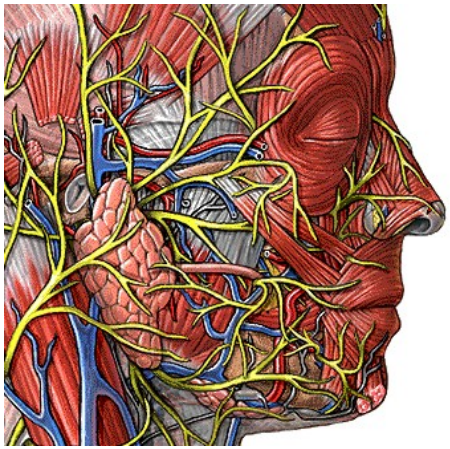
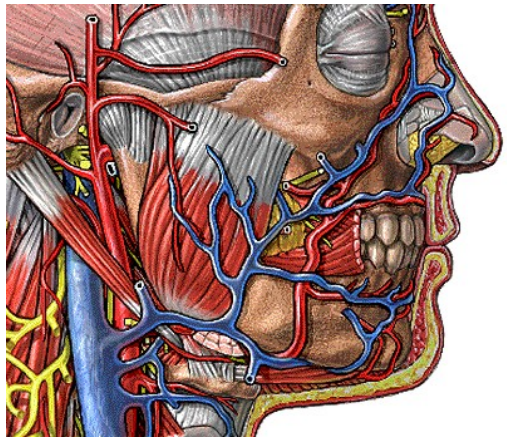
HEAD AND NECK
DISCUSSION SESSION: GROSS ANATOMY

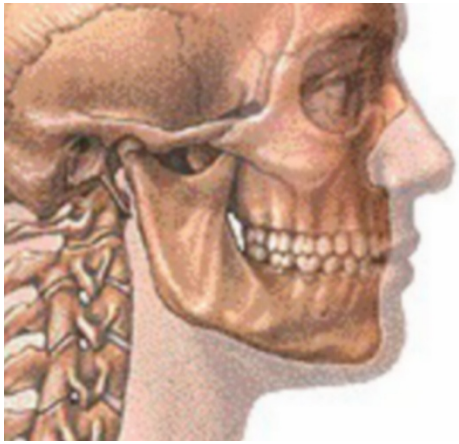
ONN BLOCK

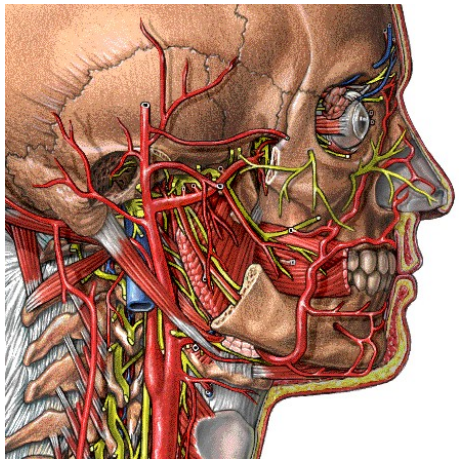
1) Parotid, Maxillary Artery, Muscles of Mastication
2) Oral cavity
3) Pharynx - Swallowing

PAROTID AND INFRATEMPORAL REGIONS







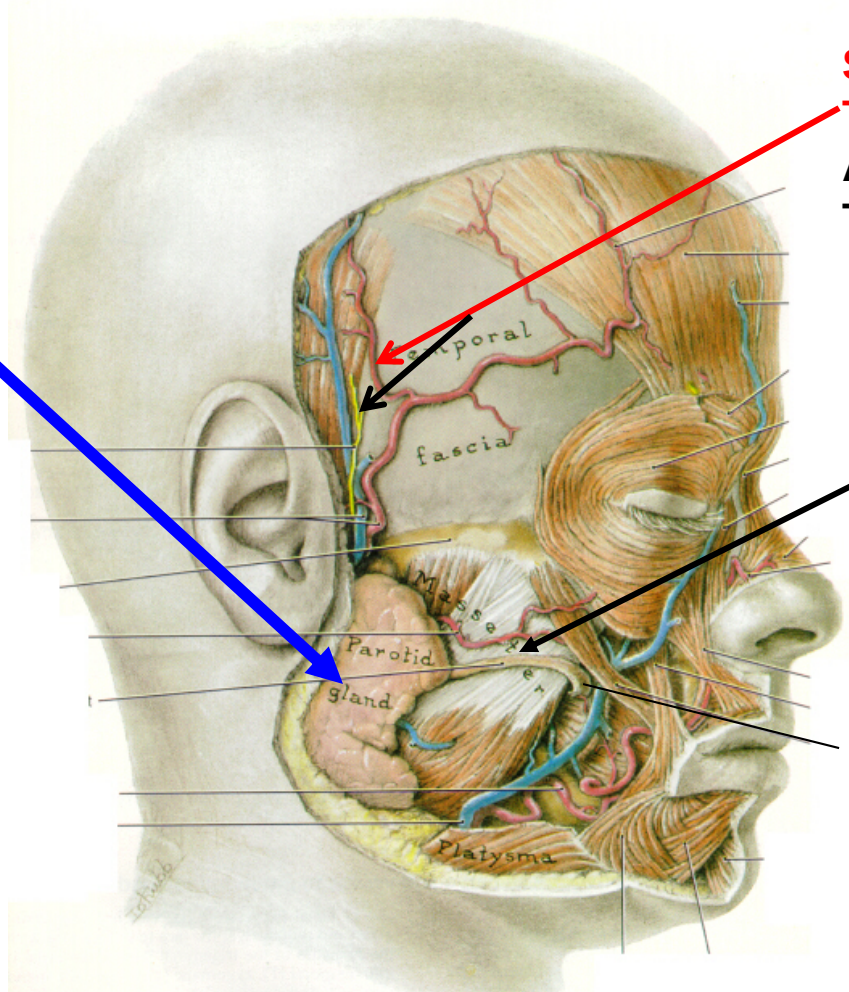


SUPERFICIAL – PAROTID GLAND, MUMPS
TMJ – MUSCLES OF MASTICATION (V3), EFFECTS DAMAGE CN V

INFRATEMPORAL REGION – (below zygomatic arch , medial to Mandible) - MAXILLARY ARTERY – meningeal branches
PTERYGOID VENOUS PLEXUS- spread of infection

COMPLEX, CLINICALLY IMPORTANT AREA - source of blood supply to nasal cavity, calvarium, oral cavity, middle ear; location of muscles of mastication

PAROTID REGION



SUPERFICIAL TEMPORAL ARTERY AND AURICULO-TEMPORAL NERVE

PAROTID GLAND –

LARGEST SALIVARY GLAND

CAPSULE VERY TOUGH

PAROTID DUCT

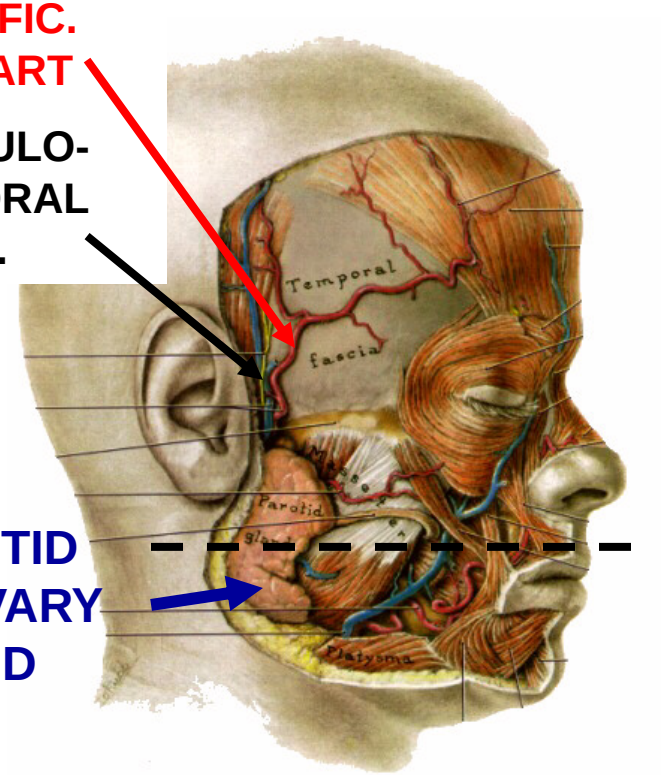
90 DEGREE TURN

PAROTID DUCT- ENTERS MOUTH, PIERCES BUCCINATOR OPPOSITE 2ND MANDIBULAR MOLAR TOOTH; MAKES 90 DEGREE TURN - ACTS AS PASSIVE VALVE, LETS YOU BLOW UP BALLOONS

STRUCTURES PASS THROUGH PAROTID GLAND

SUPERFIC. TEMP. ART

AURICULO-TEMPORAL NERVE.

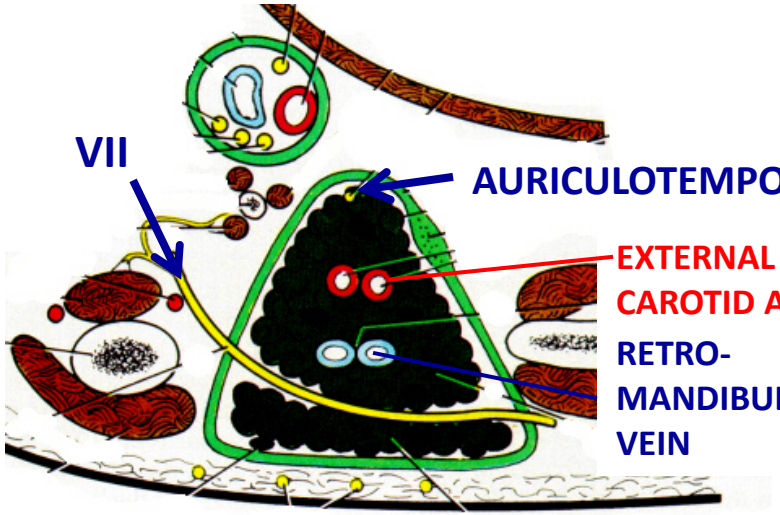


PAROTID SALIVARY GLAND

SUPERFICIAL TEMPORAL ARTERY – branch of External Carotid Artery

AURICULO-TEMPORAL NERVE (V3) – to skin of scalp, external auditory meatus

HORIZONTAL SECTION THROUGH PAROTID GLAND



WITHIN PAROTID-

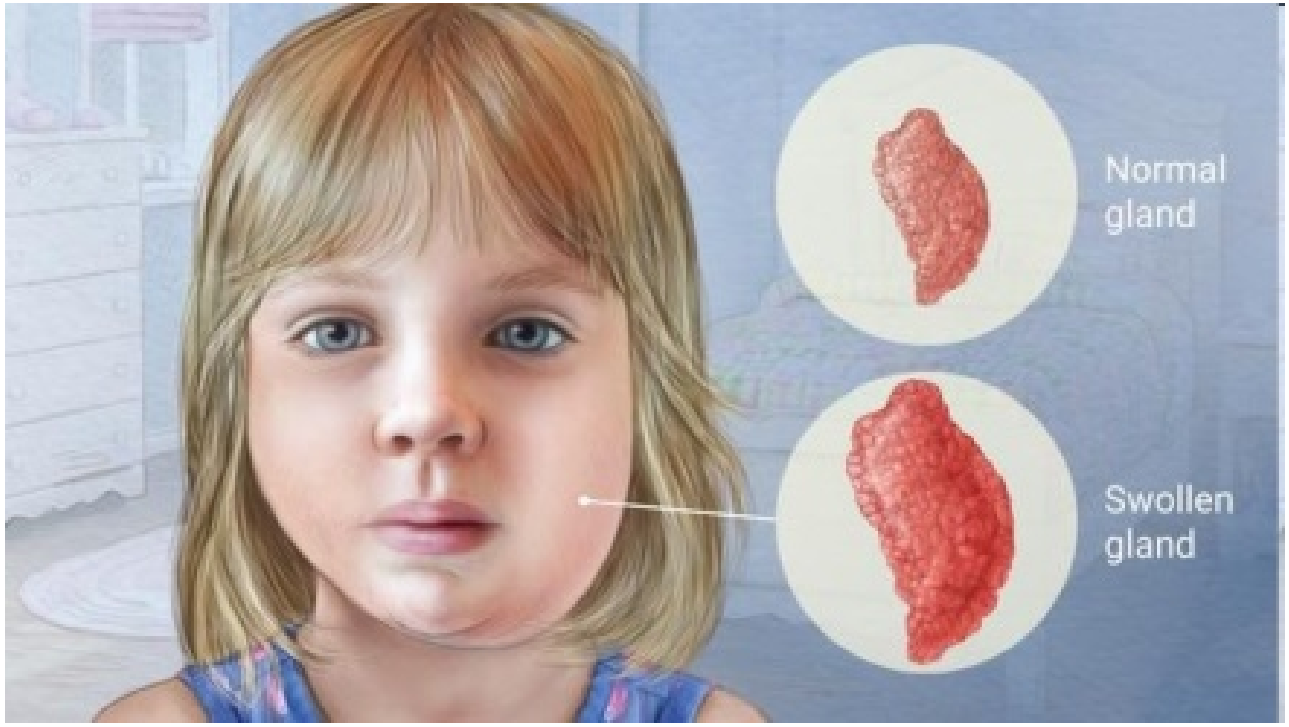
1) CN VII – FACIAL PARALYSIS IN PAROTID TUMORS

2) RETROMANDIBULAR VEIN,

3) EXT CAROTID A.,

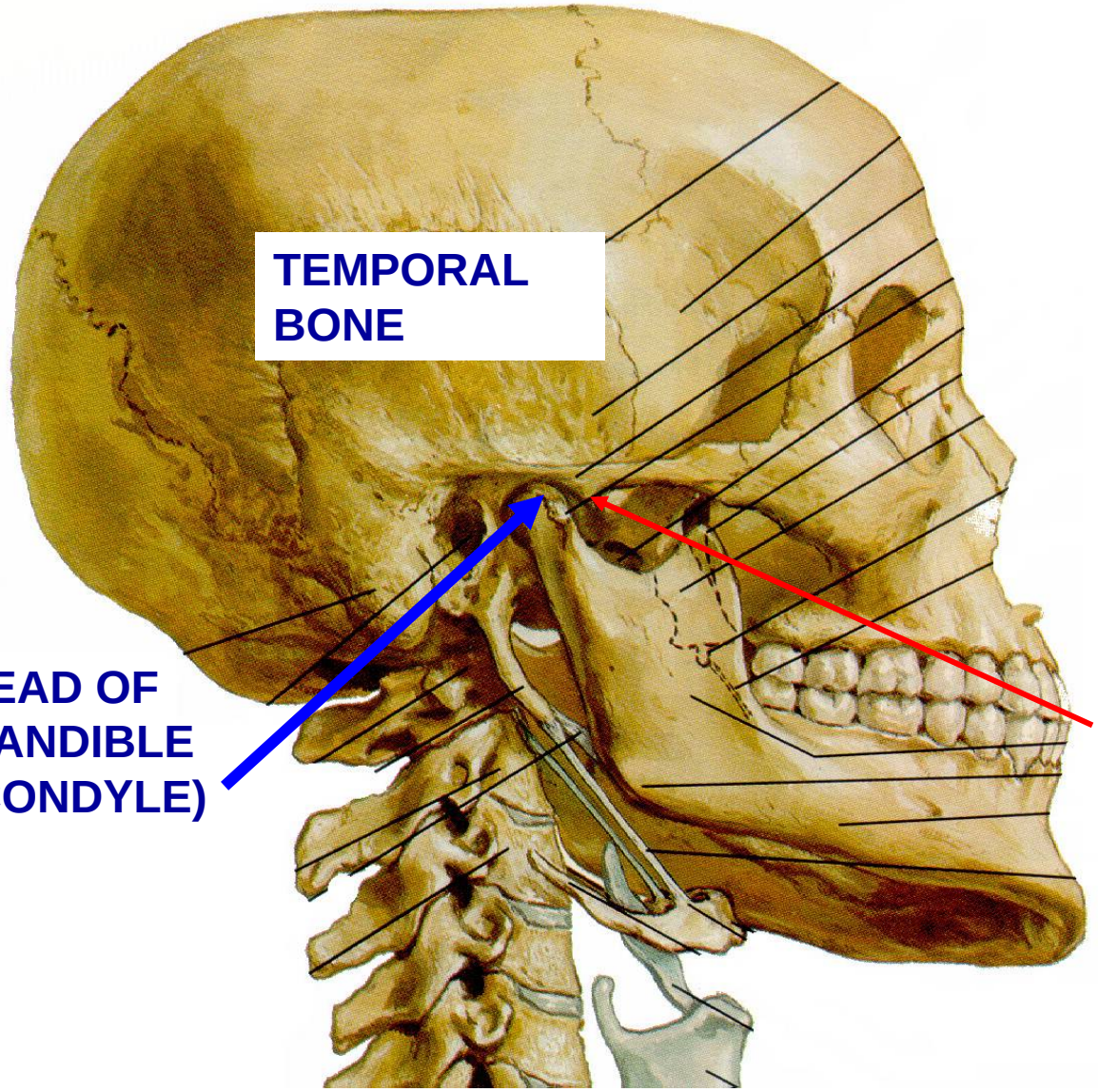
4) AURICULOTEMPORAL N.

MUMPS – VIRAL INFECTION OF PAROTID SALIVARY GLAND



NOTE: MUMPS: VIRAL INFECTION OF PAROTID; SWELLING PAINFUL DUE TO TIGHTNESS CAPSULE; REFERRED PAIN TO EAR - COMPRESSION OF AURICULO-TEMPORAL NERVE (ALSO PAROTID TUMOR) *

TEMPORO-MANDIBULAR JOINT (TMJ)



SYNOVIAL JOINT BETWEEN HEAD OF MANDIBLE (CONDYLE) AND MANDIBULAR FOSSA OF TEMPORAL BONE (DISC INTERIOR TO JOINT CAPSULE)

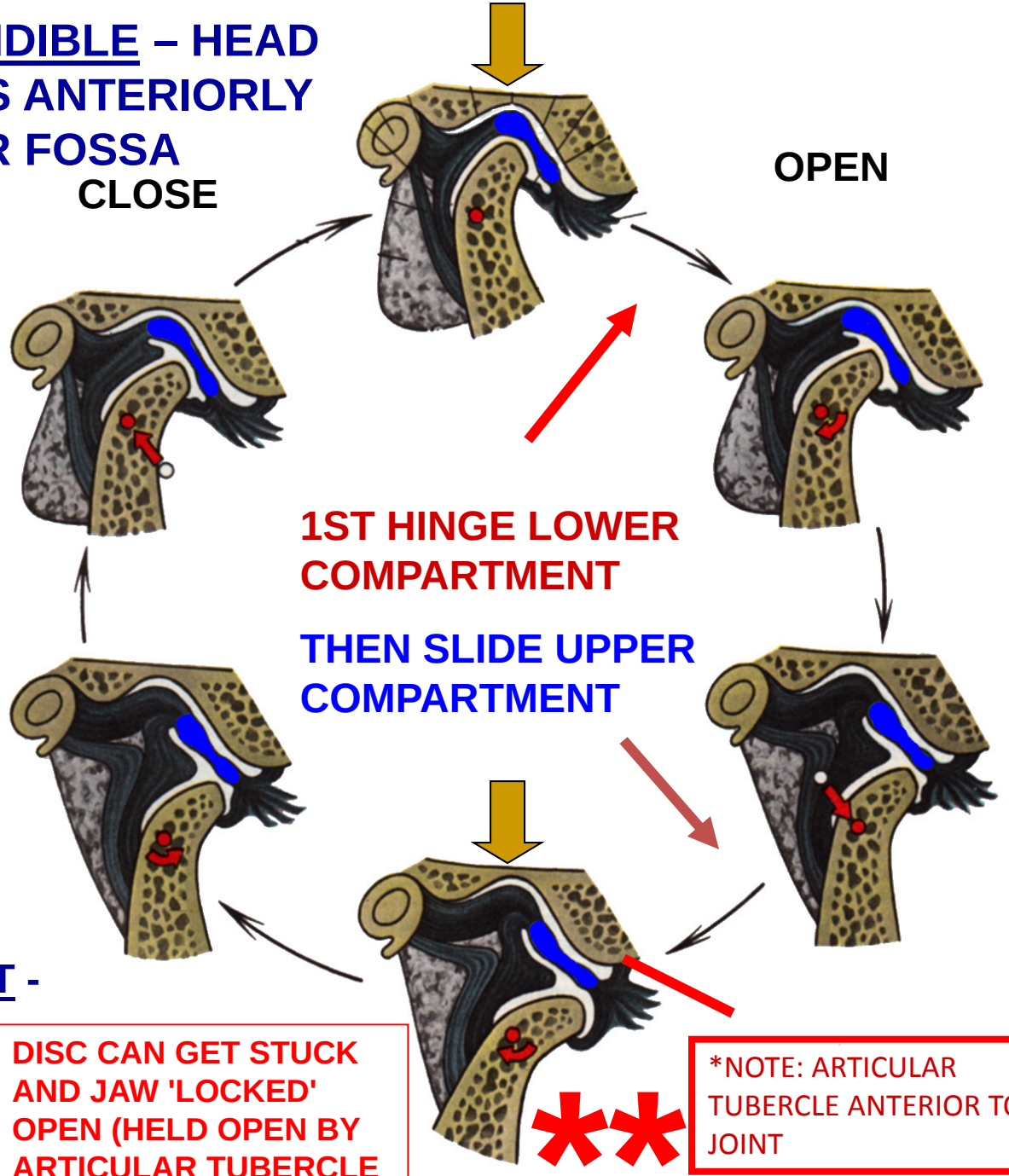
***NOTE: ARTICULAR TUBERCLE (EMINENCE) ANTERIOR TO JOINT** **

MOVEMENTS OF MANDIBLE – HEAD OF MANDIBLE MOVES ANTERIORLY OUT OF MANDIBULAR FOSSA

1. DEPRESSION/ ELEVATION - OPEN/CLOSE MOUTH - FIRST HINGE IN LOWER COMPARTMENT THEN SLIDE IN UPPER COMPARTMENT

2. PROTRUDE/ RETRUDE

3. LATERAL MOVEMENT - BOTH SLIDE UPPER COMPARTMENT

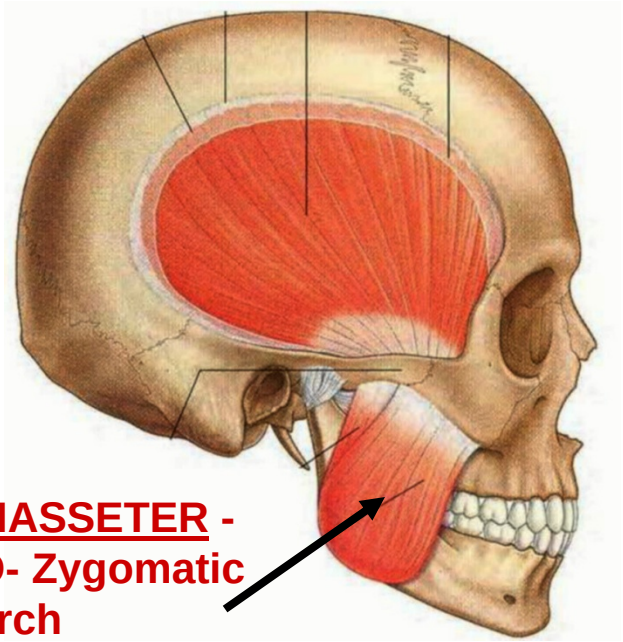


DISC CAN GET STUCK AND JAW 'LOCKED' OPEN (HELD OPEN BY ARTICULAR TUBERCLE

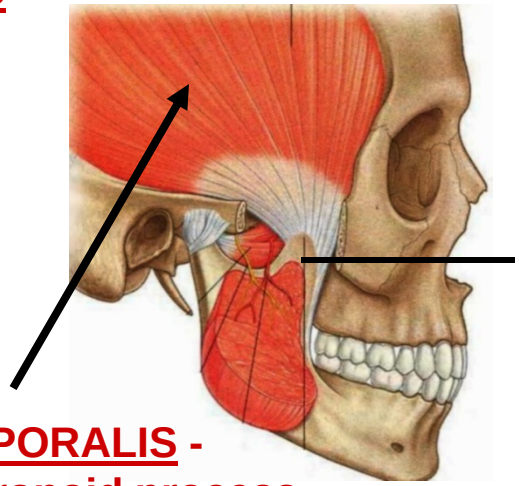
*NOTE: ARTICULAR TUBERCLE ANTERIOR TO JOINT

MUSCLES OF MASTICATION

- ALL INN BRANCHIOMOTOR V3
- MOST MUSCLES ELEVATE = CLOSE; ONE MUSCLE DEPRESS = OPEN MOUTH



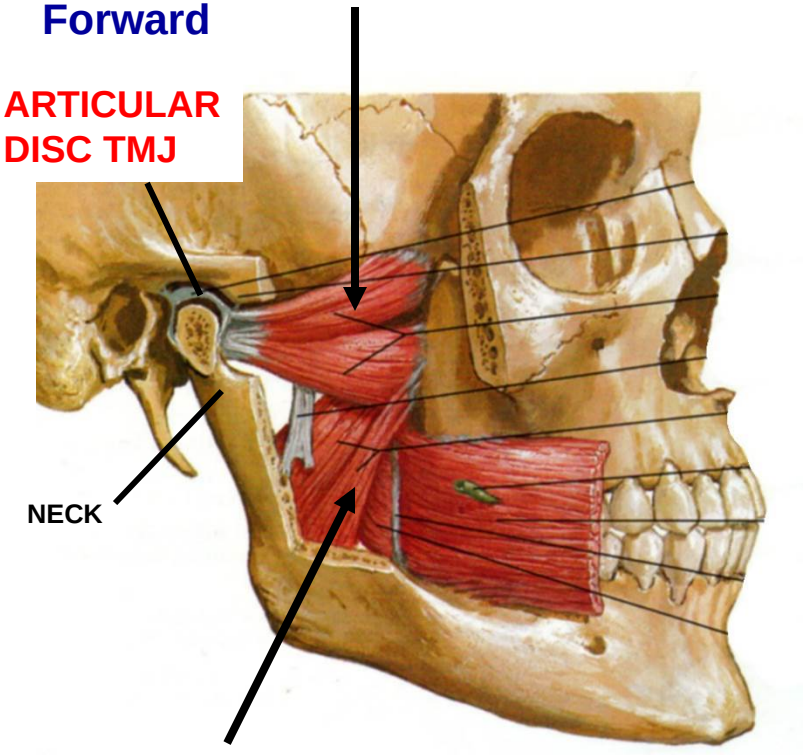
MASSETER -
O- Zygomatic arch
I Ramus, A - Elevate



