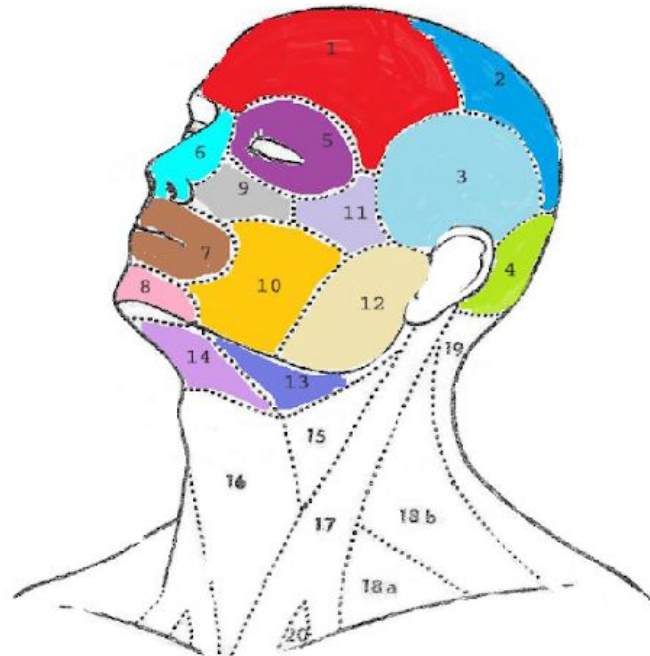


# HEAD REGIONS

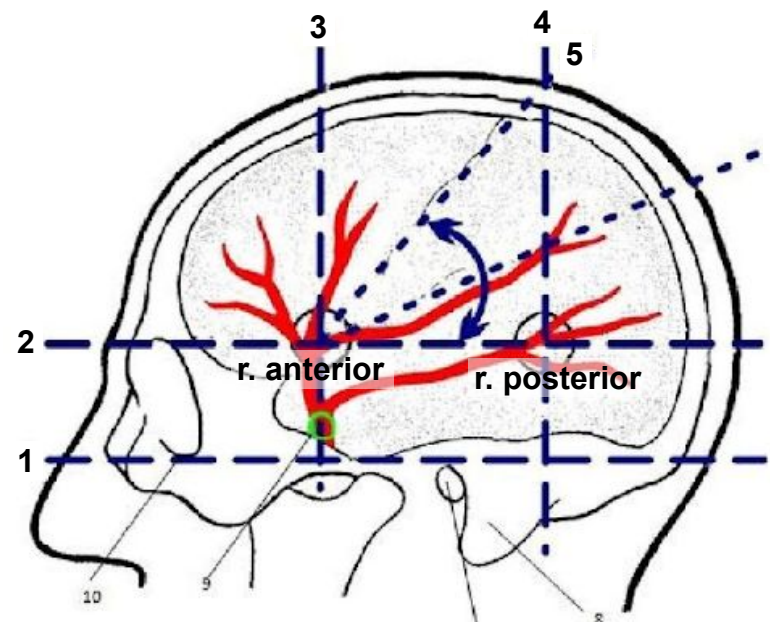
- boundary against the neck
  - connecting line between the external occipital protuberance, superior nuchal line, external acoustic meatus, and edge of the lower jaw
- cerebral and facial part
  - connecting line between the external acoustic meatus, zygomatic arch, superciliary arch, glabella, and depth of the external cranial base
- cerebral part
  - regio frontalis, parietalis, temporalis, occipitalis, basis cranii externa, basis cranii interna with cranial fossae
- facial part
  - superficially – regio orbitalis, nasalis, oralis, buccalis and parotideomasseterica, mentalis
  - deep – infratemporal region, pterygopalatine fossa, pterygomandibular space, parapharyngeal space (prae- and retrostyloid) and retropharyngeal space, orbit, nasal and oral cavities, tonsillar and sublingual regions



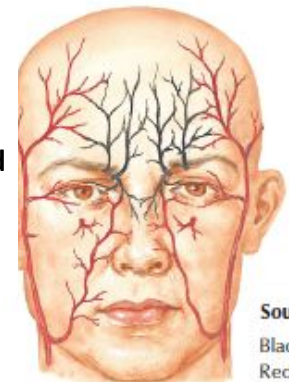
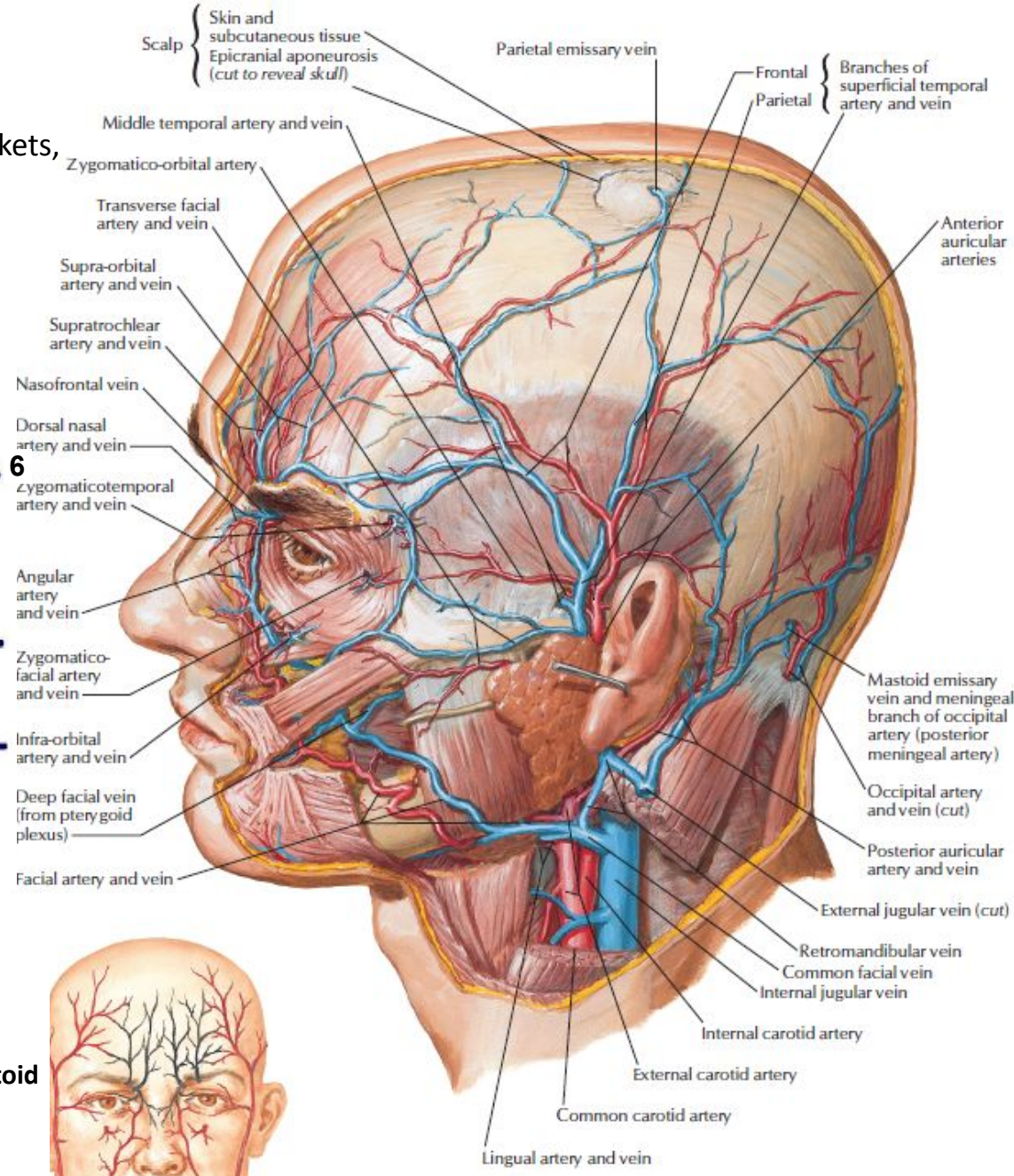
- 1 regio frontalis
- 2 regio parietalis
- 3 regio temporalis
- 4 regio occipitalis
- 5 regio orbitalis
- 6 regio nasalis
- 7 regio labialis
- 8 regio mentalis
- 9 regio infraorbitalis
- 10 regio buccalis
- 11 regio zygomatica
- 12 regio parotidomasseterica
- 13 trigonum submandibulare
- 14 trigonum submentale
- 15 trigonum caroticum
- 16 trigonum musculare
- 17 regio sternocleidomastoidea
- 18 regio cervicalis lateralis

# VASCULAR SUPPLY

- branches of ACE and ACI
- veins of soft coverings into veins of the eye sockets, SpfcTV, pterygoid plexus, IJV
- veins from diploe into sinus durae matris
- internal course of vasa meningea media



- 1 – linea auriculoorbitalis (Frankfurt horizontal)
- 2 – parallel to 1, drawn along the upper edge of the orbit
- 3 – perpendicular through the center of the arcus zygomaticus
- 4 – perpendicular through the posterior edge of the mastoid process
- 5 – sulcus centralis cerebri
- 6 – sulcus lateralis cerebri



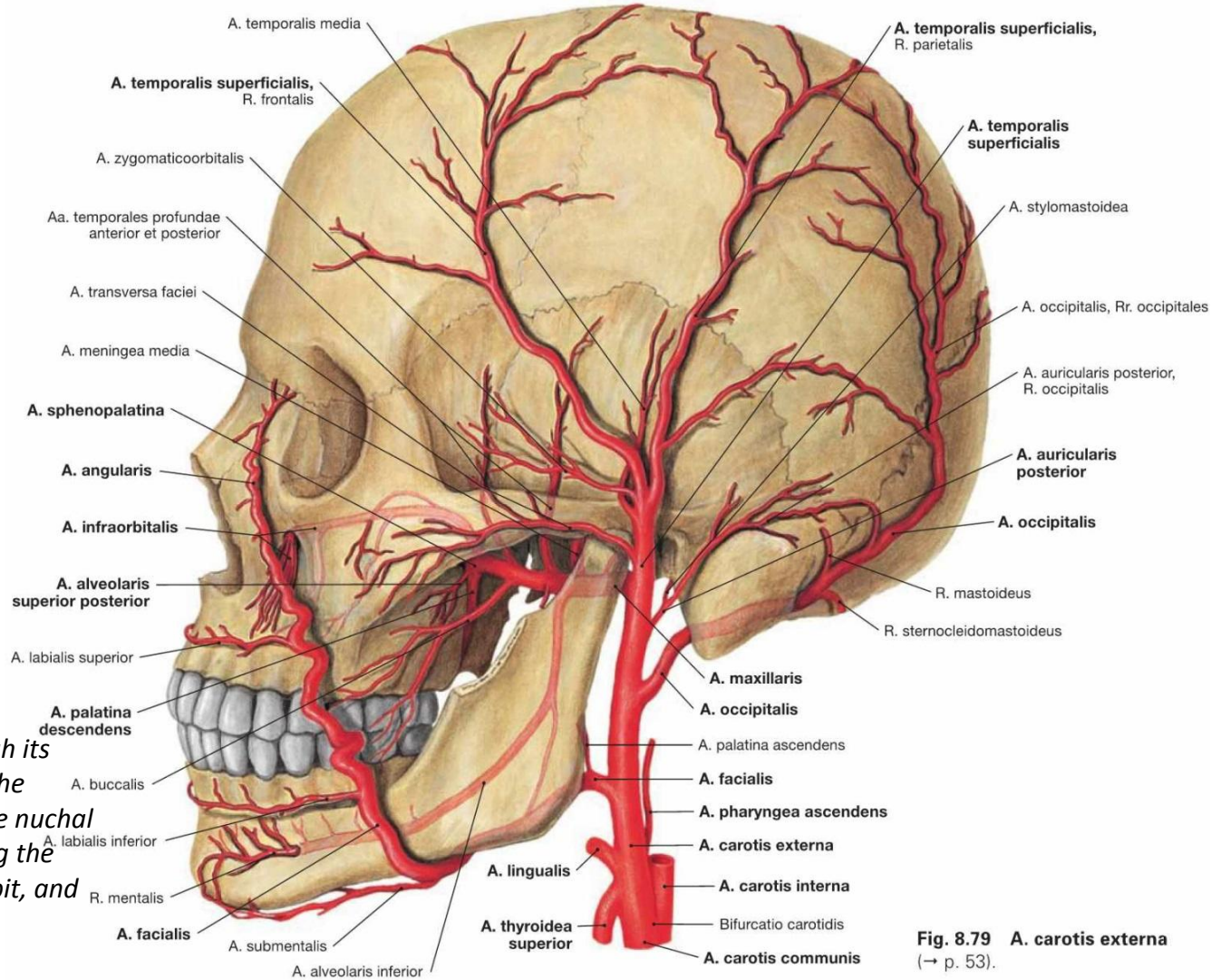
**Sources of arterial supply of face**  
 Black: from internal carotid artery (via ophthalmic artery)  
 Red: from external carotid artery

# COMMON CAROTID ARTERY

- asymmetrical origin (truncus vs. arcus)
  - on the neck, it ascends alongside the trachea and esophagus, ventrally m. sternocleidomastoideus and m. omohyoideus
- nerve-vascular bundle of the neck
  - laterally v. jugularis interna, anteriorly r. descendens nervi hypoglossi, posteriorly n. vagus
  - medially a. carotis communis (resp. interna, externa only briefly)
  - enveloped by the carotid sheath
- does not branch, divides into the carotid triangle at the level of the upper edge of the thyroid cartilage
  - external carotid artery
  - internal carotid artery
  - at the point of division is the chemoreceptor organ, the carotid body (blood oxygen saturation, nerves IX and X)

# EXTERNAL CAROTID ARTERY

- runs behind the angle and neck of the mandible (leaves the cervical neurovascular bundle), externally venter posterior muscoli digastrici, m. stylohyoideus, arcus n. hypoglossi, veins of the neck and face draining into the internal jugular vein
- ventral branches (branch off close to each other)
  - a. thyroidea superior
  - a. lingualis
  - a. facialis
- medial branch
  - a. pharyngea ascendens
- dorsal branches
  - a. occipitalis
  - a. auricularis posterior
- terminal branches
  - a. temporalis superficialis
  - a. maxillaris



*The external carotid artery supplies, through its branches, most of the organs of the neck, the muscles on the front of the neck, part of the nuchal (nape) musculature, and the head excluding the brain (it does supply the meninges), the orbit, and the inner ear*

**Fig. 8.79 A. carotis externa** (→ p. 53).

# BRANCHES OF THE EXTERNAL CAROTID

- a. thyroidea superior
  - branches off at the bifurcation
  - supplies the thyroid gland, infrahyoid muscles, and larynx
  - anastomoses with the contralateral artery and the a. thyroidea inferior (from the truncus thyrocervicalis)
  - gives the superior laryngeal artery
- lingual artery
  - branches off at the level of the greater horns of the hyoid bone and passes under the hyoglossus muscle
  - supplies the tongue, floor of the mouth, and sublingual gland
  - Béclard's angle – greater horn of the hyoid bone and posterior belly of the digastric muscle
  - Pirogov's triangle – posterior border of the mylohyoid muscle, posterior belly of the digastric muscle, and hypoglossal nerve arch
- a. facialis
  - runs under the stylohyoid muscle and the posterior belly of the digastric muscle, goes under/in the submandibular gland to the lower jaw and crosses over to the face in front of the edge of the masseter muscle (covered by the platysma muscle)
  - supplies the submandibular gland, suprahyoid muscles, pharynx, soft palate with palatine tonsil, facial muscles, and skin of the face up to the orbit and wings of the nose
  - gives off in the neck a. palatina ascendens
  - on the face, the superior and inferior labial arteries (anastomosis with the contralateral side)
  - on the face, the angular artery (anastomosis with the arteries of the eye socket – ophthalmic artery)
- ascending pharyngeal artery
  - branches off near the bifurcation and ascends along the pharynx to the base of the skull
  - supplies the pharynx, dura mater in the posterior cranial fossa, and middle ear
  - posterior meningeal artery (through the jugular foramen)
  - inferior tympanic artery (through the tympanic canaliculus)

# BRANCHES OF THE EXTERNAL CAROTID

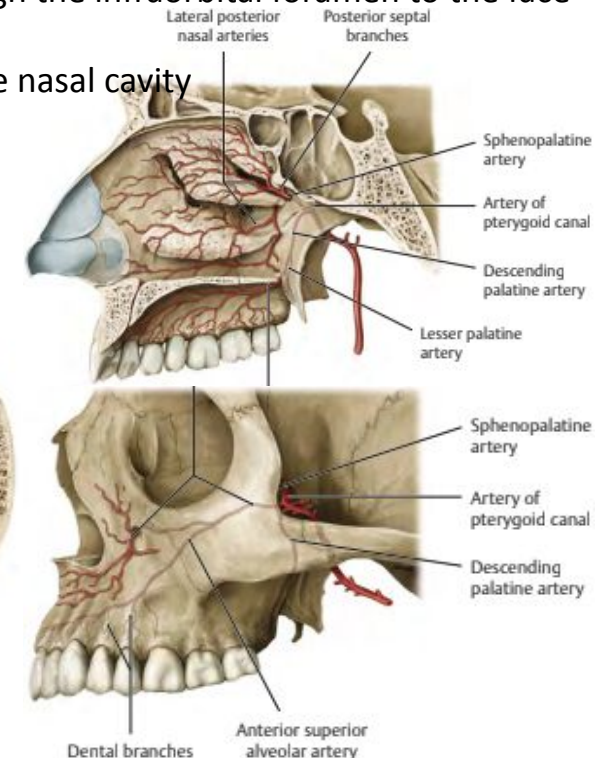
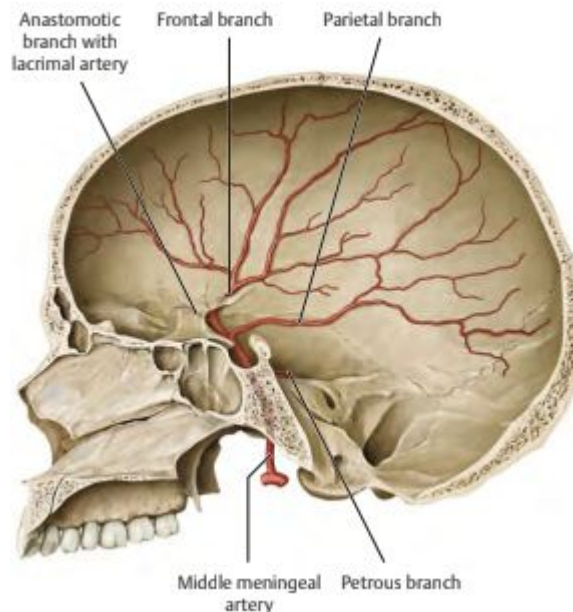
- a. occipitalis
  - under the posterior belly of the digastric muscle to the occipital artery sulcus
  - supplies the sternocleidomastoid muscle, neck muscles, soft coverings of the skull at the back of the head, posterior side of the auricle, posterior cranial fossa
- a. auricularis posterior
  - covered by the parotid gland, then runs along the posterior belly of the digastric muscle to the posterior side of the auricle
  - supplies the auricle, adjacent part of the occiput, middle ear with mastoid cells, and parotid gland
- a. temporalis superficialis
  - rises behind the neck of the mandible covered by the parotid gland, then runs in front of the auricle (palpable pulse) across the zygomatic arch to the temporal region
  - supplies the parotid gland, cheek and facial muscles, eyelids, auricle and external auditory canal, temporal muscle, skin of the lateral surface of the skull

# BRANCHES OF THE EXTERNAL CAROTID

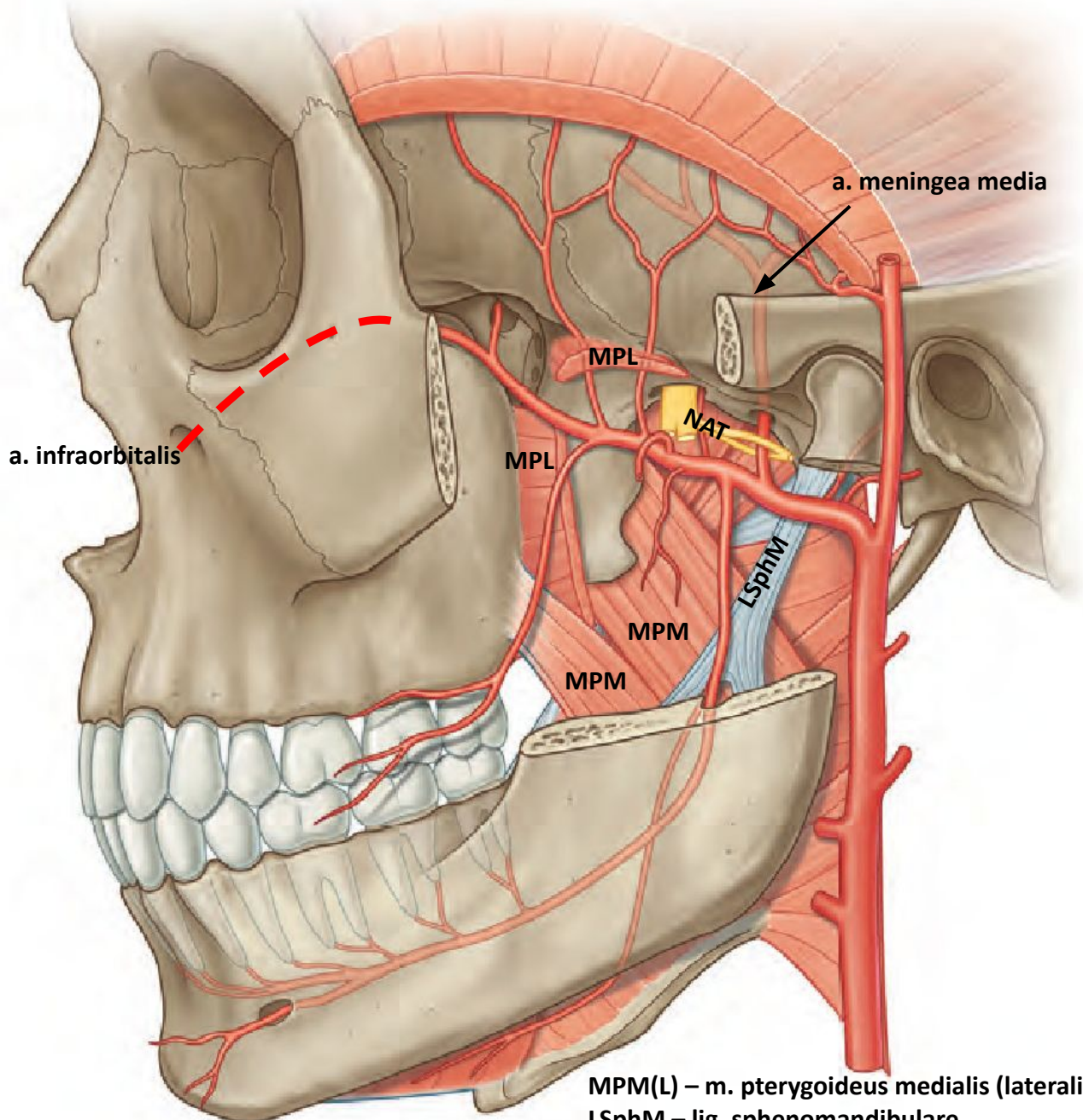
## • a. maxillaris

- behind the parotid gland medially from the temporomandibular joint, runs between the mandibular neck and the sphenomandibular ligament (mandibular part) into the infratemporal fossa, where it runs between the pterygoid muscles (pterygoid part) and ends in the pterygopalatine fossa (pterygopalatine part)
- in **pars mandibularis** gives a. tympanica anterior (into the middle ear cavity through fissura petrotympanica)
- a. meningea media – passes through the n. auriculotemporalis and through the foramen spinosum into the middle cranial fossa and supplies the dura mater
- a. alveolaris inferior – into the canalis mandibulae, ends after passing through the foramen mentale as the r. mentalis
- in the **pars pterygoidea**, it gives off branches for all the masticatory muscles and for the m. buccinator
- in the **pars pterygopalatina**, it gives off a. alveolaris superior posterior – through the openings in the tuber maxillae to the upper molars and premolars
- a. infraorbitalis – through the inferior orbital fissure to the eye socket, through the infraorbital foramen to the face
- a. palatina descendens – into the greater palatine canal
- a. sphenopalatina – final section, through the sphenopalatine foramen to the nasal cavity

*It supplies a part of the external auditory canal and the mucous membrane of the middle ear cavity, the dura mater of the middle cranial fossa and adjacent sections of the calvaria, the mandible and its teeth, the muscles of mastication and the buccinator muscle, part of the maxilla and its teeth, the cheek near the infraorbital foramen, part of the wall of the nasopharynx and the Eustachian tube, the hard and soft palate, and the posterior part of the nasal cavity mucosa.*



