

CRANIAL NERVES

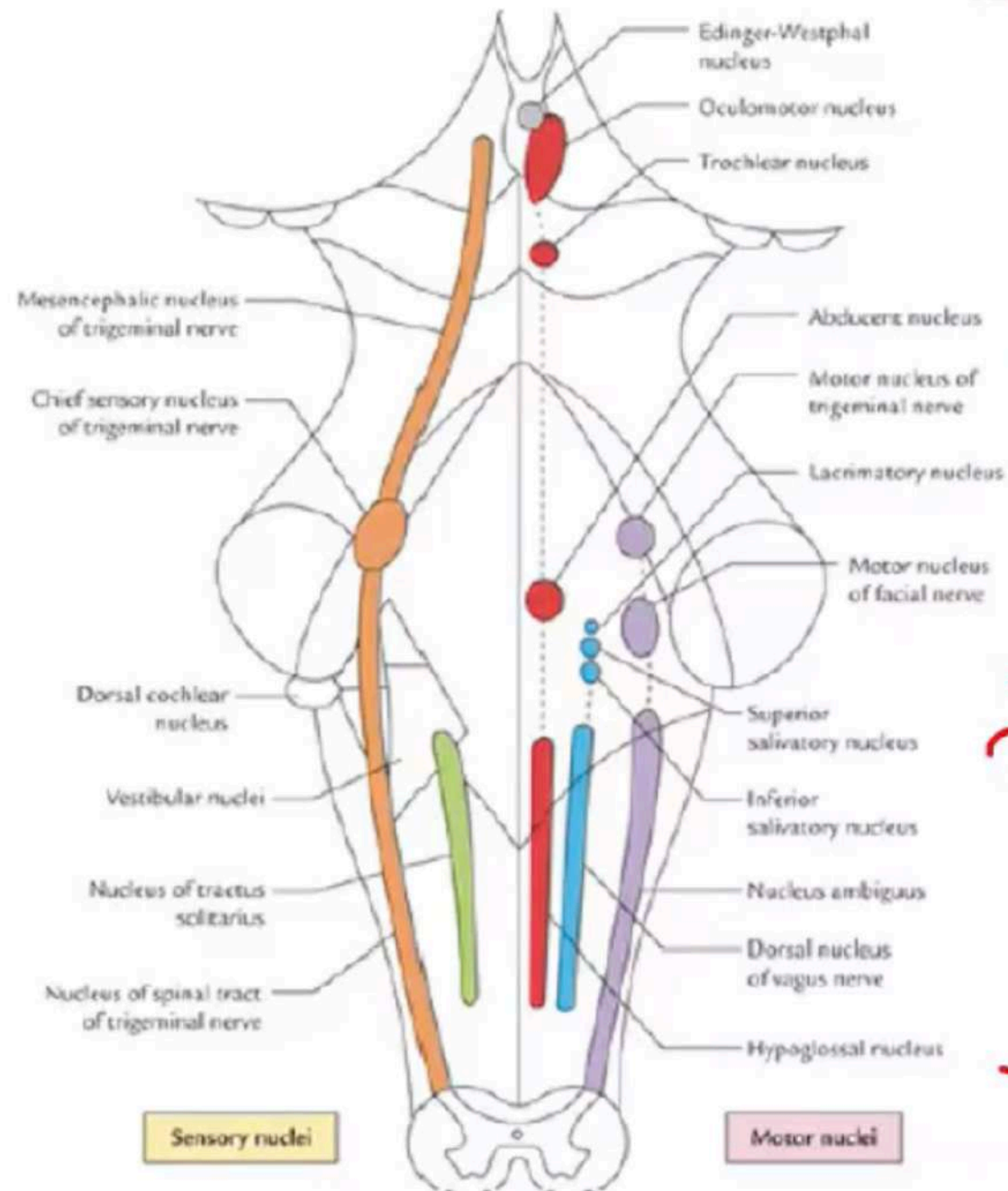
PART - 1



DR HIMANSHU CHAMPANERI

CONSULTANT NEUROSURGEON

MEDANTA HOSPITAL GURUGRAM



MB

Pons

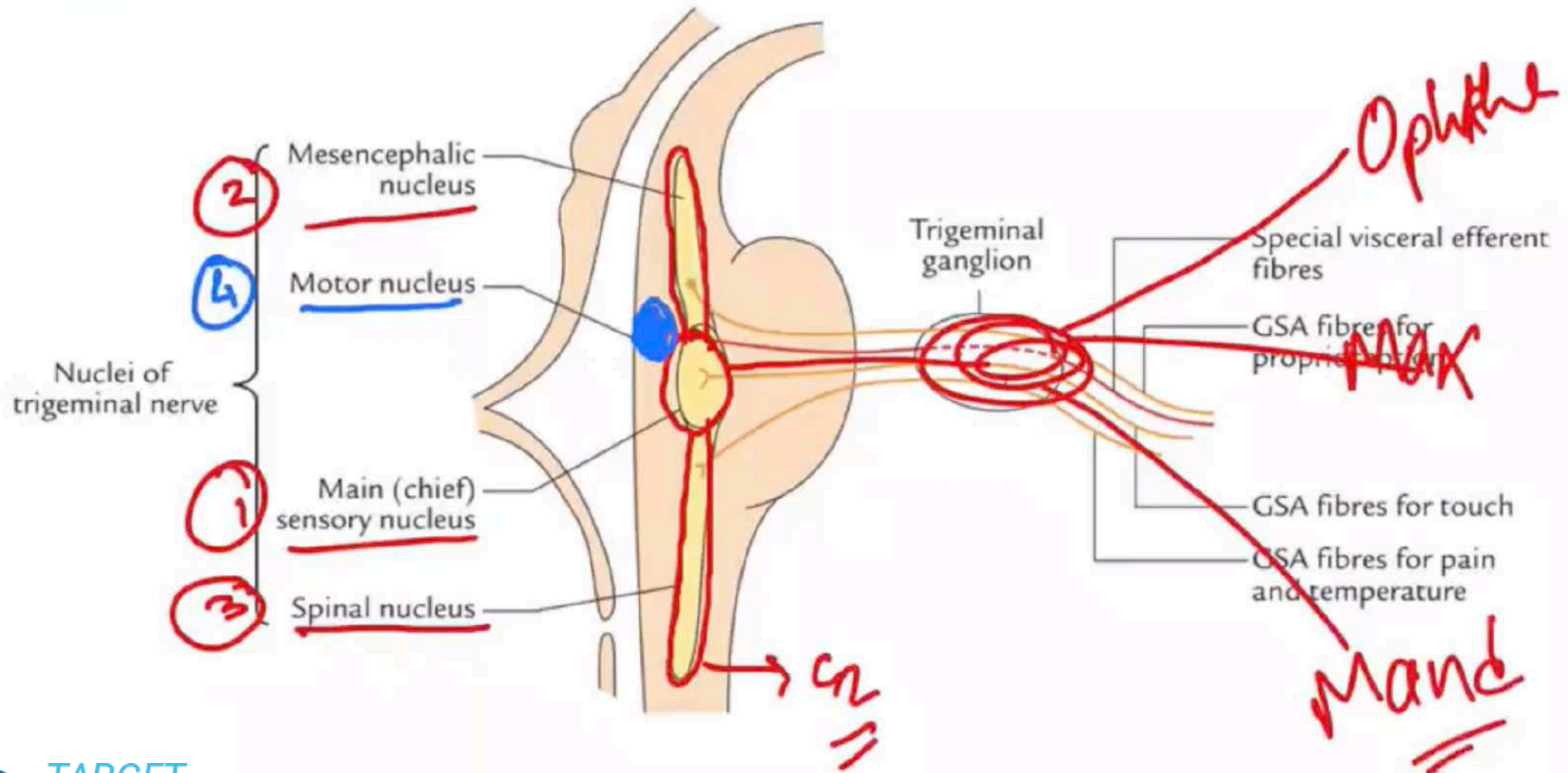
Medulla

TRIGEMINAL NERVE

NUCLEI

Sensory

4 Nuclei



- Functional components in the three divisions

- Ophthalmic segment

- GSA fibres

- Maxillary segment

- GSA fibres

- Mandibular segment

- GSA and SVE fibres

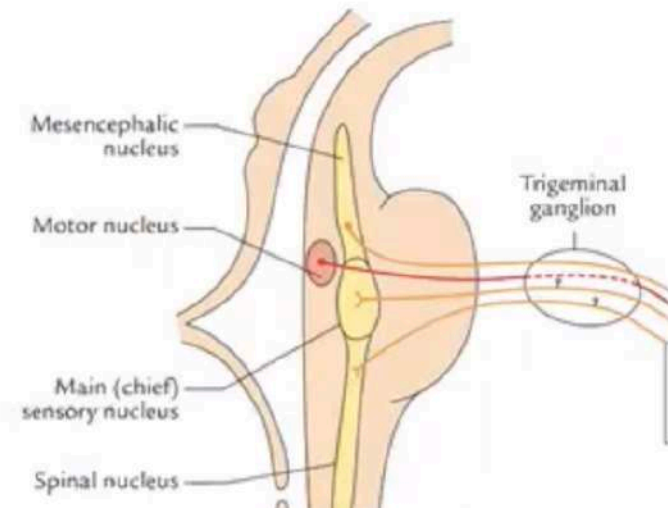
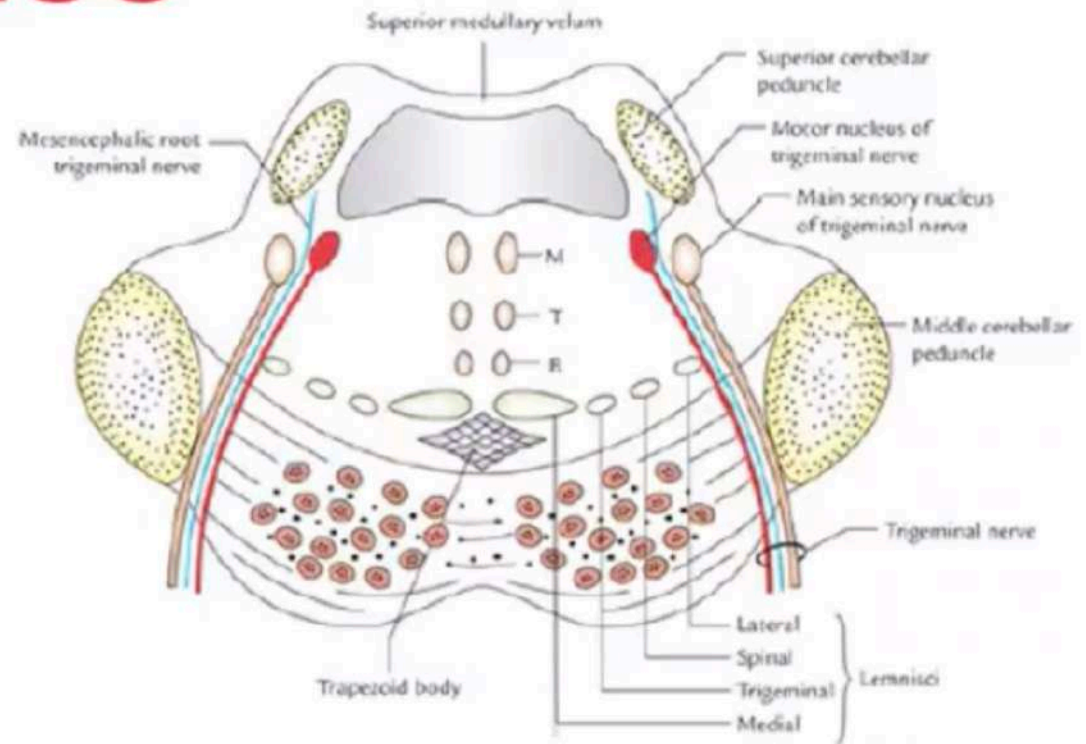
→ Extracapsular

pain
touch
temp
T.P.
V.S
Proprio

Sp. V's. Ebb.

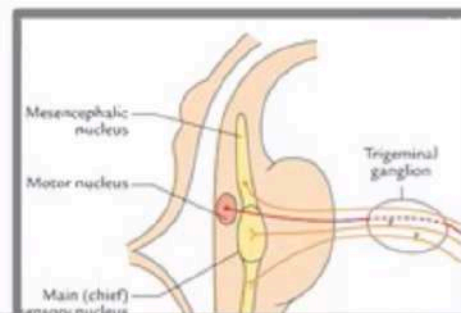
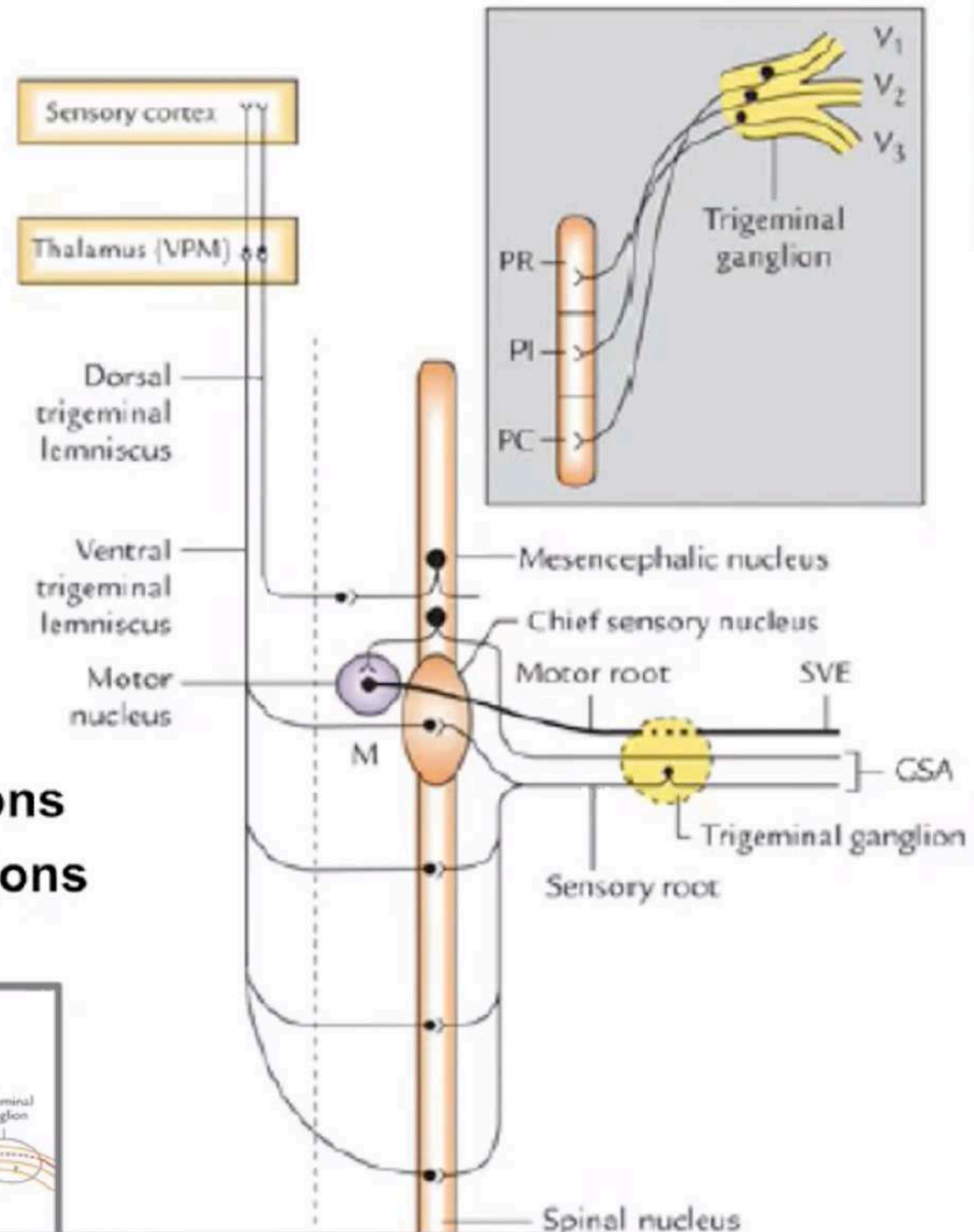
MOTOR NUCLEUS

- SVE fibres
 - Muscles of first pharyngeal arch mesoderm
 - Muscles of mastication
 - Tensor tympani
 - Tensor palati
 - Anterior belly of digastric
 - mylohyoid