TEMPORALIS -
I, Coronoid process, medial to zygomatic arch
A - Elevate, Retrude

MUSCLES INSIDE RAMUS OF MANDIBLE

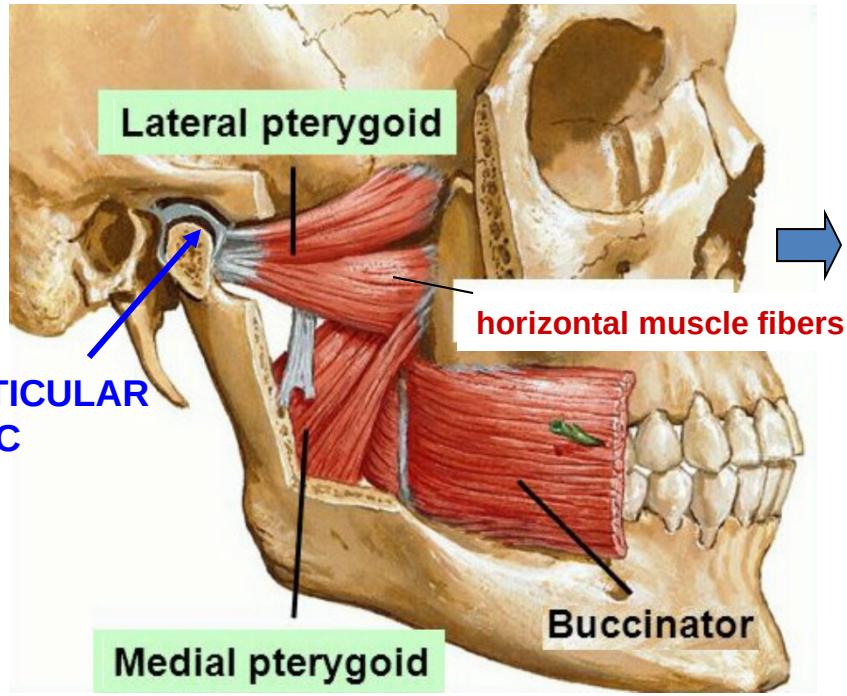
LAT. PTERYGOID - I - Neck, Articular Disc A - Depress, Protrude Pull Disc Forward

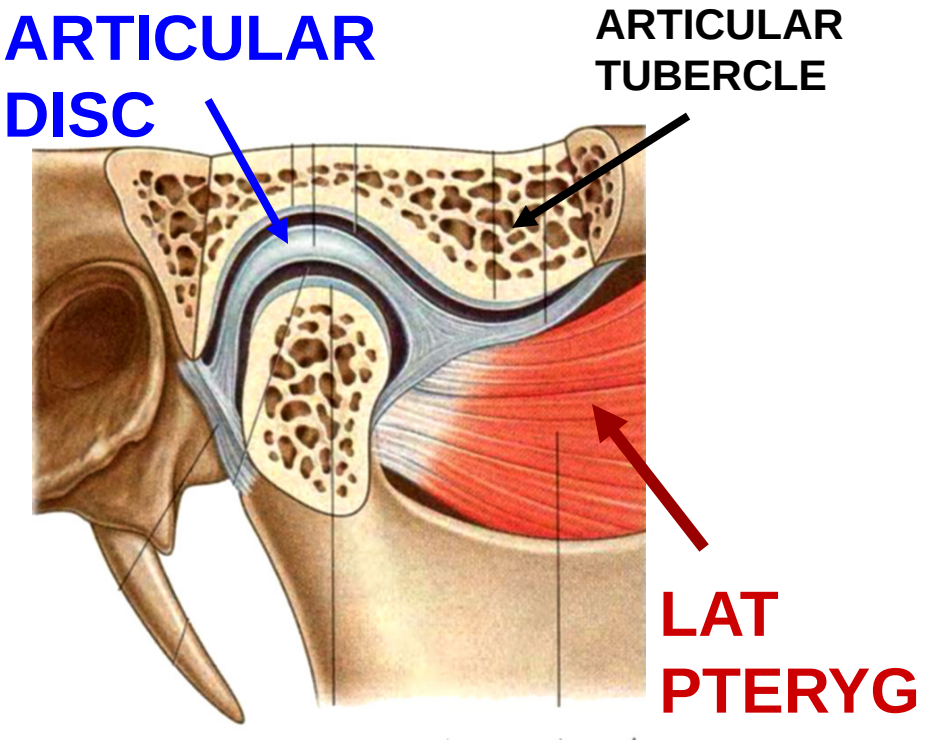


MED. PTERYGOID - I - Ramus, A - Elevate

MUSCLES OF MASTICATION

LATERAL PTERYGOID - ATTACHES TO ARTICULAR DISC OF TMJ



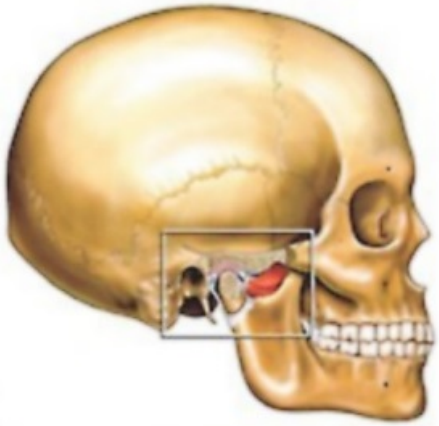


PULLS DISC ANTERIORLY WHEN OPEN MOUTH *

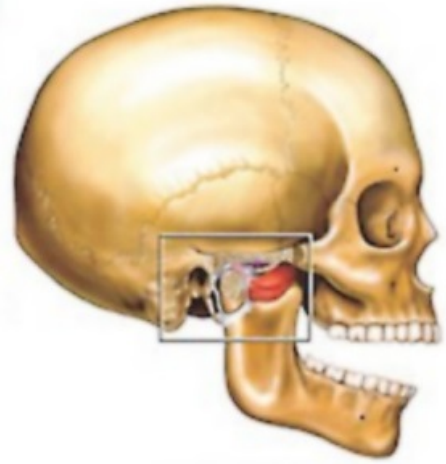
TMJ JAW LOCK - mandible stuck in partial depression

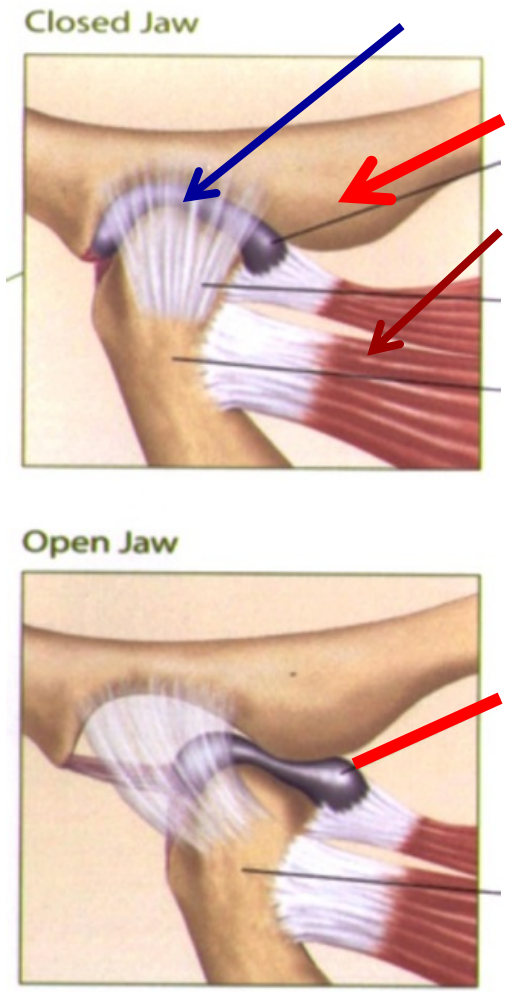
OPEN MOUTH =
depress mandible

FIRST HINGE LOWER COMPART MENT



THEN SLIDE UPPER COMPART-MENT, DISC MOVES OUT OF FOSSA





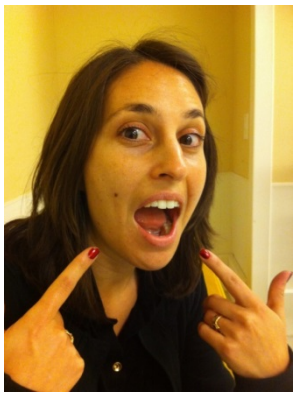
ARTICULAR DISC

ARTICULAR TUBERCLE

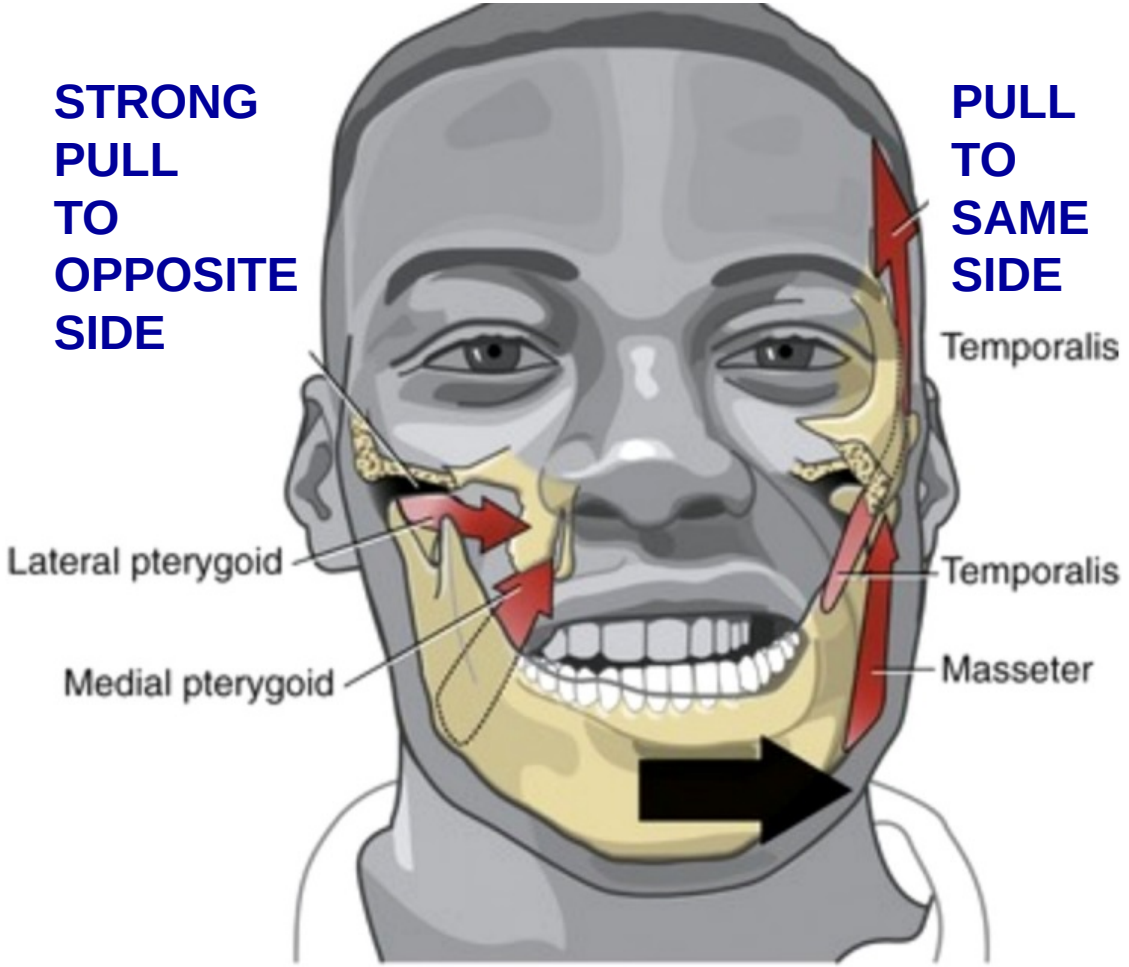
LATERAL PTERYGOID

* *

JAW LOCK - DISC STUCK ON ARTICULAR TUBERCLE (EMINENCE)



LATERAL MOVEMENTS IN CHEWING – CN V DAMAGE - JAW DEVIATES TOWARD SIDE OF LESION



Lateral movements – occur in chewing

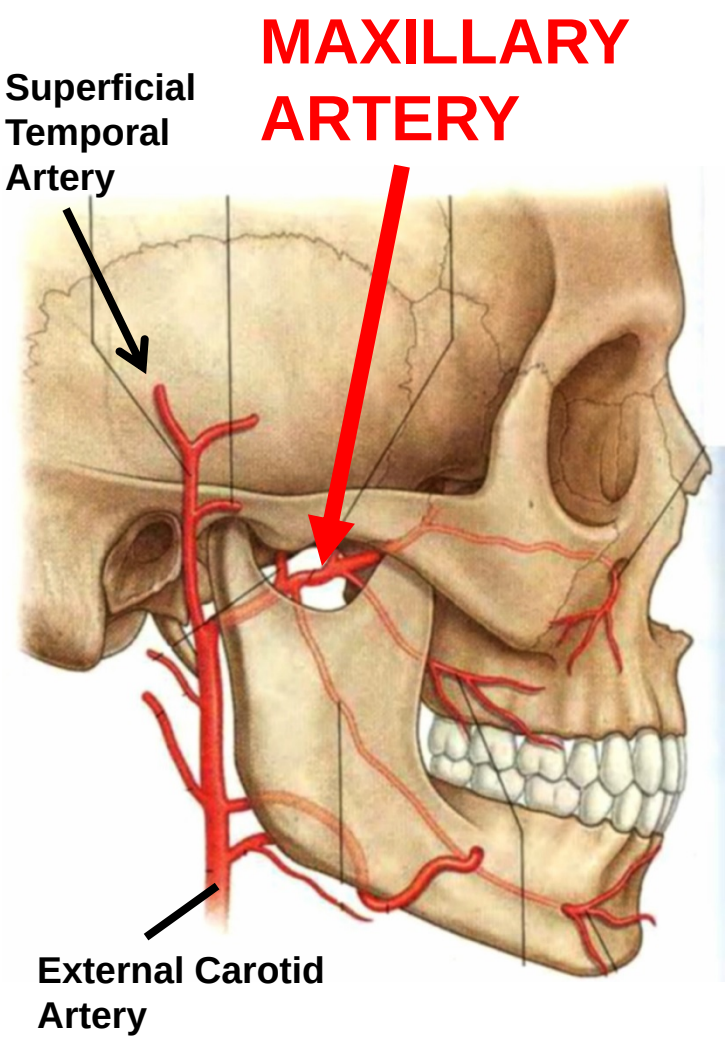
1) Lateral and Medial Pterygoid (inside mandible) pull toward opposite side

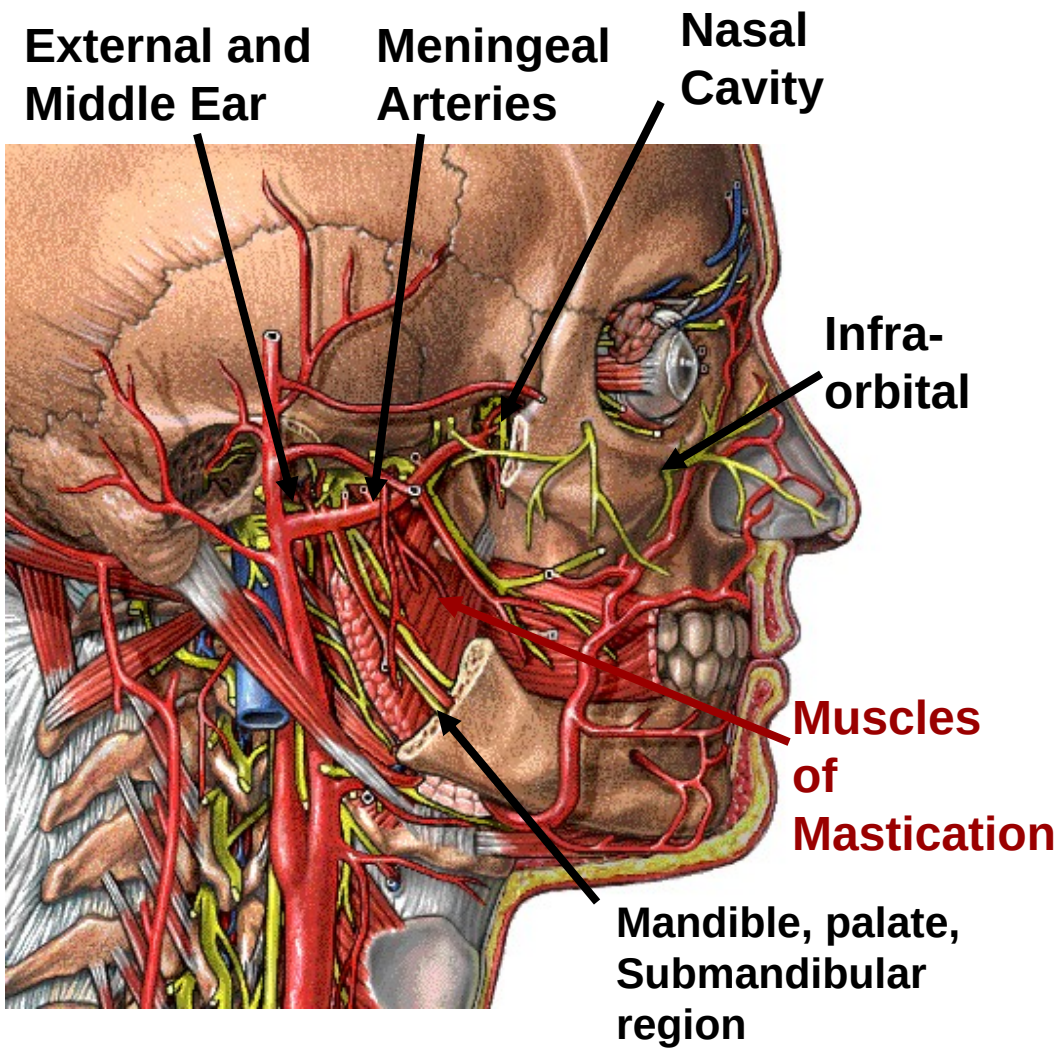
2) Temporalis and Masseter (outside mandible) pull toward same side

**

TRIGEMINAL NERVE DAMAGE (LMN) - Jaw deviates TOWARD paralyzed side (patient opens mouth); unopposed action of Lateral Pterygoid muscle of intact side)

PAROTID; INFRATEMPORAL FOSSA, MAXILLARY ARTERY





CANNOT EFFECTIVELY LIGATE MAXILLARY ARTERY - bleeding (ex. nosebleed = epistaxis) treated by cauterization of branches

MAXILLARY ARTERY

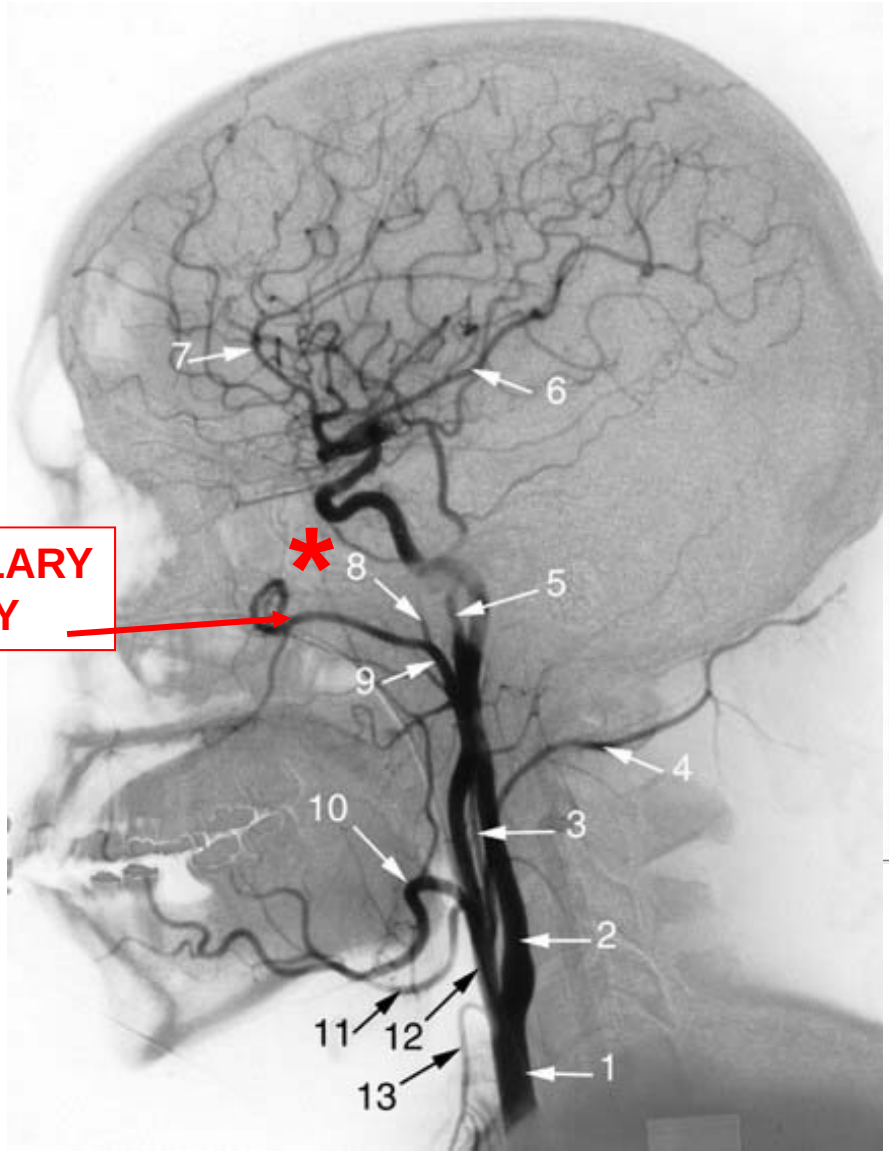
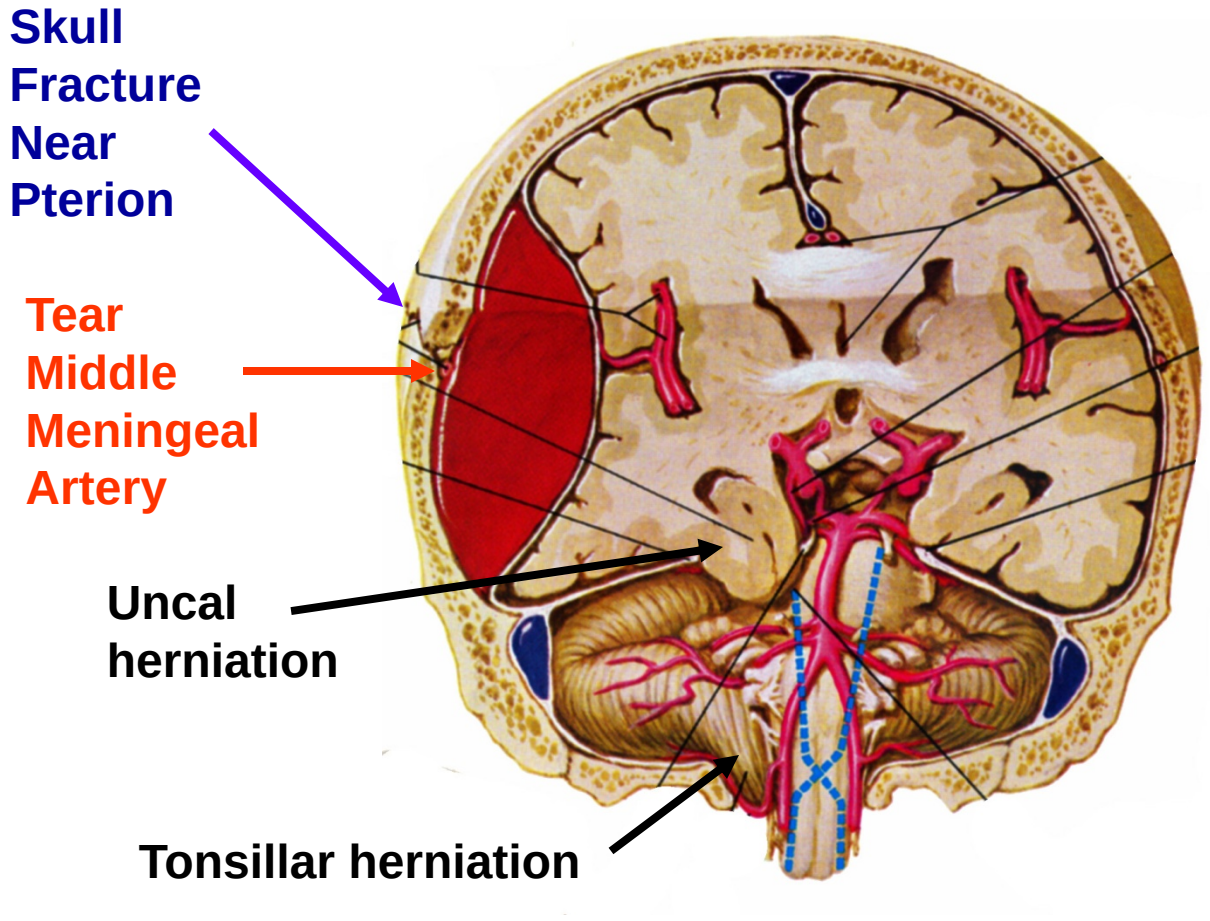


TABLE OF BRANCHES

First part - posterior and medial to neck of mandible		
1. Deep Auricular Artery	External Auditory Meatus	Outer Ear, Tympanic Membrane
2. Anterior Tympanic Artery*	Petrotympanic Fissure	Middle Ear
3. Middle Meningeal Artery*	Foramen Spinosum	Calvarium, Middle Cranial Fossa
(4. Accessory Meningeal A.)*	Forman Ovale	Calvarium, Middle Cranial Fossa
5. Inferior Alveolar Artery*	Mandibular Foramen	Mandibular teeth; branch - Mental A. to chin
Second part - superficial to or within Lateral Pterygoid muscle		
1. Deep Temporal Artery	----------	Temporalis muscle
2. Pterygoid Arteries	----------	Med. and Lat. Pterygoid m.
3. Masseteric Artery	----------	Masseter
4. Buccal Artery	----------	over Buccinator to Cheek
Third part - within Pterygopalatine fossa		
1. Post. Superior Alveolar Artery*	Post. Sup. Alveolar Foramen	Posterior Maxillary Teeth
2. Descending Palatine Artery*	Greater and Lesser Palatine Foramina	Hard and Soft Palate
3. Artery of Pterygoid Canal	Pterygoid Canal	Upper pharynx, Auditory tube
4. Sphenopalatine Artery*	Sphenopalatine Foramen	Nasal Cavity, Palate
5. Infraorbital Artery*	Infraorbital Foramen	Skin below orbit; branches: Anterior Maxillary Teeth

