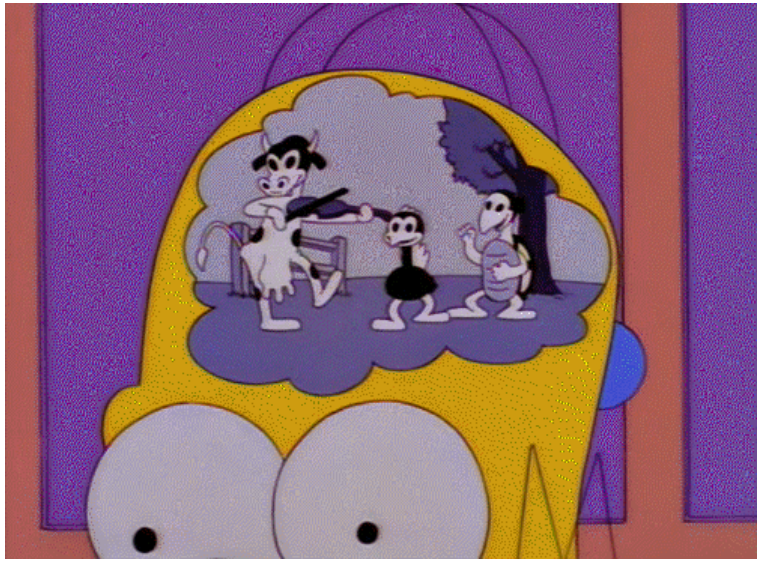
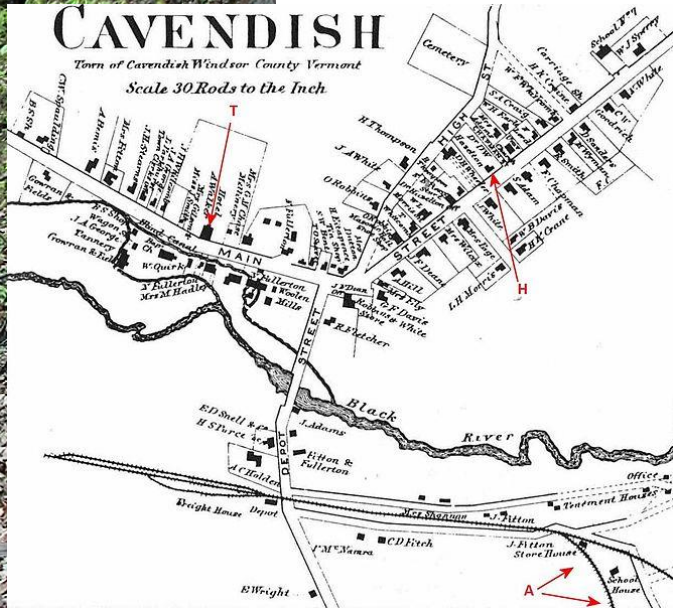
GSSE ANATOMY HEAD

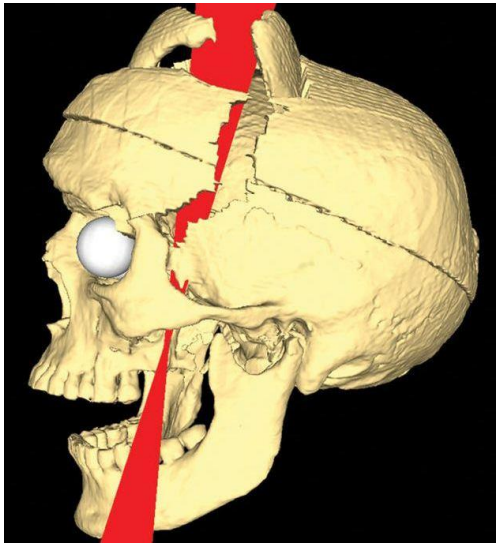
Nick Skladnev + Matt Rackemann



1848...


CAVENDISH
Town of Cavendish Windsor County Vermont
Scale 30 Rods to the Inch
T
H
A
MAIN
STREET
DEPOT
Black
River
Cemetery

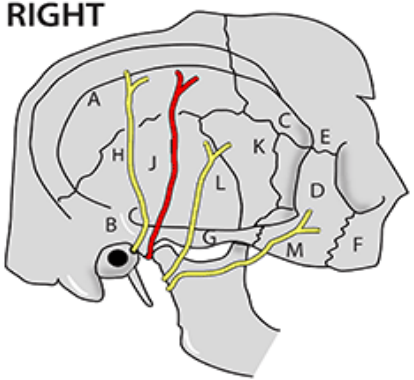
"Doctor, here is business enough for you."



Infratemporal Fossa: Relations

TEMPORAL FOSSA

RIGHT

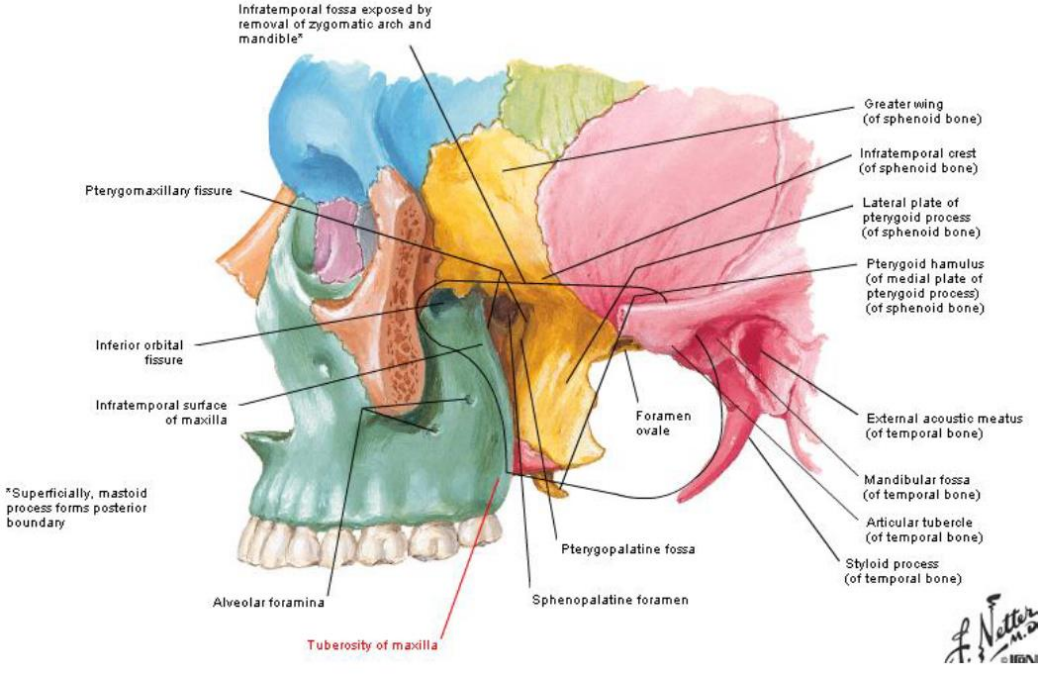


Medial to temporalis - attached inferior to inferior temporal line (A)
Roof: Temporalis fascia
Posterior: Supramastoid crest (B)
Floor: Skull - pterion (C)
Anterior: Zygoma (D), zygomatic process of frontal bone (E) & zygomatic process of maxilla (F)
Inferior: Zygomatic arch & zygomatic process of temporal bone (G)

Contains: Temporalis, deep temporal arteries (maxillary), deep temporal nerves (Vc), Superficial temporal artery (external carotid). Auriculotemporal nerve (H) from Vc
Other structures shown: temporal bone (J), greater wing of sphenoid (K), Temporal branch of VII (L) zygomatic branch of VII (M)

WHY?
Because lots of things *transition* here

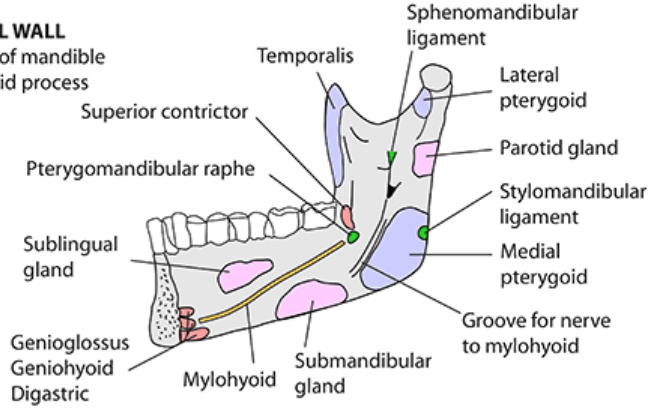
Infratemporal Fossa: Boundaries



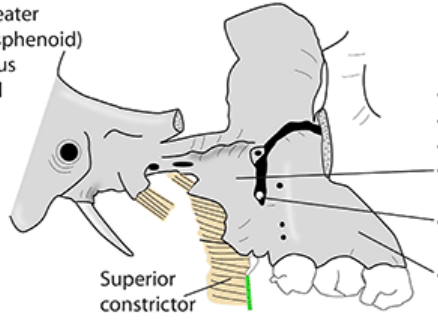
INFRATEMPORAL FOSSA - BOUNDARIES

- Base of skull
- Between pharynx & ramus of mandible

LATERAL WALL
Ramus of mandible
Coronoid process



ROOF
- Infratemporal crest (greater wing of sphenoid)
- Squamous temporal



MEDIAL WALL
- Tensor palati
- Levator palati
- Superior constrictor
- Lateral pterygoid plate
- Pterygomaxillary fissure
- Maxilla

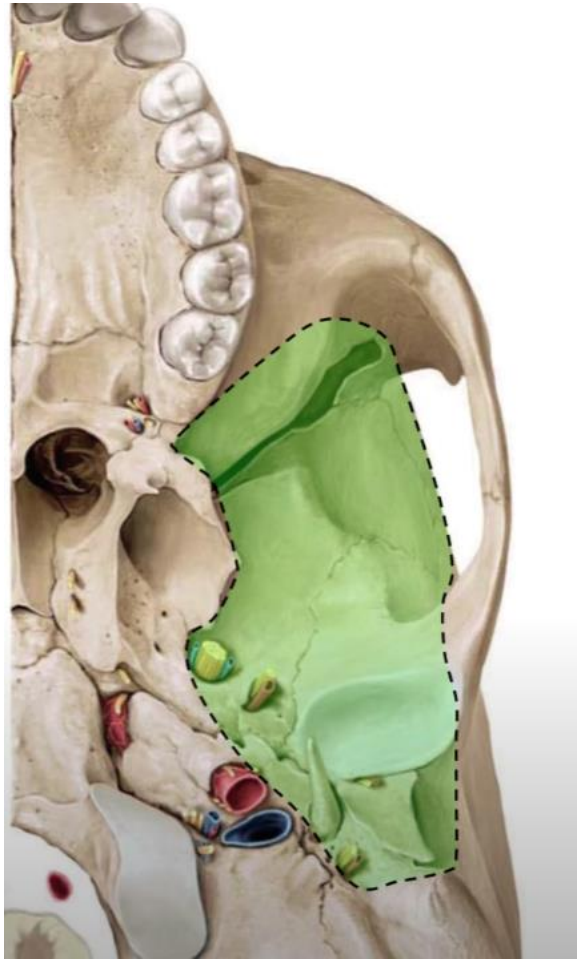
POSTERIOR WALL
Carotid sheath

ANTERIOR WALL
- Posterior maxilla
- Inferior orbital fissure

Infratemporal Fossa: Contents

Lets have a think about what we expect to see..