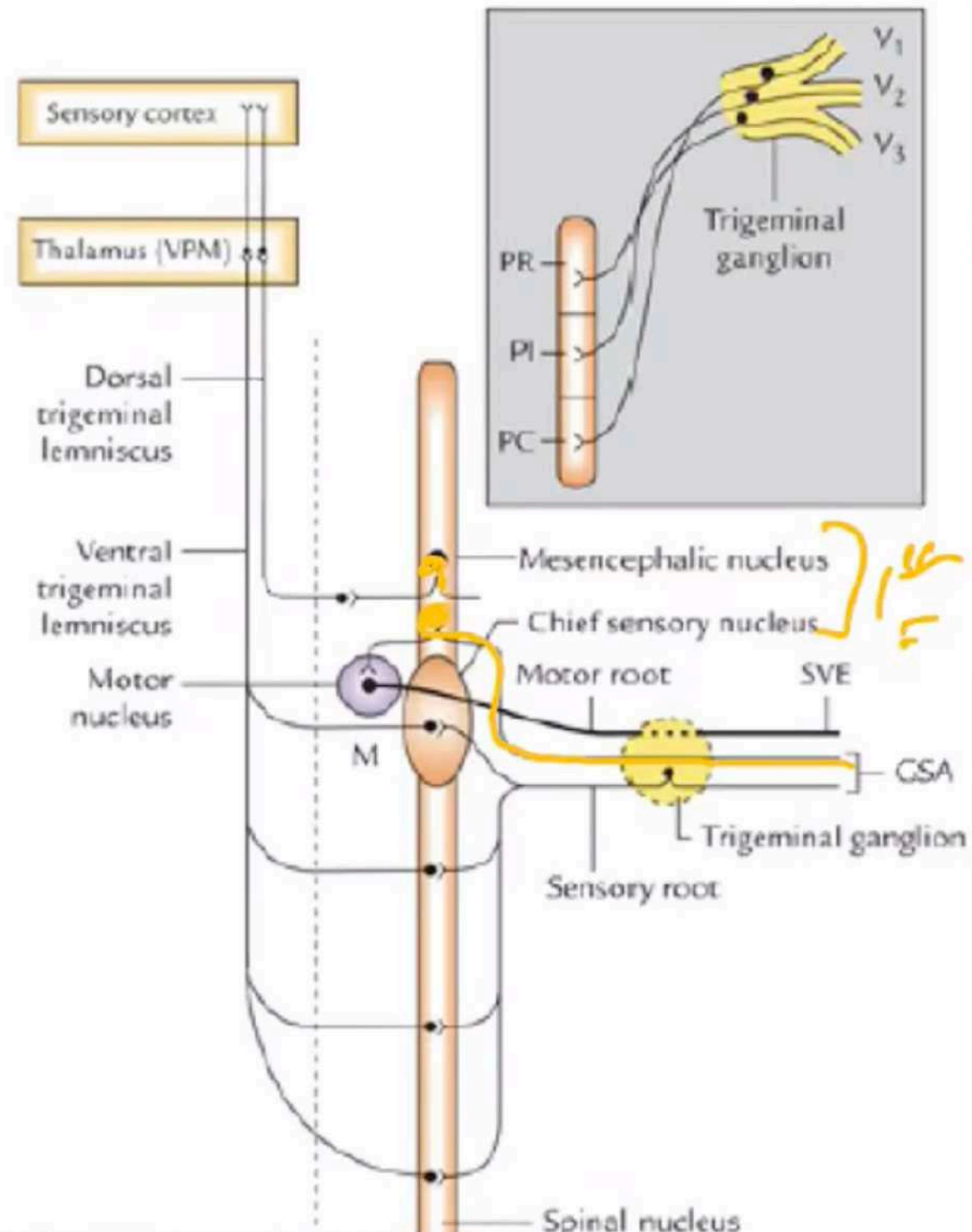
CHIEF SENSORY & SPINAL NUCLEUS

- GSA fibres
 - Exteroceptive sensations
 - Proprioceptive sensations

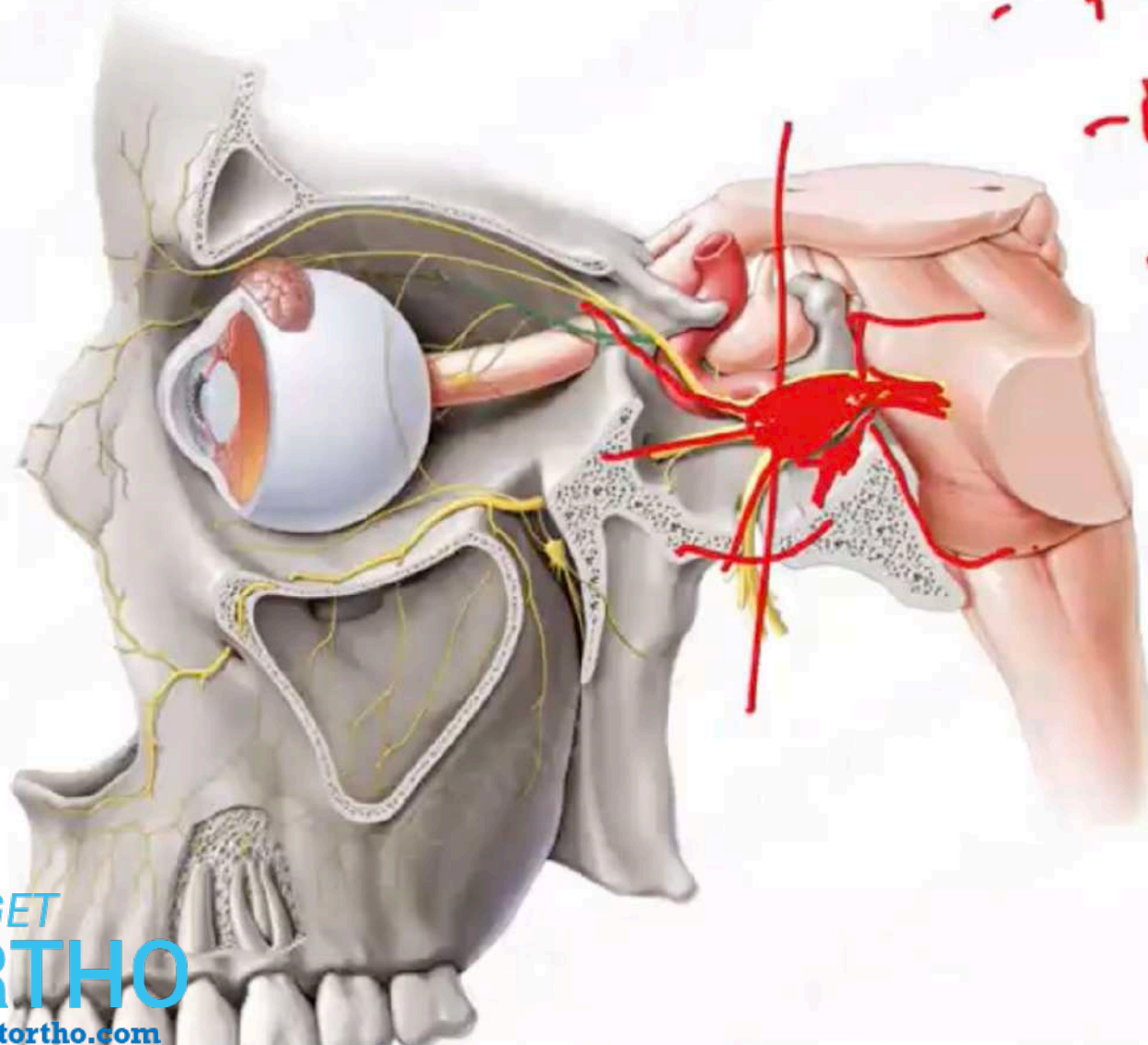
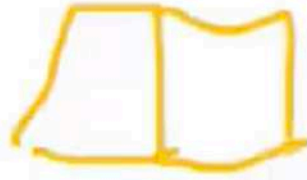


MESENCEPHALIC NUCLEUS

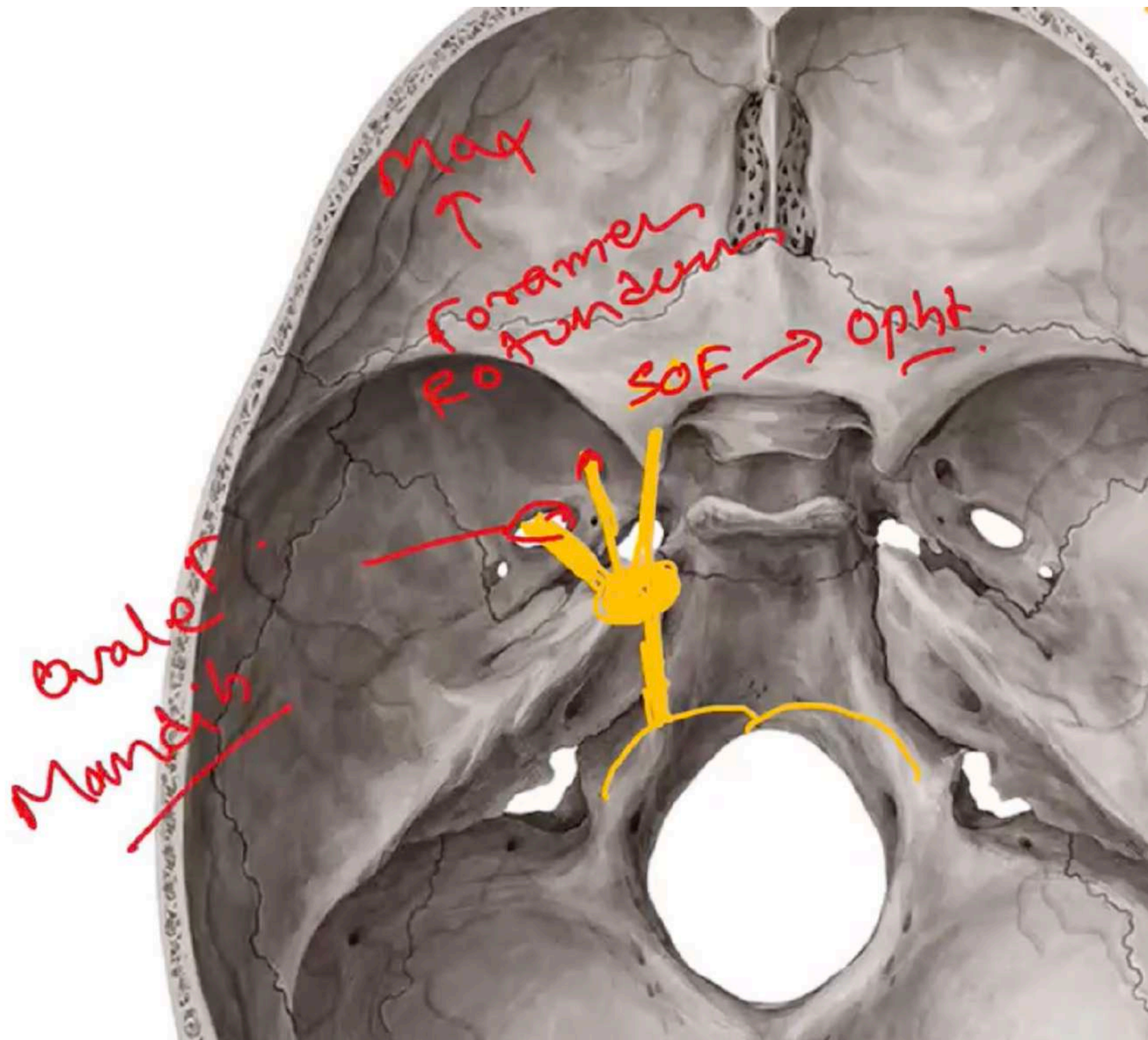
- It is similar to DRG
- First order neurons
- Proprioceptive fibres
- Also from tongue
- Stretch reflex
- Relay to VPM of thalamus
- Dorsal trigeminal lemniscus



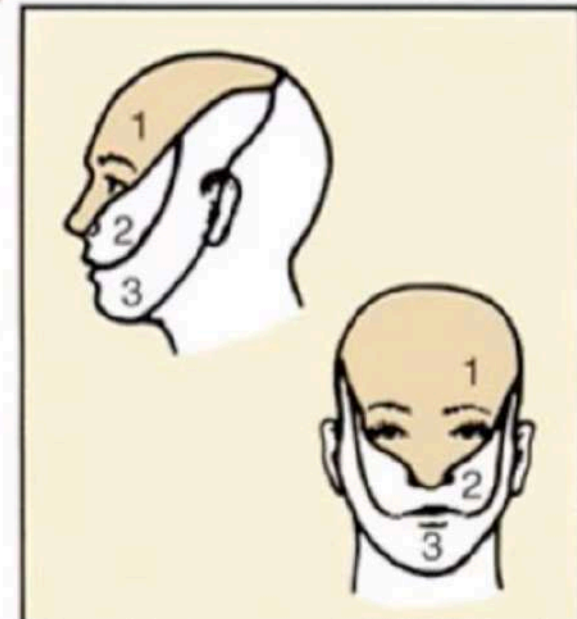
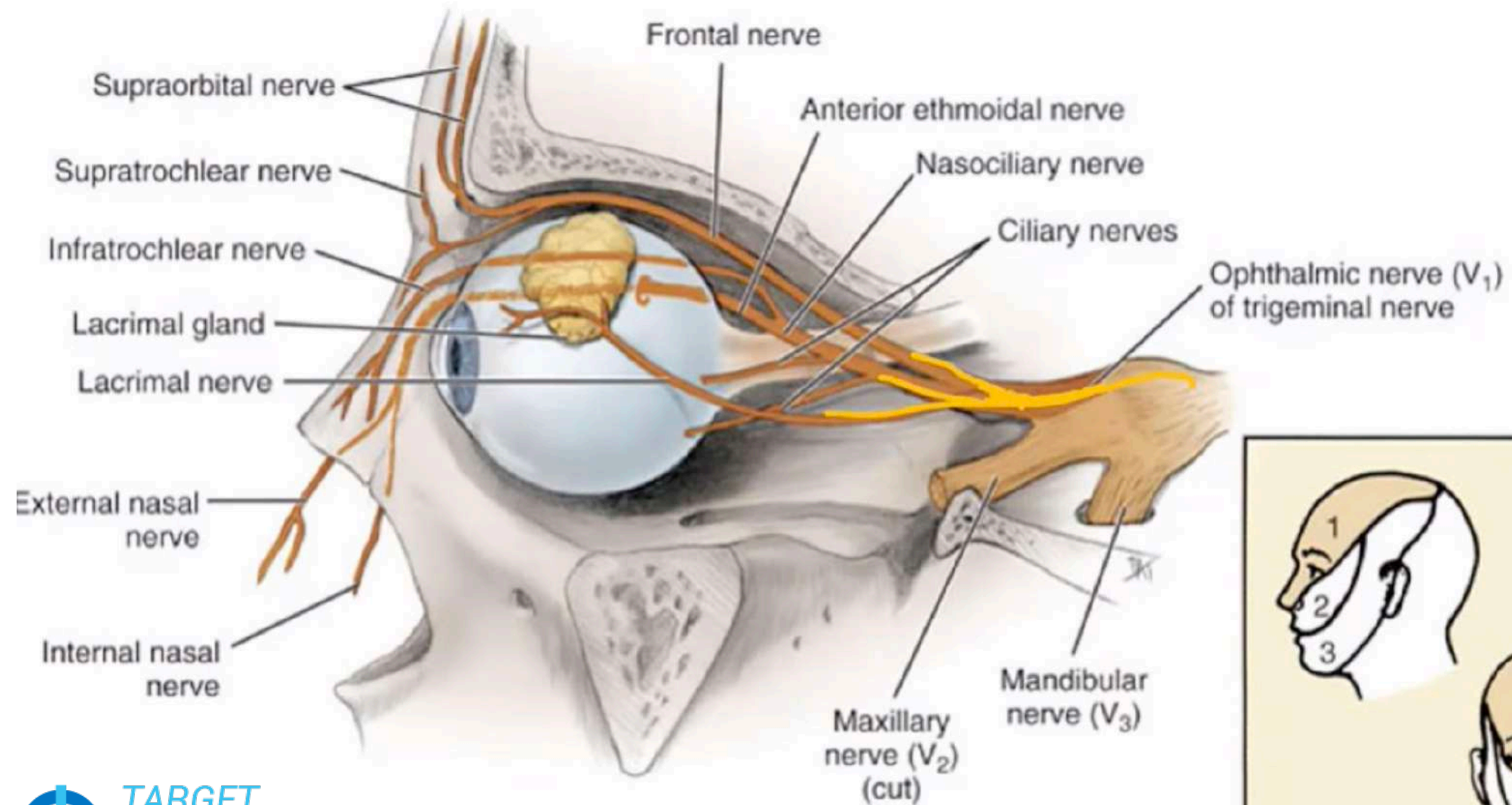
COURSE



