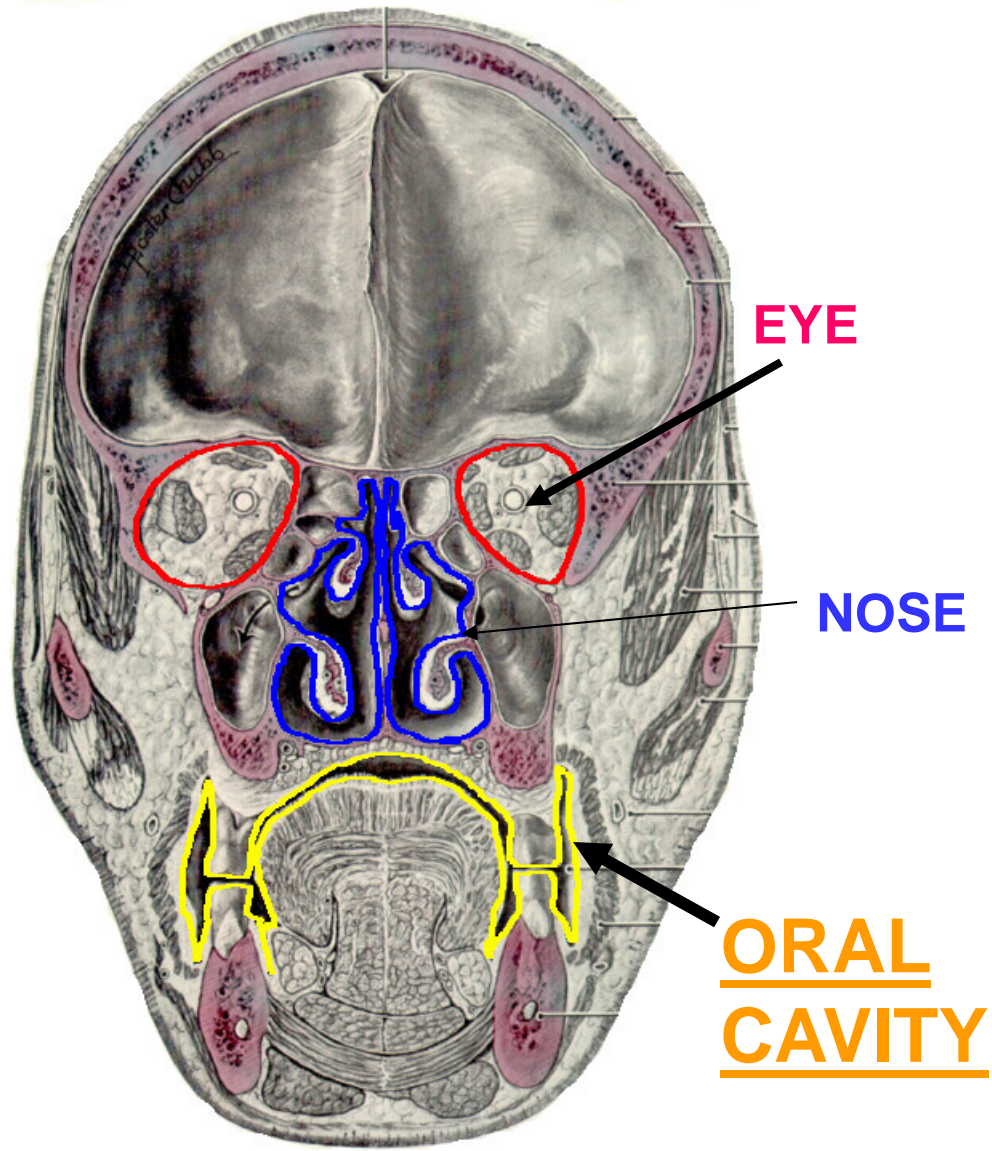


ORAL CAVITY



OUTLINE: ORAL CAVITY

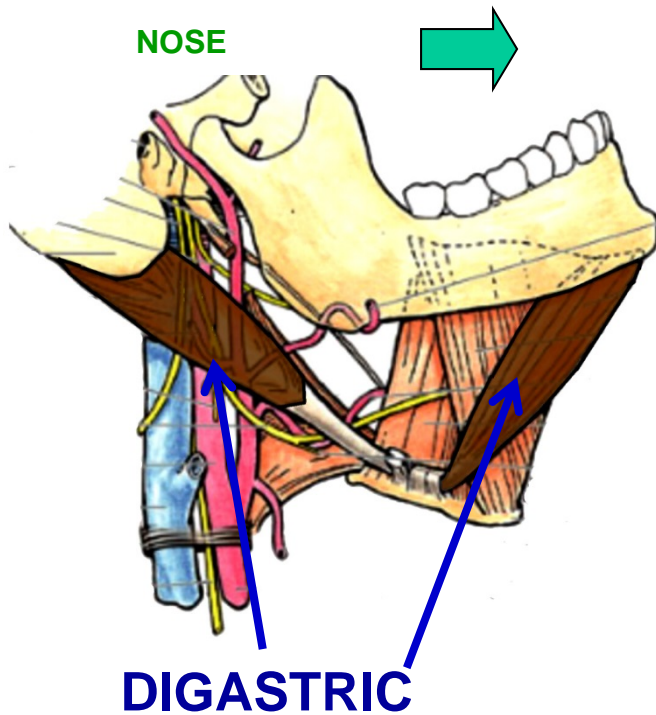
I. SUBMANDIBULAR REGION

II. TONGUE

III. NERVES, ARTERIES, SALIVARY GLANDS

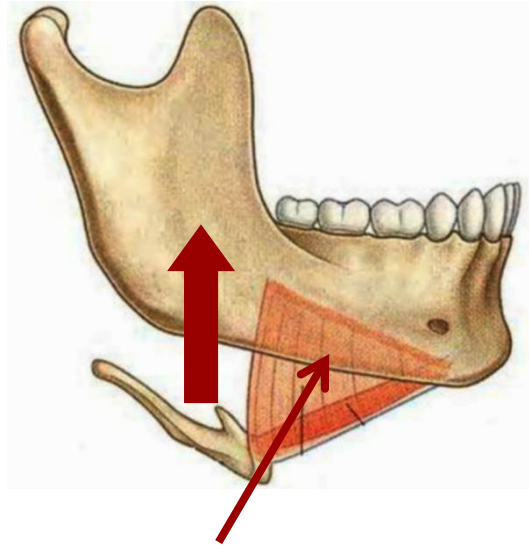
word on the street (of day) -
ANGINA = condition with
intense pain: from L. or G.,
strangling, choking

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



DIGASTRIC

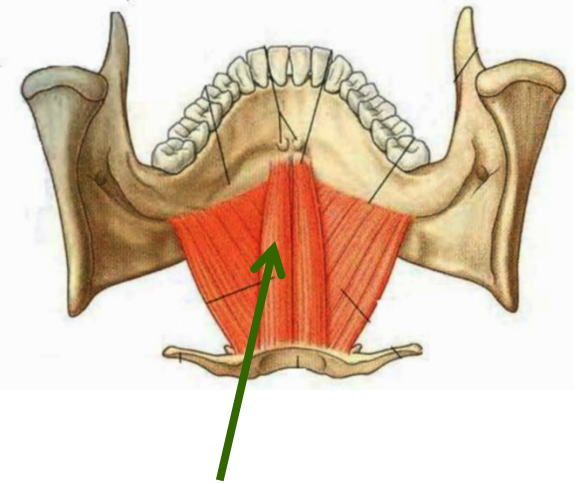
**ACTION - Depress
mandible, OPEN
MOUTH
INN - V3, VII**



MYLOHYOID

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

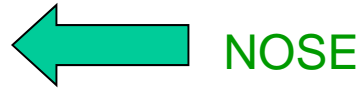
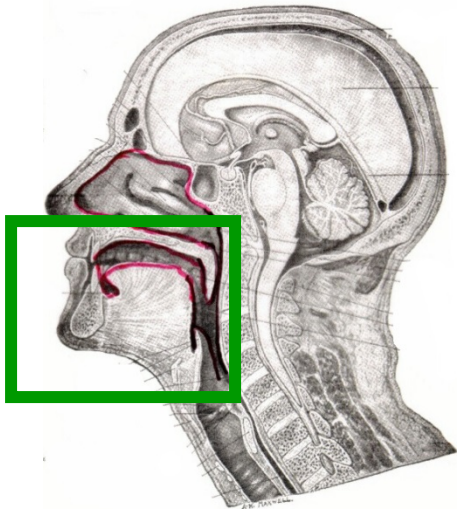
view from inside mouth