# MAXILLARY ARTERY



a. infraorbitalis

a. meningea media

MPL

MPL

NAT

LSphM

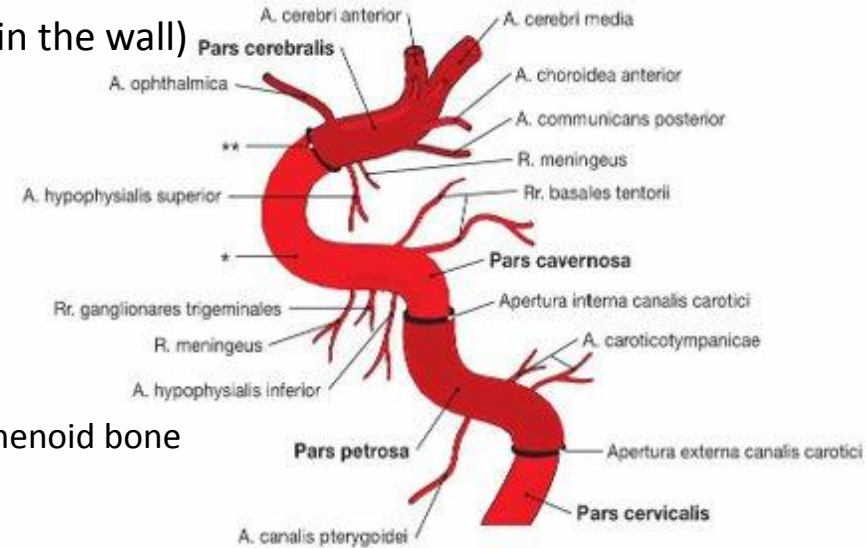
MPM

MPM

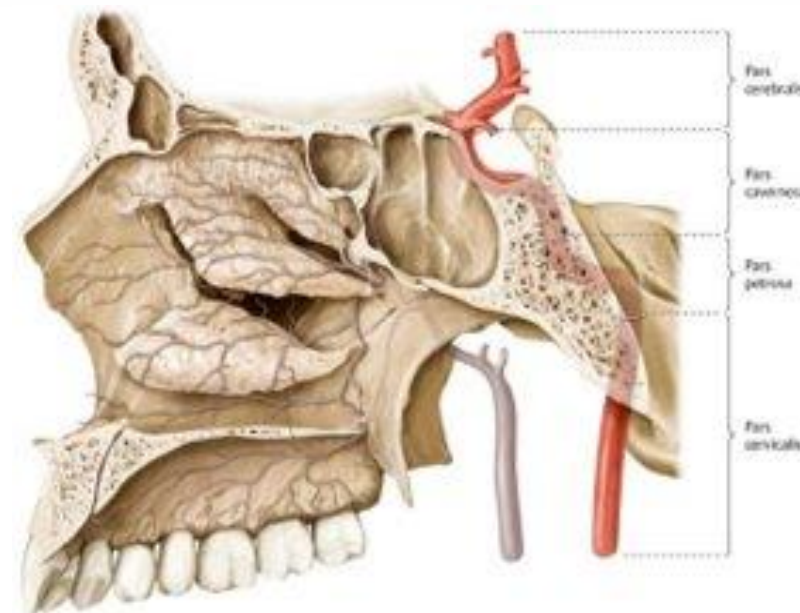
MPM(L) – m. pterygoideus medialis (lateralis)  
LSphM – lig. sphenomandibulare  
NAT – n. auriculotemporalis

# INTERNAL CAROTID ARTERY

- After branching, it runs first laterally and then dorsomedially from the external carotid artery near the lateral wall of the pharynx into the retrostyloid space and into the carotid canal, remaining within the cervical neurovascular bundle throughout, separated from the external carotid artery by the stylopharyngeus and styloglossus muscles, laterally by the internal jugular vein.
- beginning widened into the carotid sinus (baroreceptors in the wall)
- pars cervicalis
  - does not branch in the neck
  - curved like an S before entering the carotid canal
- pars petrosa
  - another S-shaped curve
  - caroticotympanic arteries
- pars cavernosa
  - through the venous sinus cavernosus on the side of the sphenoid bone
  - r. ganglii trigeminalis
  - a. hypophysialis inferior
- pars cerebralis
  - pierces the dura mater and sends
  - a. ophthalmica
  - then branches for the brain – for the blood supply of the CNS

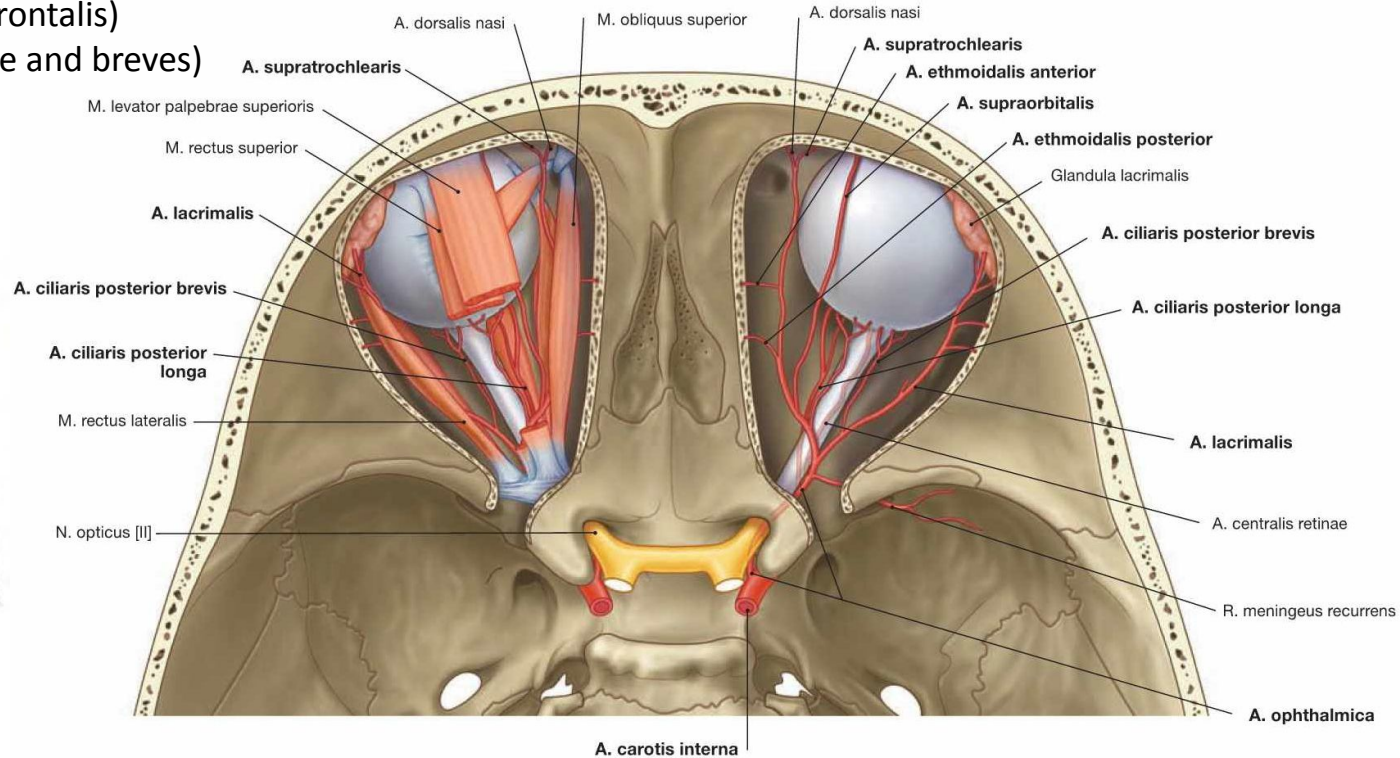
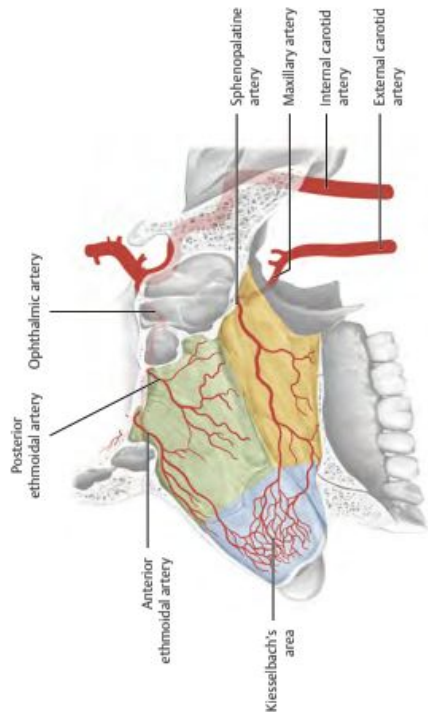
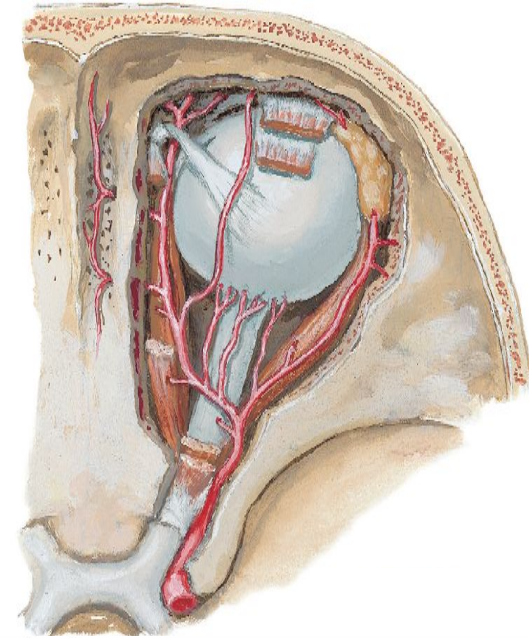


*It supplies the contents of the orbit including the eyeball, the eyelids, the skin of the forehead and the bridge of the nose, the mucous membrane of the middle ear cavity, two areas of the dura mater, the pituitary gland, and the brain.*



# OPHTHALMIC ARTERY

- It branches off from the convexity of the internal carotid artery into the carotid canal, where it lies beneath the optic nerve, then laterally, crossing the optic nerve from above in the orbit and heading toward the inner corner of the eye (anastomosing with the angular artery from the facial artery). The terminal branches are the supratrochlear artery and the dorsal nasal artery.
- supplies the entire contents of the orbit (including the eyeball), eyelids, skin on the forehead and bridge of the nose
- a. centralis retinae
- a. lacrimalis
- a. supraorbitalis (incisura supraorbitalis)
- a. ethmoidalis posterior
- a. ethmoidalis anterior – r. meningeus anterior
- a. supratrochlearis (incisura frontalis)
- aa. ciliares posteriores (longae and breves)



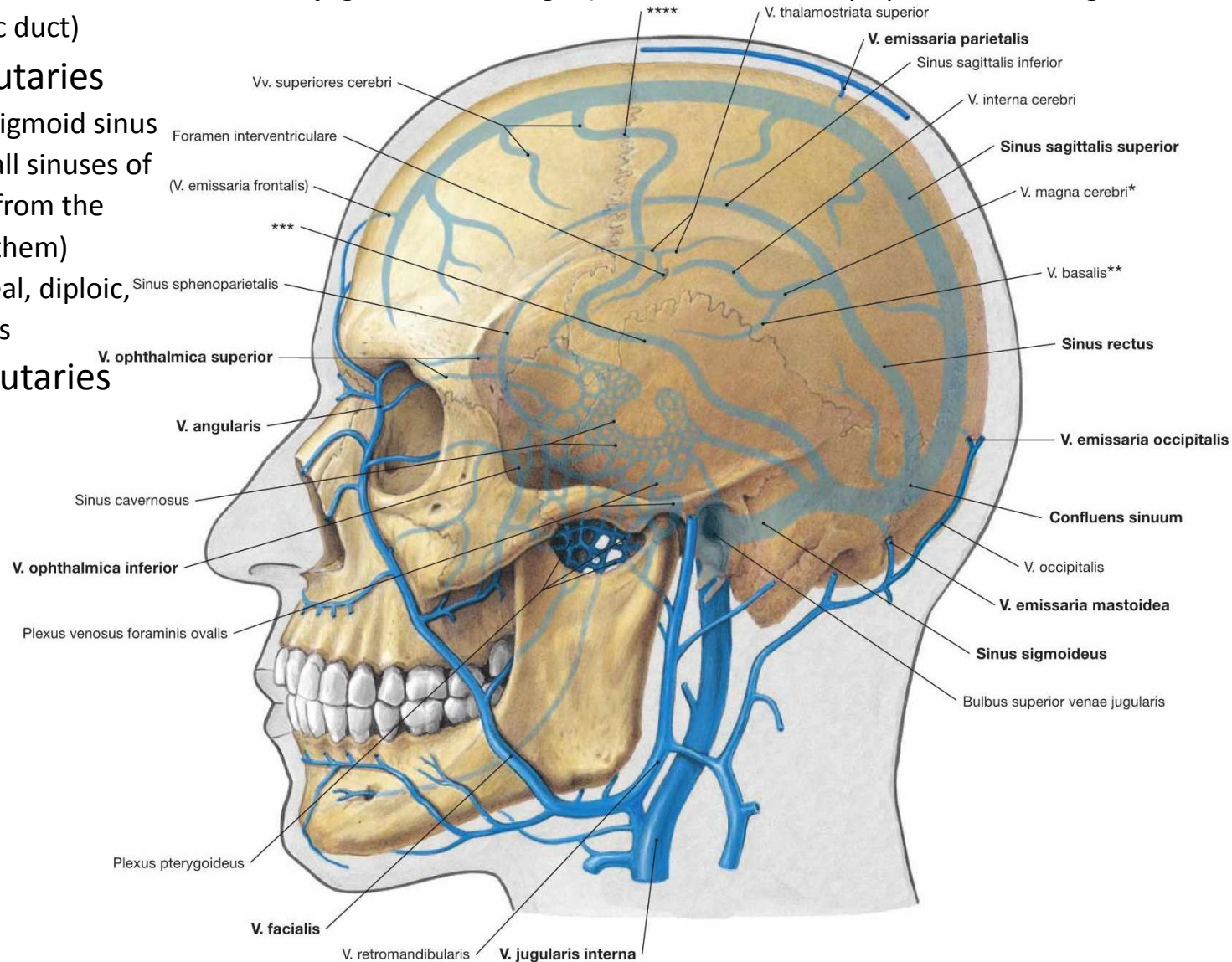
# INTERNAL JUGULAR VEIN

- begins at the basis cranii externa as the bulbus venae jugularis superior (continuation of the sinus sigmoideus, foramen jugulare)
- descends in the cervical neurovascular bundle to the inferior jugular vein bulb
- behind the clavicle, it joins the subclavian vein = jugular venous angle (mouth of the main lymphatic trunks: right lymphatic duct, thoracic duct)

## • 1. intracranial tributaries

- IJV connects to the sigmoid sinus (carries blood from all sinuses of the dura mater and from the veins that flow into them)
- encephalic, meningeal, diploic, and ophthalmic veins

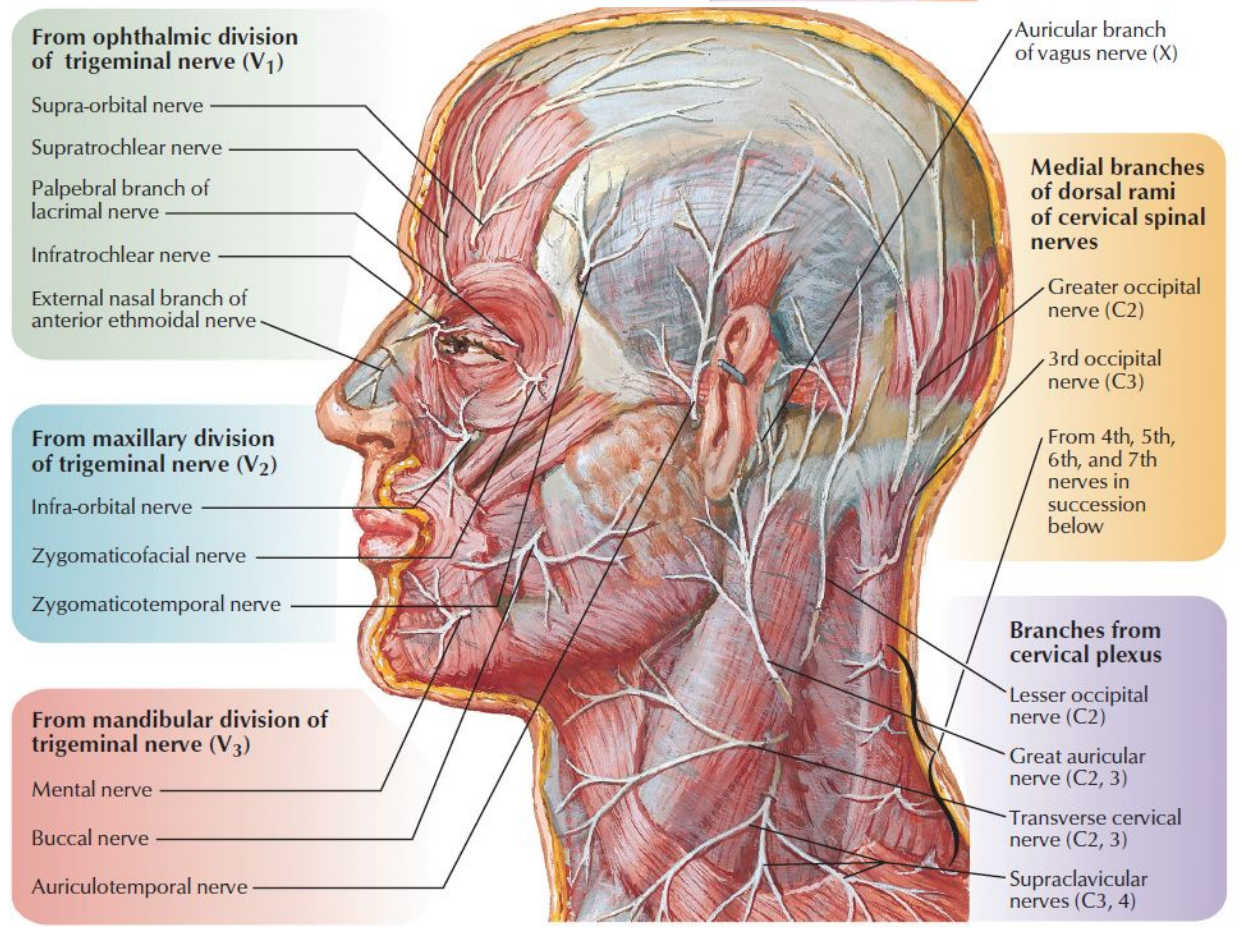
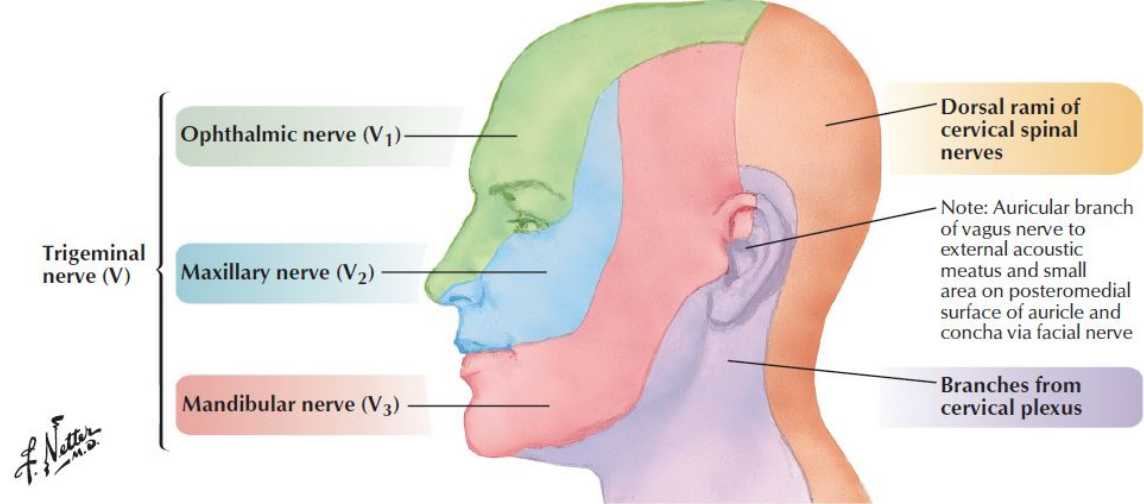
## • 2. extracranial tributaries



# INTERNAL JUGULAR VEIN – EXTRACRANIAL TRIBUTARIES

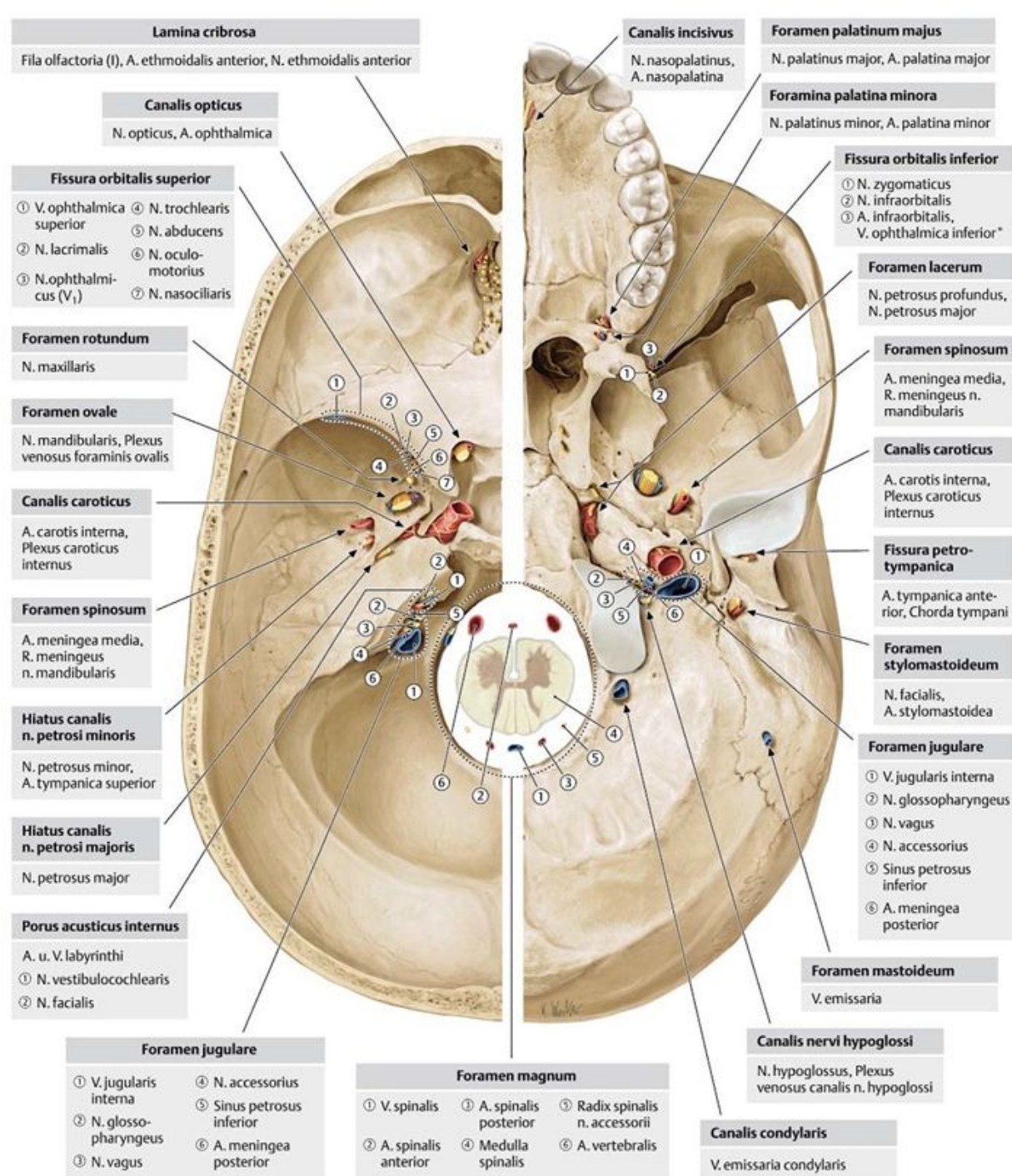
- **v. retromandibularis**
    - formed by the confluence of v. temporalis superficialis, media, and v. transversa faciei behind ramus mandibulae, descends behind angulus mandibulae, pierces the superficial cervical fascia, and enters v. jugularis interna
    - vv. maxillares from fossa infratemporalis
    - plexus pterygoideus – venous plexus in the infratemporal fossa; veins from the infratemporal fossa and pterygopalatine fossa, both jaws, orbit, from the cranial cavity; connections with veins of the orbit, face (superficial and deep), with vv. meningae and vv. emissariae of the middle cranial fossa (infection!!!)
  - **vv. pharyngeae**
    - smaller veins below the base of the skull, blood from the plexus pharyngeus
  - **v. facialis**
    - blood from the face, anastomosis with v. ophthalmica superior
  - **v. lingualis**
    - receives v. comitans nervi hypoglossi
  - **v. thyroidea superior**
    - from the larynx v. laryngea superior
  - **v. thyroidea media**
    - inconsistent, from the side of the thyroid gland in front of the a. carotis communis
  - **v. jugularis externa**
    - superficial vein on the outer side of the neck
    - begins below the mastoideus process confluence of v. auricularis posterior and v. occipitalis, descends caudally below m. platysma behind the posterior edge of m. sternocleidomastoideus, empties into bulbus inferior v. jugularis int./into v. subclavia
    - v. jugularis anterior – descends in the superficial cervical fascia (arcus venosus juguli – transverse connection of vv. jugulares anteriores in the fossa jugularis)
- opens into the internal jugular vein (at the level of the hyoid bone):
- a) separately
  - b) connected in various ways
  - c) thyrolingual trunk, thyrolinguofacial trunk

