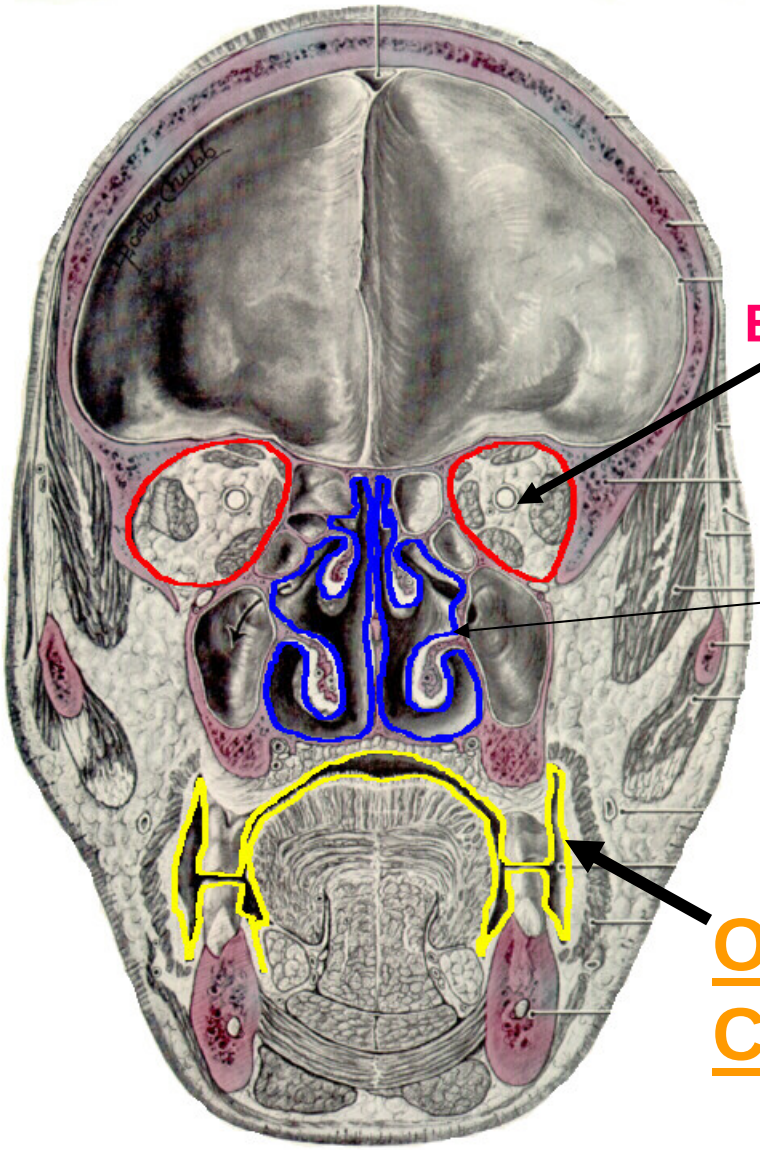
ORAL CAVITY



WHY IS HEAD & NECK SO COMPLICATED?

SPECIAL SENSES (VISION, AUDITORY) AND CHEMICAL SENSES (TASTE, SMELL - OLFACTION) SURROUND ORAL CAVITY; YOU SENSE WHAT YOU EAT (AND AVOID BEING EATEN)

OUTLINE: ORAL CAVITY

I. SUBMANDIBULAR REGION

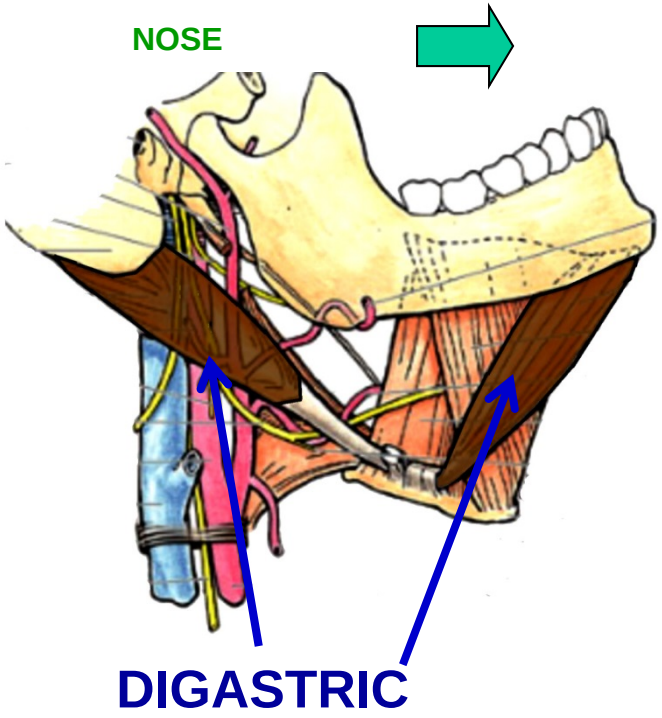
II. TONGUE

III. NERVES, ARTERIES, SALIVARY GLANDS

word on the street (of day) - ANGINA = condition with intense pain: from L. or G., strangling, choking

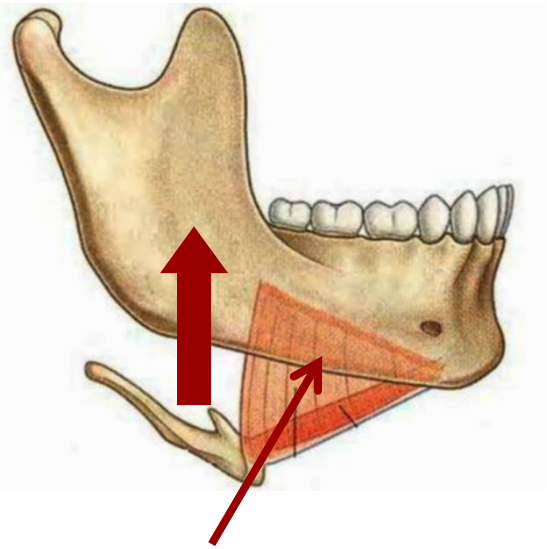
I. SUBMANDIBULAR REGION = AREA BETWEEN MANDIBLE AND HYOID BONE; REVIEW MUSCLES

view from inside mouth



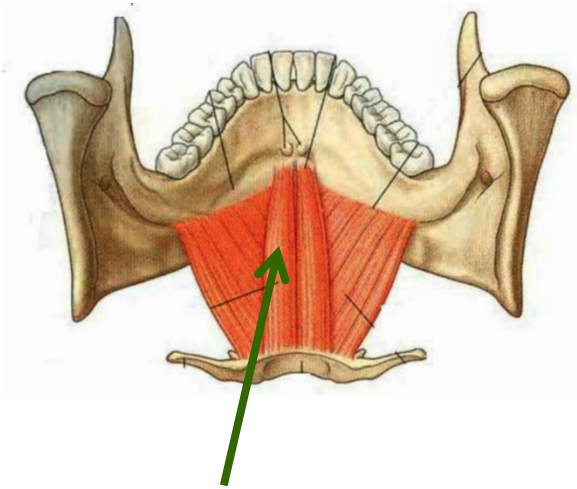
DIGASTRIC

ACTION - Depress mandible, OPEN MOUTH
INN - V3, VII



MYLOHYOID

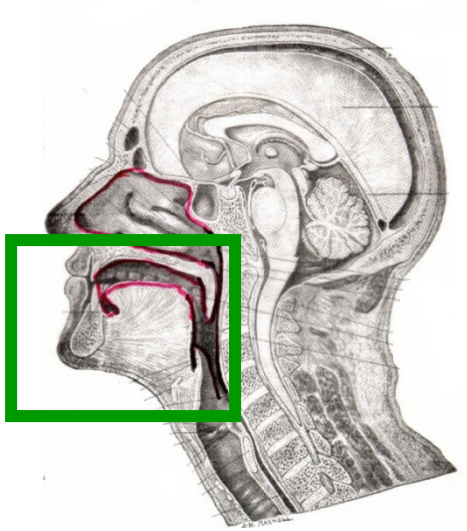
ACTION - Elevate hyoid,
RAISE FLOOR OF MOUTH
INN - V3



GENIOHYOID

ACTION - PULL HYOID FORWARD
INN - C1 (with XII)

SUBMANDIBULAR REGION *



NOSE

GENIOGLOSSUS
- mandible-tongue

GENIOHYOID
- mandible-hyoid

MYLOHYOID
- cut on end

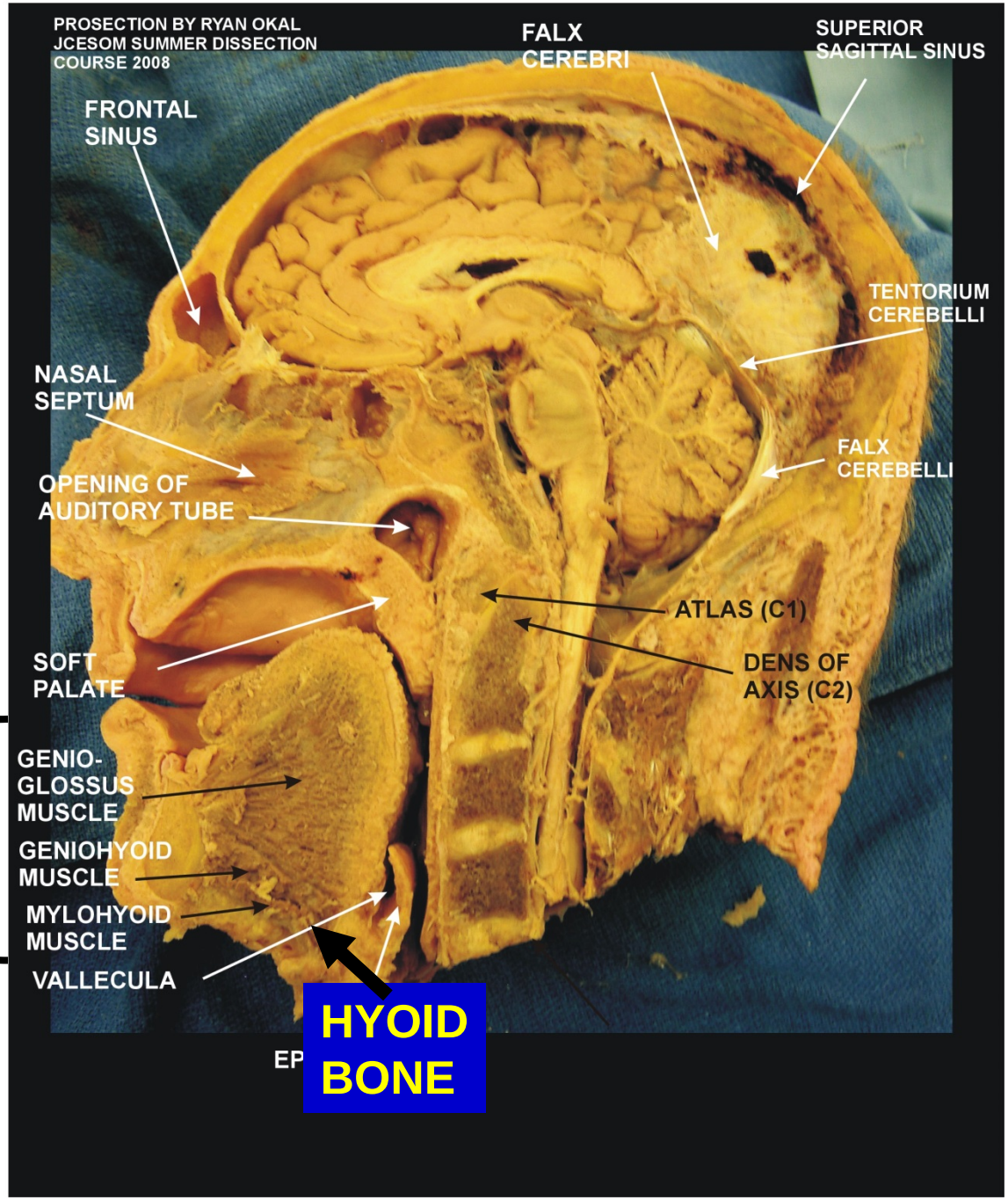
DIGASTRIC

HYOID BONE

MUSCLES VIEWED ON BISECTED HEAD – ID ON PRACTICAL BASED ON LOCATION, FIBER ORIENTATION

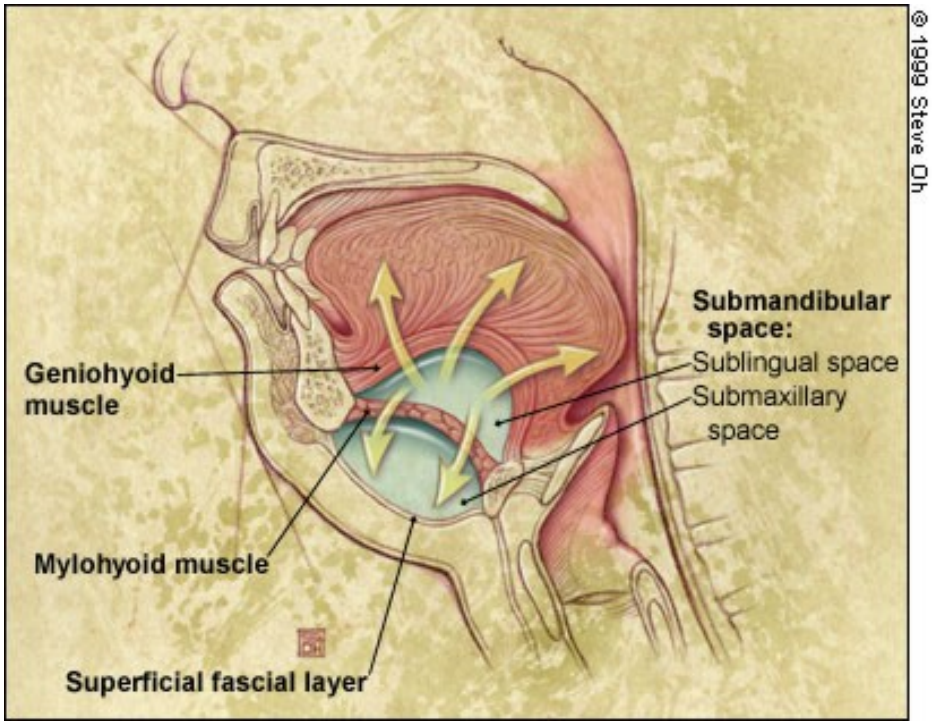
MEDIAL VIEW OF BISECTED HEAD

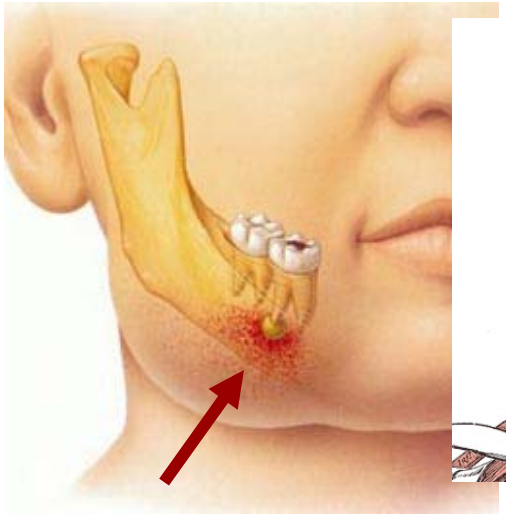
312



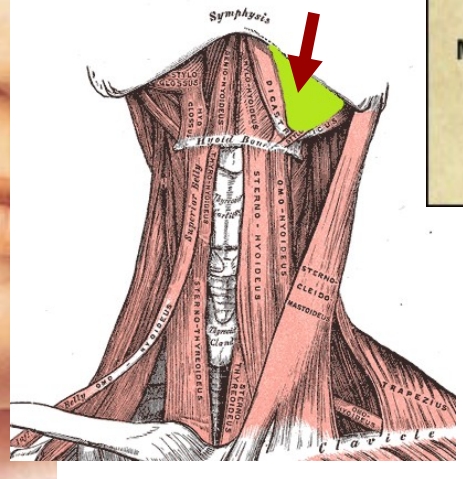
MUSCLES OF FLOOR OF MOUTH

BOARD QUESTION: LUDWIG'S ANGINA - infection of floor of mouth (Submandibular space), often due to spread from abscessed mandibular tooth *





tooth abscess

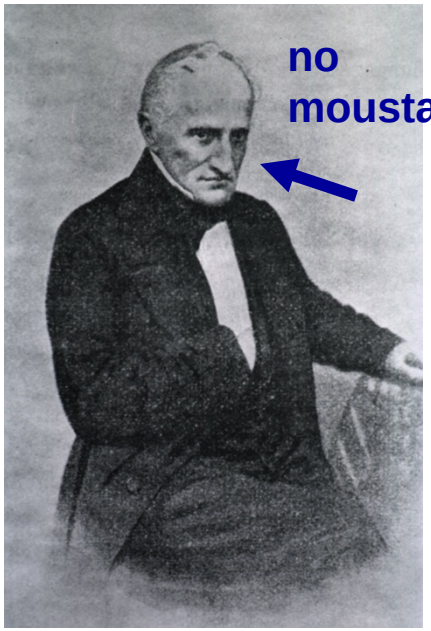


Submandibular Space - in AnteriorTriangle of neck

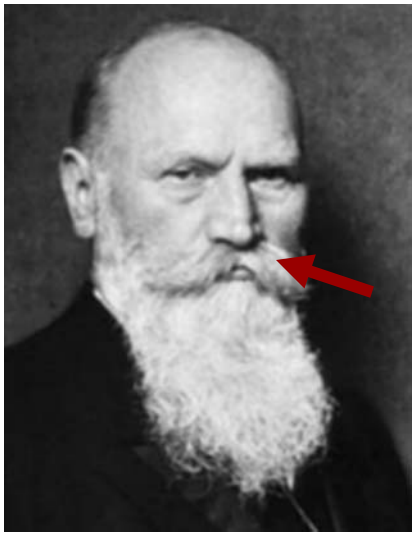
Infection may obstruct airway, push up tongue