- Body - pars
- MCF
- Petrous apex
- MECKEL'S CANAL
- Foramen Lacerum



OPHTHALMIC NERVE



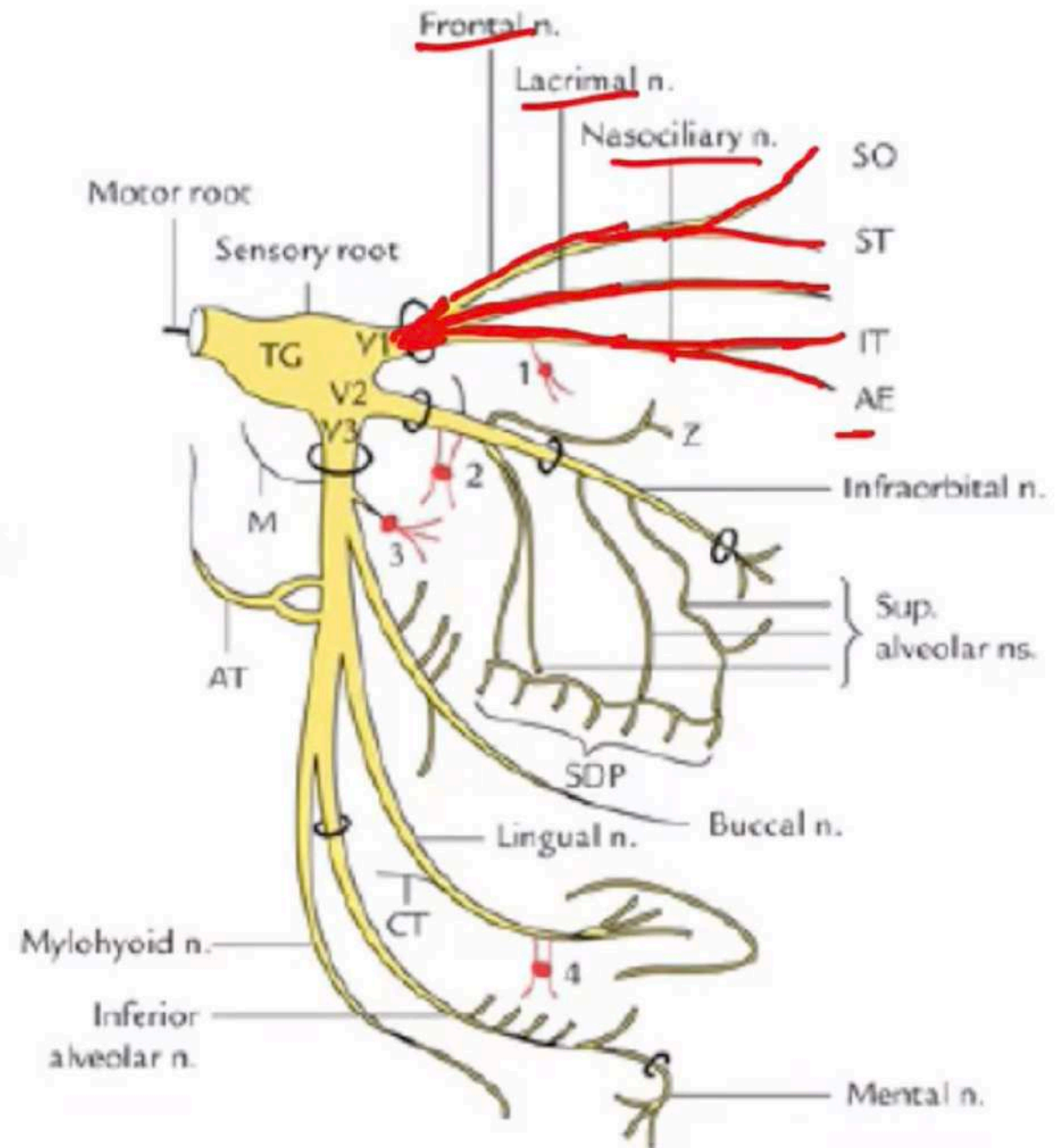
- **Branches**

1. Lacrimal
2. Frontal
3. Nasociliary

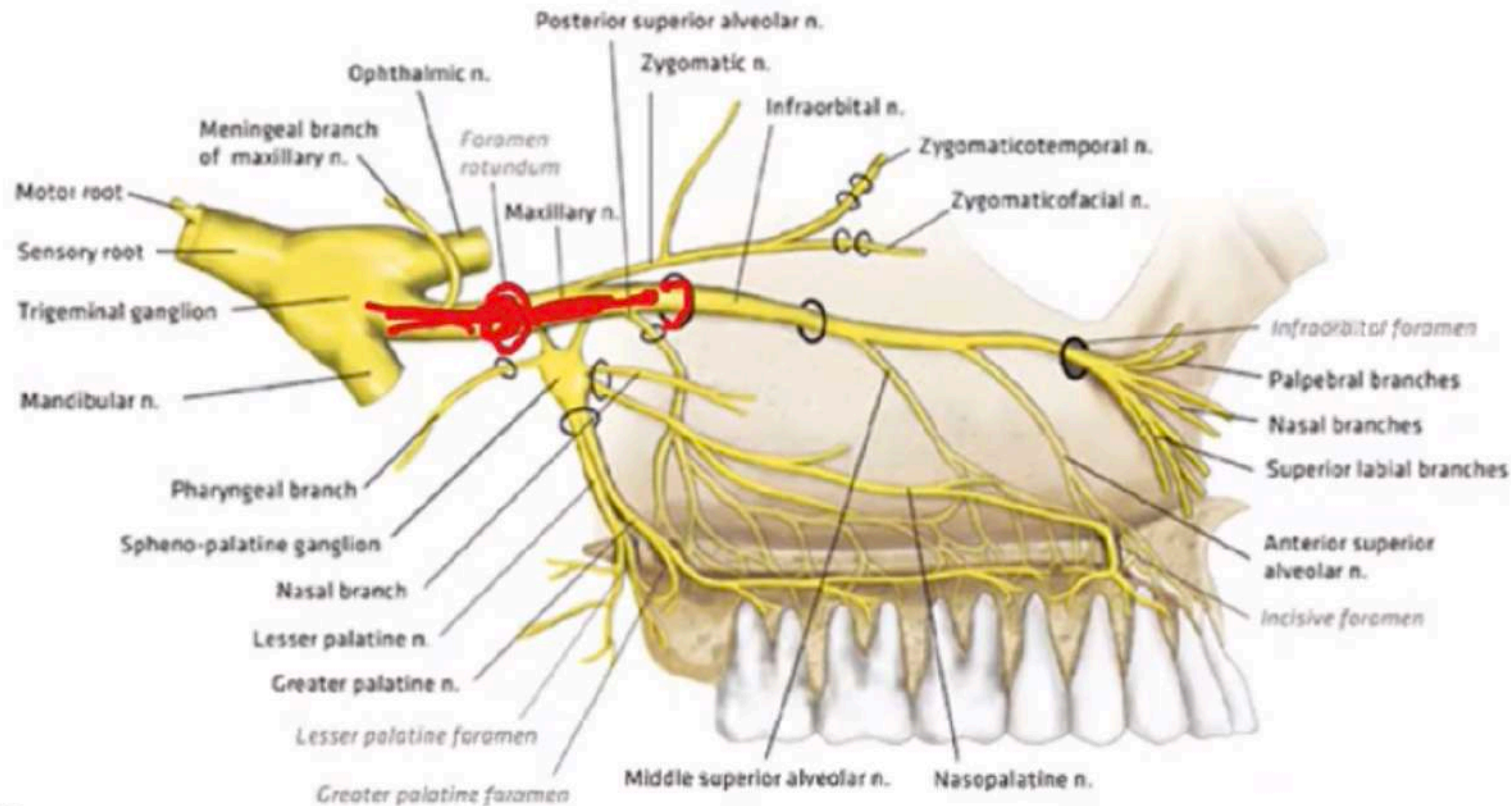
- **Supplies**

1. Eyeball, conjunctiva
2. Upper part of nasal cavity
3. Lacrimal gland
4. Skin of forehead, external nose & eyelids

- Afferent limb of corneal reflex



MAXILLARY NERVE

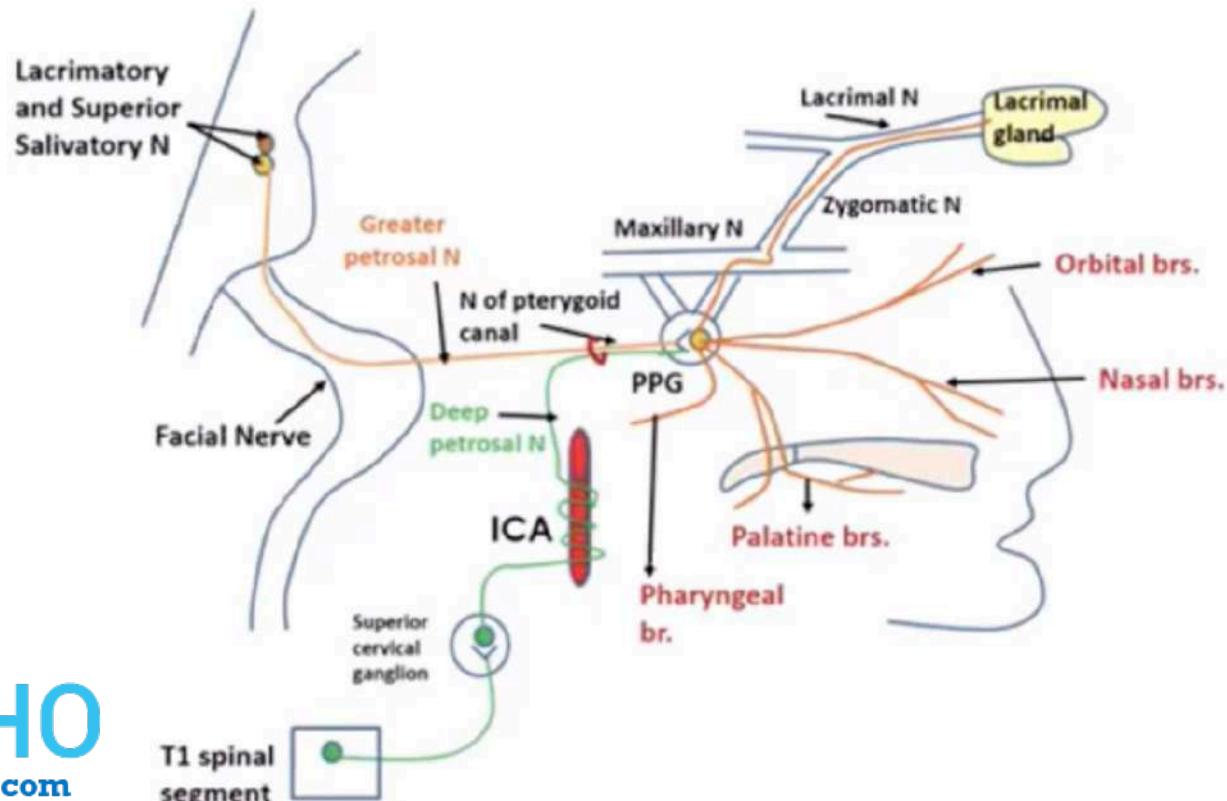


• Branches

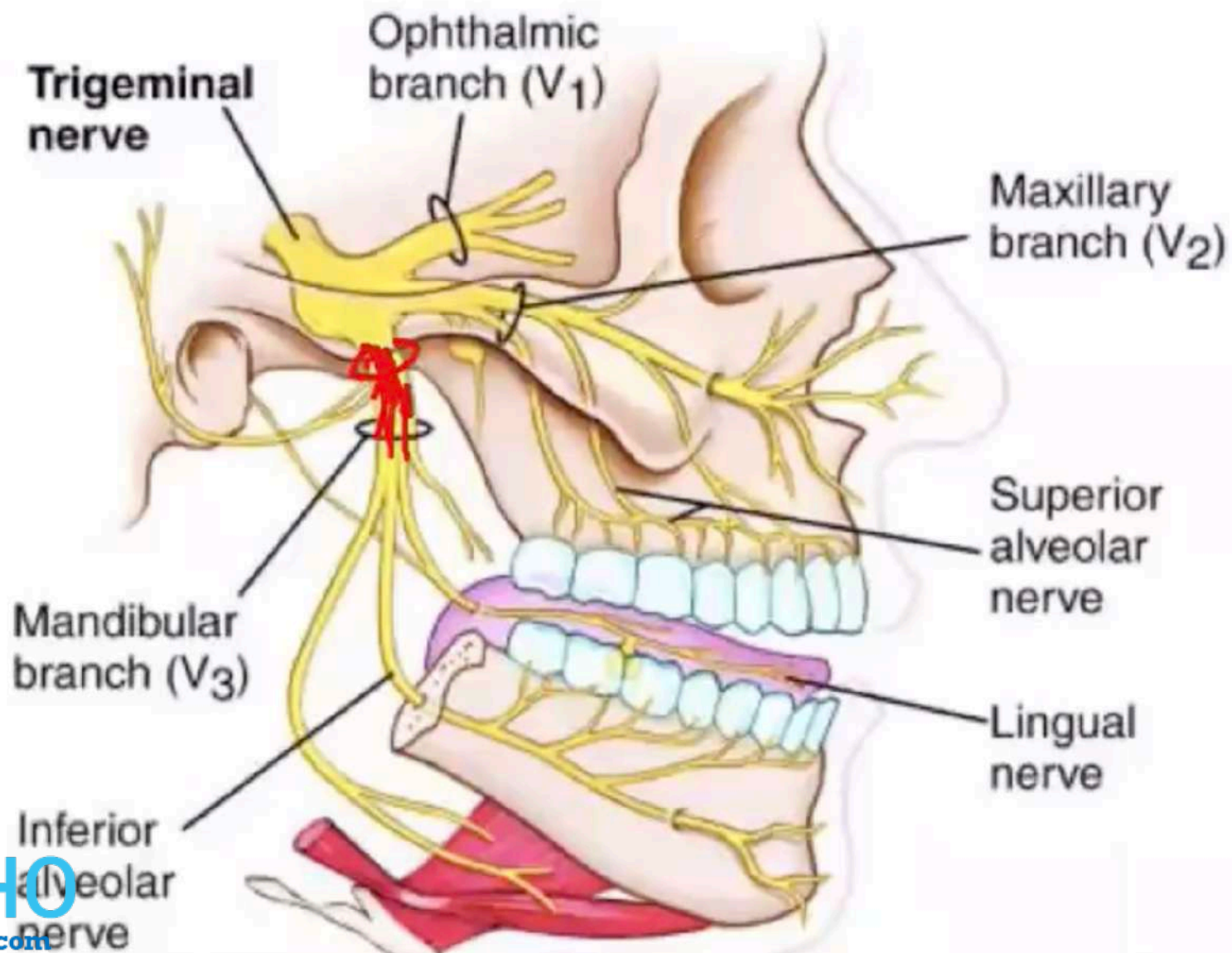
1. Meningeal branch - in the middle fossa
2. Ganglion branches to PP ganglion
3. Zygomatic nerve
4. Posterior superior alveolar nerve in PP fossa
5. Middle superior alveolar nerves in orbit
6. palpebral branches
7. Lateral nasal branches
8. Labial branches

- **Supplies**

1. Nasal cavity
2. Palate, upper teeth and gums
3. Skin of the middle third of the face
4. Sensory to mm of nasopharynx, maxillary sinus
5. secretomotor to the lacrimal gland