# SENSORY INNERVATION



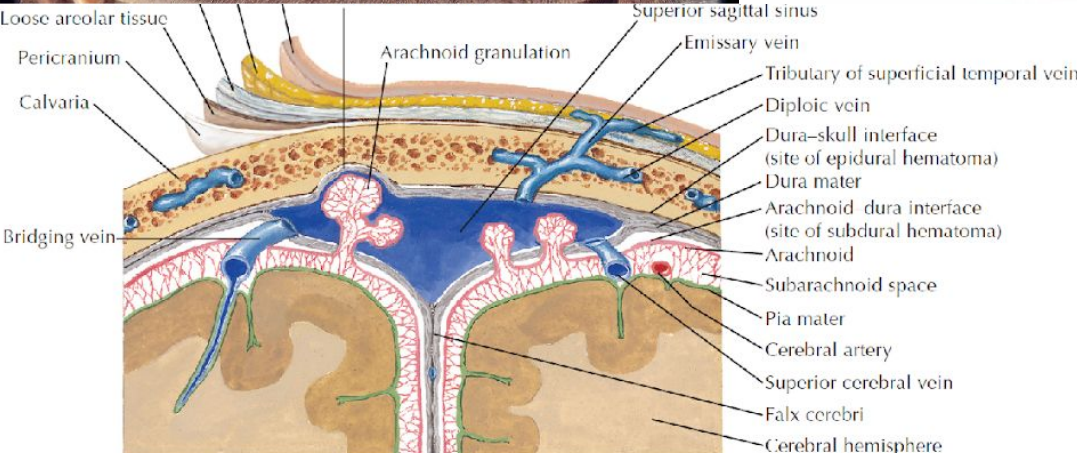
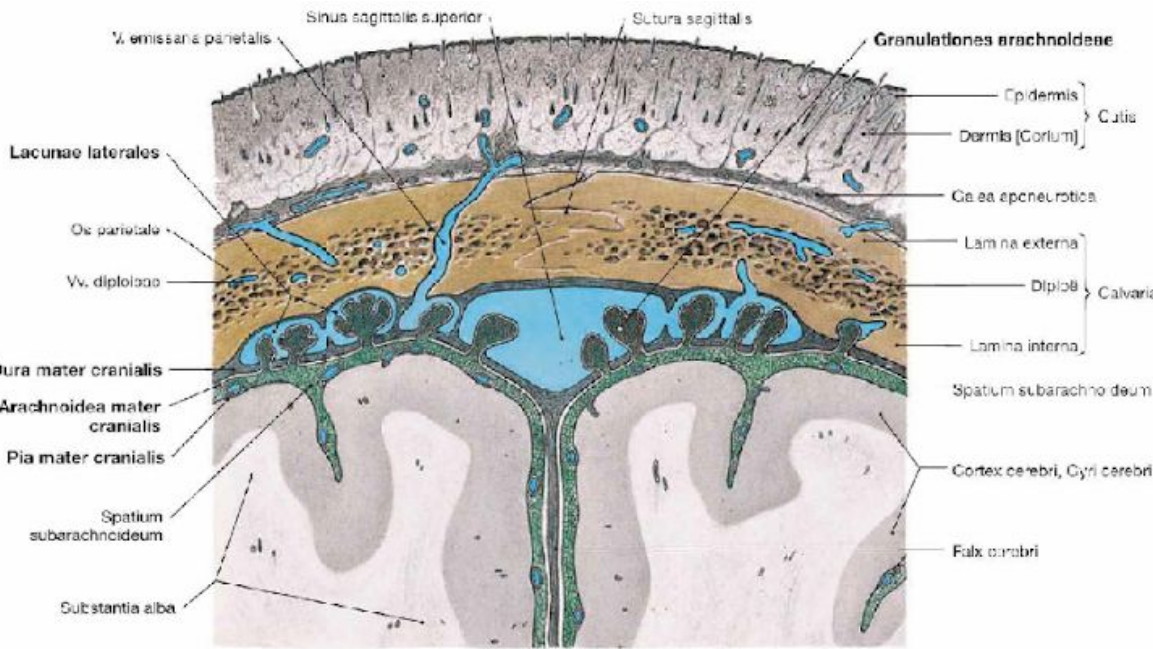
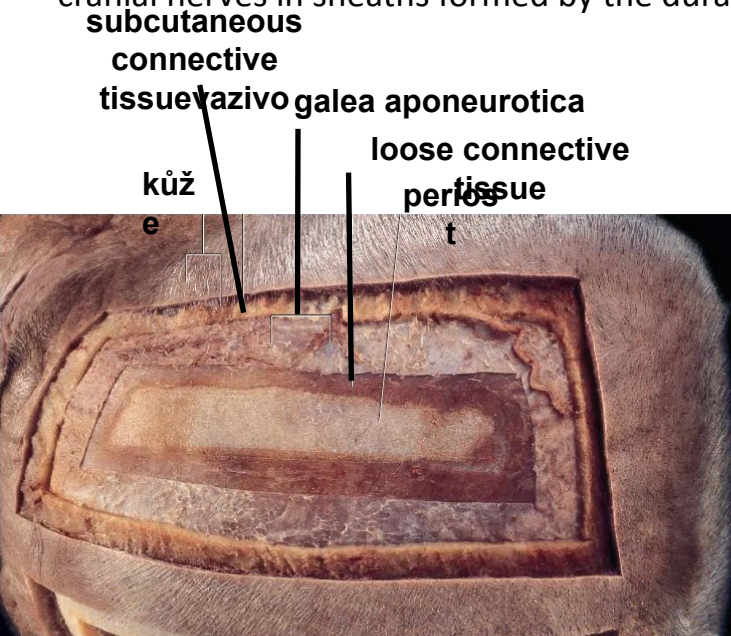
# CRANIAL BASE

- external:** in the anterior cranial fossa, it is adjacent to the cavitas nasi and cavitas oris; middle fossa – sphenoid sinus, cartilaginous part of the auditory tube, pterygopalatine fossa, infratemporal fossa, temporomandibular joint; posterior fossa – attachment of the pharynx with the parapharyngeal space, atlantooccipital joint, attachments of the neck muscles
- internal:** **anterior** cranial fossa (frontal lobes of the hemispheres, olfactory bulb, optic canal, ethmoid foramina), **middle** (hypophyseal fossa, cavernous sinus, III, IV, V1, V2, V3, ACI, VI, superior orbital fissure, for. rotundum, ovale, spinosum, trigeminal ganglion, sphenopetros synchondrosis), **posterior** (foramen magnum, internal acoustic meatus with VII and VIII, jugular foramen with sigmoid sinus and superior bulb and IX, X, XI, hypoglossal canal, condylar canal) Translated with DeepL.com (free version)



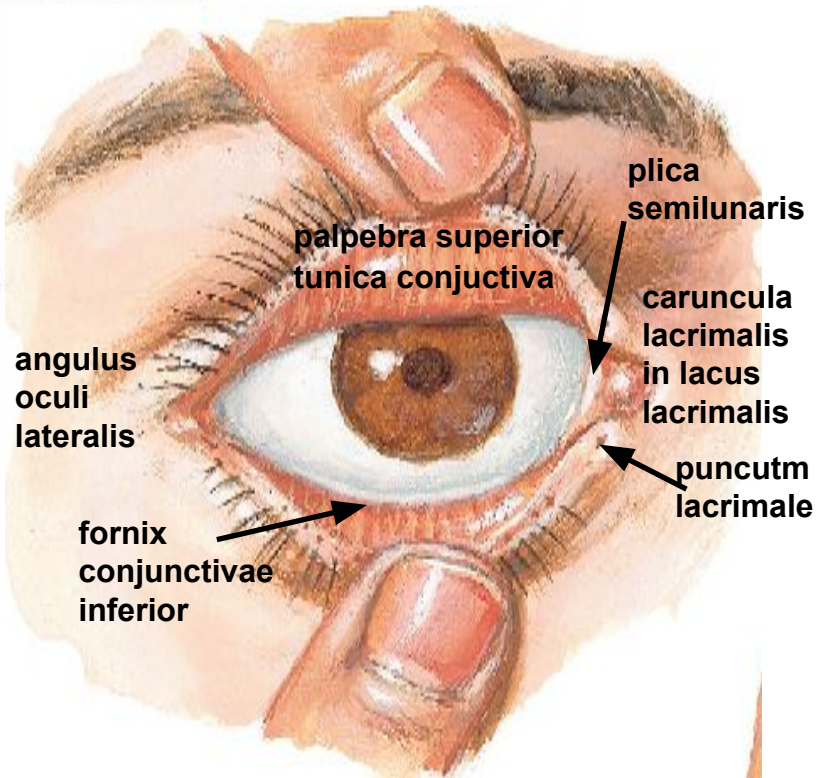
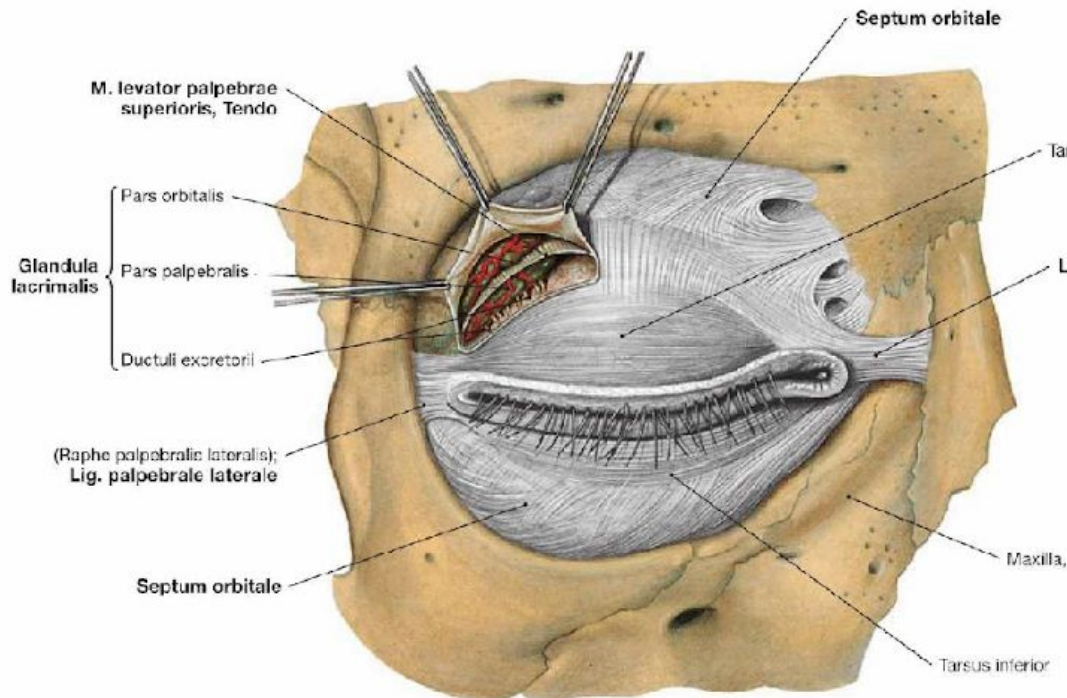
# REGIO FRONTALIS, PARIETALIS, TEMPORALIS ET OCCIPITALIS

- boundaries: divided according to bones of the same name
- layers: skin, subcutaneous tissue, m. epicranii with galea aponeurotica (+ m. temporalis), subgaleal tissue, pericranium (periosteum), bone, periosteum, dura mater (fused with periosteum), arachnoid, pia mater
- intracranial venous sinuses (sagittal sinus, confluence of sinuses, transverse sinus, occipital sinus) between the periosteum and dura mater
- cranial nerves in sheaths formed by the dura



# REGIO ORBITALIS

- boundaries: orbicularis oculi muscle
- layers: cortex with subcutis, orbicularis oculi muscle, tarsal plate, connective tissue, tunica conjunctiva palpebrarum, capillary slit, tunica conjunctiva bulbi
- in the subcutis of the eyelids, arterial arches arcus palpebralis superior et inferior (anastomosis of ECA with ICA)
- pars palpebralis glandulae lacrimalis



# REGIO NASALIS, ORALIS, BUCCALIS ET MENTALIS

## nasalis

- boundaries: root of the nose, inner corner of the eye, circumference of the ala nasi
- underlying structure: bony and cartilaginous skeleton of the nose
- m. nasalis, m. procerus
- a. dorsalis nasi, a. angularis, a. infraorbitalis; sensory V1 and V2, muscles VII.

## oralis

- boundaries: upper and lower lip, nasolabial and mentolabial sulcus
- layers: skin, subcutaneous tissue, m. orbicularis oris without fascia, attached to it are the facial muscles (modiolus), submucosa, vestibulum oris mucosa
- a. labialis superior et inferior; sensory V2 (upper lip) and V3 (lower lip), muscles VII.

## buccalis

- boundaries: nasolabial sulcus, lower eyelid circumference, edge of corpus mandibulae
- layers: skin, subcutaneous tissue, superficial layer of facial muscles (pars orbicularis m. orbicularis oculi, m. levator labii superioris alaeque nasi, m. levator labii superioris, mm. zygomatici, m. risorius, m. levator anguli oris, upper part of m. platysma), spatium intermusculare (dorsally with corpus adiposum buccae), vasa facialia with branches (especially v. profunda faciei to plexus pterygoideus – inflammation!), edge of m. masseter, branches of VII., ductus parotideus, m. buccinator with fascia buccopharyngea, submucosa, mucosa vestibulum oris

## mentalis

- boundary: sulcus mentolabialis, lower edge of mandibula
- in subcutis chin group of facial muscles, n. mentalis



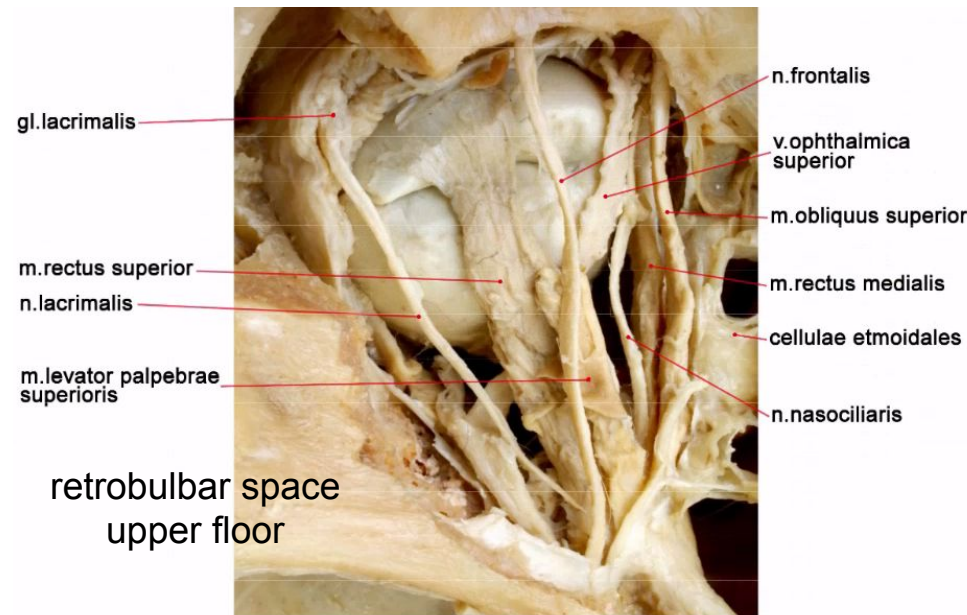
- 1 - Venter frontalis musculi occipitofrontalis
- 2 - M. procerus
- 3 - M. nasalis
- 4 - M. levator labii sup. aleque nasi
- 5 - M. levator labii sup.
- 6 - V. facialis
- 7 - M. levator anguli oris
- 8 - A. facialis
- 9 - M. zygomaticus major
- 10 - Plex. intraparotideus
- 11 - Ductus parotideus
- 12 - Glandula parotidea
- 13 - M. masseter
- 14 - M. depressor anguli oris
- 15 - M. depressor labii inf.
- 16 - M. orbicularis oris
- 17 - M. mentalis
- 18 - M. orbicularis oculi
- 19 - V. submandibularis
- 20 - Glandula submandibularis



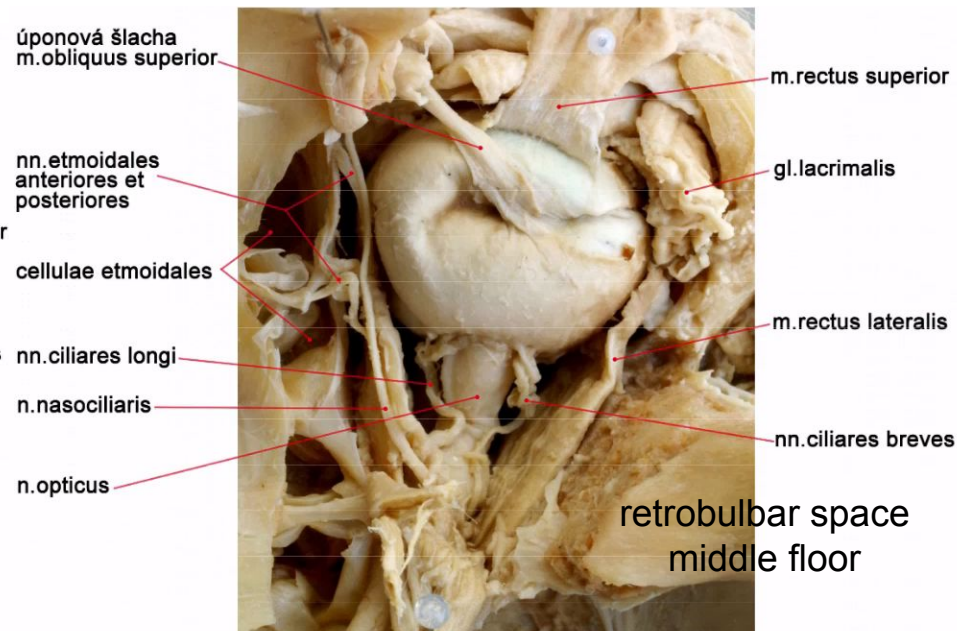
- 1 - N. auriculotemporalis
- 2 - Rr. temporales (n. facialis)
- 3 - Plex. intraparotideus
- 4 - Rr. zygomatici (n. facialis)
- 5 - Ductus parotideus
- 6 - Rr. buccales (n. facialis)
- 7 - Glandula parotis
- 8 - M. masseter
- 9 - Rr. baccuales (n. facialis)
- 10 - R. colli (n. facialis)
- 11 - A. facialis
- 12 - V. facialis

# ORBIT

- **aditus** orbitae, **medial** wall (frontalis maxillae process, lacrimal bone, orbital lamina (papyracea) of the ethmoid bone, lesser wing of the sphenoid bone), **roof** (orbital part of the frontal bone, lesser wing of the sphenoid bone), **lateral** wall (facies orbitalis ossis zygomatici, facies orbitalis alae majoris ossis sphenoidalis), **floor** (facies orbitalis ossis zygomatici, facies orbitalis corporis maxillae, proc. orbitalis laminae perpendicularis ossis palatini), **apex** orbitae
- the bulbar compartment contains the eyeball, lacrimal gland, and lacrimal drainage pathways
- the retrobulbar compartment contains retrobulbar fat and three layers:
  - above the levator palpebrae superioris muscle (including): n. and vasa lacrimalia and frontalia, IV
  - between MLPS and II.: extraocular muscles (without rectus inf., obliquus inf.) – begin as anulus tendineus communis, V1, II., III., VI., ggl. ciliare, branches of a. ophthalmica, tributaries of v. ophth. sup.
  - below II.: m. rectus inf., m. obliquus inf., n. and vasa infraorbitalia, n. zygomaticus

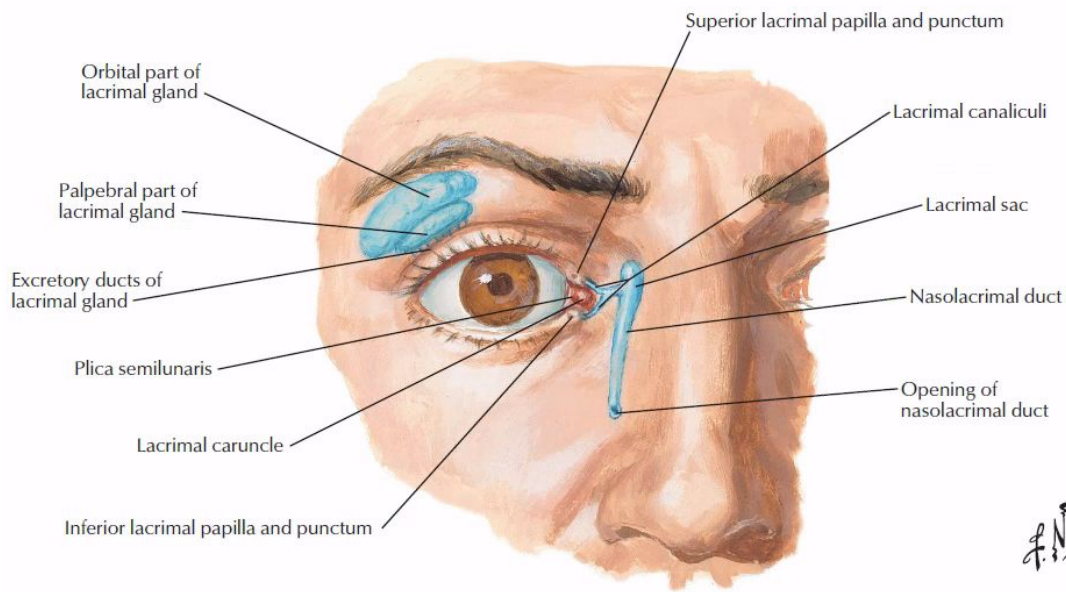


Retrobulbární prostor - horní etáž (orbita sin.)

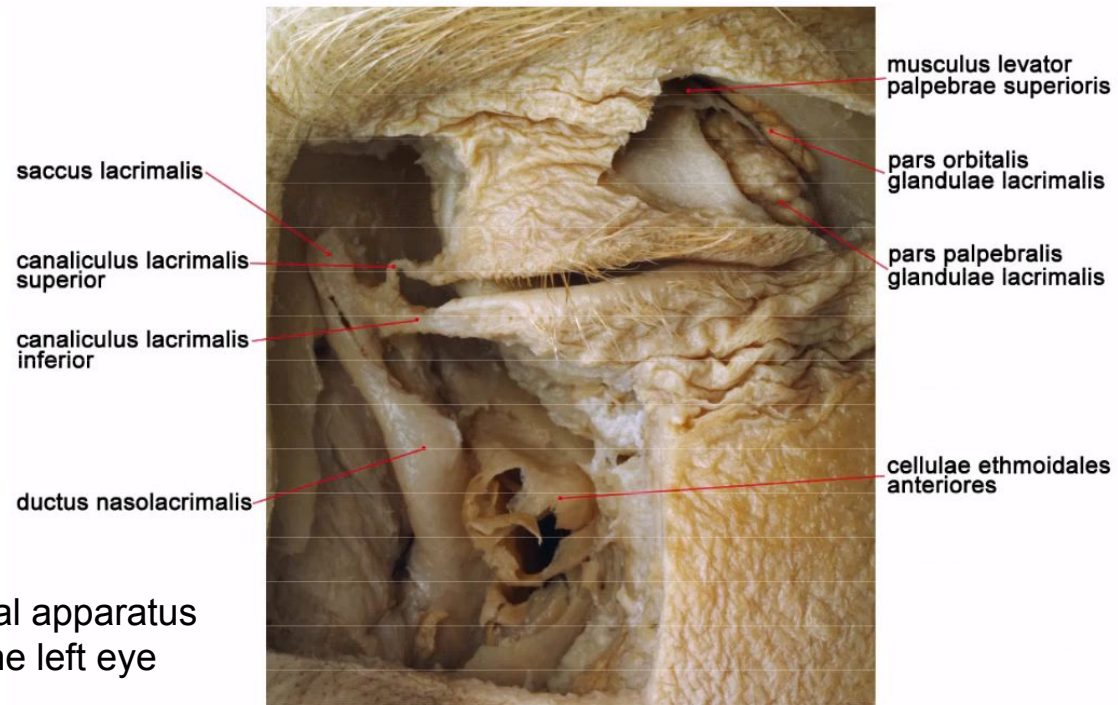


Retrobulbární prostor - střední etáž

# ORBITA

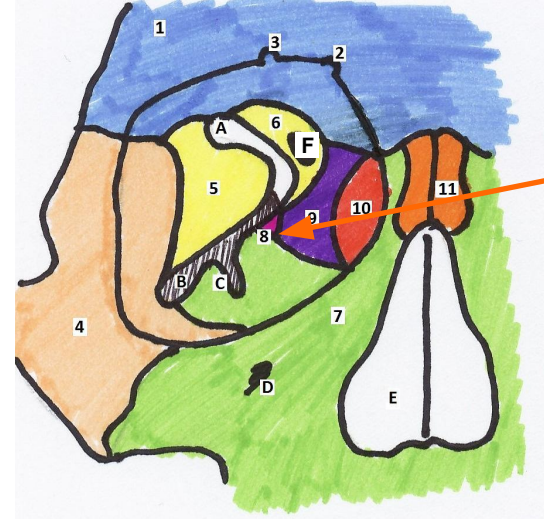
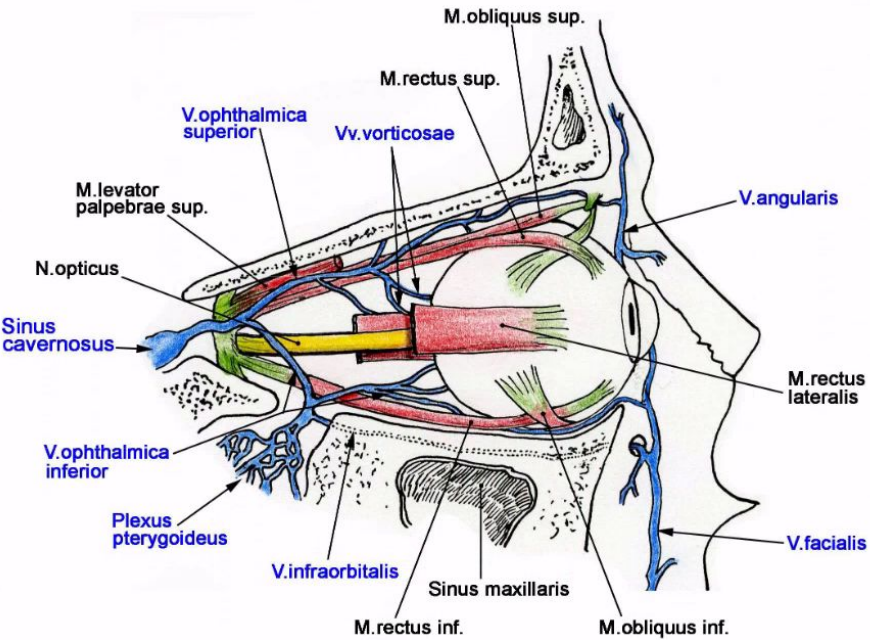