Angina = condition with intense pain: from L. strangling

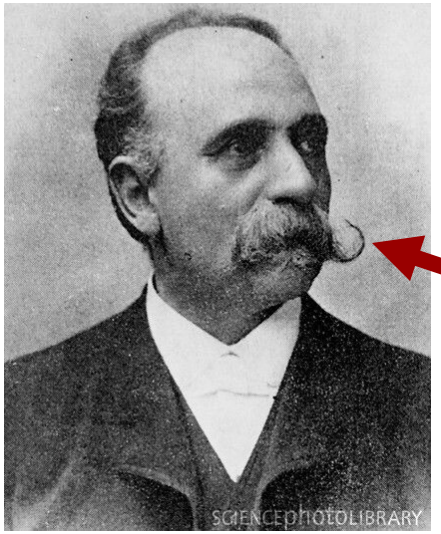
IMPLICIT: EXCELLENCE IN ANATOMY/SCIENCE IS CORRELATED WITH THE PRESENCE OF A MOUSTACHE/BEARD



WILHELM FREDERICK VON LUDWIG (1790-1865) -
- German surgeon
- first described submandibular infection



WALDEYER -
- coined term neuron
- reputation: stealing ideas from others
- however, identified all tonsils/lymphatic tissues in head

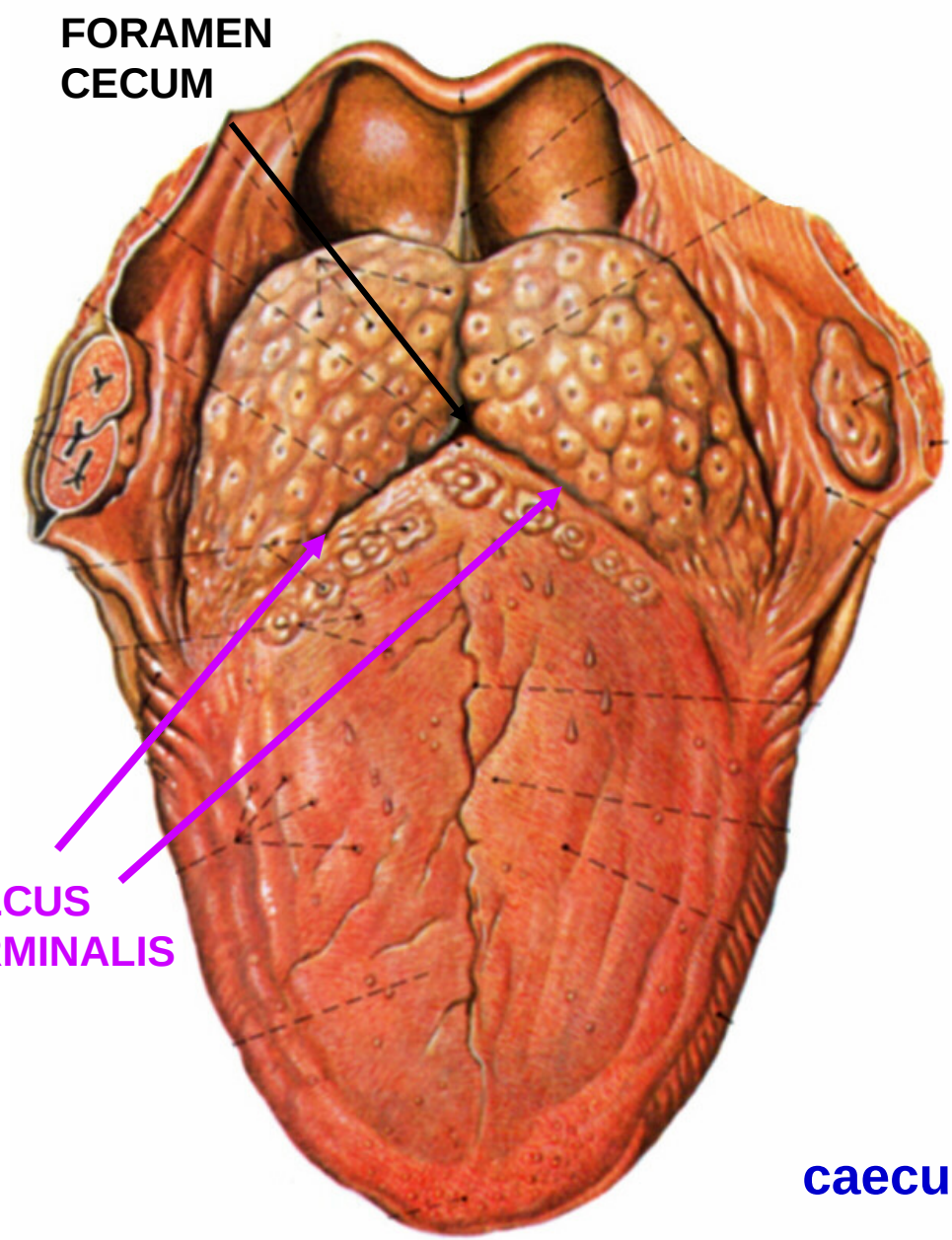


***

GOLGI -
- reputation: genius
- identified cell organelles
- identified sense organs in muscle tendons

Fact: No clear correlation exists; most early anatomists/scientists were male; most males had facial hair; there are/were also many excellent female scientists (ex. Rosalind Franklin, Jane Macpherson)

II. TONGUE



MOBILE MUSCULAR ORGAN ATTACHED TO HYOID, MANDIBLE and SKULL BY MUSCLES

FUNCTIONS: CHEWING FOOD, SPEECH, SWALLOWING, TASTE AND INFANTILE EMOTIONAL EXPRESSIONS

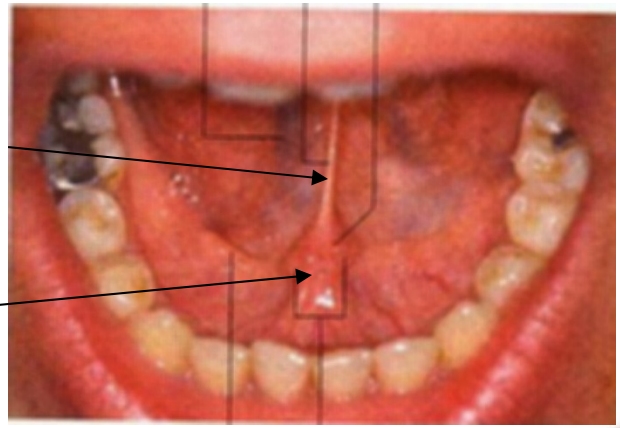
A. SUPERFICIAL STRUCTURES

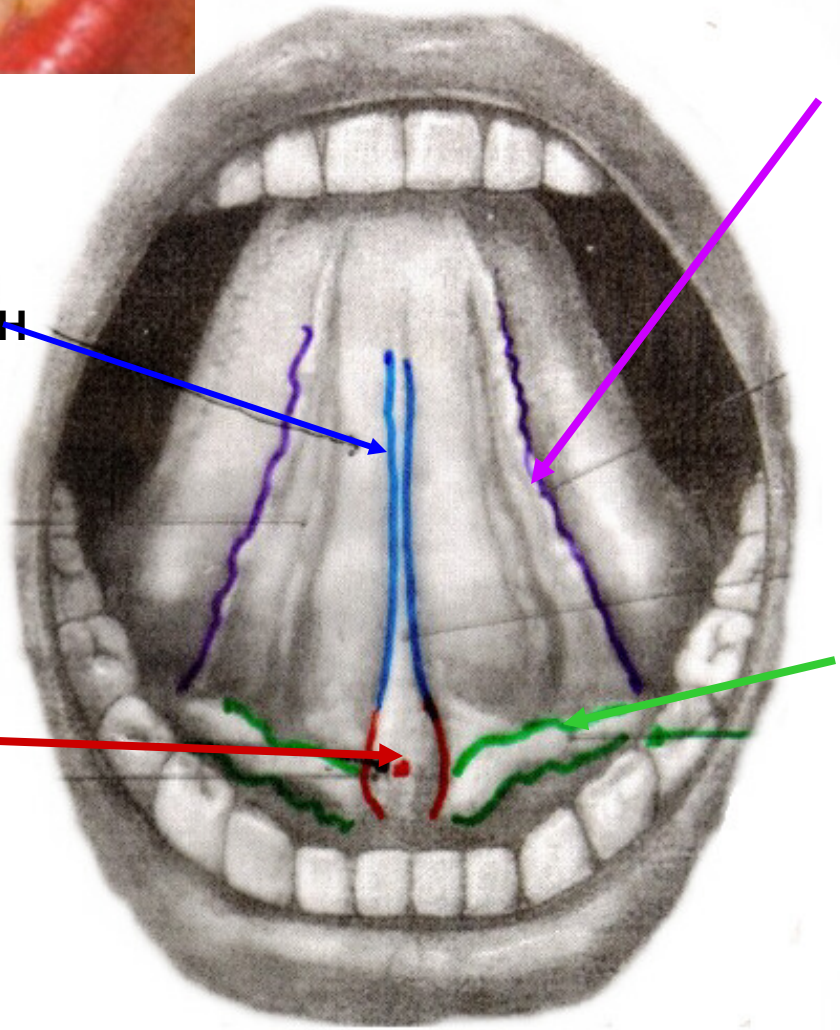
1. SULCUS TERMINALIS - V-SHAPE GROOVE DIVIDES TONGUE INTO: ANT. 2/3- ORAL PART - SOMATIC SENSORY; POST 1/3 -PHARYNGEAL PART - VISCERAL SENSORY

2. FORAMEN CAECUM - PIT IN MIDDLE OF SULCUS TERMINALIS- SITE OF INVAGINATION OF THYROID GLAND

caecum - L. blind pouch

FOLDS, LANDMARKS BENEATH TONGUE





3. LINGUAL FRENULUM (L. BRIDLE) MIDLINE FOLD FROM FLOOR OF MOUTH

SUBLINGUAL PAPILLA- SWELLING AT BASE OF FRENULUM; OPENINGS SUBMANDIB. SALIV. GLANDS

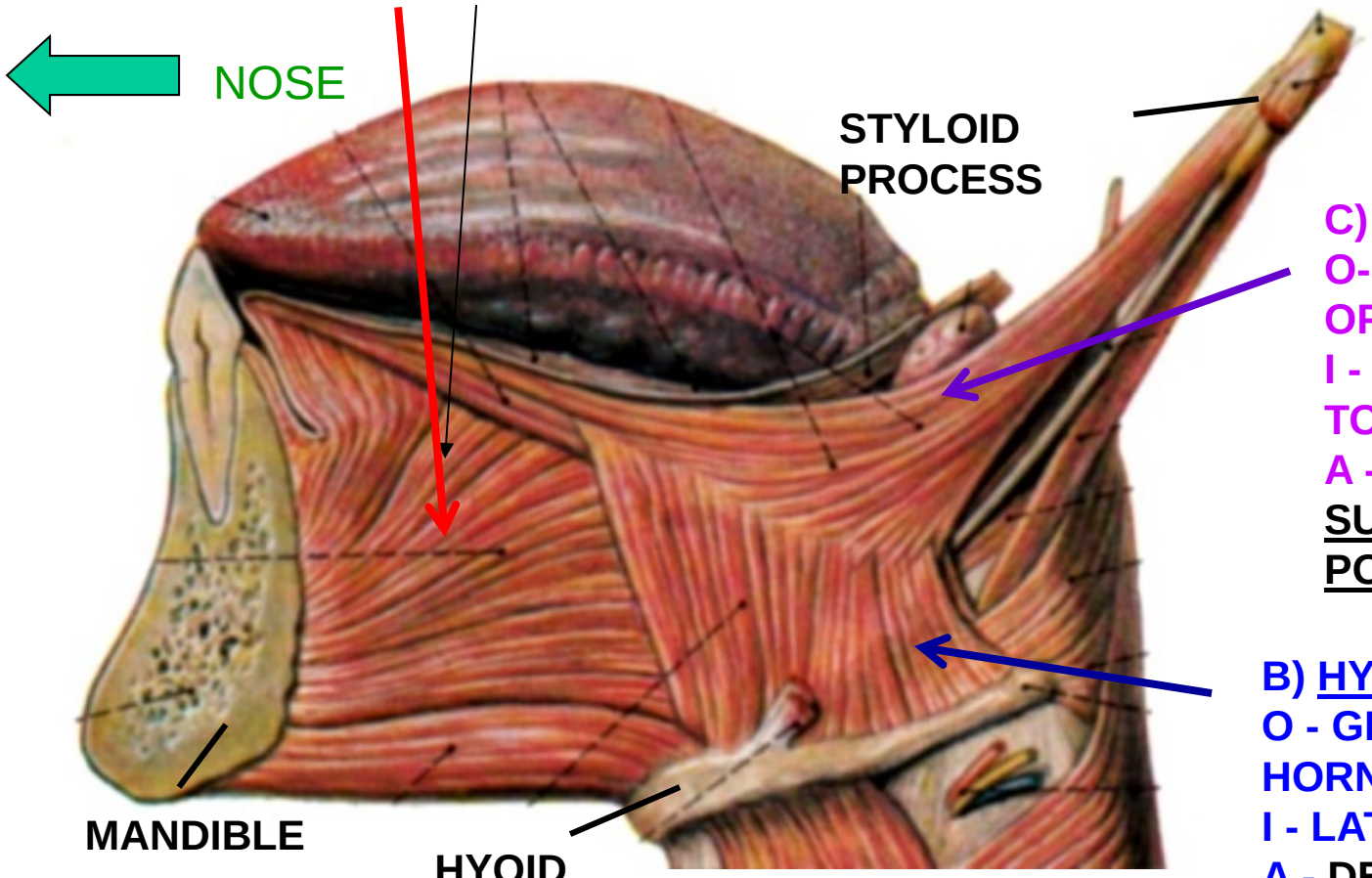
4. FIMBRIATED FOLDS (PLICA FIMBRIATA) (L. FRINGE) - LATERAL TO LINGUAL FRENULUM, LOCATION OF LINGUAL VEINS