*** - 8- MIDDLE MENINGEAL ARTERY**

DAMAGE MIDDLE MENINGEAL, [ACCESSORY MENINGEAL ARTERIES] - EPIDURAL HEMATOMA



1) Skull fracture near Pterion
2) Tear Middle Meningeal Artery
3) Blood 'peels' dura from bone
4) Lens shaped (biconvex) mass on CT

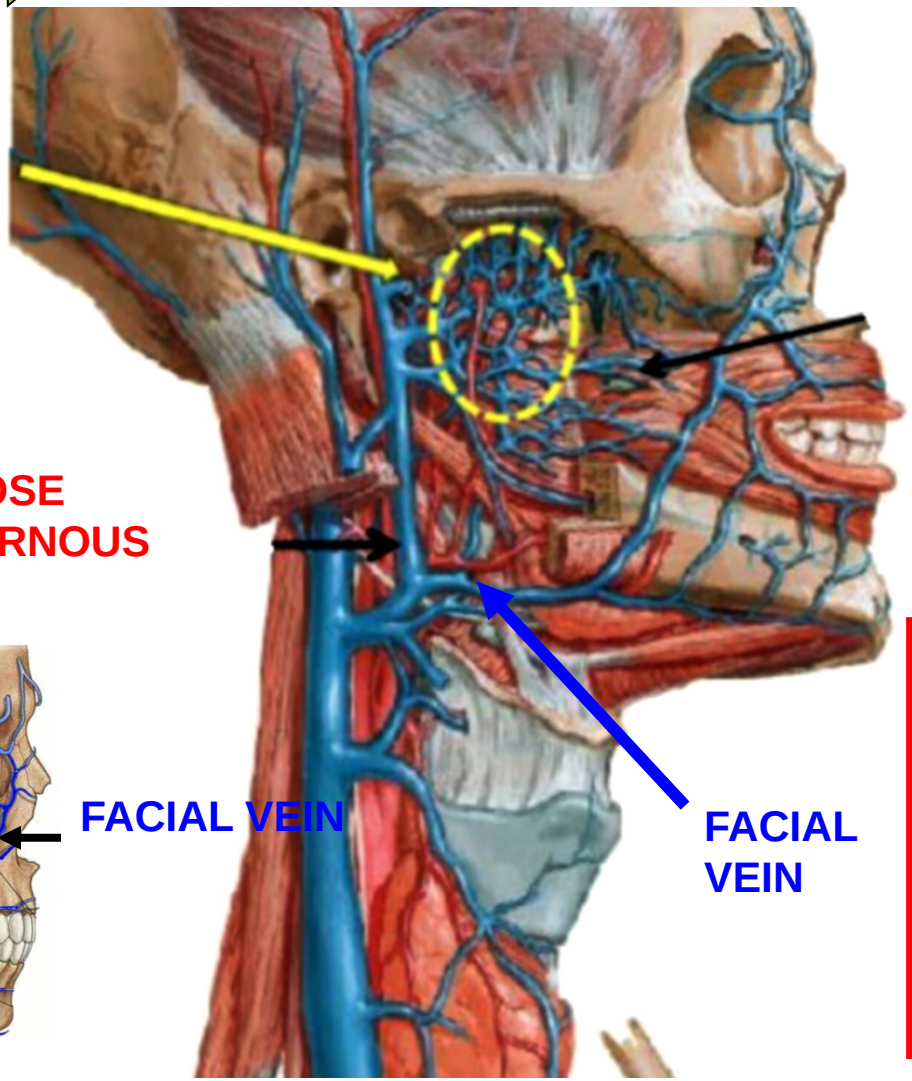
5) mass can displace brain

6) Herniation -
i. Uncal herniation- push Temporal lobe (uncus) through tentorial notch
ii. Tonsillar herniation - push Cerebellum (tonsil) through foramen magnum

Clinical - bleeding is arterial – can be profuse and rapid; - ex, car accident – patient lucid at first - can be fatal within hours if herniation occurs

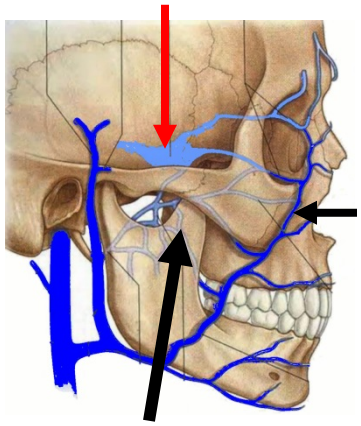
PTERYGOID VENOUS PLEXUS

NOSE



PTERYGOID VENOUS PLEXUS

ANASTOMOSE WITH CAVERNOUS SINUS



FACIAL VEIN

FACIAL VEIN

PTERYGOID VENOUS PLEXUS

1) Branches of Maxillary artery have accompanying veins.

2) Drain to Pterygoid Venous Plexus (Superficial to

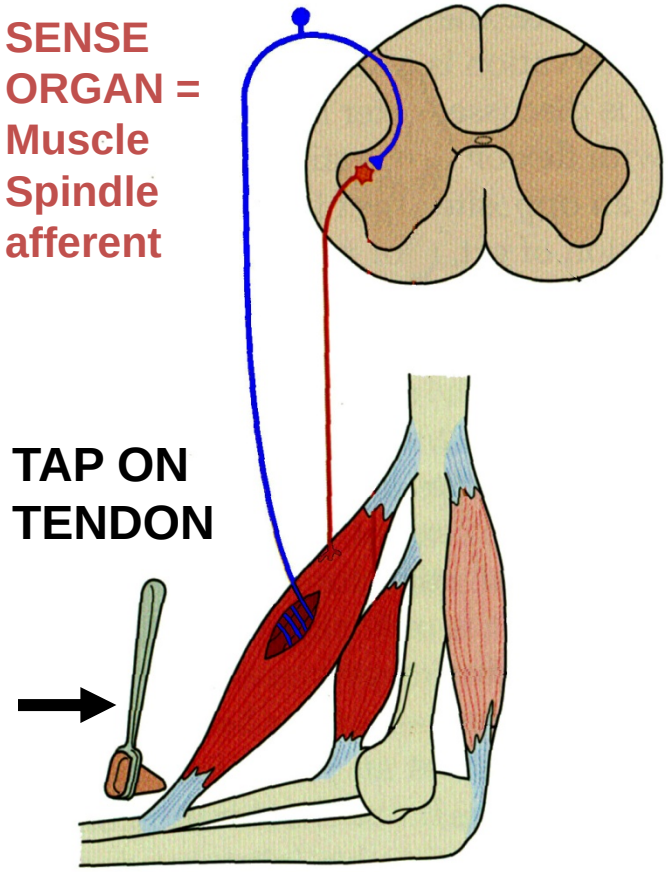
3) ANASTOMOSE WITH CAVERNOUS SINUS AND FACIAL VEIN

*

Clinical Note: Pterygoid venous plexus has anastomoses with veins that drain to Cavernous Sinus; Infections can spread from teeth, nasal cavity, palate, etc. to brain (similar to anastomses of Facial Vein).

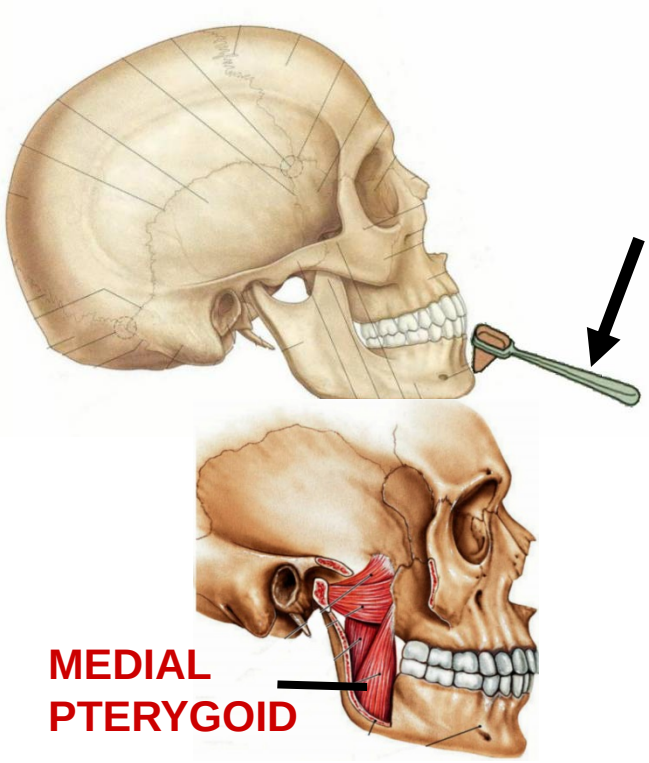
JAW JERK REFLEX = STRETCH REFLEX OF MUSCLES OF MASTICATION - sensory and motor in V3

STRETCH REFLEX IN BICEPS

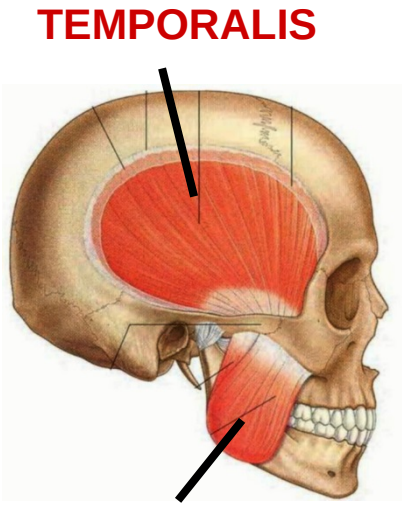


STRETCH REFLEX IN MUSCLES OF MASTICATION

TAP DOWN ON CHIN



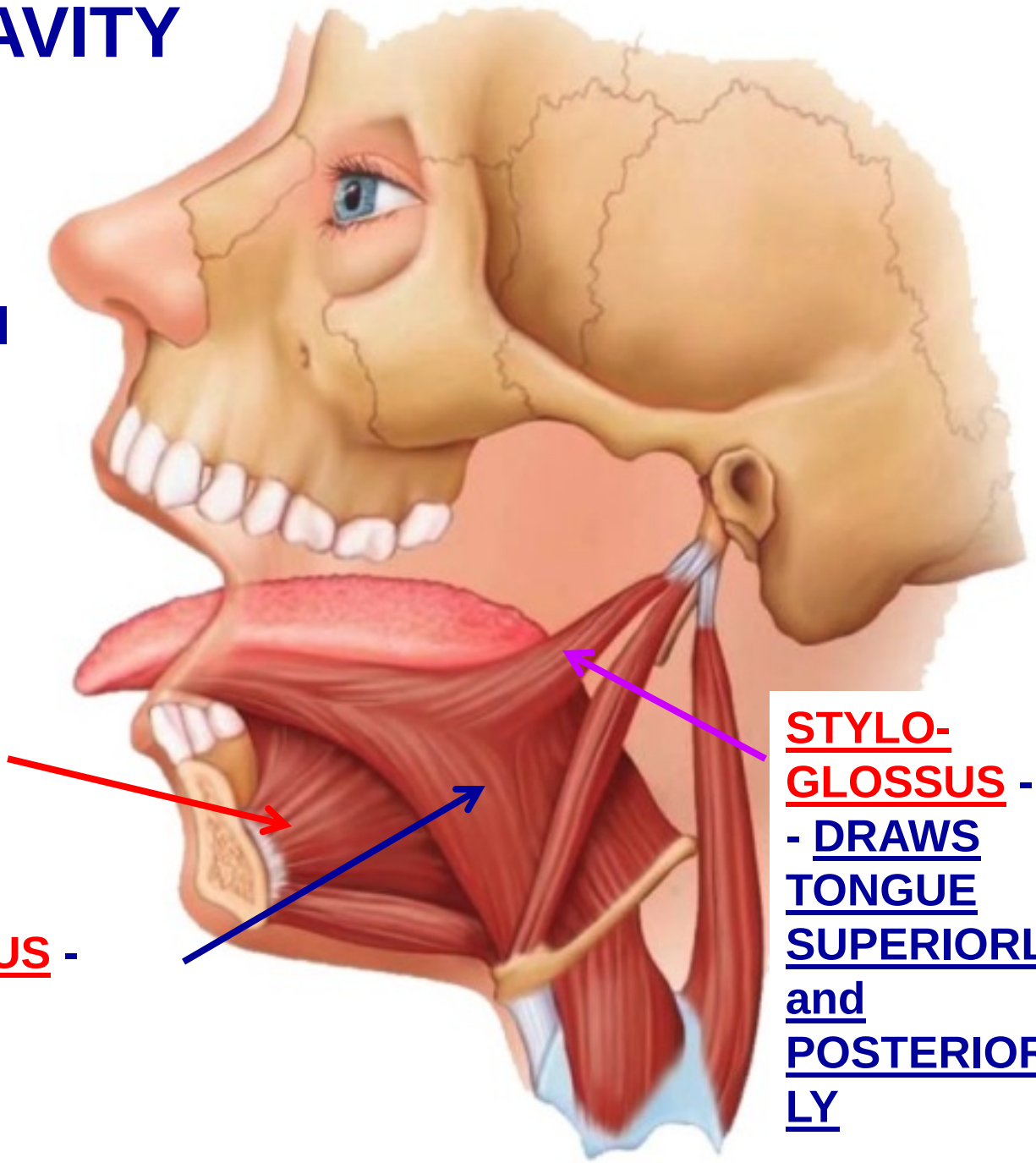
STRETCH MUSCLES THAT CLOSE MOUTH (ELEVATE MANDIBLE)



Hyperreflexia in Jaw Jerk – UMN lesion

ORAL CAVITY

MUSCLES OF TONGUE - all innervated by XII



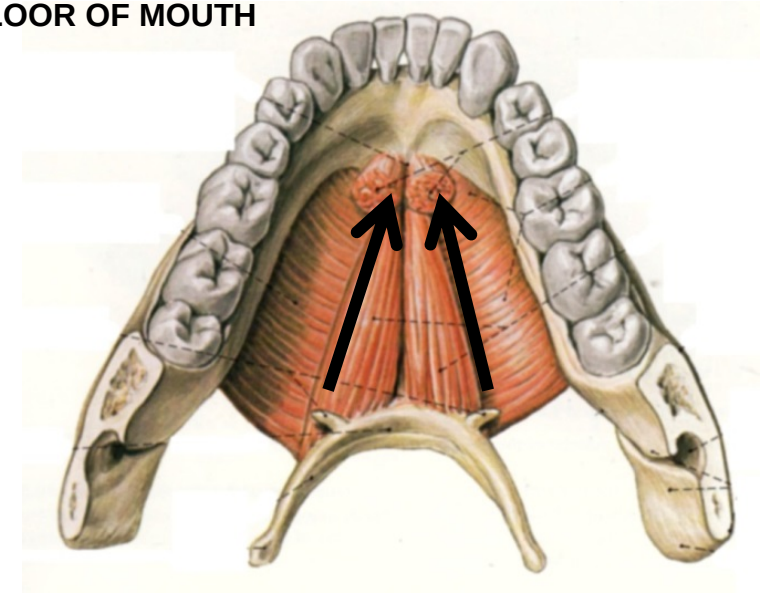
GENIOGLOSSUS - PROTRUDES (STICKS OUT) TONGUE

HYOGLOSSUS - - DEPRESS TONGUE

STYLO-GLOSSUS - - DRAWS TONGUE SUPERIORLY and POSTERIORLY

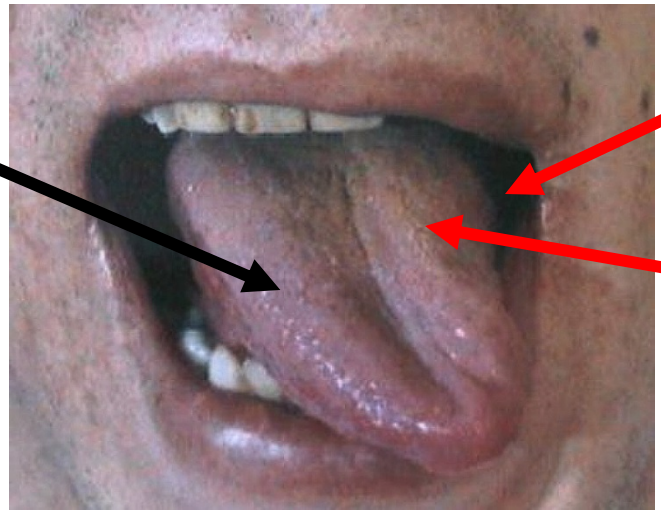
VIEW OF FLOOR OF MOUTH

GENIO-GLOSSUS DIRECTION OF ACTION



CLINICAL SIGN OF DAMAGE TO HYPOGLOSSAL NERVE (XII)

GENIO-GLOSSUS INTACT



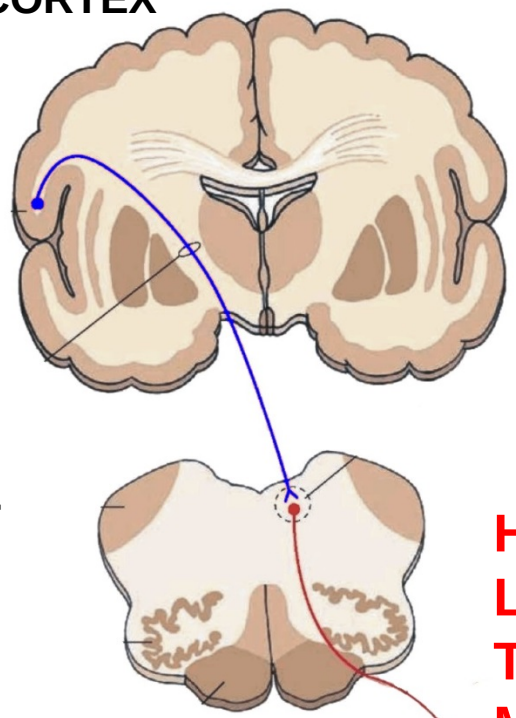
DAMAGE HYPOGLOSSAL NERVE ON ONE SIDE

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 - ONLY CONTRALATERAL

CORTEX



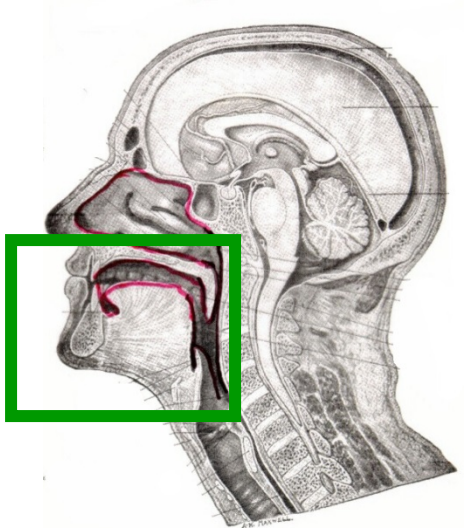
BRAINSTEM - MEDULLA

UPPER MOTOR NEURON – LESIONS OF 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**



SUBMANDIBULAR REGION

NOSE

GENIOGLOSSUS
- mandible-tongue

GENIOHYOID
- mandible-hyoid

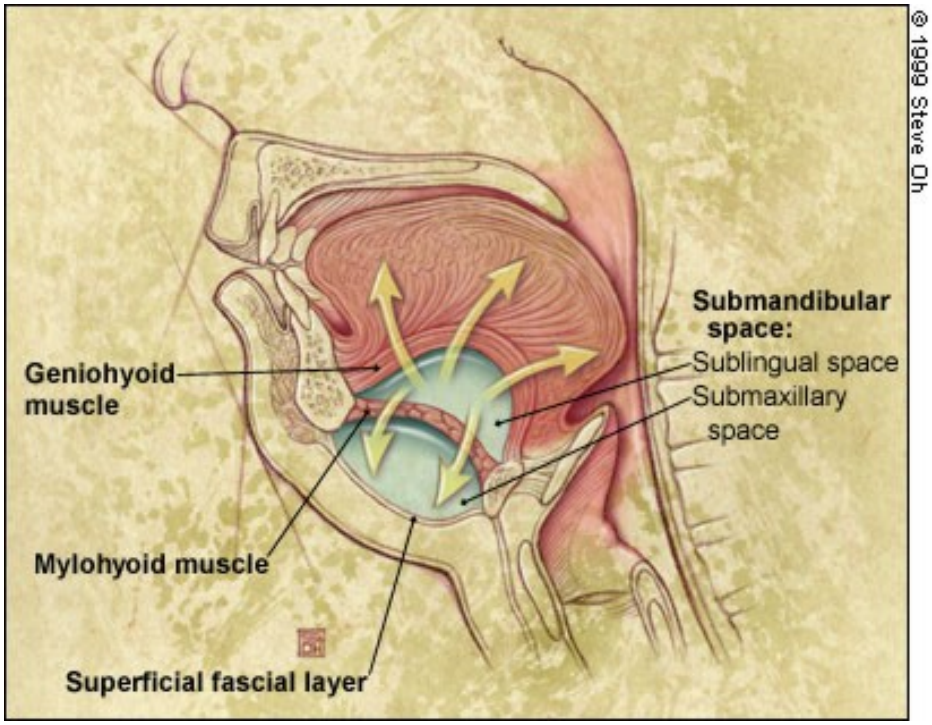
MYLOHYOID
- cut on end

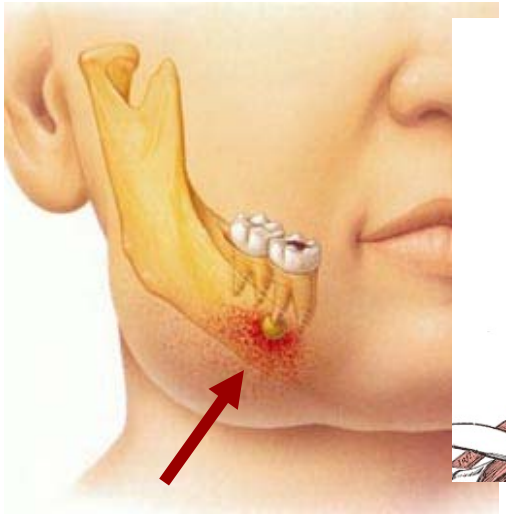
DIGASTRIC

HYOID BONE

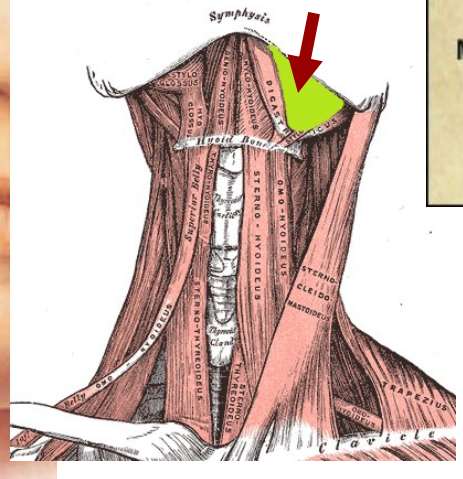
MUSCLES VIEWED ON BISECTED HEAD

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





tooth abscess

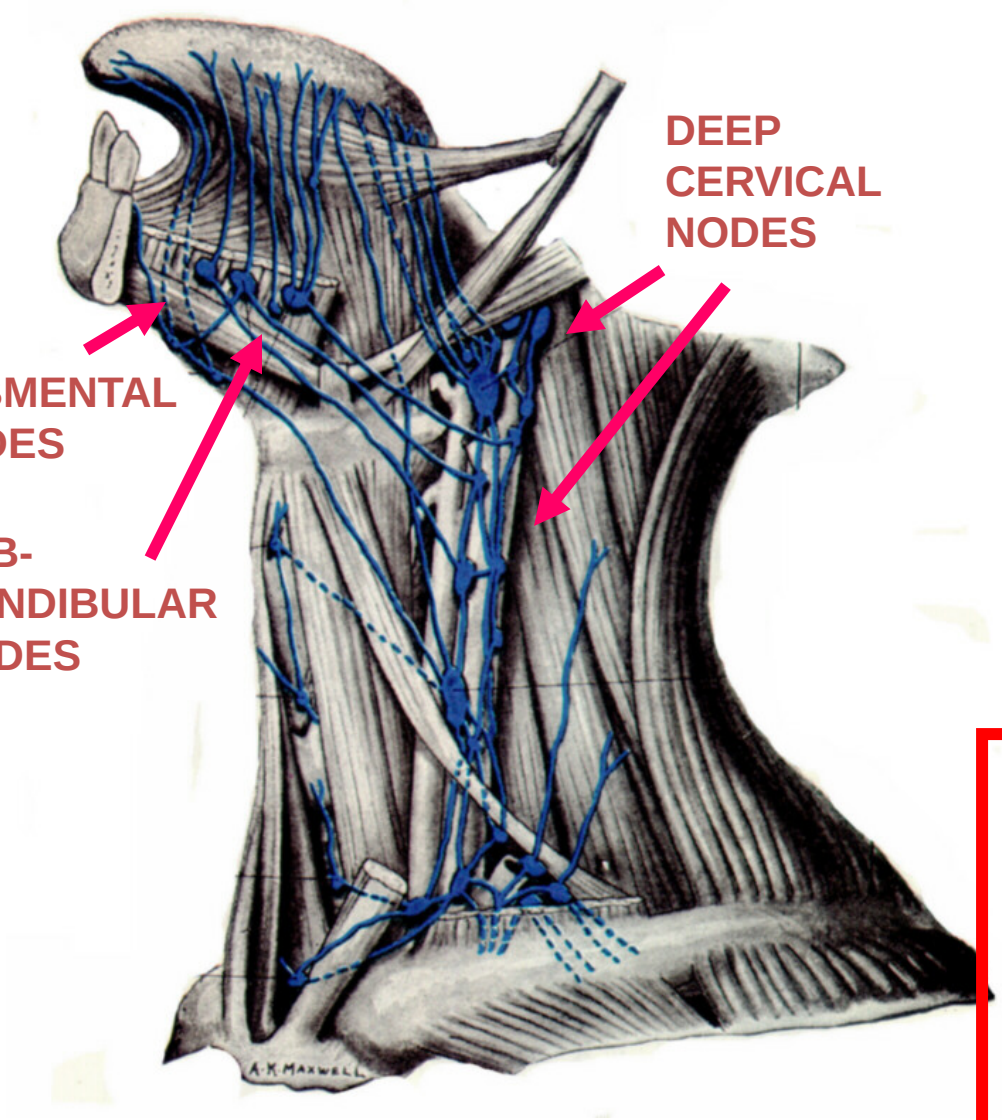


Submandibular Space - in AnteriorTriangle of neck

Infection may obstruct airway, push up tongue

Angina = condition with intense pain: from L. strangling

LYMPHATICS OF TONGUE – CROSS MIDLINE



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 (ex. Cancer) MAY SPREAD TO OPPOSITE SIDE