GENIOHYOID

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

SUBMANDIBULAR REGION *

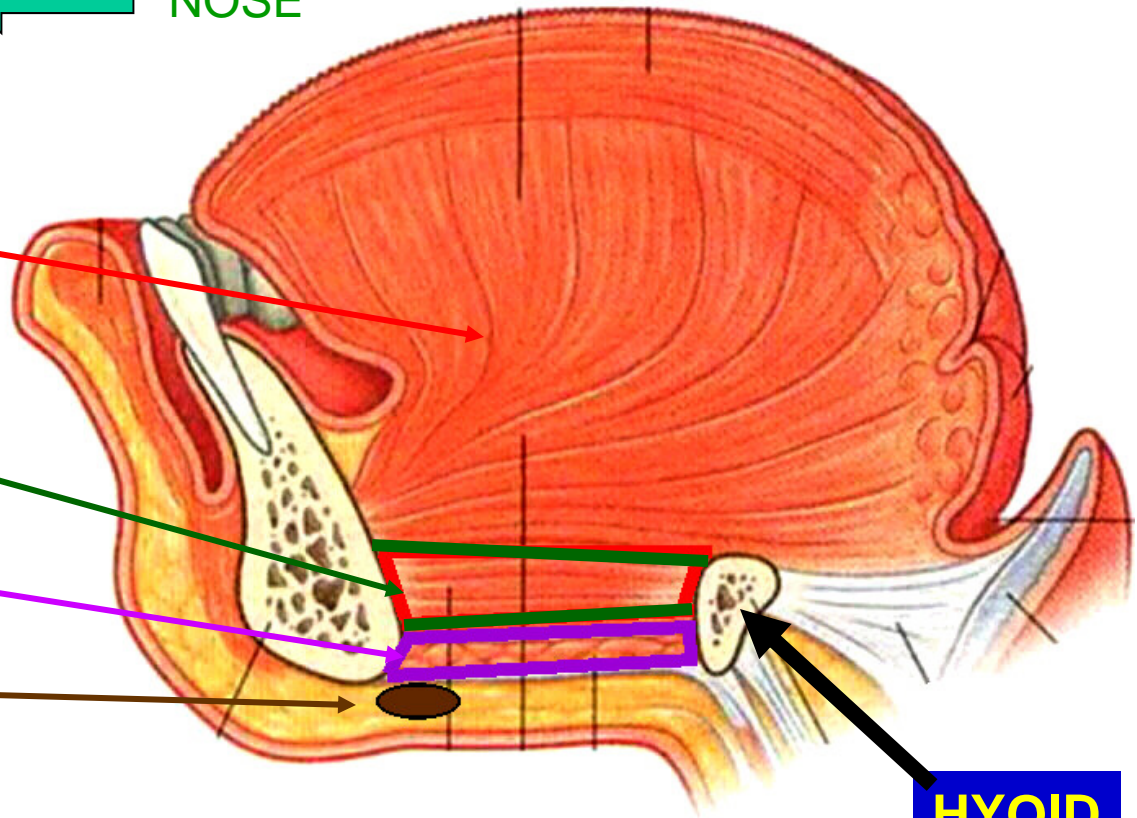


GENIOGLOSSUS
- mandible-tongue

GENIOHYOID
- mandible-hyoid

MYLOHYOID
- cut on end

DIGASTRIC

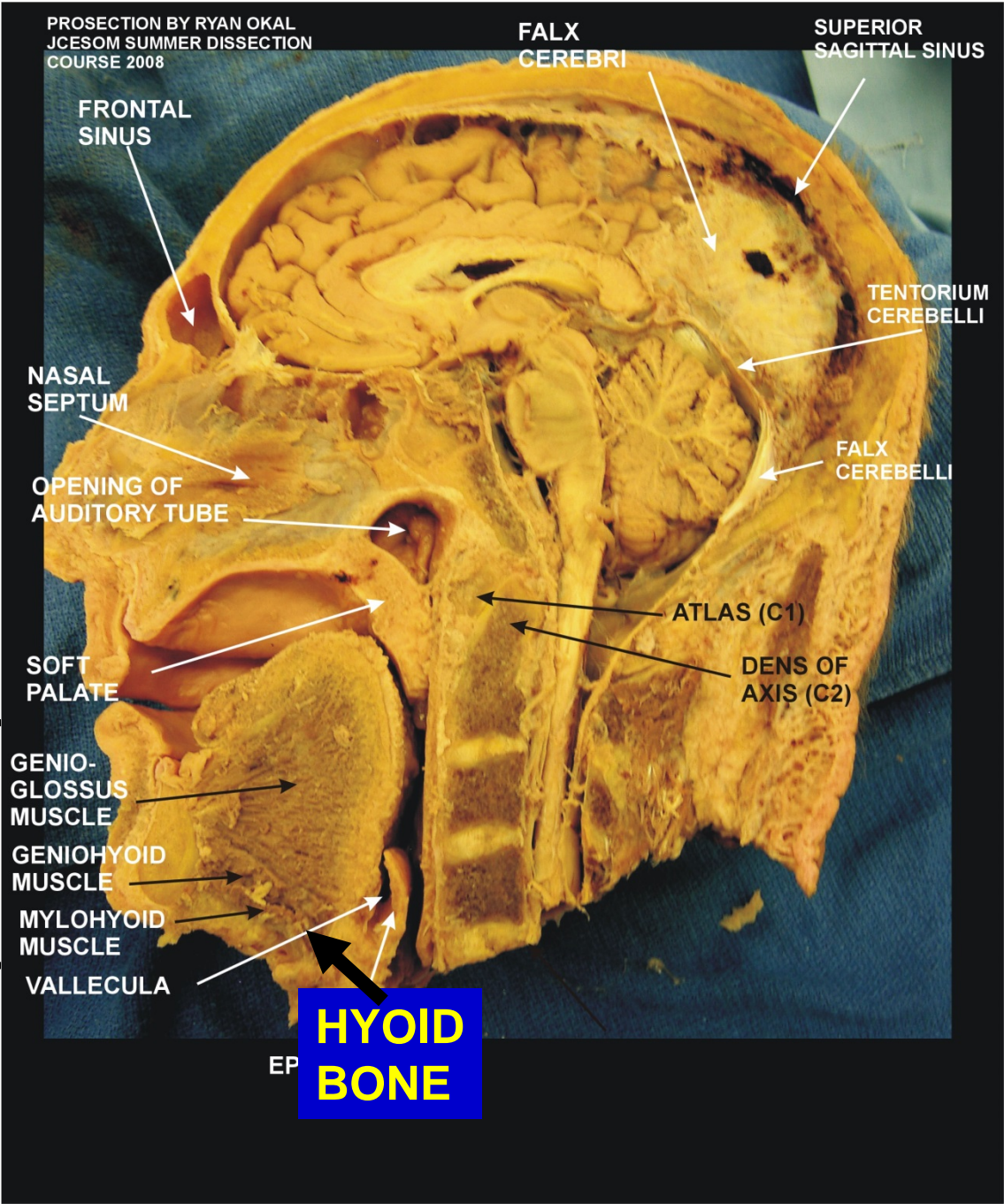


HYOID BONE

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

MEDIAL VIEW OF BIASECTED HEAD

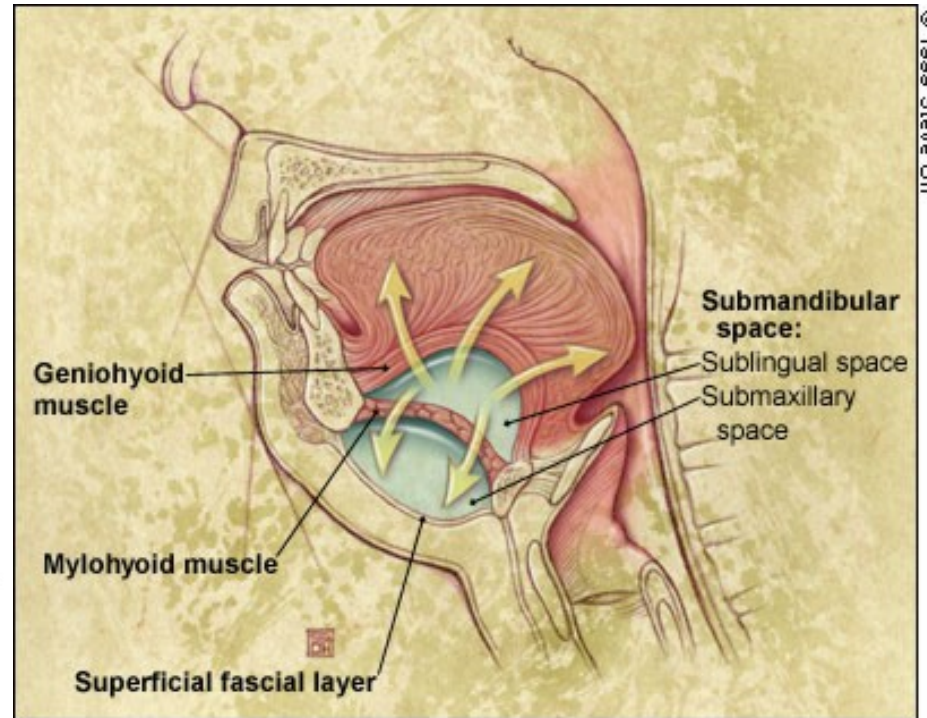
PROSECTON BY RYAN OKAL
JCESOM SUMMER DISSECTION
COURSE 2008



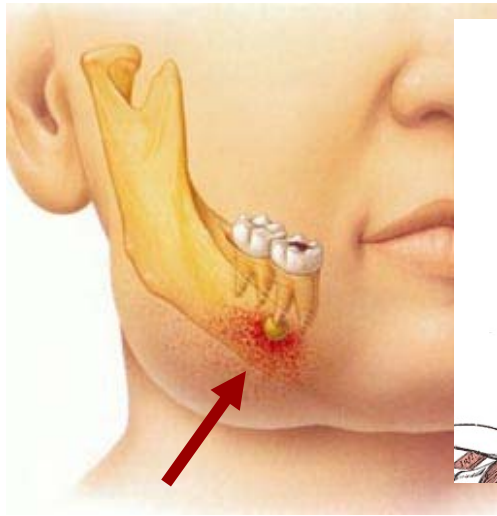
**MUSCLES
OF
FLOOR
OF
MOUTH**

**HYOID
BONE**

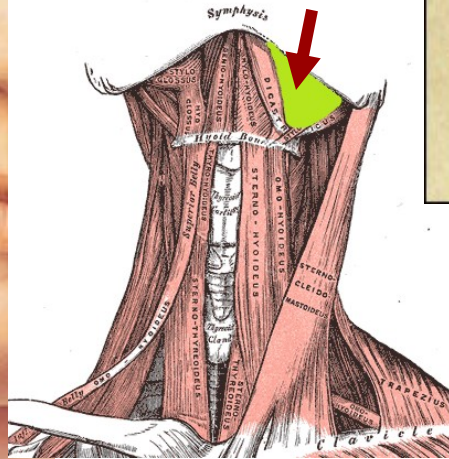
BOARD QUESTION: LUDWIG'S ANGINA - infection of floor of mouth (Submandibular space), often due to spread from abscessed mandibular tooth *



© 1999 Steve Oh



tooth abscess

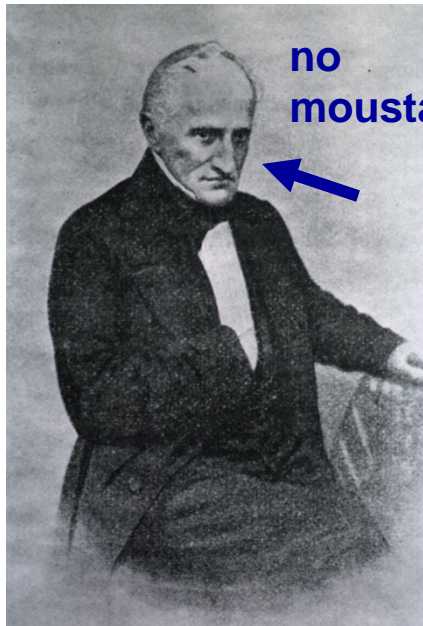


Submandibular Space - in Anterior Triangle of neck

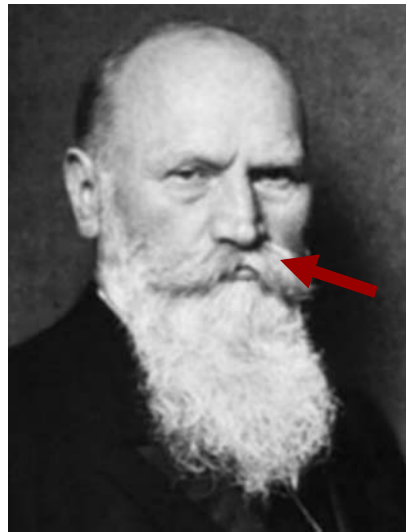
Infection may obstruct airway, push up tongue

Angina = condition with intense pain: from L. strangling

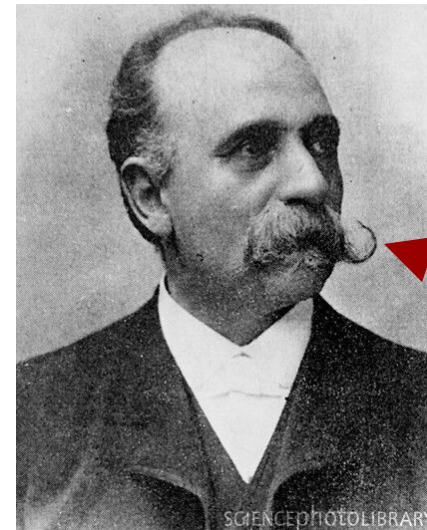
IMPLICIT: EXCELLENCE IN ANATOMY/SCIENCE IS CORRELATED WITH THE PRESENCE OF A MOUSTACHE/BEARD



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



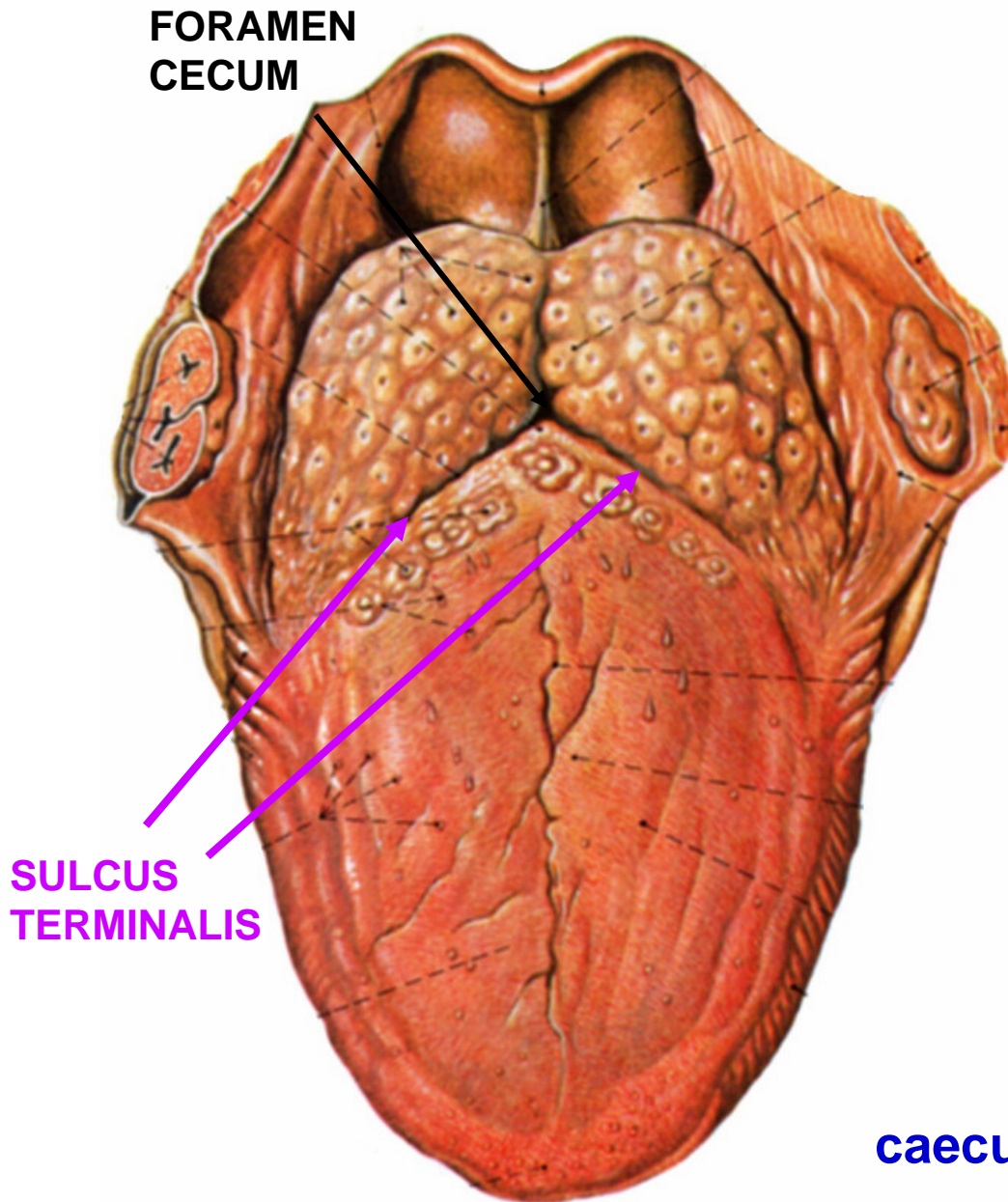
WALDEYER -
- coined term neuron
- reputation: stealing ideas from others
- however, identified all tonsils/lymphatic tissues in head



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

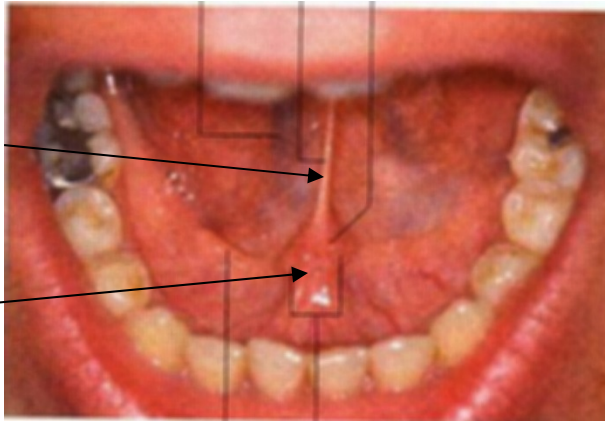
2. FORAMEN CAECUM - PIT IN MIDDLE OF SULCUS TERMINALIS- SITE OF INVAGINATION OF THYROID GLAND