5. SUBLINGUAL FOLDS (PLICA SUBLINGUALIS) OVERLIE and HAVE OPENINGS FOR SUBLINGUAL SALIV GLANDS

B. MUSCLES OF TONGUE - all innervated by XII

1. EXTRINSIC MUSCLES - ATTACH TONGUE TO BONES

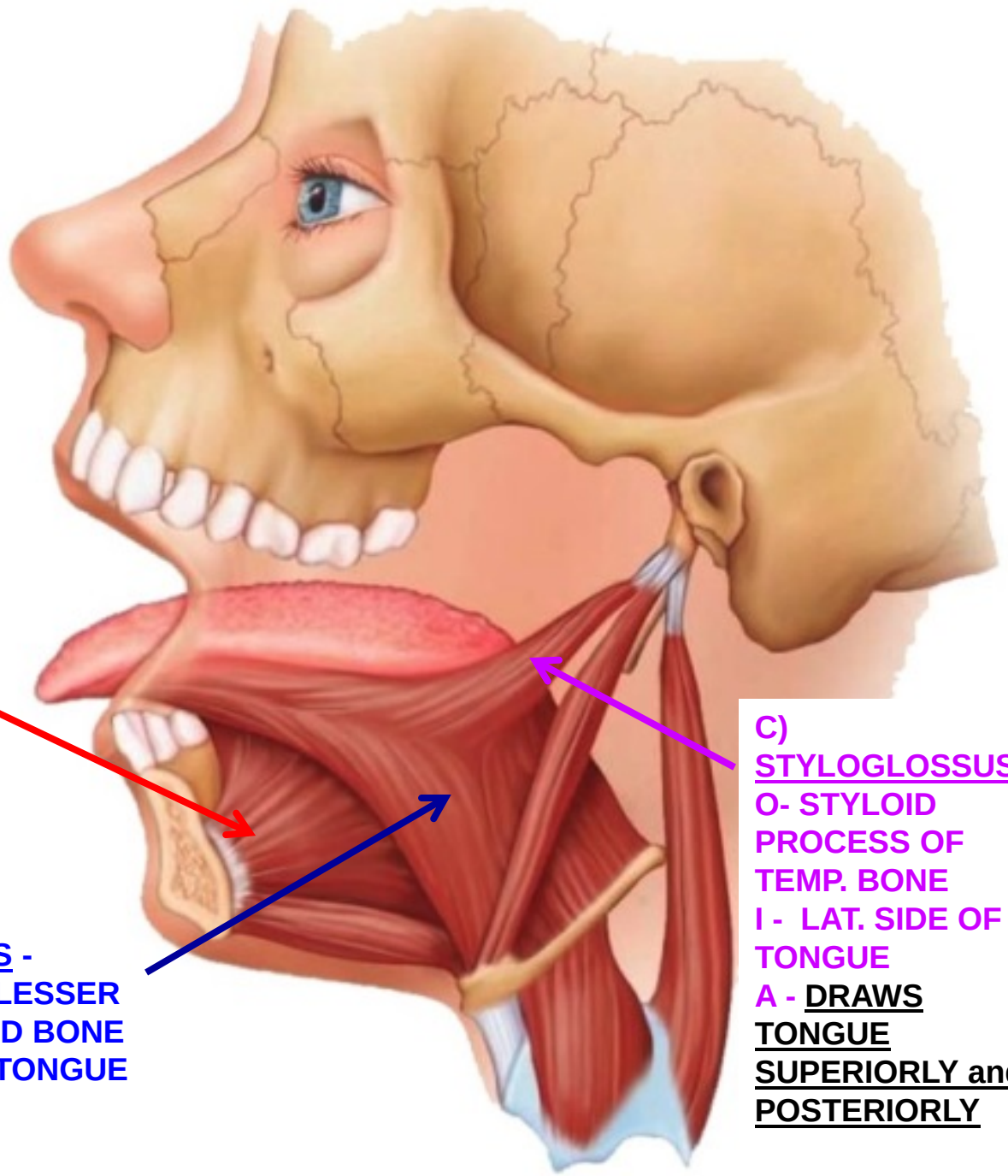
A) GENIOGLOSSUS
O - GENIAL TUBERCLE OF MANDIBLE
I - TONGUE TO ITS DORSAL SURFACE
A - PROTRUDE



C) STYLOGLOSSUS - O-STYLOID PROCESS OF TEMP. BONE
I - LAT. SIDE OF TONGUE
A - DRAWS TONGUE SUPERIORLY and POSTERIORLY

B) HYOGLOSSUS -
O - GREATER & LESSER HORNS OF HYOID BONE
I - LAT. SIDE OF TONGUE
A - DEPRESS

B. MUSCLES OF TONGUE - all innervated by XII



A) GENIOGLOSSUS
O - GENIAL TUBERCLE OF MANDIBLE
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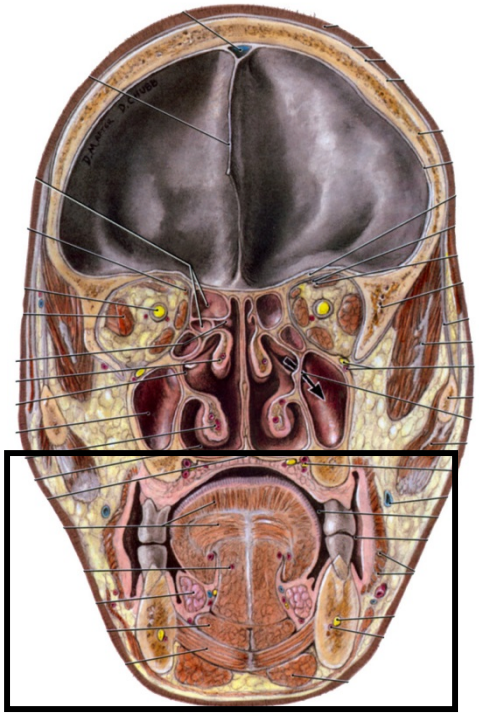
B) HYOGLOSSUS -
O - GREATER & LESSER HORNS OF HYOID BONE
I - LAT. SIDE OF TONGUE
A - DEPRESS

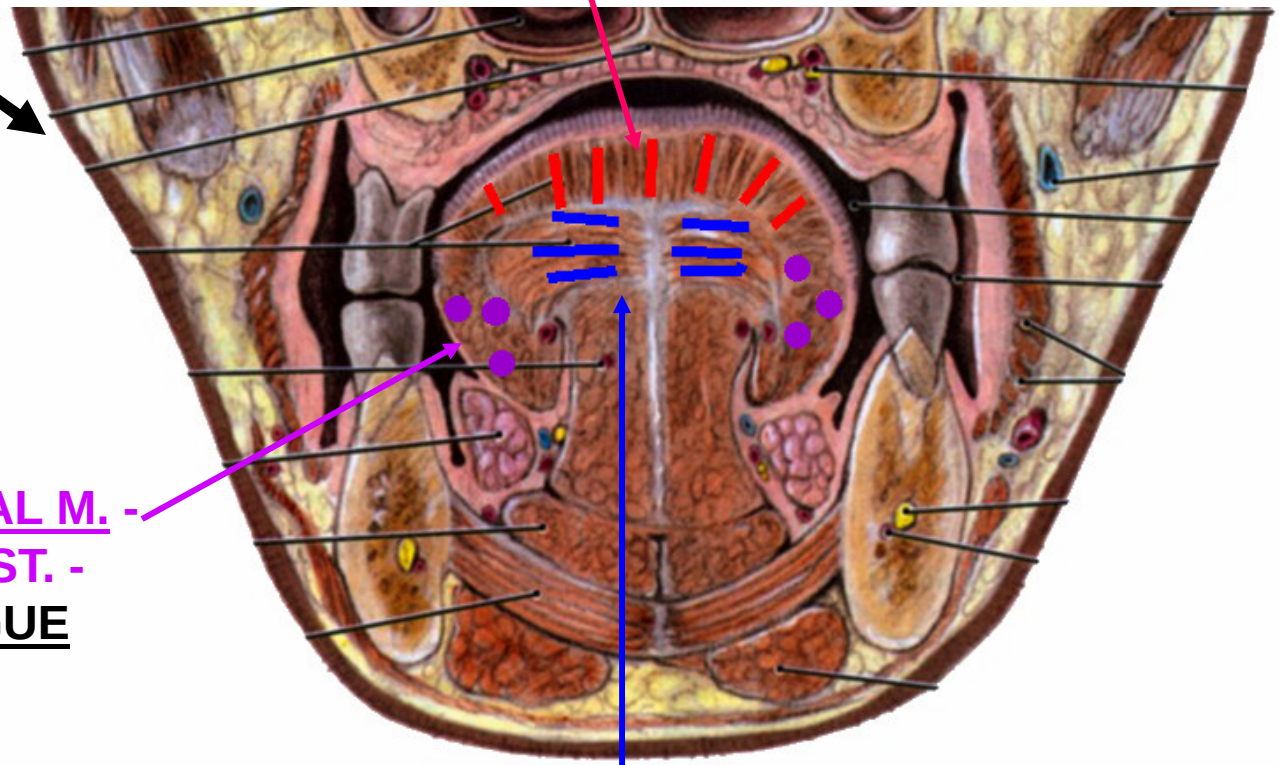
C) STYLOGLOSSUS -
O- STYLOID PROCESS OF TEMP. BONE
I - LAT. SIDE OF TONGUE
A - DRAWS TONGUE SUPERIORLY and POSTERIORLY

2. INTRINSIC MUSCLES OF TONGUE



CORONAL SECTION

A) VERTICAL M. - FIBERS SUP & INF - FLATTEN and BROADEN TONGUE



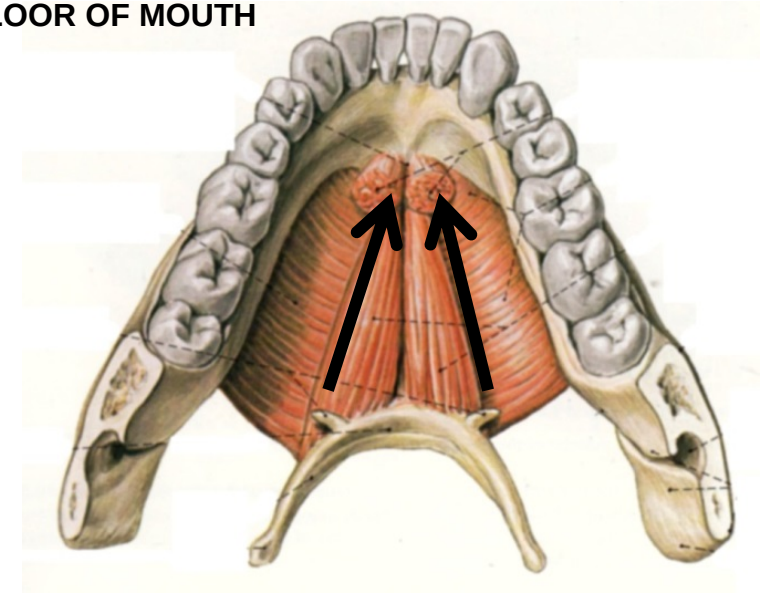
C) LONGITUDINAL M. - FIBERS ANT-POST. - SHORTEN TONGUE

B) TRANSVERSE M. - FIBERS HORIZONTAL - NARROW TONGUE

ALL INTRINSIC AND EXTRINSIC MUSCLES – INN BY CN XII

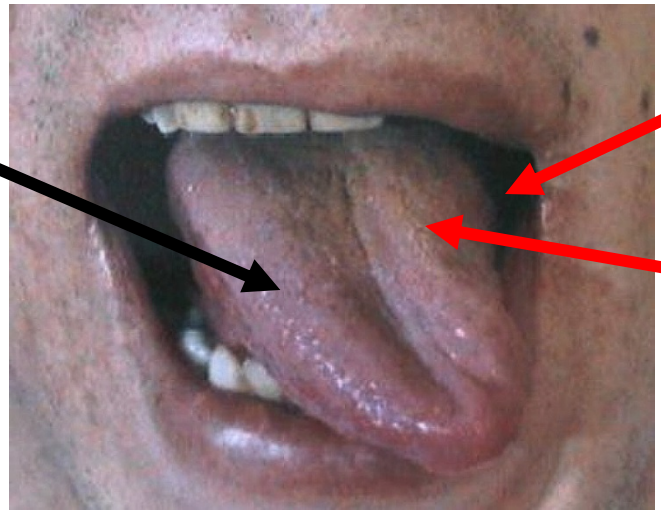
VIEW OF FLOOR OF MOUTH

GENIO-GLOSSUS DIRECTION OF ACTION



CLINICAL SIGN OF DAMAGE TO HYPOGLOSSAL NERVE (XII)

GENIO-GLOSSUS INTACT



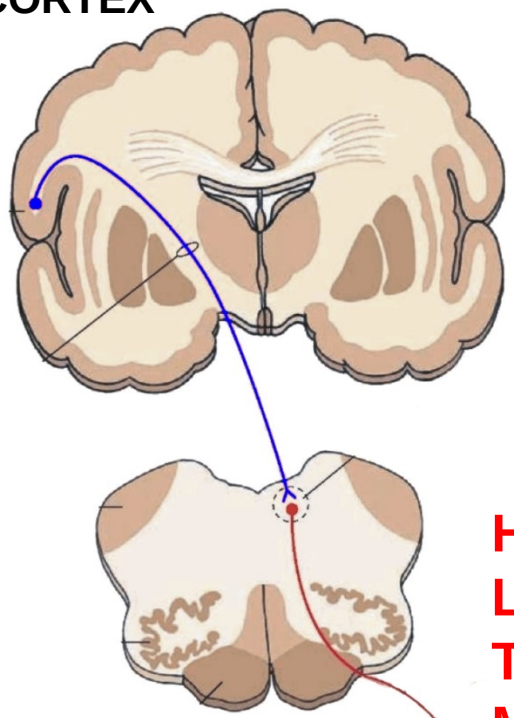
DAMAGE HYPOGLOSSAL NERVE ON ONE SIDE

GENIO-GLOSSUS PARALYZED

LOWER MOTOR NEURON LESION - PROTRUDED TONGUE DEVIATES TOWARD SIDE OF LESION - due to unopposed action of the Genioglossus muscle. **