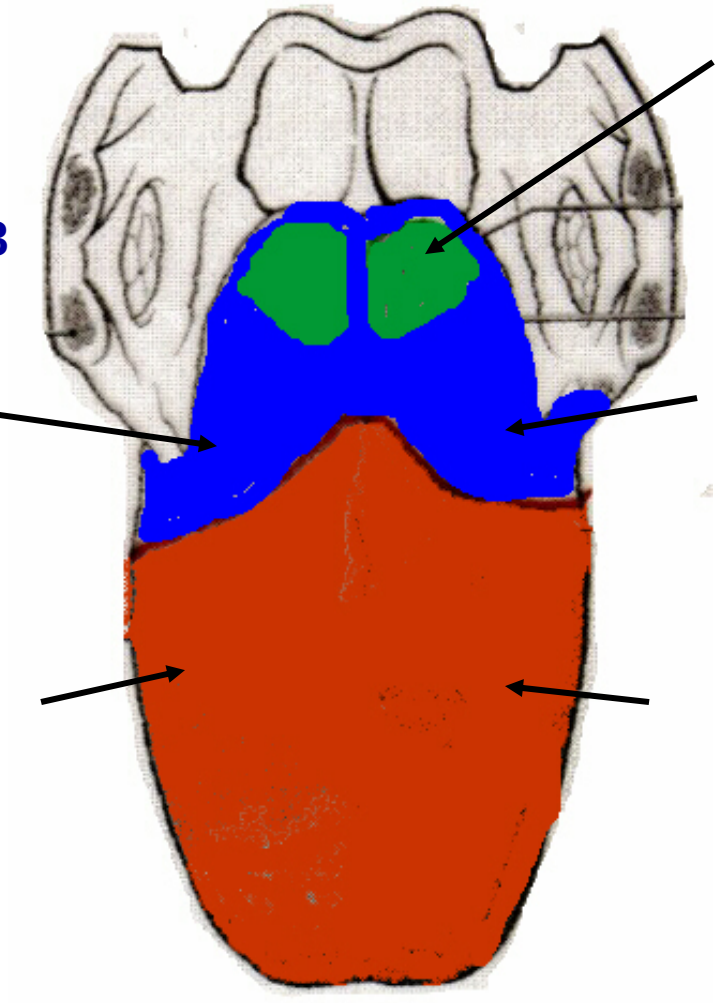
*

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



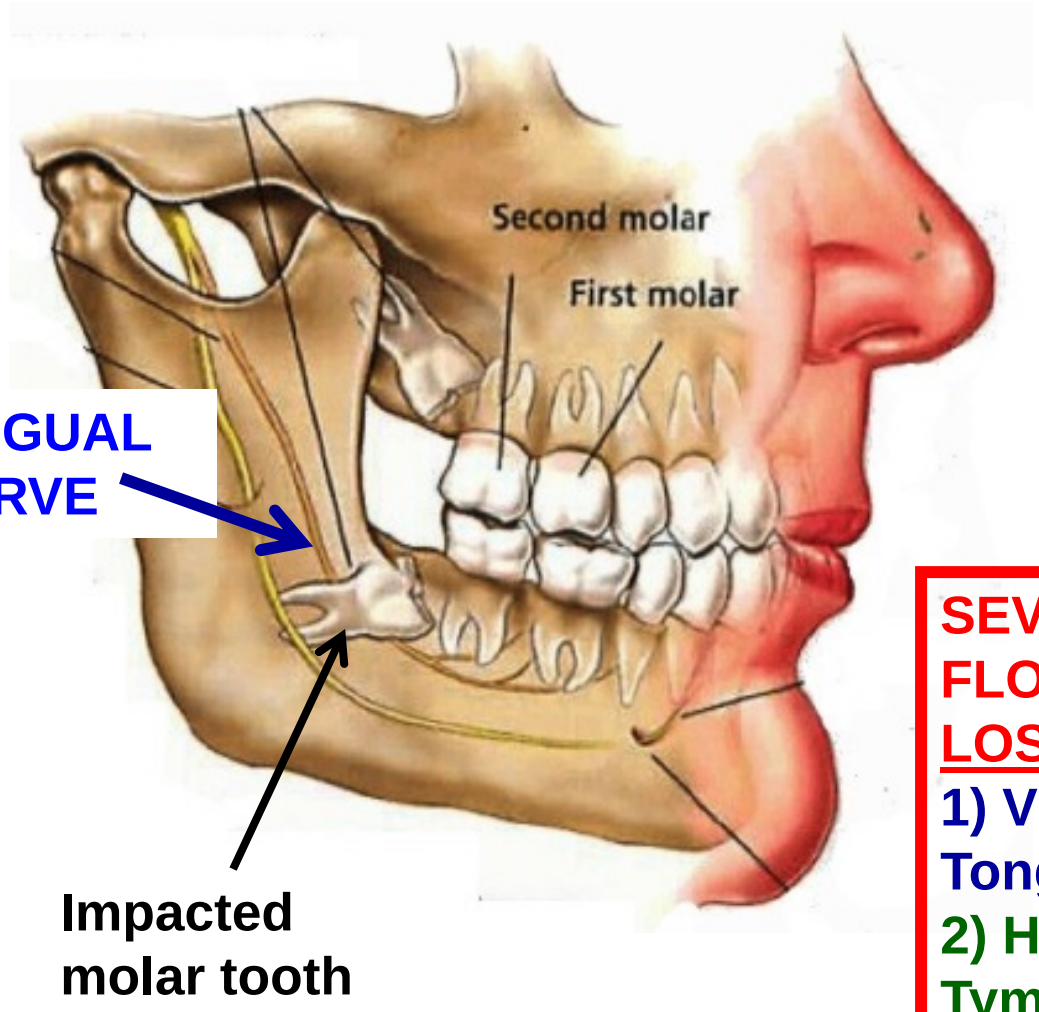
ANT. TO EPIGLOTTIS -
1) X- VAGUS- VISCERAL SENSORY TOUCH AND TASTE

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)

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



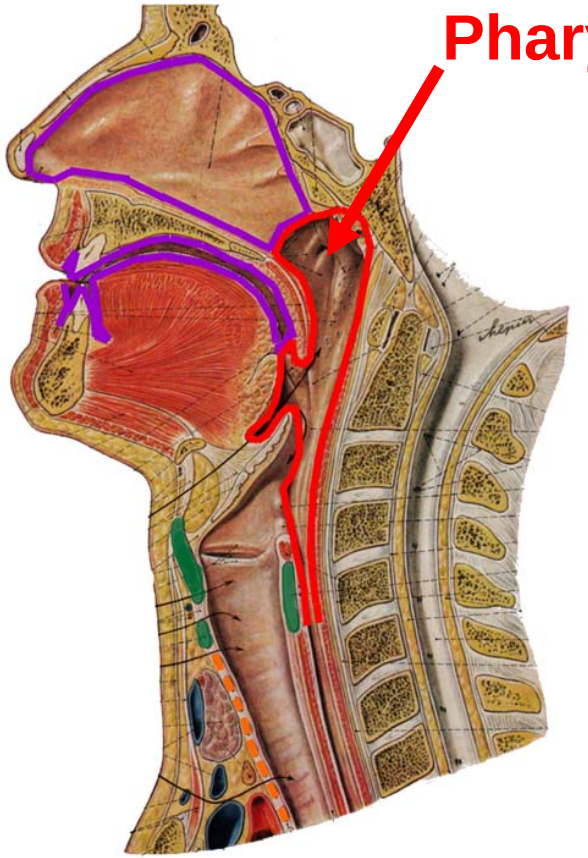
- Lingual nerve courses below mucosa in floor of mouth
- Can readily be damaged during dental extraction of impacted molar tooth
- Also damaged in children: ex. fall with glass pop bottle in mouth

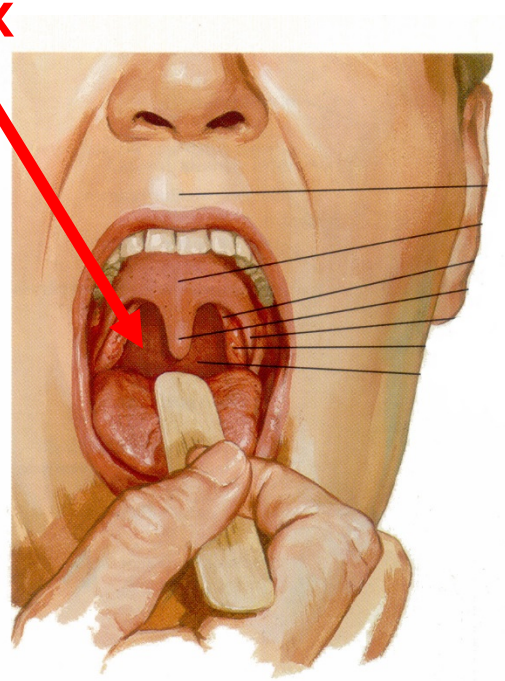
SEVERING LINGUAL NERVE IN FLOOR OF MOUTH - LOSE TOUCH AND TASTE:

1) V - General sensation to Ant. Tongue AND

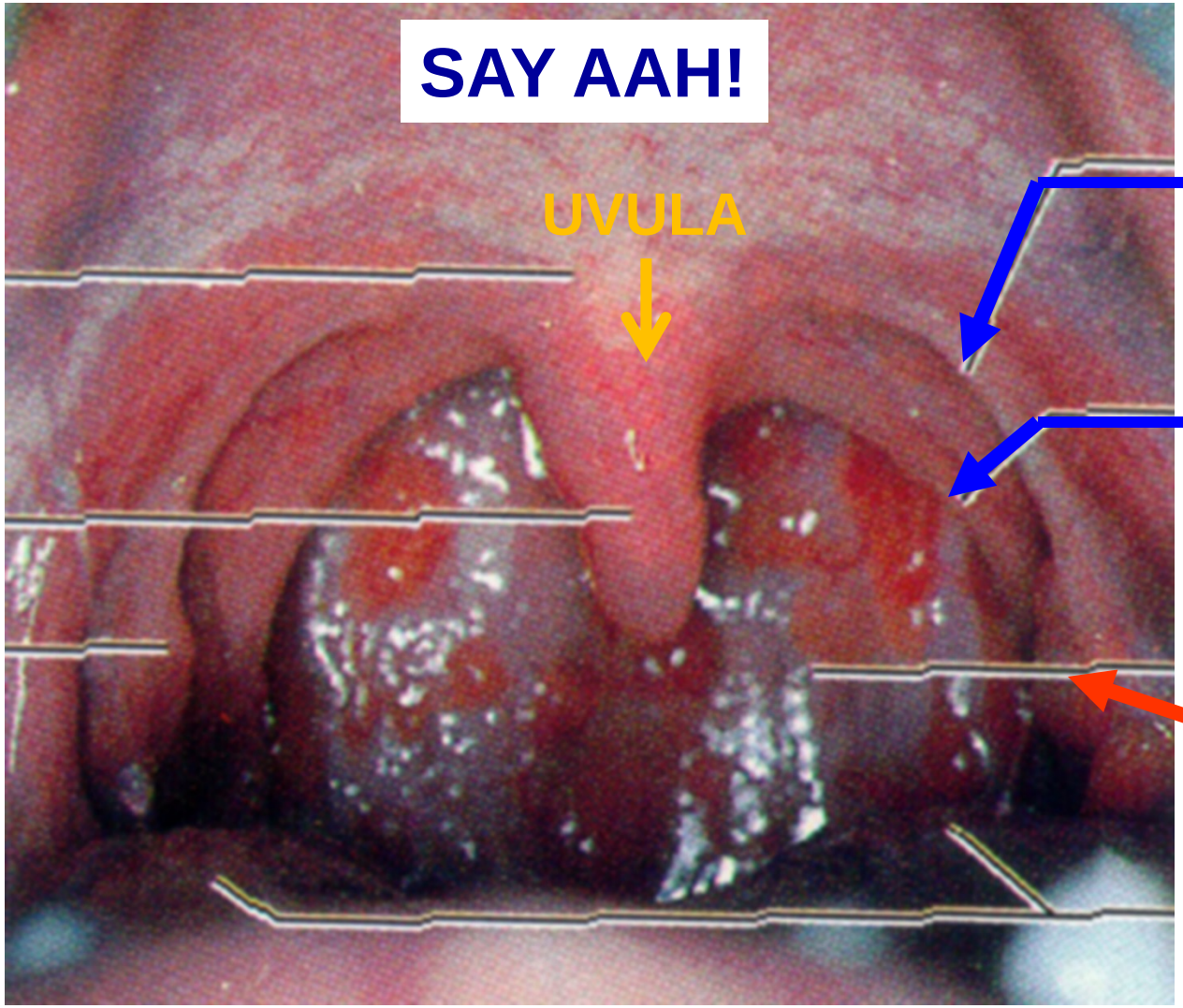
2) Hitchhiking VII – (Chorda Tympani Taste fibers to Anterior Tongue **

PHARYNX





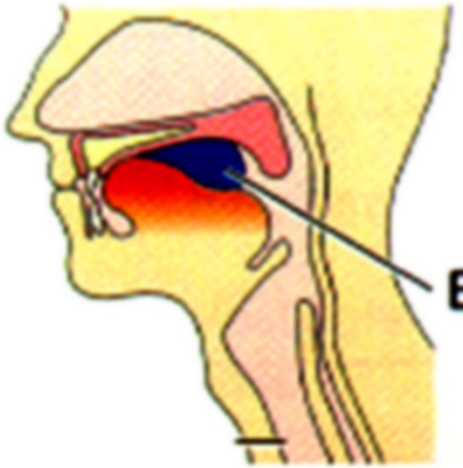
SAY
AAHH!



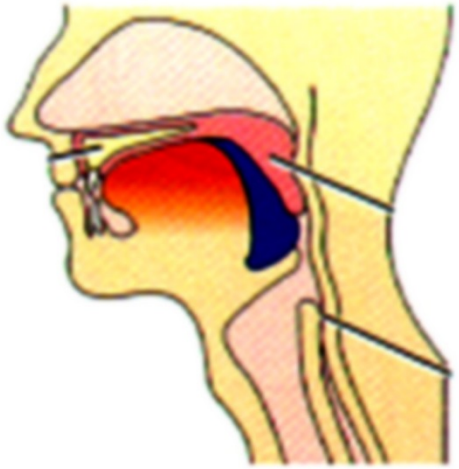
CLINICAL - PALATOGLOSSAL ARCH = SITE OF THE OROPHARYNGEAL MEMBRANE = BOUNDARY BETWEEN ORAL CAVITY (PRECISE SOMATIC SENSORY) AND PHARYNX (IMPRECISE VISCERAL SENSORY)

OVERVIEW OF SWALLOWING

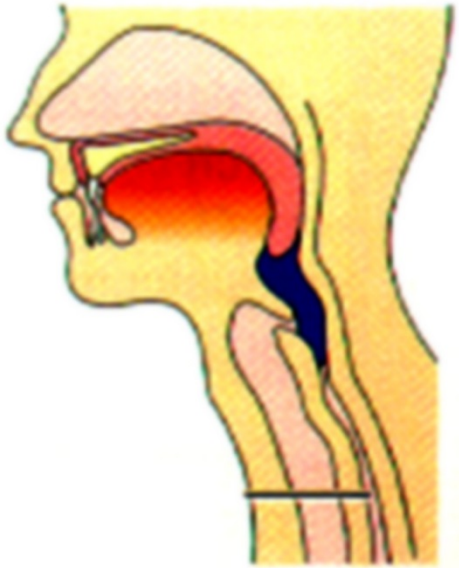
PHARYNX ACTS TO PROPEL FOOD IN SWALLOWING



Voluntary phase

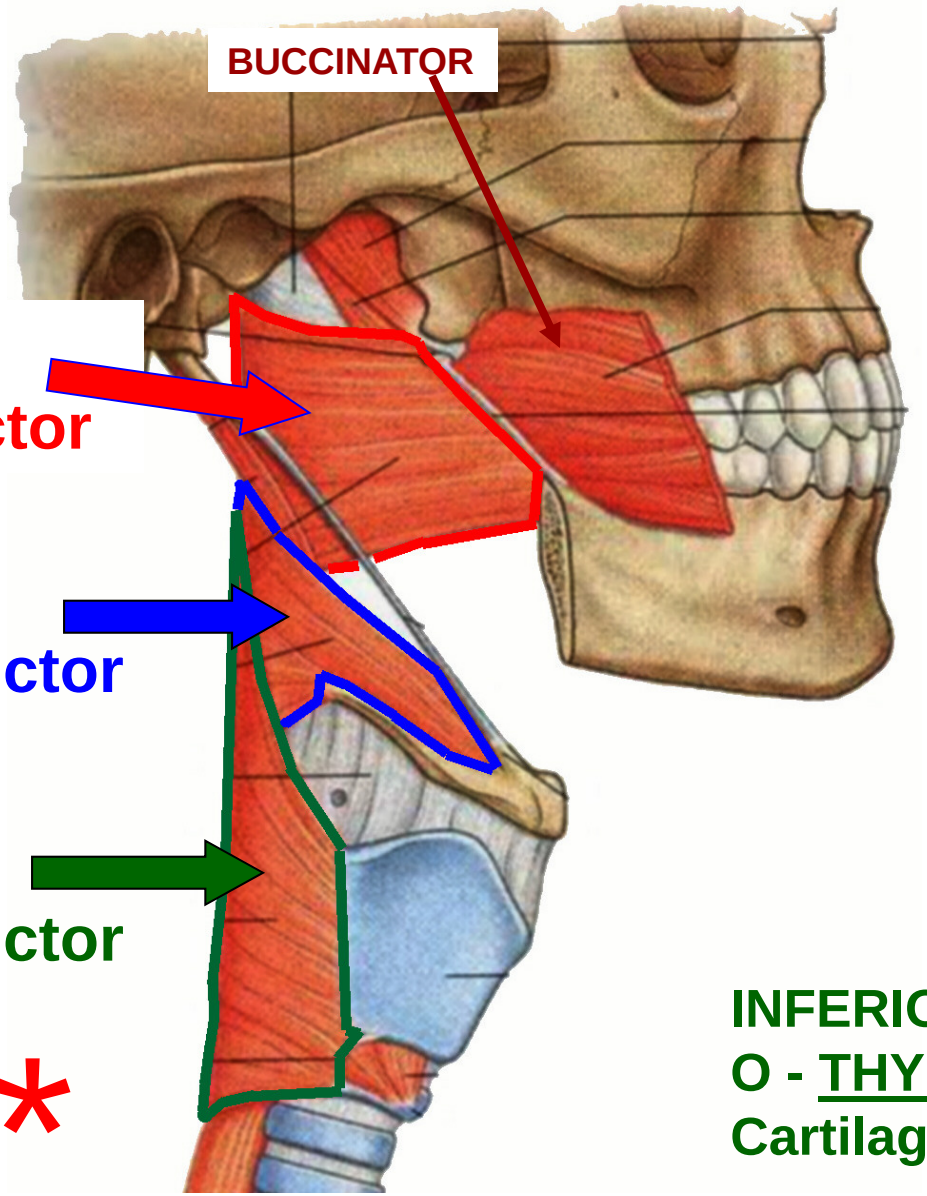


Involuntary phase 1



Involuntary phases 2,3 = Constrictor Muscles of pharynx propel food down to esophagus

PHARYNX CONSTRICTOR MUSCLES – ALL CN X



Superior Constrictor

Middle Constrictor

Inferior Constrictor

***

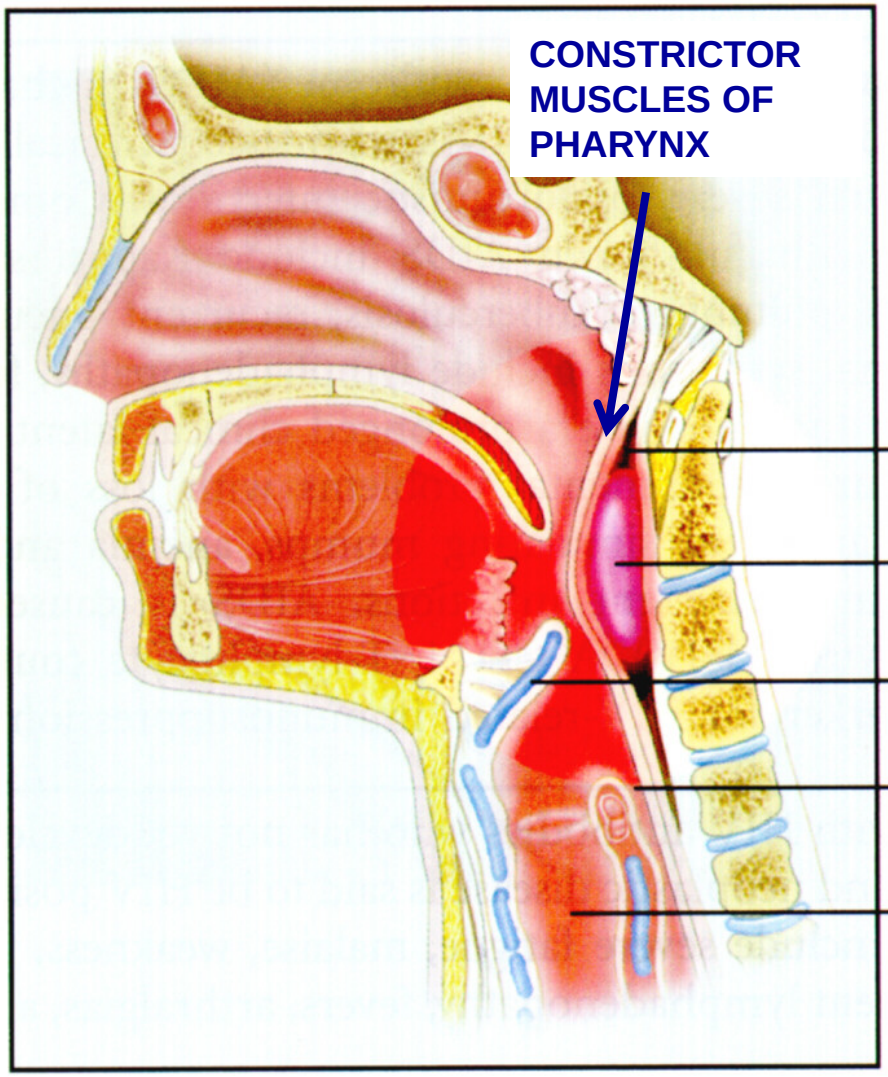
SUPERIOR CONSTRICTOR *

CONTINUOUS ANT. WITH BUCCINATOR)

MIDDLE CONSTRICTOR
O - HYOID

INFERIOR CONSTRICTOR
O - THYROID & CRICOID Cartilage

RETROPHARYNGEAL ABSCESS

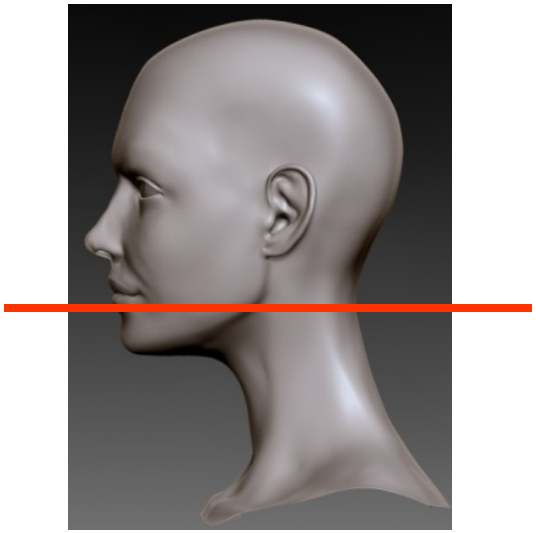


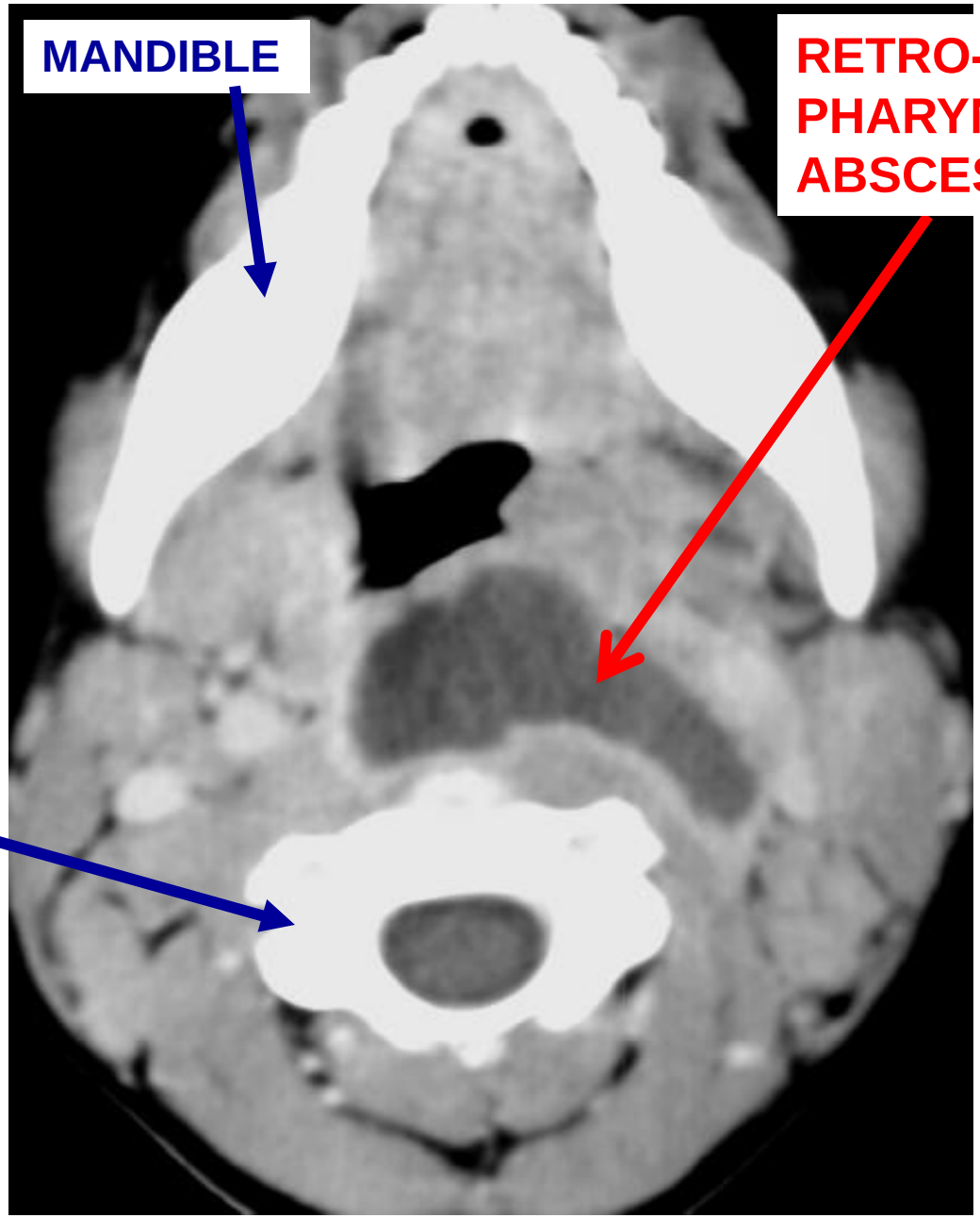
Retropharyngeal space – potential space between pharynx (" pretracheal " fascial layer) and vertebrae ("prevertebral ") layer of fascia