Infraorbital fissure = Zygomatic (V2)
Foramen Ovale = Mandibular (V3), LPN, AMA
Foramen spinosum = MMA, MMV, meningeal (V3)
Petrotympanic fissure = Chorda tympani -> lingual n

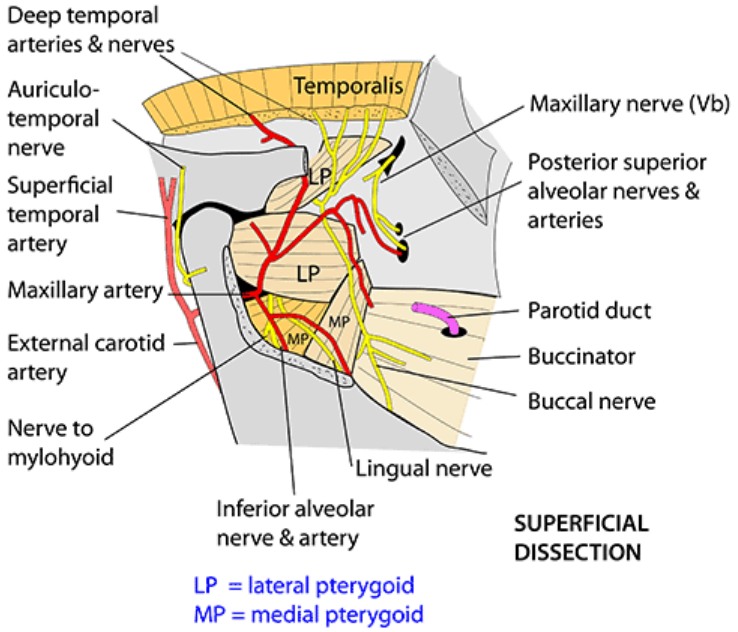


Infratemporal Fossa:
Contents

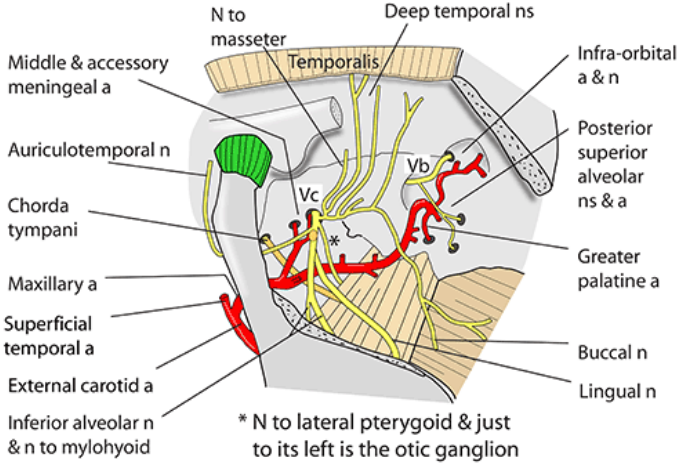
INFRATEMPORAL FOSSA - CONTENTS

CONTENTS

- Pterygoid muscles
- Fat
- Insertion of temporalis
- Chorda tympani
- Posterior superior alveolar branches of Vb (maxillary branch of trigeminal)
- Pterygoid venous plexus
- Mandibular nerve & branches
- Otic ganglion
- Maxillary artery & branches

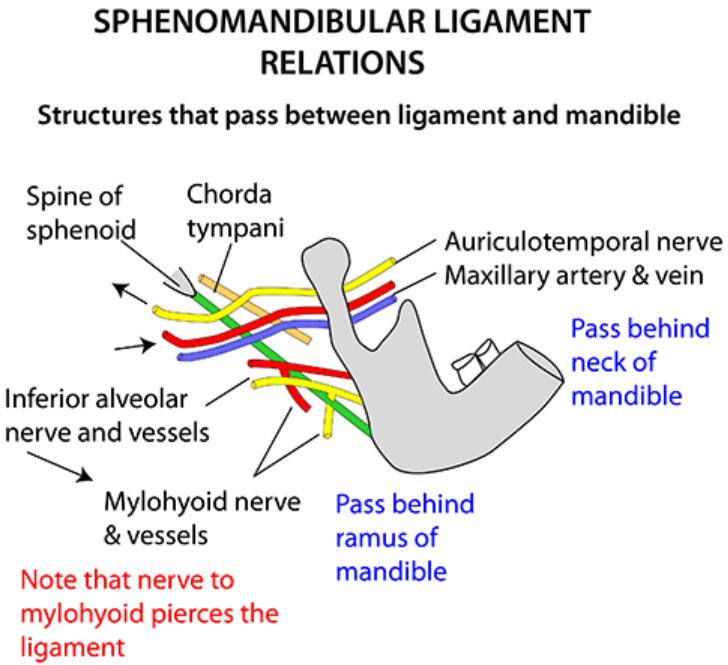


INFRATEMPORAL FOSSA - DEEP DISSECTION



Infratemporal Fossa:

Contents



Q: With respect to the infratemporal fossa

1: It contains only the lateral pterygoid muscle, whilst the medial pterygoid is considered seperate medially

2: The lingual nerve appears here as it runs across the lateral aspect of the lateral pterygoid muscle division of the mandibular nerve

3: It is largely made up of the sphenoid bone

4: Nerve to mylohyoid passes laterally to the sphenomandibular ligament

5: The maxillary artery runs along the lower border of the lateral pterygoid muscle

Q: With respect to the infratemporal fossa

1: It contains only the lateral pterygoid muscle, whilst the medial pterygoid is considered seperate medially **= F**

2: The lingual nerve appears here as it runs across the lateral aspect of the lateral pterygoid muscle division of the mandibular nerve **= F**

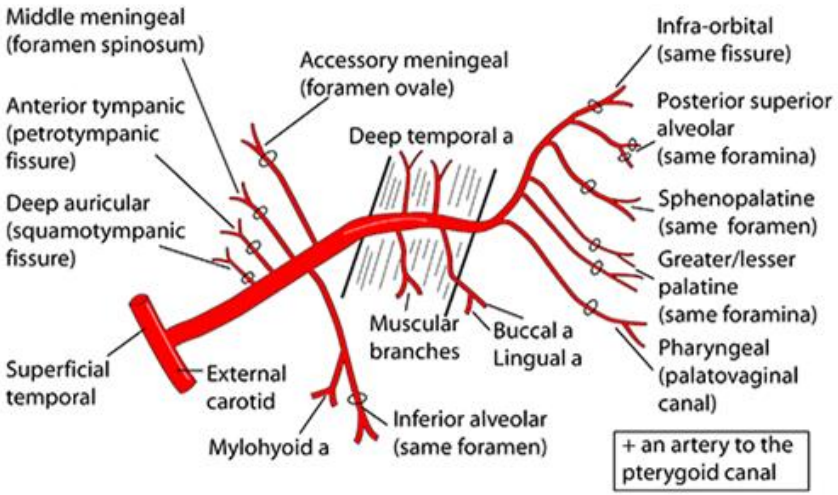
3: It is largely made up of the sphenoid bone **= T**

4: Nerve to mylohyoid passes laterally to the sphenomandibular ligament **= F**

5: The maxillary artery runs along the lower border of the lateral pterygoid muscle **= T**

Maxillary Artery

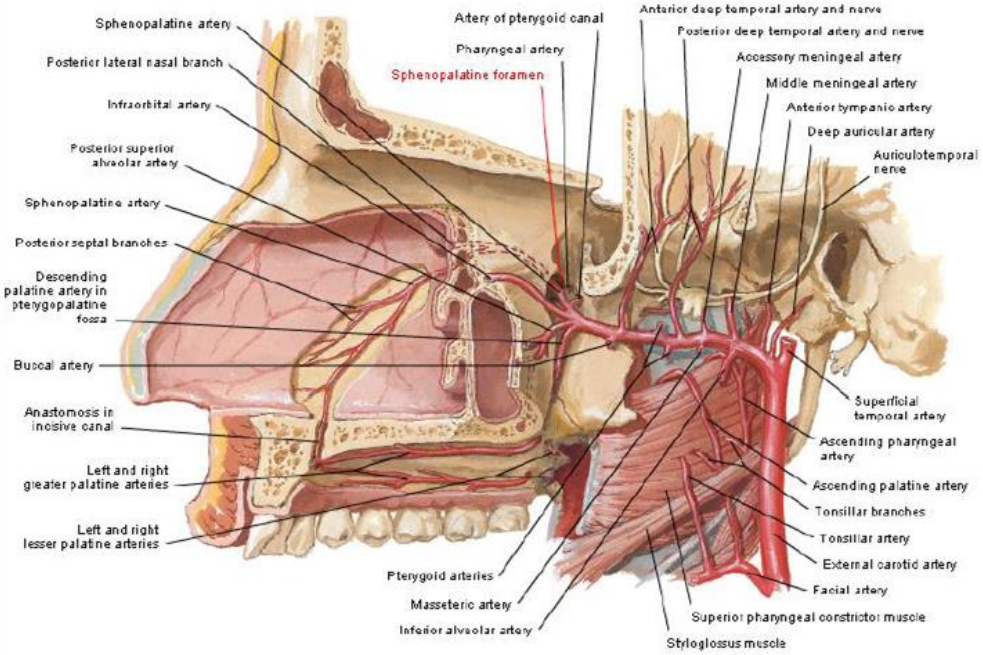
In infratemporal fossa, either within or lateral to the superficial head of lateral pterygoid muscle. This muscle is shown below