*F. Netter M.D.*

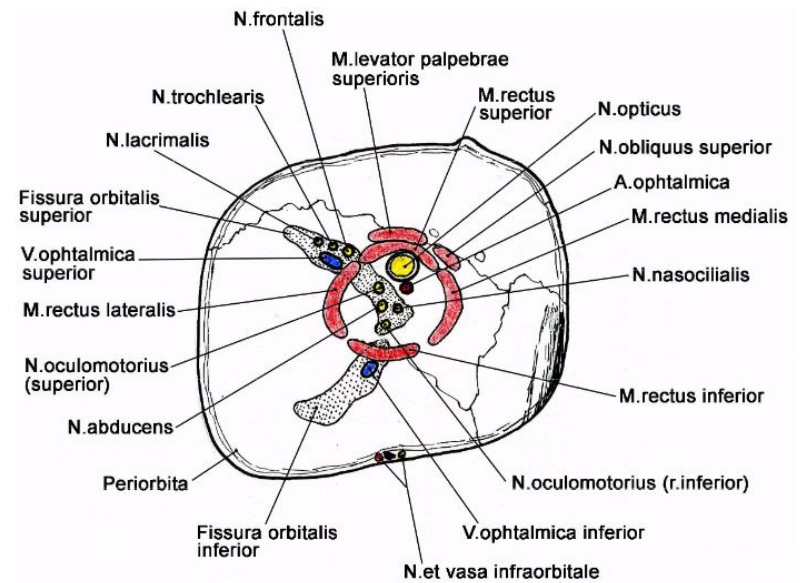
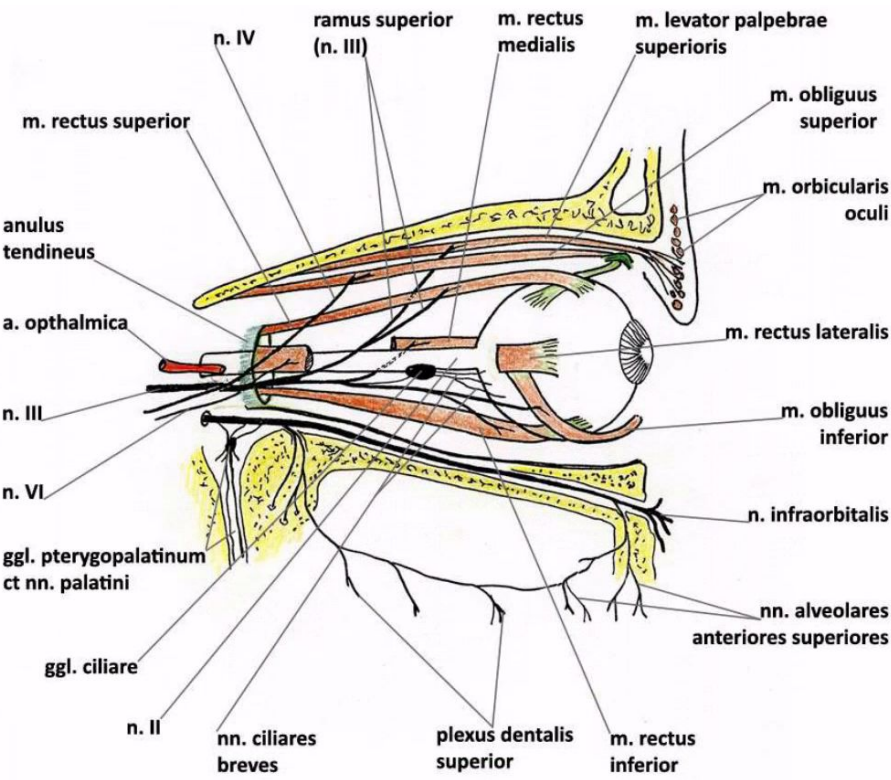


lacrimal apparatus  
of the left eye

Slzní aparát levého oka (pohled zředu)

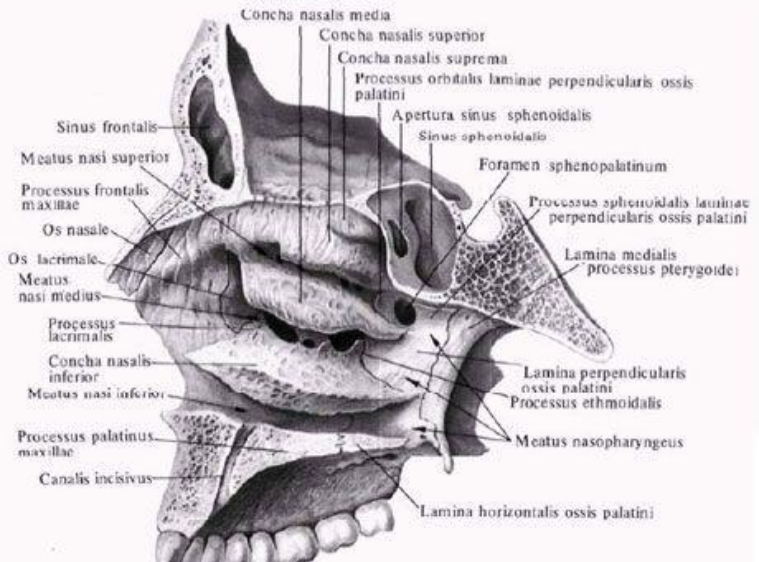
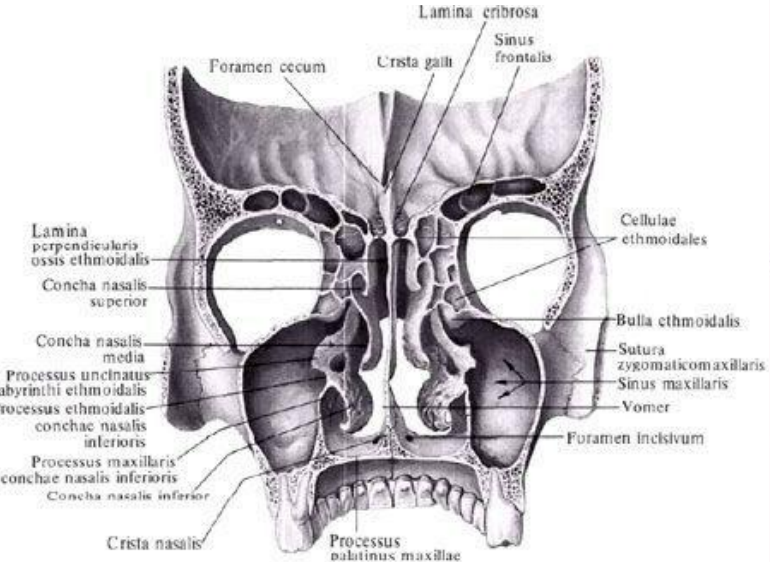
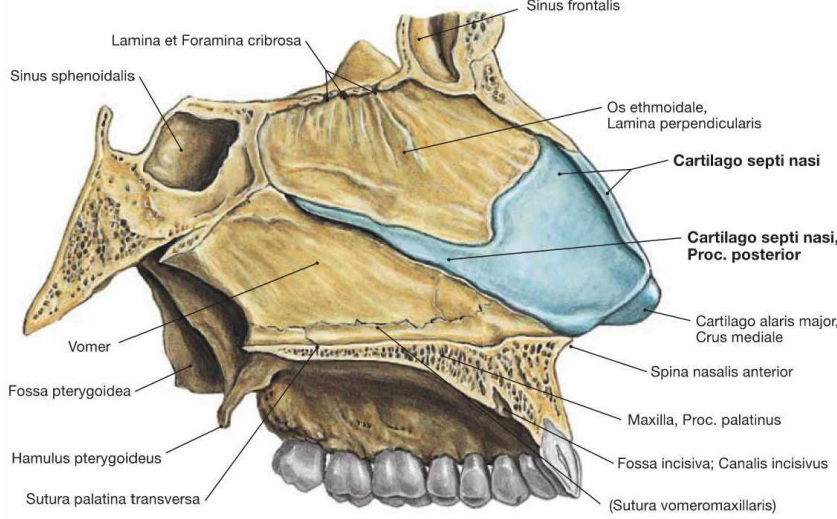


- 1 - os frontale
  - 2 - incisura frontalis
  - 3 - incisura supraorbitalis
  - 4 - os zygomaticum
  - 5 - ala major ossis sphenoidalis
  - 6 - ala minor ossis sphenoidalis (s. canalis opticus)
  - 7 - maxilla
  - 8 - processus orbitalis ossis palatini
  - 9 - lamina orbitans (papyracea) ossis ethmoidalis
  - 10 - os lacrimale
  - 11 - os nasale
- A - fissura orbitalis sup.  
 B - fissura orbitalis inf.  
 C - sulcus infraorbitalis  
 D - foramen infraorbitale  
 E - apertura piriformis nasi  
 F - canalis opticus



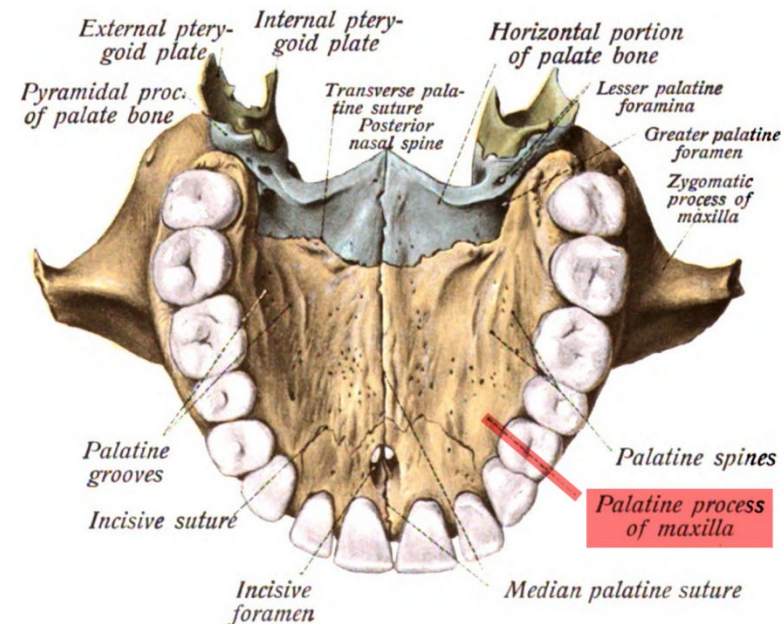
# NASAL CAVITY

- entrance: nares and vestibulum nasi
- choanae open into the nasopharynx
- septum nasi divides it into
  - pars ossea
  - pars cartilaginea
  - pars membranacea (cutanea)
- concha media et inferior separate the nasal passages
  - meatus nasi superior, medius et inferior
- roof
  - ossa nasalia, pars nasalis ossis frontalis, lamina cribrosa ossis ethmoidalis, corpus ossis sph.
- floor
  - premaxilla, maxilla (palatine process), palatine bone (horizontal lamina)
- lateral wall
  - maxilla (corpus and frontal process), lacrimal bone, ethmoid labyrinths, perpendicular lamina of the palatine bone, medial lamina of the pterygoid process of the sphenoid bone

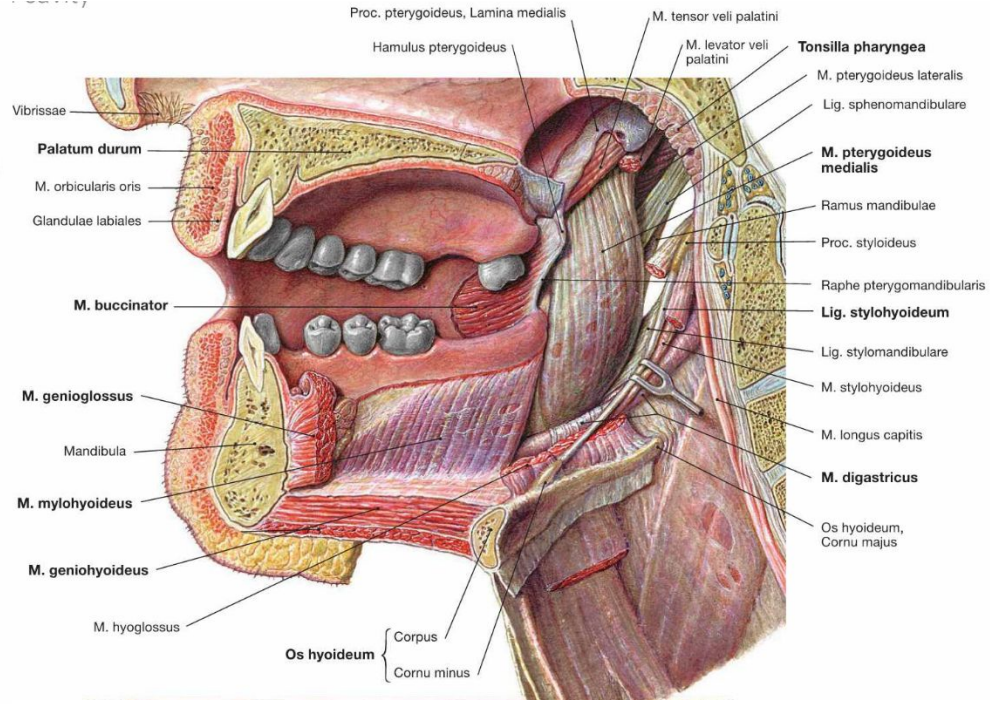
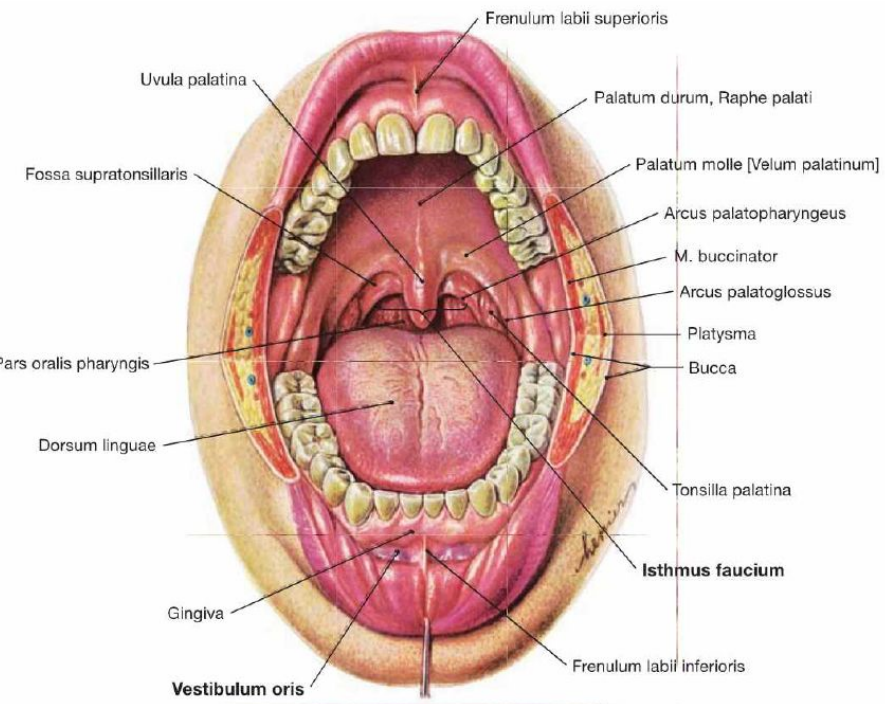


# ORAL CAVITY

- boundaries
  - rima oris, isthmus faucium, labia oris, buccae, palatum, floor of the mouth (m. geniohyoideus, m. mylohyoideus, m. genioglossus – lingua)
- vestibulum oris
  - boundaries: lips, cheeks, vestibular surfaces of teeth, gums, larger gap behind the last molars – communication with cavitas oris propria
  - fornix vestibuli superioris et inferioris, frenulum labii superioris et inferioris
  - papilla parotidea (level of upper M2 crown) – opening of ductus parotideus from glandula parotidea
- labia oris
  - labium superius – borders: lower edge of the nose, nasolabial sulcus; philtrum, tuberculum labii superioris
  - labium inferius – borders: mentolabial sulcus
- bucca
  - borders: zygomatic arch, edge of the mandible, corner of the mouth, nasolabial sulcus
  - m. buccinator, corpus adiposum buccae, m. masseter
- gingiva
  - margo gingivalis, sulcus gingivalis, papillae gingivales
  - gingivodental junction



# CAVITAS ORIS

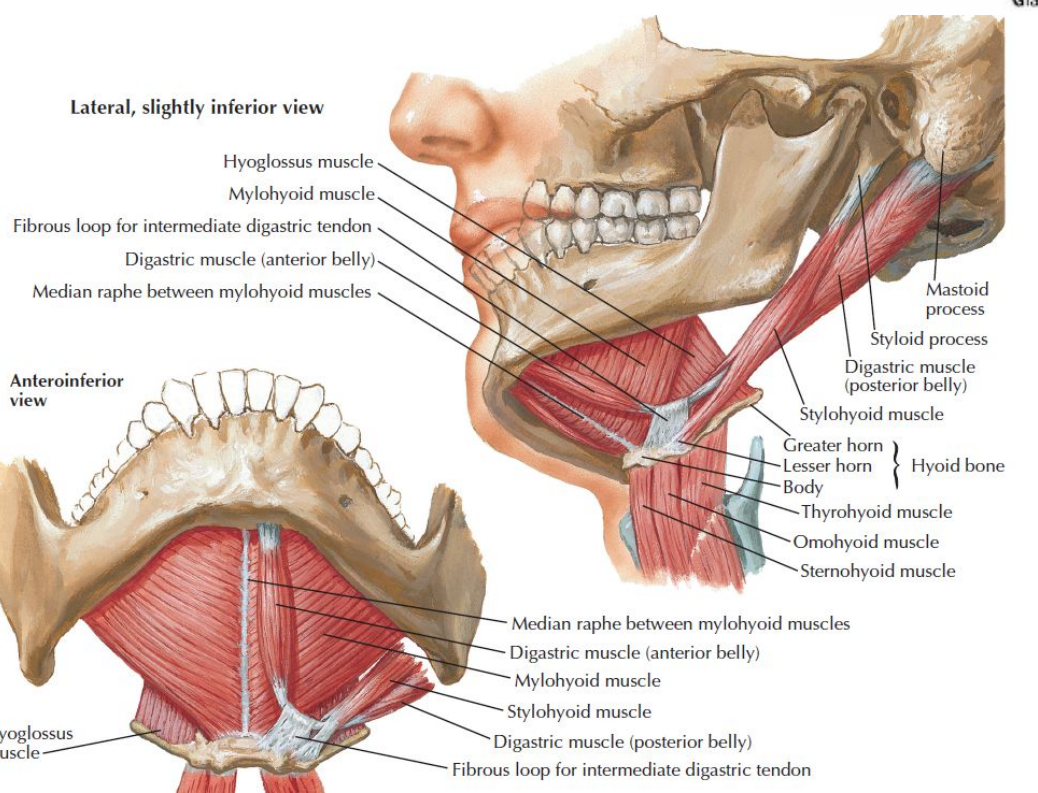
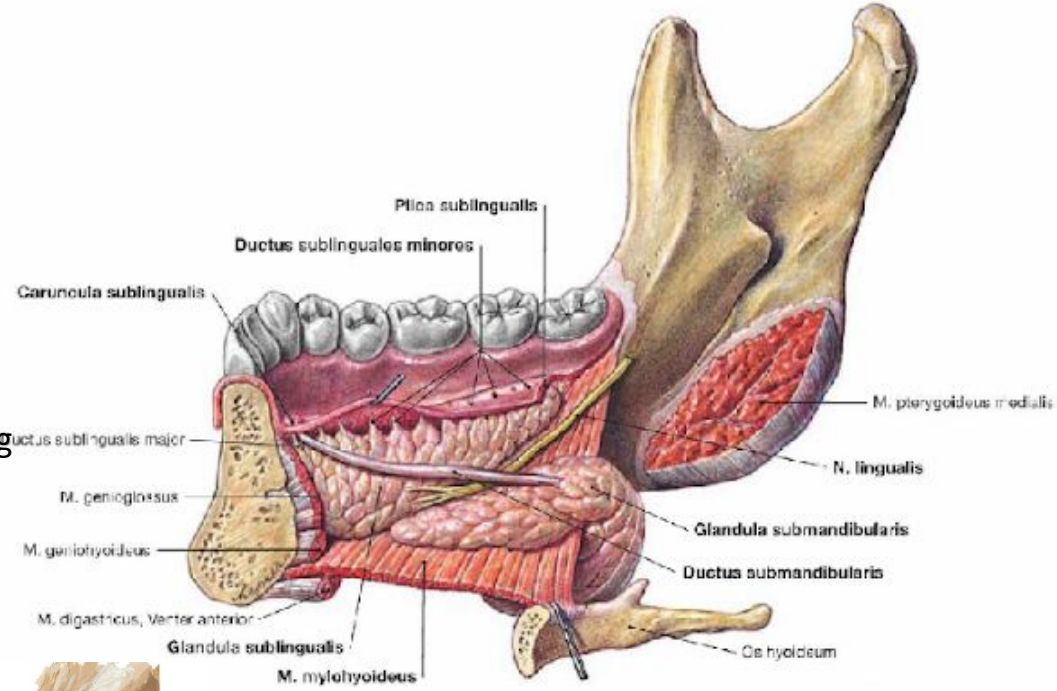


# TONSILLAR REGION

- between the arcus palatoglossus and palatopharyngeus tonsilla palatina (laterally covered by the capsula tonsillaris), which presses on the upper and middle pharyngeal sphincters, and externally on the m. styloglossus and stylopharyngeus
- between the capsule and the muscles of the pharynx, the spatium peritonsillare with the tonsillar branches of the descending palatine artery, the lingual artery, the ascending pharyngeal artery, the ascending palatine artery, and the tonsillar plexus, which drains into the paratonsillar vein