Infection in retropharyngeal space can spread unimpeded to mediastinum (MIDDLE OF THORACIC CAVITY)

**

Note: George Washington may have died from this



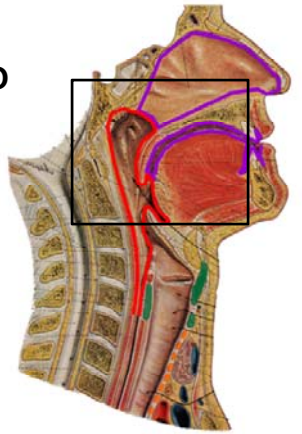


POST. COMPARTMENT -

. <u>Posterior Compartment -</u>
Vertebrae and muscles which support and move head & neck

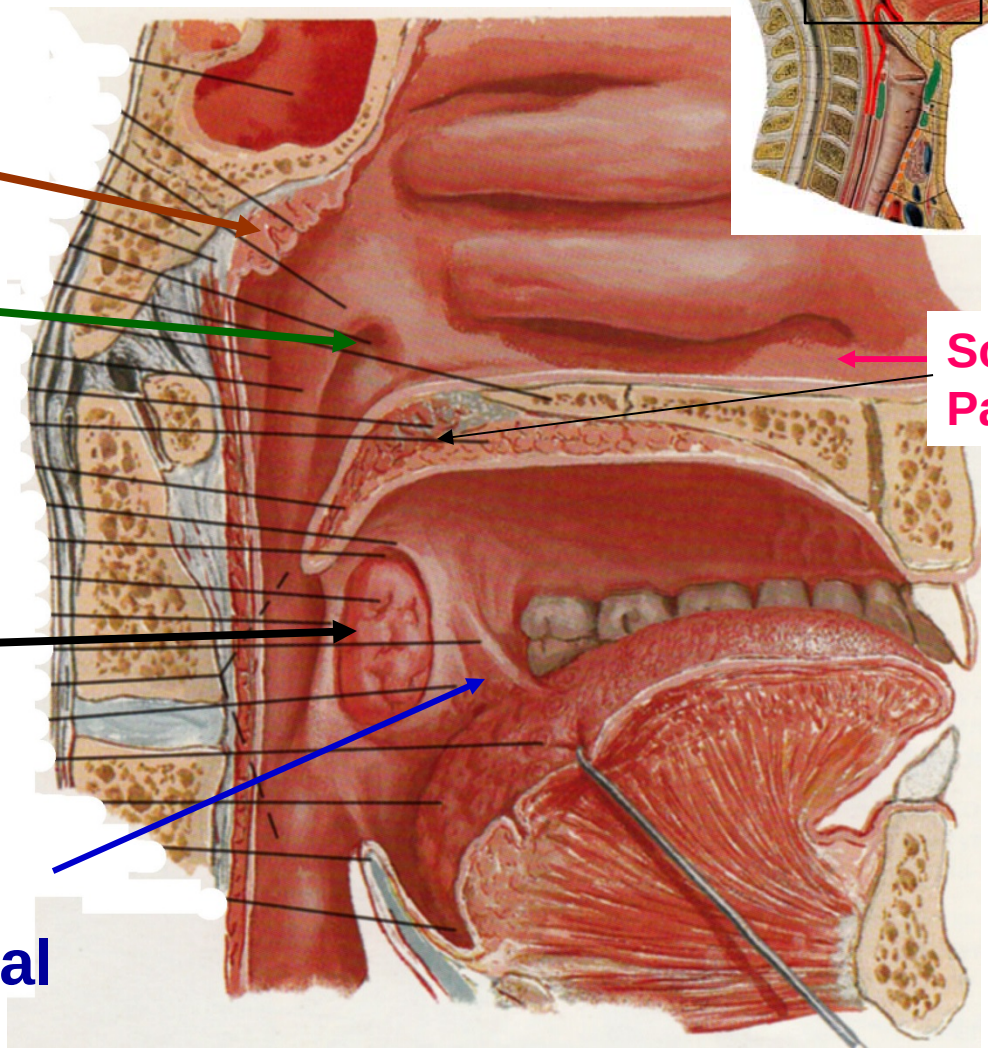
STRUCTURES IN PHARYNX

ORIENT TO PALATE



in Nasopharynx
- Pharyngeal Tonsil (Adenoids)
- opening of Auditory Tube (Torus tubarius
- overlies opening)

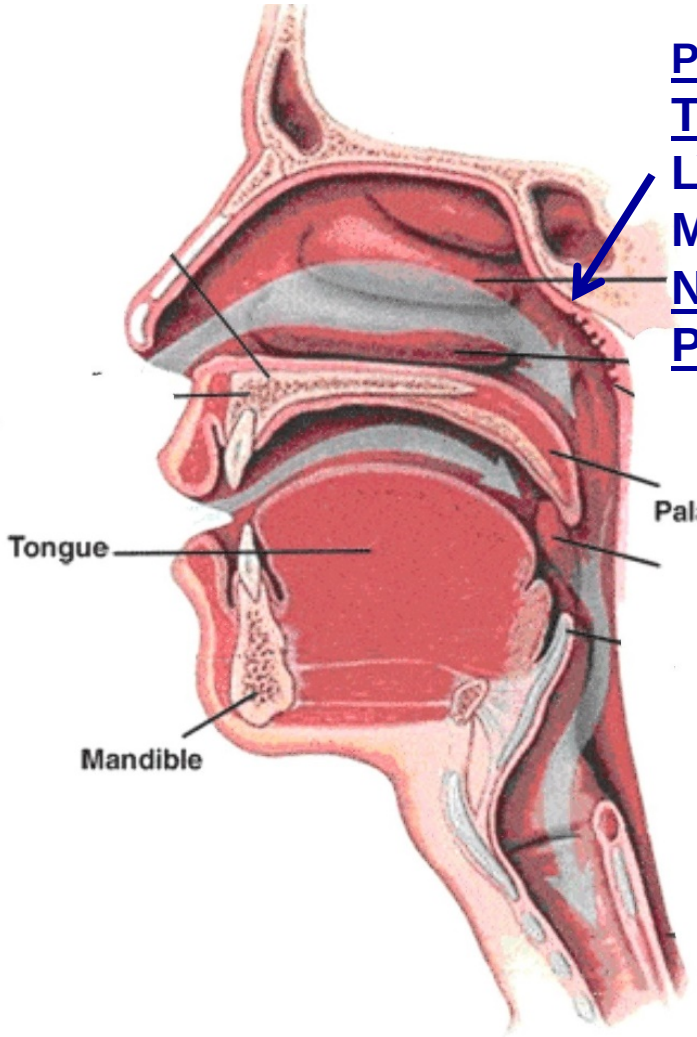
in Oropharynx
- Palatine Tonsils (Tonsillitis)
posterior to Palatoglossal Arch (boundary between Oral Cavity and Oropharynx)



Soft Palate

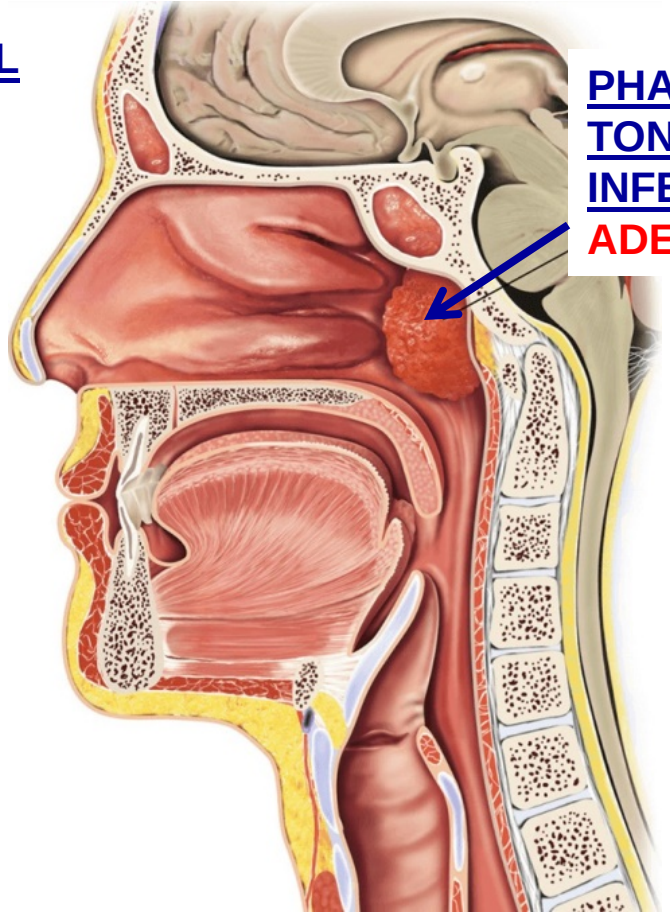
–**TORUS** - donut shape

PHARYNGEAL TONSIL – INFECTION IS ADENOIDS



PHARYNGEAL TONSIL – LYMPHOID MASS IN NASO-PHARYNX

PALATINE TONSIL – LYMPHOID MASS IN ORO-PHARYNX
INFECTED = TONSILLITIS



PHARYNGEAL TONSIL INFECTED = ADENOIDS

ADENOIDS CAN BLOCK PASSAGE OF AIR THROUGH NASAL CAVITY – SYMPTOM: NASAL VOICE

‘POCKETS’ IN PHARYNX

in Oropharynx
- Valleculae = depressions (2) Between Med., Lat. Glossoepiglottic Folds; Food/objects Lodge in Valleculae

Clinical: **Valleculae = Popcorn 1**

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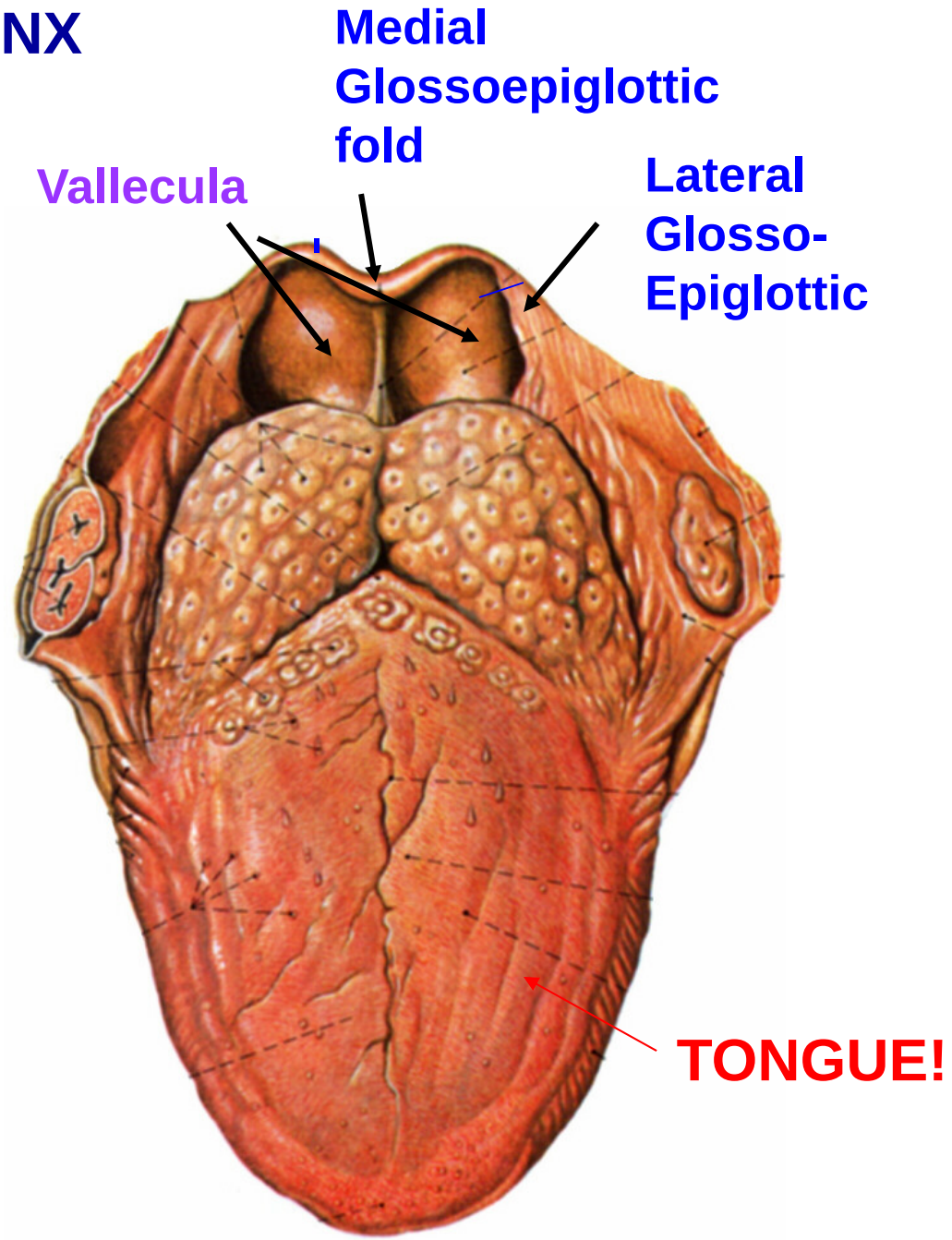
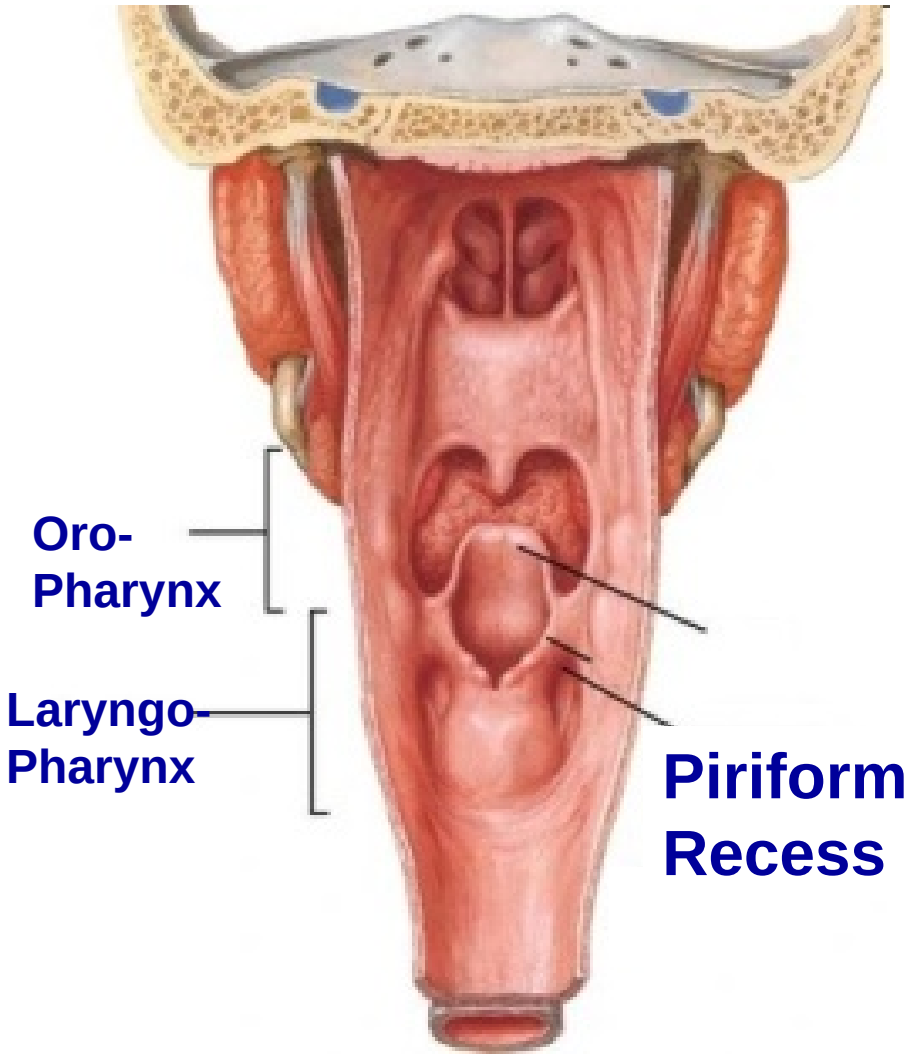
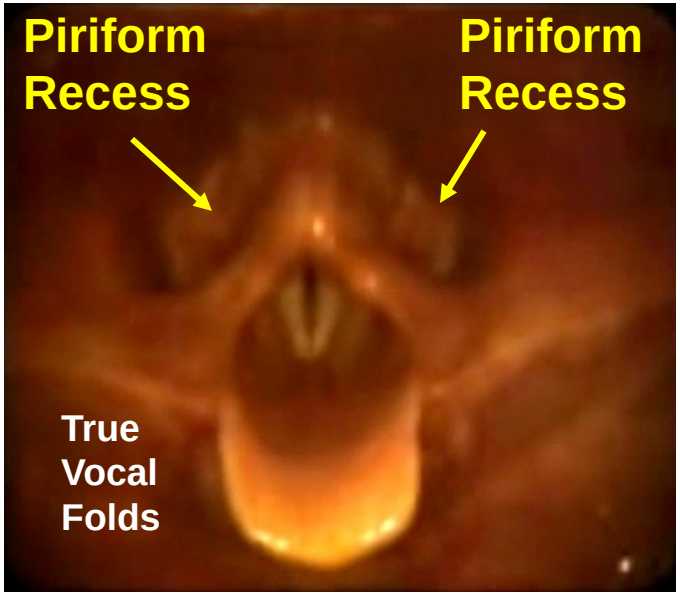


‘POCKETS’ IN PHARYNX



Piriform Recesses - in Laryngo-Pharynx- lateral to inlet of Larynx



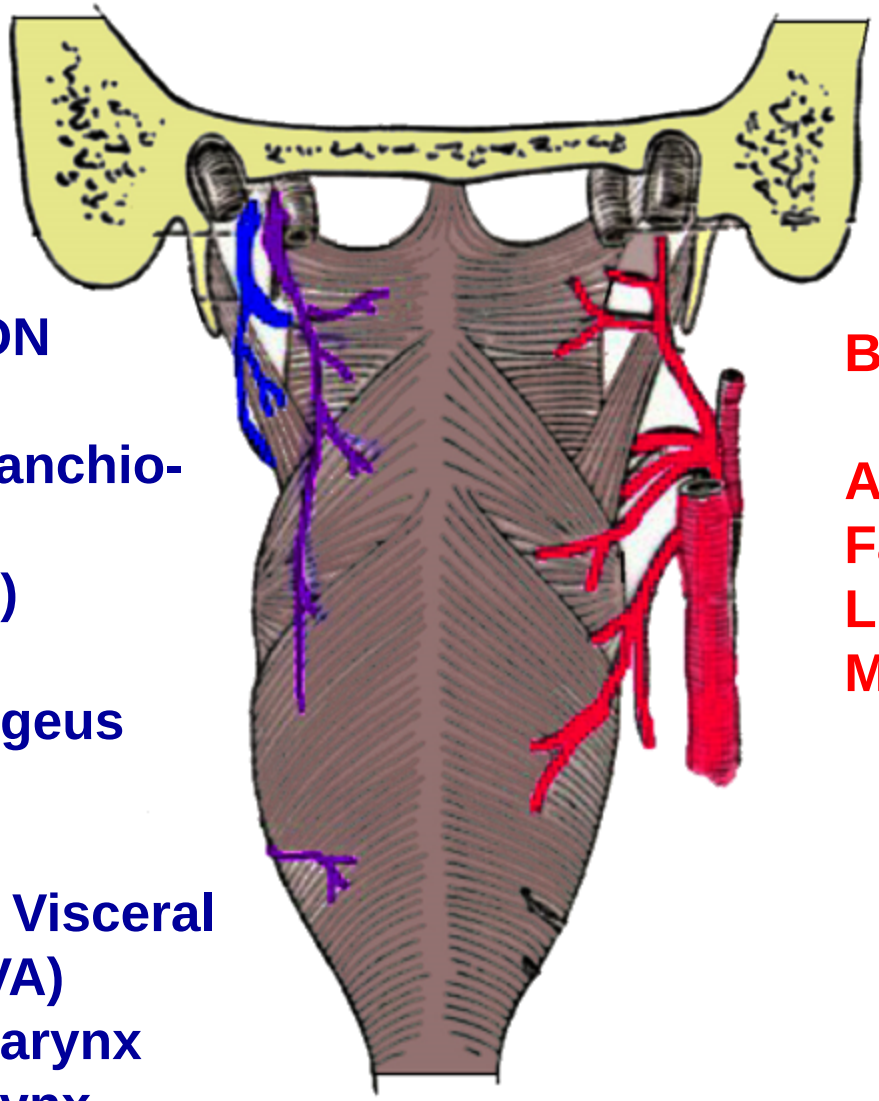
Clinical: **Piriform Recess = Popcorn 2 – food lodge in Laryngo-Pharynx**

POPCORN QUESTIONS - Food stuck when trying to swallow - not localize because innervation is Visceral Sensory

POPCORN 1) Posterior tongue - food caught in Valleculae between Medial and Lateral Glossoepiglottic folds

POPCORN 2) 'Throat'- food caught in Piriform recesses, lateral to opening of larynx

PHARYNX: INNERVATION, BLOOD SUPPLY



INNERVATION

1) Motor- Branchio-motor (SVE)
All Vagus (X) except Stylopharyngeus (IX)

2) Sensory - Visceral Sensory (GVA)
VII - Nasopharynx
IX - Oropharynx
X - Laryngopharynx

Blood Supply Arteries

Ascending Pharyngeal
Facial
Lingual
Maxillary

DISCUSSION SESSION: GROSS ANATOMY

ONN BLOCK

Discuss Larynx, Ear

LARYNX

Actions muscles of Larynx
- Change pitch of sound
- Open close airway

Anaphylactic shock – block airway; open by Cricothyrotomy

Damage to nerves to Larynx - Recurrent Laryngeal nerve

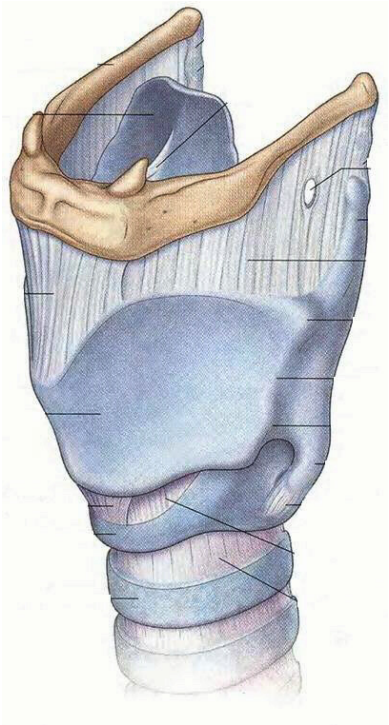
LARYNX

Billie Holliday – Greatest Jazz Singer of All Time

LARYNX IS SOUND GENERATOR - SOUNDS ARE EXTENSIVELY MODIFIED IN SPEECH AND SINGING BY RESONANCE OF PHARYNX, NASAL CAVITY, ORAL CAVITY

LARYNX REGULATES AIR FLOW TO RESPIRATORY SYSTEM - MUSCLES OF LARYNX OPEN AIRWAY FOR DEEP BREATHING; MUSCLE CAN CLOSE AIRWAY, ALLOWING FOR INCREASE IN PRESSURE IN ABDOMINAL AND PELVIC CAVITIES (EX. CHILDBIRTH, DEFECATION, ETC.)