MANDIBULAR NERVE

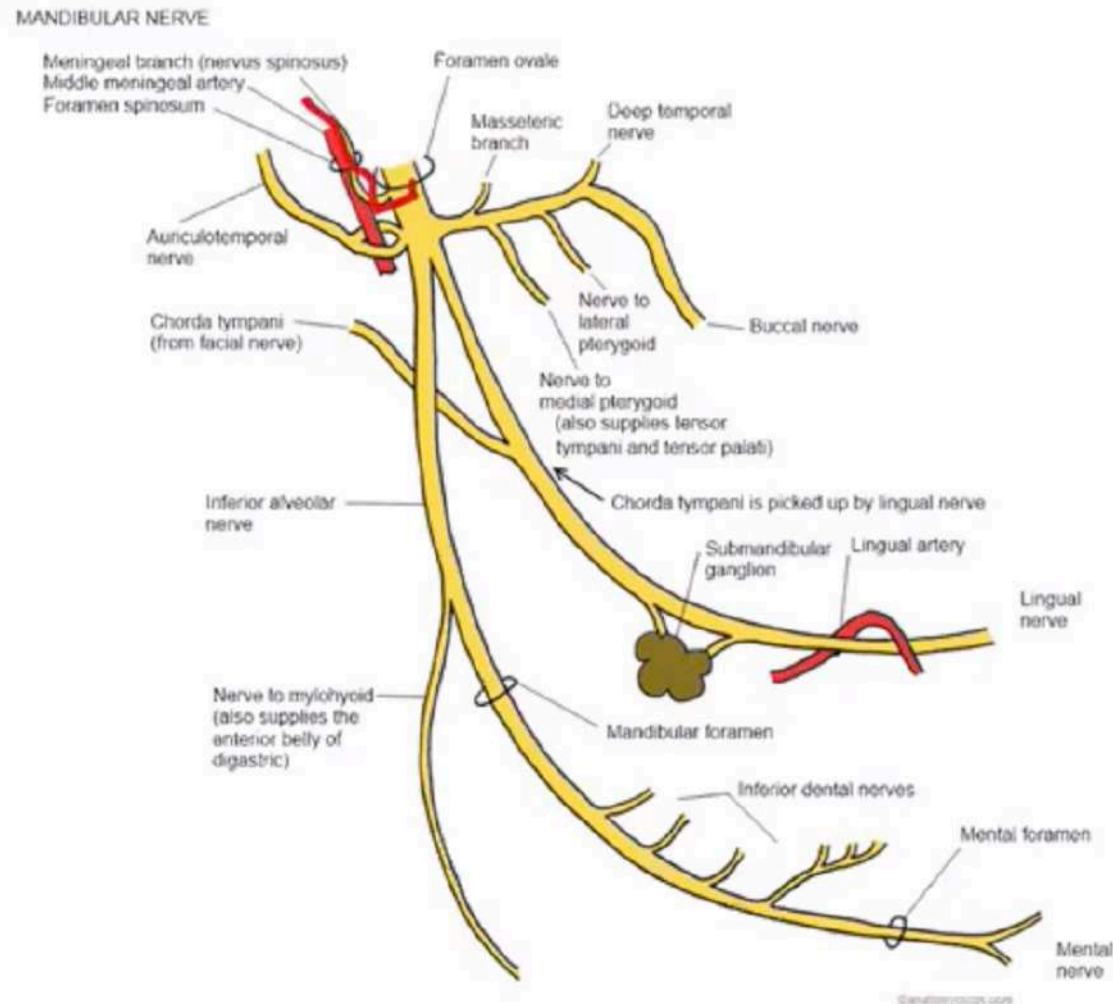


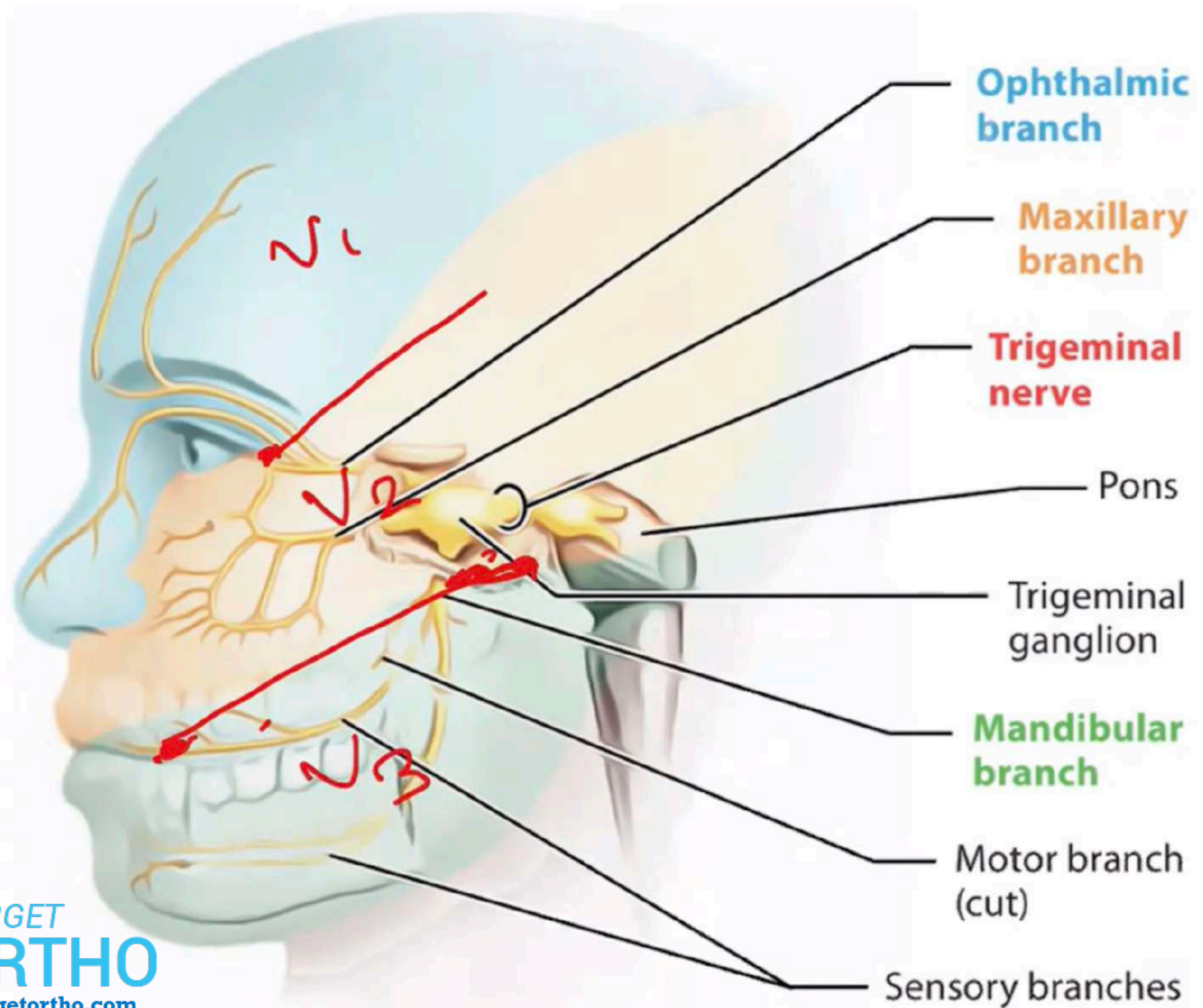
- **Branches**

1. Meningeal branch
2. Nerve to medial and lateral pterygoid, masseter
3. Deep temporal nerves
4. Buccal nerve
5. auriculotemporal nerve
6. Lingual nerve
7. Inferior alveolar nerve

- **Supplies**

2. Muscles of mastication
3. mylohyoid
4. Anterior belly of digastric
5. Tensor veli palatine and tensor tympani
6. Sensory to auricle, temporal region, skin of the lower third of face over the angle of mandible





PARASYMPATHETIC ASSOCIATIONS

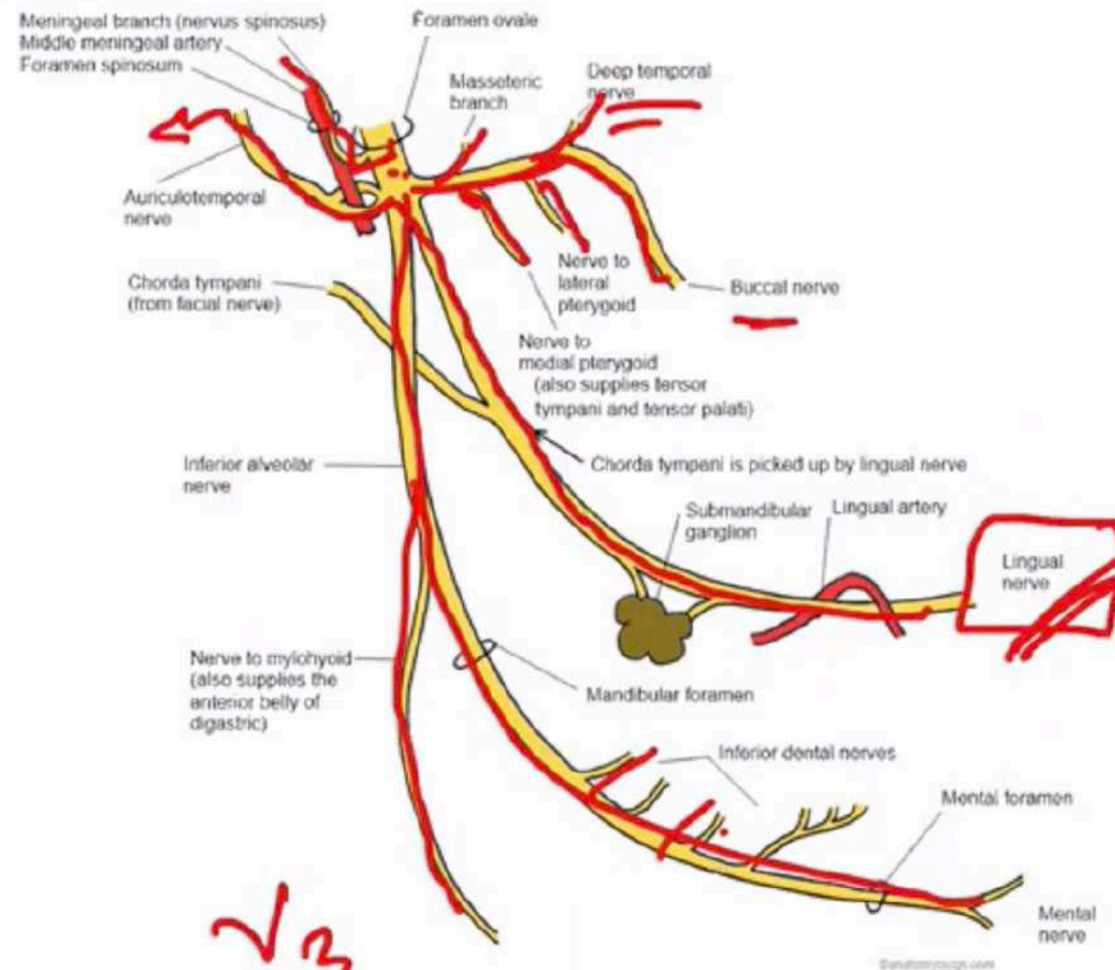
- The ciliary ganglion → pupil & ciliary
 - The EW nucleus → ophthalmic division → ciliary and sphincter papillae muscles via the short ciliary nerve
 - asso. CN III
- The otic ganglion → parotid gland
 - Inferior salivary nucleus → CN IX → mandibular division → parotid gland via the auriculotemporal nerve ✓₃
- The submandibular ganglion
 - Superior salivary nucleus → nervus intermedius of CN VII → chord tympani → lingual nerve → submandibular and sublingual glands

PP

• Branches

1. Meningeal branch
2. Nerve to medial and lateral pterygoid, masseter
3. Deep temporal nerves
4. Buccal nerve
5. auriculotemporal nerve
6. Lingual nerve
7. Inferior alveolar nerve

MANDIBULAR NERVE



• Supplies

2. Muscles of mastication
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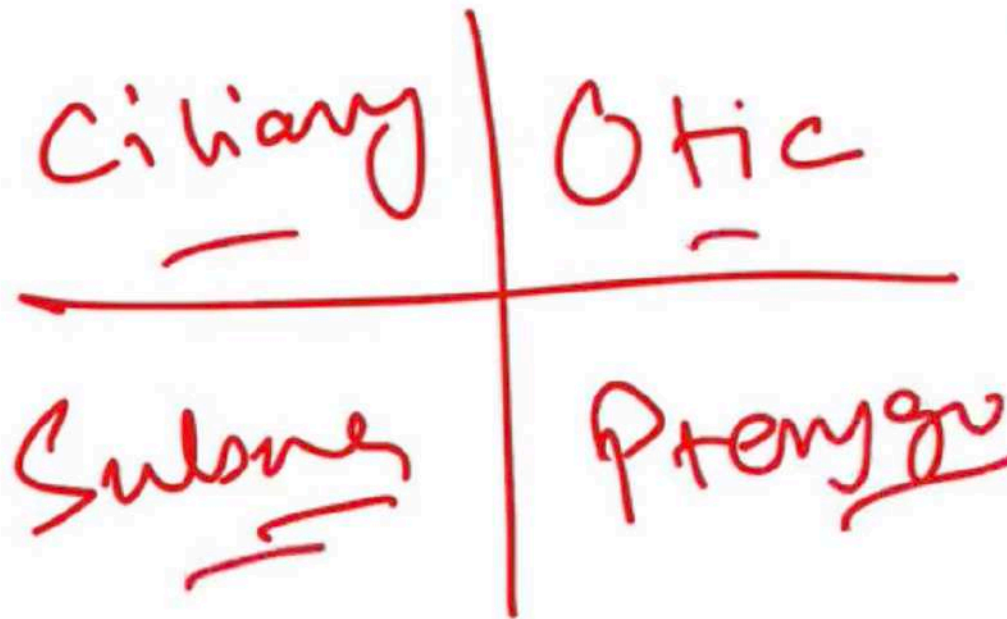
V3 =

- The pterygopalatine ganglion

7th

- Greater pretrosal nerve (CN VII branch) → lacrimal gland, palatal and nasal mucous glands

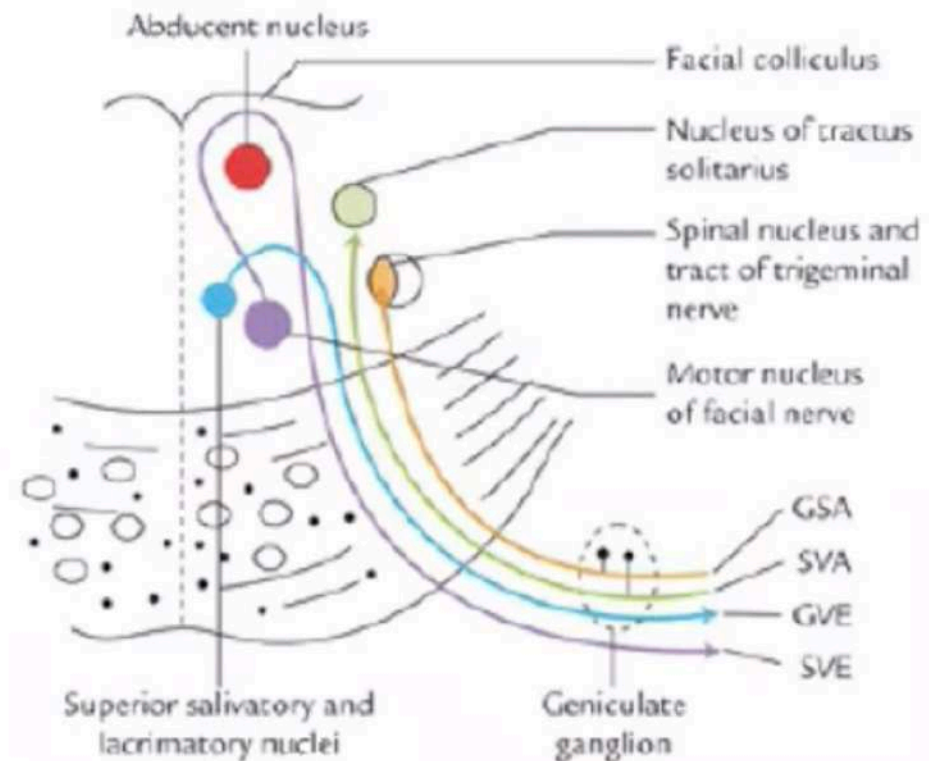
lacrimal



FACIAL NERVE

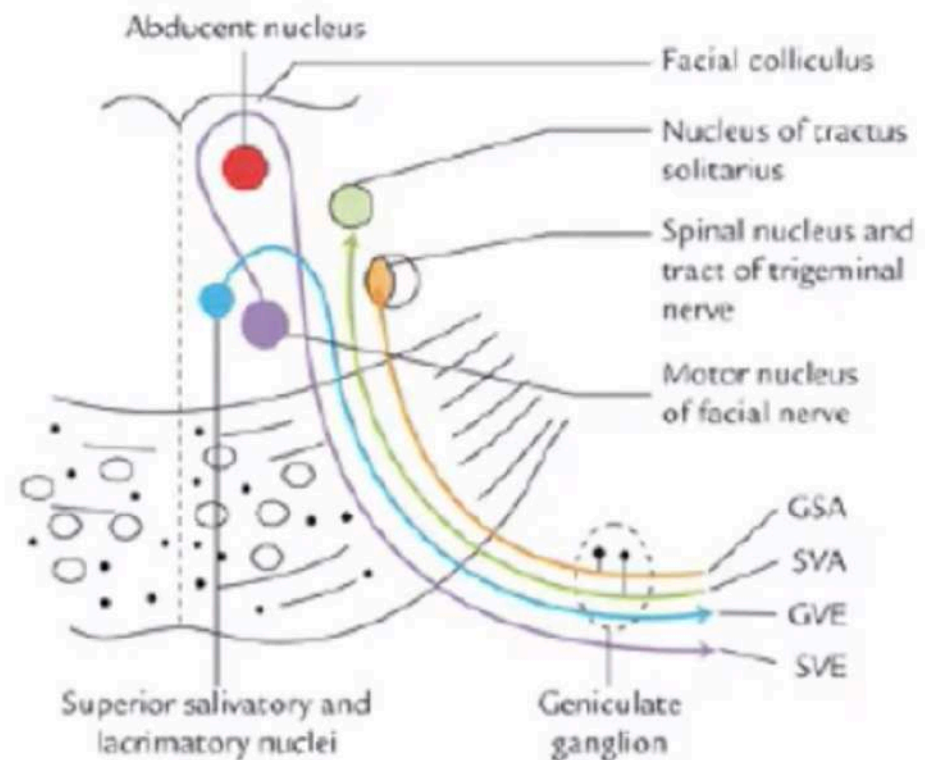
NUCLEI

- Motor nucleus
- Lacratory and superior salivary nuclei
- Nucleus of tractus solitarius
- Spinal nucleus of trigeminal nerve