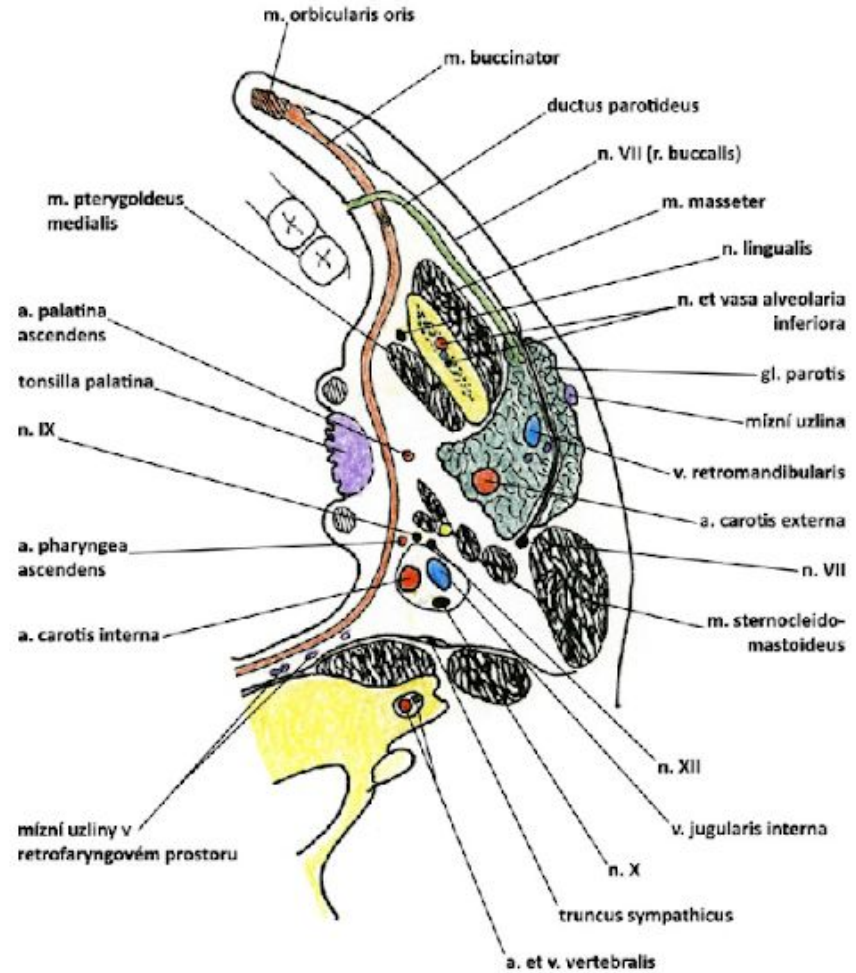
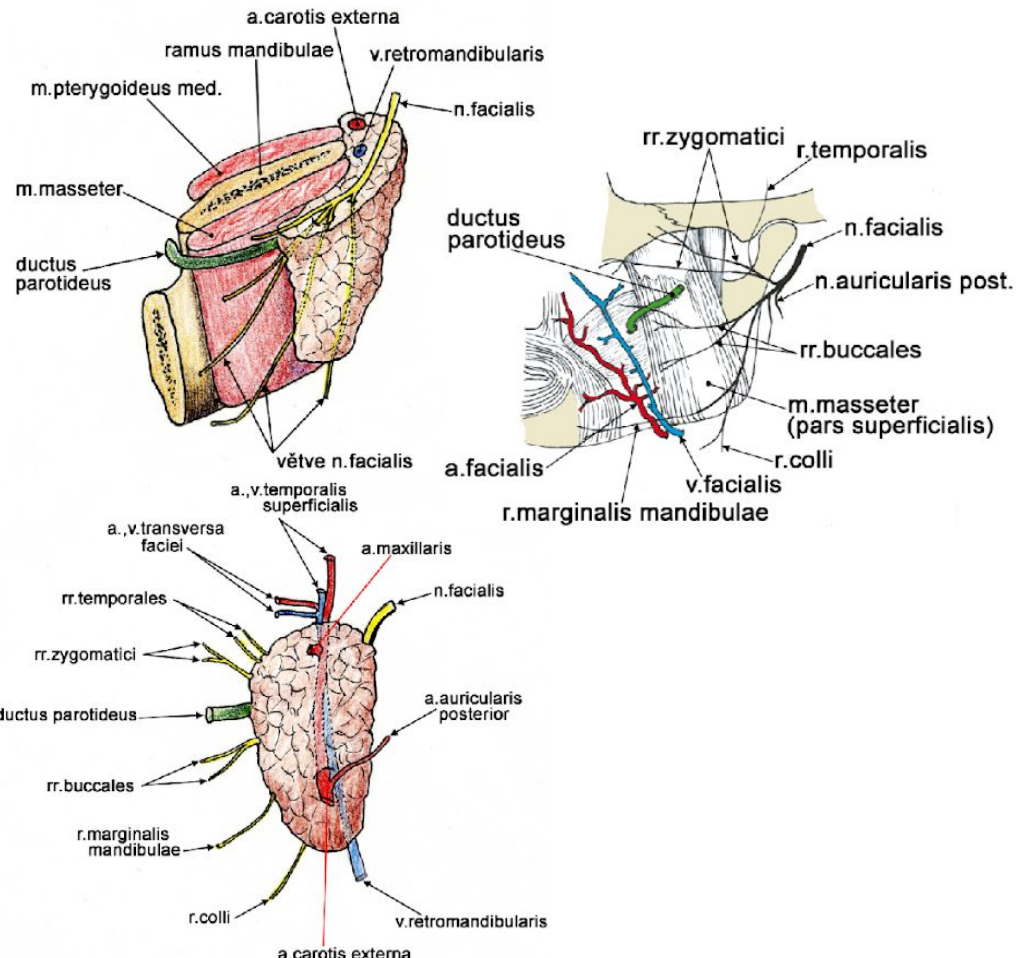
# REGIO SUBLINGUALIS

- borders: laterally – fovea sublingualis mandibulae; medially – m. hyoglossus, m. genioglossus, m. geniohyoideus; dorsocranially – m. styloglossus; caudally and laterally – m. mylohyoideus; roof – mucosa of the floor of the oral cavity
- gl. sublingualis (ductus submandibularis runs along the medial surface), processus anterior gl. submandibularis, n. lingualis and branches, XII. (along the external surface of m. hyoglossus) with v. comitans nervi hypoglossi



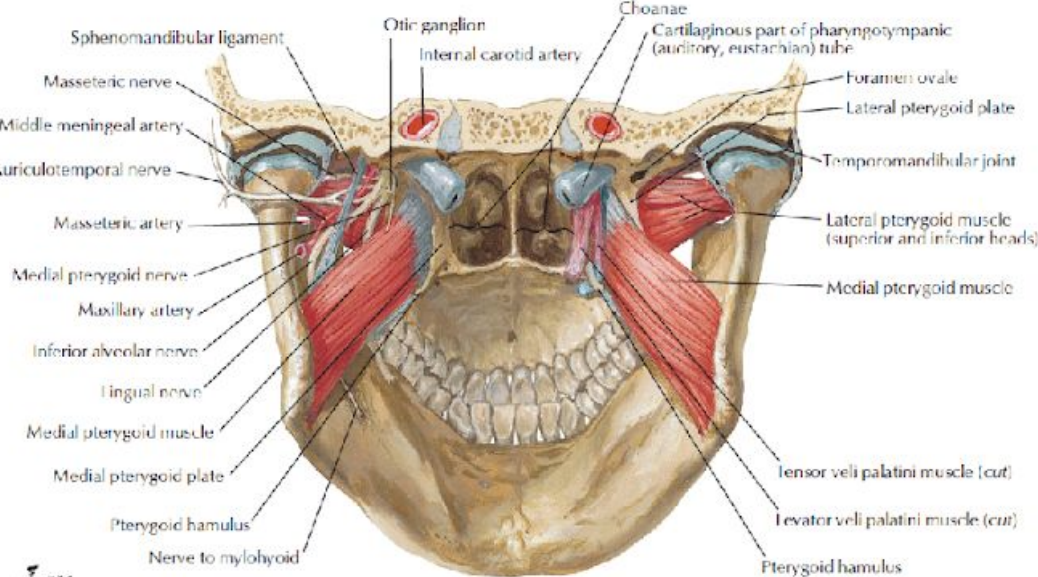
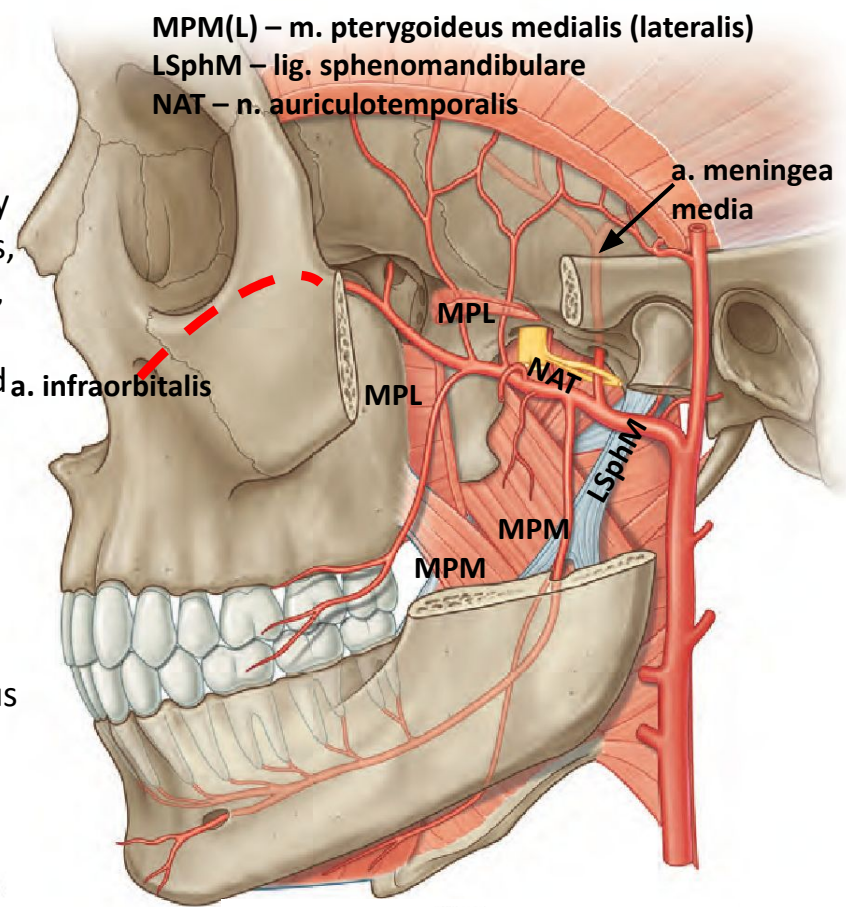
# REGIO PAROTIDOMASSETERICA

- boundaries: zygomatic arch, anterior border of the masseter muscle, lower border of the mandible, line connecting the mandibular angle with the anterior border of the external auditory meatus
- layers: skin covered with beard in men, subcutaneous branches VII, n. auricularis magnus, n. auriculotemporalis, vasa temporalia spf., glandula parotis (inside plexus parotideus VII; ACE – ATSpf., AMax.; VRetrom = VTSpf.+VVMMax.), internally and caudally m. masseter (gland and muscle covered by fascia parotidomasseterica – from arcus zygomaticus to the edge of the mandible (thickened in tractus angularis) and further to the neck as lamina superficialis)
- gl. parotis dorsally to m. sternocleidomastoideus, ventrally art. temporomandibularis

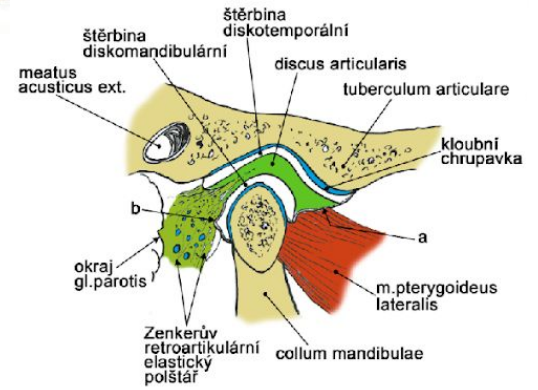


# REGIO INFRATEMPORALIS

- boundaries: medially (lateral lamina of the sphenoid process, superior pharyngeal constrictor muscle), laterally (mandibular ramus), ventrally (infratemporal surface of the maxilla), inferiorly (superior alveolar nerve), superior pterygoidei ossis sphenoidalis, m. constrictor pharyngis superior), laterally (ramus mandibulae), ventrally (facies infratemporalis corporis maxillae), roof (facies infratemporalis alae majores ossis sphenoidalis), dorsally (styloid a. infraorbitalis septum – muscles originating from proc. styloideus)
- foramen ovale, foramen spinosum, foramen mandibulae, foramina alveolaria, fissura orbitalis inferior, medially fossa pterygopalatina, ventrocaudally trigonum submandibulare
- mm. pterygoidei, a. maxillaris with branches, plexus pterygoideus with dorsal Zenker's cushion, branches V3, ganglion oticum



Posterior view



Kloubní pouzdro a - přední část b - zadní část

Čelistní kloub pravé strany sagitální řez

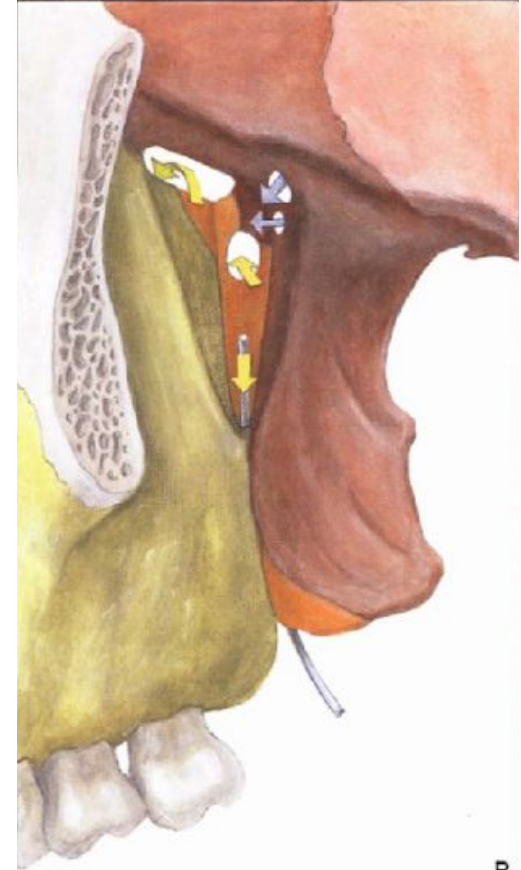
*Handwritten signature*

- 1 - Ductus parotideus (odsunut)
- 2 - Aa. temporales prof.
- 3 - Plex. intraparotideus
- 4 - A. temporalis spfc.
- 5 - A. maxillaris
- 6 - N. buccalis
- 7 - N. lingualis
- 8 - N. alveolaris inf.
- 9 - ACE
- 10 - N. mylohyoideus
- 11 - V. facialis
- 12 - A. facialis
- 13 - Venter post. musculi digastrici
- 14 - N. accessories
- 15 - V. retromandibularis
- 16 - A. occipitalis
- 17 - N. hypoglossus
- 18 - VJI
- 19 - Radix sup. ansa cervicalis prof.
- 20 - Truncus venosus thyrolinguofacialis
- 21 - Glandula submandibularis
- 22 - A. thyroidea sup.



# FOSSA PTERYGOPALATINA

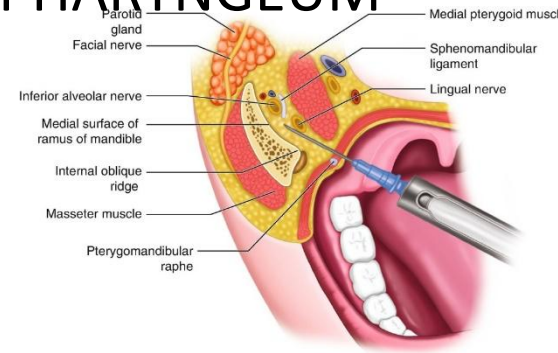
- boundaries: roof (facies maxillaris alae majores ossis sphenoidalis), caudal border (narrowing and transition into canalis pterygopalatinus (canalis palatinus major)), anterior wall (facies infratemporalis corporis maxillae), posterior wall (proc. pterygoideus ossis sphenoidalis), medial wall (lamina perpendicularis ossi palatini), fissura pterygomaxillaris (lateral communication with fossa infratemporalis)
- foramen rotundum, canalis pterygoideus, foramen sphenopalatinum, fissura orbitalis inferior, canalis palatinus major – foramen palatinum majus et foramina palatina minora
- branches of the maxillary artery (sphenopalatina, palatina desc., canalis pterygoidei), V2 divides here into the infraorbital nerve, zygomatic nerve, and pterygopalatine nerves (with pterygopalatinum ganglion)



# SPATIUM PTERYGOMANDIBULARE, PARA- ET RETROPHARYNGEUM

## ptmdb

- the gap between the mandibular ramus and the medial pterygoid muscle
- the lingual nerve, inferior alveolar vessels, initial section of the mylohyoid nerve

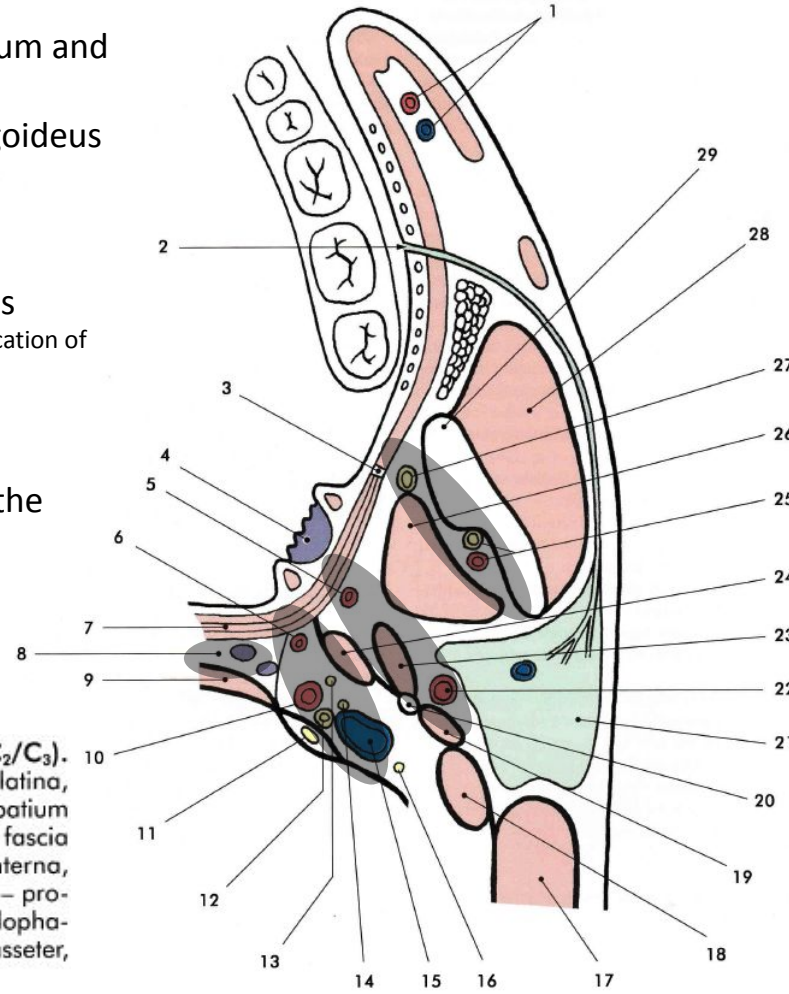


## paraph

- the most medial space in the infratemporal region, on the outer surface of the pharynx
- the digastric muscle and styloid septum divide it into the praestyloideum and retrostyloideum spaces (spatium parapharyngeum sensu stricto)
- praestyloideum: between m. constrictor pharyngis superior, m. pterygoideus medialis, styloid septum
  - ACE, a. palatina ascendens, part of gl. parotis
- styloid septum
- retrostyloideum: between MCPS, styloid septum, lamina prevertebralis
  - ACI, VII, IX., X., XI., XII., truncus sympathicus with ganglion cervicale superius in the duplication of the prevertebral lamina

## retroph

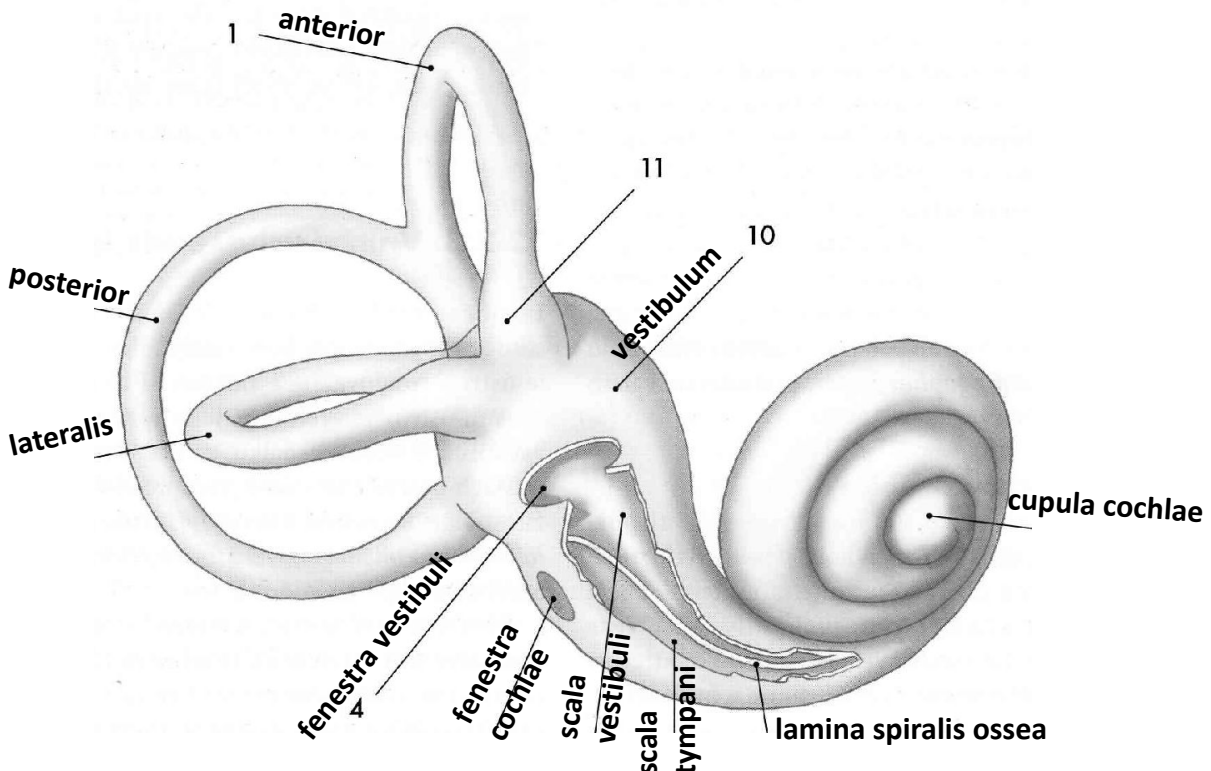
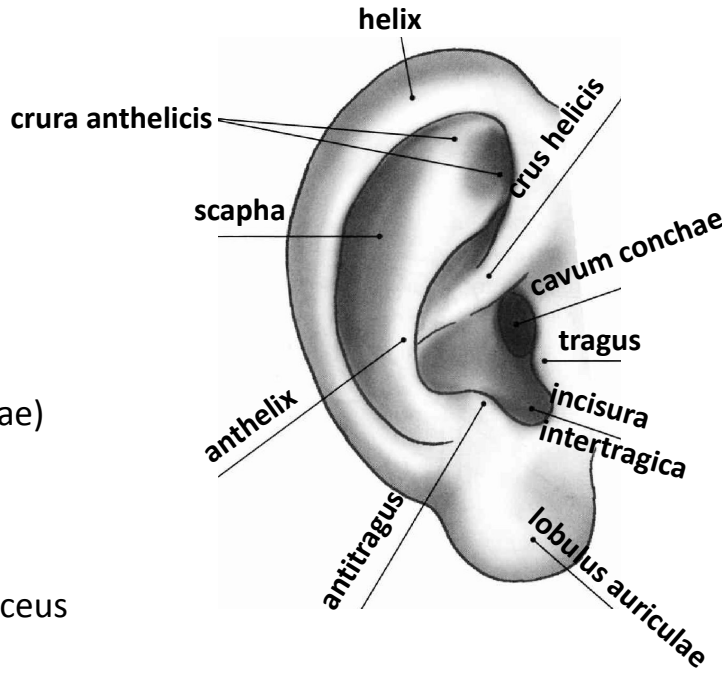
- between the pharynx and the prevertebral lamina, anterior access to the cervical spine



Obr. 13.12. Schematický transverzální řez obličejovou částí hlavy v úrovni ústní štěrbiny (C<sub>2</sub>/C<sub>3</sub>).  
 1 – a. et v. facialis, 2 – výústění ductus parotidea, 3 – raphe pterygomandibularis, 4 – tonsilla palatina,  
 5 – a. palatina ascendens, 6 – a. pharyngea ascendens, 7 – m. constrictor pharyngis superior, 8 – spatium  
 retropharyngeum, 9 – m. longus colli, 10 – a. carotis int., 11 – truncus sympathicus v duplikatuře fascia  
 prevertebralis, 12 – n. vagus, 13 – n. glossopharyngeus, 14 – n. hypoglossus, 15 – v. jugularis interna,  
 16 – n. accessorius, 17 – m. sternocleidomastoideus, 18 – m. digastricus, 19 – m. stylohyoideus, 20 –  
 processus styloideus, 21 – glandula parotidea, 22 – a. carotis externa, 23 – m. styloglossus, 24 – m. stylopharyngeus,  
 25 – n. et a. alveolaris inferior, 26 – m. pterygoideus medialis, 27 – n. lingualis, 28 – m. masseter,  
 29 – mandibula

# EAR

- auris externa
  - auricula (elastic cartilage outside the lobe)
  - meatus acusticus externus (cartilage and bone)
  - membrana tympani (stria et prominentia mallearis, light reflex)
- auris media
  - cavitas tympani with ossicula auditus
  - tubes in the processus mastoideus (antrum mastoideum and cellulae)
  - tuba auditiva (connection to the nasopharynx)
- auris interna
  - in the pyramid
  - balance and auditory apparatus – labyrinthus osseus et membranaceus