LARYNX CONSISTS OF CARTILAGES (WITH JOINTS) MOVED BY SKELETAL MUSCLES



THYROID CARTILAGE

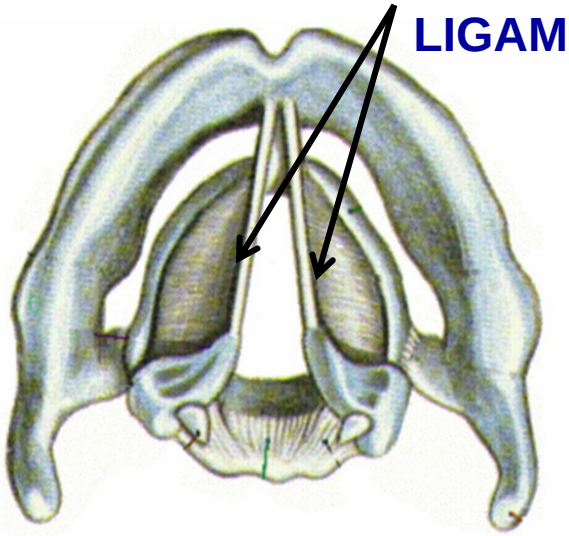
ARYTENOID CARTILAGES

CRICOID CARTILAGE

View with Thyroid Cartilage Removed

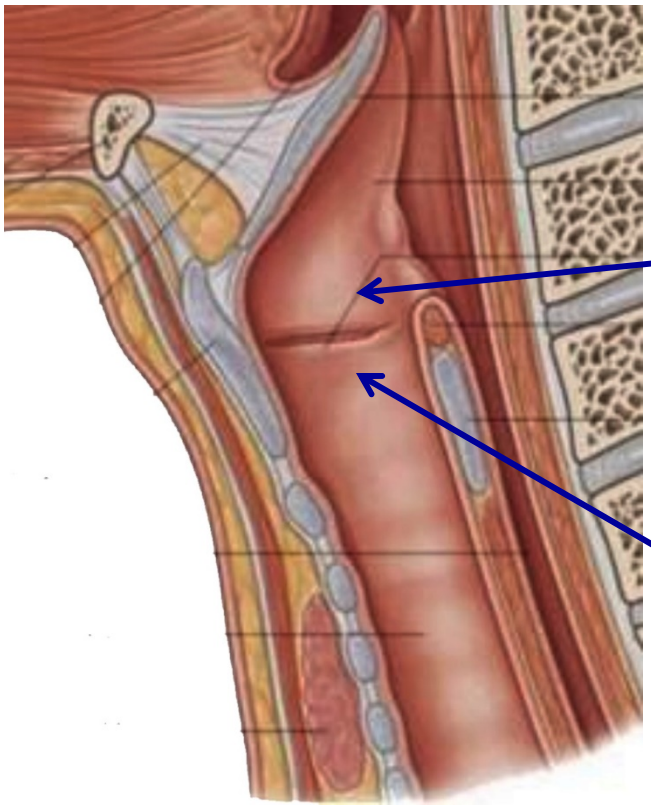
SOUND IS PRODUCED BY FORCING AIR THROUGH VIBRATING INTERNAL LIGAMENTS (VOCAL LIGAMENTS (extend from Thyroid to Arytenoid Cartilages)

VOCAL LIGAMENTS



Vocal ligaments act like lips of a trumpet player

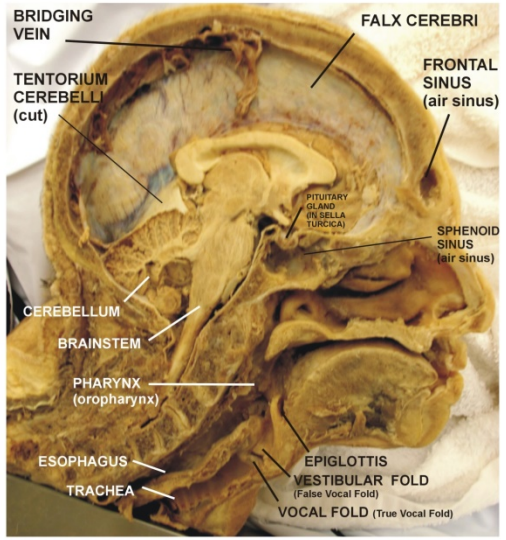
INTERNAL VIEW OF LARYNX



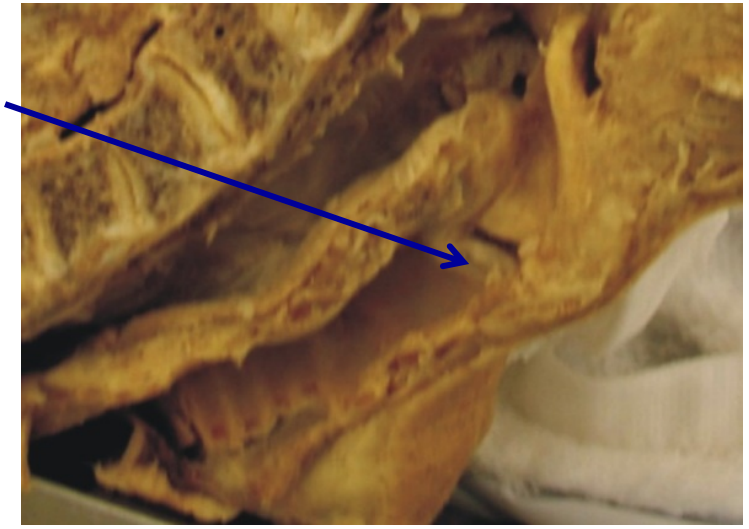
VESTIBULAR (FALSE VOCAL) FOLDS - overlie vestibular ligaments

VOCAL (TRUE VOCAL) FOLDS - overlie vocal ligaments

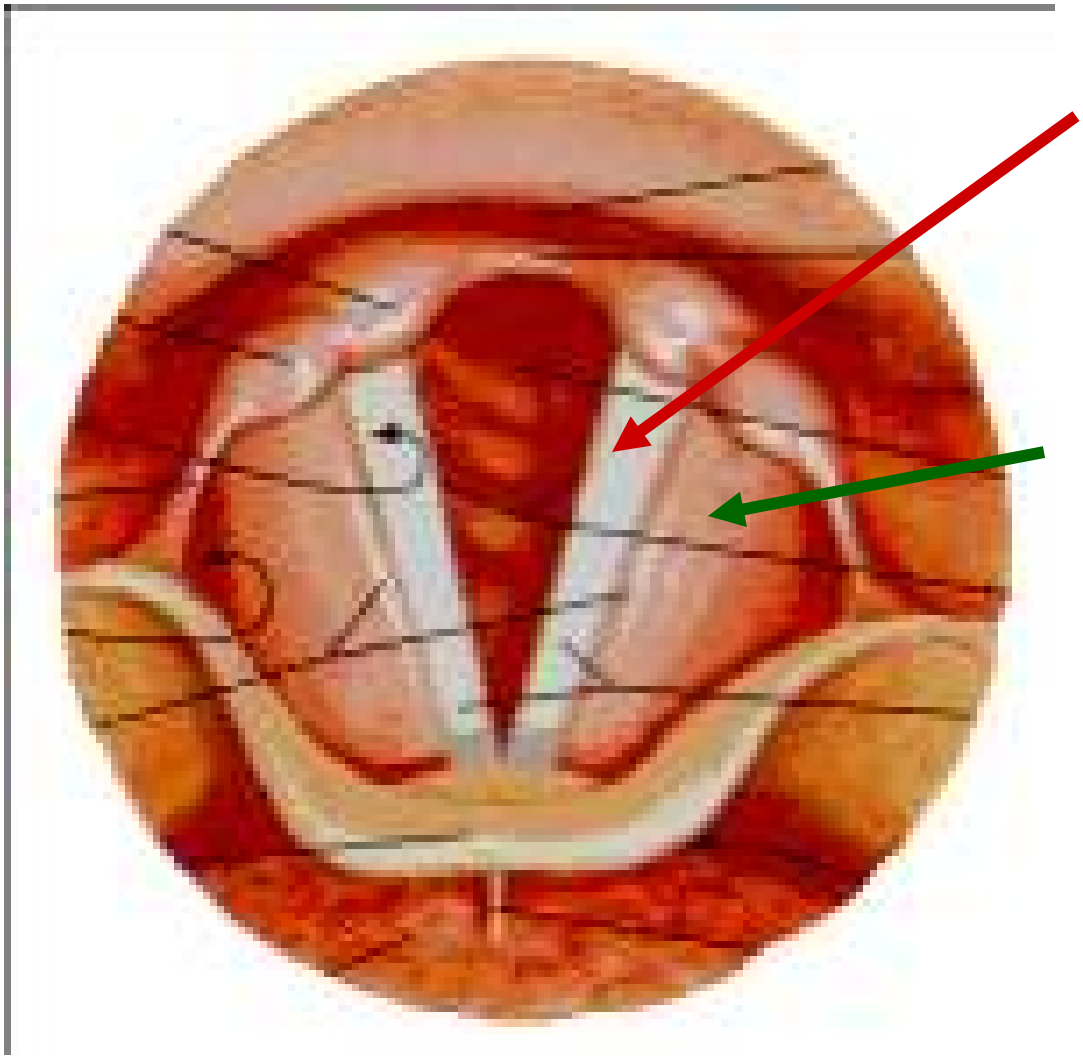
BISECTED HEAD WITH INTACT FALX CEREBRI 75



Note: Bridging Vein - cut when brain removed but still attached and entering Sup. Sagittal Sinus



LARYNGOSCOPE VIEW OF LARYNX



TRUE VOCAL FOLDS - overlie vocal ligaments

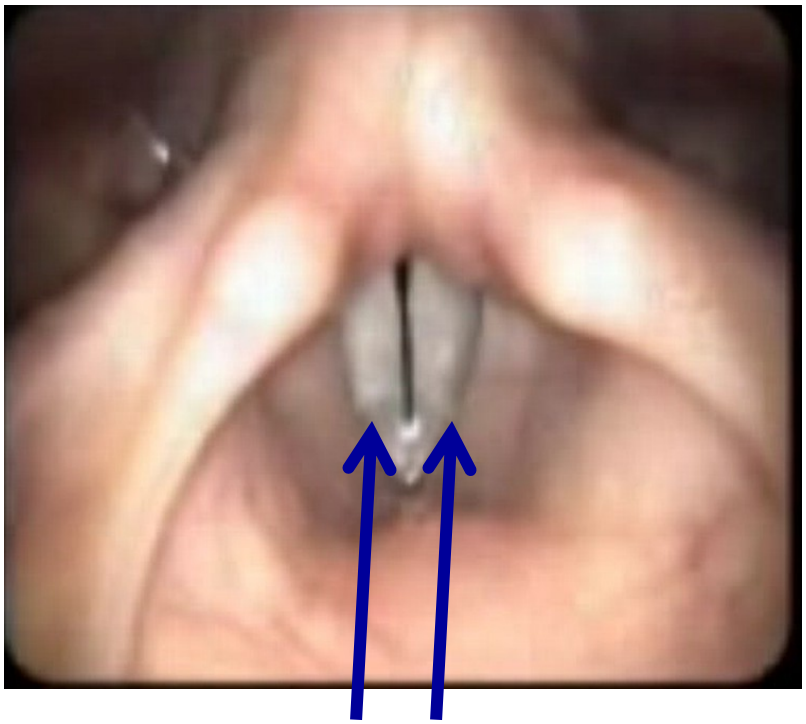
FALSE VOCAL FOLDS - overlie vestibular ligaments

LARYNGOSCOPE VIEW OF LARYNX

DEEP BREATHING

TRUE VOCAL FOLDS SPREAD APART – OPEN LARYNX

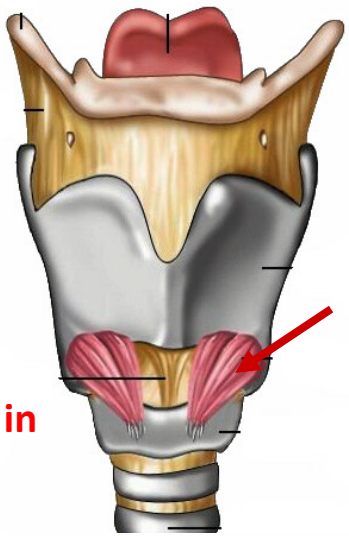
PRODUCE SOUND



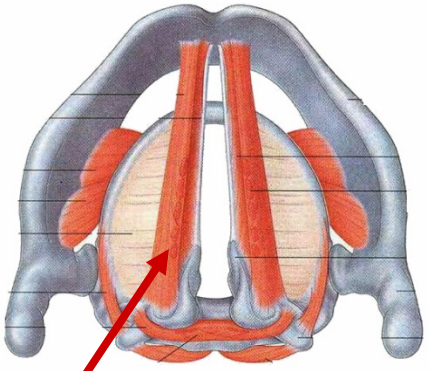
TRUE VOCAL FOLDS BROUGHT TOGETHER – VIBRATE AND PRODUCE SOUND

MUSCLES OF LARYNX: RAISE/LOWER PITCH

ADAM'S APPLE - longer vocal folds in males

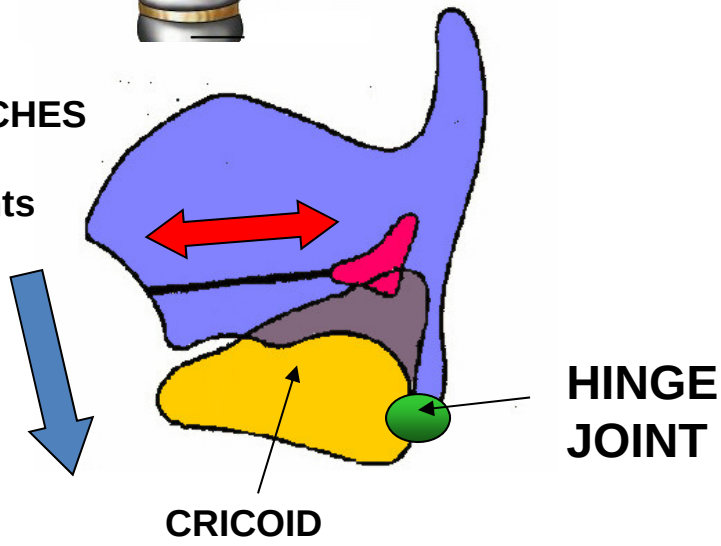


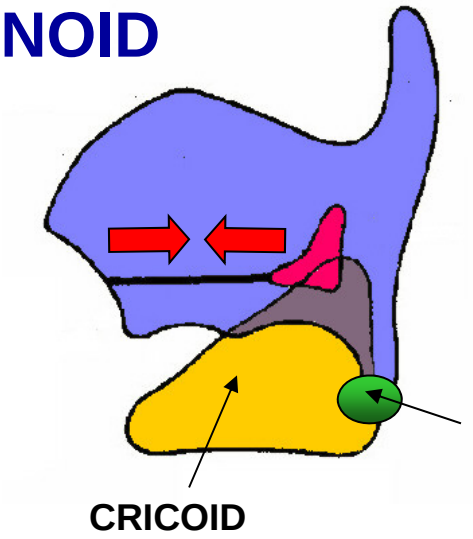
CRICO-THYROID



THYRO-ARYTENOID

Tilting - STRETCHES vocal ligaments



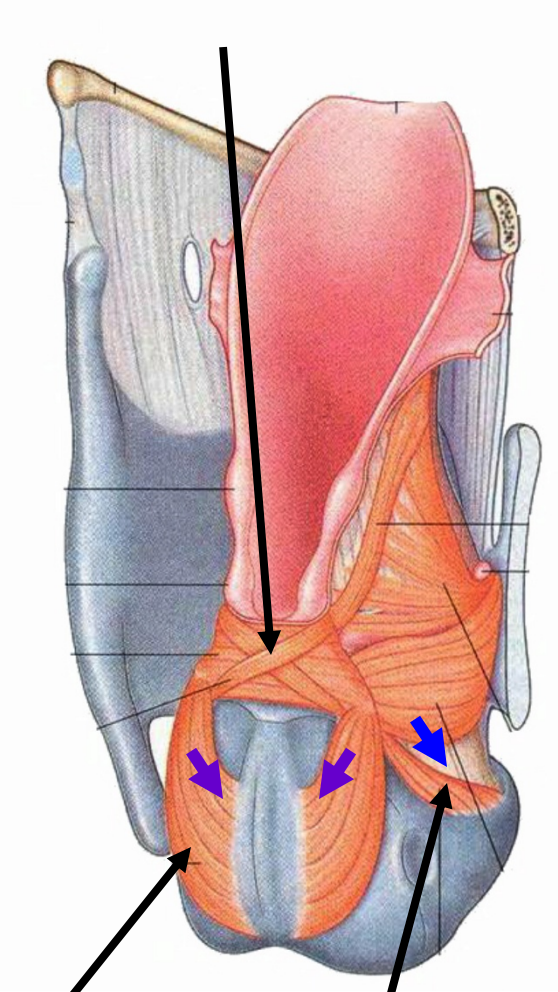


STRETCH vocal ligament
INCREASE PITCH -
CRICOTHYROID

RELAX vocal ligament
DECREASE PITCH -
THYROARYTENOID

OPEN AND CLOSE LARYNX –
(OPENING CALLED RIMA GLOTTIDIS)

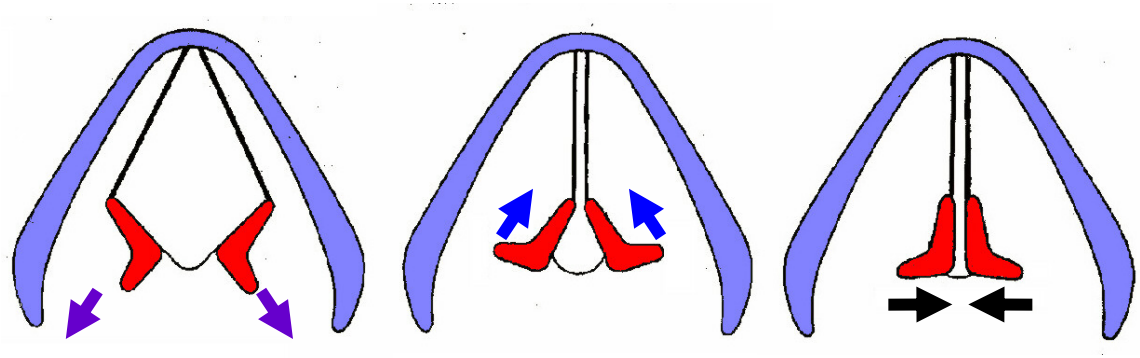
ARYTENOIDEUS



POSTERIOR CRICO-ARYTENOID

LATERAL CRICO-ARYTENOID

OPEN	CLOSE	CLOSE
POST. CRICO-ARYTENOID	LATERAL CRICO-ARYTENOID	ARYTENOIDEUS



Open - deep breathing

Close - speech; also raise abdominal pressure (childbirth, defecation, micturition = empty urinary bladder)

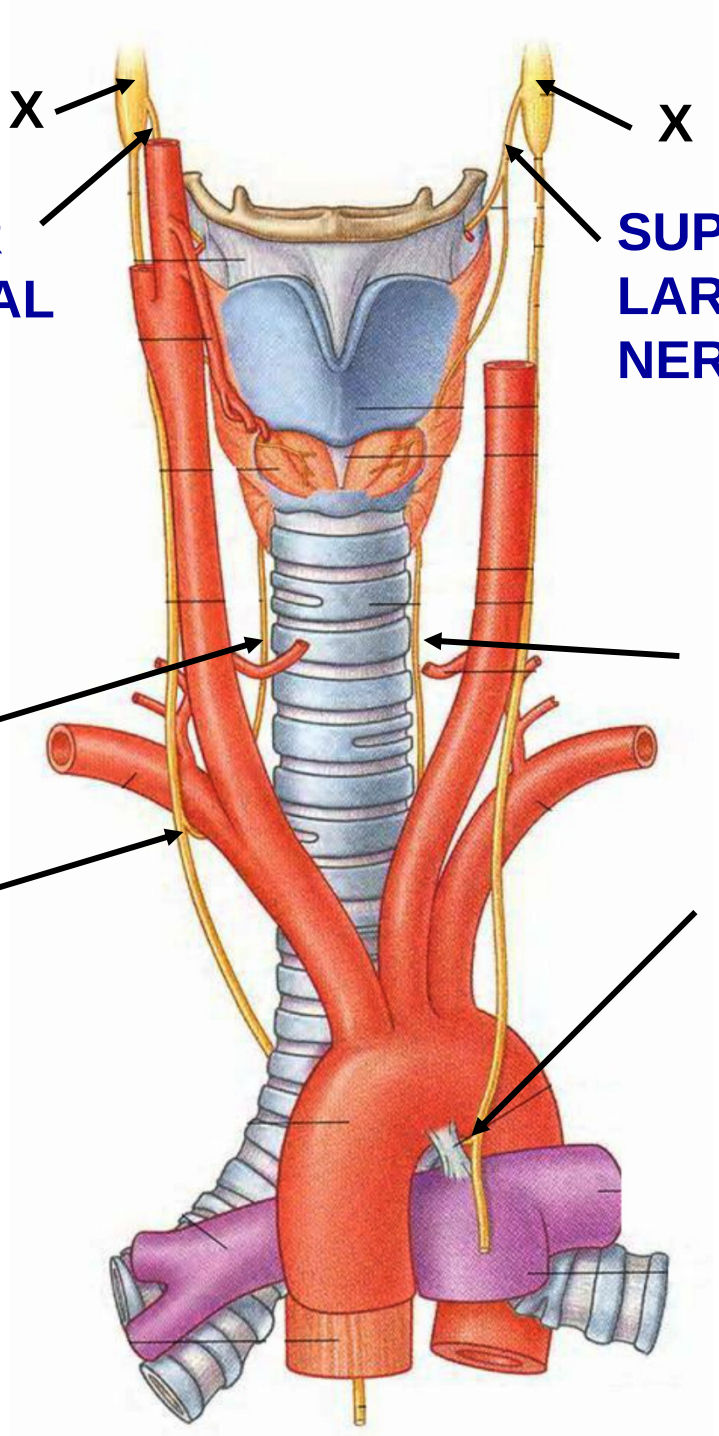
CHART: ACTIONS OF LARYNGEAL MUSCLES

**

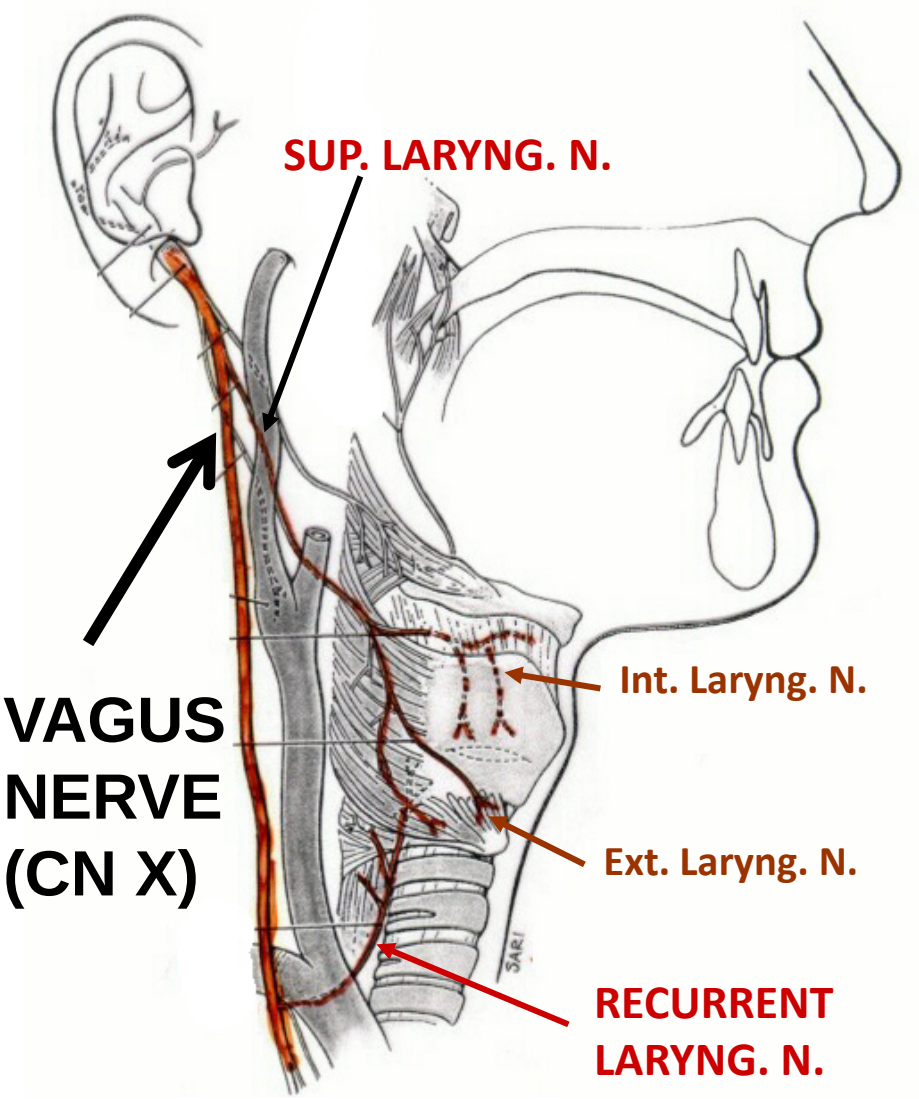
MUSCLE	ACTION	NERVE
Cricothyroid	Tenses vocal fold, Raises pitch of sound	External Laryngeal n. (X)
Thyroarytenoid	Relaxes vocal fold, Decreases pitch of sound	Recurrent Laryngeal n. (X)
Posterior cricoarytenoid	Abducts vocal folds, opens rima glottides (open larynx)	Recurrent Laryngeal n. (X)
Lateral cricoarytenoid	Adducts vocal folds, closes rima glottides (close larynx)	Recurrent Laryngeal n. (X)
Arytenoid (Transverse arytenoid)	Adducts vocal folds, closes rima glottides (close larynx)	Recurrent Laryngeal n. (X)

NERVES OF LARYNX –

All are Branches of Vagus CN X



DAMAGE TO RECURRENT LARYNGEAL NERVE



ALL NERVES ARE BRANCHES OF VAGUS (CN X)

A. **Superior Laryngeal N.** motor to **Cricothyroid**

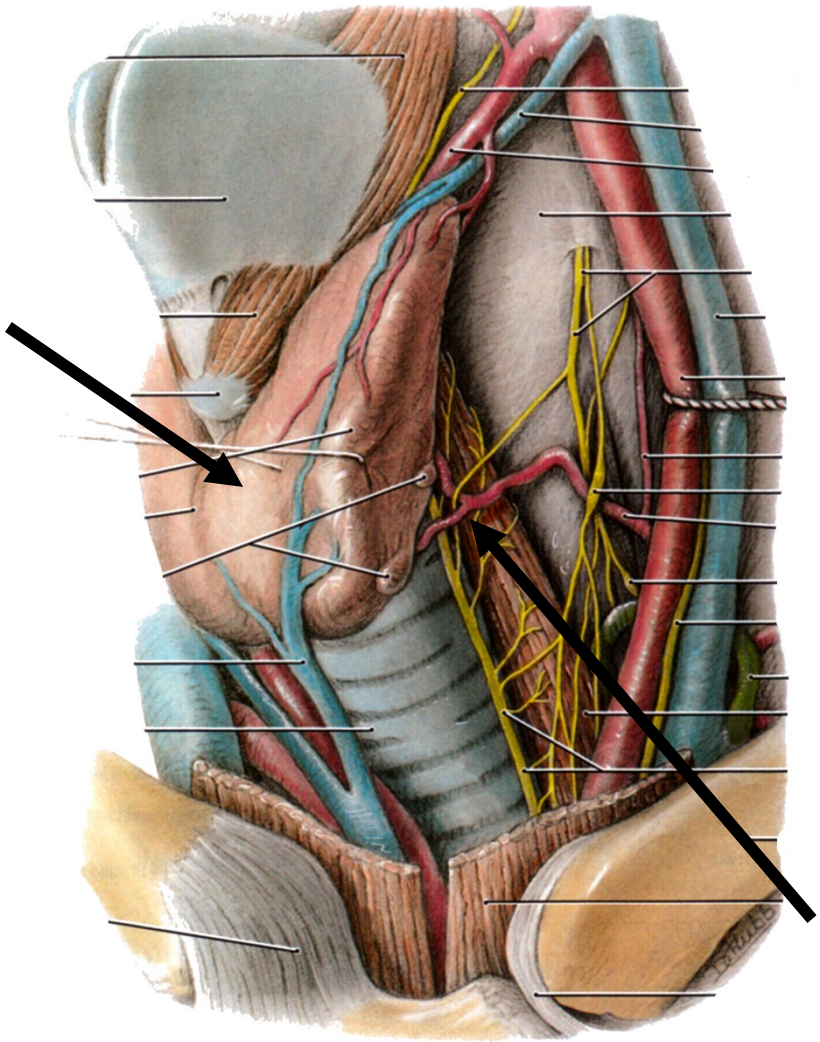
B. **Recurrent Laryngeal N.** motor to **All other Muscles of Larynx**

**

DAMAGE TO RECURRENT LARYNGEAL NERVE - can occur in Thyroid Surgery; paralyze all muscles one side except Cricothyroid; permanent hoarse voice