caecum - L. blind pouch

FOLDS, LANDMARKS BENEATH TONGUE

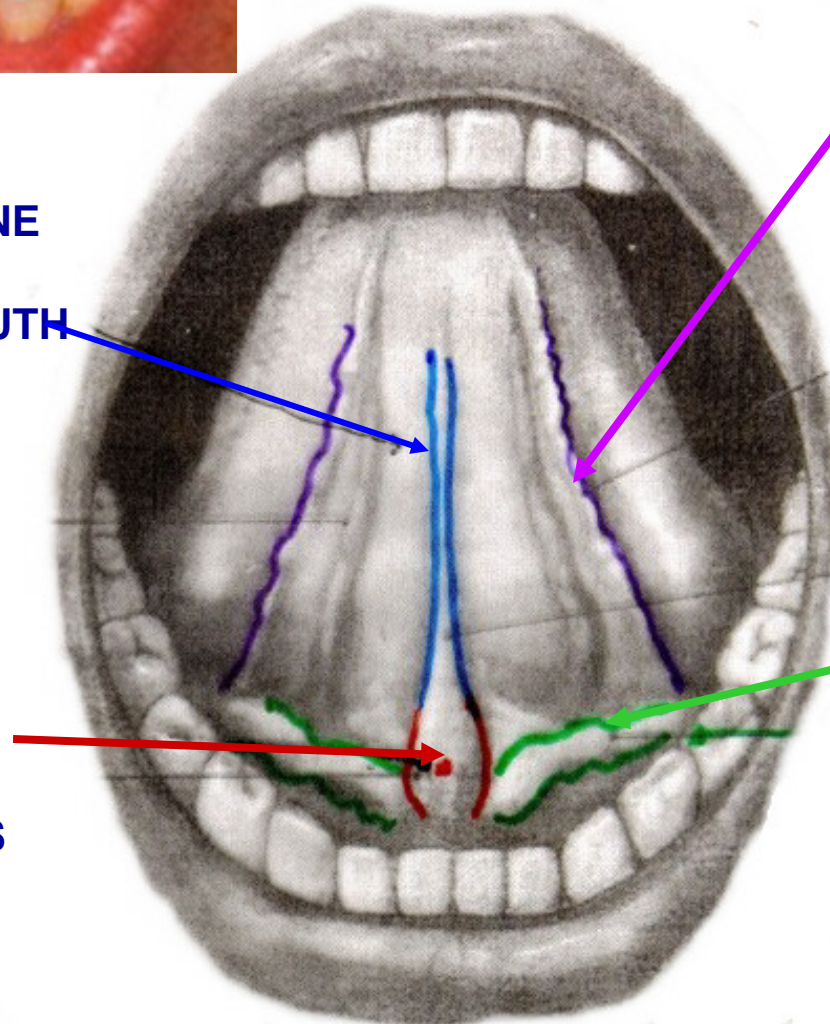
LINGUAL FRENULUM

SUB-LINGUAL PAPILLA



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

A) GENIOGLOSSUS

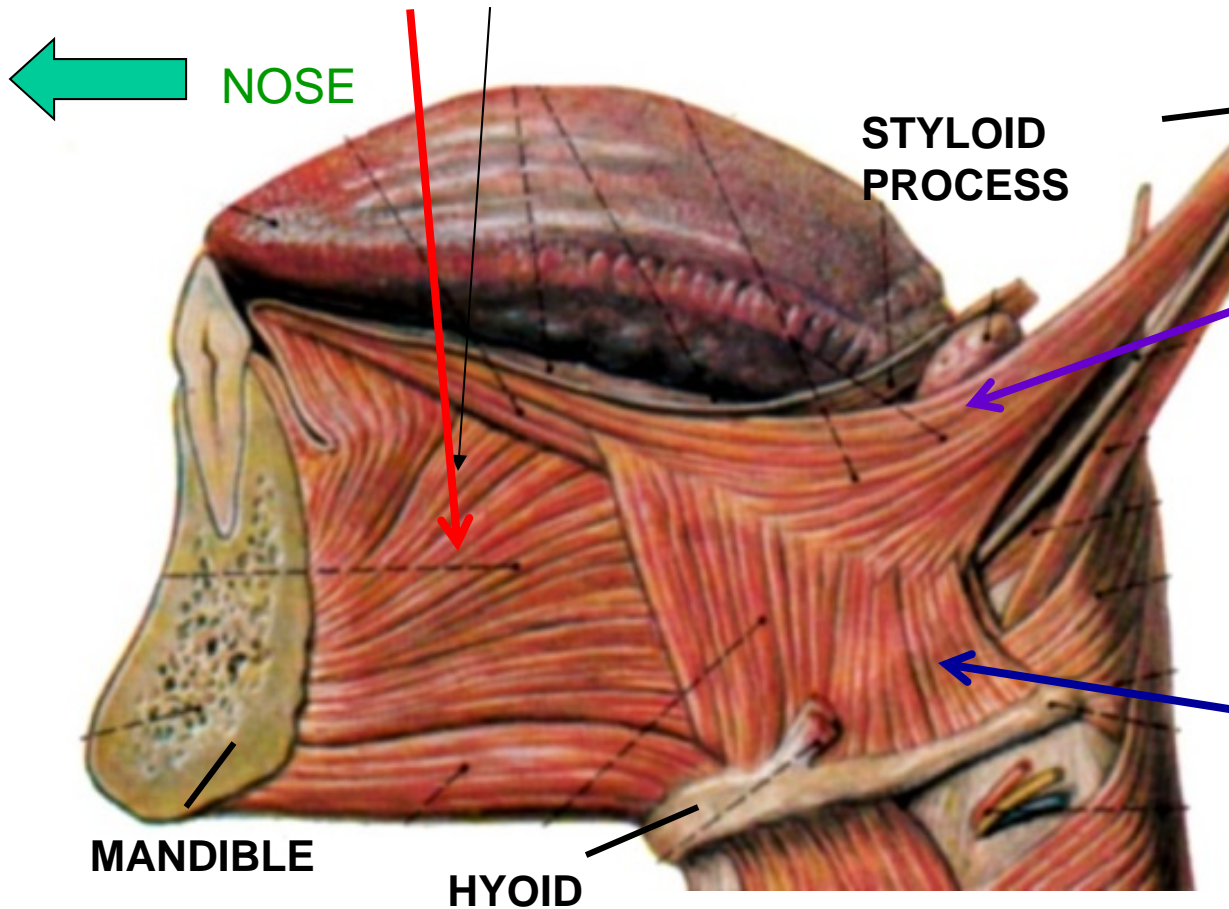
O - GENIAL TUBERCLE OF MANDIBLE

I - TONGUE TO ITS DORSAL SURFACE

A - PROTRUDE

1. EXTRINSIC MUSCLES -

ATTACH TONGUE TO BONES



STYLOID
PROCESS

NOSE

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

MANDIBLE

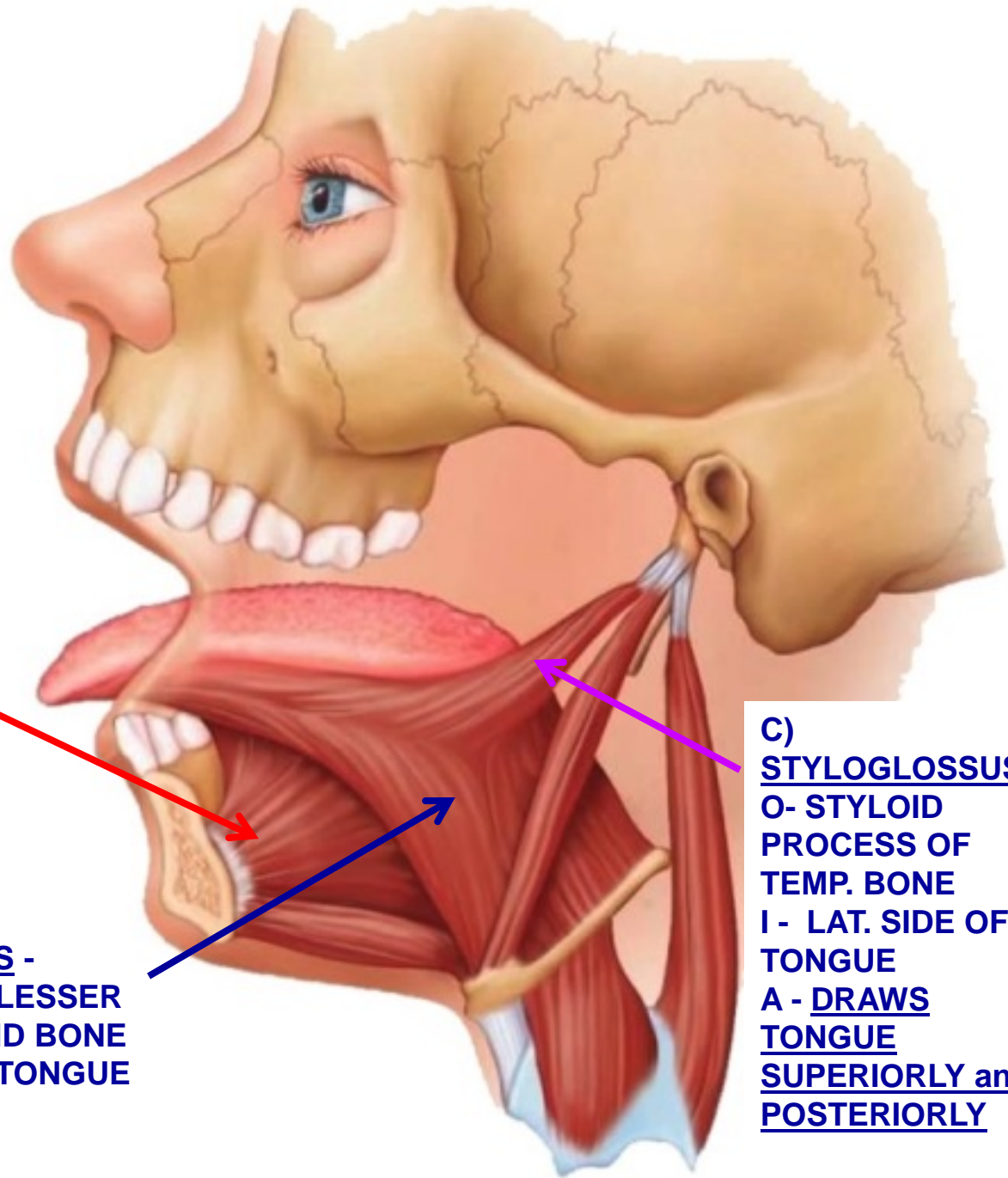
HYOID

B. MUSCLES OF TONGUE - all innervated by XII

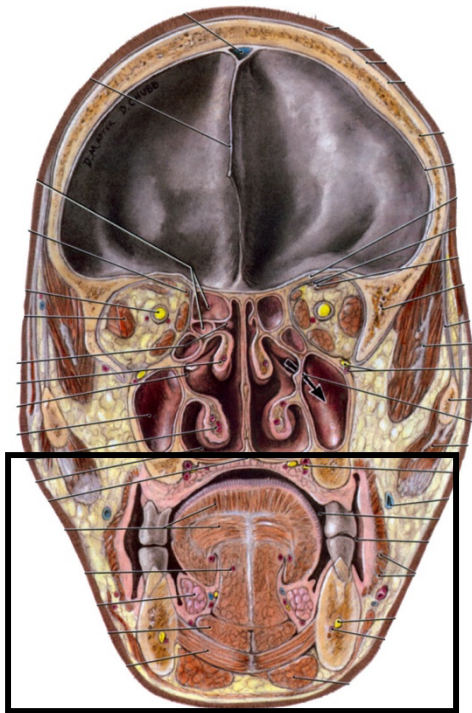
A) GENIOGLOSSUS
O - GENIAL TUBERCLE OF MANDIBLE
I - TONGUE TO ITS DORSAL SURFACE
A - PROTRUDE

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

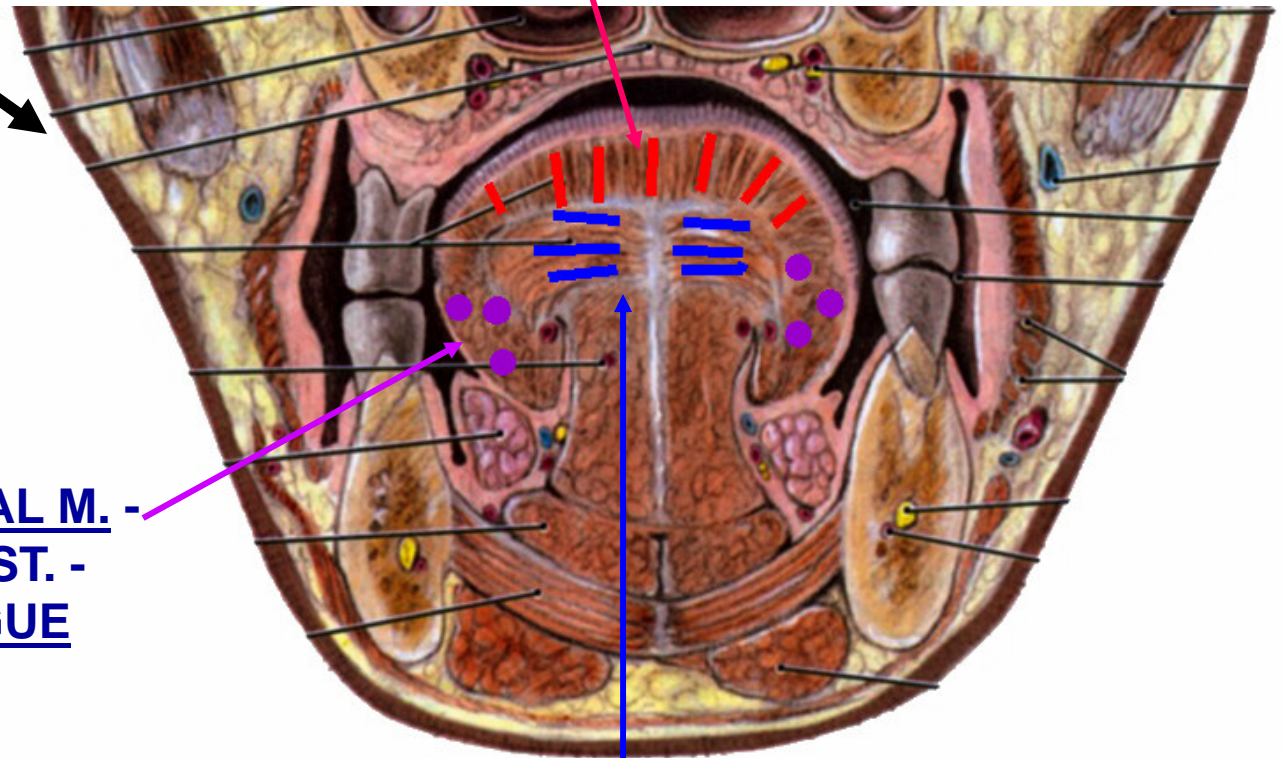


2. INTRINSIC MUSCLES OF TONGUE



CORONAL SECTION

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



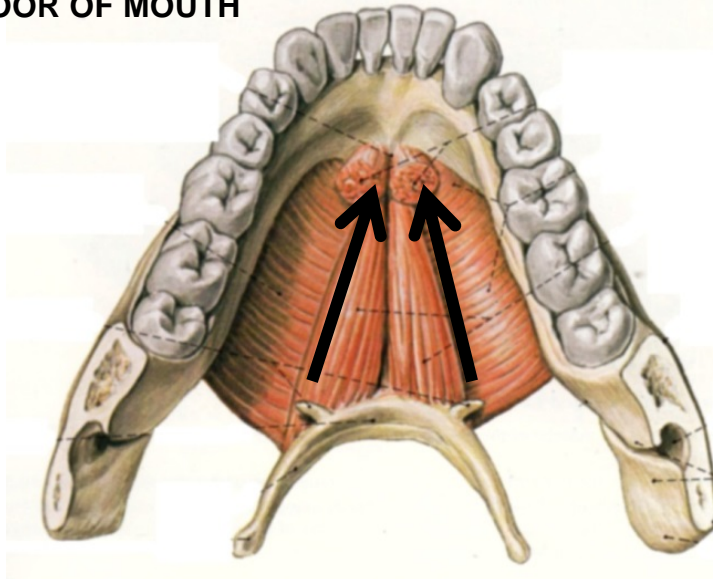
C) LONGITUDINAL M. - FIBERS ANT-POST. - SHORTEN TONGUE

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



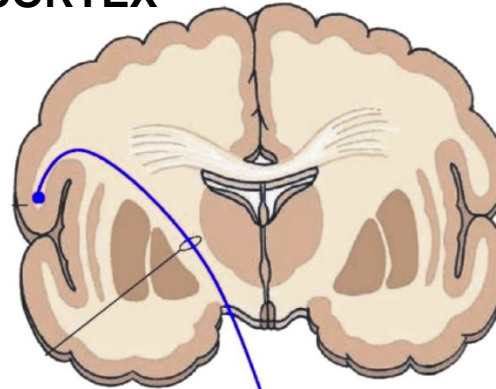
DAMAGE
HYPOGLOSSAL
NERVE ON ONE
SIDE

GENIO-
GLOSSUS
PARALYZED

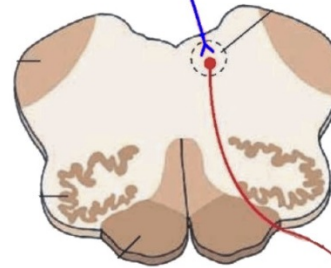
LOWER MOTOR NEURON LESION - PROTRUDED TONGUE **
DEVIATES TOWARD SIDE OF LESION - due to unopposed action
of the **Genioglossus** muscle.