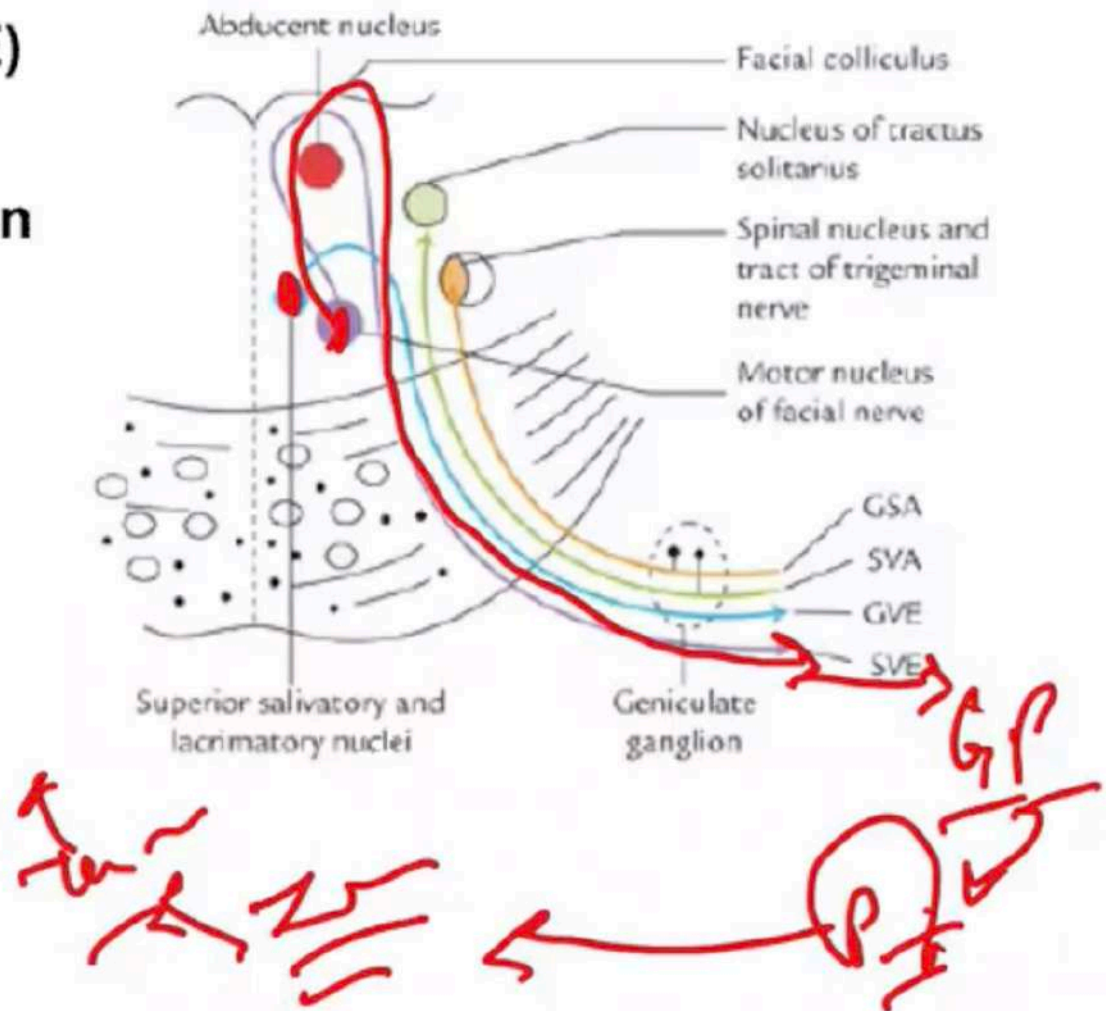
MOTOR NUCLEUS OF FACIAL NERVE

- Lower part of pons
- Internal menu of facial nerve
- Facial colliculus
- SVE
- Muscles of facial expression



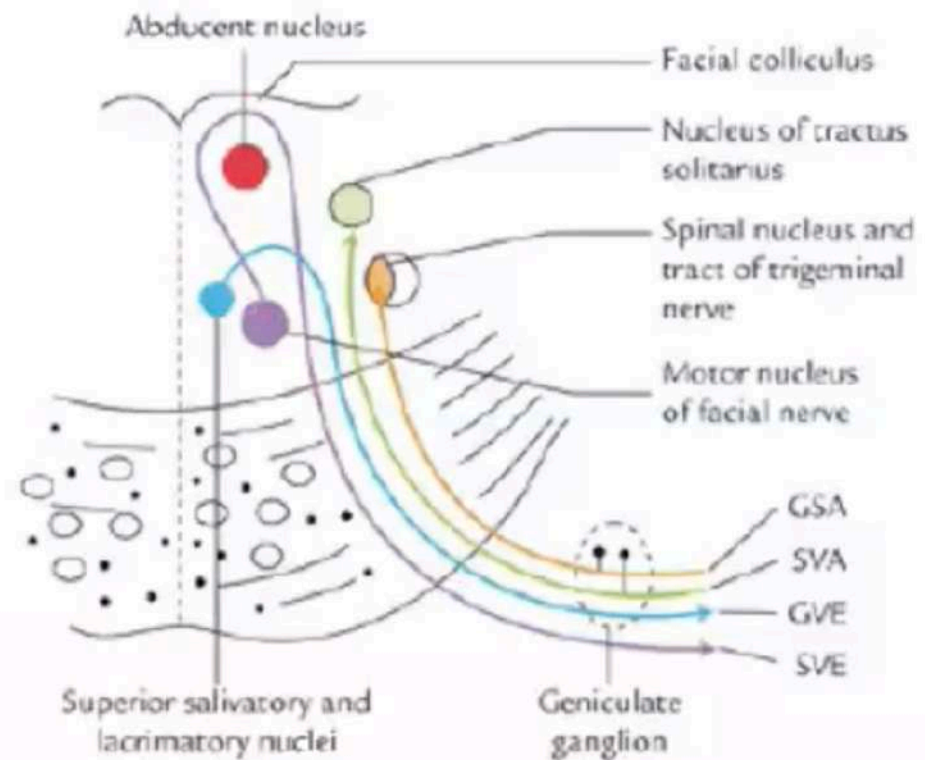
SUPERIOR SALIVARY AND LACRIMATORY NUCLEI

- General visceral efferent (GVE)
 - Lacrimary nucleus
 - Relay in the PP ganglion
 - Supply the lacrimal gland through zygomatic branch of trigeminal nerve
 - Superior salivary nucleus
 - Relay in the SM ganglion
 - Supply the SM and SL salivary glands



SPINAL NUCLEUS OF TRIGEMINAL NERVE

- General somatic afferent (GSA)
 - Skin of external ear
 - Relay in the geniculate ganglion
 - Spinal nucleus of trigeminal nerve



NUCLEUS OF SOLITARY TRACT

Gustatory nucleus

taste

Lies in the medulla

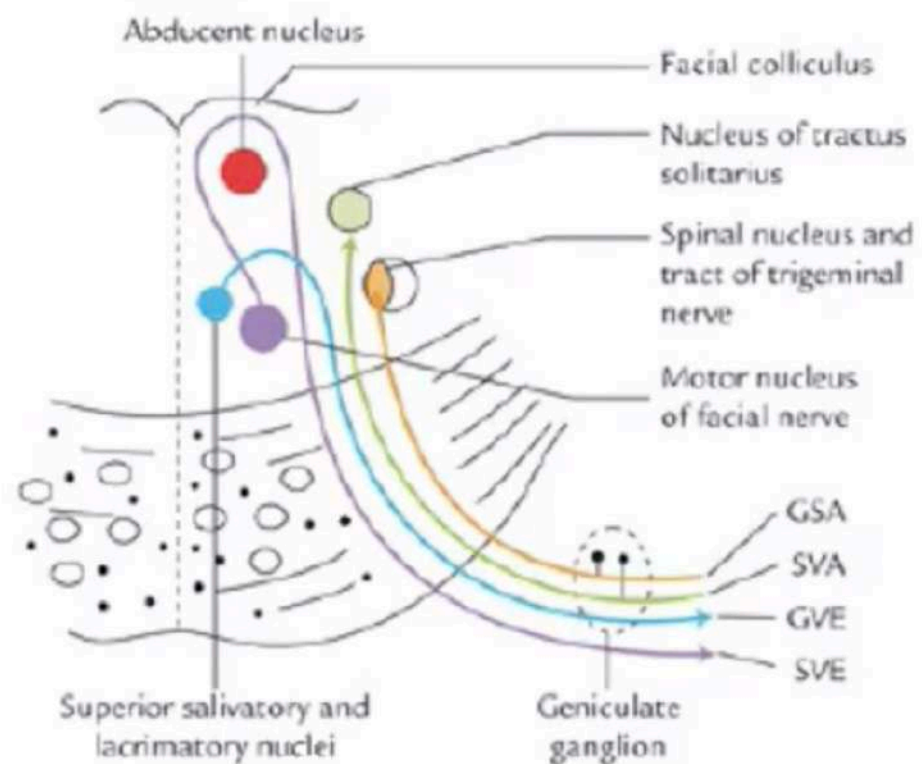
Dorsal part of central grey matter

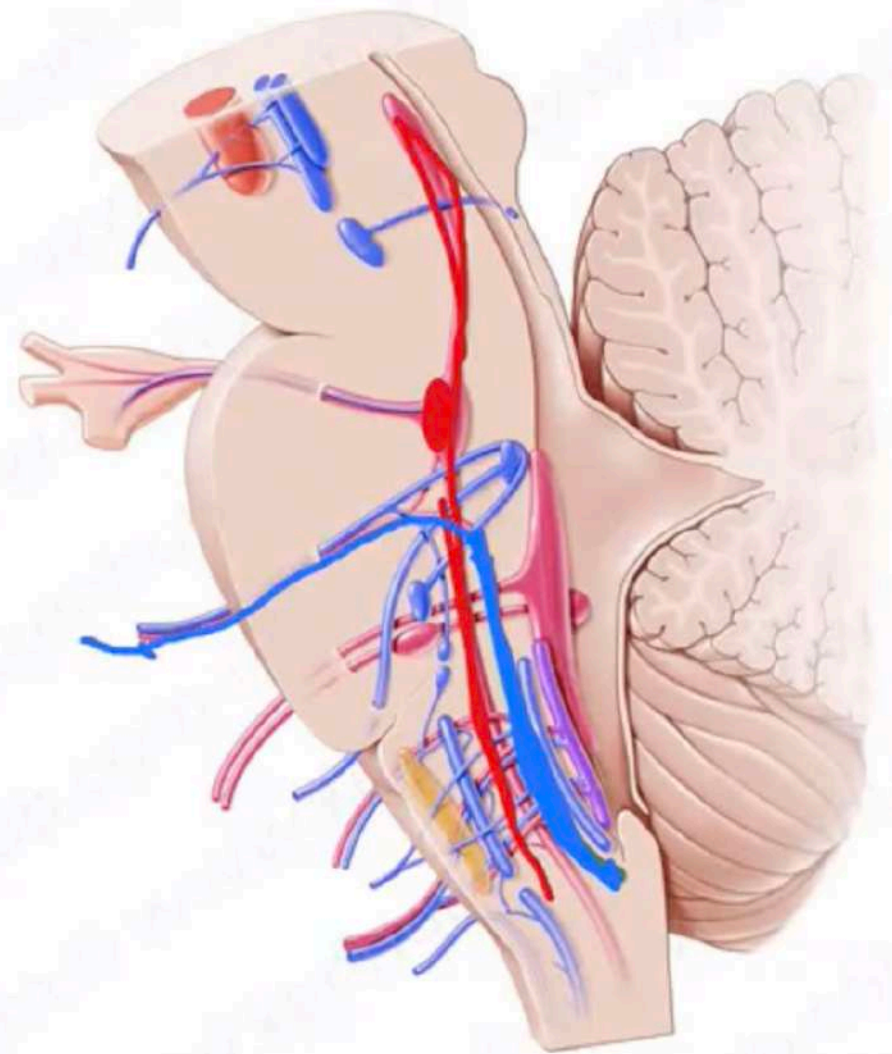
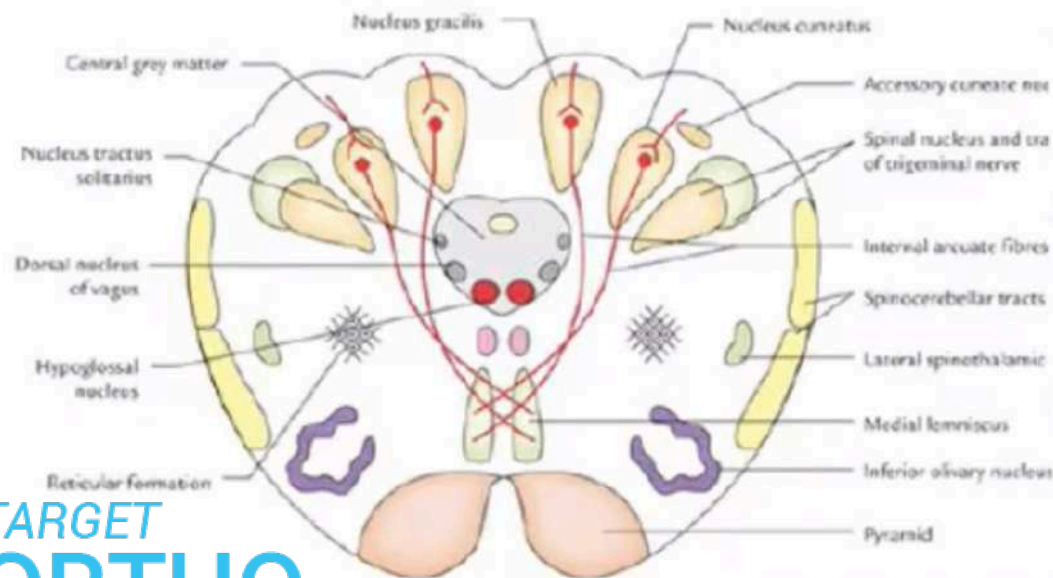
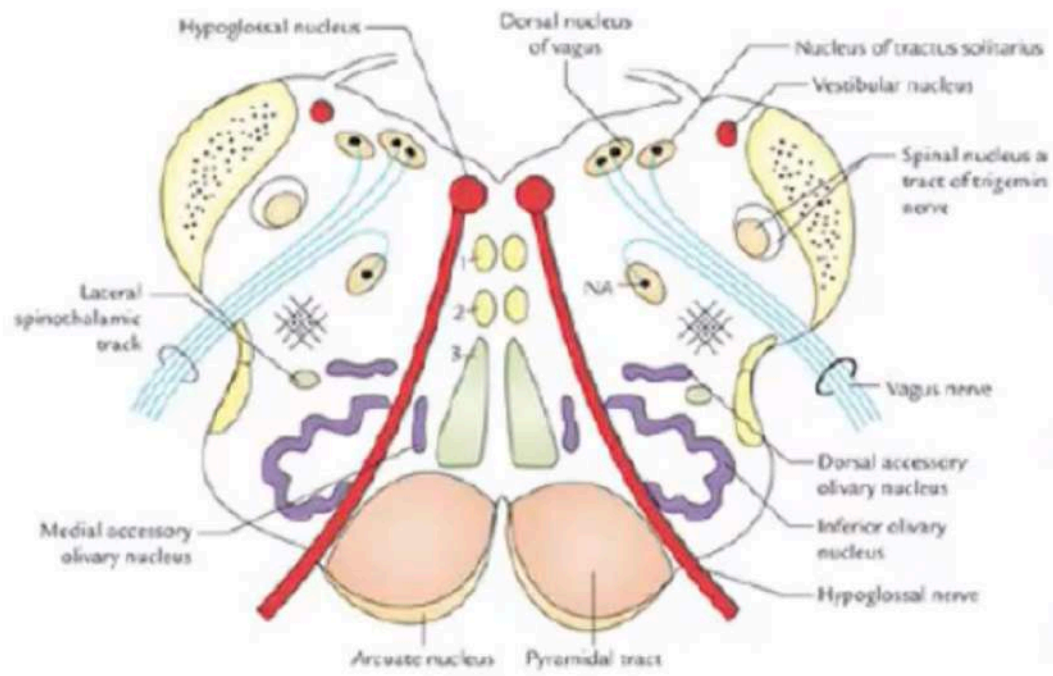
Lower ends fuse to form
commusural fibres of the vagus
nerve