BEFORE LATERAL PTERYGOID 5 BRANCHES INTO BONE

LATERAL OR WITHIN LATERAL PTERYGOID. 4/5 BRANCHES TO SOFT TISSUE

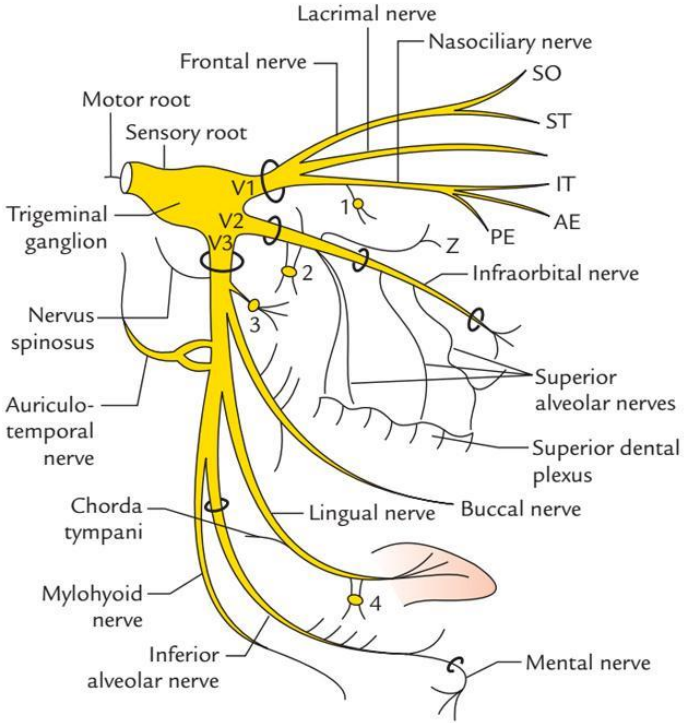
BEYOND LATERAL PTERYGOID 5/6 BRANCHES WITH NERVES

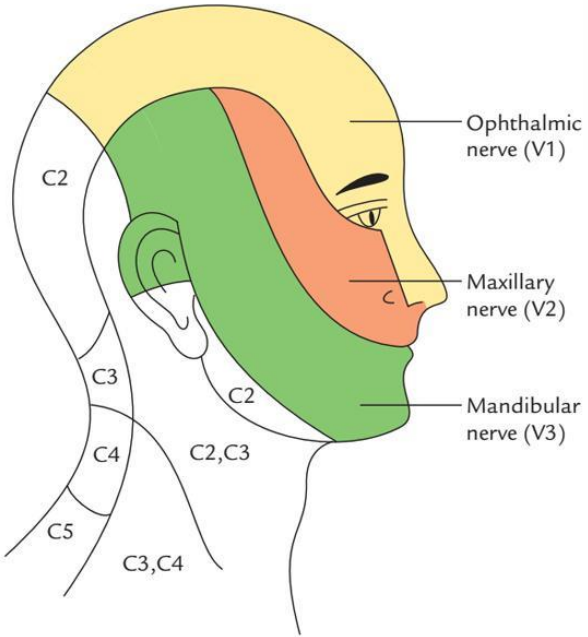


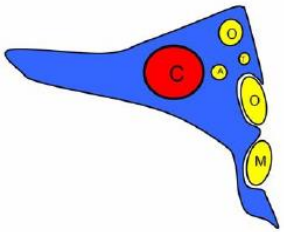
Trigeminal nerve (CN V)

Overview

Big boy in Meckel's cave
V1 Ophthalmic – SOF – 3
V2 Maxillary – FR – 4
V3 Mandibular – FO – 2, 4, 3

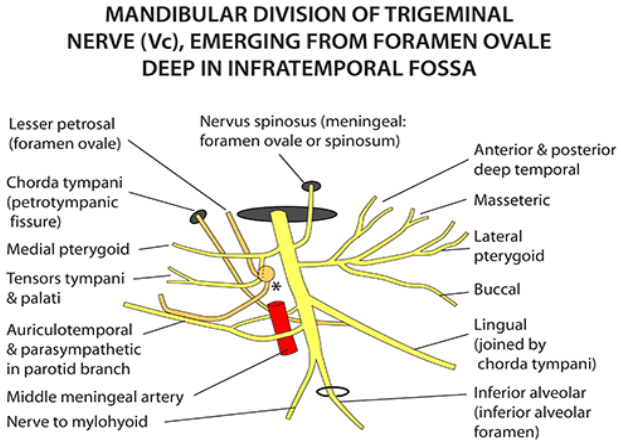




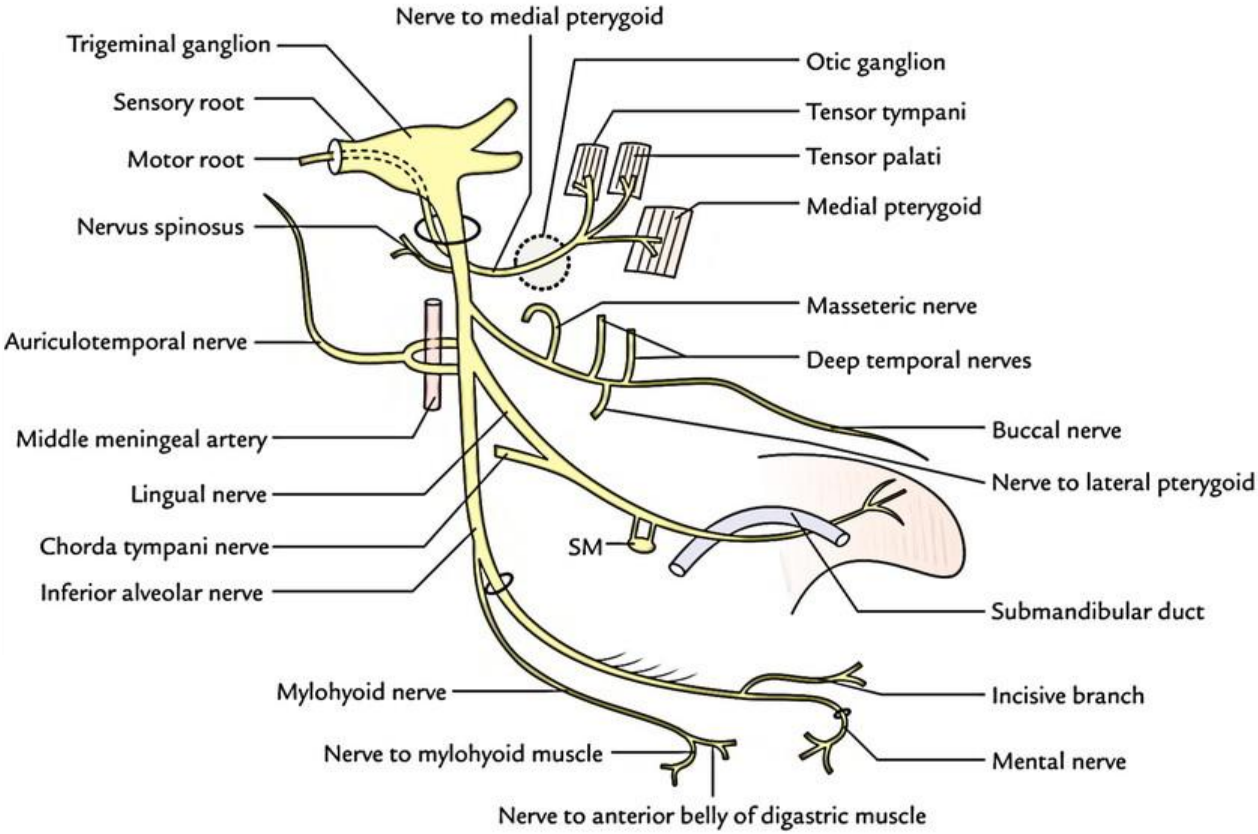


Oculomotor (III)
Trochlear Nerve (IV)
Opthalmic Nerve (V1)
Maxillary Nerve (V2)
Internal Carotid Artery
Abducens Nerve (VI)
The sympathetic plexus

Mandibular nerve (CN V_3)



* Otic ganglion. Parasympathetics from lesser petrosal nerve synapse within it and post-ganglionic fibres are taken to the parotid gland by the auriculotemporal nerve



Lingual Nerve

Enters the mouth from outside the pharynx by passing below the inferior border of the superior constrictor at its attachment to the mandible

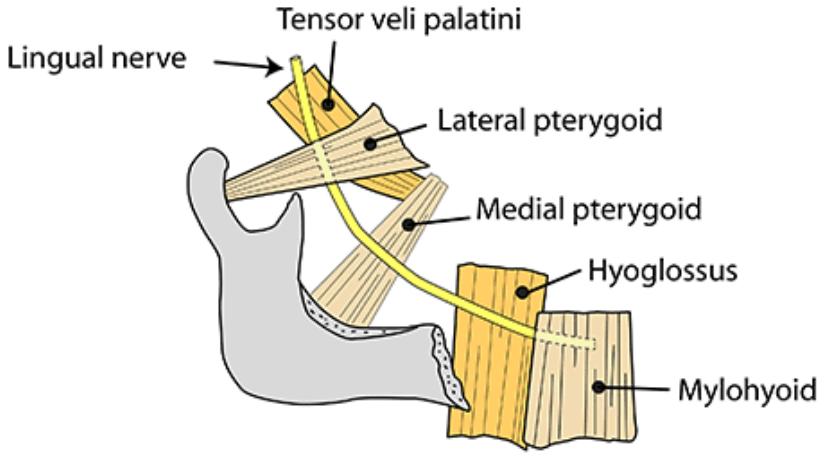
The lingual nerve appears below the lateral pterygoid on the side wall of the pharynx and passes forwards and downwards **between the medial pterygoid and the mandible**

1. comes into contact with the mandible, making a groove below and medial to the **third molar**, just above the posterior end of the mylohyoid line

1. **is a branch of the posterior division of the mandibular nerve.**

1. **runs on the mylohyoid muscle and is SUPERIOR to the hypoglossal nerve.**

LINGUAL NERVE: RELATION TO MUSCLES



The lingual nerve passes between:

1. Tensor veli palatini and lateral pterygoid
2. Medial pterygoid and mandible
3. Mandible and mucosa of mouth
4. Mylohyoid and hyoglossus

The lingual nerve is best considered as a "2-way nerve":

General sensory: ant. 2/3 tongue

Taste (via chorda tympani): ant 2/3 tongue

Secretomotor (via chorda tympani): submandibular & sublingual glands

Lingual Nerve

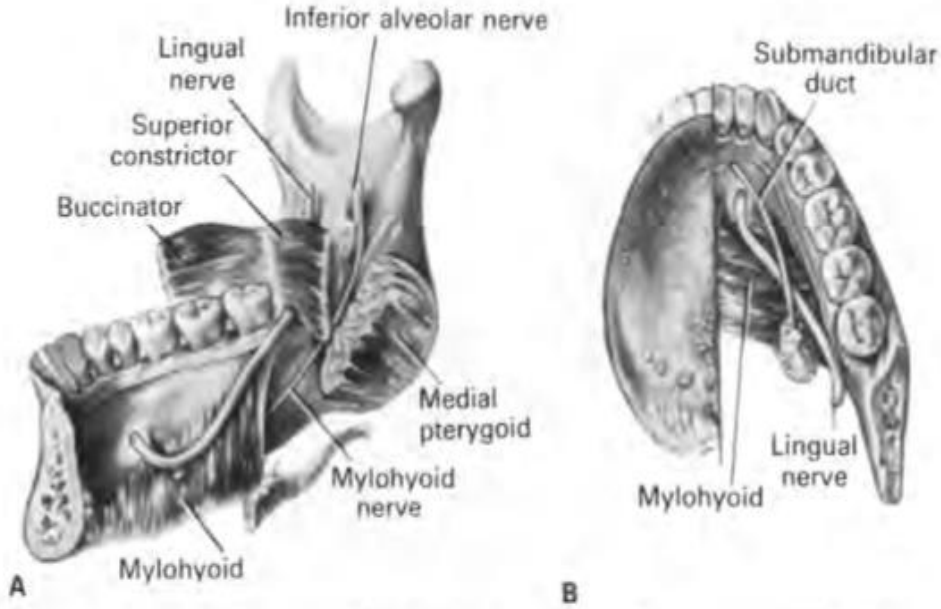


Fig. 6.26 Course of the right lingual nerve from outside the pharynx to within the mouth. In **A**, viewed from within the mouth, the nerve is seen passing under the free lower border of the superior constrictor, which interdigitates with buccinator at the pterygomandibular raphe. In **B**, the nerve is viewed from above, entering the mouth in contact with the periosteum below and behind the third molar tooth.