DAMAGE RECURRENT LARYNGEAL NERVE IN THYROID AND OTHER NECK SURGERY

Thyroid Gland

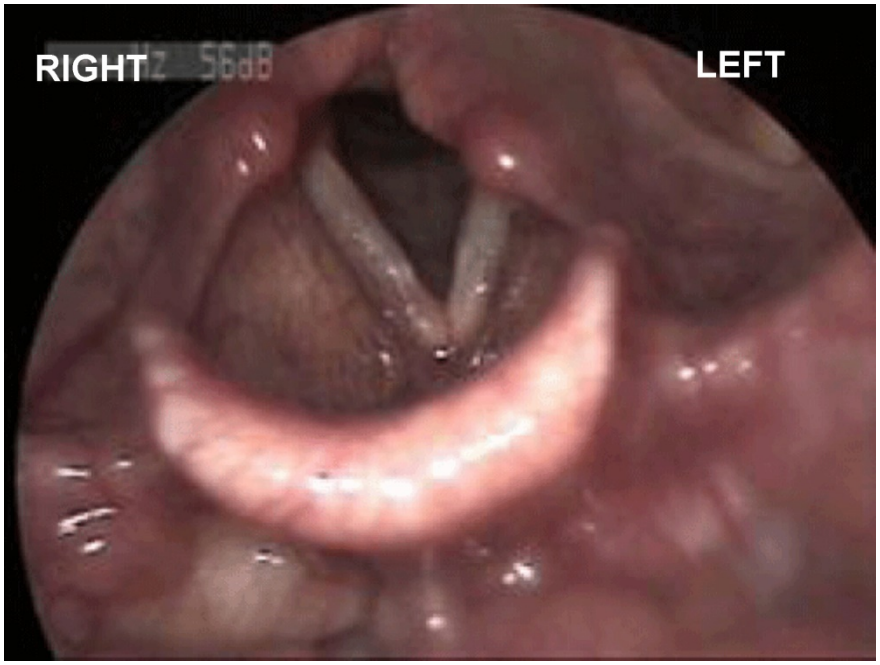


**

DAMAGE TO RECURRENT LARYNGEAL NERVE - can occur in Thyroid Surgery; paralyze all muscles one side except Cricothyroid; permanent hoarse voice

Recurrent Laryngeal Nerve

PRACTICE QUESTION CLINICAL VIGNETTE

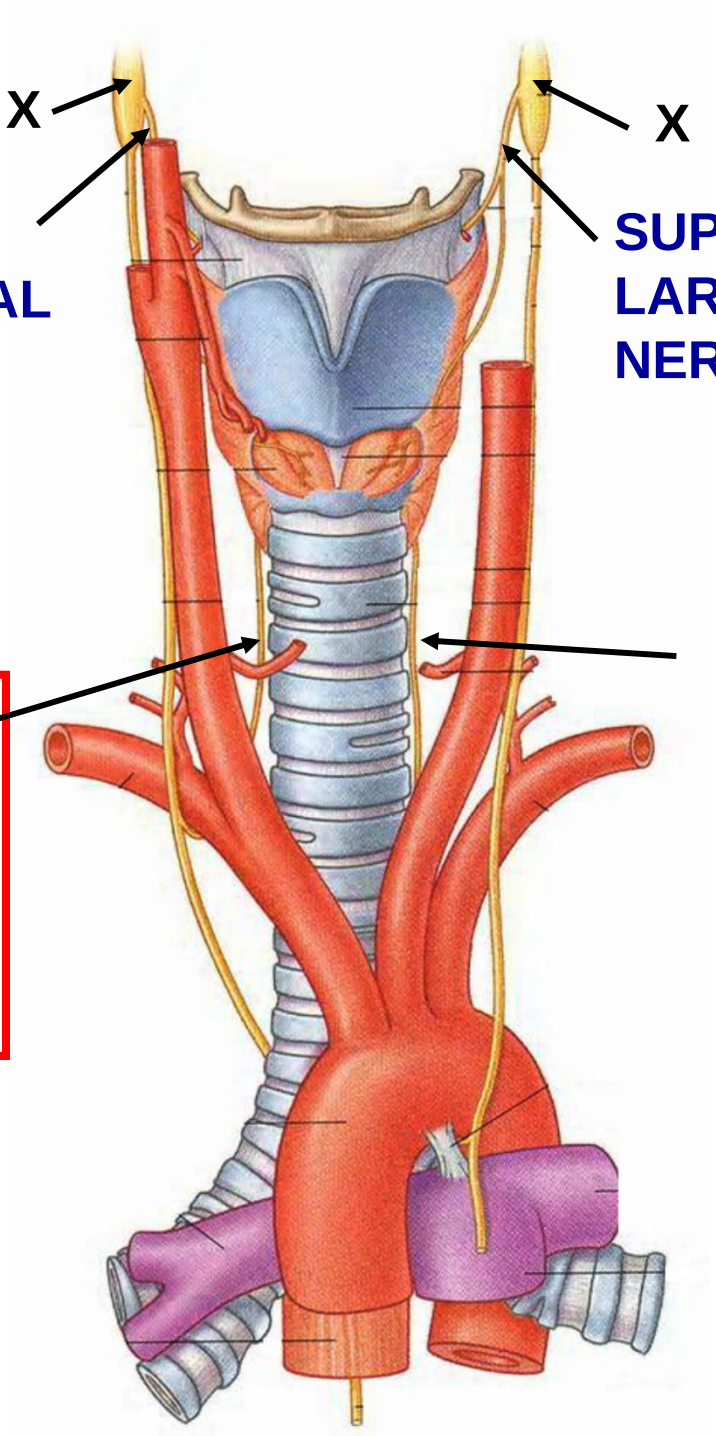


A patient undergoes surgery for removal of thyroid nodules. The nodules are found to be noncancerous but post-operatively the patient has a 'hoarse' voice. Laryngoscopic examination (photo left) shows asymmetry in position of the vocal folds when the patient is told to breathe deeply. The physician suspects that this is due to damage of which of the following structures?

A. Right Superior Laryngeal nerve
B. Right Recurrent Laryngeal nerve
C. Left Superior Laryngeal nerve
D. Left Recurrent Laryngeal nerve
E. Right Sympathetic chain

NERVES OF LARYNX –

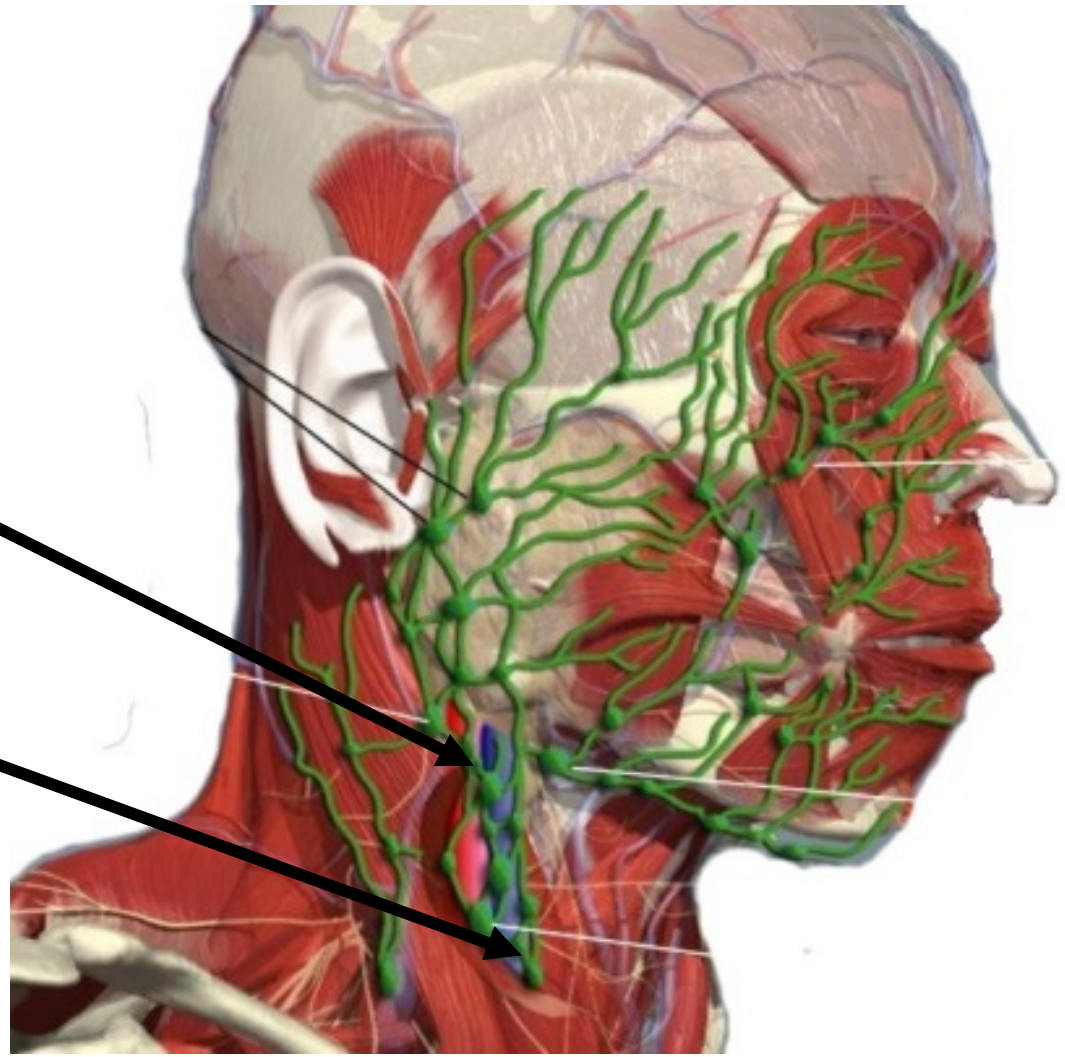
All are Branches of Vagus CN X



LARYNX - LYMPHATICS

Superior Deep Cervical Nodes - drain Larynx above true vocal folds

Inferior Deep Cervical Nodes - drain Larynx below true vocal folds



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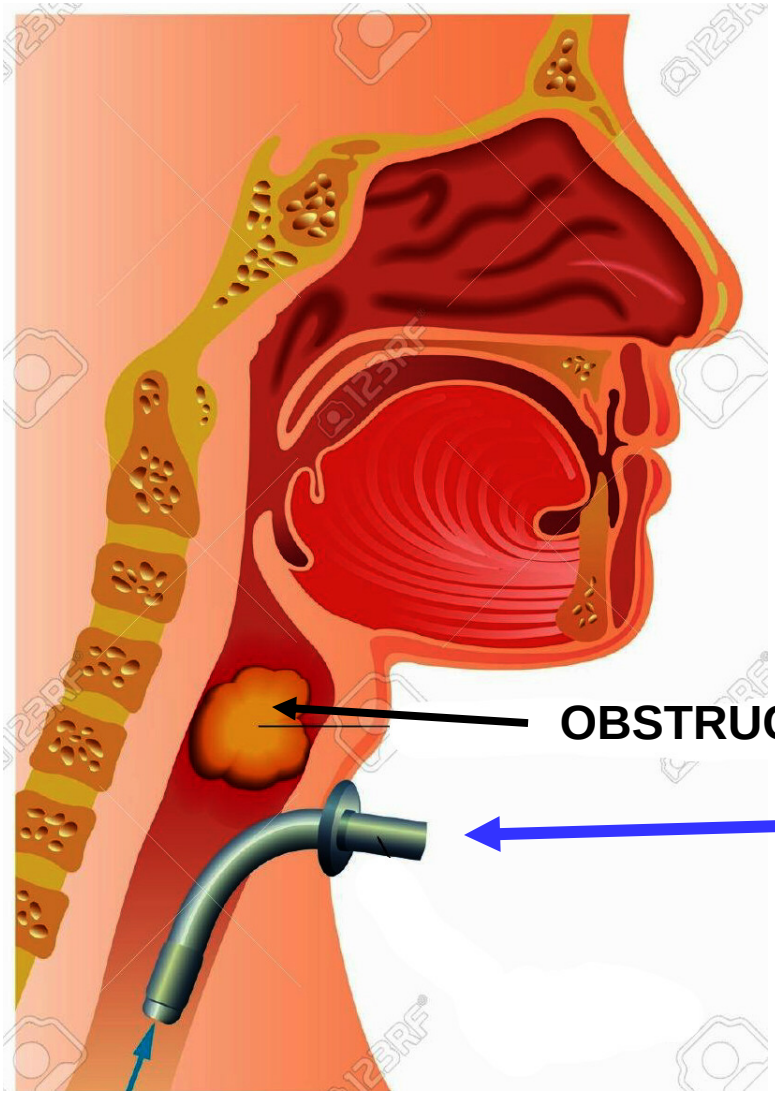
CLINICAL Note: Mucosa is tightly attached to vocal folds; in Anaphylactic Shock (acute allergic reaction) swelling of Vestibular folds can constrict airway and lead to Suffocation

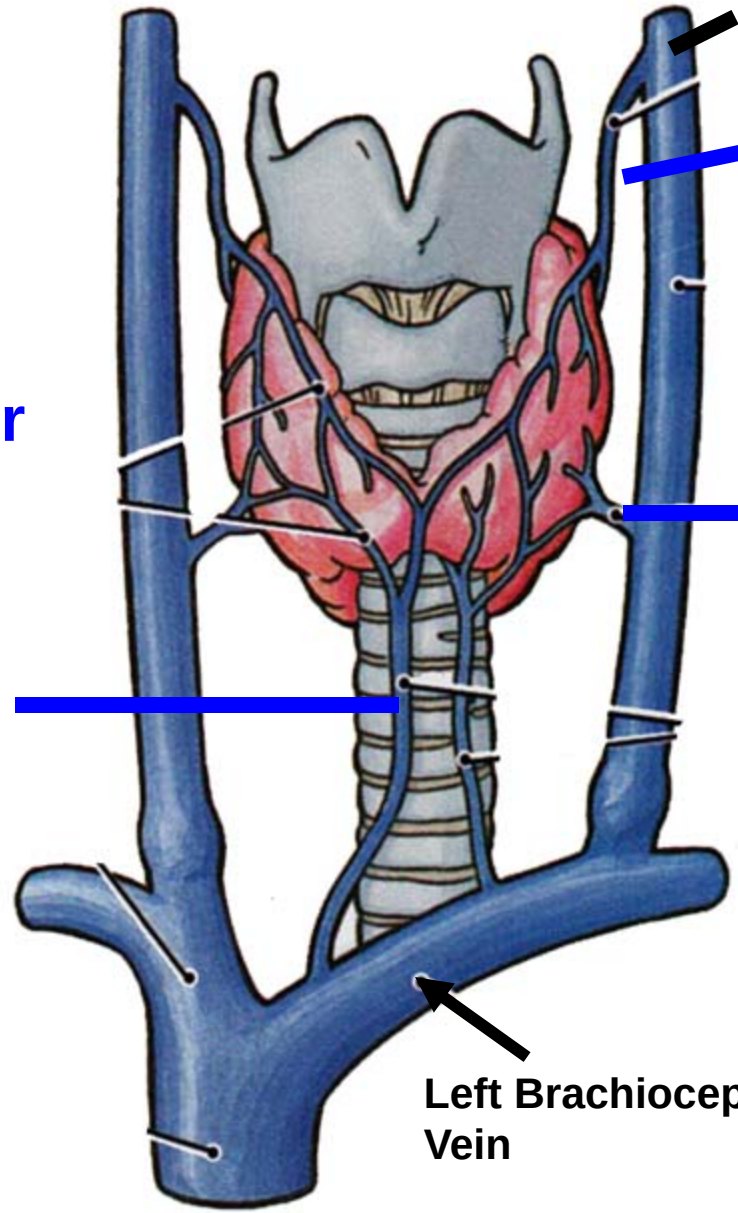
OBSTRUCTION OF LARYNX: TRACHEOTOMY



open airway to lungs below obstructed larynx OR swollen vestibular folds

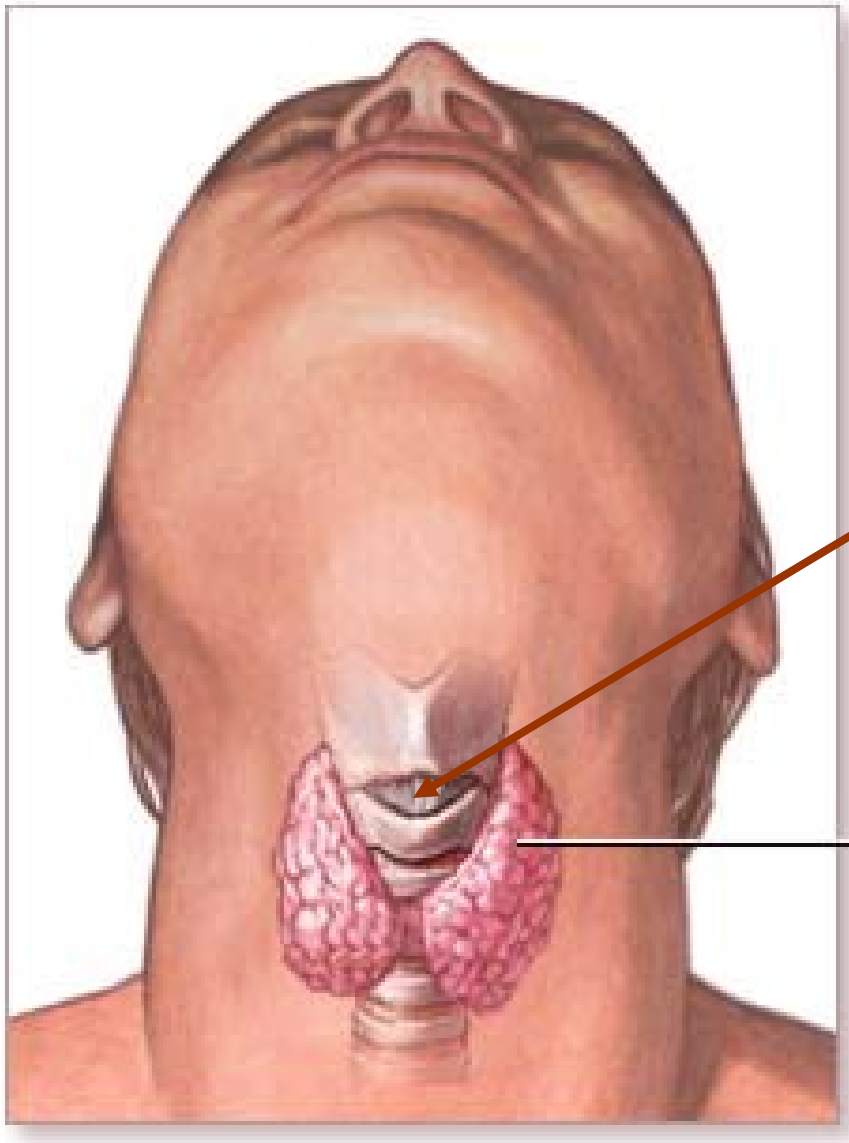
Tracheotomy - cut between 1st and 2nd or 2nd and 3rd Tracheal cartilages

THYROID GLAND - LOTS OF VEINS



CLINICAL NOTE: THERE CAN BE A LARGE VEIN IN FRONT OF (ANTERIOR TO) THE TRACHEA - IMPORTANT IN TRACHEOTOMY; BLEEDING AVOIDED BY CRICOTHYROTOMY

OBSTRUCTION OF LARYNX: CRICOTHYROTOMY



CLINICALLY IMPORTANT:
IN ANAPHYLACTIC SHOCK, INSERT TUBE TO CRICOTHYROID MEMBRANE (LESS BLEEDING THAN TRACHEOTOMY)

Cricothyroid Membrane

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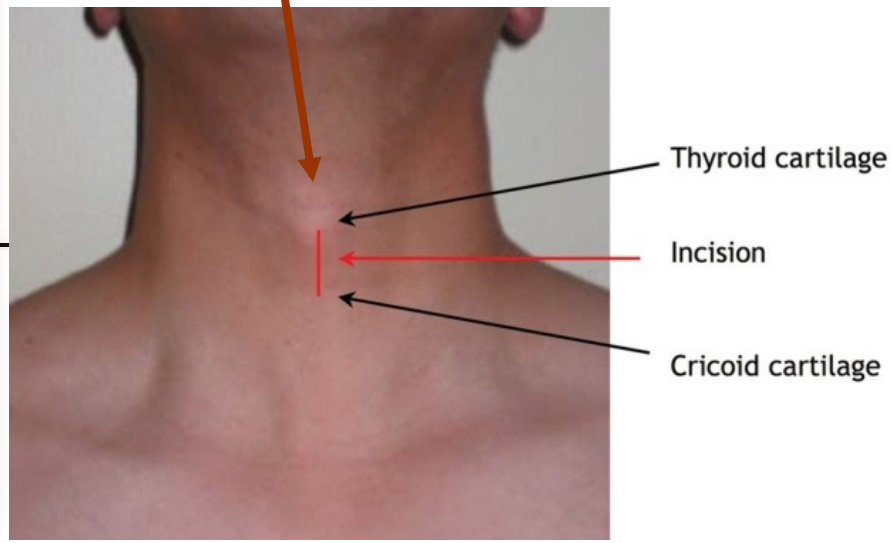
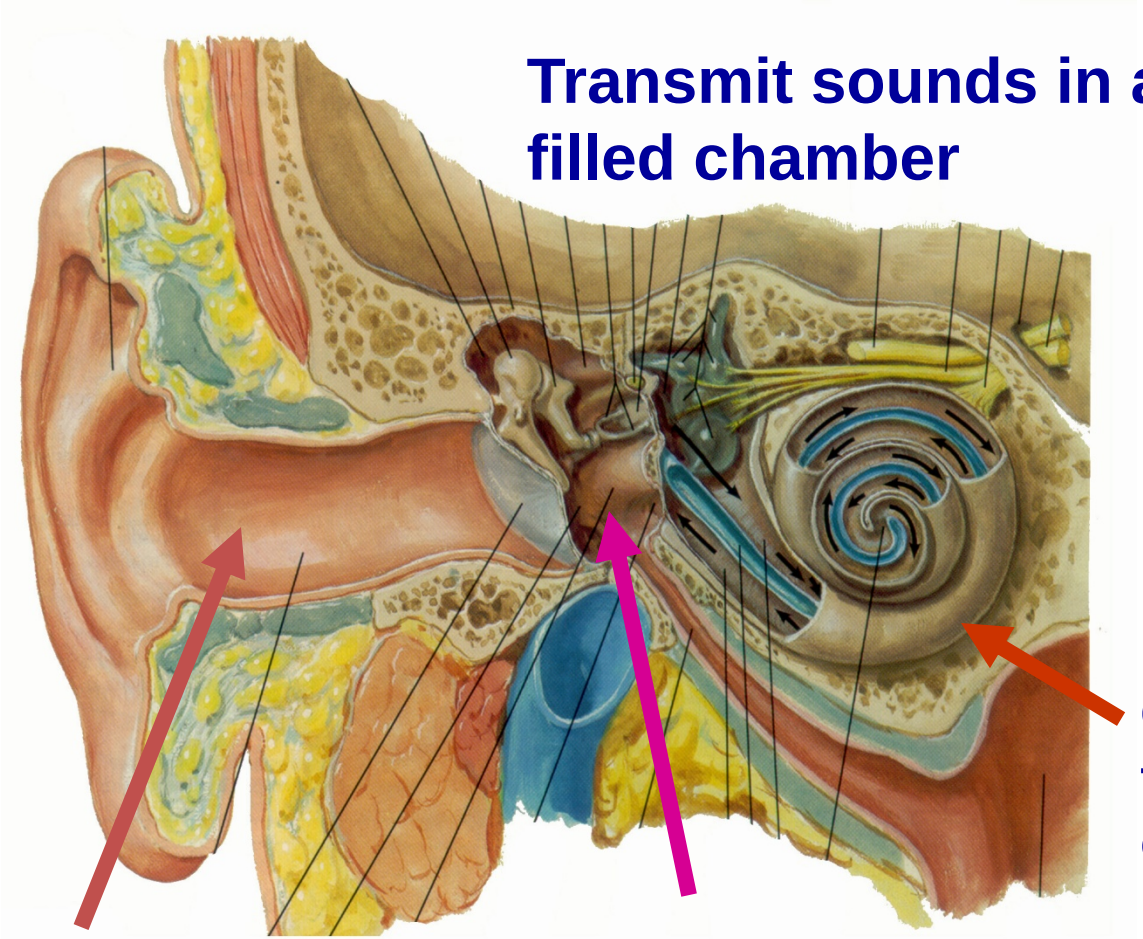


EAR

Otitis media – spread of infection
Muscles that dampen sound – Stapedius, Tensor Tympani
Loss of taste if damage branches of VII that cross middle ear
Innervation of skin of outer ear

EAR

Transmit sounds in air to fluid filled chamber



REGIONS

A. Outer Ear directs sound (pressure waves in air) to tympanic membrane

B. Middle Ear - air-filled chamber
- bones link tympanic membrane to cochlea; amplify force/area
- muscles can dampen loud sounds

C. Inner Ear- fluid-filled chamber inside BONE Cochlea- hearing; Vestibular apparatus- gravity, balance

CONDUCT SOUND

(CONDUCTIVE HEARING LOSS)