UPPER MOTOR NEURON TO GENIOGLOSSUS - CONTRALATERAL

CORTEX



BRAINSTEM - MEDULLA

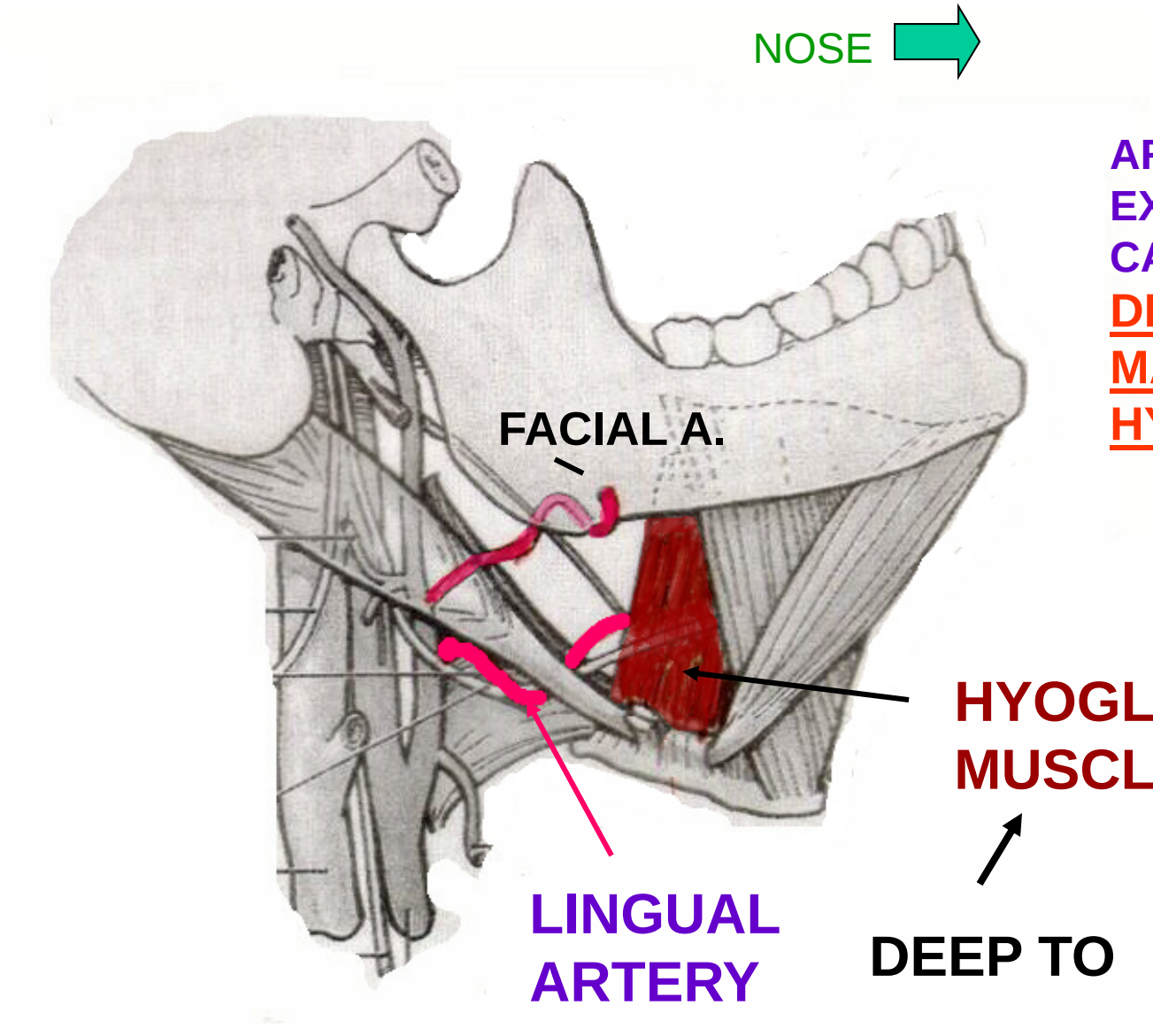
UPPER MOTOR NEURON - CRANIAL NERVES - ALL BILATERAL EXCEPT:
1) ONLY CONTRALATERAL:
- VII - LOWER FACE (BELOW ORBICULARIS OCULI)
- XII - GENIOGLOSSUS
- XI - TRAPEZIUS
2) ONLY IPSILATERAL:
- XI - STERNOCLEIDOMASTOID

HYPOGLOSSAL LOWER MOTOR TO GENIOGLOSSUS MUSCLE (IPSILATERAL)

DAMAGE UPPER MOTOR - TONGUE DEVIATES AWAY FROM SIDE OF CORTICAL LESION **

DAMAGE LOWER MOTOR - TONGUE DEVIATES ** **TOWARD SIDE OF LOWER MOTOR NEURON LESION**

C. ARTERIES TO TONGUE - LINGUAL ARTERY

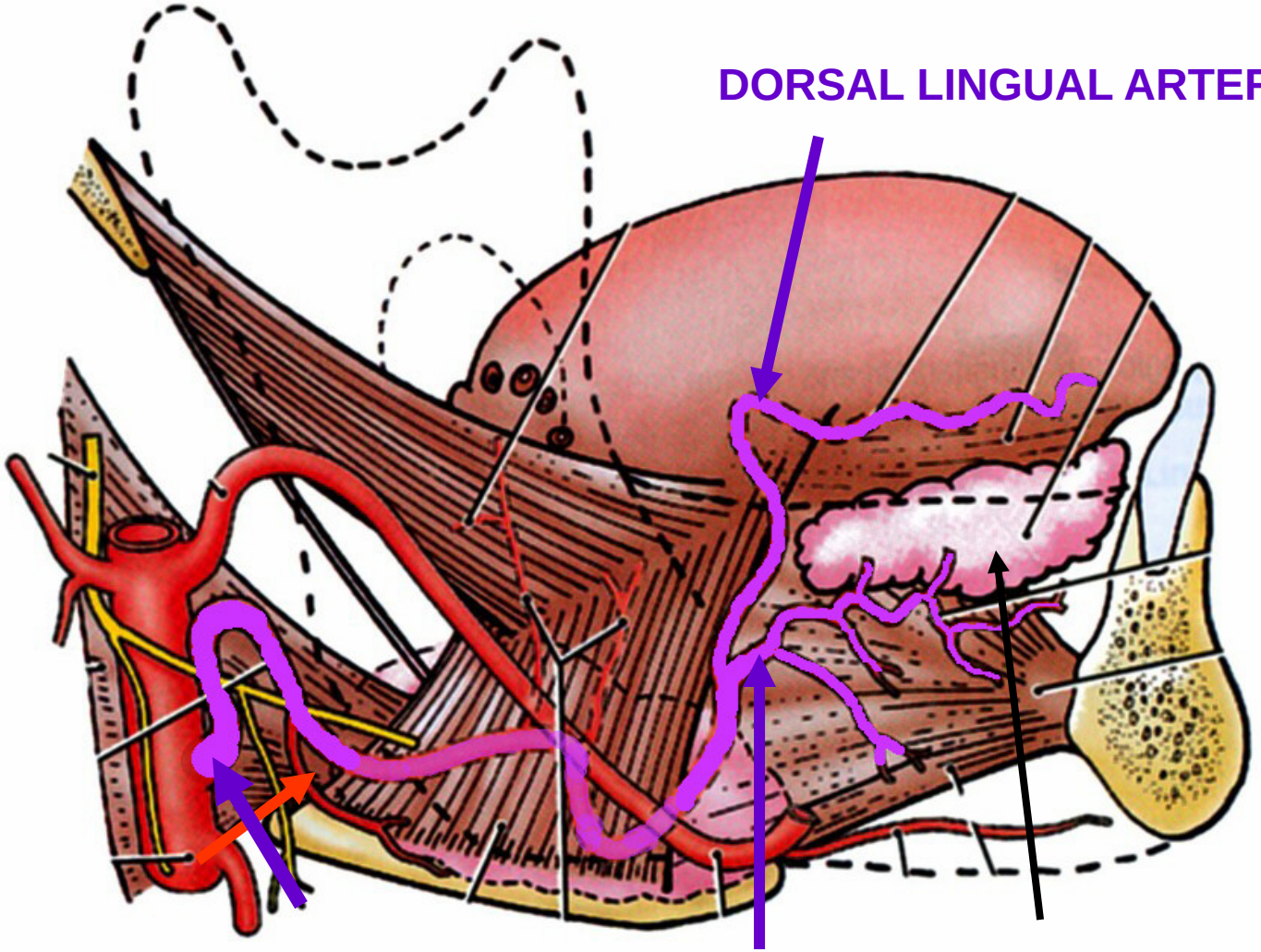


ARISES FROM EXTERNAL CAROTID ARTERY

DEEP TO POST MARGIN OF HYOGLOSSUS

LINGUAL ARTERY

NOSE



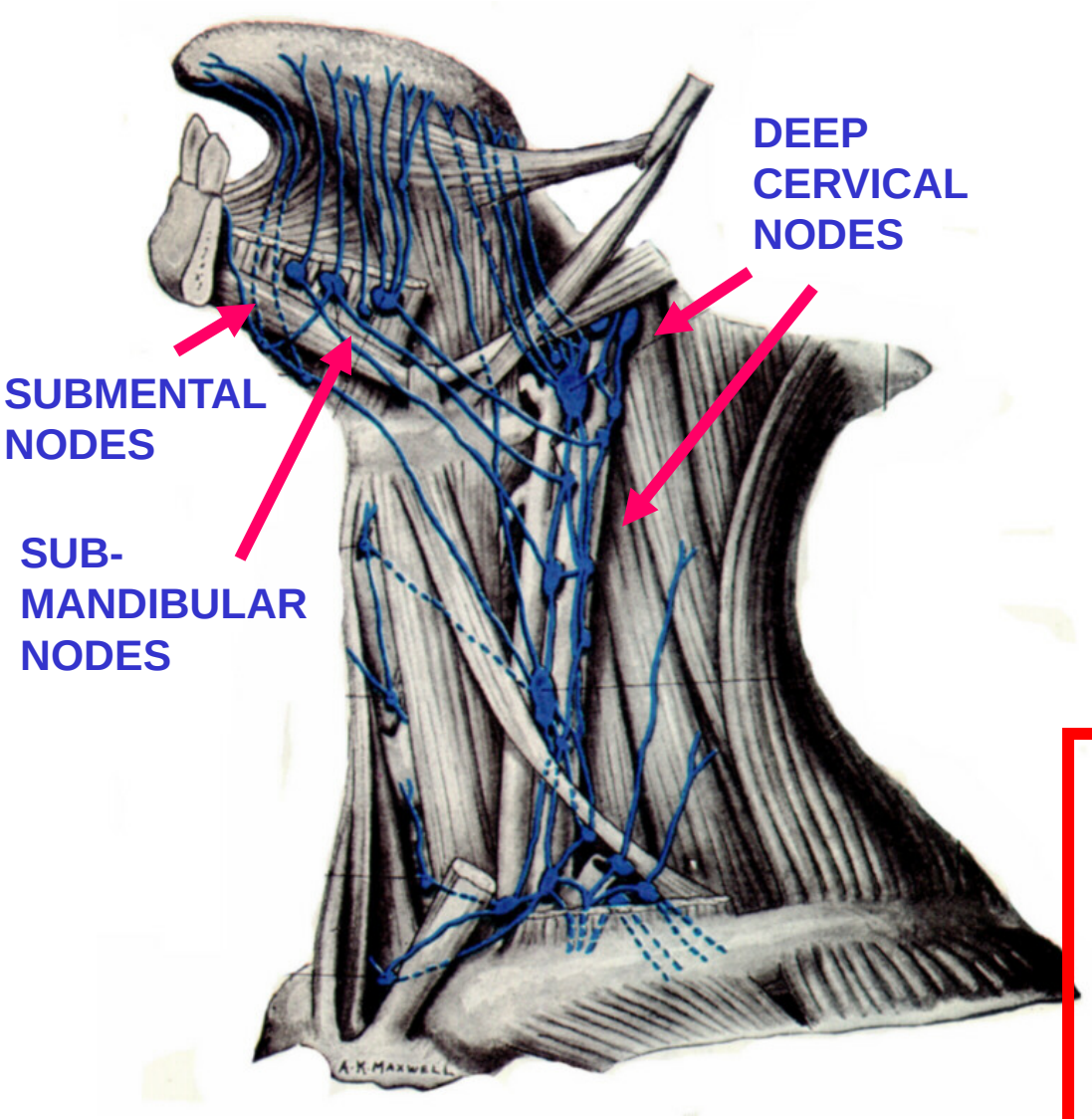
LINGUAL ARTERY- TURNS UPWARD TO SUPPLY TONGUE

BRANCHES

A) DORSAL LINGUAL BRANCHES- TO DORSUM OF TONGUE

B) SUBLINGUAL ARTERY - TO SUBLINGUAL SALIVARY GLAND

D. LYMPHATICS OF TONGUE



1. TIP OF TONGUE to SUBMENTAL NODES
2. REST OF ANTERIOR 2/3 OF TONGUE to SUBMANDIBULAR NODES AND DEEP CERVICAL LYMPH NODES
3. POSTERIOR 1/3 OF TONGUE TO DEEP CERVICAL LYMPH NODES