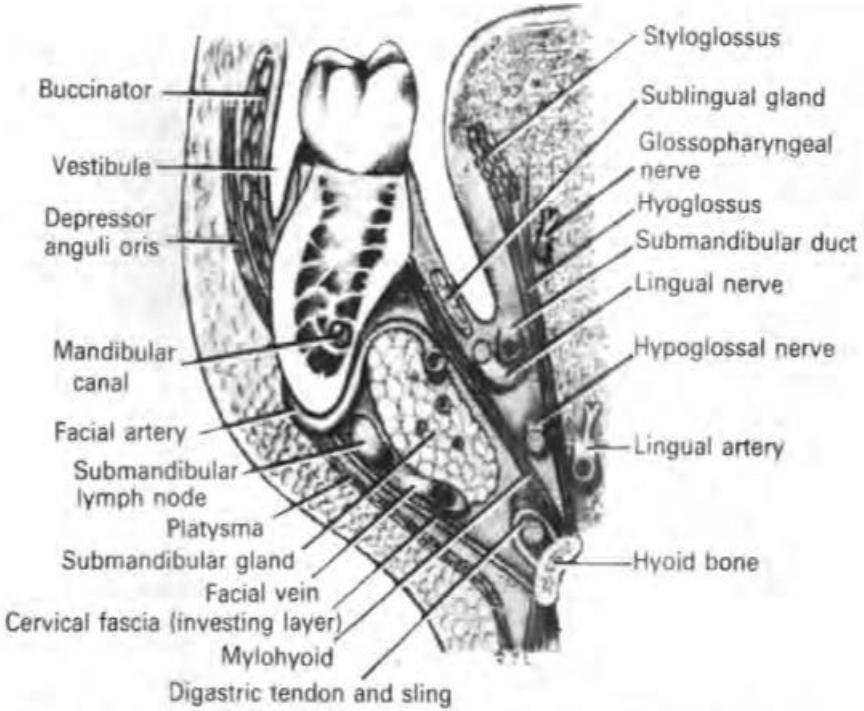


Fig. 6.25 Coronal section of the left side of the mandible and adjacent structures, just behind the first molar tooth, viewed from behind.

24249 – The lingual nerve

1: appears in the infratemporal fossa on the lateral aspect of the lateral pterygoid muscle (T/F)

2: is a branch of the anterior division of the mandibular nerve (T/F)

3: runs on the hyoglossus muscle inferior to the hypoglossal nerve (T/F)

4: enters the mouth by passing between the superior and middle constrictor muscles (T/F)

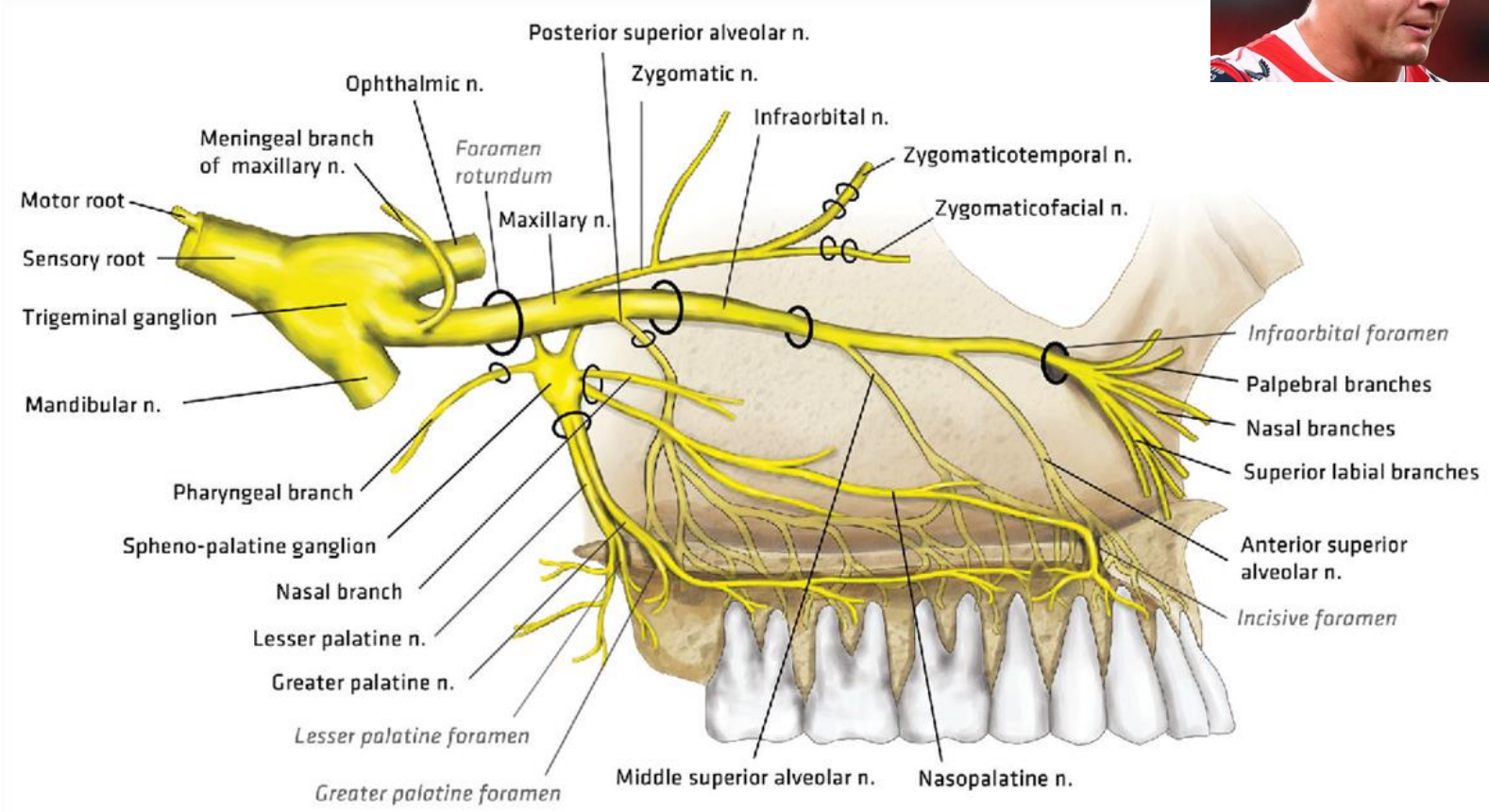
False, appears below the lateral pterygoid between the medial pterygoid and the mandible

False, is a branch of the posterior division of the mandibular nerve.

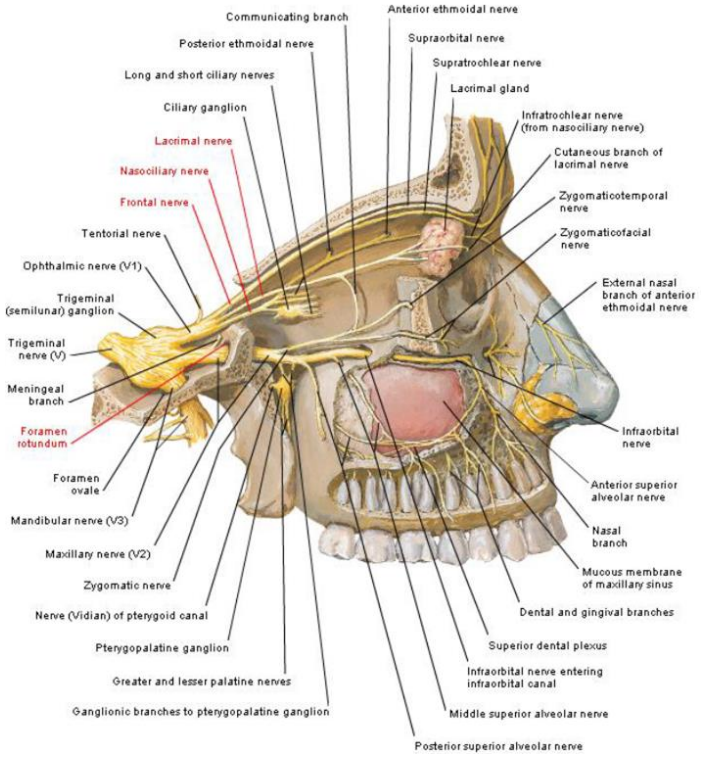
False, runs on the mylohyoid muscle and is SUPERIOR to the hypoglossal nerve.

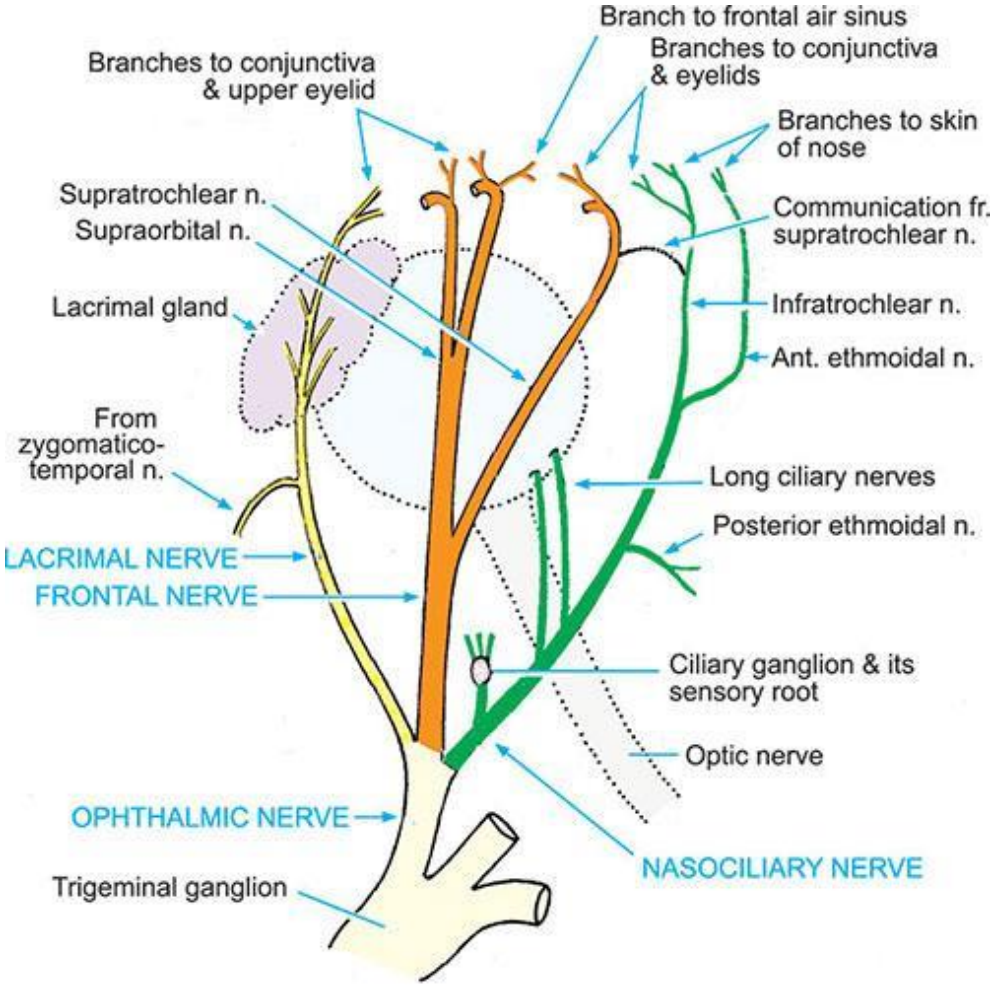
True, below the inferior border of the superior constrictor at its attachment to the mandible