**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)**

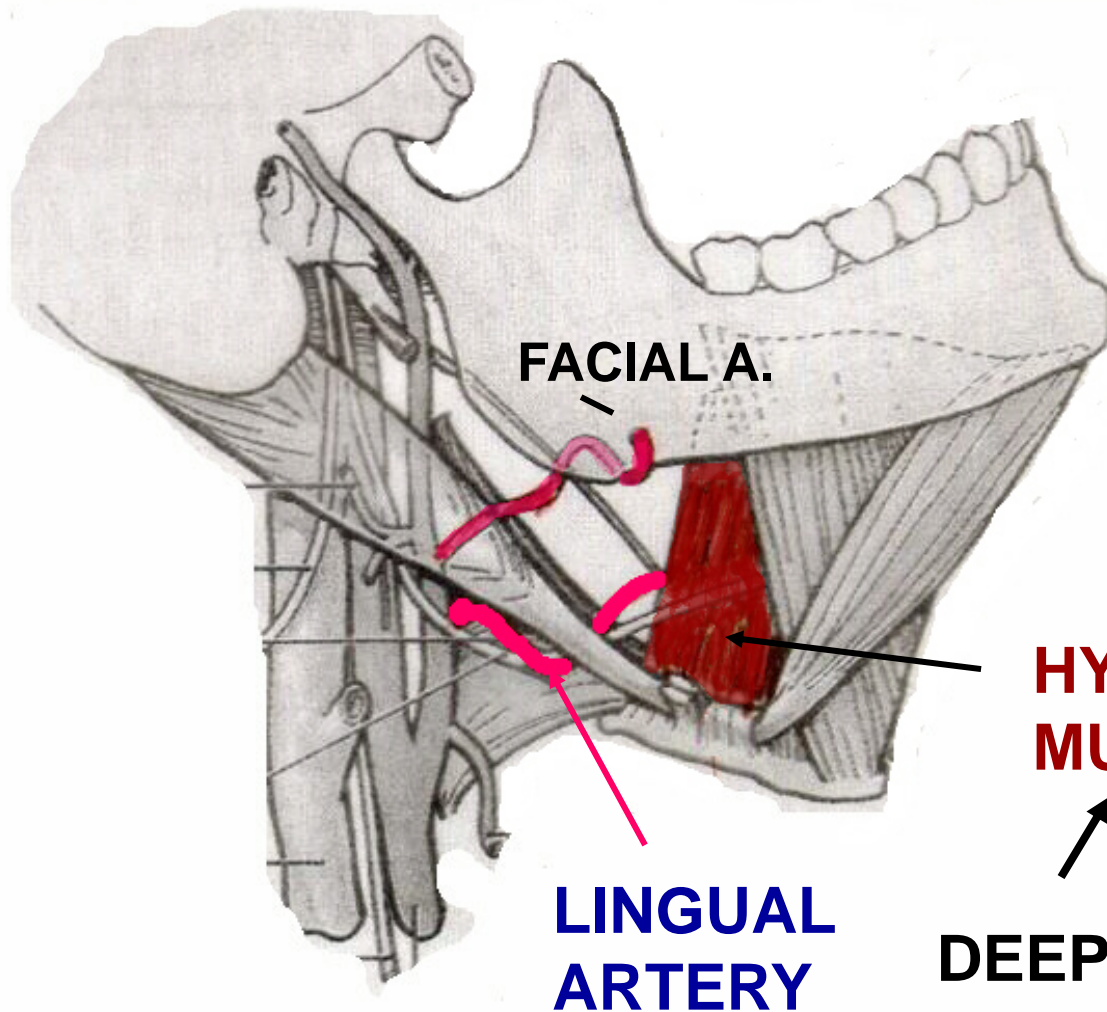
**DAMAGE
UPPER MOTOR -
TONGUE
DEVIATES
AWAY FROM SIDE
OF CORTICAL
LESION ****



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

C. ARTERIES TO TONGUE - LINGUAL ARTERY

NOSE →



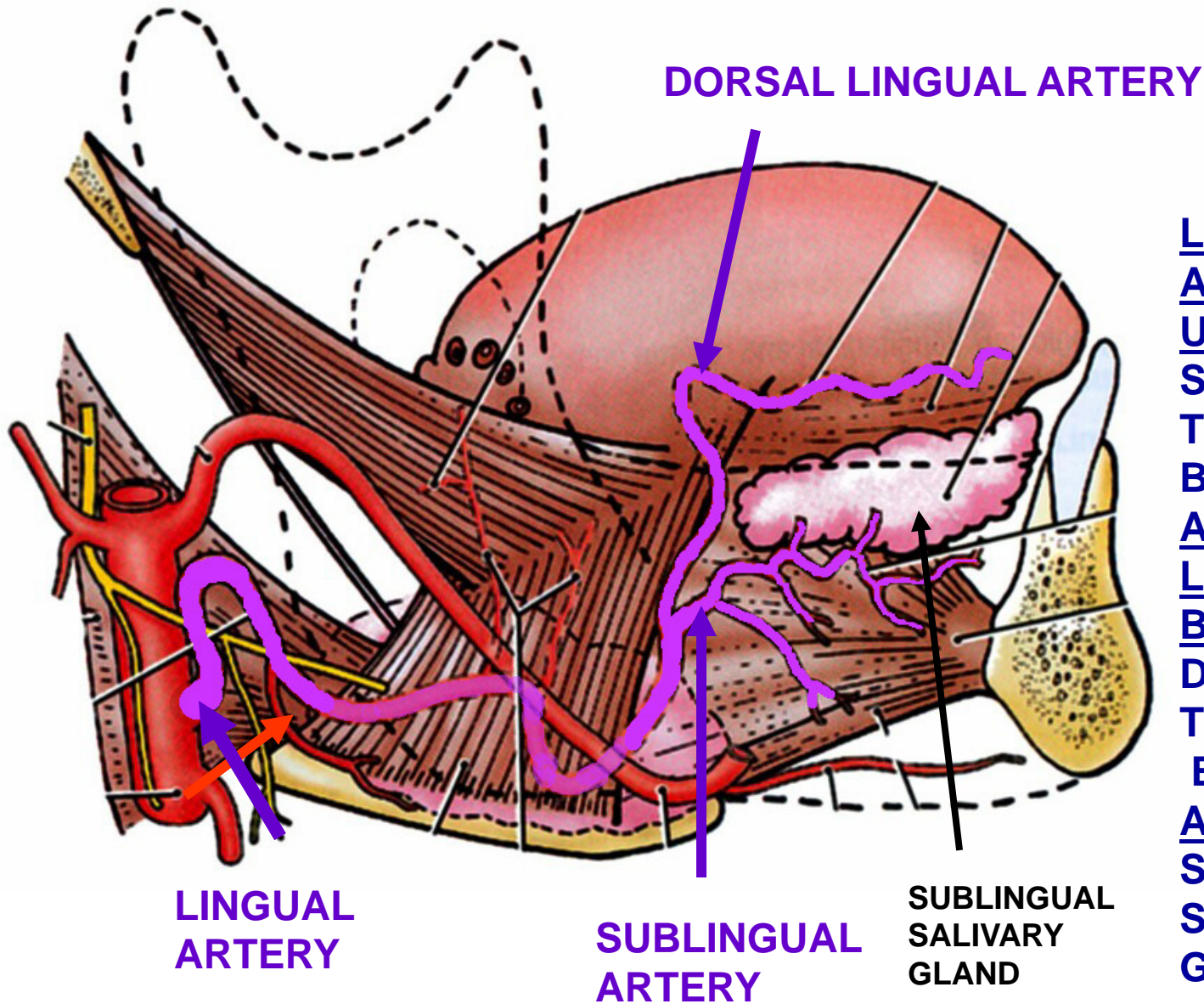
ARISES FROM
EXTERNAL
CAROTID ARTERY
DEEP TO POST
MARGIN OF
HYOGLOSSUS

HYOGLOSSUS
MUSCLE

DEEP TO

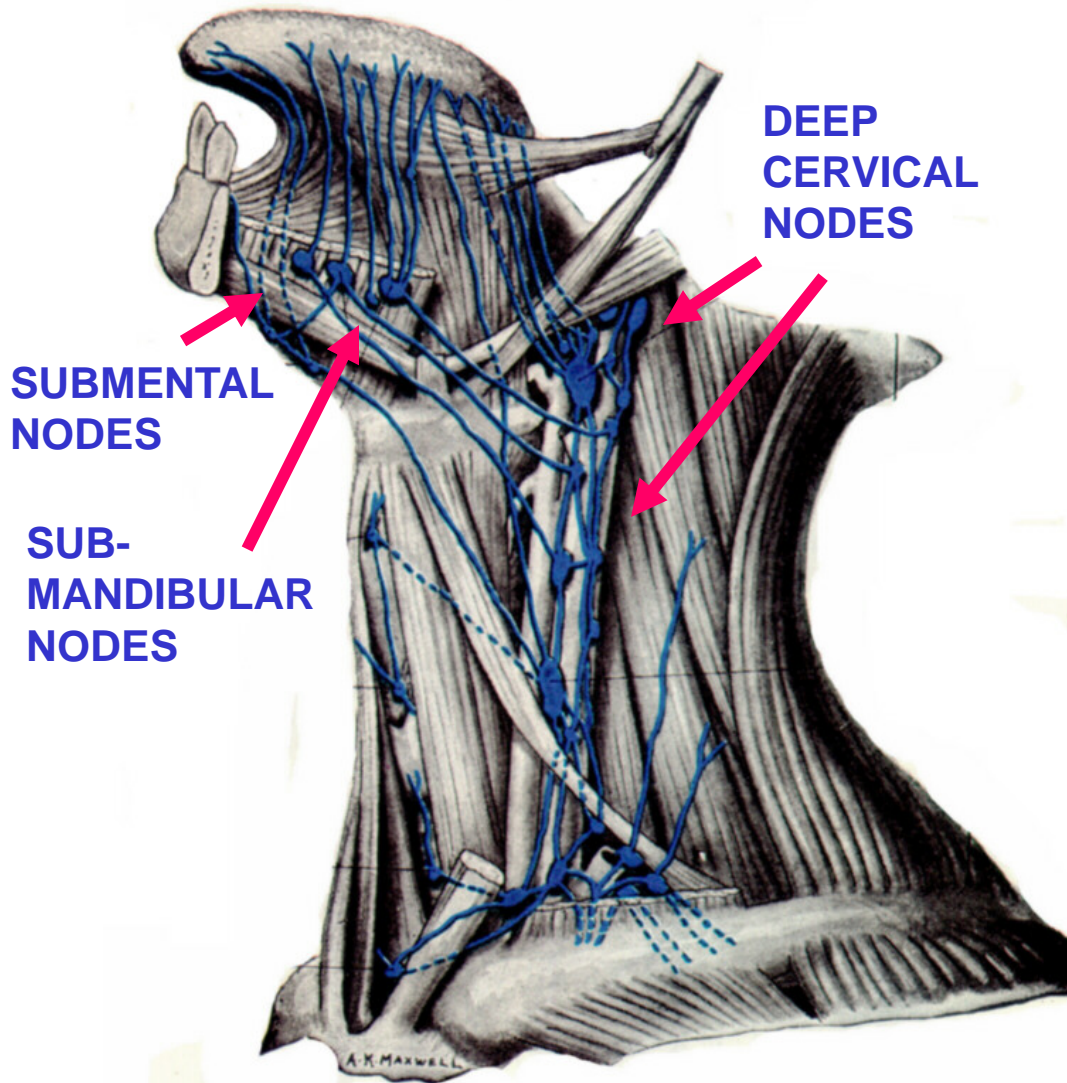
LINGUAL ARTERY

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

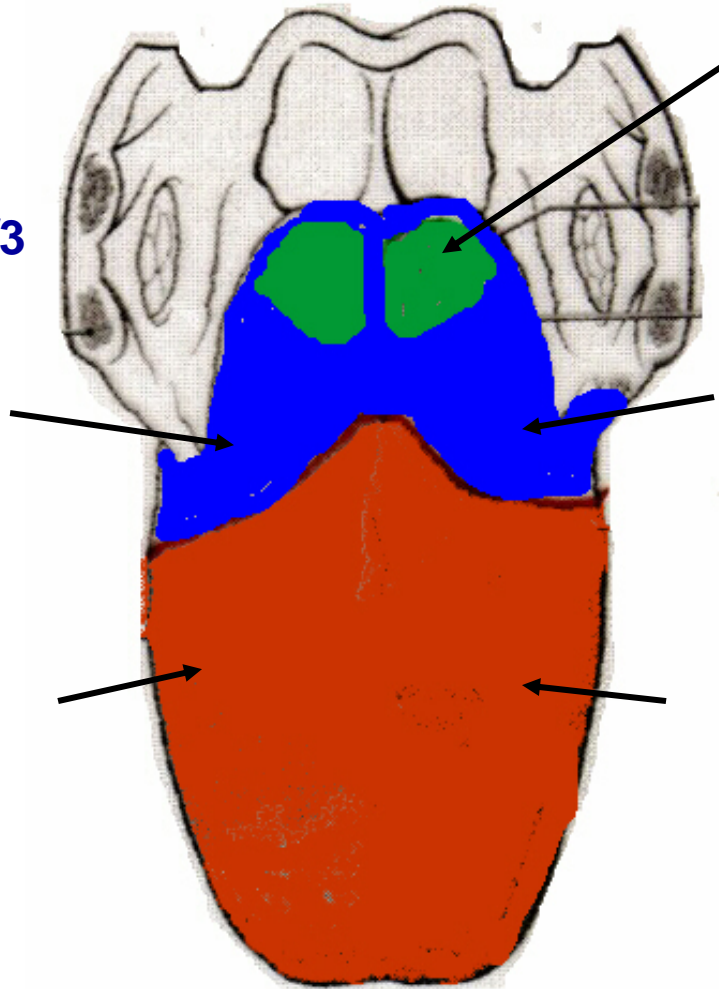
E. SENSORY INNERVATION OF TONGUE

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



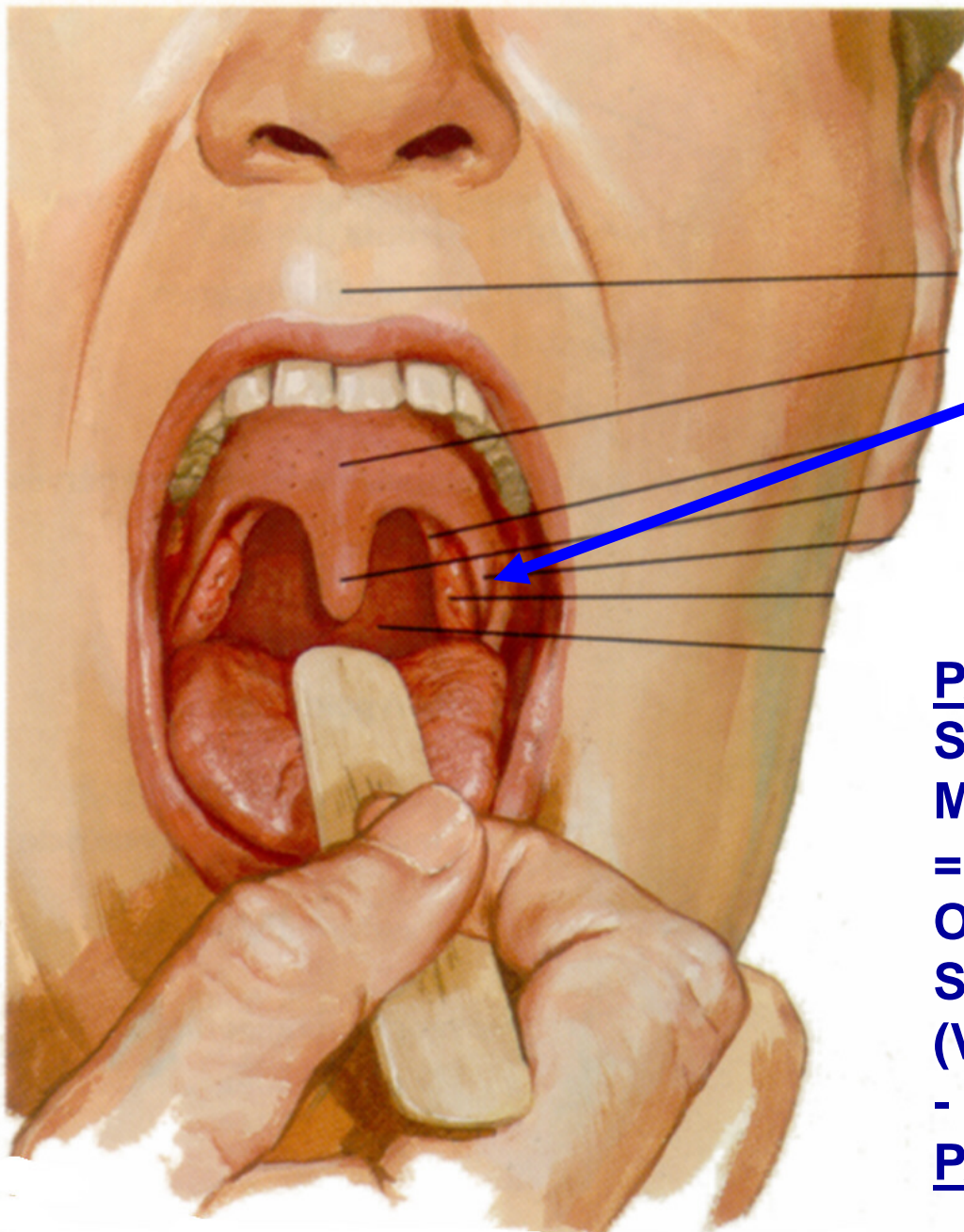
ANT. TO EPIGLOTTIS -
1) X- VAGUS- VISCERAL