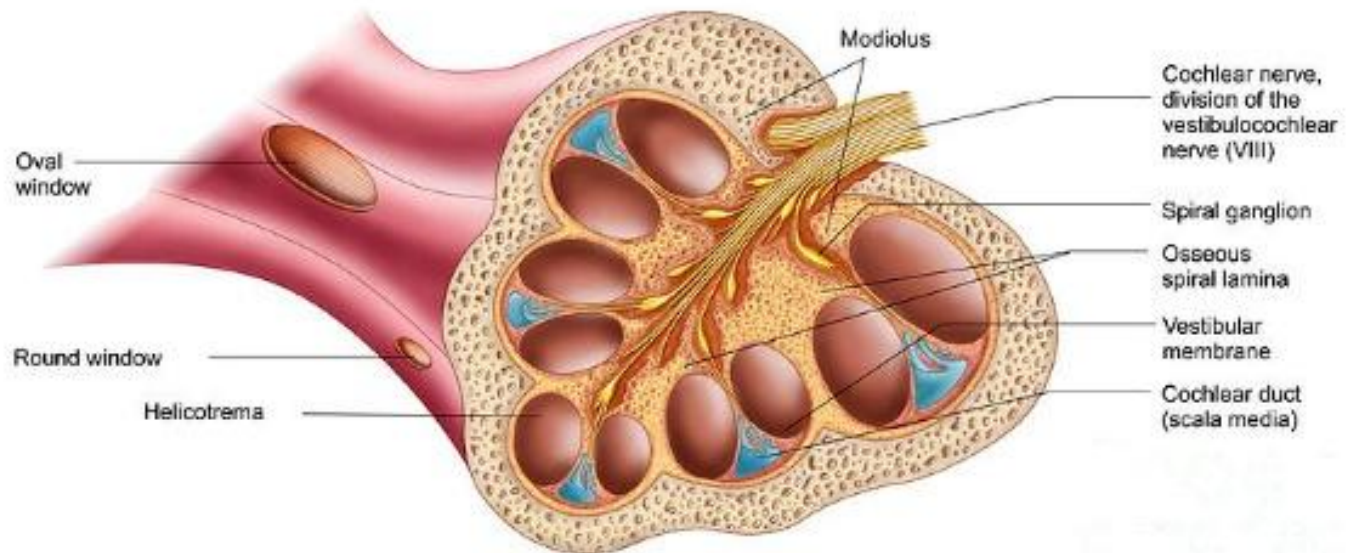
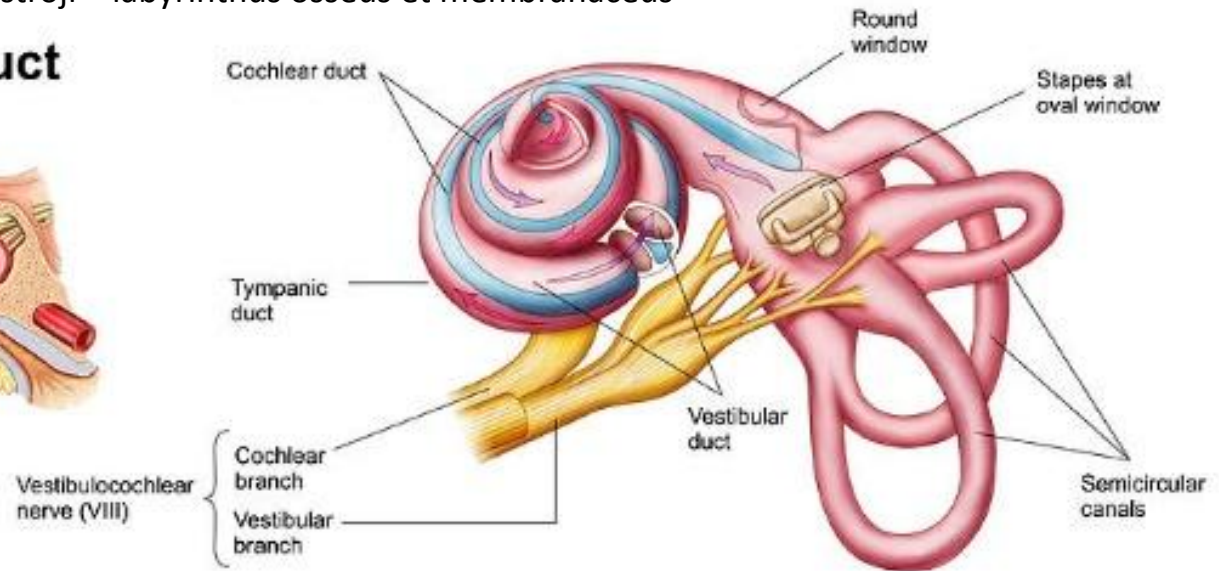


# UCHO

- auris interna

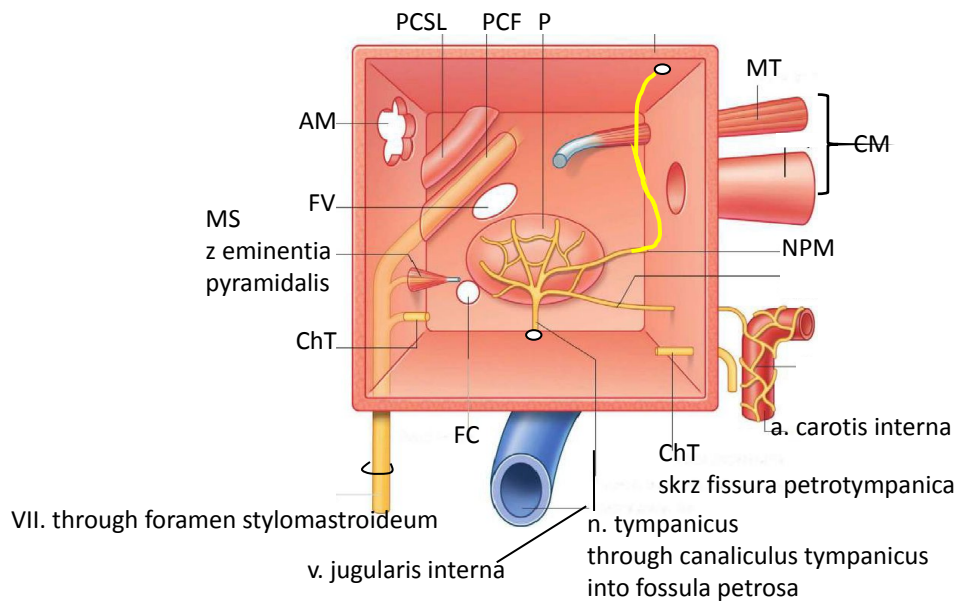
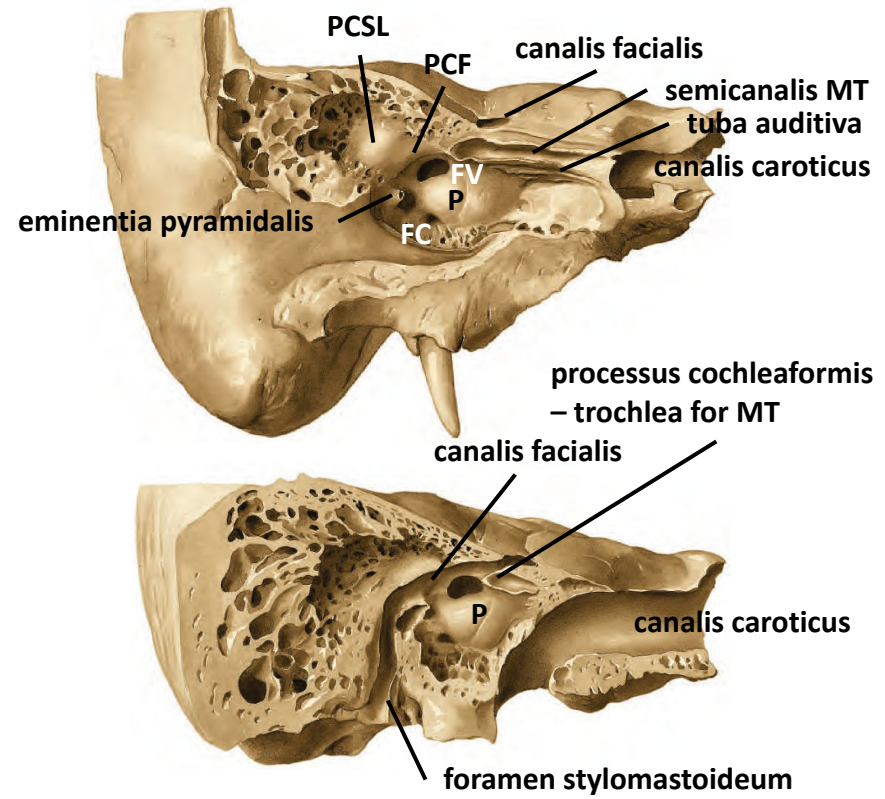
- v pyramidě
- rovnovážné a sluchové ústrojí – labyrinthus osseus et membranaceus

## Cochlear Duct



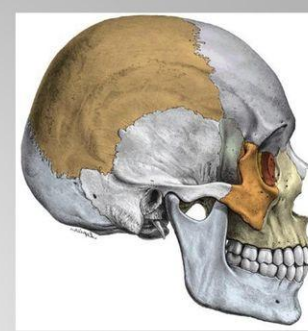
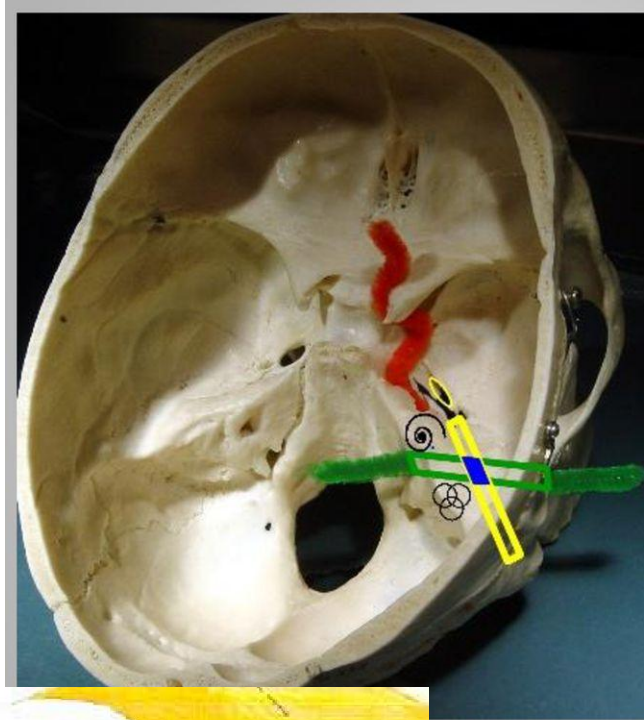
# CAVITAS TYMPANI

- paries membranaceus (lateral)
  - eardrum and temporal bone
- paries caroticus (ventral)
  - canalis musculotubarius **CM**
  - canaliculi caroticotympanici
- paries labyrinthicus (medial)
  - promontorium (first thread of cochlea) **P**
  - fenestra vestibuli (fenestra ovalis) **FV**
  - eminentia pyramidalis (m. stapedius) **MS**
  - fenestra cochlae (fenestra rotunda) **FC**
- paries mastoideus (dorsal)
  - aditus ad antrum mastoideum **AM**
  - prominentia canalis facialis (**PCF**) et semicircularis lateralis (**PCSL**)
- paries tegmentalis (roof)
  - tegmen tympani
- paries jugularis (floor)
  - tympanic bone

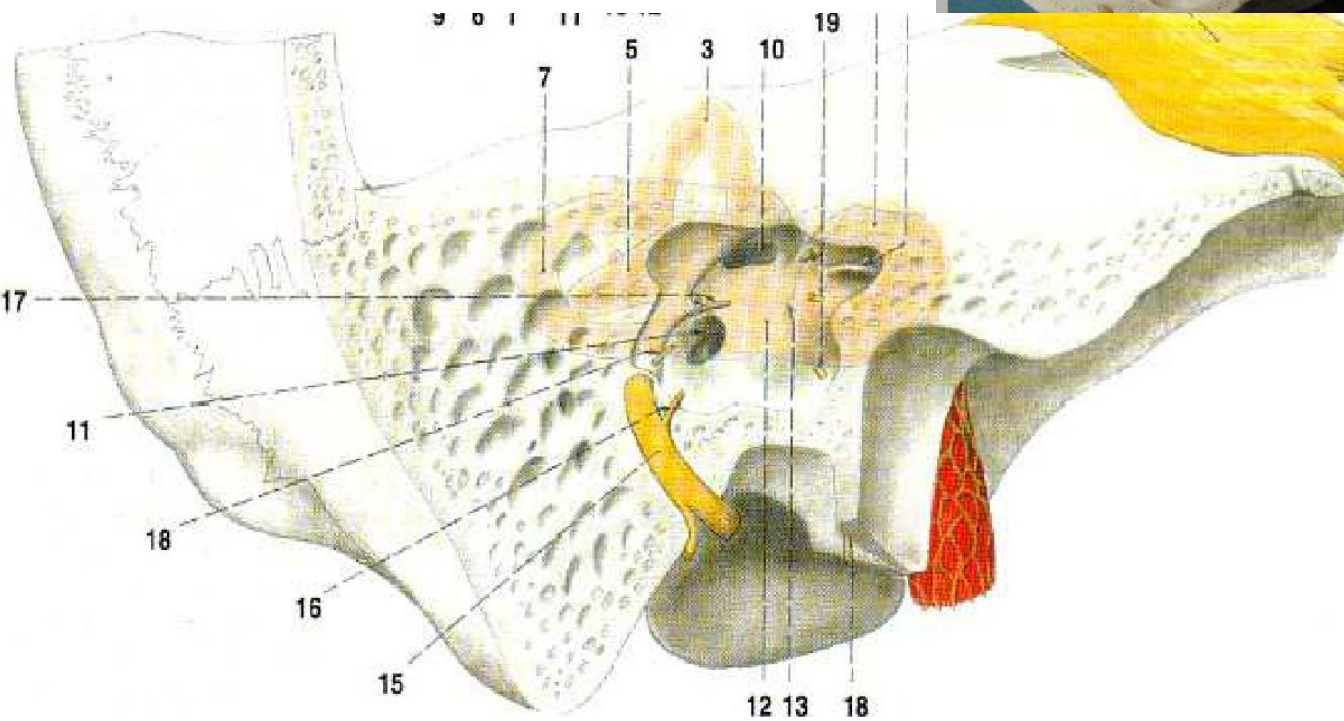


- ossicles
- chorda tympani **ChT**
- m. stapedius **MS**
- m. tensor tympani **MT**
- n. petrosus minor **NPM**

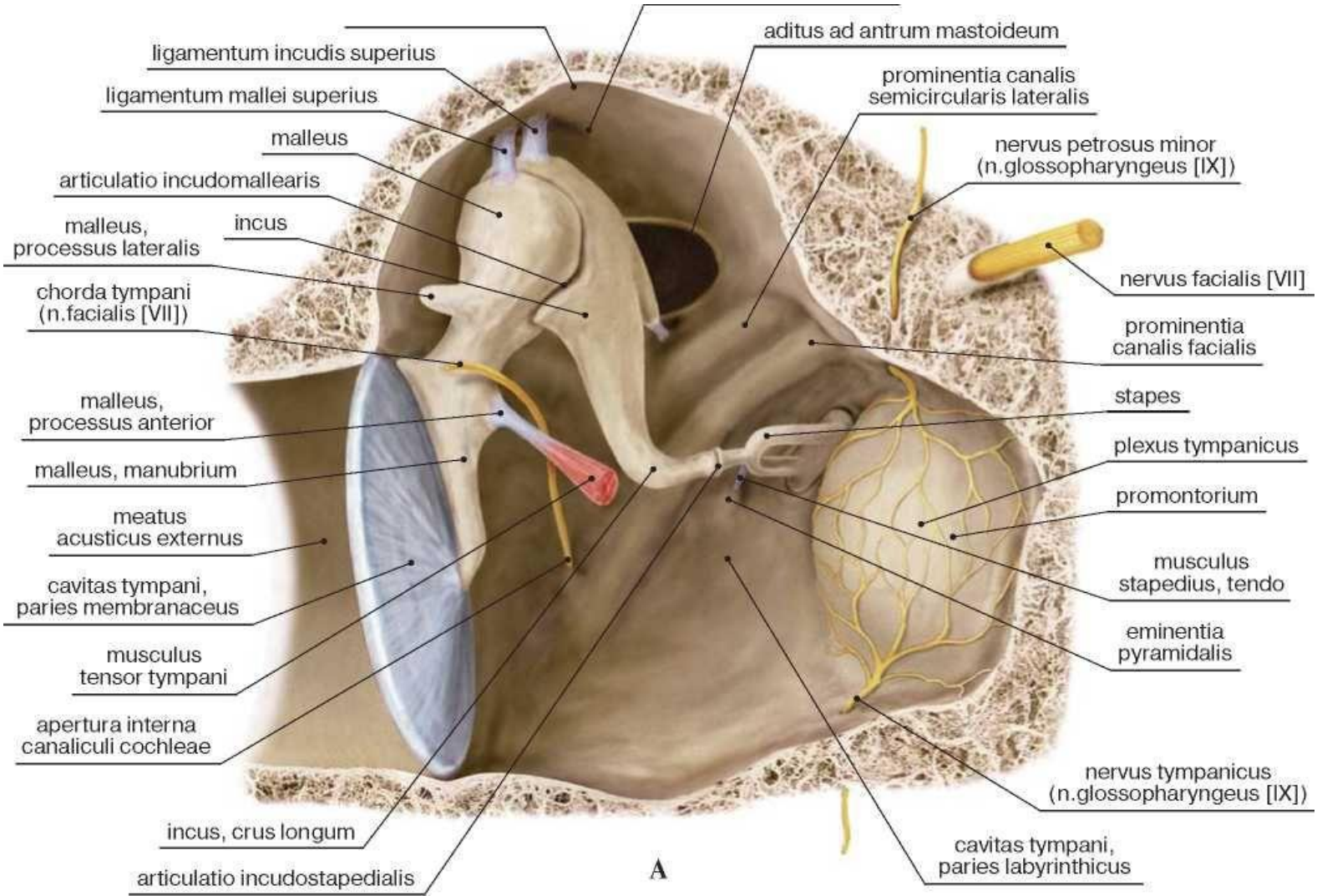
# CAVITAS TYMPANI



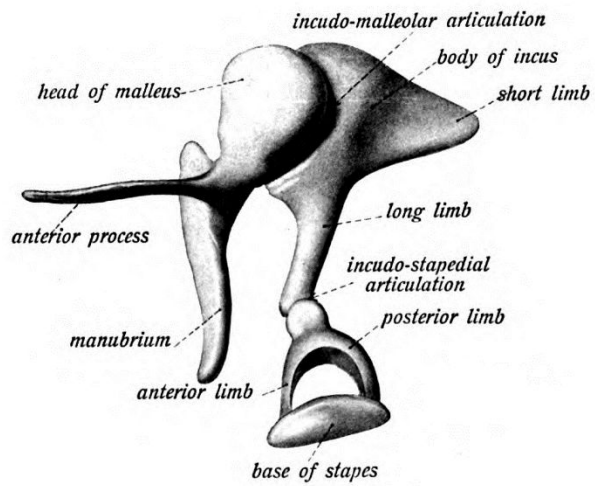
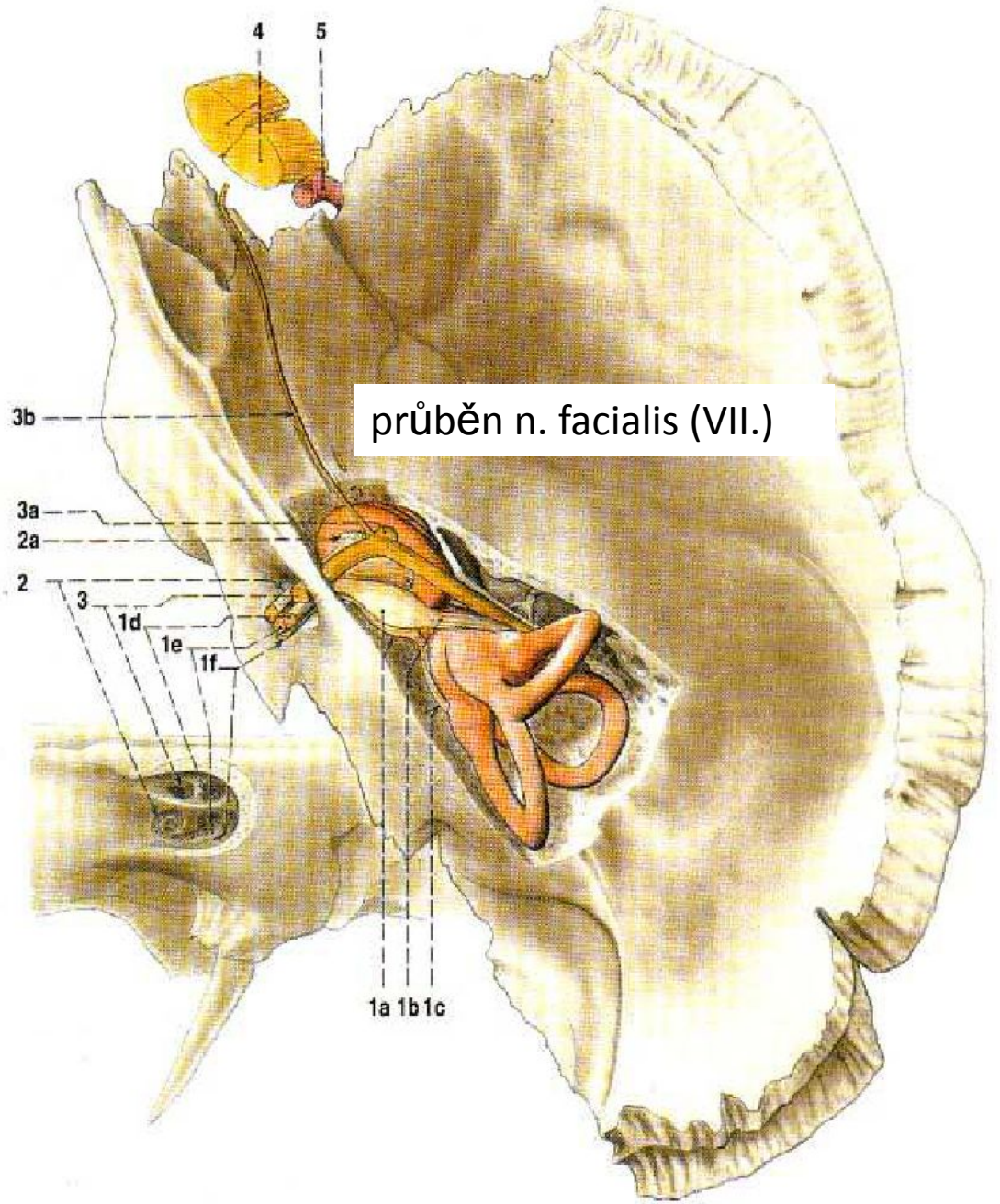
OS TEMPORALE