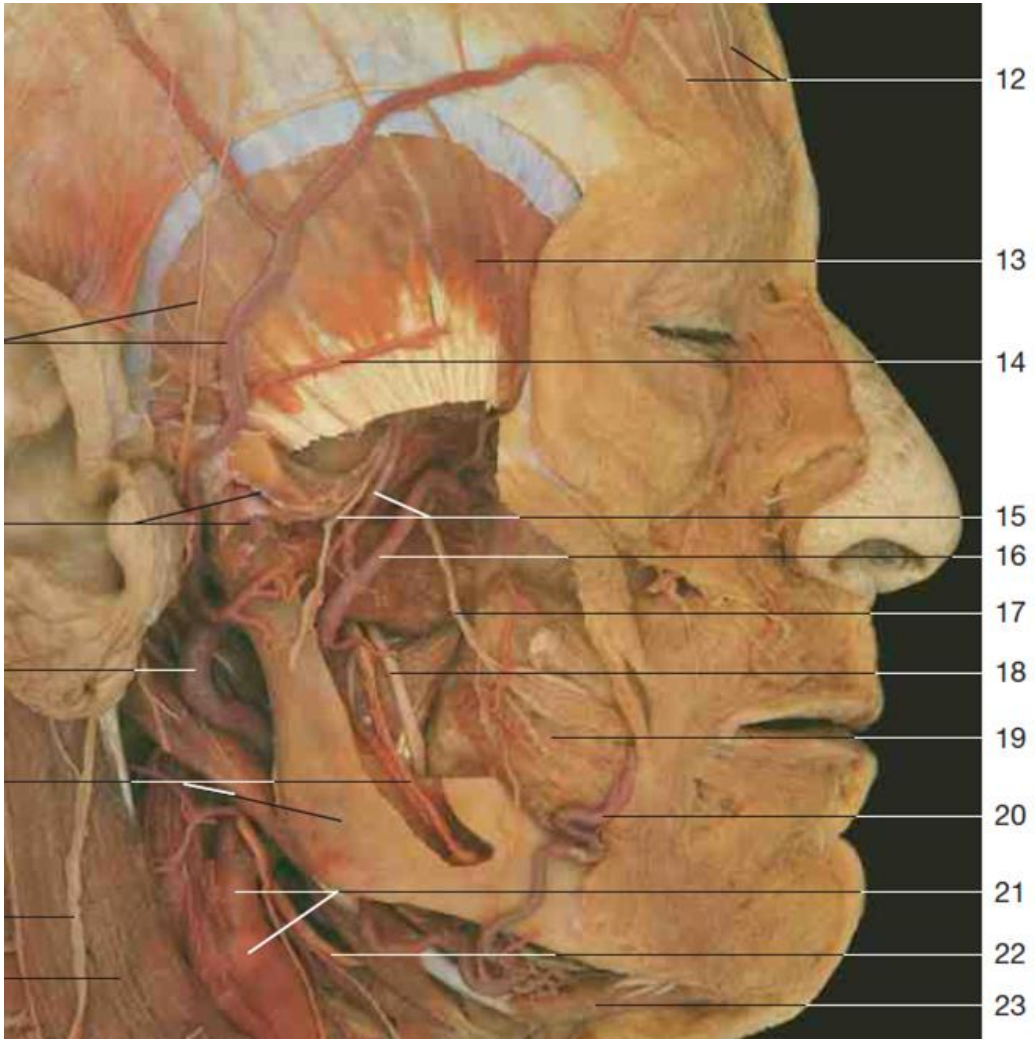
Maxillary nerve (CN V_2)



Ophthalmic nerve (CN V_1)



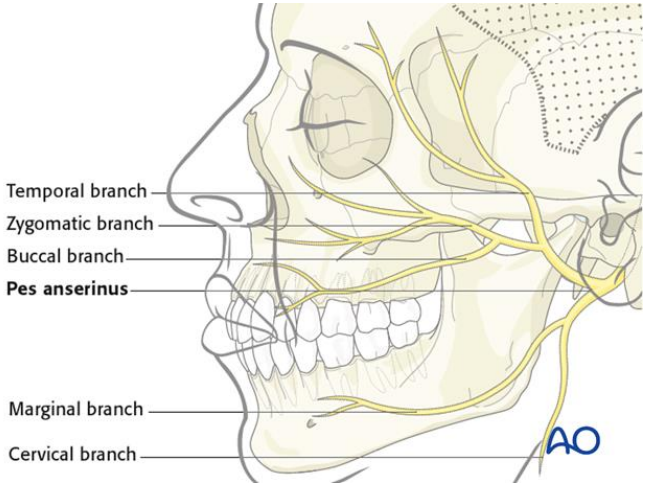


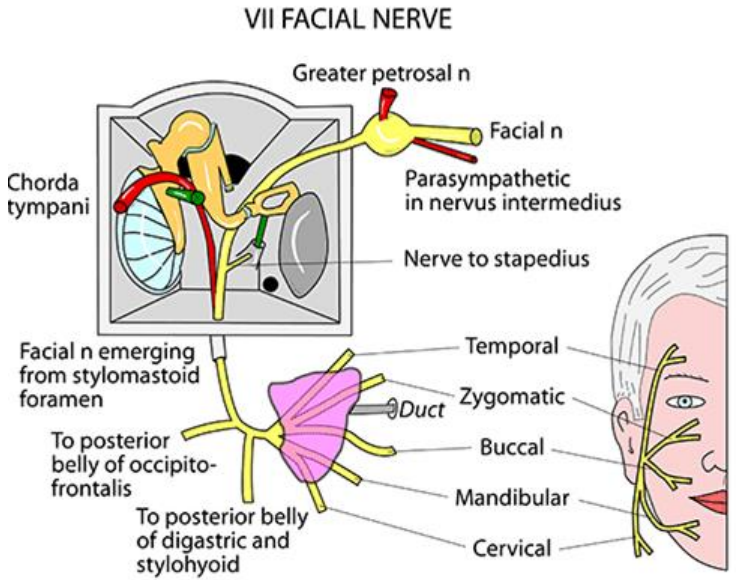


1. **Identify structure labelled ‘16’**
2. **Identify structure labelled ‘13’**
3. **Identify structure labelled ‘18’**
4. **Which structure joins to accompany ’18’ to its final sensory destination?**
5. **Describe innervation of ‘19’**

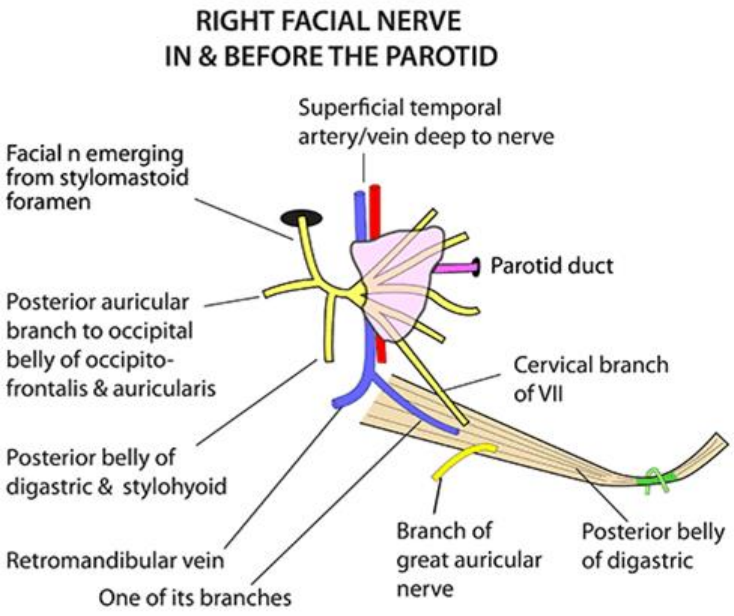
Facial nerve (CN VII)