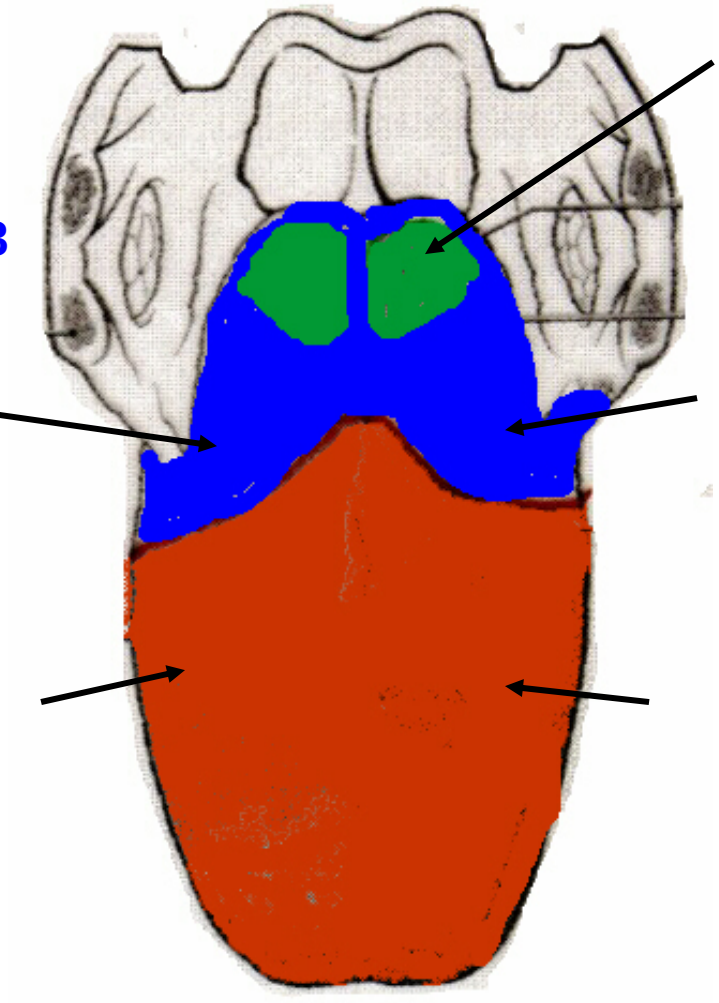
NOTE: LYMPH VESSELS OF TONGUE CROSS MIDLINE; LESION MAY SPREAD TO OPPOSITE SIDE

E. SENSORY INNERVATION OF TONGUE

NOTE: ↓

PHARYNGEAL PART- POST 1/3 and ANT. TO EPIGLOTTIS- VISCERAL SENSORY, TOUCH, PAIN; TASTE

ORAL PART - ANT 2/3 - SOMATIC SENSORY TOUCH, PAIN; TASTE

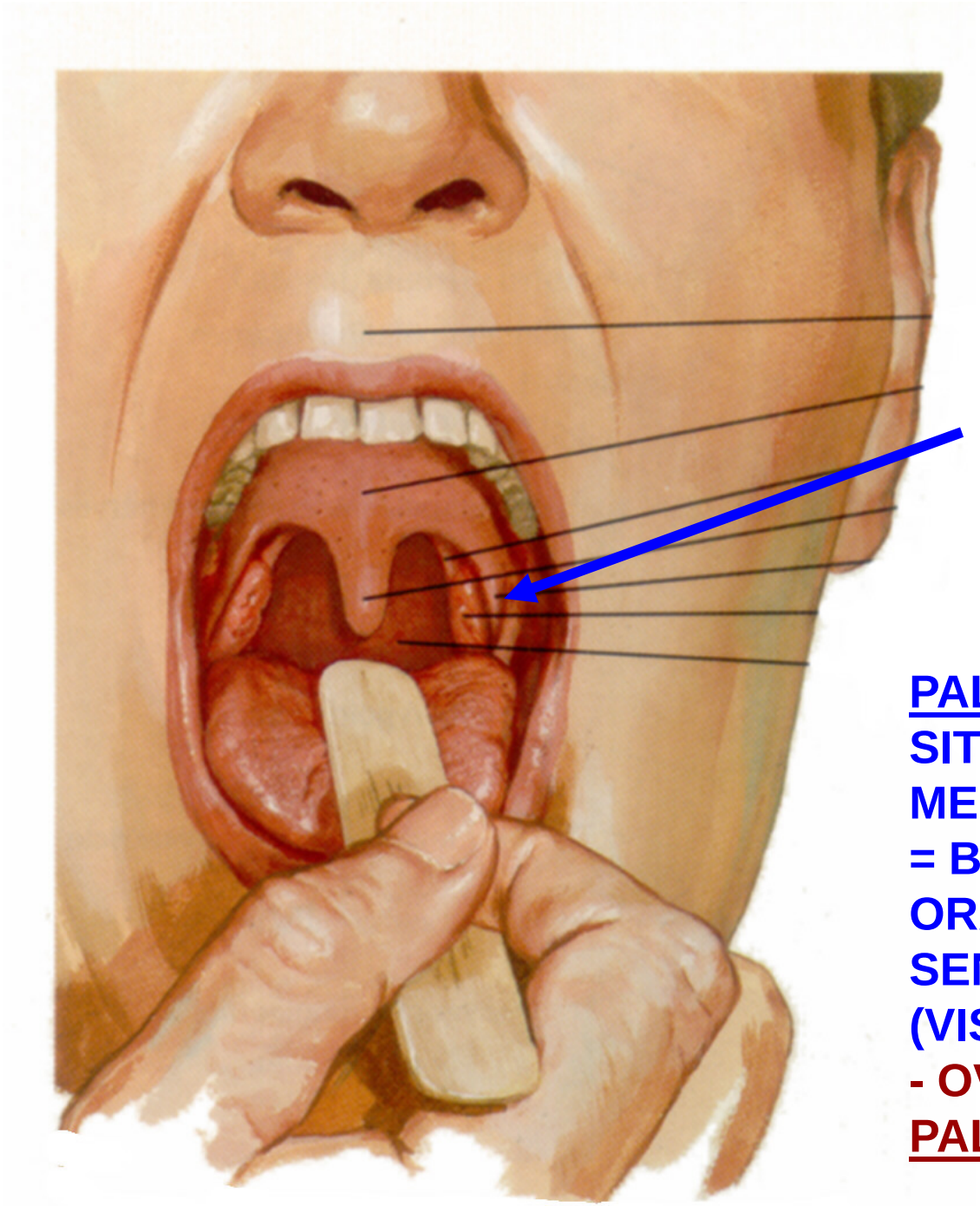


ANT. TO EPIGLOTTIS -
1) X- VAGUS- VISCERAL SENSORY TOUCH AND TASTE

POST. 1/3 OF TONGUE
1) IX - GLOSSOPHARYNGEAL - VISCERAL SENSORY TOUCH AND TASTE

ANT. 2/3 OF TONGUE
1) **V3 - LINGUAL N. SOMATIC SENSORY TOUCH**
2) VII - CHORDA TYMPANI - TASTE

NOTE: ALL MUSCLES INNERVATED BY XII HYPOGLOSSAL (SOMATIC MOTOR)
NOTE; PALATOGLOSSUS IS MUSCLE OF PALATE INNERVATED BY X (VAGUS)



SAY
AAHH!

PALATOGLOSSAL ARCH

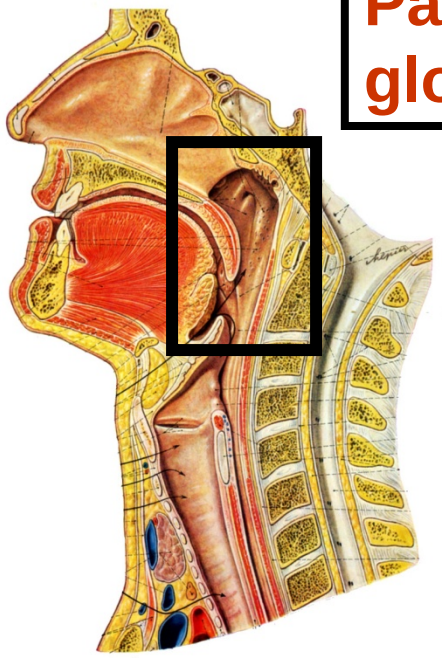
PALATOGLOSSAL ARCH = SITE OF OROPHARYNGEAL MEMBRANE
= BOUNDARY BETWEEN ORAL CAVITY (SOMATIC SENSORY) AND PHARYNX (VISCERAL SENSORY)
- OVERLIES PALATOGLOSSUS MUSCLE

PALATOGLOSSUS IS A MUSCLE OF SOFT PALATE

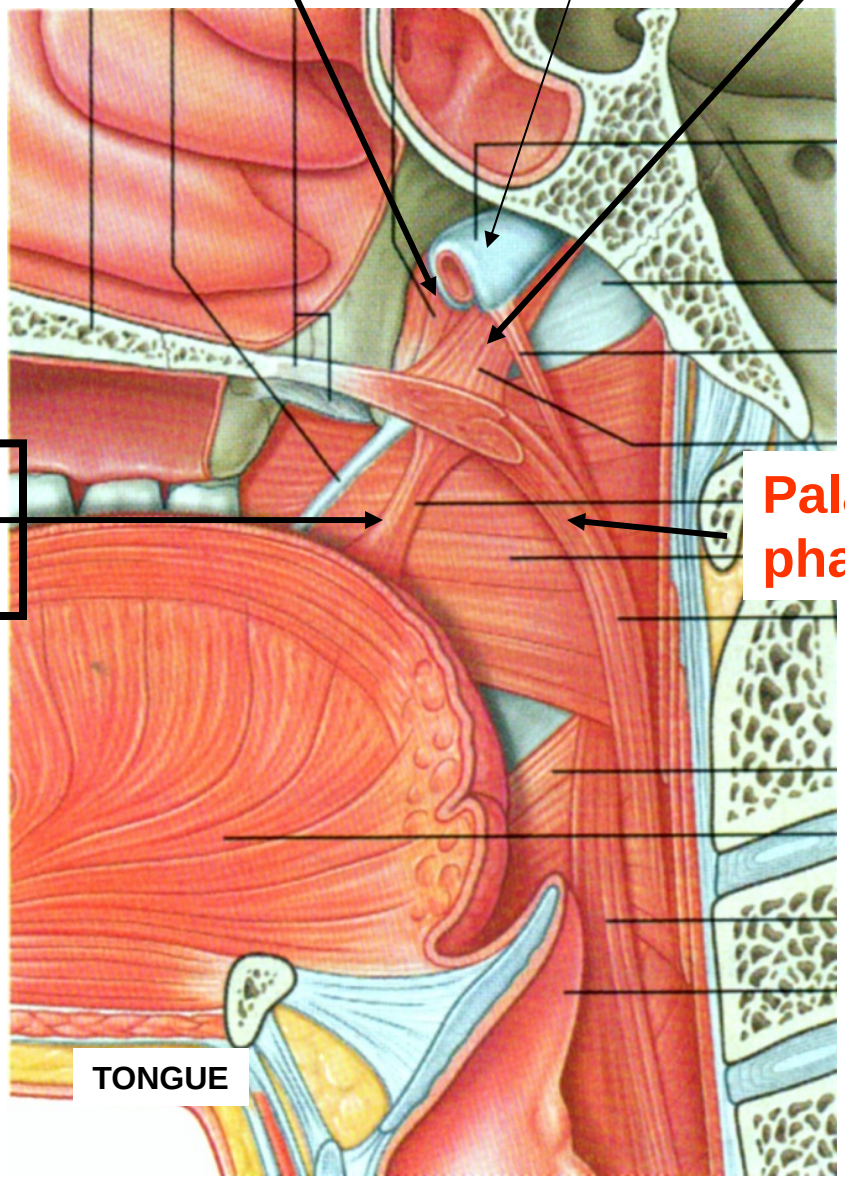
Innervation - VAGUS
CN X

Palatoglossus

O - Palatine aponeurosis, I - Side of tongue; A - Draws palate down, raises tongue

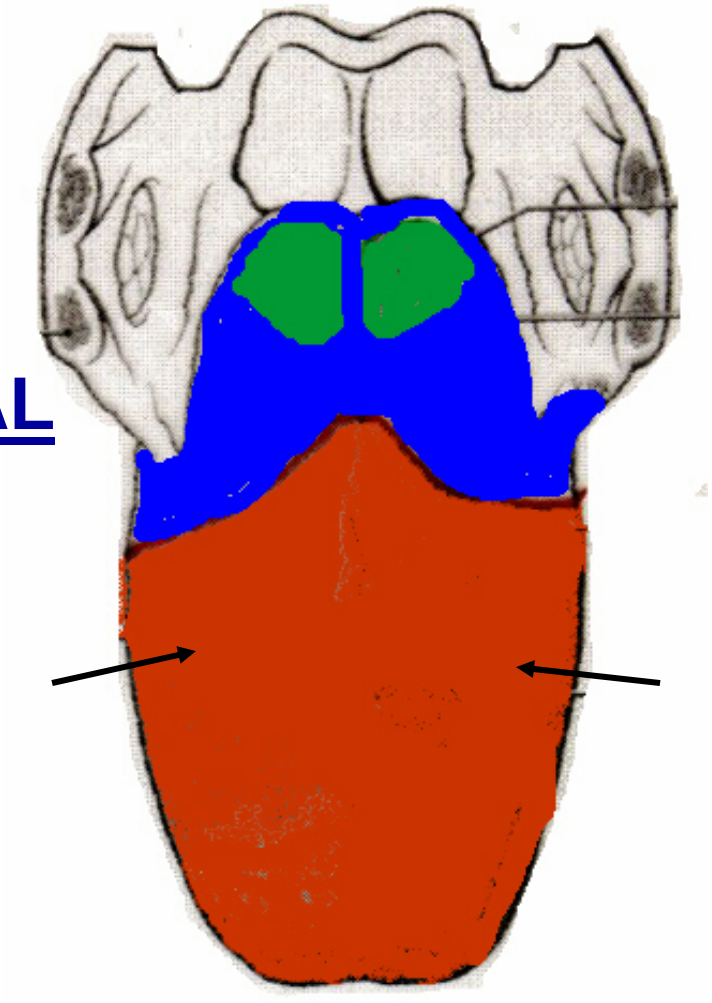


Palato-glossus



III. INNERVATION OF ANTERIOR 2/3 OF TONGUE - in two Cranial Nerves - V, VII

SOMATIC SENSORY - (GSA) IN TRIGEMINAL N. (V)



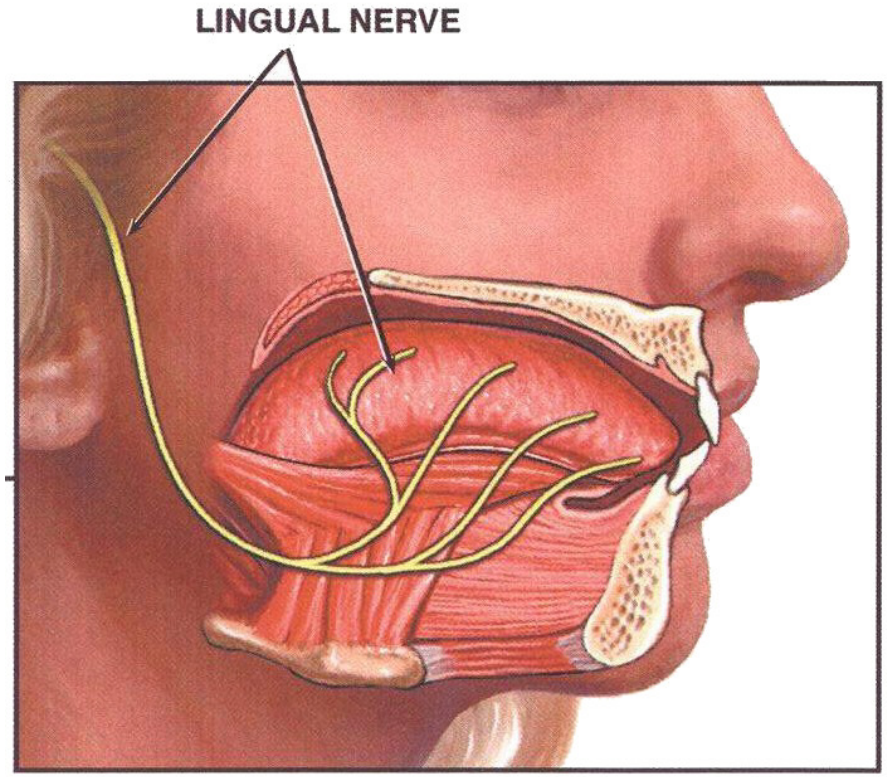
TASTE - (SVA) IN FACIAL N. (VII)

V3 - LINGUAL N. - SOMATIC SENSORY TOUCH

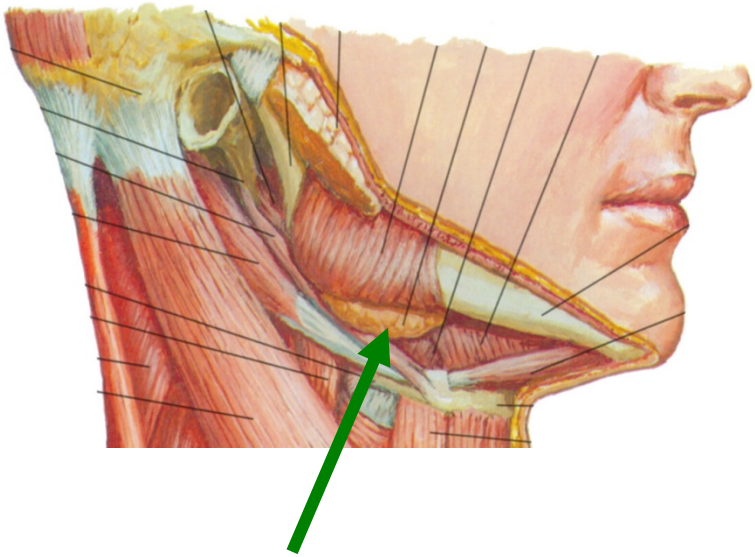
VII - CHORDA TYMPANI - TASTE

III. PATHWAYS OF NERVES TO TONGUE

LINGUAL NERVE (V3) - PROVIDES SOMATIC SENSATION (precise touch, etc.) to ANT. 2/3 OF TONGUE