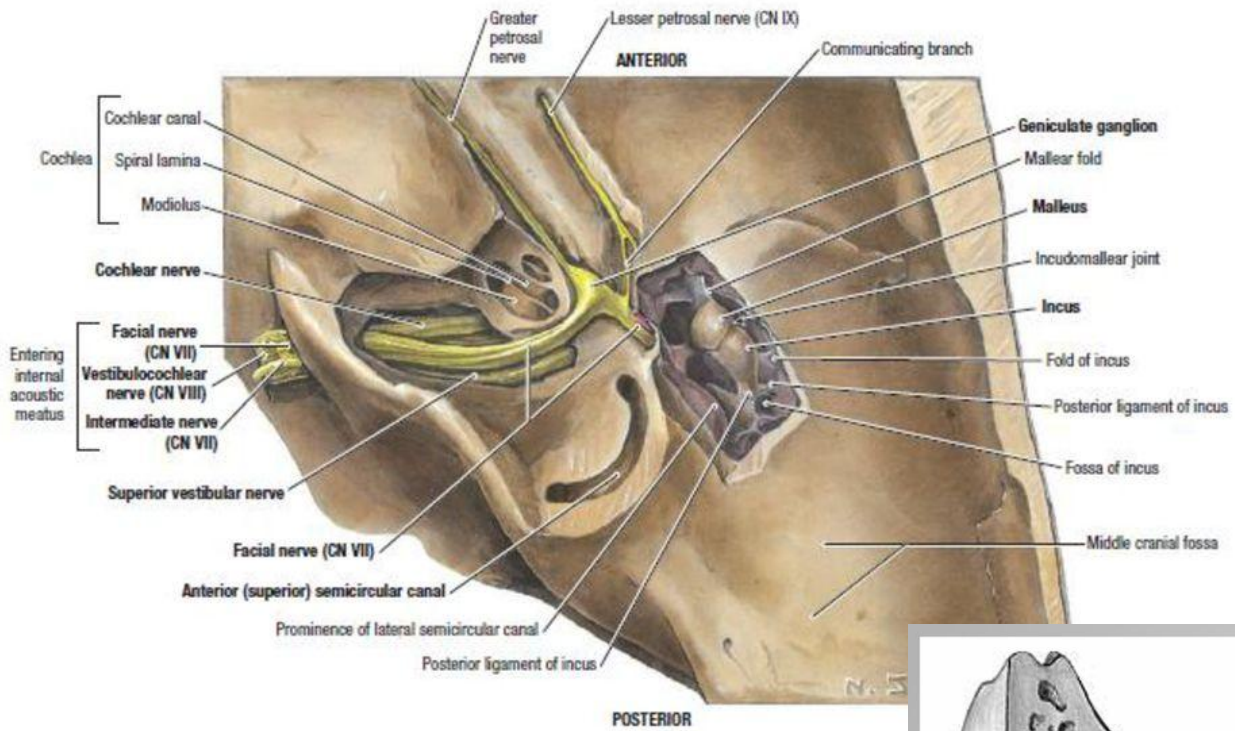


# CAVITAS TYMPANI

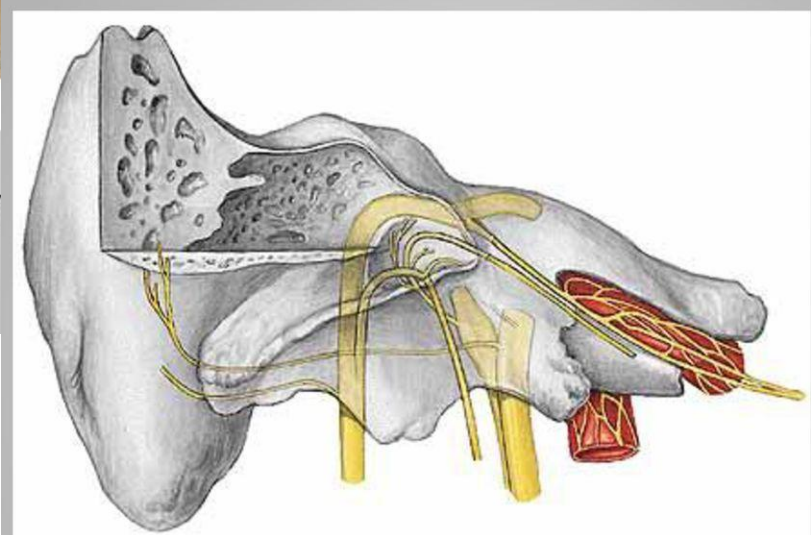


# CAVITAS TYMPANI





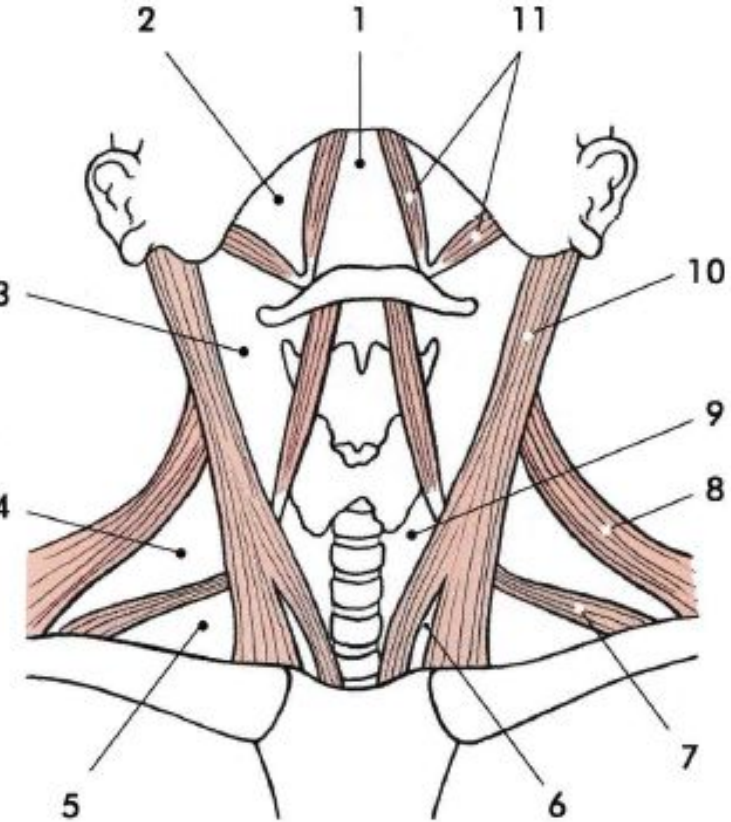
## OS TEMPORALE, CAVUM TY



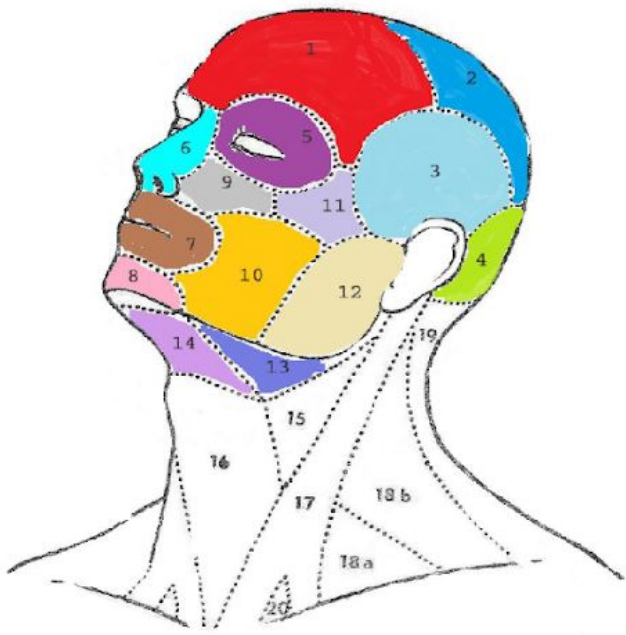
## OS TEMPORALE, CANALIS FACIALIS, CANALICULUS TYMPANICUS, CANALIS CAROTICUS

# NECK REGIONS

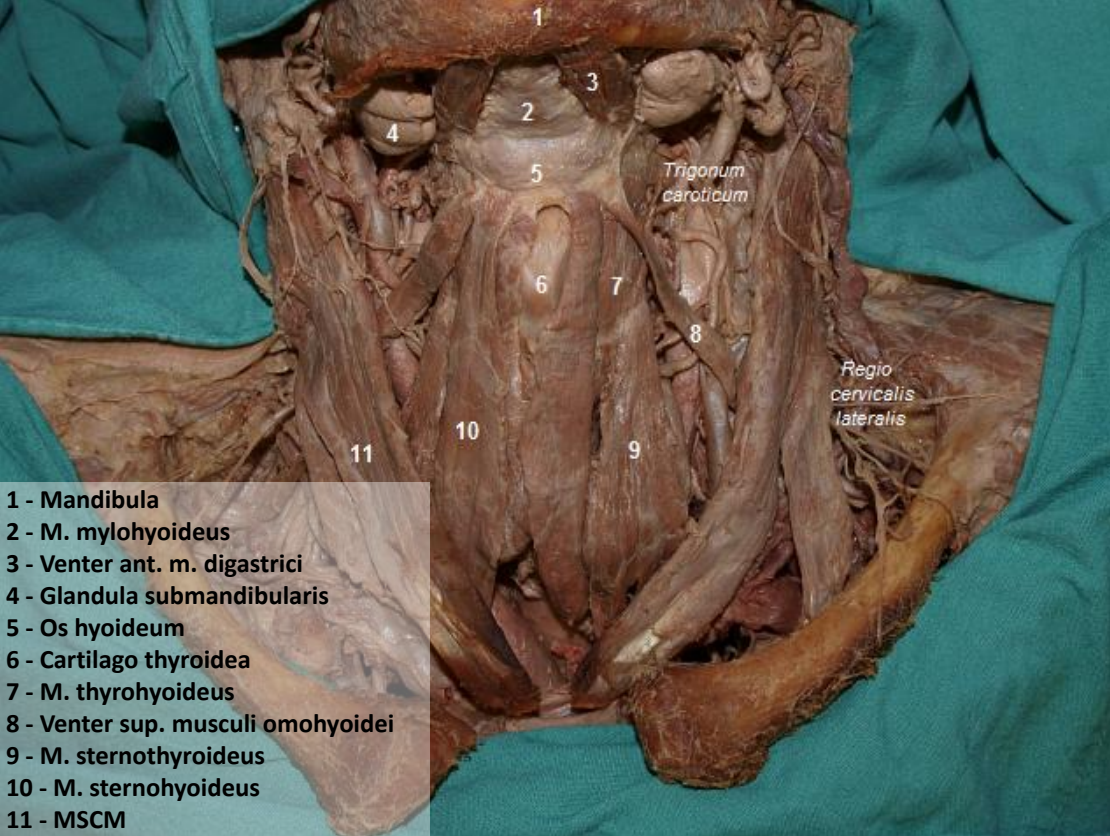
- boundary against the chest: line connecting the jugular fossa, clavicle, acromion, and C7 spinous process
- anterior and lateral cervical region
  - anterior cervical region: trigonum musculare (omotracheale), submandibulare, submentale, caroticum, and scalenovertbrale, sternocleidomastoidea region
  - lateral cervical region



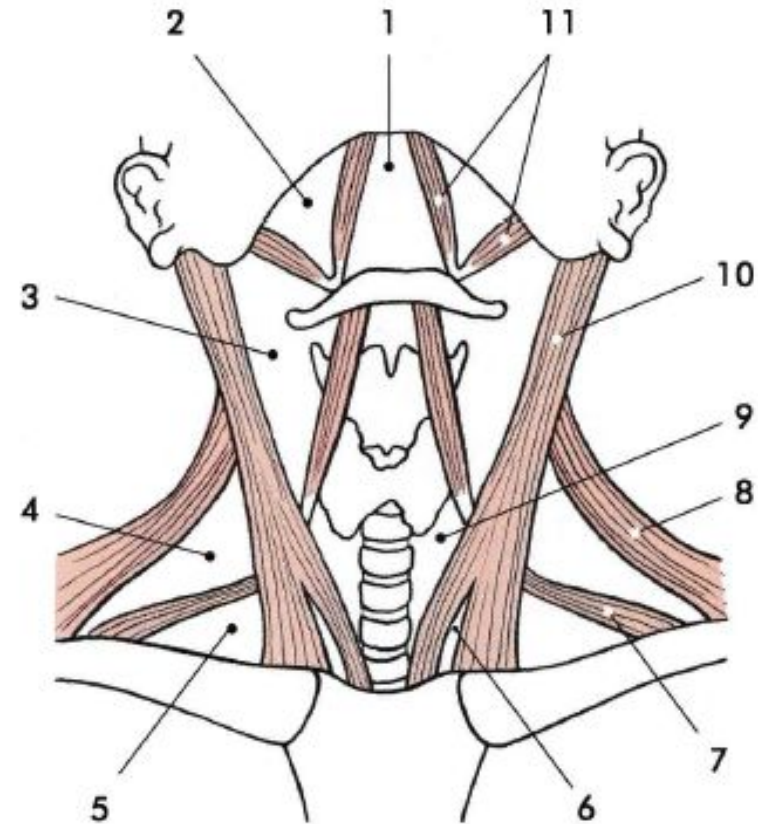
**Obr. 14.1. Krajiny krční.** 1 – regio submentalis, 2 – trigonum submandibulare, 3 – trigonum caroticum, 4 – trigonum omotrapium, 5 – trigonum omoclaviculare, 6 – fossa supraclavicularis minor, 7 – m. omohyoideus, dolní bříško, 8 – m. trapezius, 9 – trigonum omotracheale, 10 – m. sternocleidomastoideus, 11 – m. digastricus



- 1 regio frontalis
- 2 regio parietalis
- 3 regio temporalis
- 4 regio occipitalis
- 5 regio orbitalis
- 6 regio nasalis
- 7 regio labialis
- 8 regio mentalis
- 9 regio infraorbitalis
- 10 regio buccalis
- 11 regio zygomatica
- 12 regio parotidomasseterica
- 13 trigonum submandibulare
- 14 trigonum submentale
- 15 trigonum caroticum
- 16 trigonum musculare
- 17 regio sternocleidomastoidea
- 18 regio cervicalis lateralis



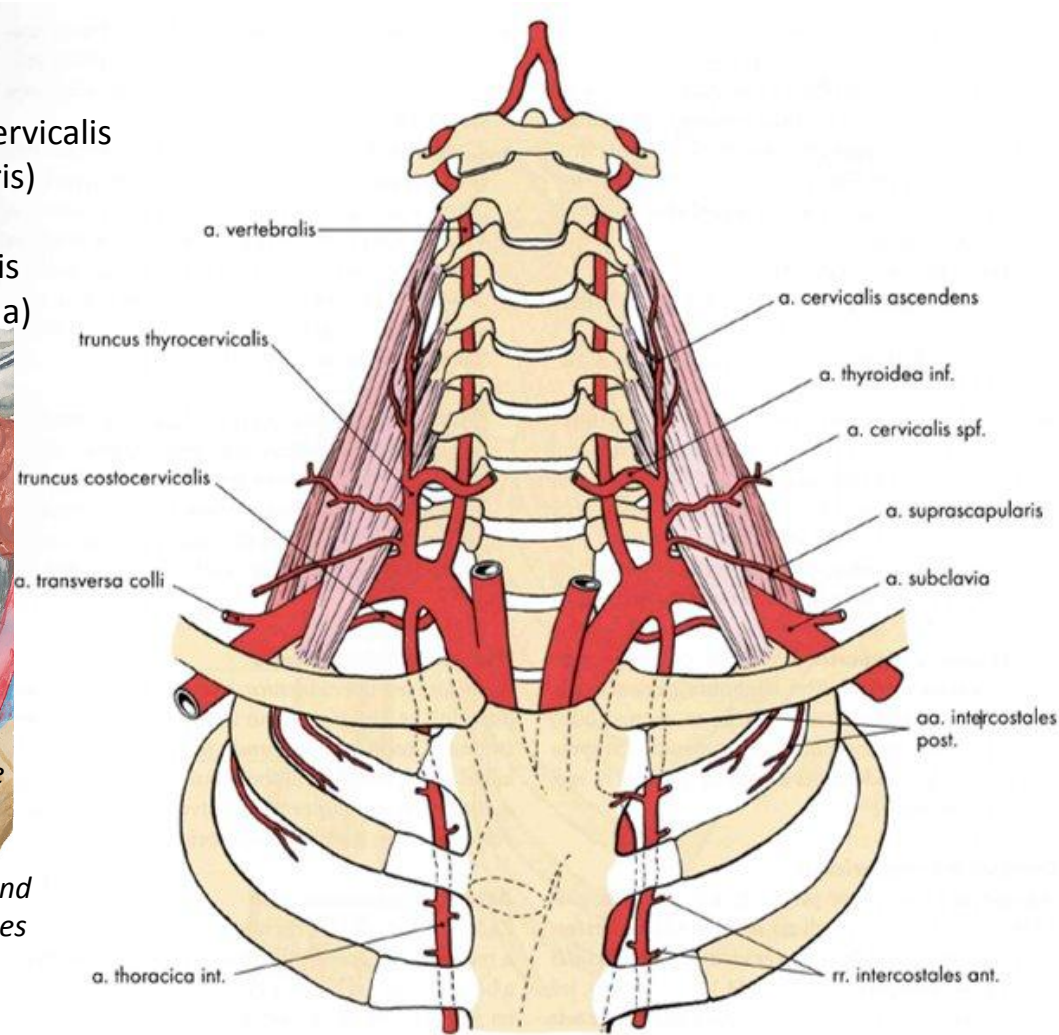
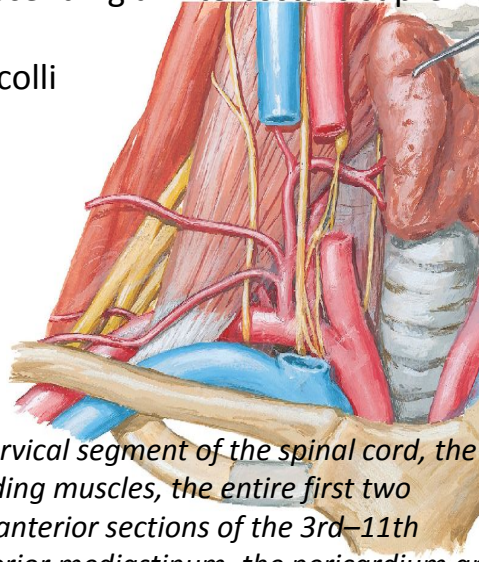
- 1 - Mandibula
- 2 - M. mylohyoideus
- 3 - Venter ant. m. digastrici
- 4 - Glandula submandibularis
- 5 - Os hyoideum
- 6 - Cartilago thyroidea
- 7 - M. thyrohyoideus
- 8 - Venter sup. musculi omohyoidei
- 9 - M. sternothyroideus
- 10 - M. sternohyoideus
- 11 - MSCM



**Obr. 14.1. Krajiny krční.** 1 – regio submentalis, 2 – trigonum submandibulare, 3 – trigonum caroticum, 4 – trigonum omotrapezium, 5 – trigonum omoclaviculare, 6 – fossa supraclavicularis minor, 7 – m. omohyoideus, dolní bříško, 8 – m. trapezius, 9 – trigonum omotracheale, 10 – m. sternocleidomastoideus, 11 – m. digastricus

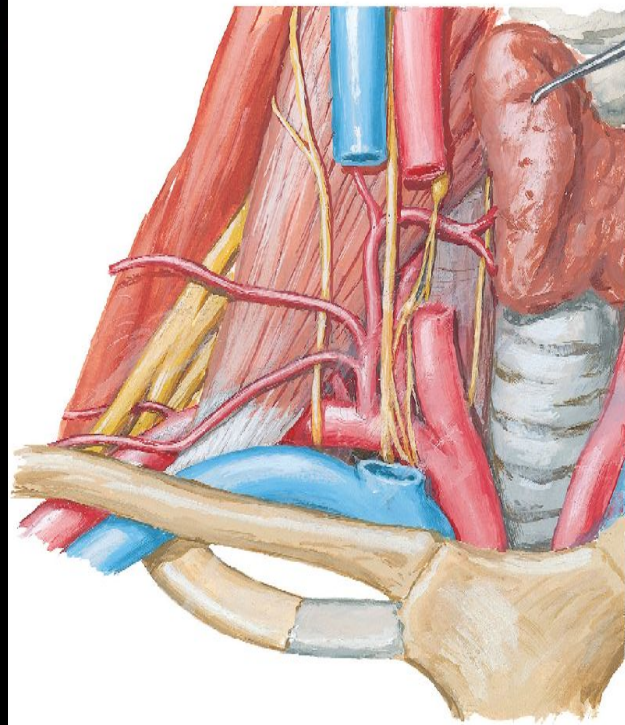
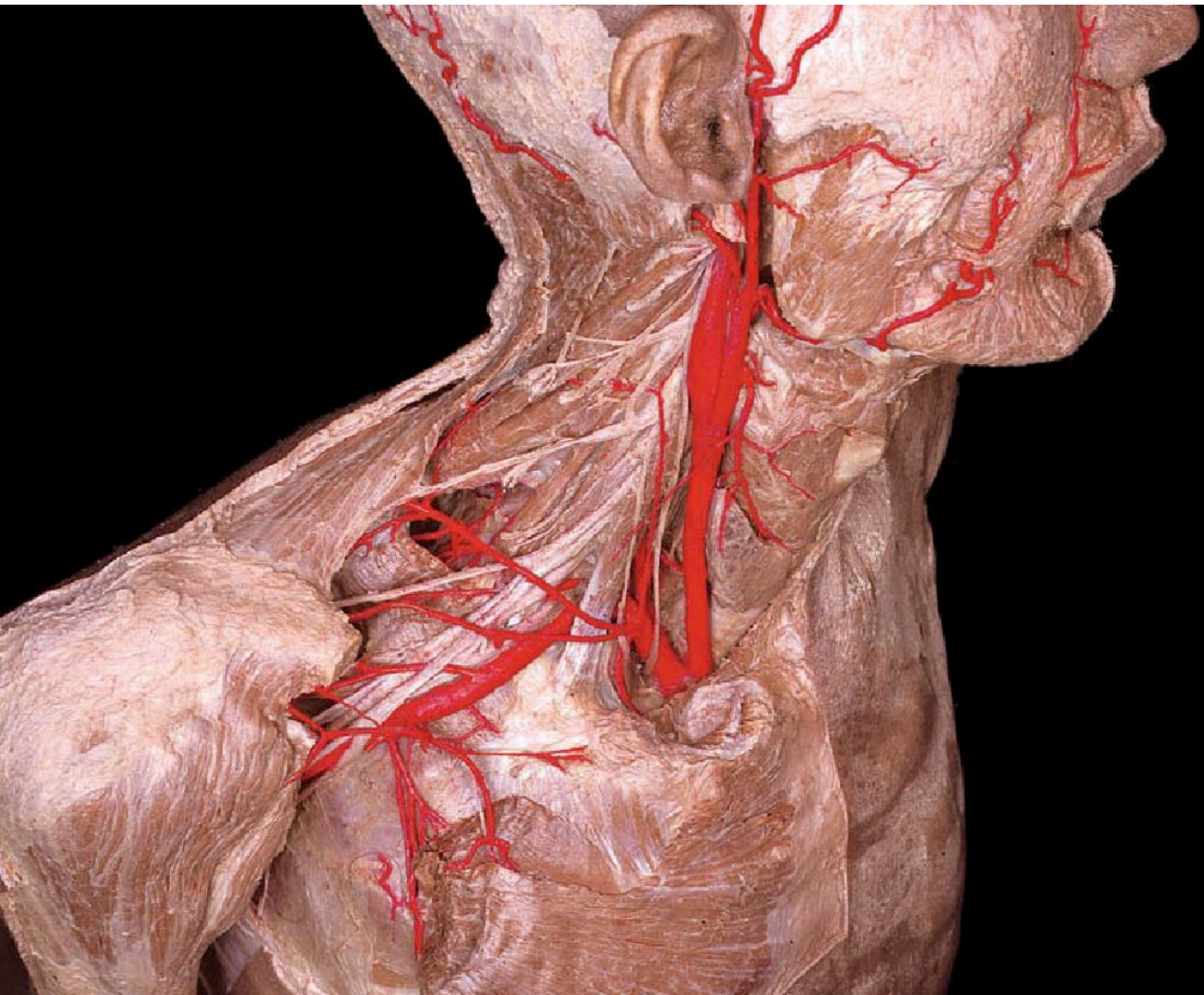
# A. SUBCLAVIA

- On the right from the brachiocephalic trunk, on the left from the aortic arch
- runs in an arc across the cupula pleurae, leaving an impression on the lungs (sulcus arteriae subclaviae) and runs through the fissura scalenorum (between m. scalenus anterior and medius) across the first rib, above which is the brachial plexus, ending at the outer edge of the first rib with a transition into the axillary artery
- subclavian vein located before the fissura scalenorum, between the vein and the artery, with the n. phrenicus running laterally and the n. vagus medially, wrapping around the artery on the right side of the n. laryngeus recurrens dx.
- pars intrascalenica
  - a. vertebralis
  - a. thoracica interna
  - truncus thyrocervicalis (a. thyroidea inf., a. cervicalis ascendens, a. cervicalis spfc., a. supracapularis)
- pars interscalenica
  - truncus costocervicalis (ascending a. cervicalis profunda, descending a. intercostalis suprema)
- pars extrascalenica
  - a. transversa colli

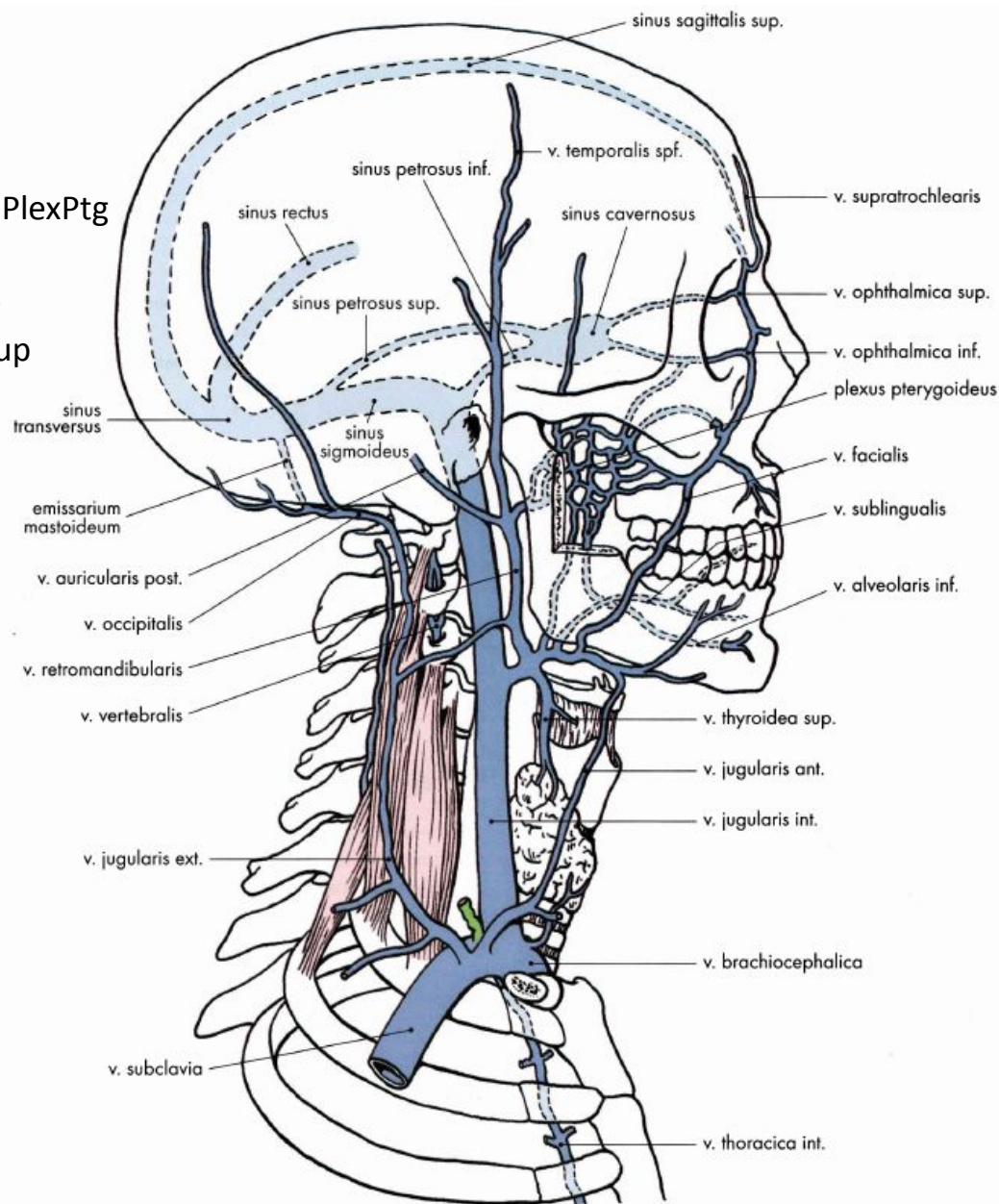
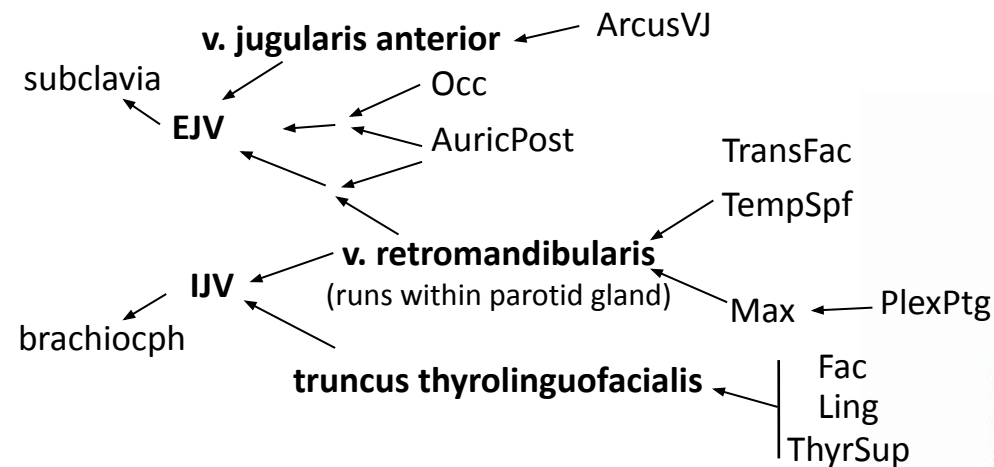