SENSORY TOUCH AND
TASTE

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**

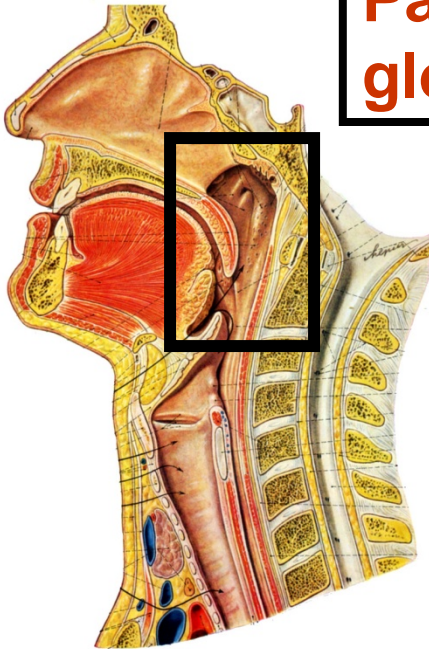
**PALATOGLOSSAL ARCH =
SITE OF OROPHARYNGEAL
MEMBRANE
= BOUNDARY BETWEEN
ORAL CAVITY (SOMATIC
SENSORY) AND PHARYNX
(VISCERAL SENSORY)
- OVERLIES
PALATOGLOSSUS MUSCLE**

PALATOGLOSSUS IS A MUSCLE OF SOFT PALATE

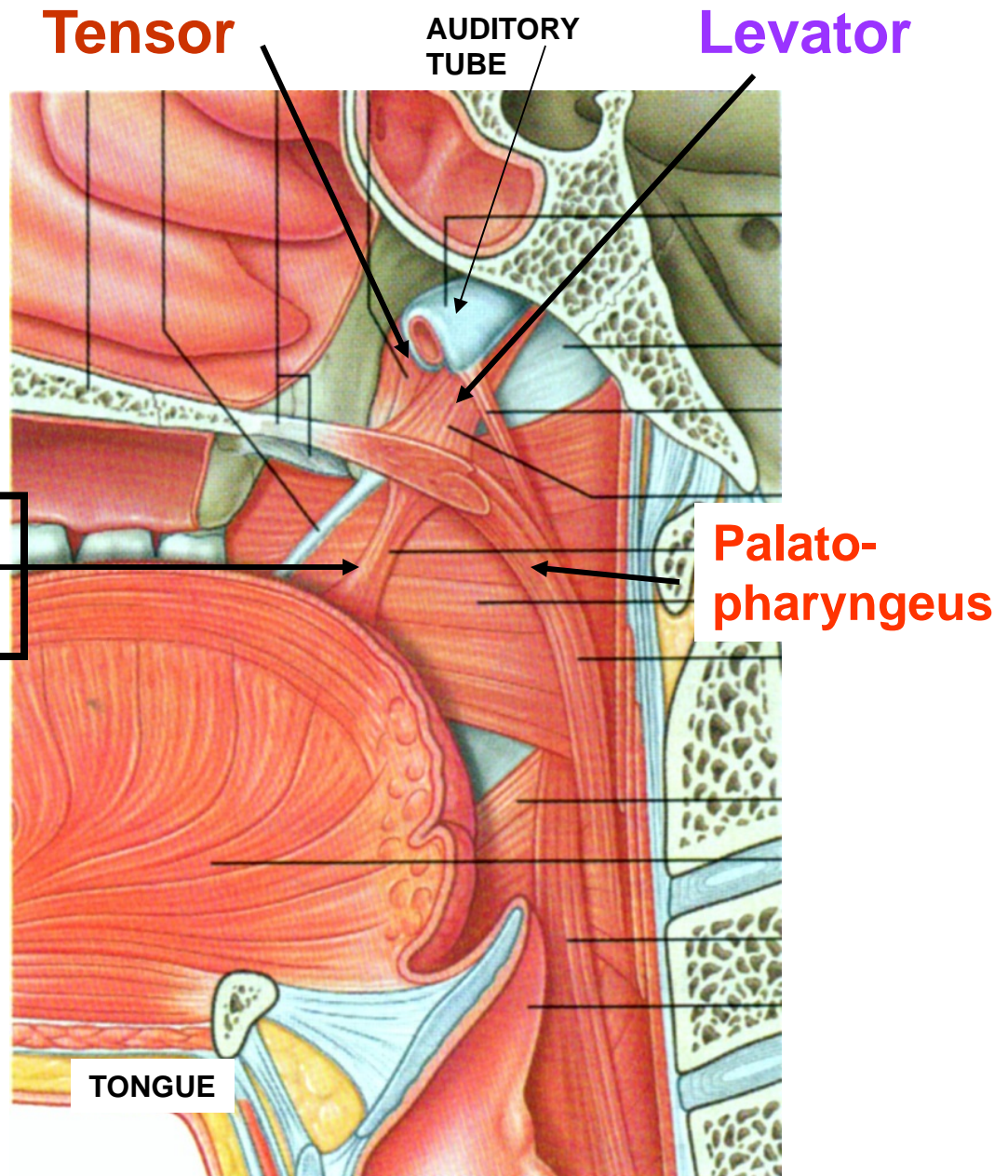
Innervation - VAGUS
CN X

Palatoglossus

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



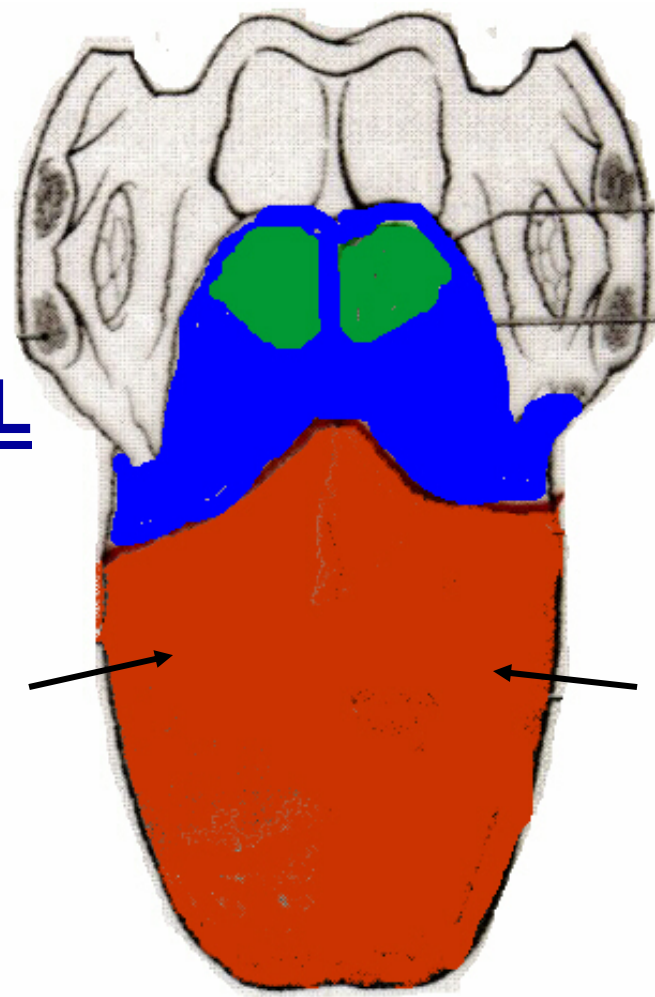
Palato-
glossus



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

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

V3 - LINGUAL N. - SOMATIC SENSORY TOUCH

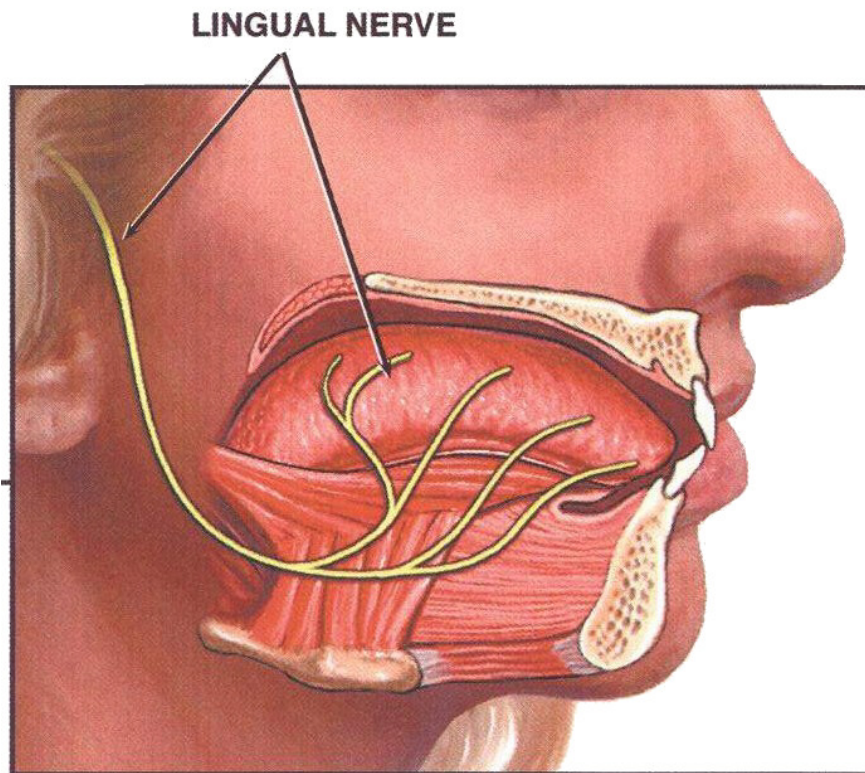


TASTE - (SVA) IN FACIAL N. (VII)