Taste sensations

Anterior 2/3 of the tongue
except valuate papillae

Relay in the geniculate
ganglion





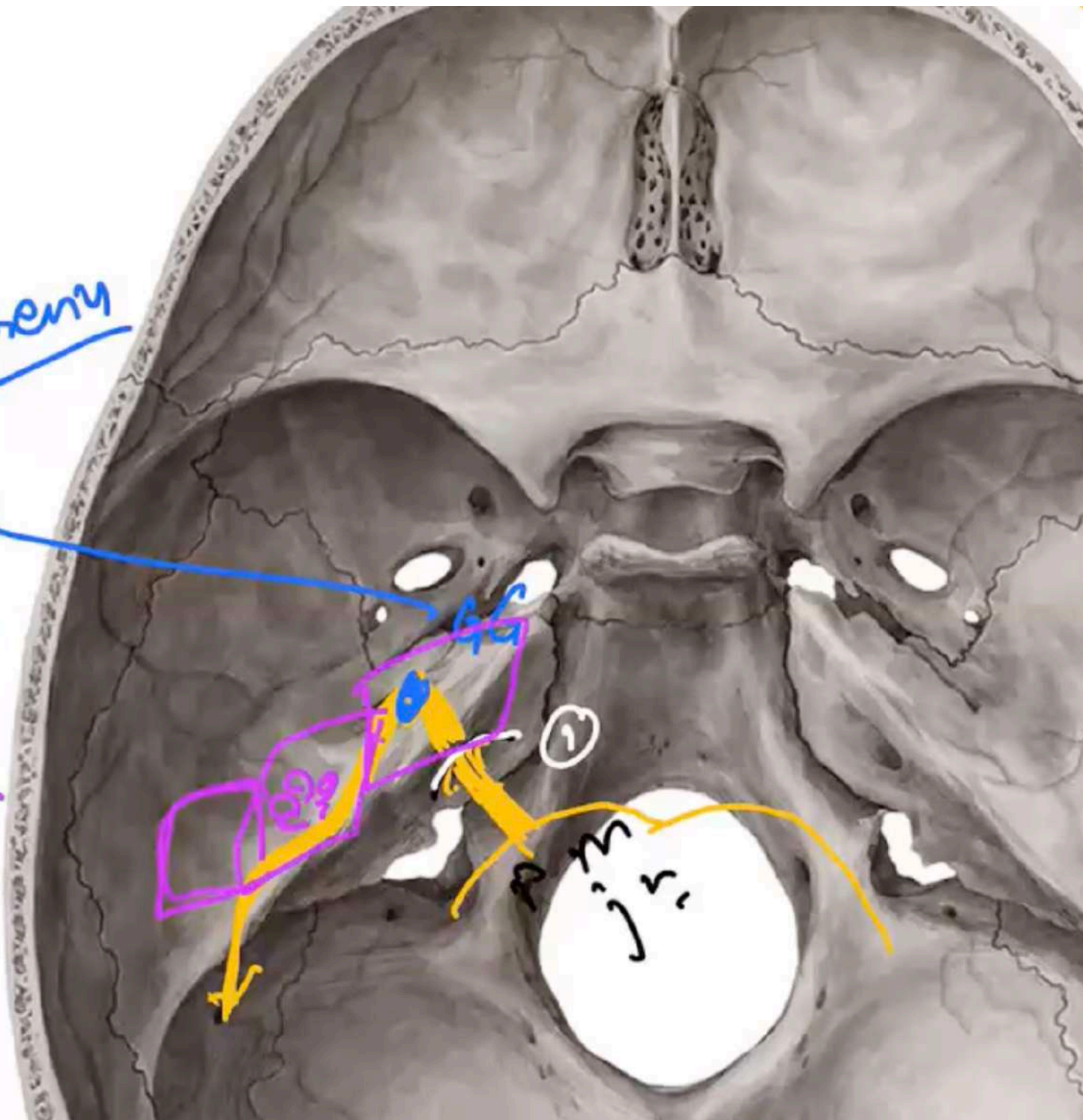
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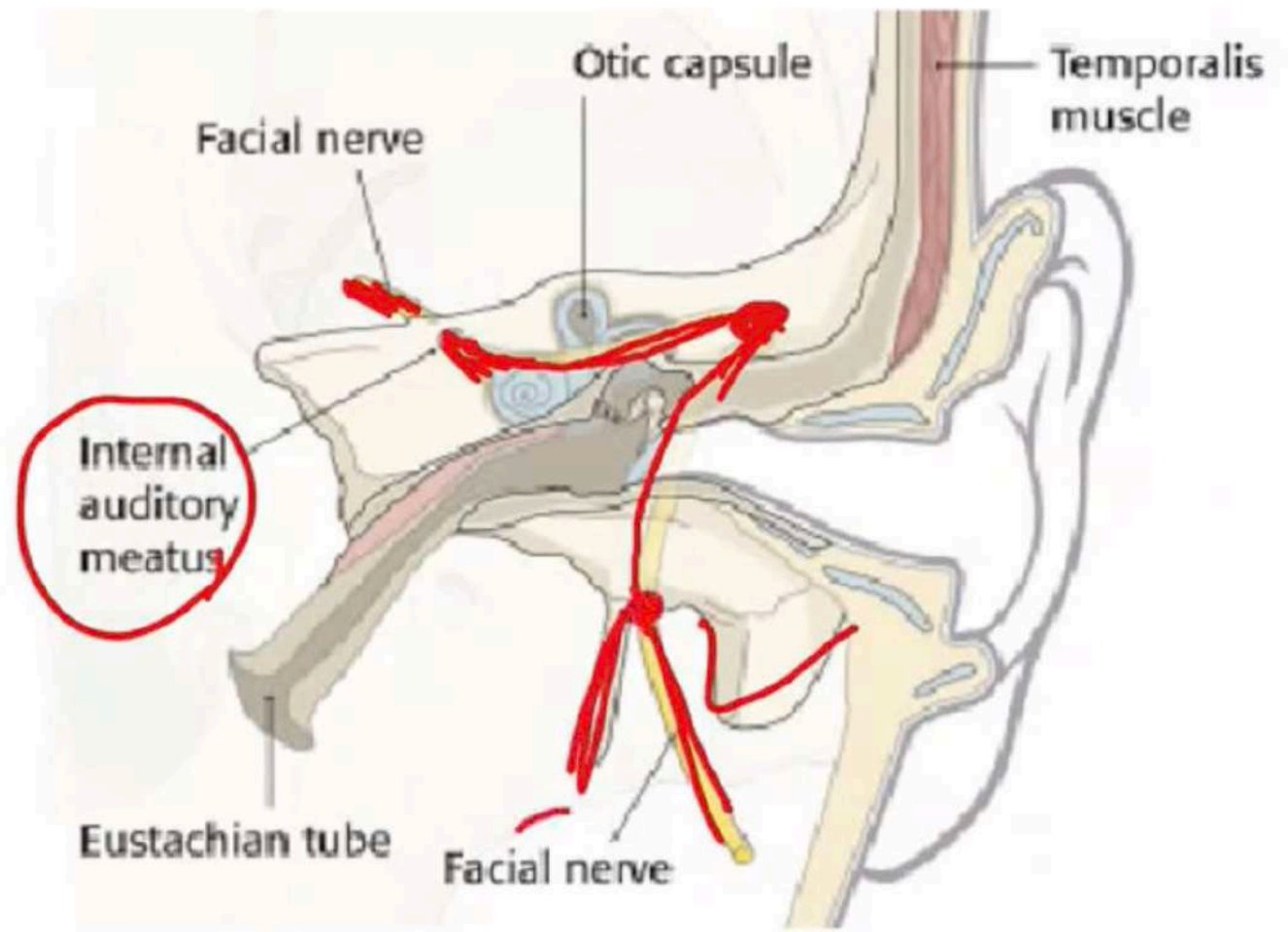
COURSE

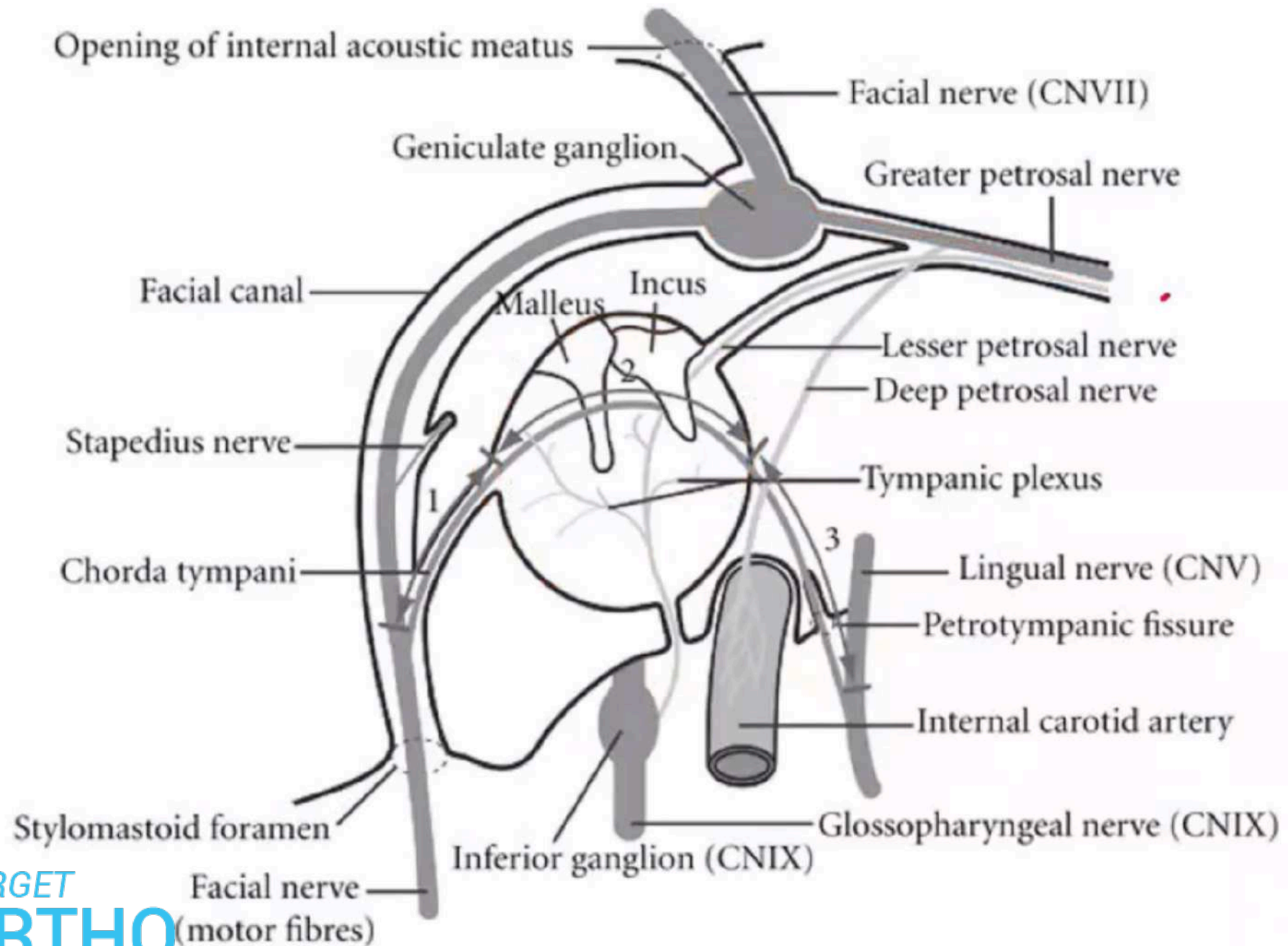


Extr. Geny

① IAM
P.T. Bone
gastromash
F.