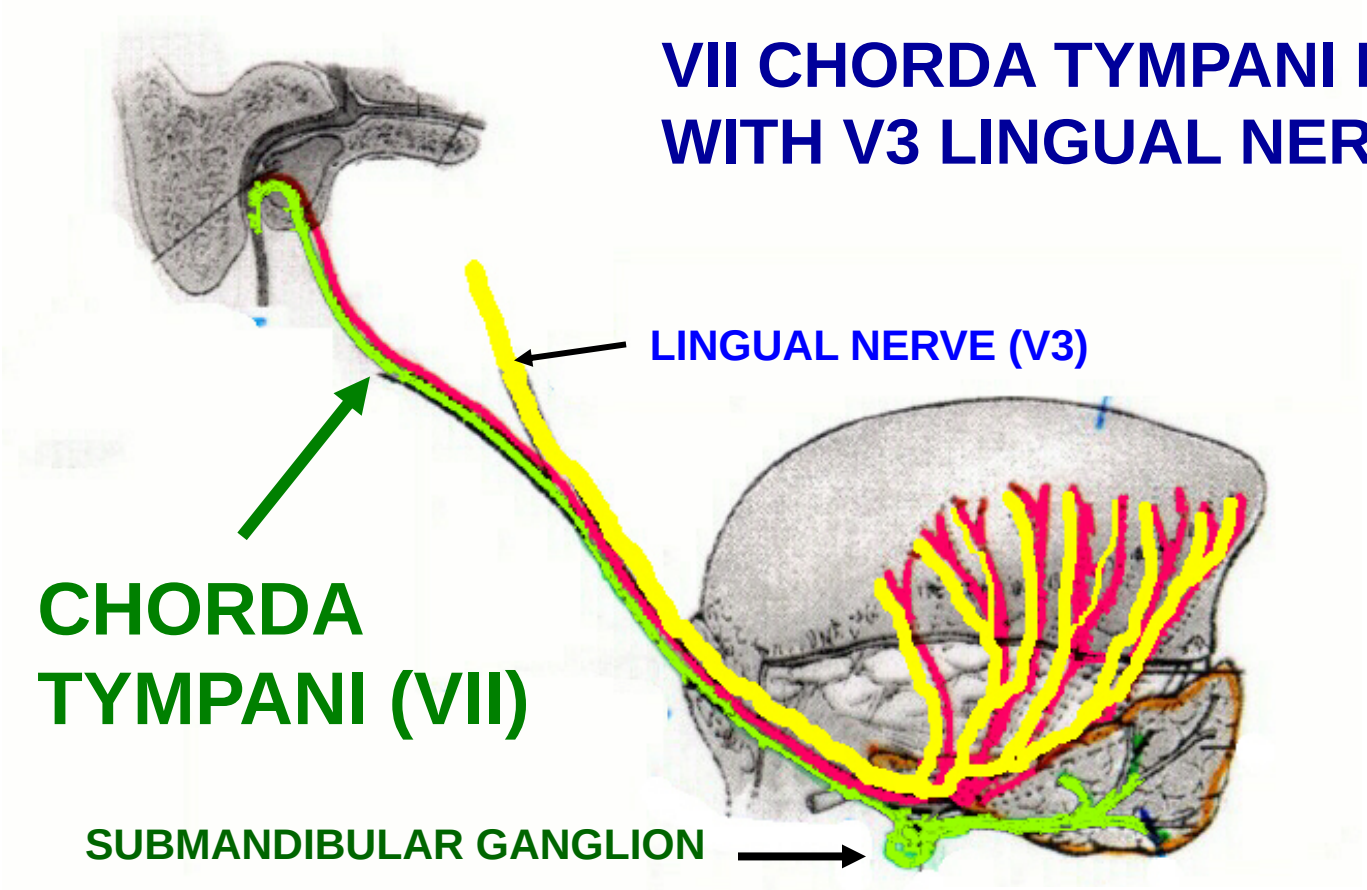
LATERAL VIEW OF THE TONGUE



SUBMANDIBULAR SALIVARY GLAND

LINGUAL NERVE COURSES NEAR SUBMANDIBULAR AND SUBLINGUAL SALIVARY GLANDS

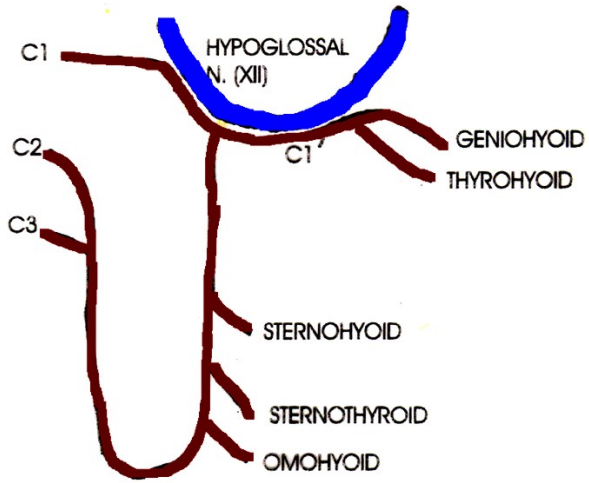
VII CHORDA TYMPANI HITCHHIKES WITH V3 LINGUAL NERVE



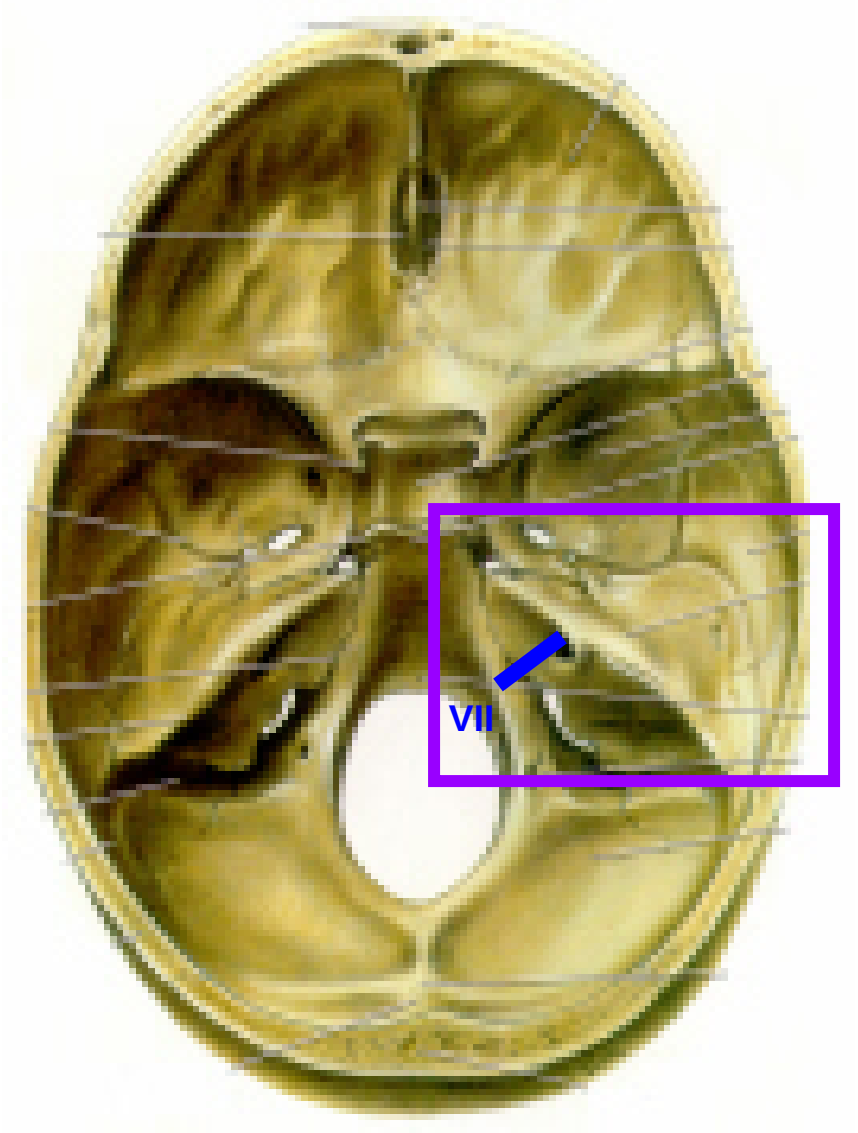
CHORDA TYMPANI (VII)- Parasympathetics - to Submandibular, Sublingual salivary glands
- Taste fibers - to taste buds on Ant. 2/3 of tongue

SIMILAR TO ANSA CERVICALIS

RECALL: CN XII Receives hitchhiking fibers of C1



VII – FACIAL – review pathway

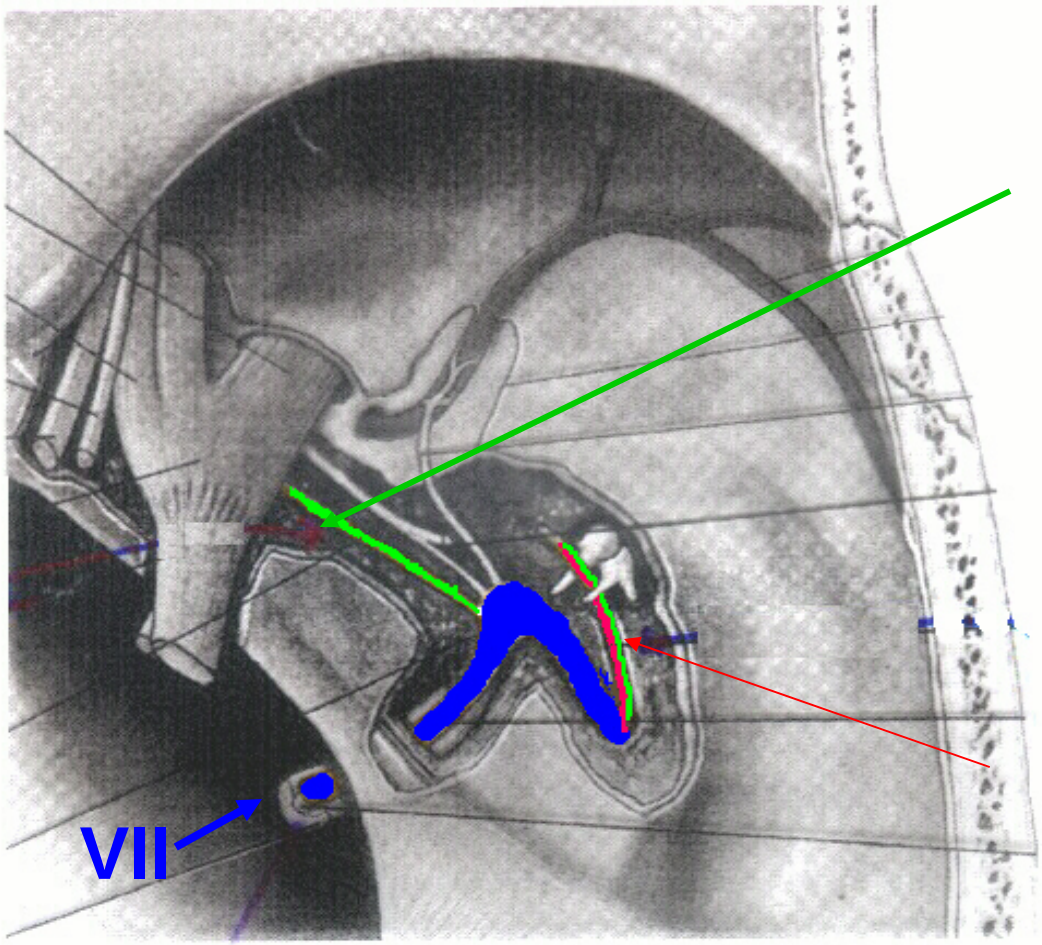


VII leaves Posterior Cranial fossa via Internal Auditory Meatus

Look inside Petrous part of temporal bone

FACIAL NERVE

VII leaves Post. Cranial fossa via Internal Aud. Meatus - enters Facial Canal



Branches in Facial Canal

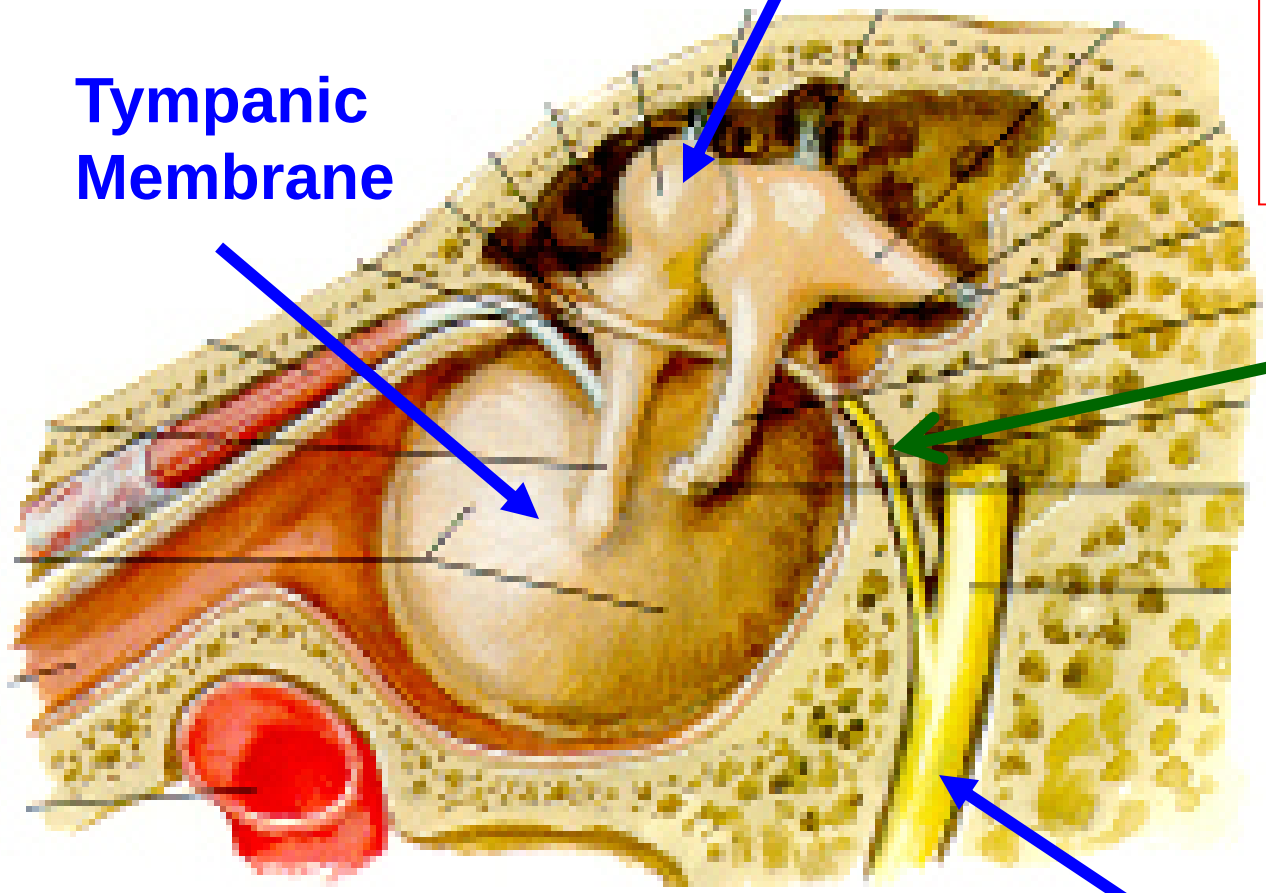
1. Greater Petrosal N.
- Visceral motor Parasymp. to Lacrimal gland, mucous glands of nose and palate,
- Visceral sensory to Nasopharynx

2. Stapedial N. - Branchio-motor to stapedius

3. Chorda Tympani
Taste to ant 2/3 tongue
Visceral motor Parasymp to submandibular, subling. salivary glands

CHORDA TYMPANI CROSSES TYMPANIC MEMBRANE

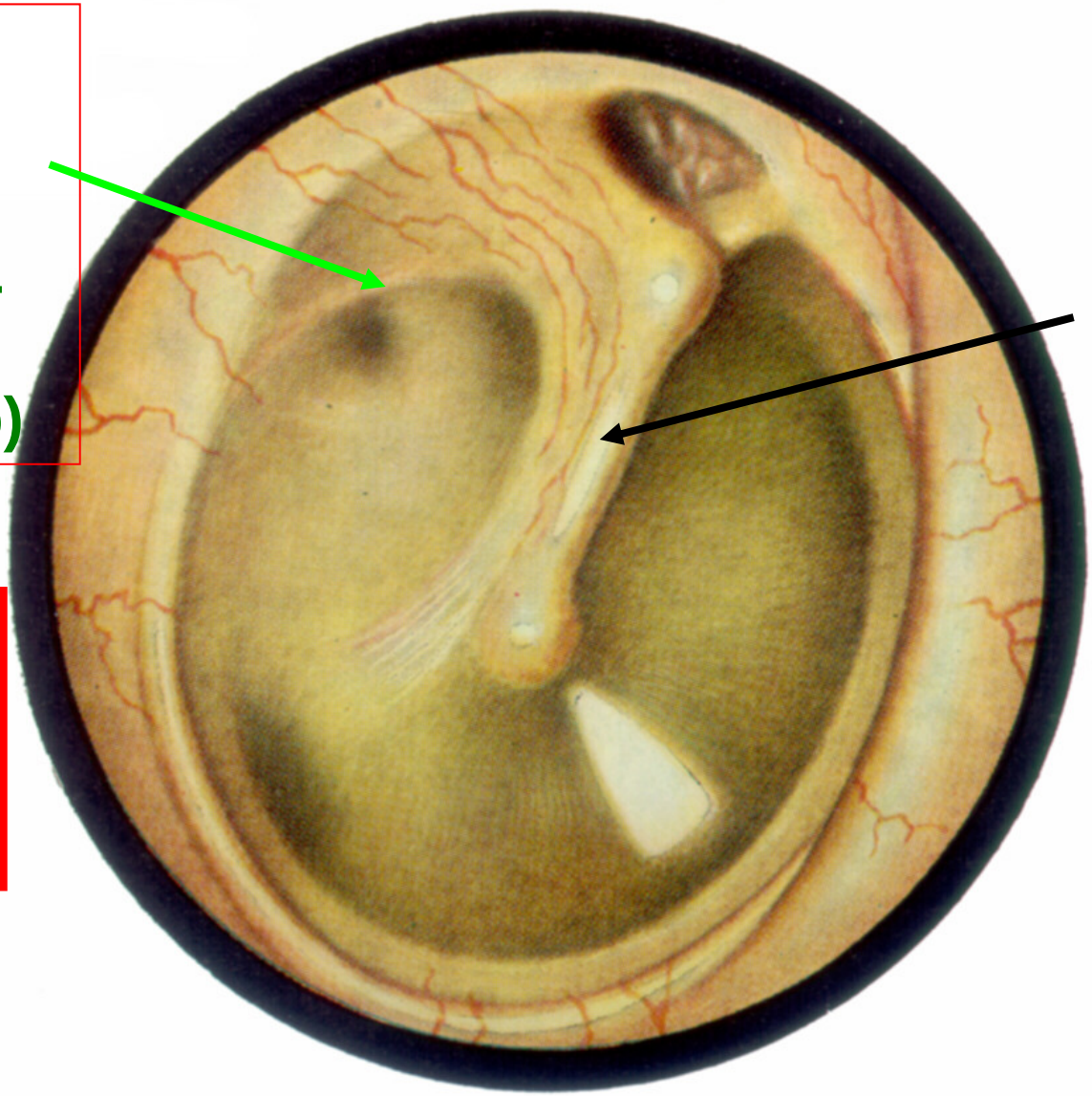
Taste to ant. 2/3 of tongue
Parasympathetic to submandibular, sublingual salivary glands