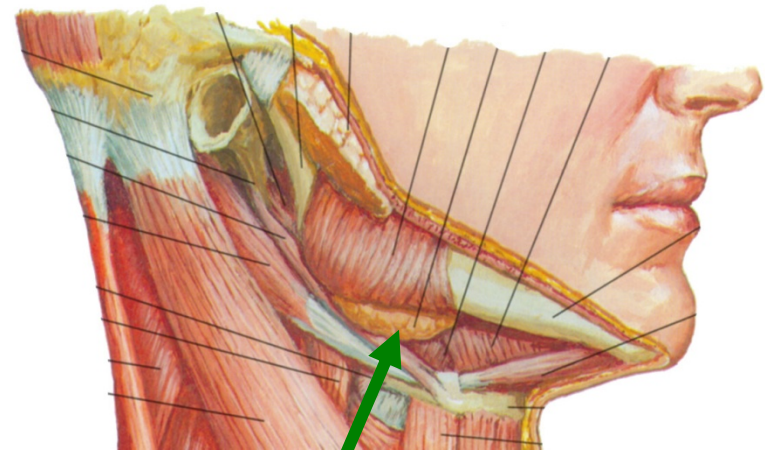
VII - CHORDA TYMPANI - TASTE

III. PATHWAYS OF NERVES TO TONGUE

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



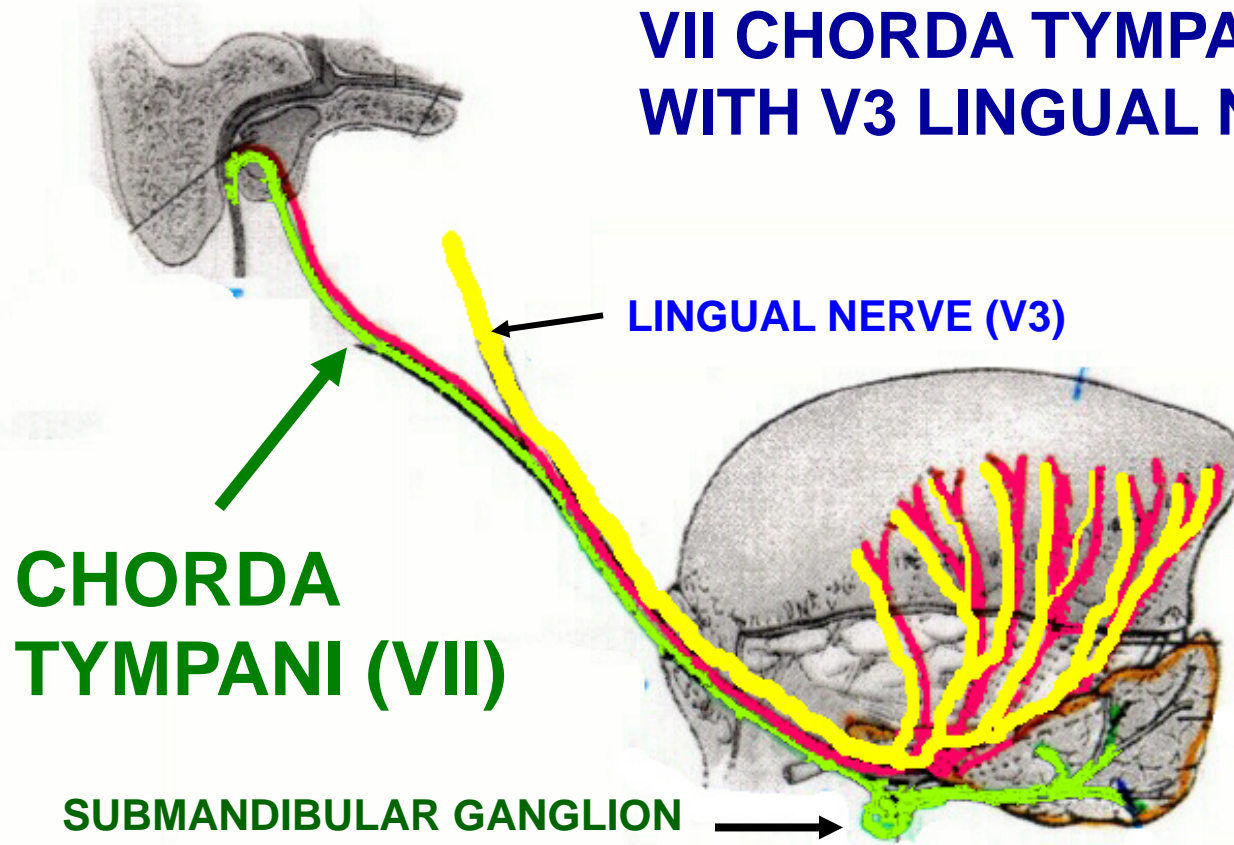
LATERAL VIEW OF THE TONGUE



SUBMANDIBULAR SALIVARY GLAND

LINGUAL NERVE COURSES NEAR SUBMANDIBULAR AND SUBLINGUAL SALIVARY GLANDS

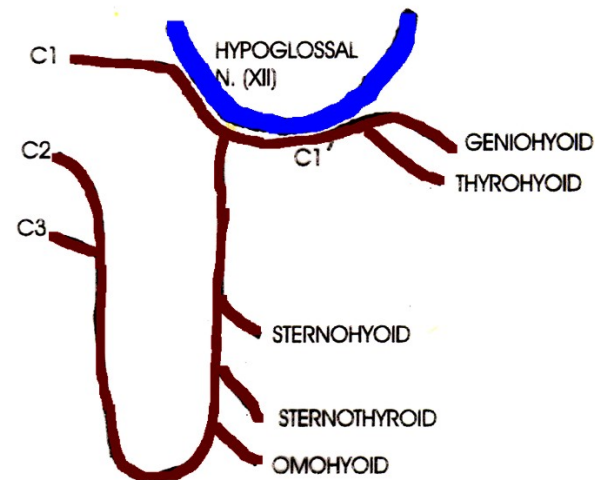
VII CHORDA TYMPANI HITCHHIKES WITH V3 LINGUAL NERVE



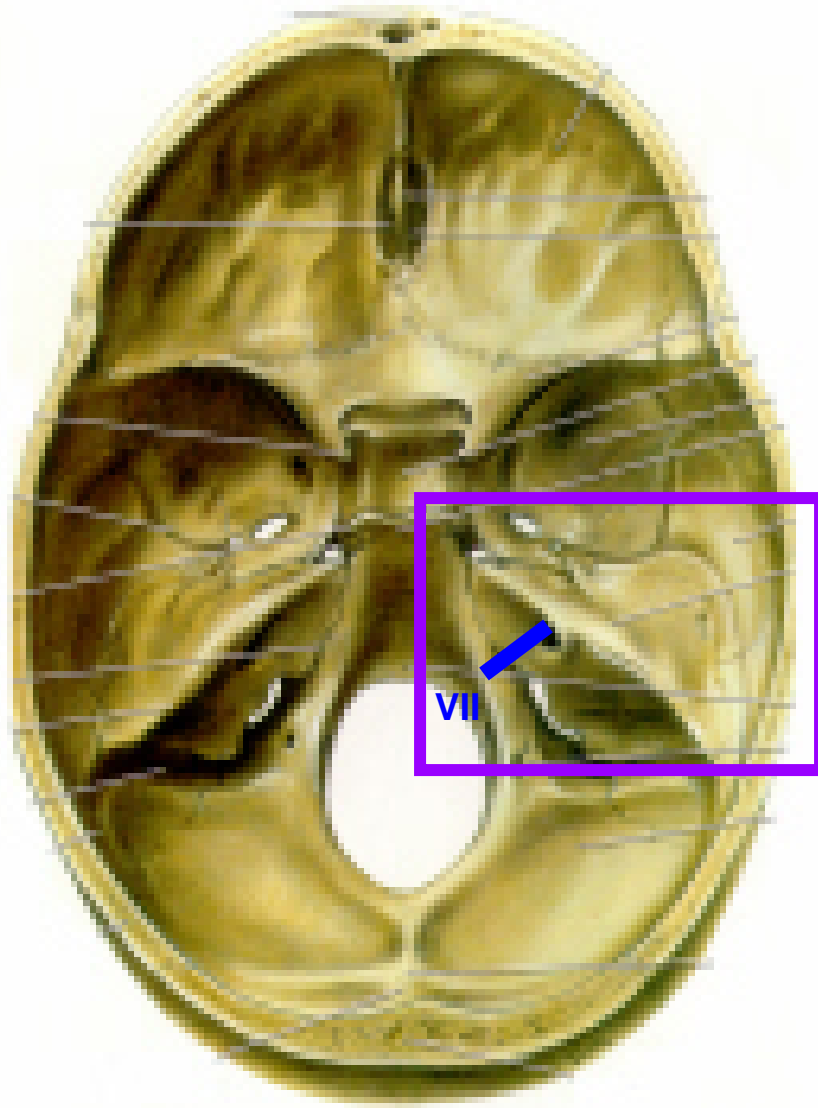
CHORDA TYMPANI (VII)-
Parasympathetics
- to Submandibular, Sublingual salivary glands
- Taste fibers - to taste buds on Ant. 2/3 of tongue

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

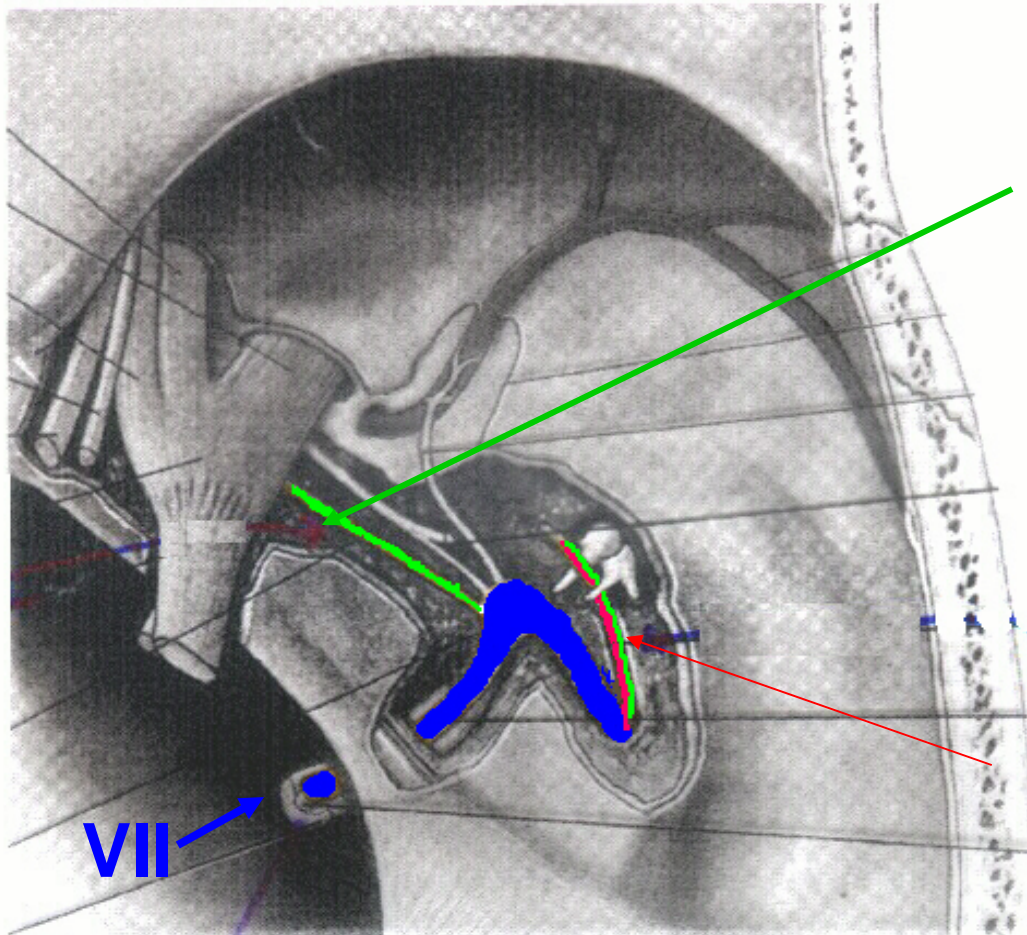
VII leaves Post. Cranial fossa via Internal Aud. Meatus - enters Facial Canal

Branches in Facial Canal

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

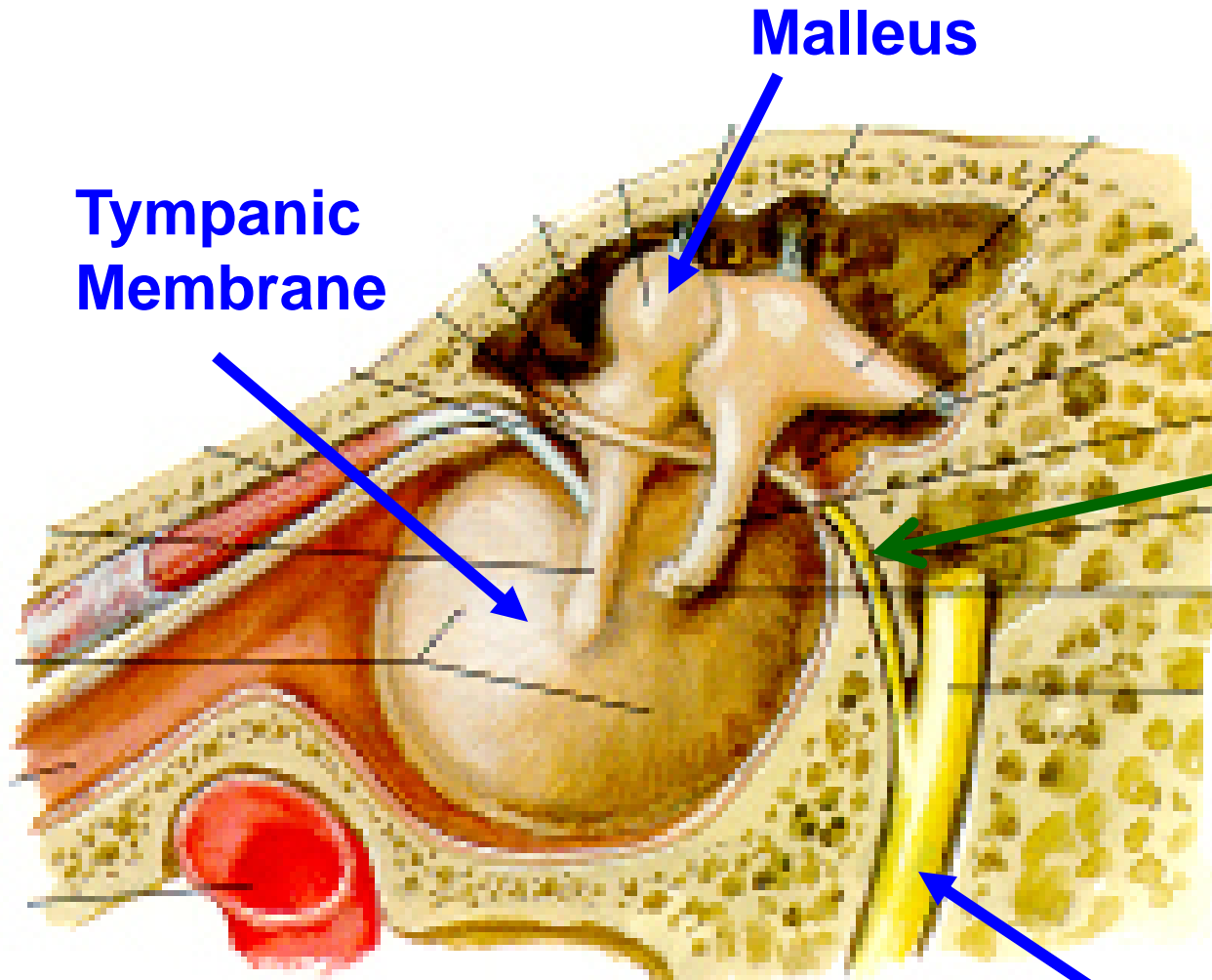
2. Stapedial N. - Branchio-motor to stapedius

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



- Chorda Tympani has no function in middle ear
- Crosses through tympanic cavity
- Over handle of malleus