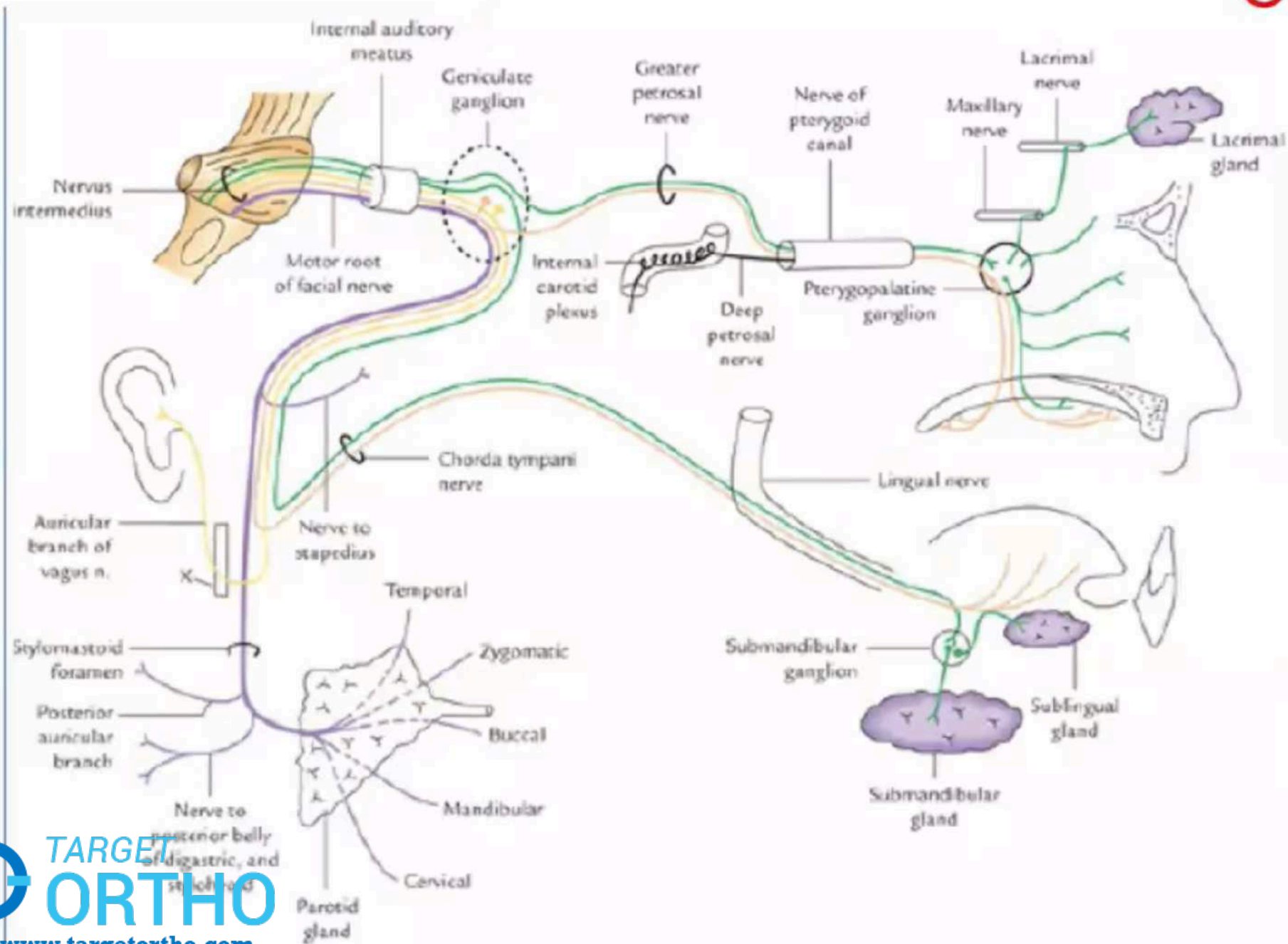
BRANCHES

① Motor

② Lac Sup Sat

③ Tr. Sol

④ Sp. Trig



IX

- **Greater petrosal nerve**

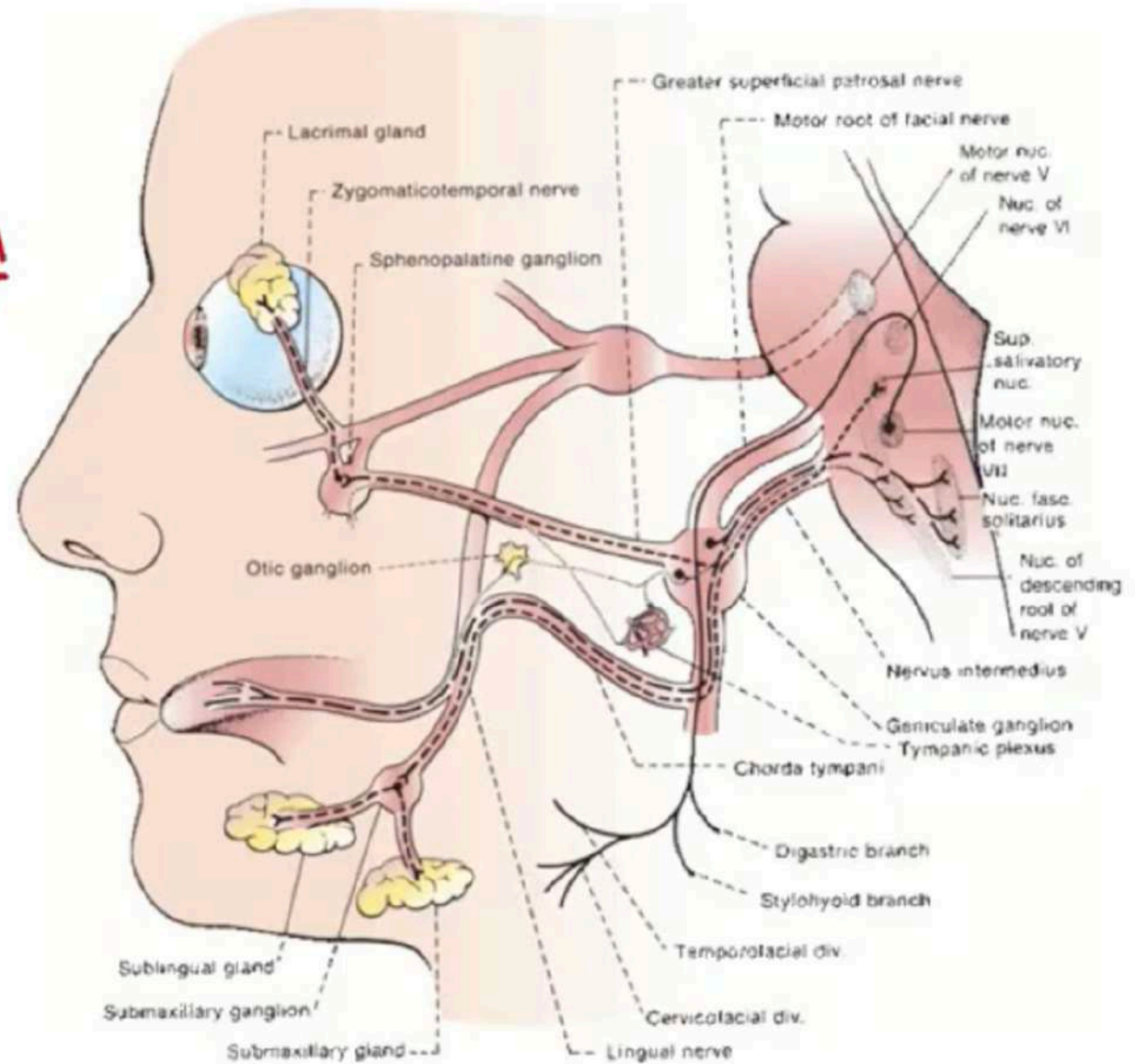
- **Deep petrosal nerve**

Sym

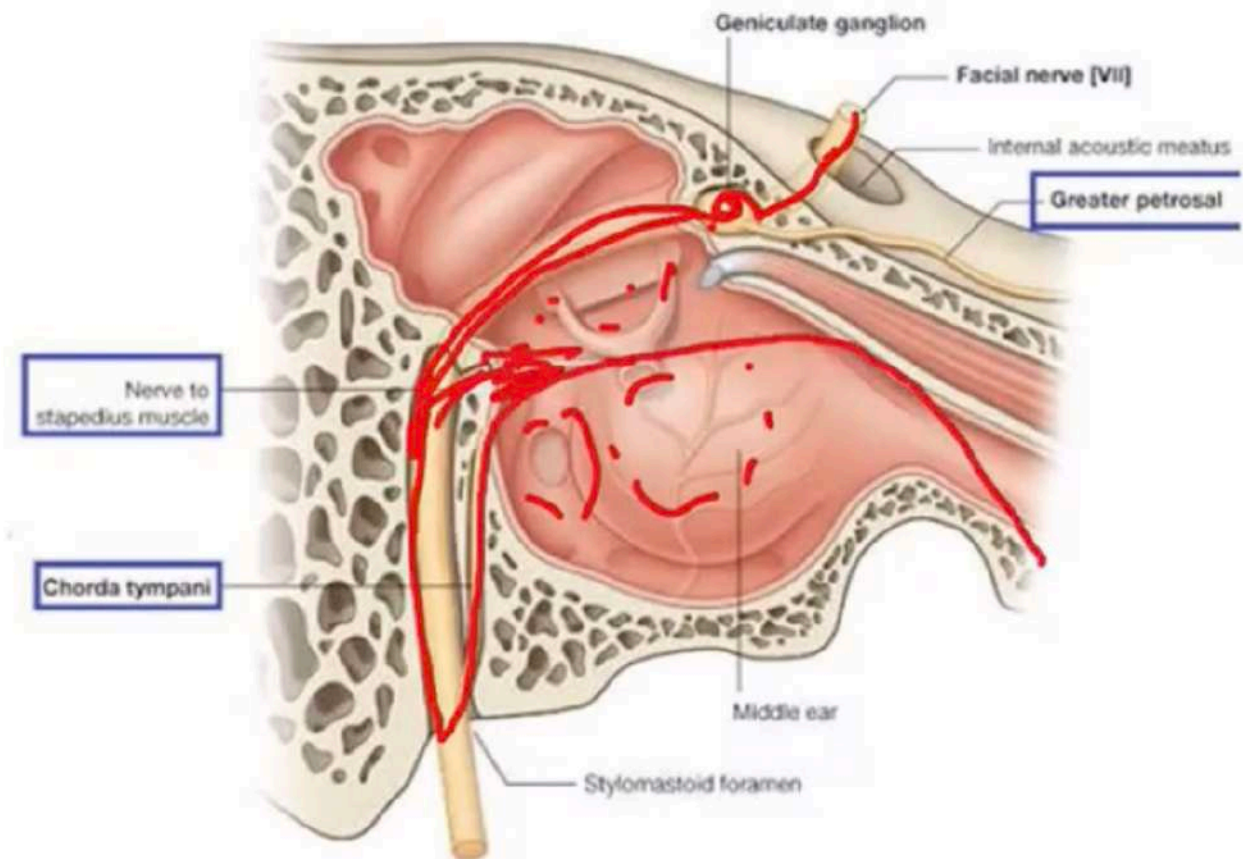
- **Nerve of pterygoid canal**

- **Secretomotor to lacrimal, nasal and palatal glands**

DP IV

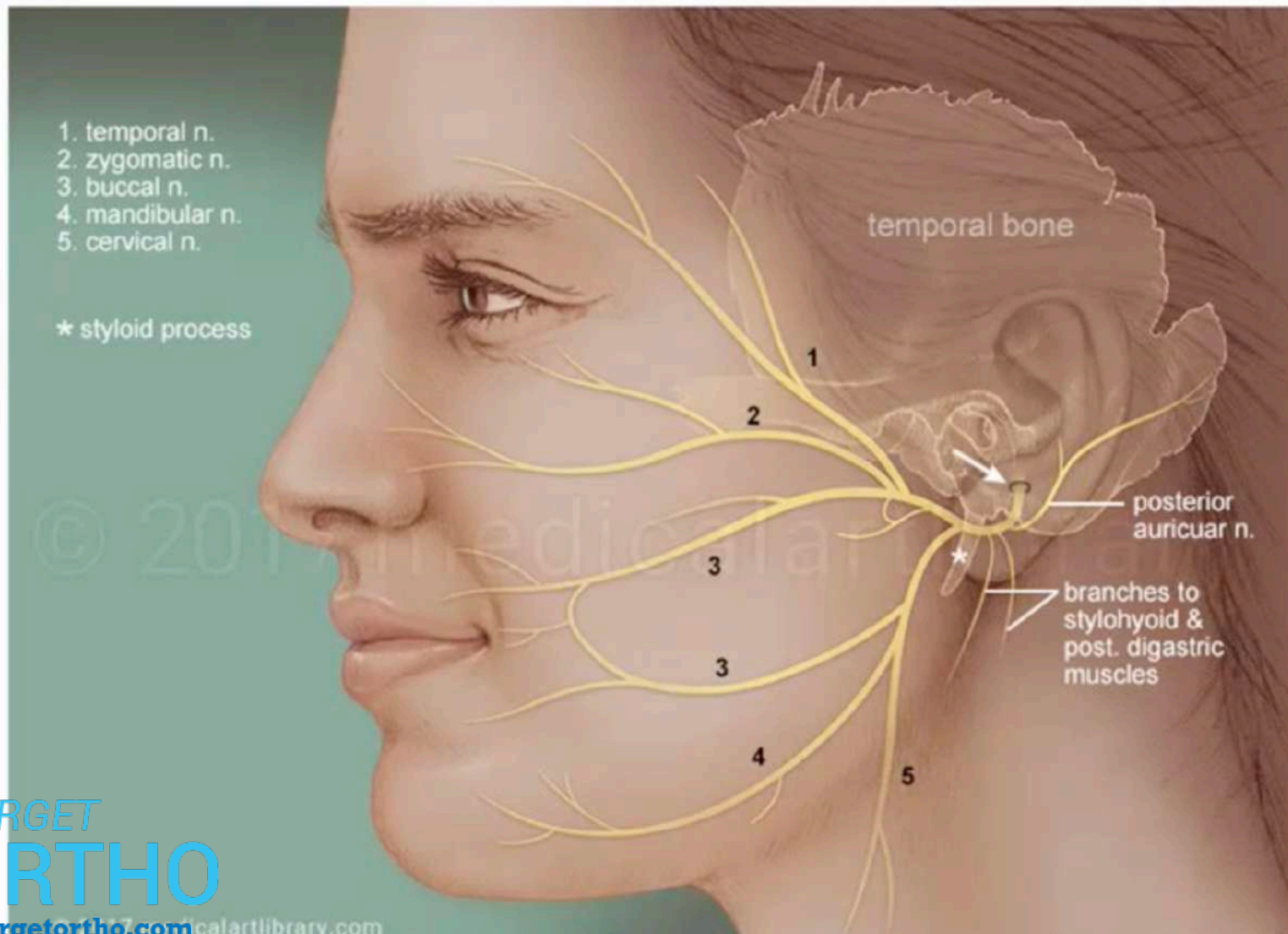


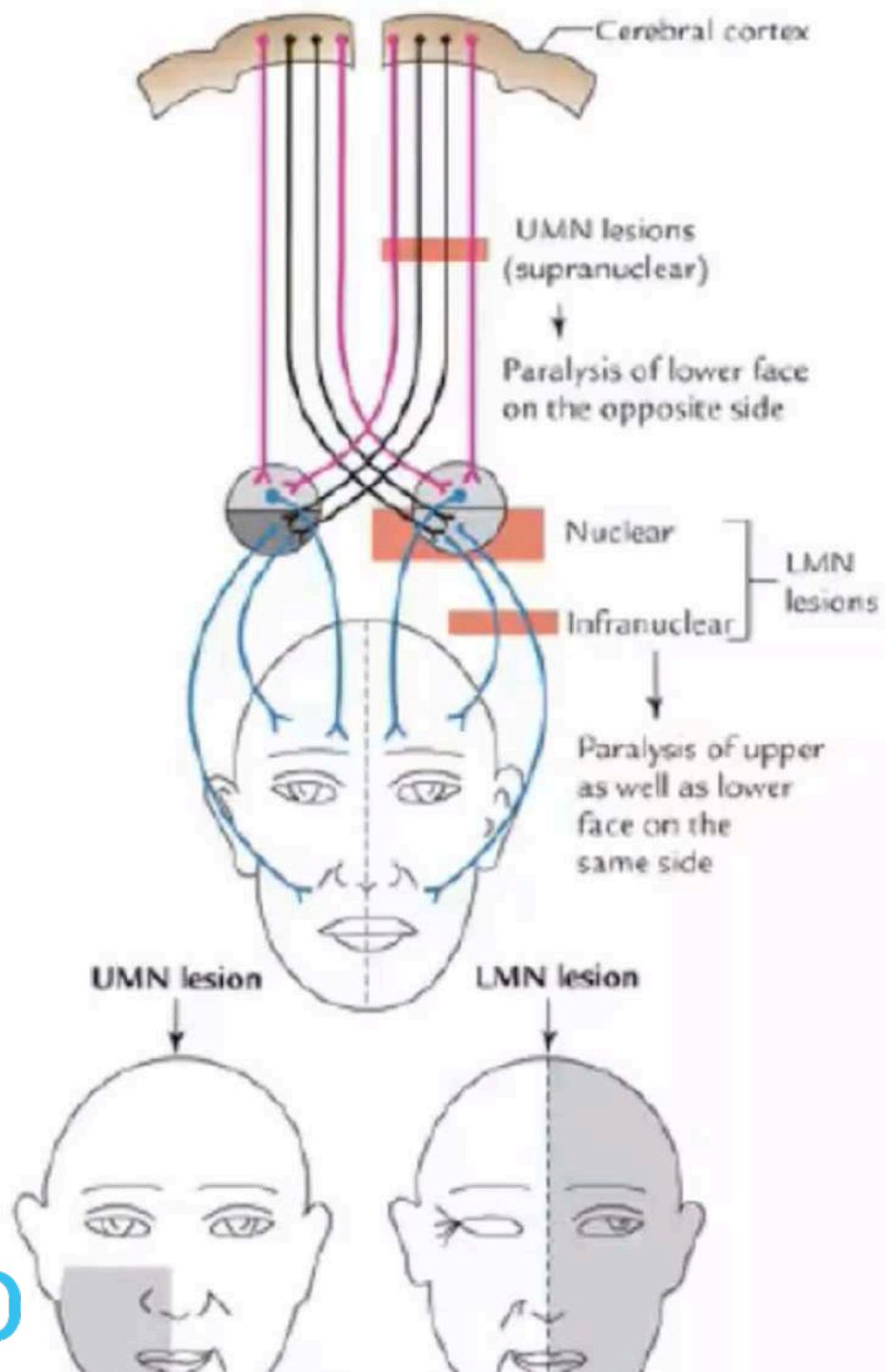
- Nerve to stapedius
- Chord tympani
 - Joins lingual nerve
 - Taste fibres from ant 2/3