VIEW OF INNER SURFACE

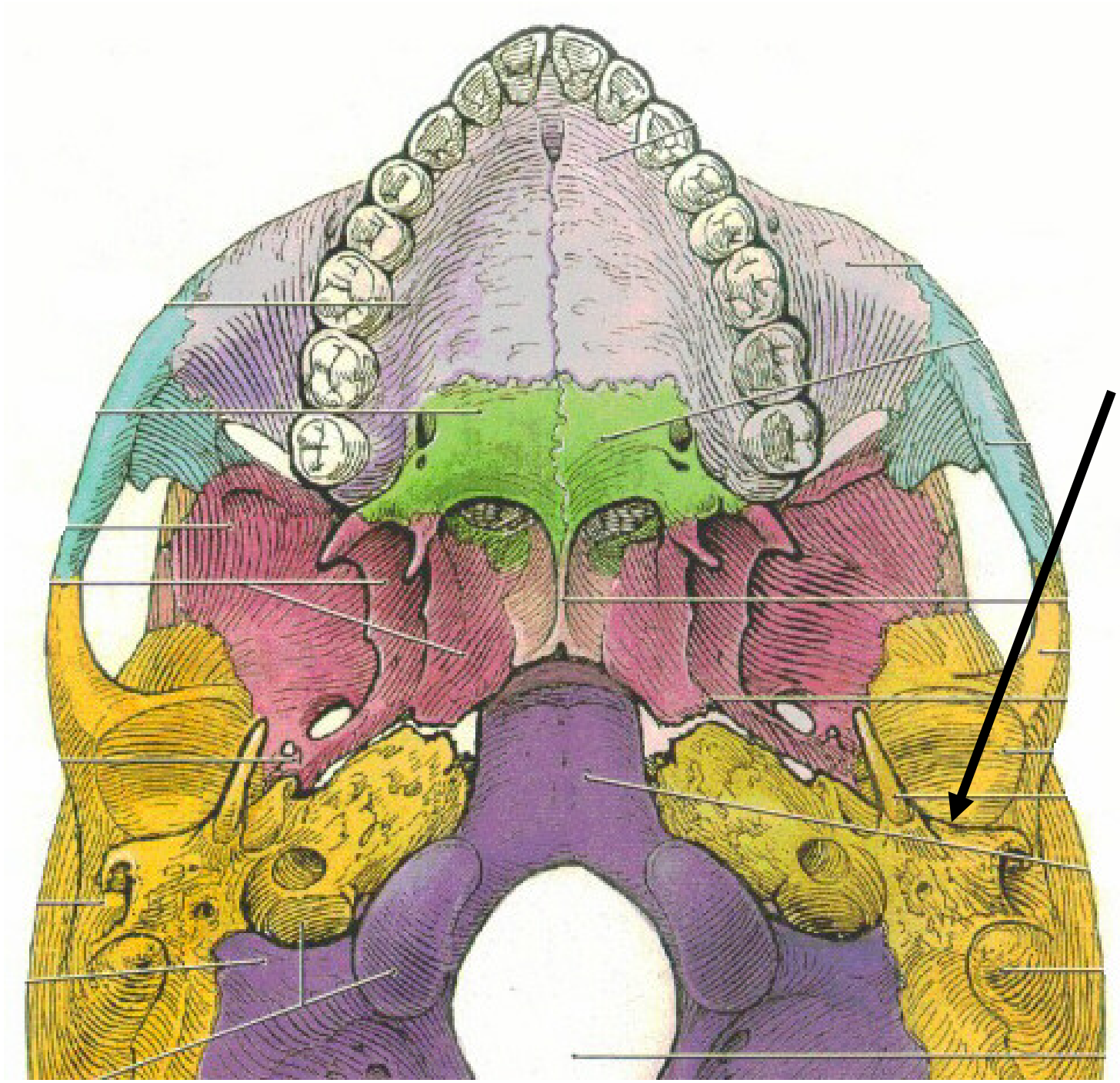
OTOSCOPE VIEW OF TYMPANIC MEMBRANE

CHORDA TYMPANI: TASTE, VISCERAL MOTOR (parasymp)



MALLEUS – manubrium (handle)

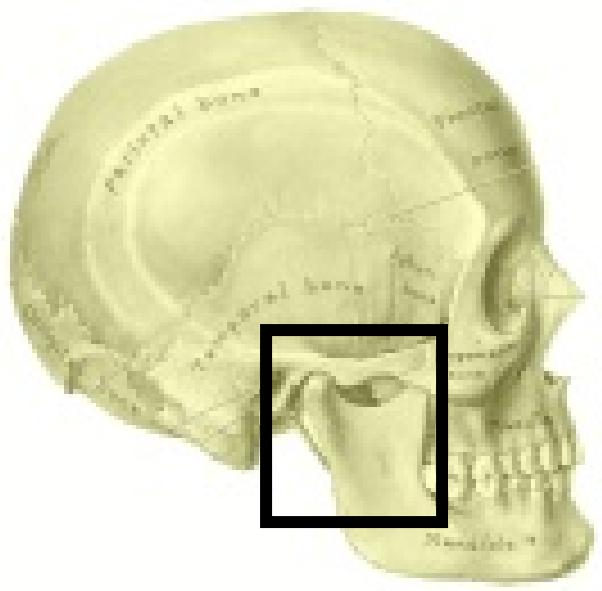
Lose taste if pierce tympanic membrane

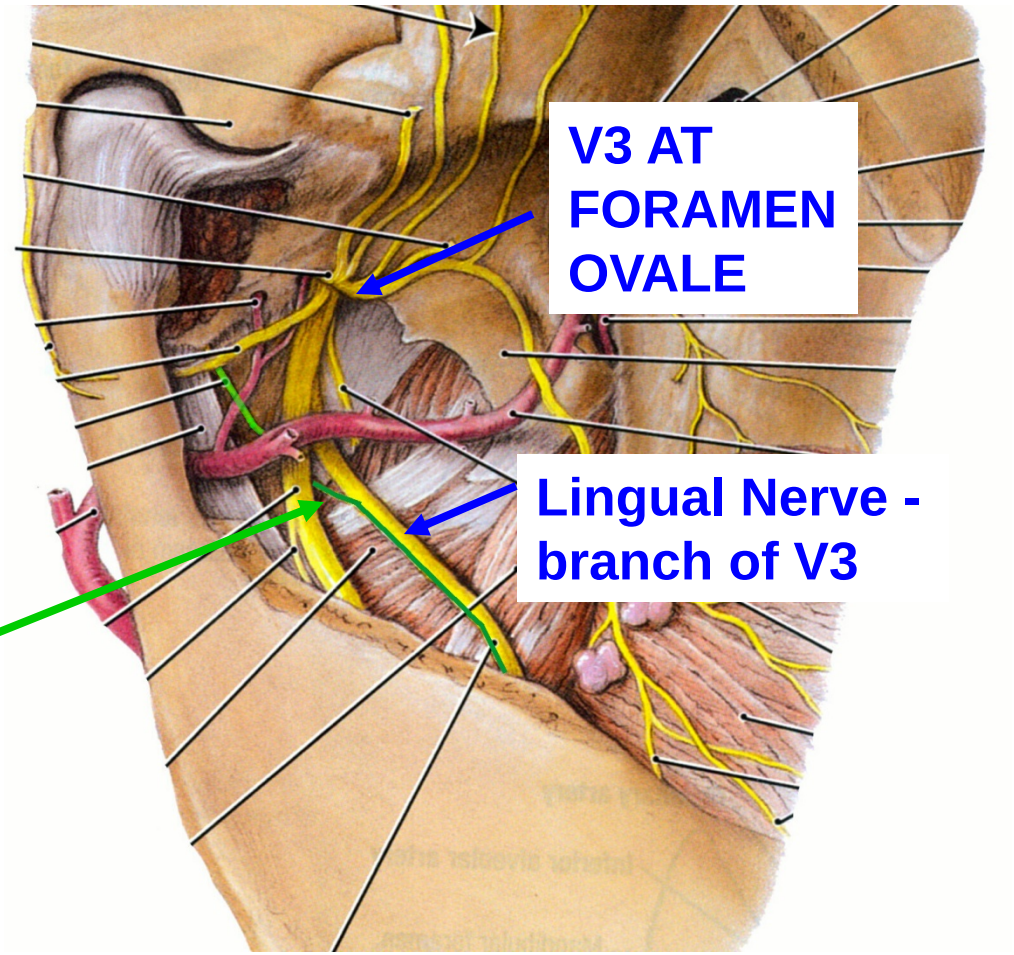


PETRO-TYMPANIC FISSURE - for CHORDA TYMPANI and ANT. TYMPANIC ARTERY

VII - CHORDA TYMPANI - PARASYMPATHETIC TO SUBMANDIBULAR AND SUBLINGUAL GLANDS, TASTE FIBERS TO ANT 2/3 OF TONGUE

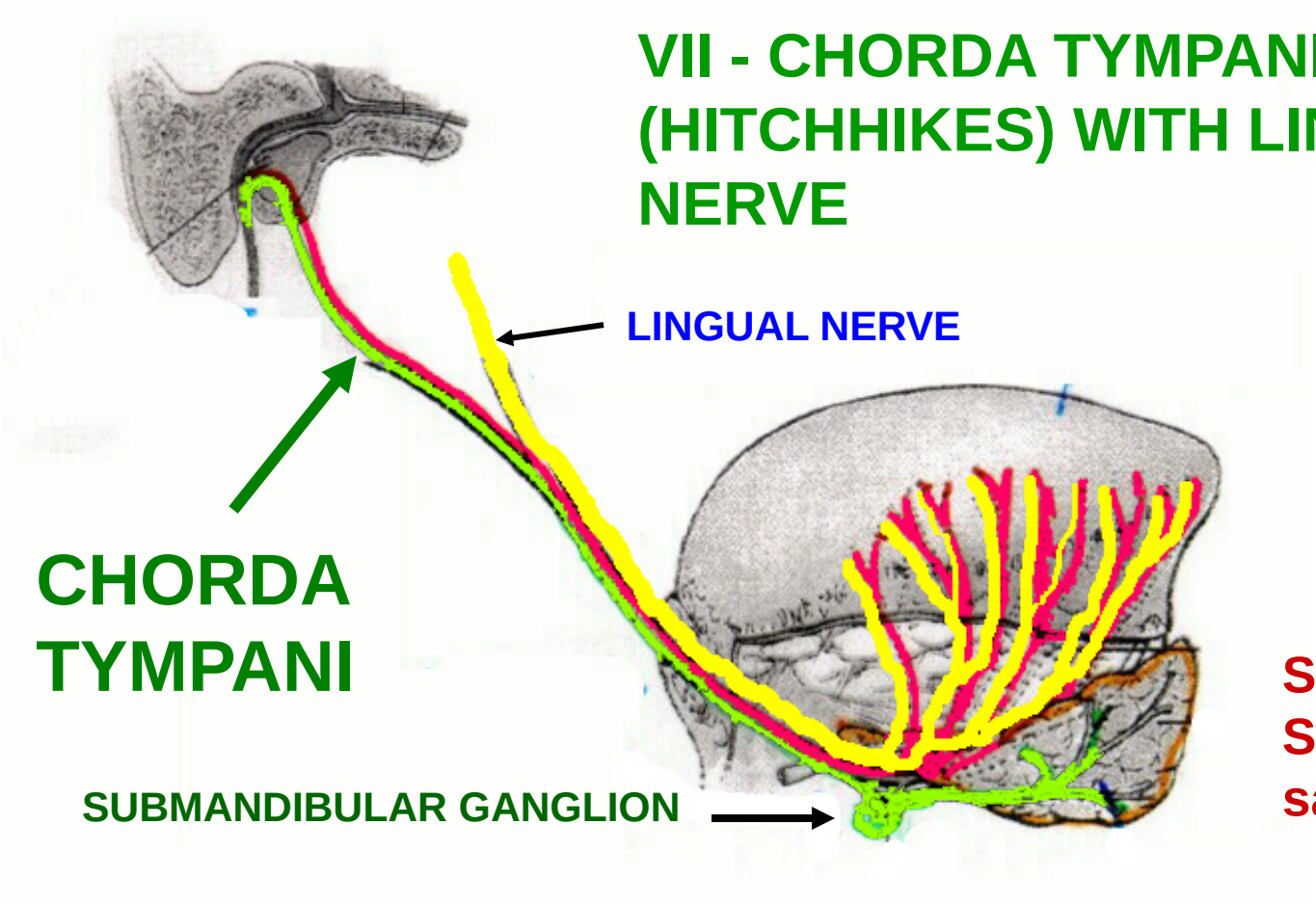
NOSE





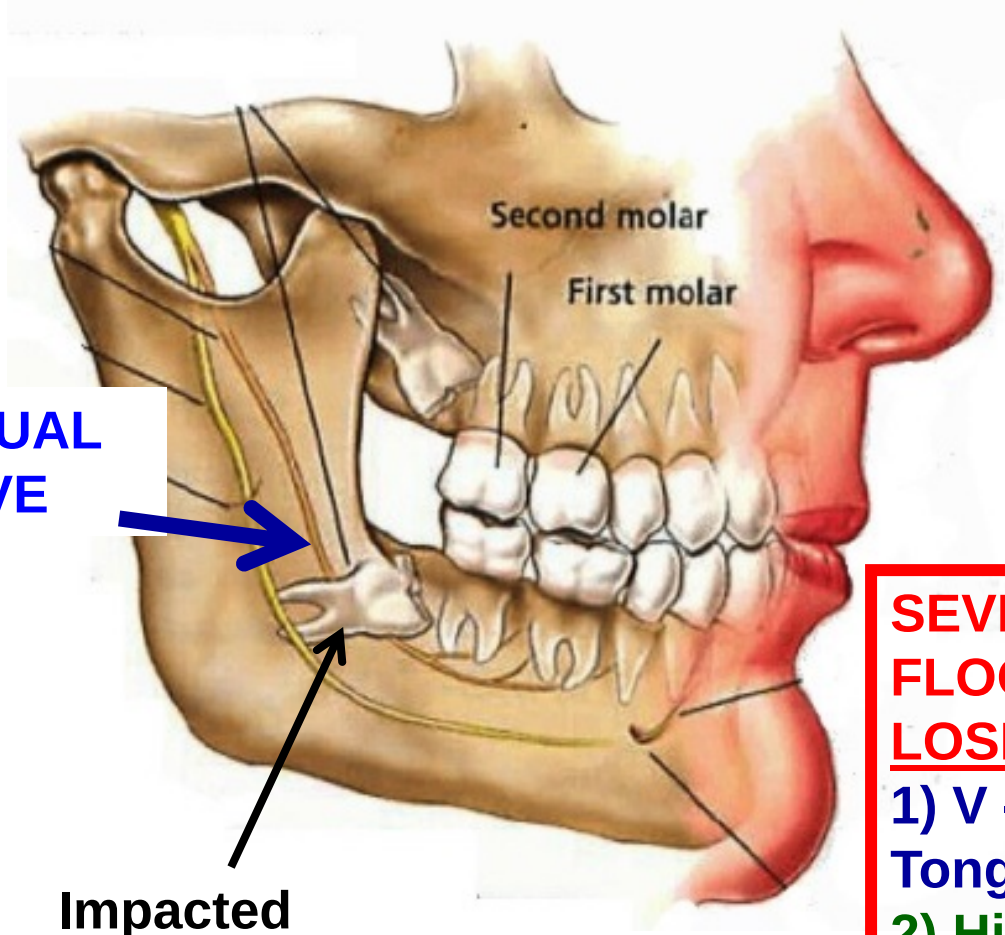
CHORDA TYMPANI joins and hitchhikes with Lingual Nerve (V3)