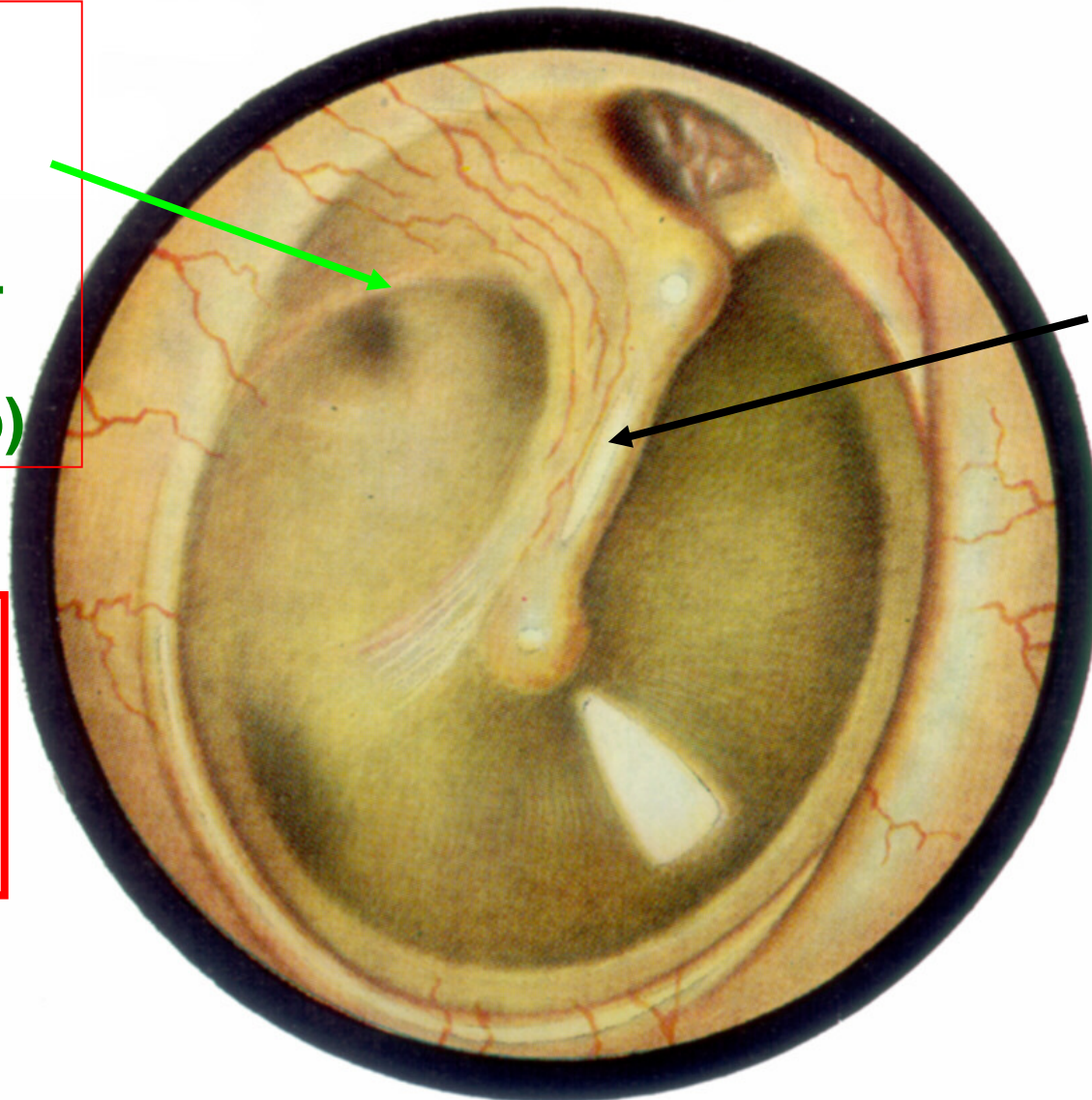
VIEW OF INNER SURFACE

FACIAL NERVE

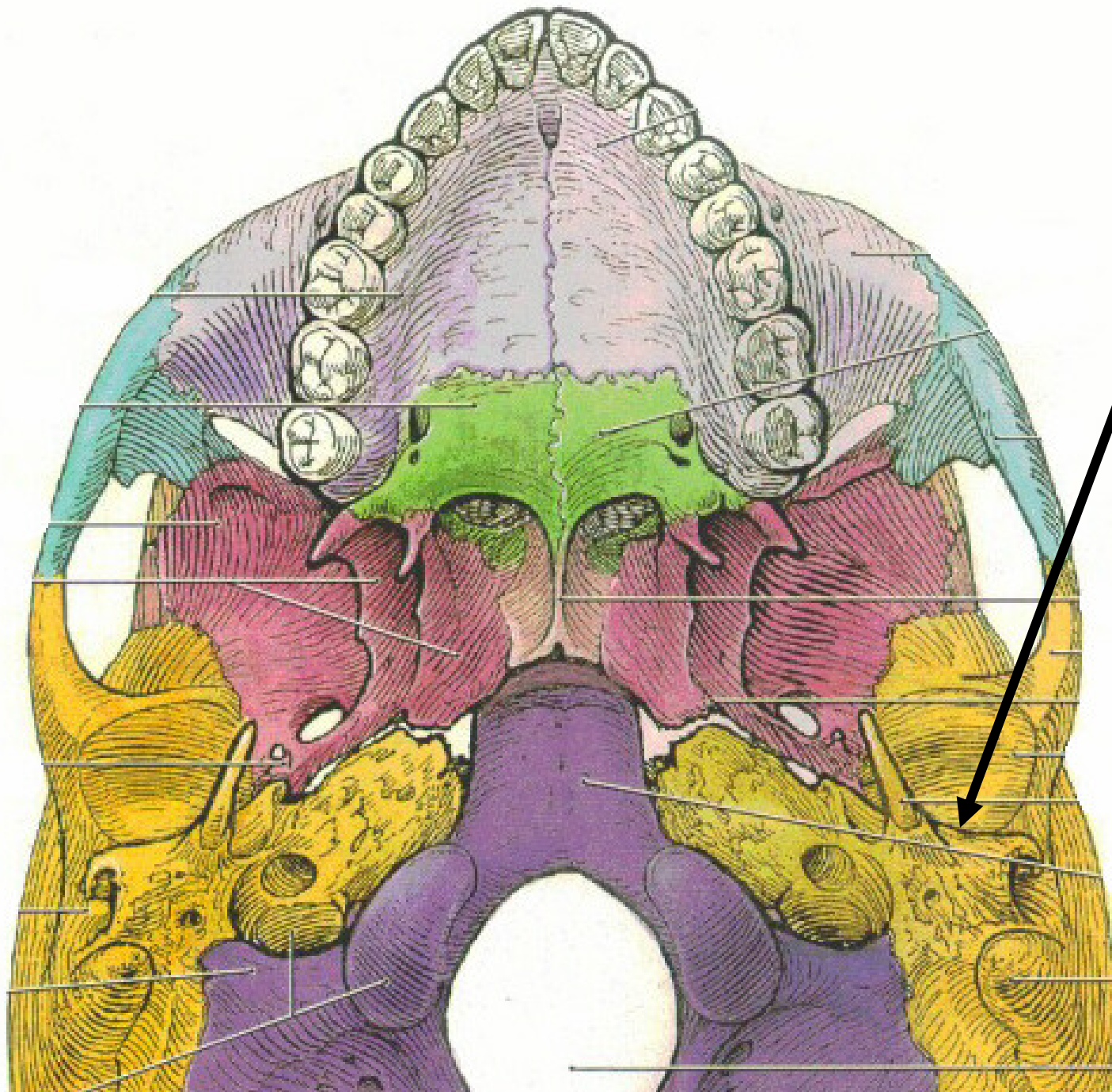
OTOSCOPE VIEW OF TYMPANIC MEMBRANE

**CHORDA
TYMPANI:
TASTE,
VISCERAL
MOTOR
(parasymp)**

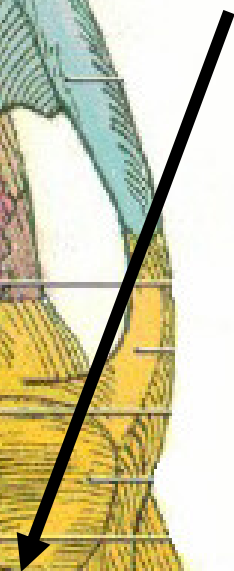
**Lose
taste if
pierce
tympanic
membrane**



**MALLEUS –
manubrium
(handle)**

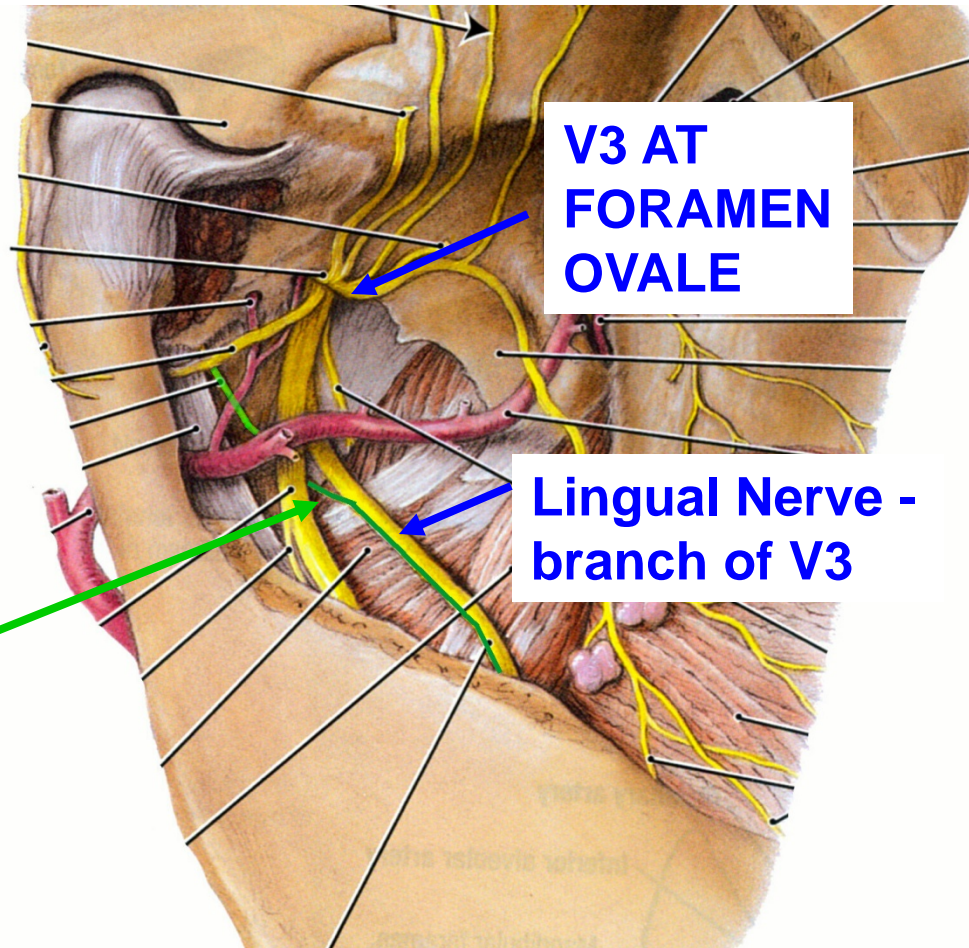
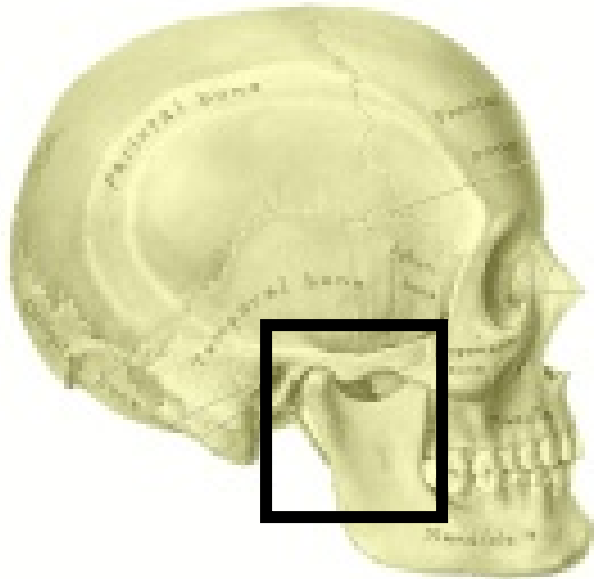


PETRO-
TYMPANIC
FISSURE - for
CHORDA
TYMPANI and
ANT.
TYMPANIC
ARTERY



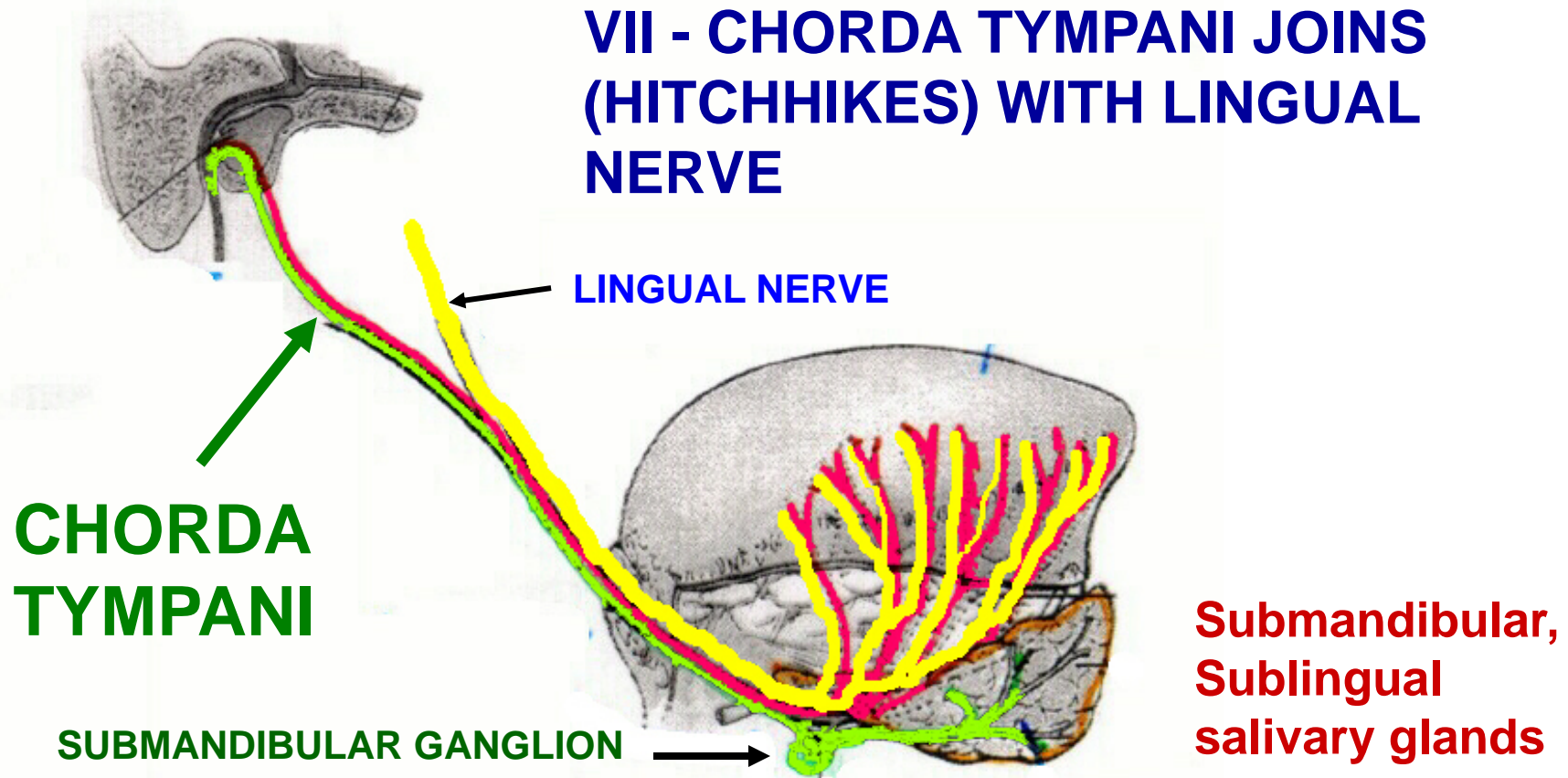
**VII - CHORDA TYMPANI - PARASYMPATHETIC TO
SUBMANDIBULAR AND SUBLINGUAL GLANDS,
TASTE FIBERS TO ANT 2/3 OF TONGUE**