*It supplies the brain, the cervical segment of the spinal cord, the cervical spine and surrounding muscles, the entire first two intercostal spaces and the anterior sections of the 3rd–11th intercostal spaces, the anterior mediastinum, the pericardium and the diaphragm, the thyroid gland and larynx, parts of the muscles and skin of the neck, chest, and back, and the upper half of the rectus abdominis muscle.*

# A. SUBCLAVIA



# VEINS OF THE NECK

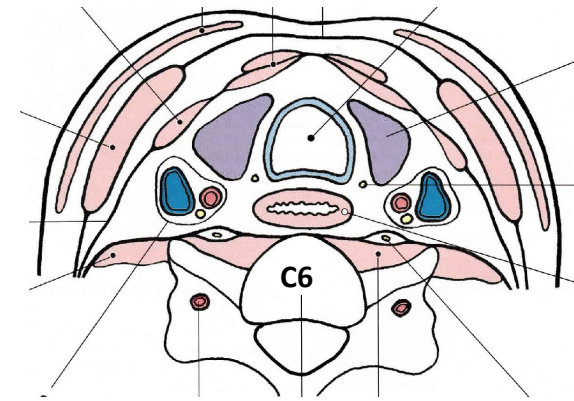
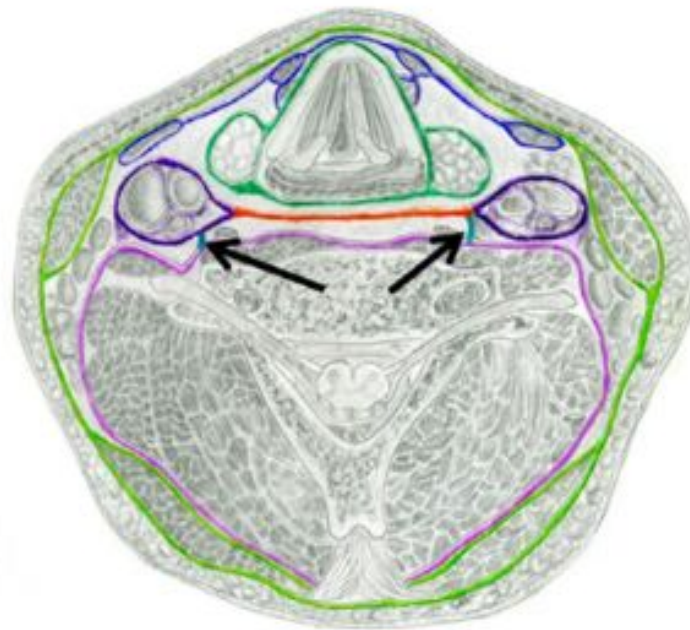
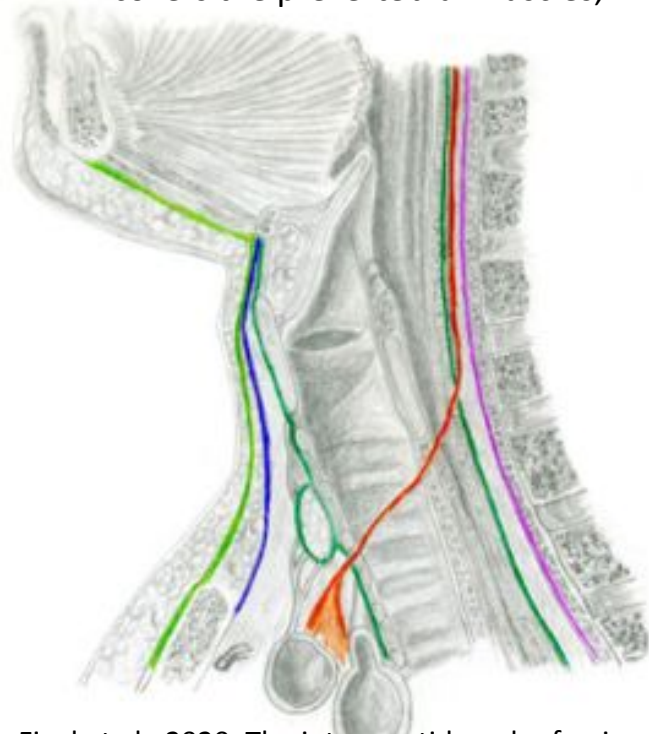


# INTERNAL JUGULAR VEIN – EXTRACRANIAL TRIBUTARIES

- **v. retromandibularis**
    - formed by the confluence of v. temporalis superficialis, media, and v. transversa faciei behind ramus mandibulae, descends behind angulus mandibulae, pierces the superficial cervical fascia, and enters v. jugularis interna
    - vv. maxillares from fossa infratemporalis
    - plexus pterygoideus – venous plexus in the infratemporal fossa; veins from the infratemporal fossa and pterygopalatine fossa, both jaws, orbit, from the cranial cavity; connections with veins of the orbit, face (superficial and deep), with vv. meningae and vv. emissariae of the middle cranial fossa (infection!!!)
  - **vv. pharyngeae**
    - smaller veins below the base of the skull, blood from the plexus pharyngeus
  - **v. facialis**
    - blood from the face, anastomosis with v. ophthalmica superior
  - **v. lingualis**
    - receives v. comitans nervi hypoglossi
  - **v. thyroidea superior**
    - from the larynx v. laryngea superior
  - **v. thyroidea media**
    - inconsistent, from the side of the thyroid gland in front of the a. carotis communis
  - **v. jugularis externa**
    - superficial vein on the outer side of the neck
    - begins below the mastoideus process confluence of v. auricularis posterior and v. occipitalis, descends caudally below m. platysma behind the posterior edge of m. sternocleidomastoideus, empties into bulbus inferior v. jugularis int./into v. subclavia
    - v. jugularis anterior – descends in the superficial cervical fascia (arcus venosus juguli – transverse connection of vv. jugulares anteriores in the fossa jugularis)
- opens into the internal jugular vein (at the level of the hyoid bone):
- a) separately
  - b) connected in various ways
  - c) thyrolingual trunk, thyrolinguofacial trunk

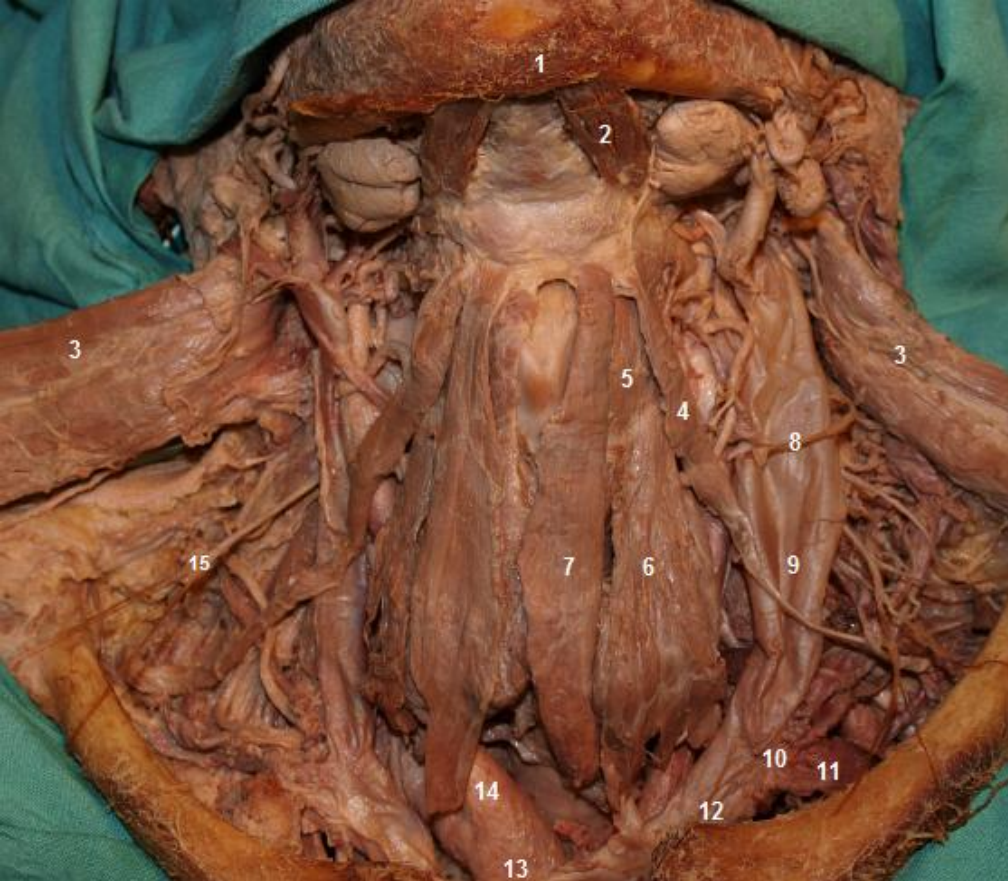
# NECK FASCIAL LAYERS

- lamina superficialis fasciae cervicalis = superficial cervical fascia
  - behind the platysma muscle
  - from mandible, mastoid process, occipital region to the ventral surface of the manubrium sterni, clavicle, acromion
  - caudally transitions into the superficial fascia of the chest (covers m. pectoralis major) and fascia m. deltoideus, cranially into fascia parotideomasseterica
  - envelops m. sternocleidomastoideus and m. trapezius
- lamina pretrachealis fasciae cervicalis = fascia cervicalis media
  - from the hyoid bone and between the omohyoidei muscles to the infrahyoid muscles (envelops) on the manubrium sterni/clavicula
  - the carotid sheath branches off from it
- lamina prevertebralis fasciae cervicalis = fascia prevertebralis
  - covers the prevertebral muscles, mm. scaleni, mm. levator scapulae



# REGIO CERVICALIS ANTERIOR

- trigonum musculare (omotracheale): jugular fossa; larynx, trachea, thyroid gland with parathyroid glands, pharynx, esophagus; palpable: hyoid bone (C3), laryngeal cartilages (prominentia laryngea – C4), trachea; superior thyroid vessels, inferior thyroid artery, recurrent laryngeal nerve, superior laryngeal nerve, impar thyroid venous plexus
  - in the subcutaneous tissue platysma and branches of the VJA; superficial layer (from the mandible across the hyoid bone, envelops the sternocleidomastoid muscle, fuses with the sternum and clavicle); infrahyoid muscles incorporated into the lamina pretrachealis; in the lower part between the laminae spatium suprasternale (adipose tissue with arcus venosus juguli); spatium viscerale; behind the posterior wall of the esophagus loose connective tissue (cranially into the retropharynx, caudally into the posterior mediastinum); lamina prevertebralis
- trigonum submandibulare: base formed by m. mylohyoideus, m. hyoglossus, m. styloglossus; gl. submandibularis, ductus submandibularis between m. mylohyoideus and m. hyoglossus, v. facialis laterally, a. facialis medially from the gland, n. lingualis (medially from the edge of the mandible), XII. (medially from the venter posterior of the digastric muscle, arcus nervi hypoglossi anteriorly between the mylohyoideus and hyoglossus muscles), n. mylohyoideus from n. alveolaris inf. (to the venter anterior of the digastric muscle)
  - in the subcutaneous tissue of the platysma; connective tissue; lamina spf. (tractus angularis)
- trigonum submentale: base formed by m. mylohyoideus; access to the tongue
- trigonum caroticum
  - in the subcutaneous platysma, beneath which branch the n. transversus colli and variably arranged veins (v. retromandibularis, v. facialis); lamina spf.; VJI, ACC divides (glomus caroticum) into ACE (ATS, AL, AF, APhA, AO) and ACI, nerves: ansa cervicalis profunda (connection XII. – radix sup., with plexus cervicalis – radix inf.; motor innervation of the infrahyoid muscles), XII. (between VJI and ACI, inward from the venter posterior digastricus to the trigonum submandibulare on the m. mylohyoideus and further to the regio sublingualis), X. (in the vagina carotica), truncus sympathicus in the prevertebral fascia (ganglion cervicale superius et medium)
- sternocleidomastoideus region: fossa supraclavicularis minor; under the platysma of the VJE, punctum nervosum and ansa cervicalis spf. (connection of n. transversus colli with r. colli VII.); lamina spf. envelops m. sternocleidom.; XI.; m. omohyoideus in lamina pretrachealis; cervical neurovascular bundle, n. phrenicus with a. cervicalis ascendens
- trigonum scalenovertbrale – border: tuberculum caroticum C6, m. longus colli, m. scalenus anterior; cupula pleurae, vasa subclavia (AS gives branches), on the right truncus brachioceph., lymphatic vessels, X., n. phrenicus, truncus sympathicus in fascia prevertebralis



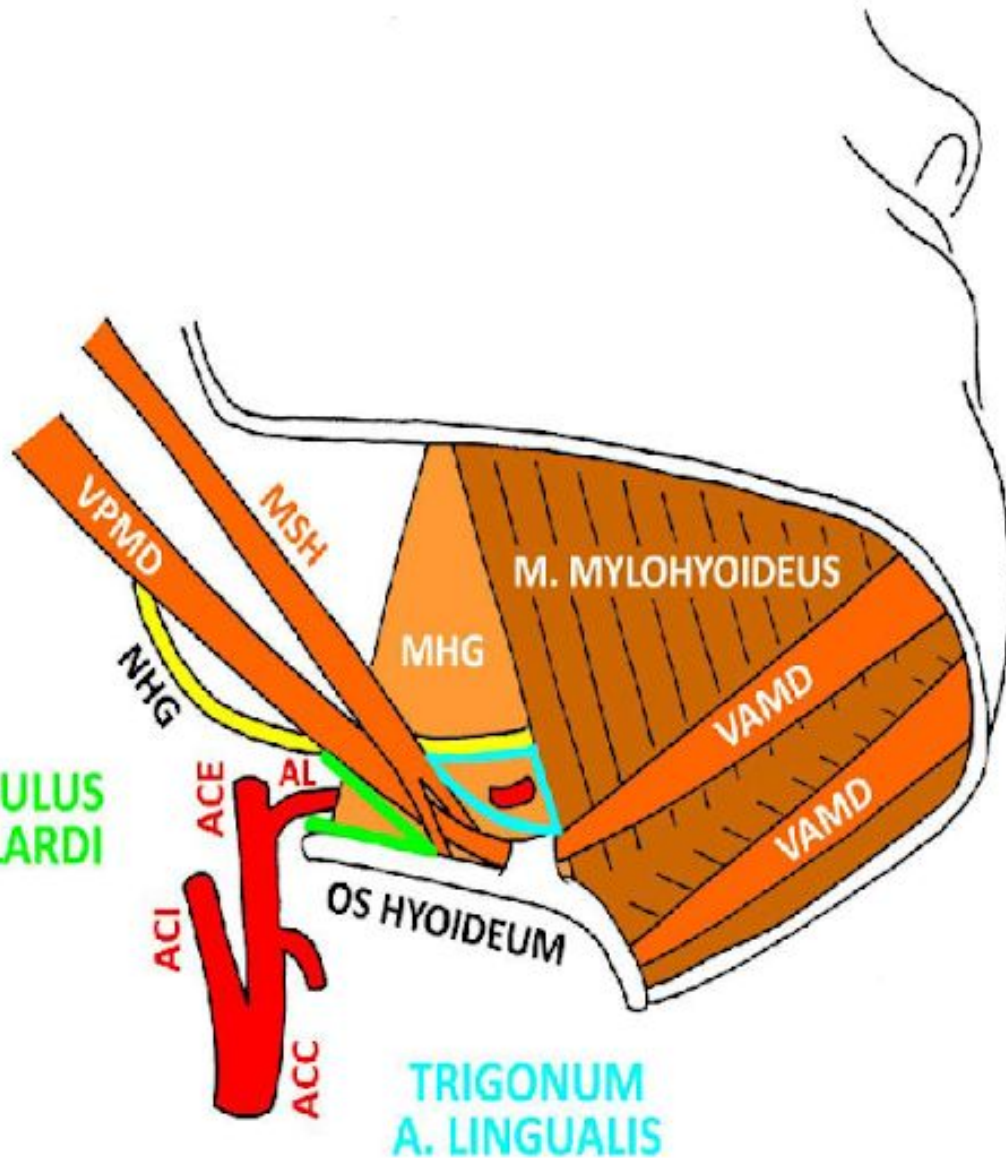
- 1 - Mandibula
- 2 - Venter ant. m. digastrici
- 3 - MSCM
- 4 - M. omohyoideus
- 5 - M. thyrohyoideus
- 6 - M. sternothyroideus
- 7 - M. sternohyoideus
- 8 - Ansa cervicalis prof.
- 9 - V. jugularis int.
- 10 - Angulus venosus
- 11 - V. subclavian
- 12 - V. brachiocephalica
- 13 - Truncus brachiocephalicus
- 14 - A. carotis comm. dx.
- 15 - Nn. supraclaviculares



- 1 - N. hypoglossus (N XII)
- 2 - A. + v. + n. laryng. sup.
- 3 - M. omohyoideus
- 4 - Ansa cervicalis prof.
- 5 - A. thyroidea sup.
- 6 - IJV
- 7 - Glandula thyroidea
- 8 - inner tendon of m. omohyoideus
- 9 - Nn. supraclaviculares

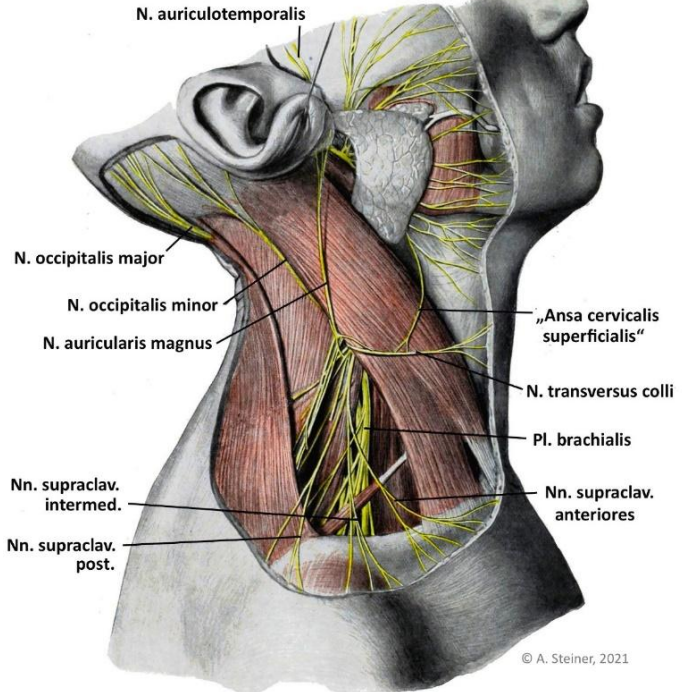


# Trigonum a. lingualis (Pirigovi)

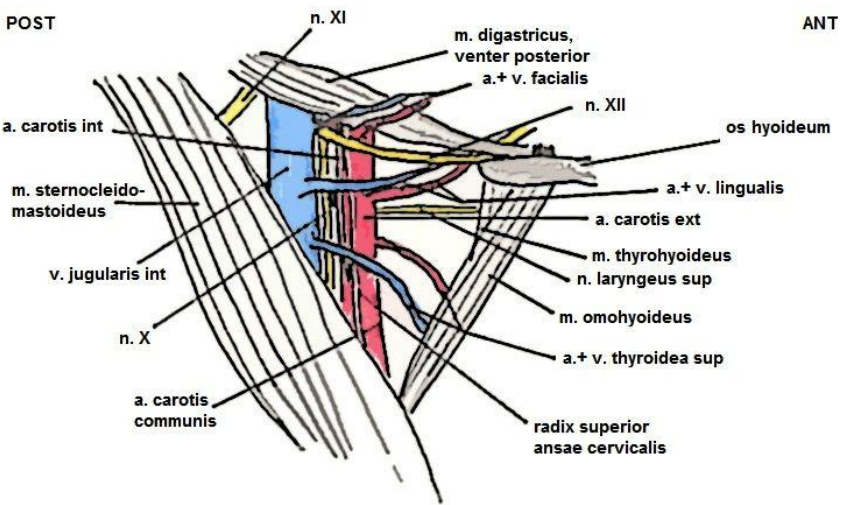


- VPMD - VENTER POST. M. DIGASTRICI
- NHG - N. HYPOGLOSSUS
- MSH - M. STYLOHYOIDEUS
- MHG - M. HYOGLOSSUS
- ACE - A. CAROTIS EXTERNA
- AL - A. LINGUALIS
- ACI - A. CAROTIS INTERNA
- ACC - A. CAROTIS COMMUNIS
- VAMD - VENTER ANT. M. DIGASTRICI

# PUNCTUM NERVOSUM



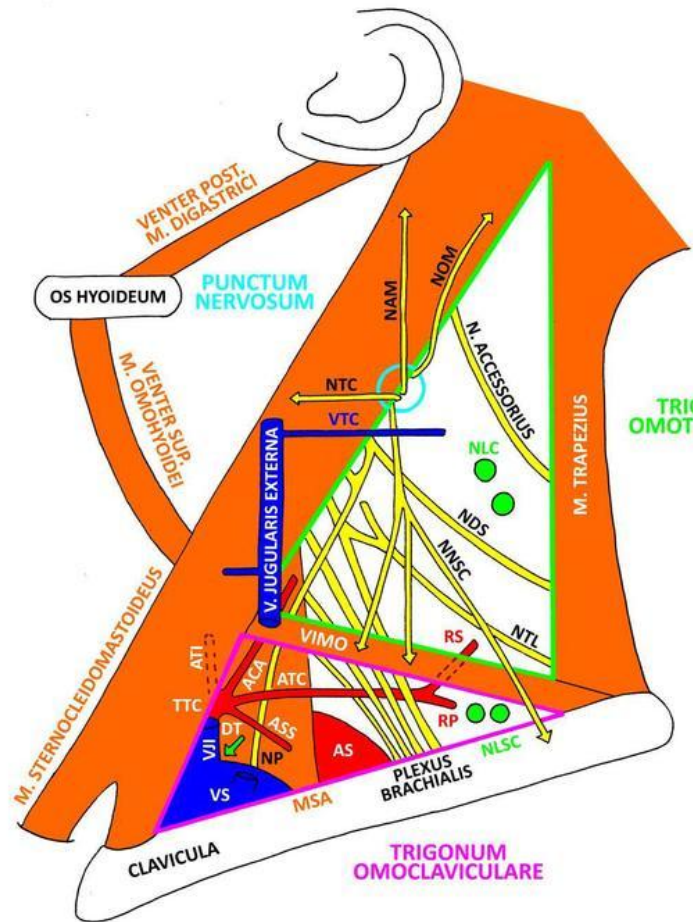
# TRIGONUM CAROTICUM



1 - A. facialis, 2 - Glandula submandibularis, 3 - Glandula parotis, 4 - N. hypoglossus (N XII), 5 - A. lingualis, 6 - V. retromandibularis, 7 - VJI, 8 - A. thyroidea sup., 9 - Venter sup. muscoli omohyoidei, 10 - MSCM, 11 - Nn. supraclaviculares, 12 - A. cervicalis spfc

# REGIO CERVICALIS LATERALIS

- between the sternocleidomastoid muscle, trapezius muscle, clavicle
  - in the subcutaneous platysma; VJE (pierces the fascia), punctum nervosum (sem nn. supraclaviculares); lamina spf.; m. omohyoideus; lamina prevertebralis invests mm. scaleni, m. levator scapulae, mm. splenii
  - laterally fissura scalenorum (brachial plexus, a. subclavia), v. subclavia
  - in the upper part: XI., n. dorsalis scapulae, n. suprascapularis, n. thoracicus longus, nn. pectorales
  - in the lower part: a. transversa colli, vasa and n. suprascapularis



- NOM - N. OCCIPITALIS MINOR
- NAM - N. AURICULARIS MAGNUS
- NTC - N. TRANSVERSUS CERVICIS
- VTC - V. TRANSVERSA CERVICIS
- NLC - N. L. CERVICALES
- NDS - N. DORSALIS SCAPULAE
- NNSC - NN. SUPRACLAVICULARES
- NTL - N. THORACICUS LONGUS
- VIMO - VENTER INF. M. OMOHYOIDEI
- RS - R. SUPERFICIALIS (A. TRANSVERSAE CERVICIS)
- TTC - TRUNCUS THYROCERVICALIS
- ATI - A. THYROIDEA INF.
- ACA - A. CERVICALIS ASCENDENS
- ATC - A. TRANSVERSA CERVICIS
- RP - R. PROFUNDUS (A. TRANSVERSAE CERVICIS)
- ASS - A. SUPRASCAPULARIS
- VJI - V. JUGULARIS INTERNA
- DT - DUCTUS THORACICUS
- VS - V. SUBCLAVIA
- NP - N. PHRENICUS
- AS - A. SUBCLAVIA
- MSA - M. SCALENUS ANT.
- NLSC - N. L. SUPRACLAVICULARES