Overview



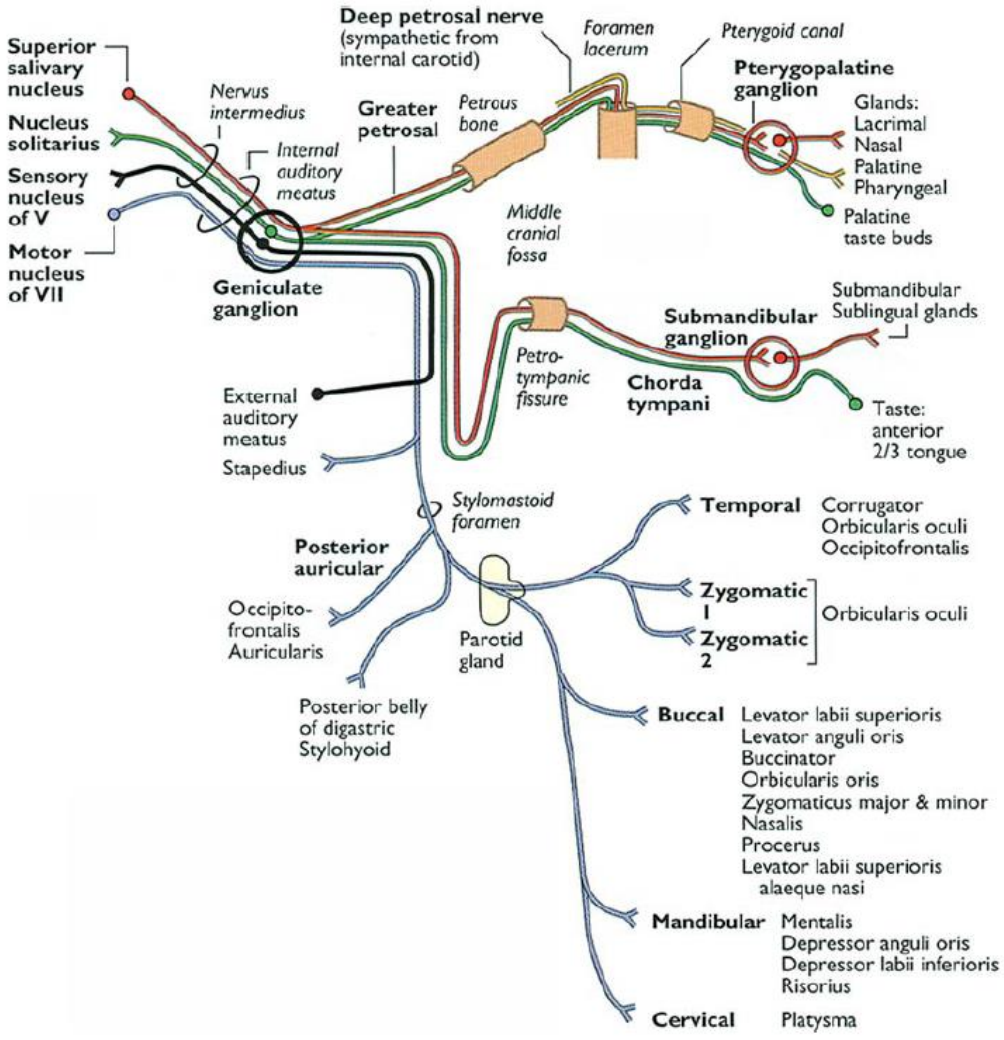


Facial nerve (CN VII) Detailed



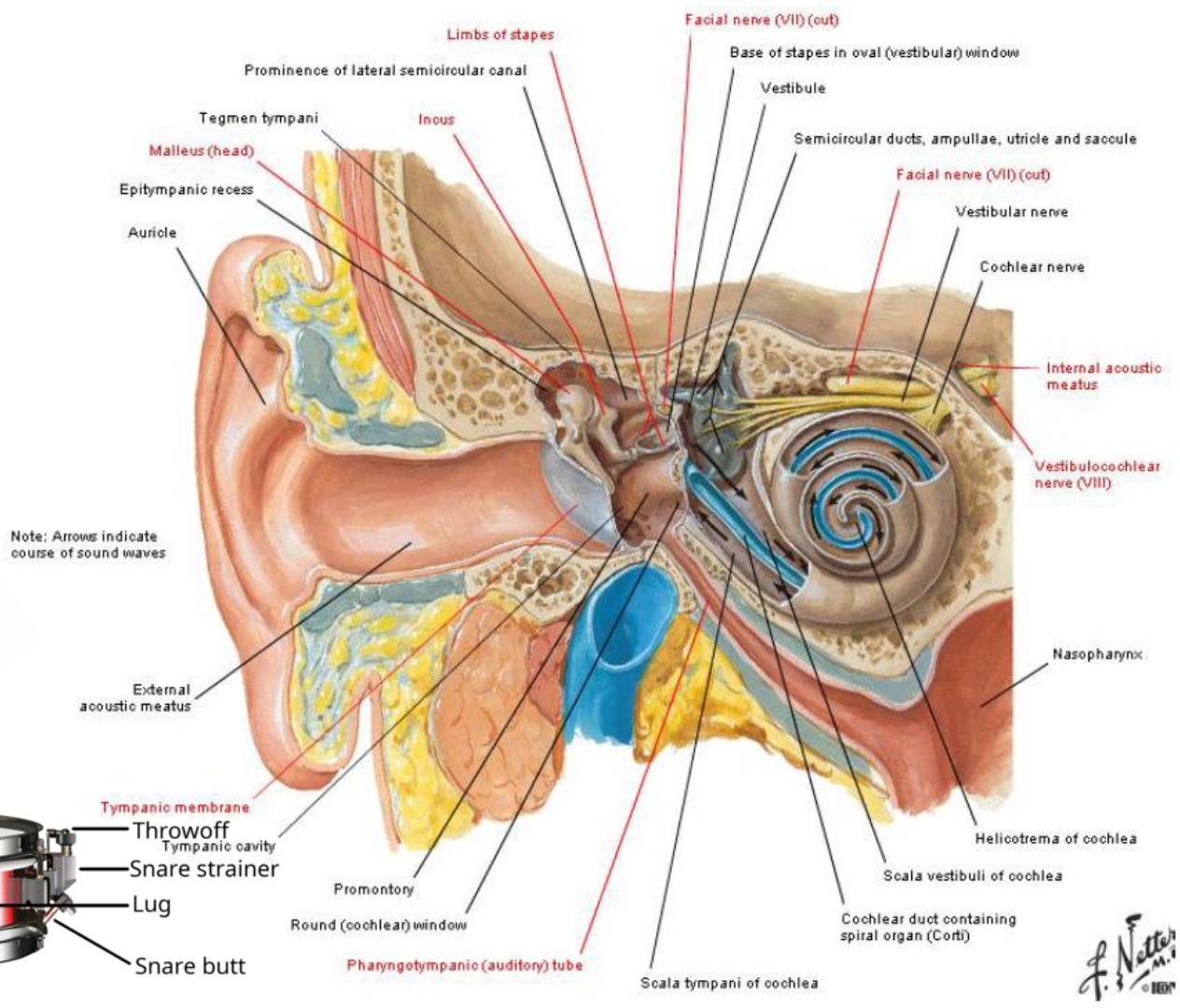
Note: Only three structures lie anterior to the posterior belly of digastric:-

- Cervical branch of VII
- Branch of the retromandibular vein
- Branch of great auricular nerve (cervical plexus)



Middle Ear

TM
Malleus + Incus + Stapes
Oval window
Stapedius (CN VII)
Promontory



Q: With respect to cranial nerve VII

1: The anterior belly of digastric is supplied by fibres from the 7th cranial nerve

2: The chorda tympani joins the lingual nerve on the lower border of the lateral pterygoid muscle

3: Innervates all muscles of mastication except buccinator

4: Supplies motor fibres to stapedius

5: The zygomatic branch is extracranial

Q: With respect to cranial nerve VII

1: The anterior belly of digastric is supplied by fibres from the 7th cranial nerve**= F**

2: The chorda tympani joins the lingual nerve on the lower border of the lateral pterygoid muscle **= T**

3: Innervates all muscles of mastication except buccinator **= F**

4: Supplies motor fibres to stapedius **= T**

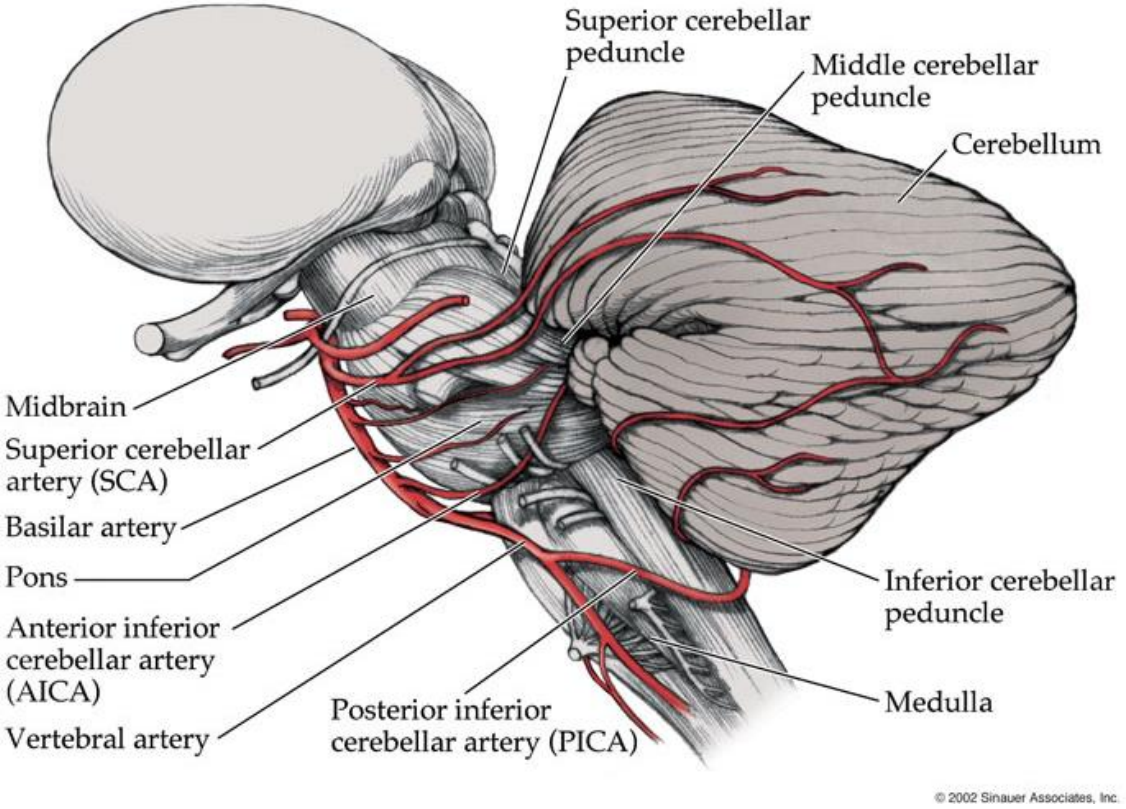
5: The zygomatic branch is extracranial **= T**

Nerves that ‘steal’ muscles

RULES OF NERVE SUPPLY FOR MUSCLE GROUPS

ALL MUSCLES OF	SUPPLIED BY	EXCEPT	WHICH IS SUPPLIED BY
PHARYNX	Pharyngeal plexus (IX, X & sympathetic)	Stylopharyngeus	Glossopharyngeal (IX)
PALATE	Pharyngeal plexus (IX, X & sympathetic)	Tensor veli palatini	Nerve to medial pterygoid (Vc)
TONGUE	Hypoglossal (XII)	Palatoglossus	Pharyngeal plexus (IX, X & sympathetic)
FACIAL EXPRESSION & BUCCINATOR	Facial (VII)	Levator palpebrae superioris	Oculomotor (III)
MASTICATION	Mandibular divisionof Trigeminal (Vc)	Buccinator	Facial (VII)
LARYNX	Recurrent laryngeal	Cricothyroid	External branch of superior laryngeal nerve (X)

Posterior arterial circulation



Blood supply of Pons?

Blood supply of the medulla?

