covered by fibrocartilage **Articular disc:** divides the joint into upper and lower cavities, attached to the capsule and tendon of the lateral pterygoid. **Capsule:** attached above to the articular tubercle and the margins of the mandibular fossa and below to the neck of the mandible. **Synovial membrane:** lines both compartments of the joint and attached to the margins of the articular disc
Ligaments	• **Lateral ligament** Prevents lateral and posterior displacement of the condyle • **Sphenomandibular ligament** Keeps same amount of tension during both opening and closing of the mouth • **Stylomandibular ligament** Limit anterior protrusion of the mandible
Relations	**Anteriorly:** Mandibular notch, masseteric nerve and artery **Posteriorly:** external auditory meatus, glenoid process of the parotid gland **Laterally:** parotid gland, fascia, and skin **Medially:** maxillary artery and vein and the auriculotemporal nerve
Nerve supply	Auriculotemporal and masseteric
Blood supply	Deep auricular, Anterior tympanic, Superficial temporal

Masseter muscle

Origin	Superficial part: maxillary process of the zygomatic, zygomatic process of the maxilla Deep part: medial aspect of the zygomatic arch
Insertion	Lateral surface of mandible ramus
Nerve supply	Masseteric nerve from anterior trunk of mandibular nerve
Action	Elevation of mandible
Figure