- Terminal branches

pes ancherus





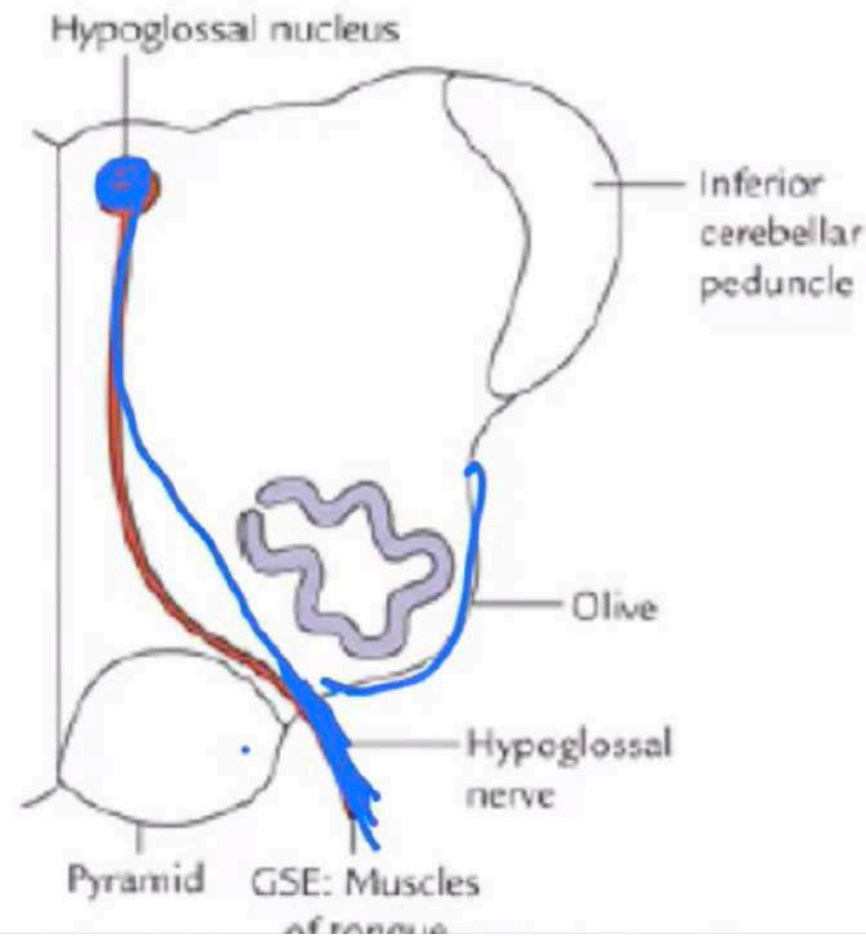
HYPOGLOSSAL NERVE

HYPOGLOSSAL NUCLEUS

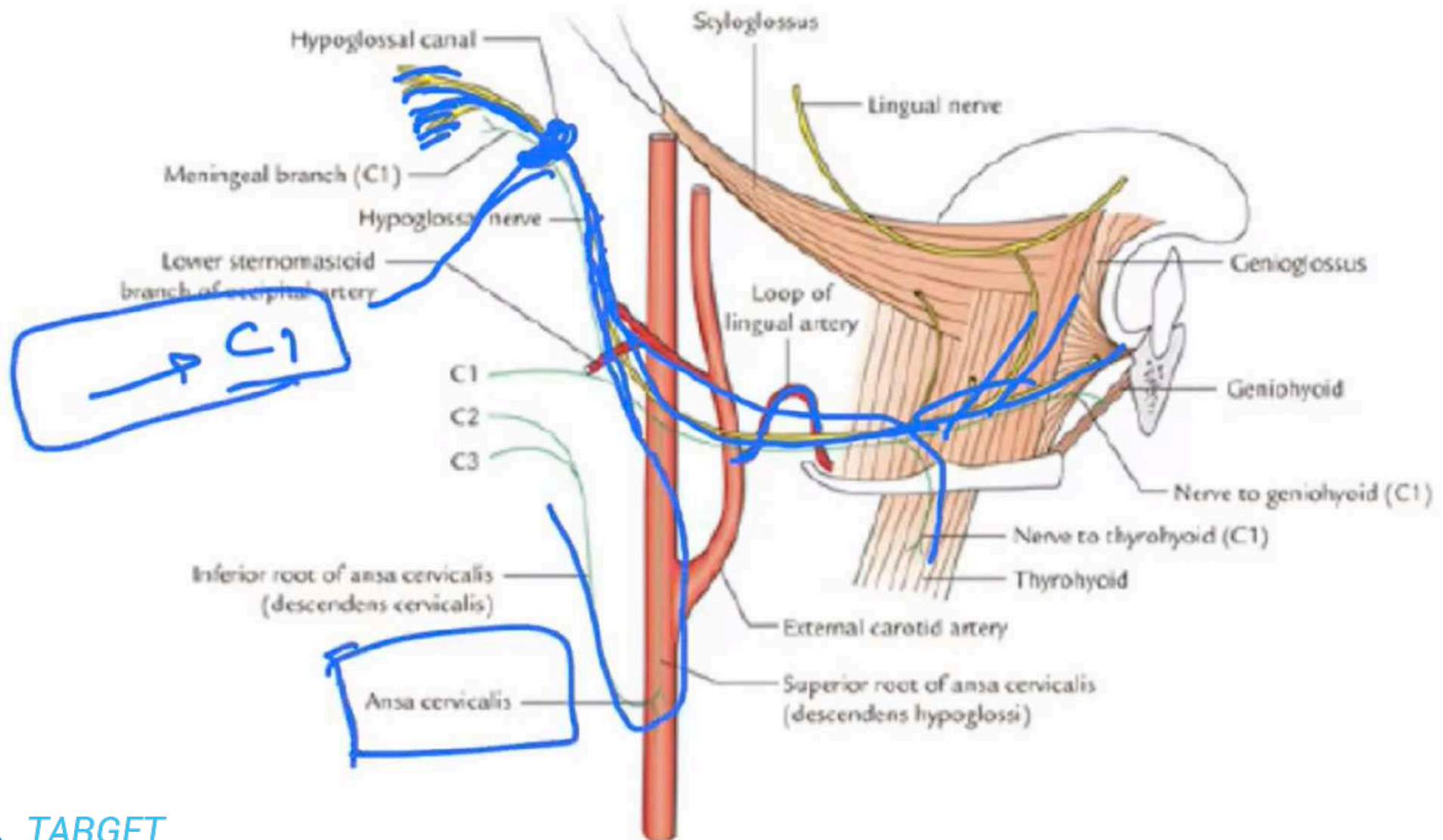
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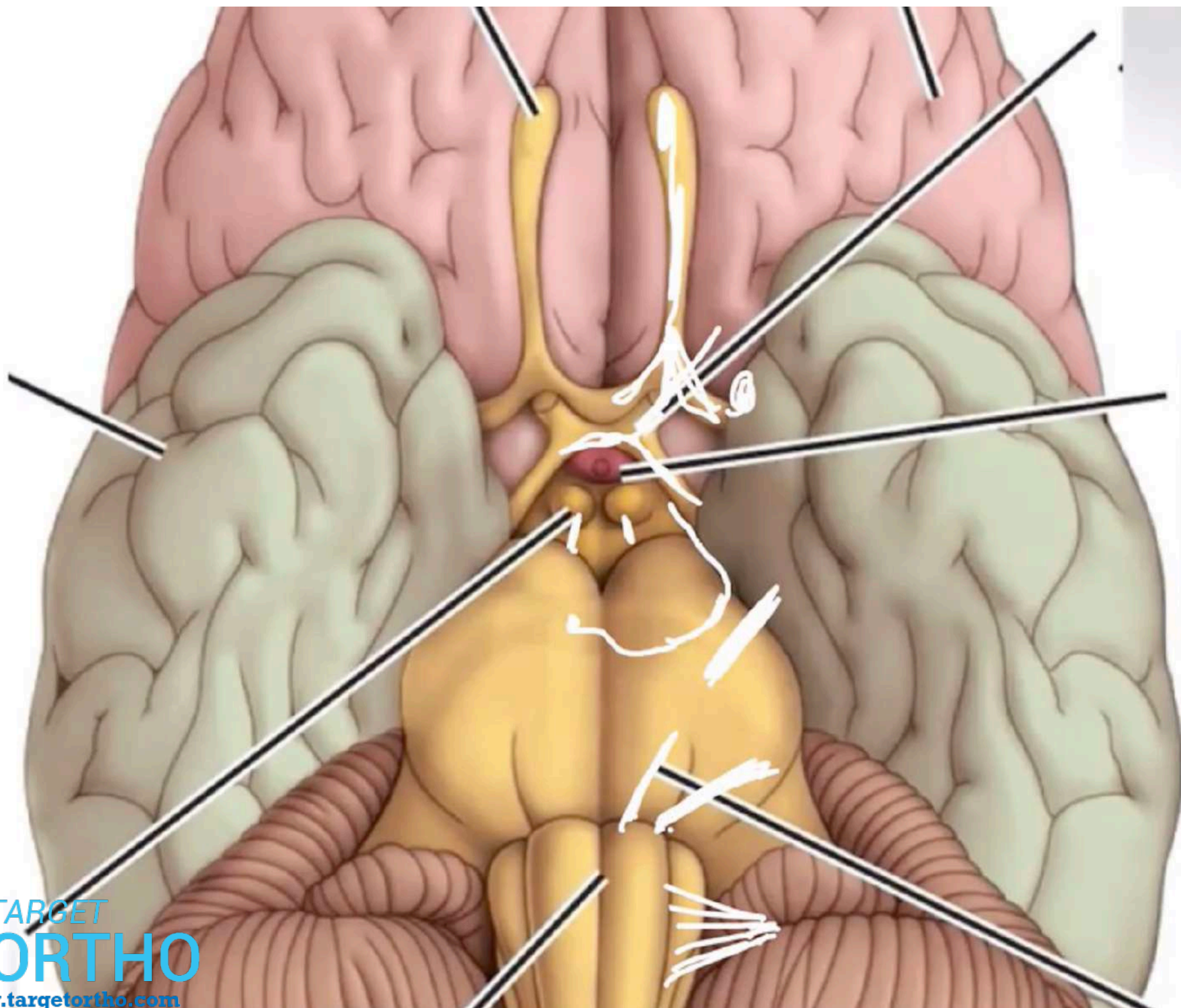
- General somatic efferent
- Intrinsic and extrinsic muscles of the tongue except palatoglossus (supplied by cranial accessory nerve)

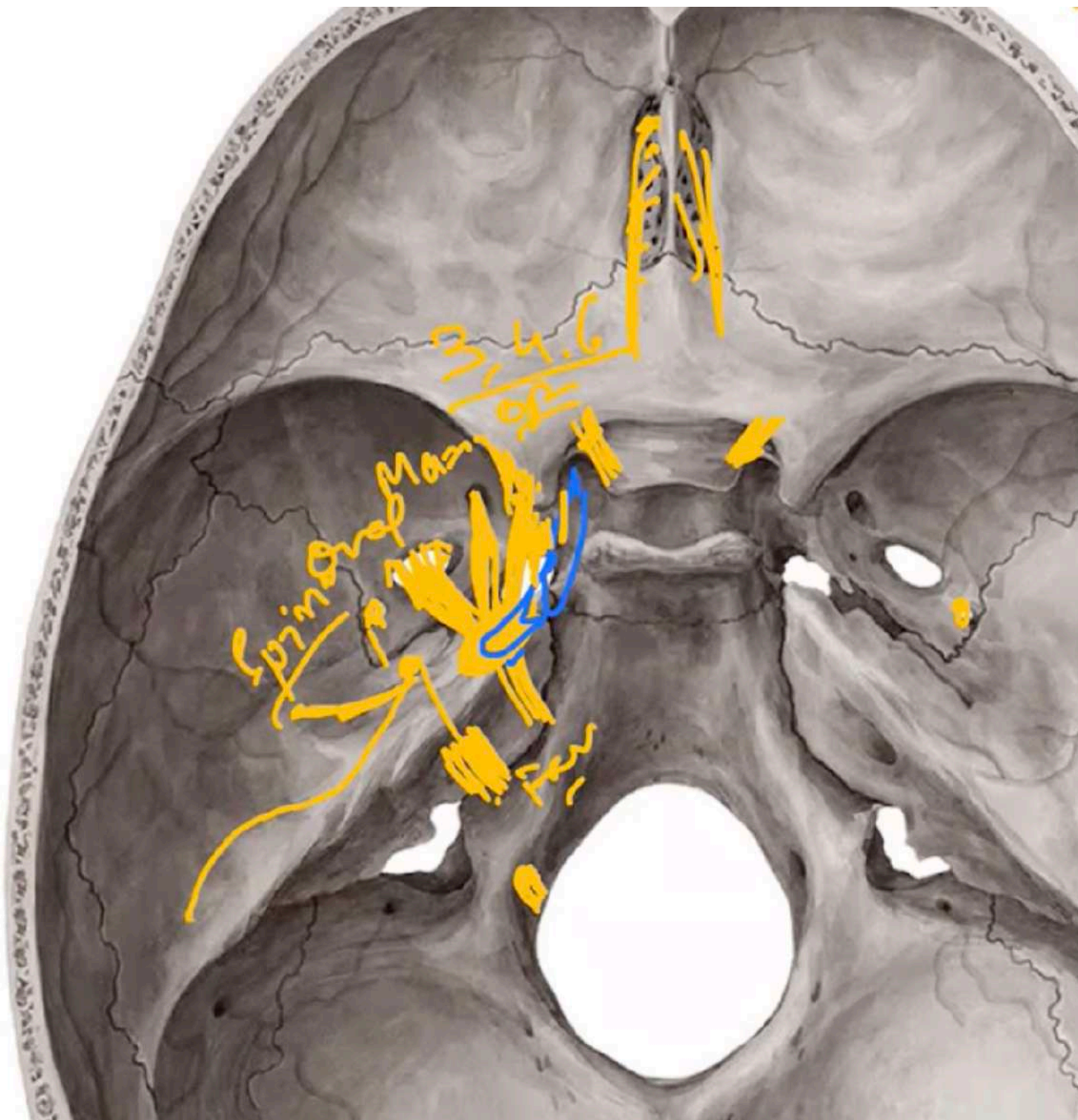
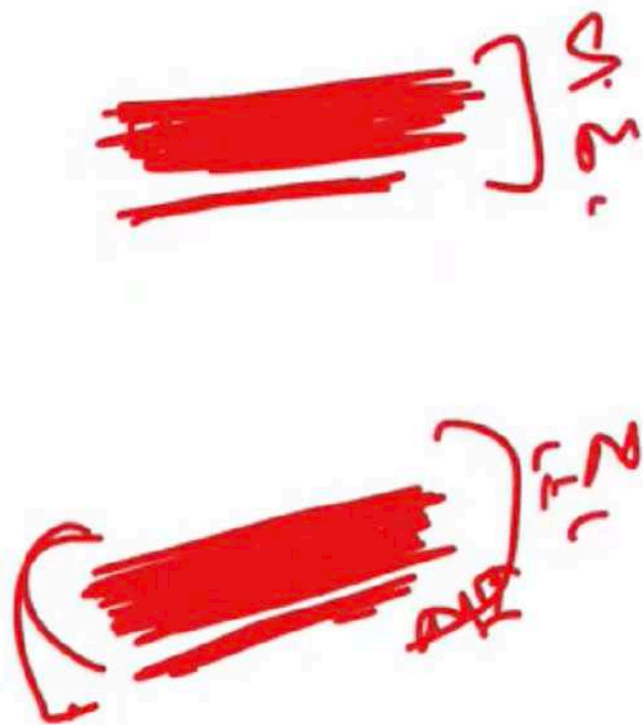
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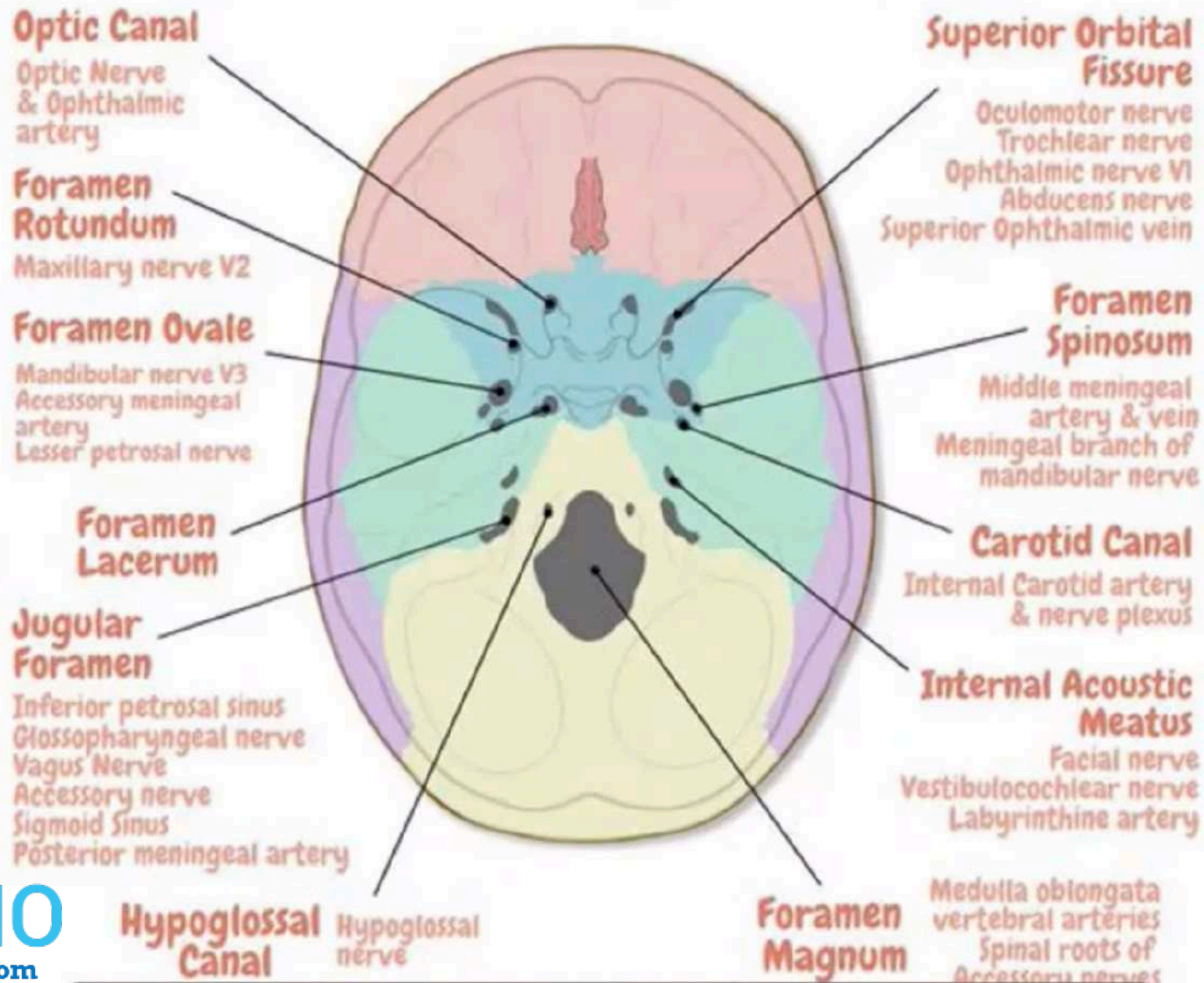
COURSE

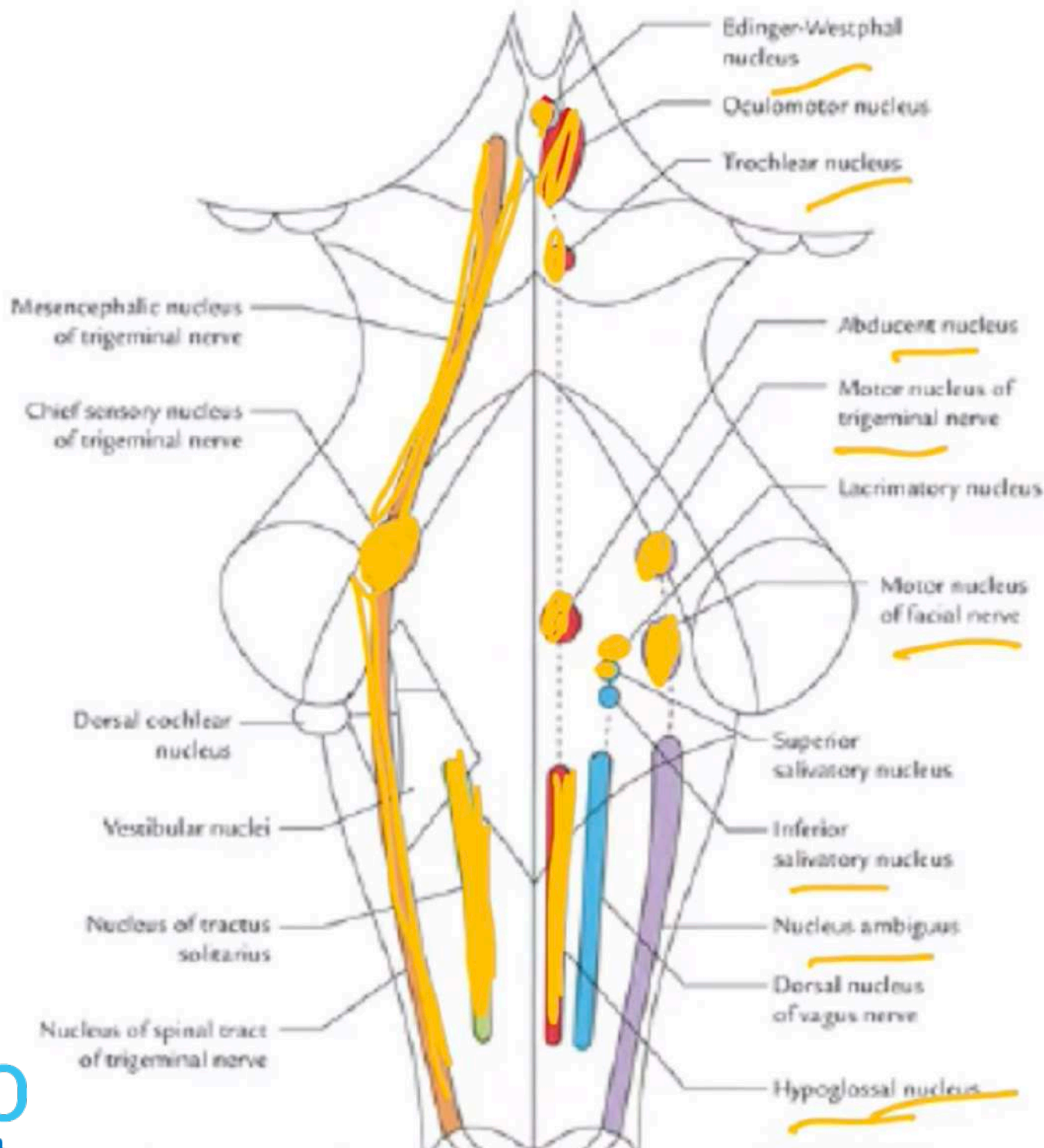






Foramina Contents





SNG

GSE