VII - CHORDA TYMPANI JOINS (HITCHHIKES) WITH LINGUAL NERVE



- Parasympathetics - synapse in Submandibular ganglion; post. ganglionics to Submandibular, Sublingual salivary glands
- Taste fibers - continue to taste buds on Ant. 2/3 of tongue

CLINICAL: LINGUAL NERVE (V3) CAN BE DAMAGED IN THE FLOOR OF THE MOUTH



- Lingual nerve courses below mucosa in floor of mouth
- Can readily be damaged during dental extraction of impacted molar tooth
- Also damaged in children: ex. fall with glass pop bottle in mouth

**

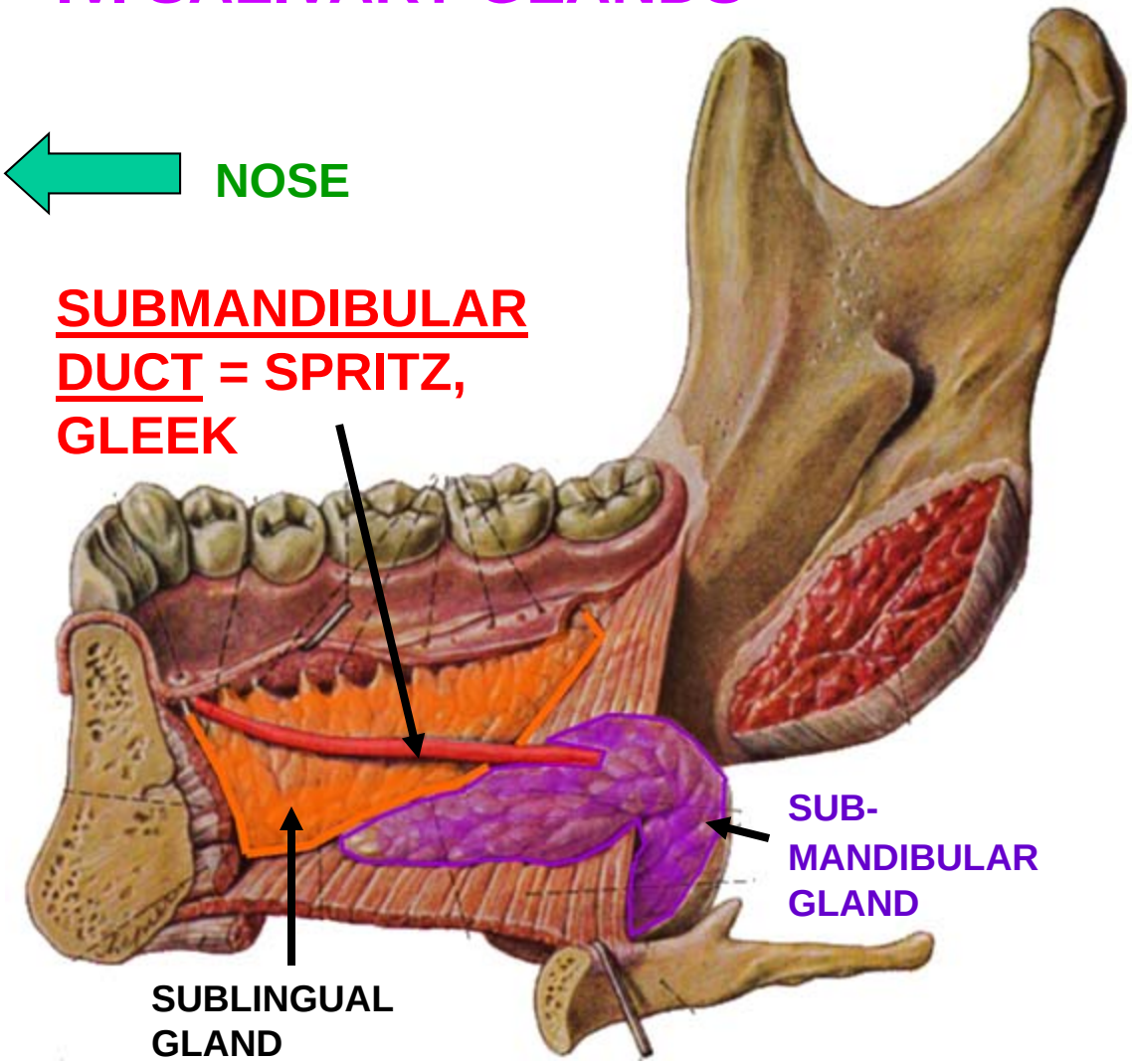
SEVERING LINGUAL NERVE IN FLOOR OF MOUTH - LOSE TOUCH AND TASTE:

1) V - General sensation to Ant. Tongue AND
2) Hitchiking VII - Taste fibers to Anterior Tongue

IV. SALIVARY GLANDS

NOSE

SUBMANDIBULAR DUCT = SPRITZ, GLEEK

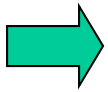


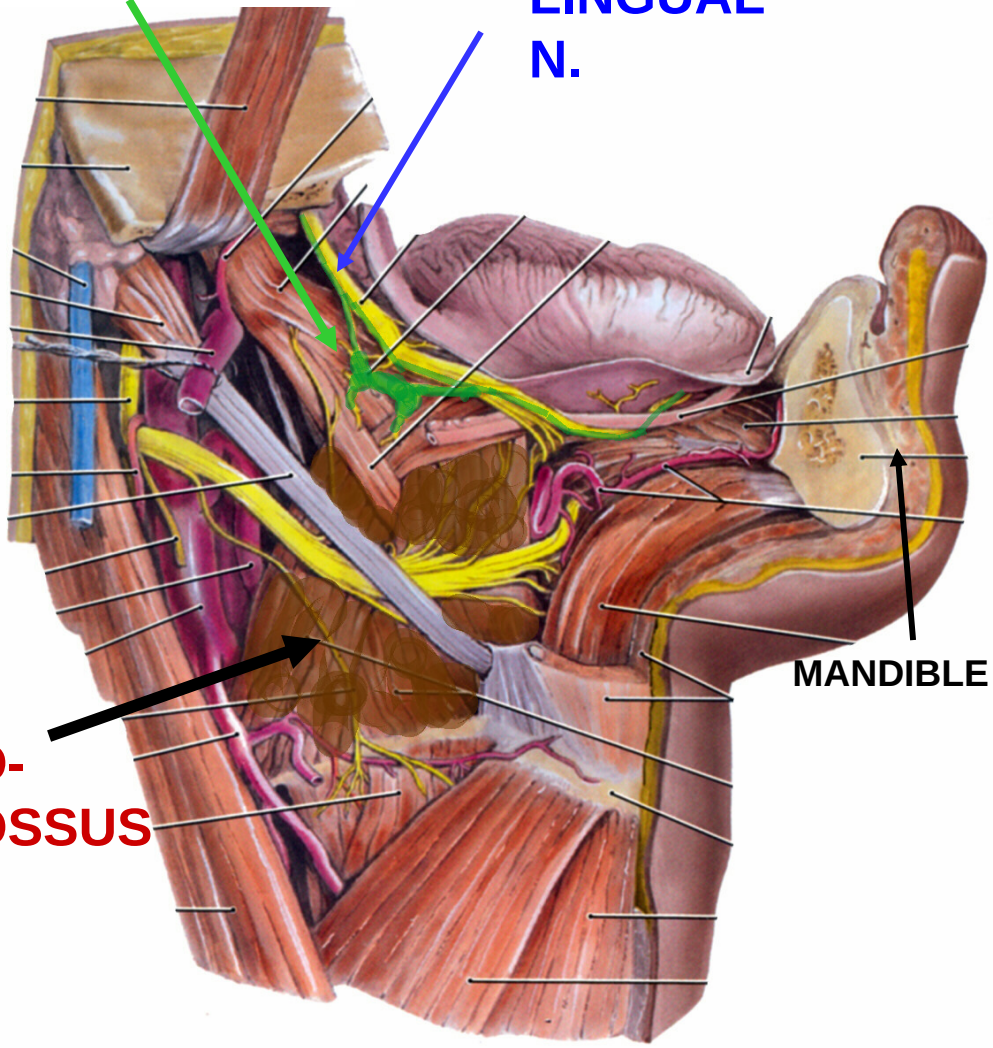
1) SUBMANDIBULAR GLAND - C SHAPED, WRAPS AROUND POST BORDER OF MYLOHYOID; –CAPSULE ATTACHED TO MANDIBLE, DERIVED FROM INVESTING LAYER

SUBMANDIBULAR DUCT- ARISES BETWEEN MYLOHYOID (ANT) & HYOGLOSSUS- POST – OPENS- 1-3 ORIFICES ON SUBLINGUAL PAPILLA

2) SUBLINGUAL GLANDS- LOCATED BETWEEN MANDIBLE & GENIOGLOSSUS –OPENS- 10-12 SMALL DUCTS TO SUBLINGUAL FOLDS (PLICAE SUBLINGUALIS)

SALIVARY GLANDS INNERVATION BY CN VII

NOSE 

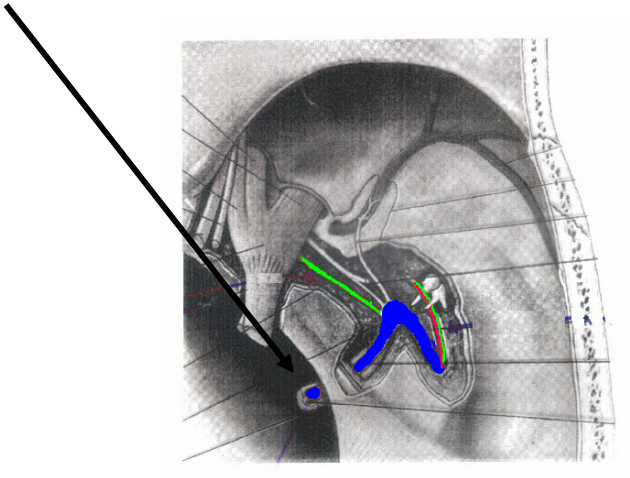


PARASYMPATHETICS FROM VII (CHORDA TYMPANI) HITCHHIKE WITH LINGUAL NERVE ;

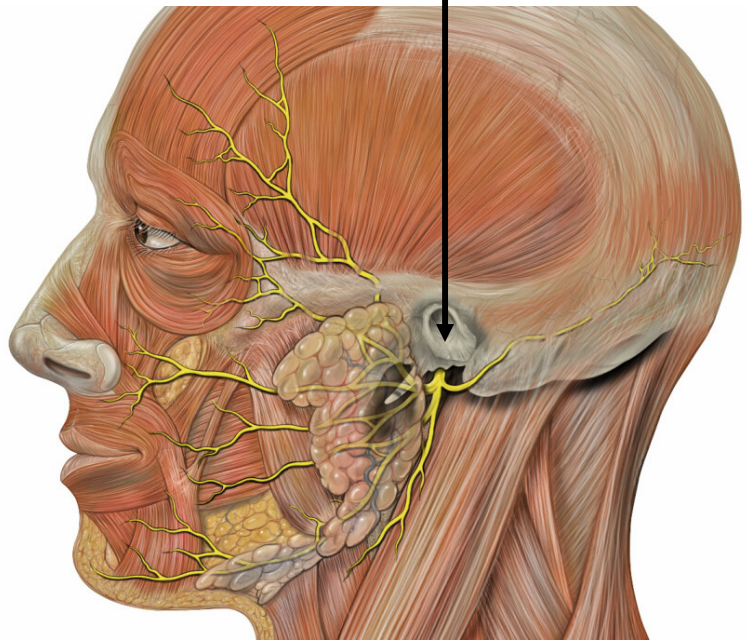
SUBMANDIBULAR GANGLION (VII) - SUSPENDED FROM LINGUAL N., INN SUBMANDIBULAR & SUBLINGUAL SALIV. GLAND

FACIAL NERVE (CRANIAL NERVE VII) - MANY BRANCHES INSIDE TEMPORAL BONE

VII - leaves post cranial fossa via Internal Auditory Meatus



VII - EXITS SKULL VIA STYLOMASTOID FORAMEN



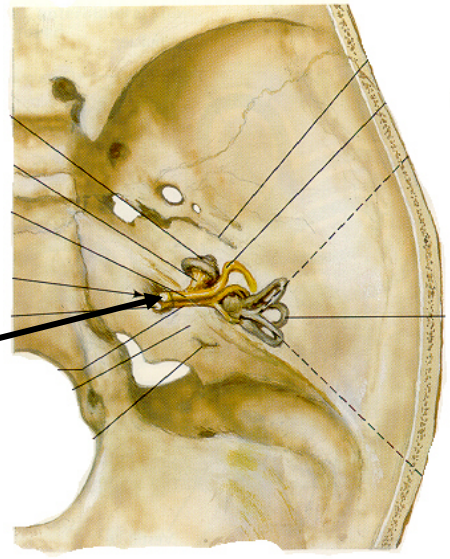
Branches arise in petrous temporal bone:

1) Parasympathetics - to Pterygopalatine ganglion - Lacrimal gland, Mucous glands nose palate
2) Taste fibers to ant. 2/3 tongue Chorda tympani - also contains parasymp. Submand., Sub.ling saliv. glands

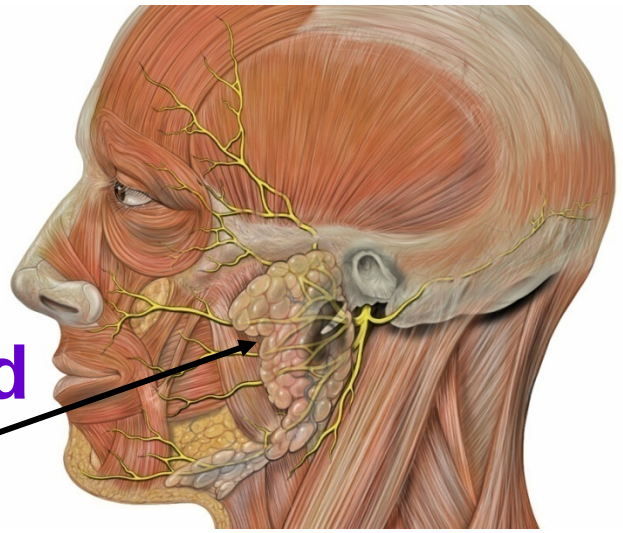
branches only to Muscles Facial Expression, Neck muscles

IV. SYMPTOMS OF DAMAGE TO FACIAL NERVE DEPEND UPON LOCATION

Int. aud. meatus



Stylo-mastoid foramen or in Parotid Gland



VII - FACIAL AND
VIII - VESTIBULO-COCHLEAR

ACOUSTIC NEUROMA (NEURINOMA)- tumor at INTERNAL AUDITORY MEATUS - BLOCK VII AND VIII **

VIII - auditory/vestibular deficits

VII - all FACIAL NERVE SYMPTOMS PRESENT - facial paralysis, loss of taste, hyperacousia, decrease in secretion of lacrimal and salivary glands

VII - ONLY

VII - ONLY facial paralysis; NO loss of taste, NO hyperacousia, NO decrease in secretion of lacrimal and salivary glands **

NO auditory/vestibular deficits; VIII NOT AFFECTED