NOSE



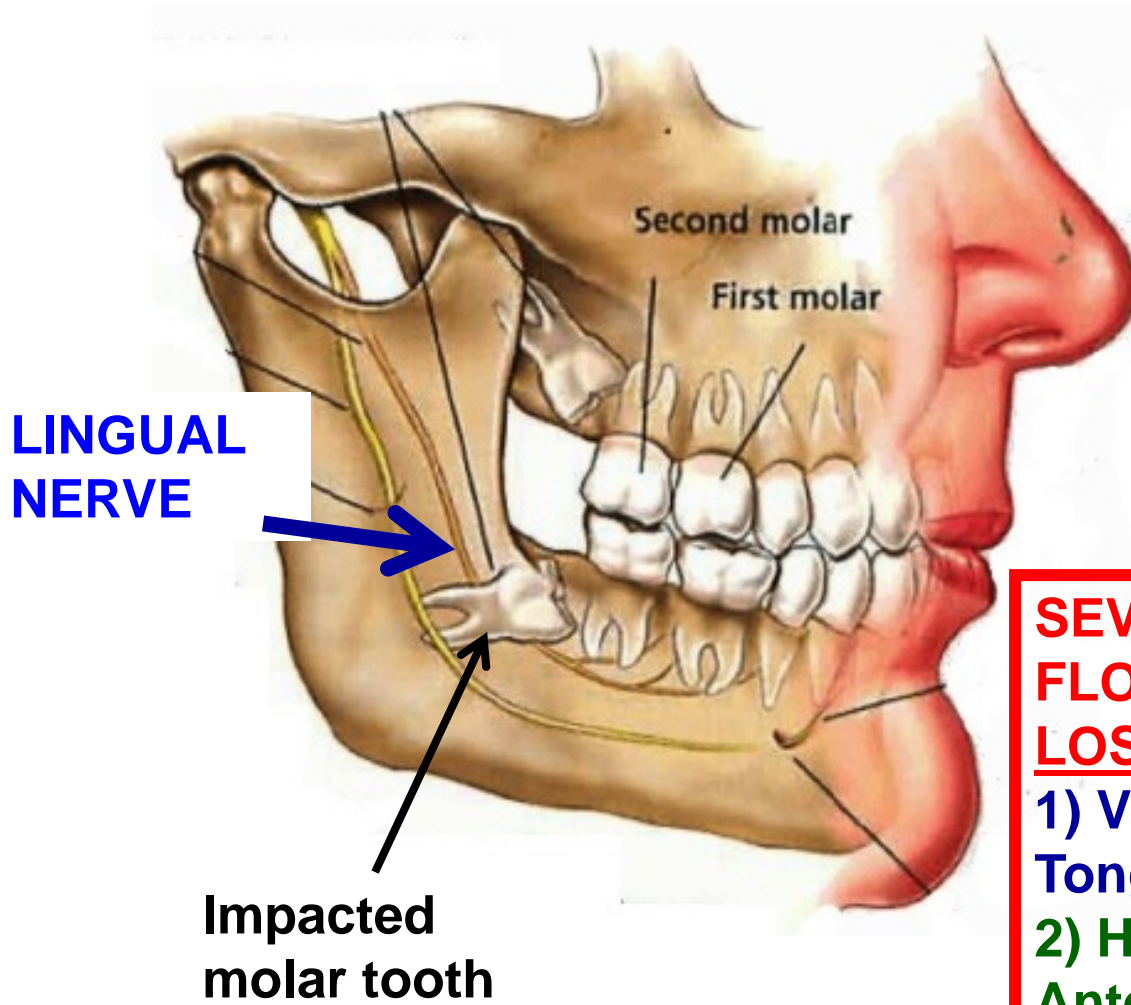
**CHORDA
TYMPANI joins
and hitchhikes
with Lingual
Nerve (V3)**

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

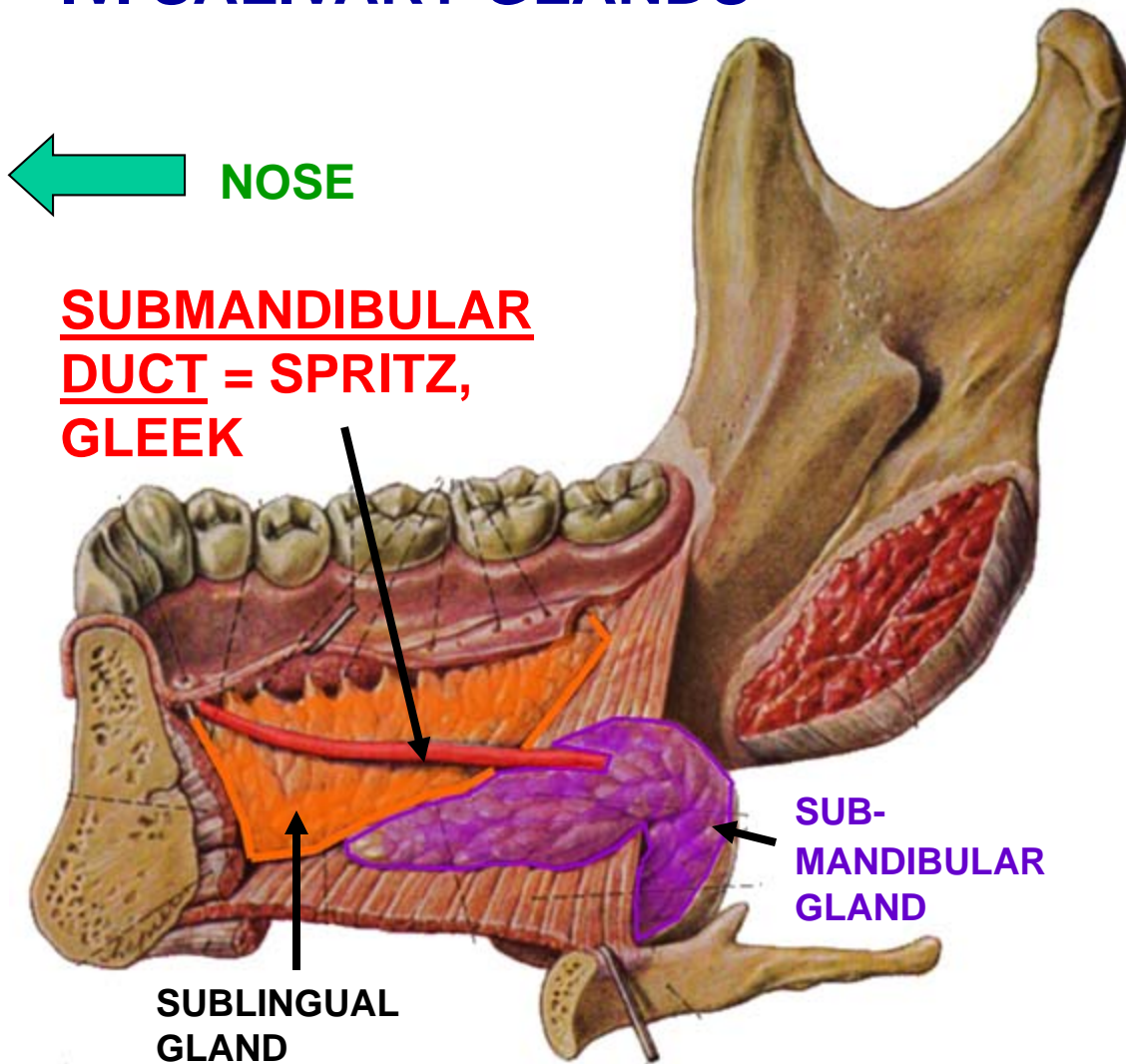


- Lingual nerve courses below mucosa in floor of mouth
- Can readily be damaged during dental extraction of impacted molar tooth
- Also damaged in children: ex. fall with glass pop bottle in mouth

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

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

IV. SALIVARY GLANDS



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 →

SUBMANDIBULAR
GANGLION

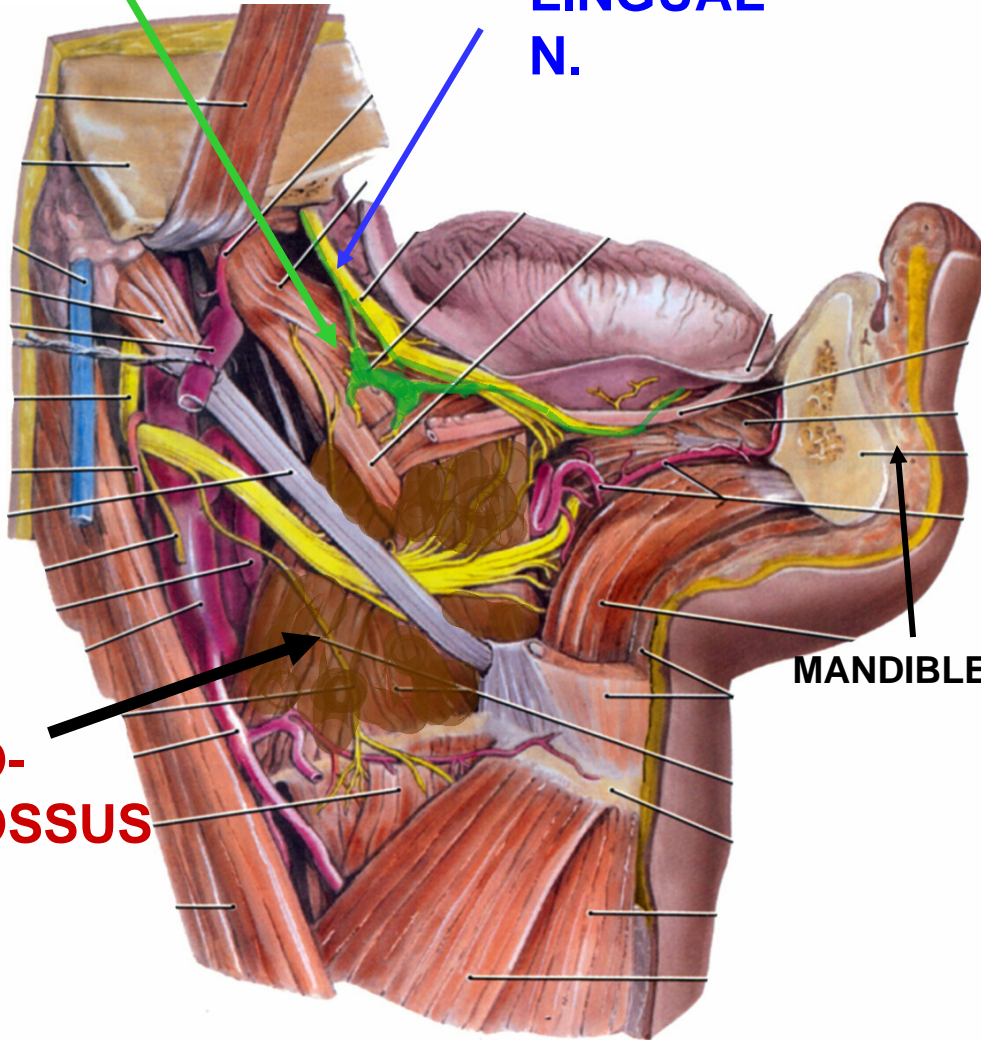
LINGUAL
N.

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

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

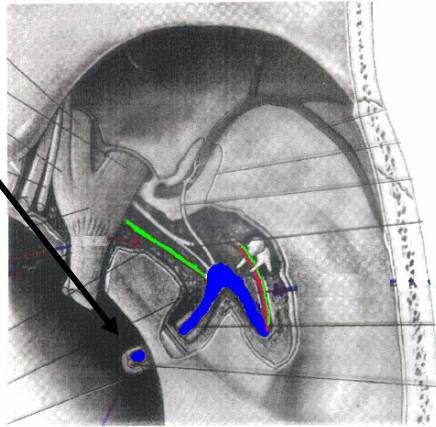
HYO-
GLOSSUS
M.

MANDIBLE

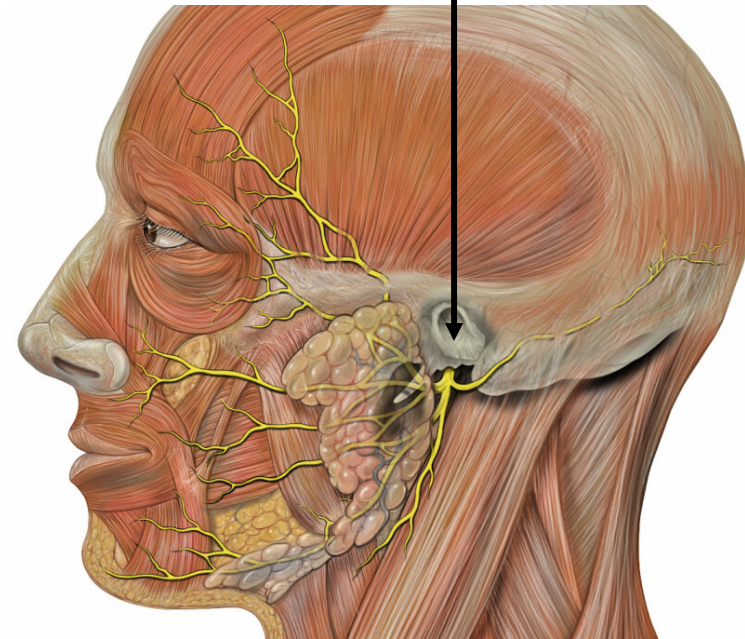


FACIAL NERVE (CRANIAL NERVE VII) - MANY BRANCHES INSIDE TEMPORAL BONE

VII - leaves post cranial fossa via Internal Auditory Meatus



VII - EXITS SKULL VIA STYLOMASTOID FORAMEN



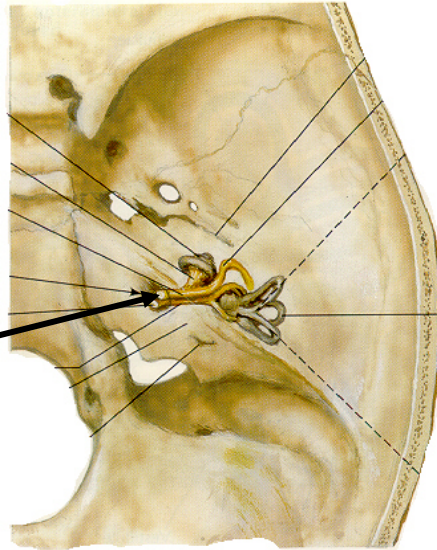
Branches arise in petrous temporal bone:

- 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

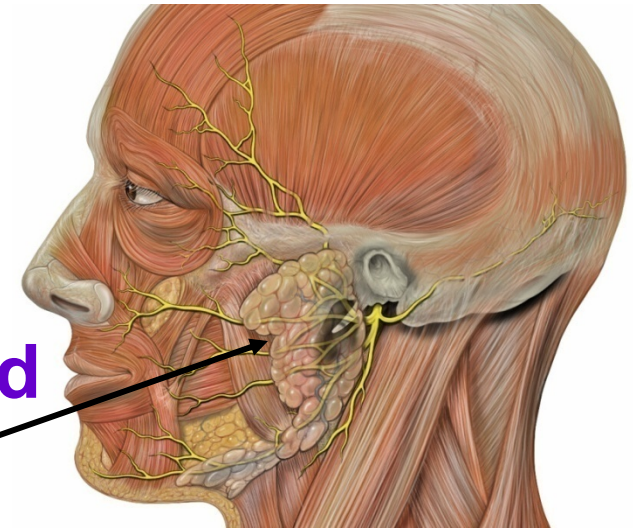
branches only to Muscles Facial Expression, Neck muscles

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

VII - ONLY

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, hyperacusia, decrease in
secretion of lacrimal and salivary glands

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

NO auditory/vestibular deficits;
VIII NOT AFFECTED