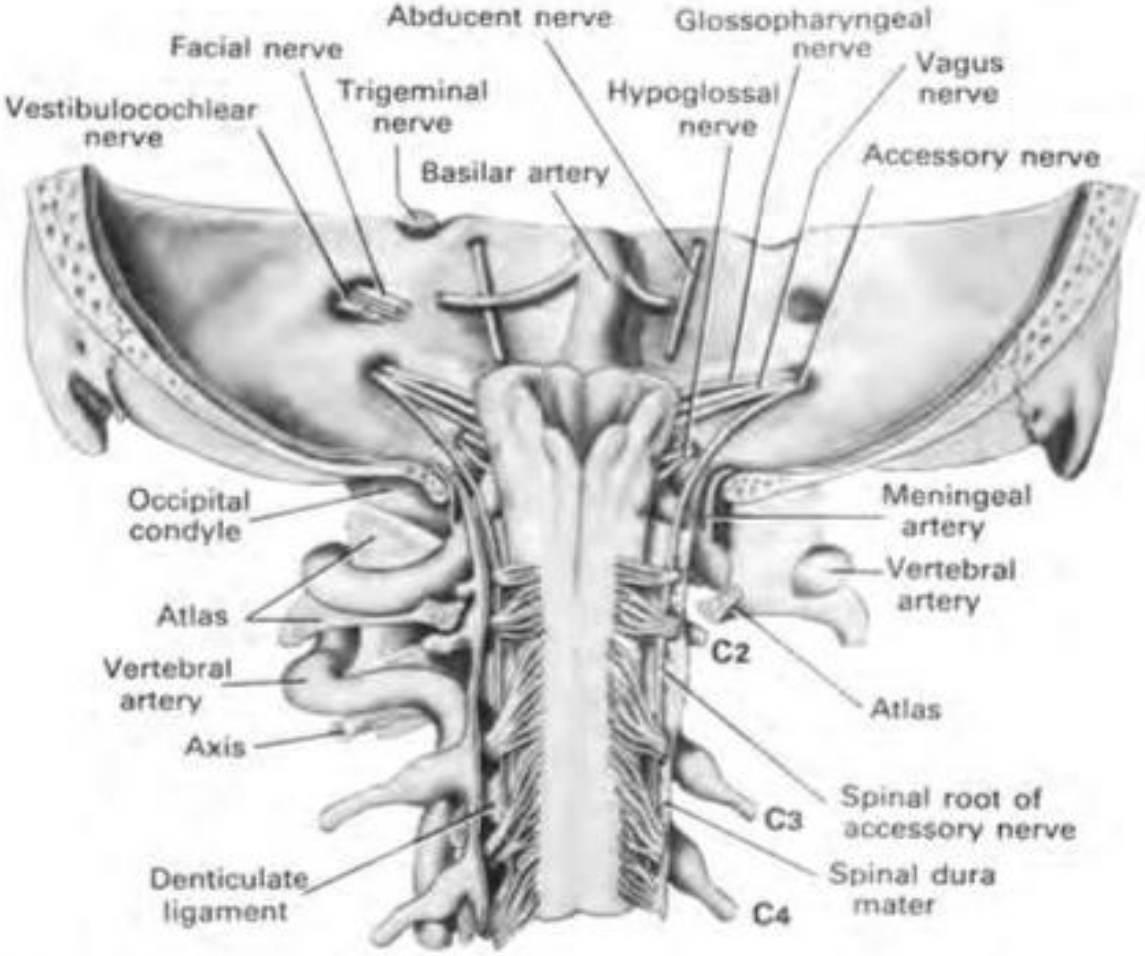


Fig. 6.96 Posterior cranial fossa and the vertebral canal opened from behind.

Medullary Syndromes:

Medial medullary syndrome: paralysis of the tongue on the same side and hemiplegia with loss of touch and kinaesthetic sense on the opposite side

Caused by: damage to the anterior spinal branch of the vertebral gives penetrating branches which supply the region next to the midline, i.e. the part containing the pyramid, medial lemniscus and hypoglossal nucleus

Lateral medullary syndrome: Vocal fold, palatal and pharyngeal muscle paralysis on the ipsilateral side → dysphonia/dysphagia

Loss of pain and temperature sensation on the ipsilateral face and contralateral body (due to loss of uncrossed spinal tract of trigeminal and crossed spinal lemniscus)

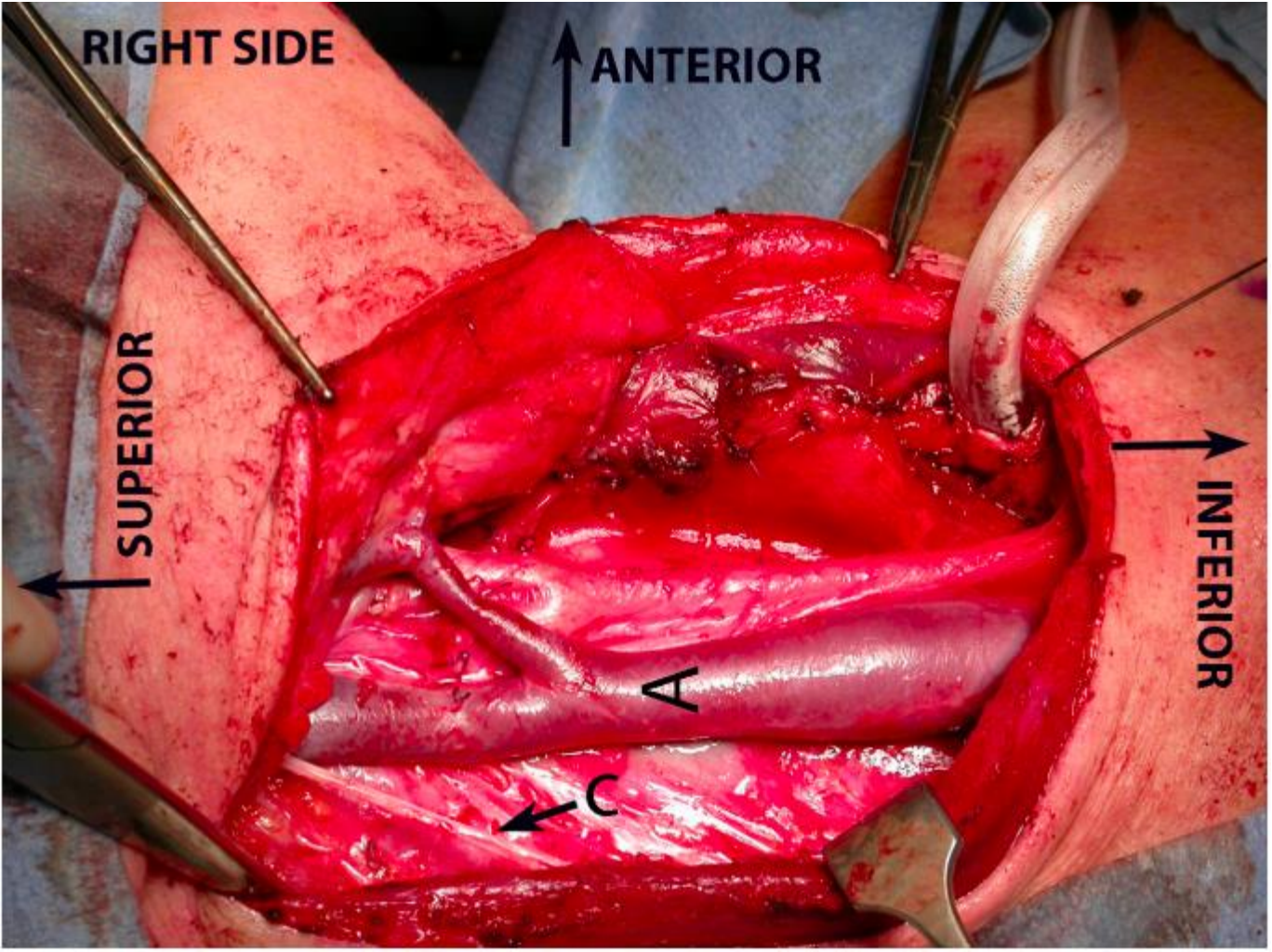
Horner's syndrome on the ipsilateral side due to descending sympathetic fibre disruption

Vertigo, nystagmus, nausea and vomiting from vestibular nuclei involvement

Caused by: ??? which vessel?

S. Thrombosis of the posterior inferior cerebellar artery causes palatal and pharyngeal paralysis BECAUSE R. the posterior inferior cerebellar artery supplies the nucleus ambiguus

Answer: S is true, R is true and a valid explanation of S



i. The structure A is formed in the region of:

ii. Structure A is formed from:

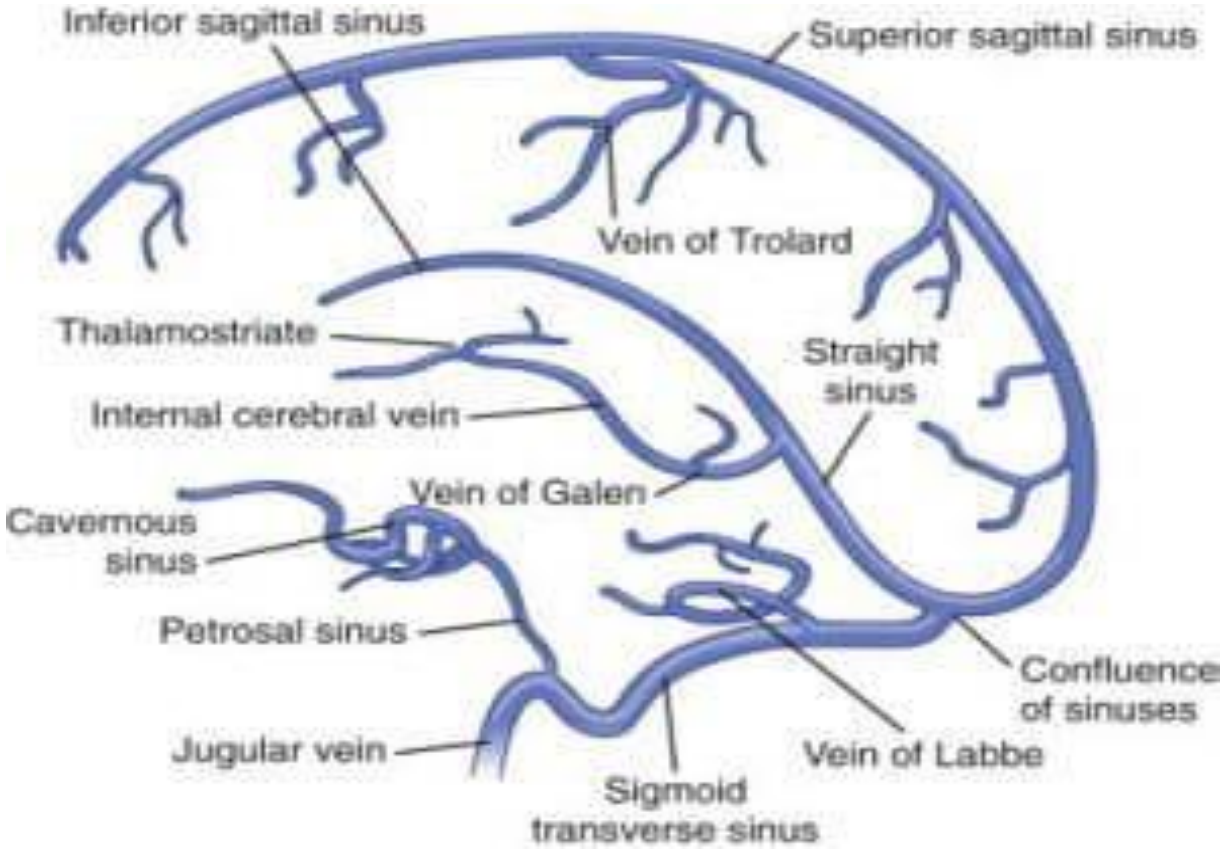
iii. The termination of A is at:

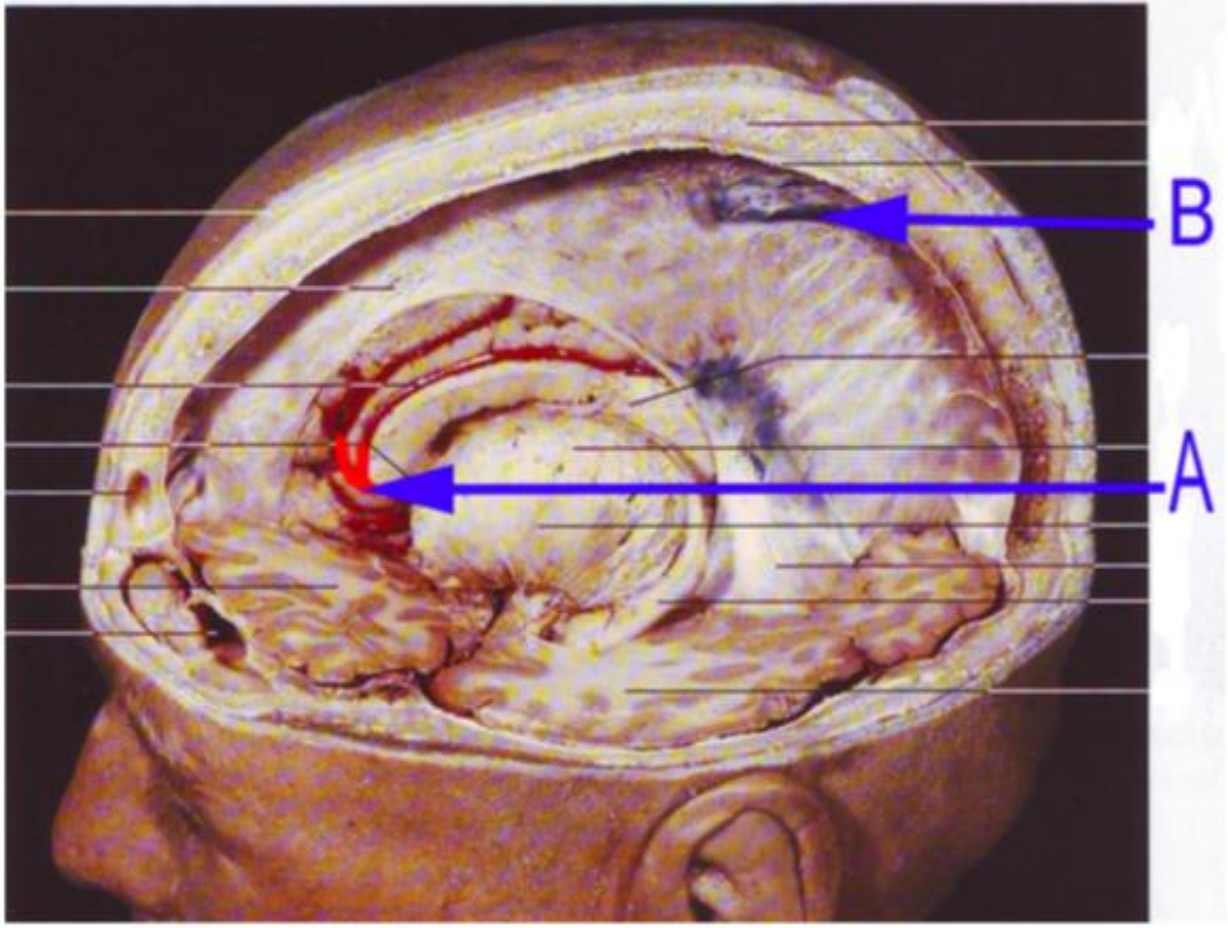
iv. The structure C is:

i. Below skull / below / inferior to jugular foramen
ii. (The union of) sigmoid sinus and inferior petrosal sinus

iii. (Confluence of) right subclavian vein and (origin of) right brachiocephalic vein
iv. Spinal accessory nerve / accessory nerve / External accessory nerve

Cerebral Venous supply

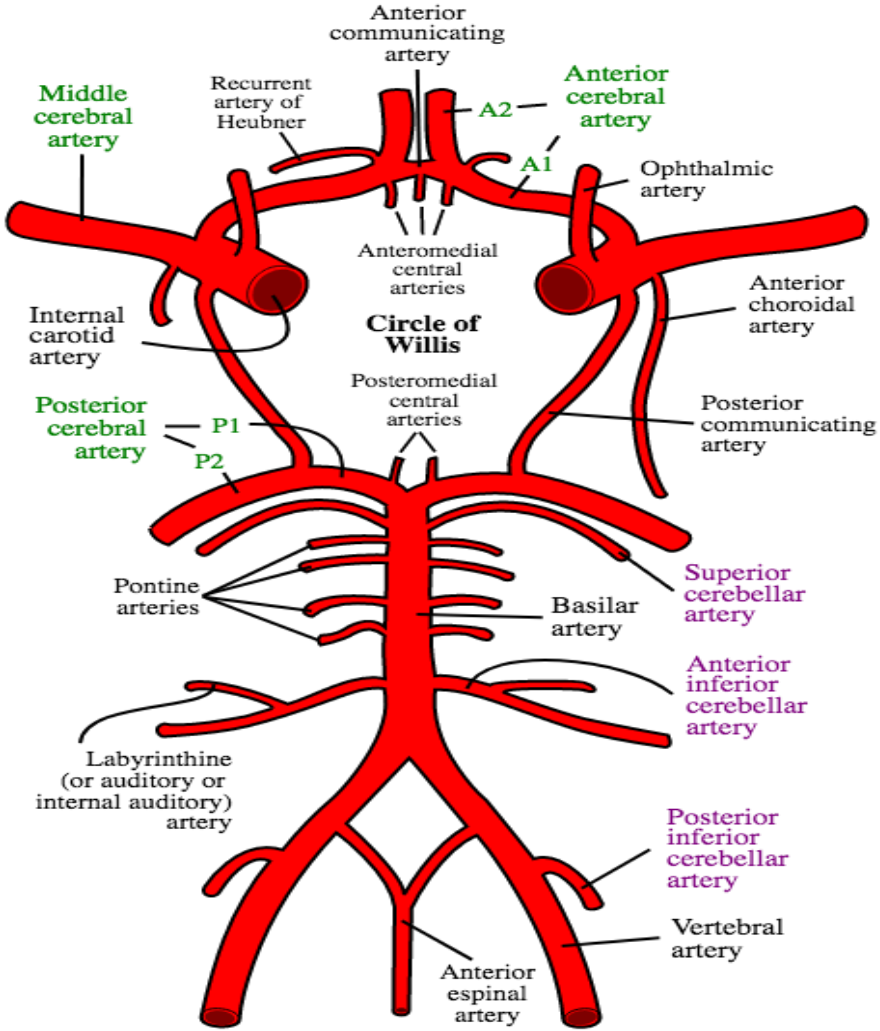


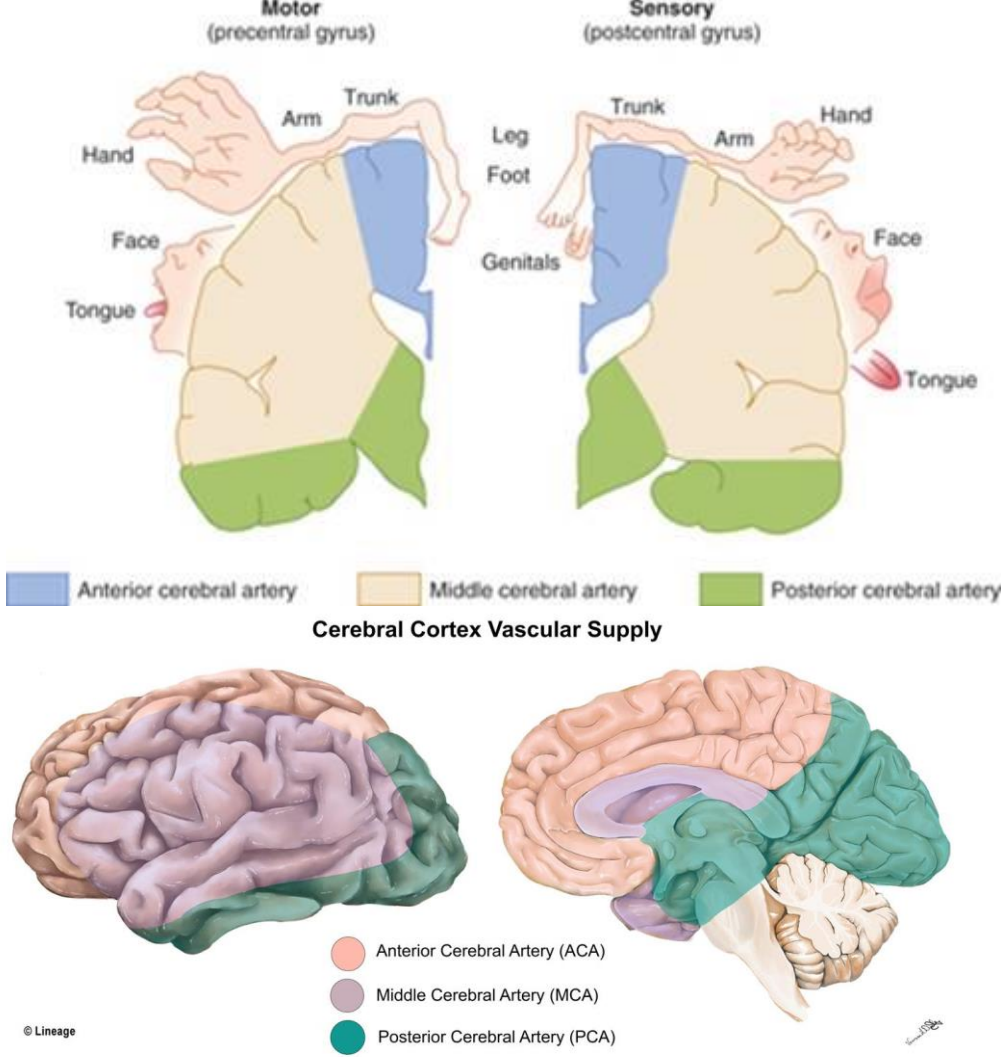


i. The structure A is:

ii. Give two functional territories supplied by this structure:

iii. What major cerebral lobe does it supply distally?:


Anterior communicating artery
Middle cerebral artery
Recurrent artery of Heubner
A2
Anterior cerebral artery
A1
Ophthalmic artery
Anteromedial central arteries
Circle of Willis
Anterior choroidal artery
Internal carotid artery
Posteromedial central arteries
Posterior cerebral artery
P1
P2
Posterior communicating artery
Pontine arteries
Basilar artery
Superior cerebellar artery
Anterior inferior cerebellar artery
Labyrinthine (or auditory or internal auditory) artery
Posterior inferior cerebellar artery
Vertebral artery
Anterior espinal artery


Motor
(precentral gyrus)
Sensory
(postcentral gyrus)
Hand
Arm
Trunk
Face
Tongue
Leg
Foot
Genitals
Anterior cerebral artery
Middle cerebral artery
Posterior cerebral artery
Cerebral Cortex Vascular Supply
Anterior Cerebral Artery (ACA)
Middle Cerebral Artery (MCA)
Posterior Cerebral Artery (PCA)
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With Williams' assistance Harlow shaved the scalp around the region of the tamping iron's exit, then ***removed coagulated blood, small bone fragments, and "an ounce or more" of protruding brain****. After probing for foreign bodies and replacing two large detached pieces of bone, Harlow* ***closed the wound with adhesive straps, leaving it partially open for drainage****; the entrance wound in the cheek was bandaged only loosely, for the same reason. A* ***wet compress was applied, then a nightcap****, then further bandaging to secure these dressings. Harlow also dressed Gage's hands and forearms (which along with his face had been "deeply burned") and ordered that Gage's* ***head be kept elevated.***

"cut off the fungi which were sprouting out from the top of the brain and filling the opening, and made free application of caustic to them. With a scalpel I laid open the [frontalis muscle, from the exit wound down to the top of the nose] and immediately there were discharged eight ounces [250 ml] of ill-conditioned pus, with blood, and excessively fetid."