DETECT SOUND

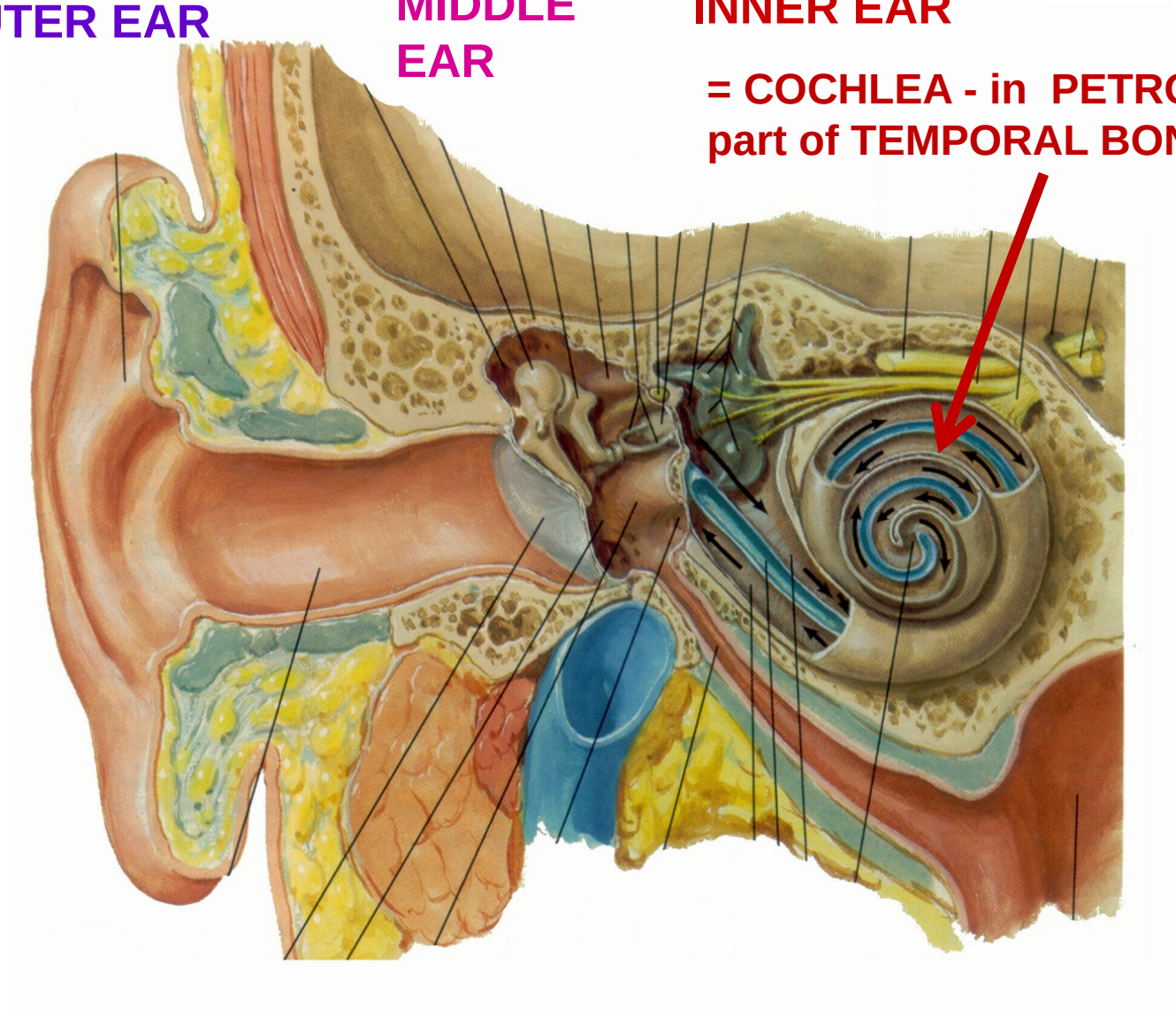
(= SENSORINEURAL PART)

OUTER EAR

MIDDLE EAR

INNER EAR

= COCHLEA - in PETROUS part of TEMPORAL BONE



MIDDLE EAR - BOUNDARIES

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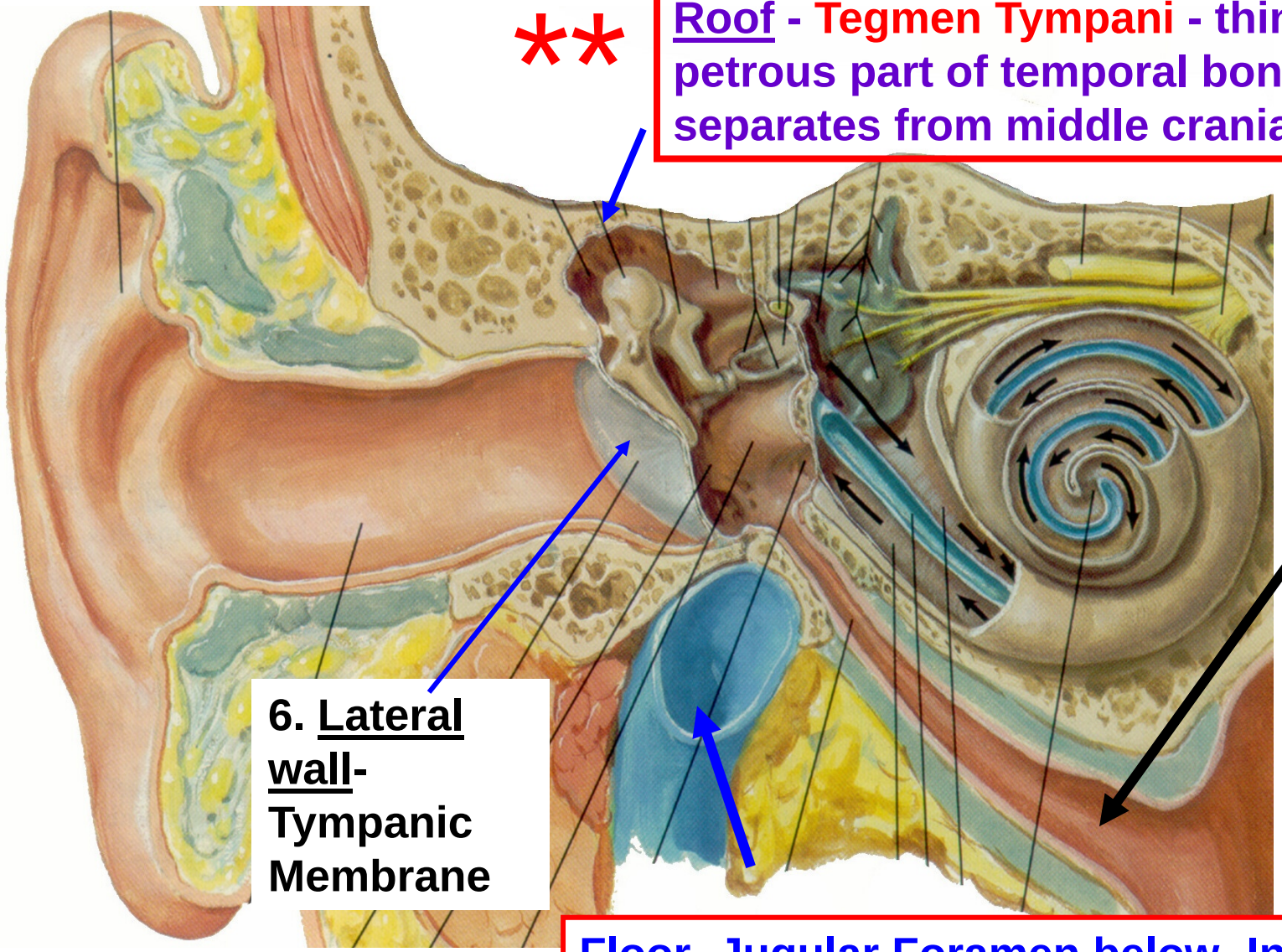
Roof - Tegmen Tympani - thin plate of petrous part of temporal bone; separates from middle cranial fossa



3. Ant. wall -

Opening of Auditory Tube (ant. 2/3 cartilage; post. 1/3 bone

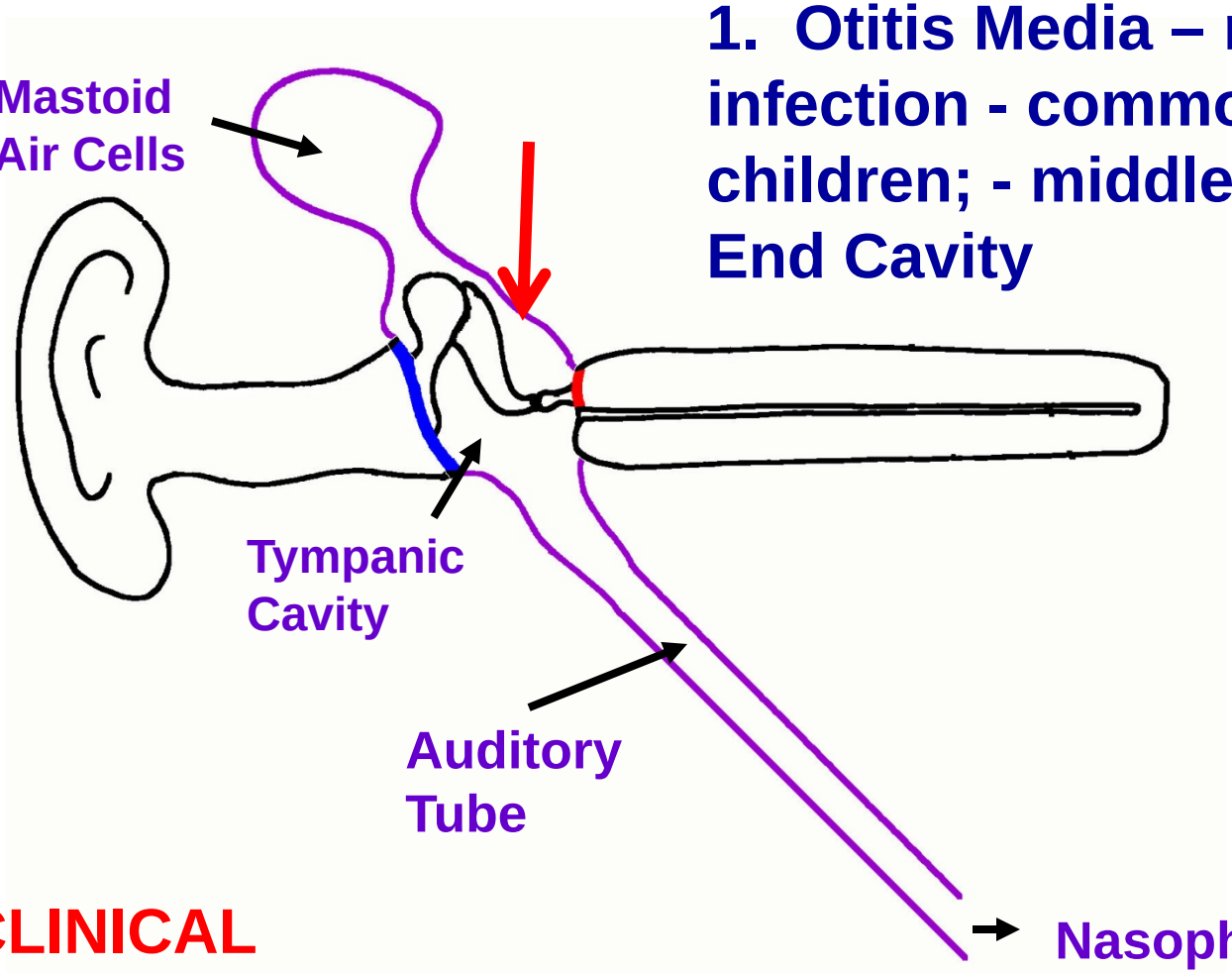
6. Lateral wall- Tympanic Membrane

Tegmen = L. roof

Floor- Jugular Foramen below- Internal Jugular vein can rupture to middle ear

OTITIS MEDIA

1. Otitis Media – middle ear infection - common in children; - middle ear is Dead End Cavity

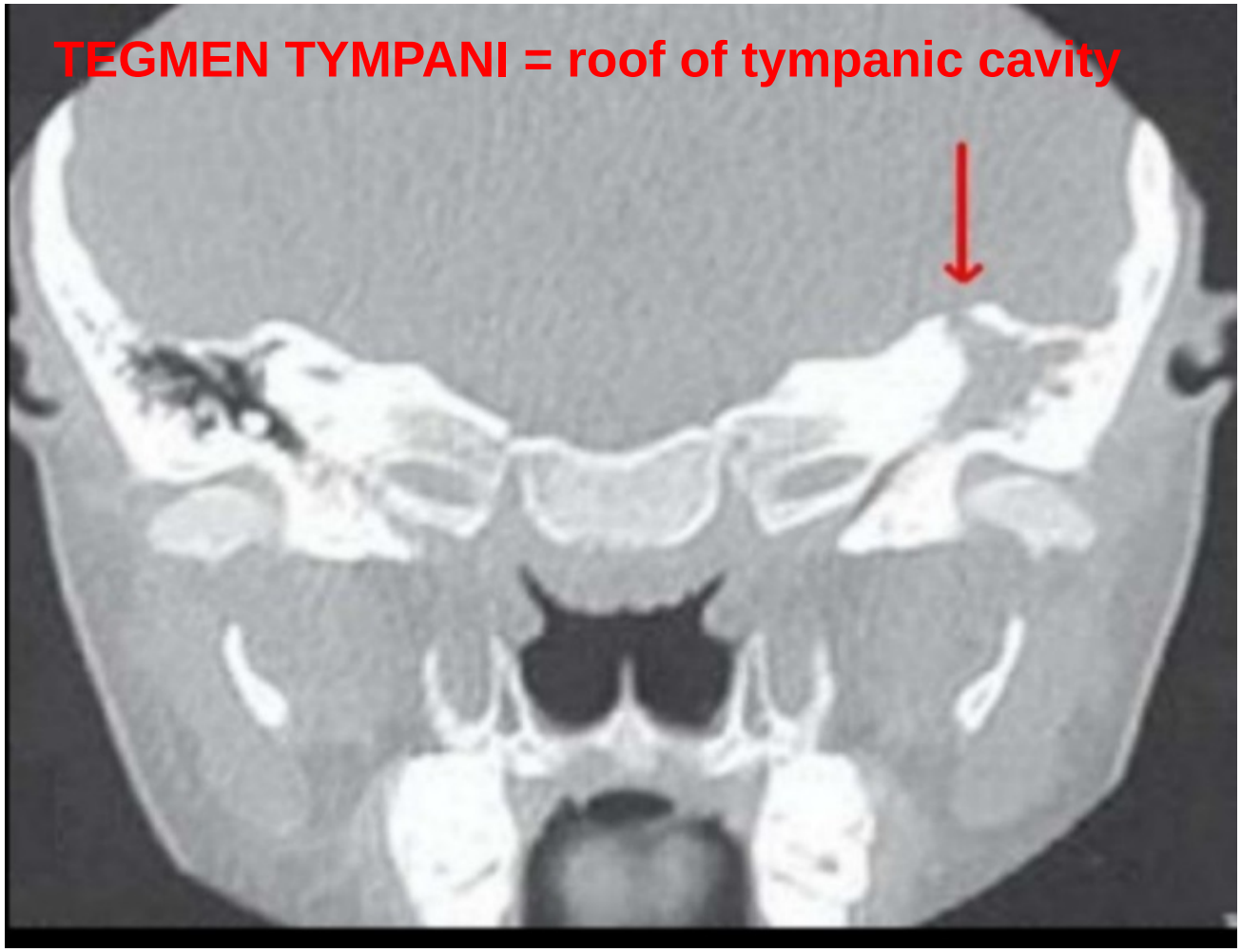


CLINICAL **

Spread of infection from Respiratory System can damage Auditory Ossicles - Hearing Loss; Prolonged infection - Tegmen Tympani to Brain; treatment tympanostomy - tube through tympanic membrane

INFECTION IN OTITIS MEDIA CAN SPREAD TO MIDDLE CRANIAL FOSSA

tegman L. = covering



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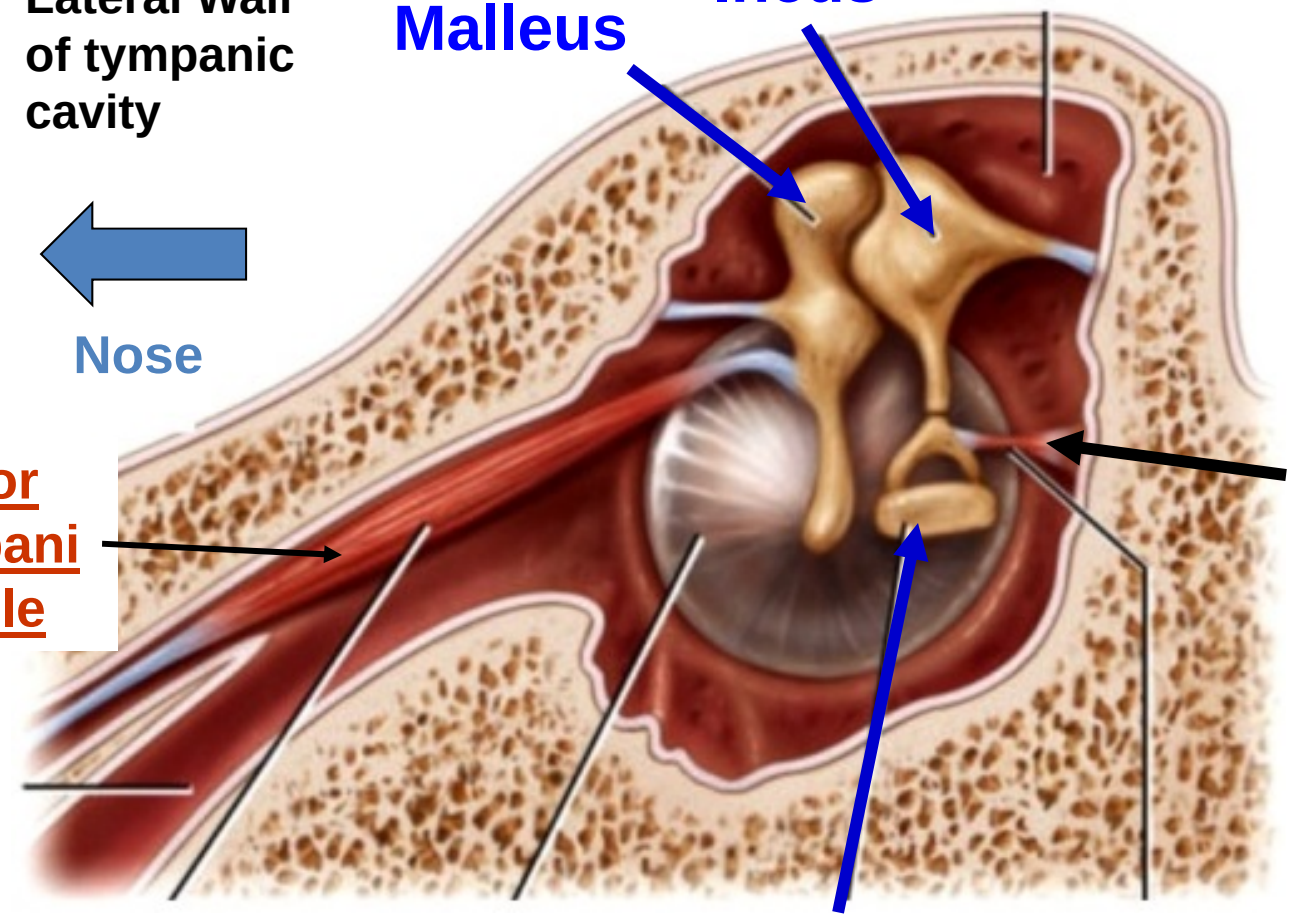
In prolonged Otitis media, infection can spread to Middle Cranial Fossa by eroding Tegmen Tympani (roof of tympanic cavity, middle ear)

MUSCLES OF MIDDLE EAR - dampen sound

View of Lateral Wall of tympanic cavity



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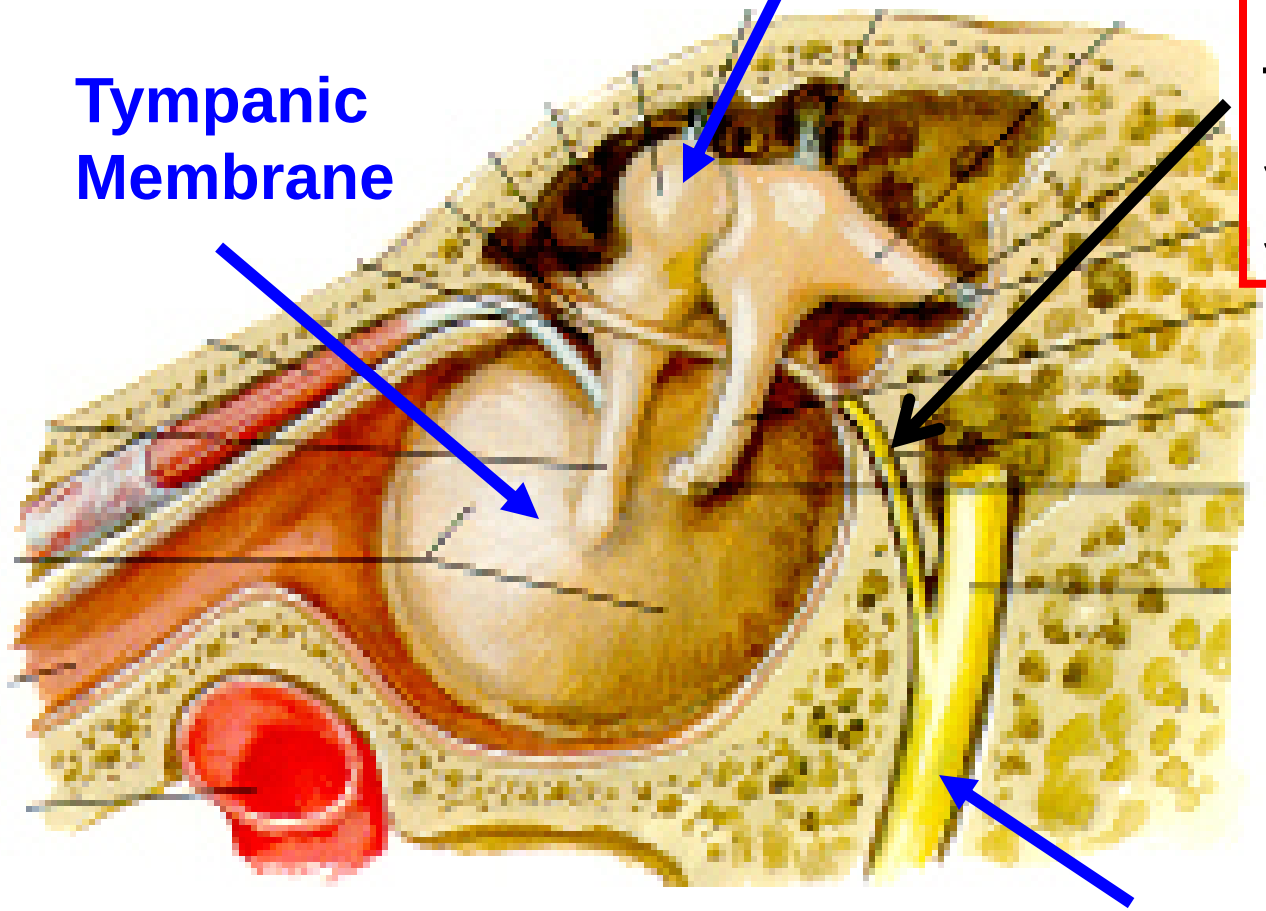
Damage to VII - Hyperacousia - sounds seem too loud

PRACTICE QUESTION CLINICAL VIGNETTE

.____ A 6-year old child is seen at a rural clinic for a persistent ear infection on the left side. The parents indicate that the child has had recurrent ear infections for several years that have been resistant to antibiotic treatment. The infection is diagnosed as chronic otitis media and a tympanostomy tube is inserted through the tympanic membrane. The tube is removed after 6 months and successful resolution of the infection. However, the pediatrician carefully tests for potential complications and finds that there is loss of taste to the anterior tongue on the left side. This could indicate damage to which of the following nerves?

A. Tympanic nerve (CN IX)
B. Chorda tympani (CN VII)
C. Auriculotemporal nerve (CN V)
D. nerve to Stapedius (CN VII)
E. Buccal nerve (CN V)

CHORDA TYMPANI

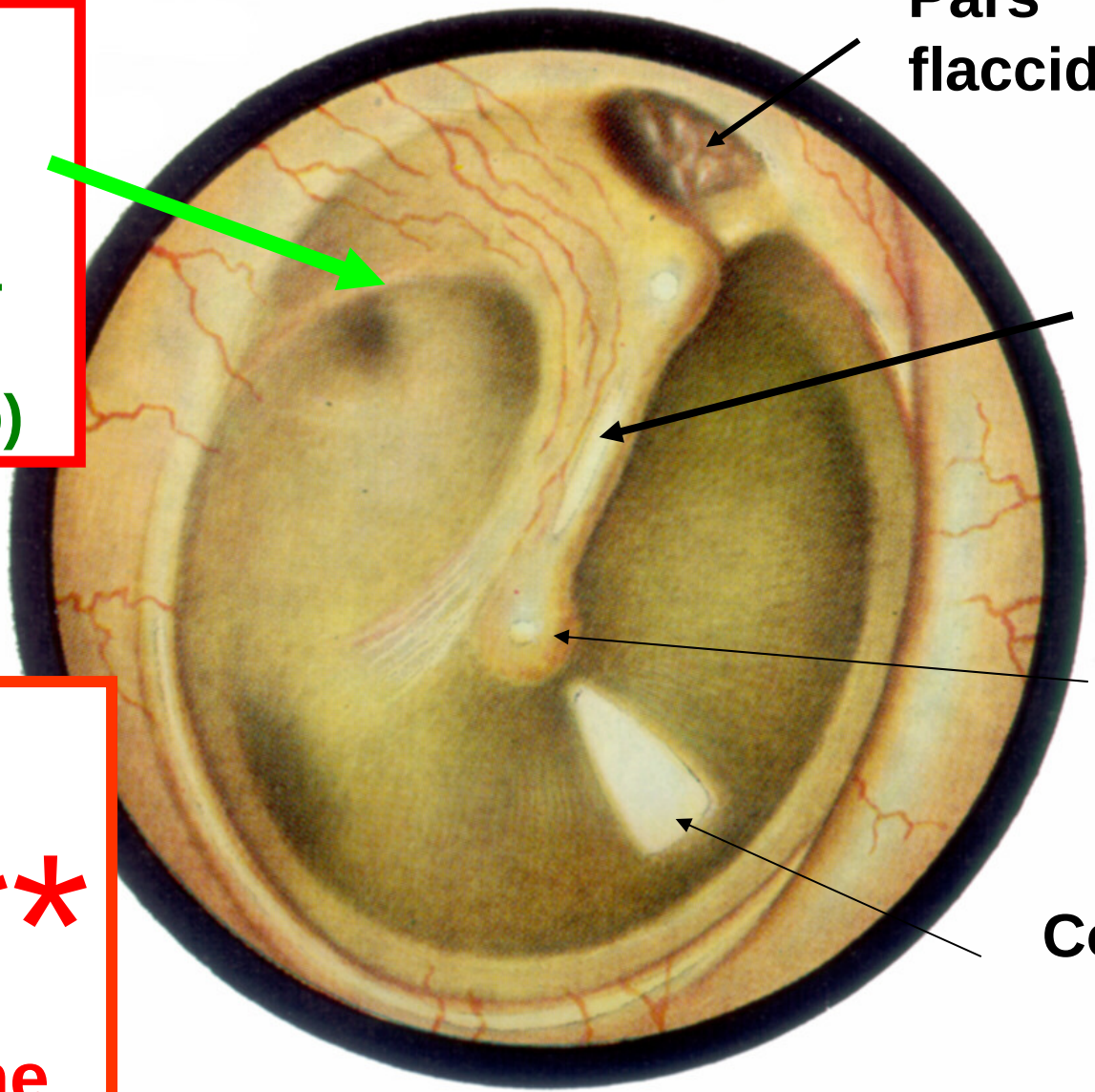


CLINICAL

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

OTOSCOPE VIEW OF TYMPANIC MEMBRANE



CHORDA TYMPANI: TASTE, VISCERAL MOTOR (parasymp)

Pars flaccida

MALLEUS – manubrium (handle)

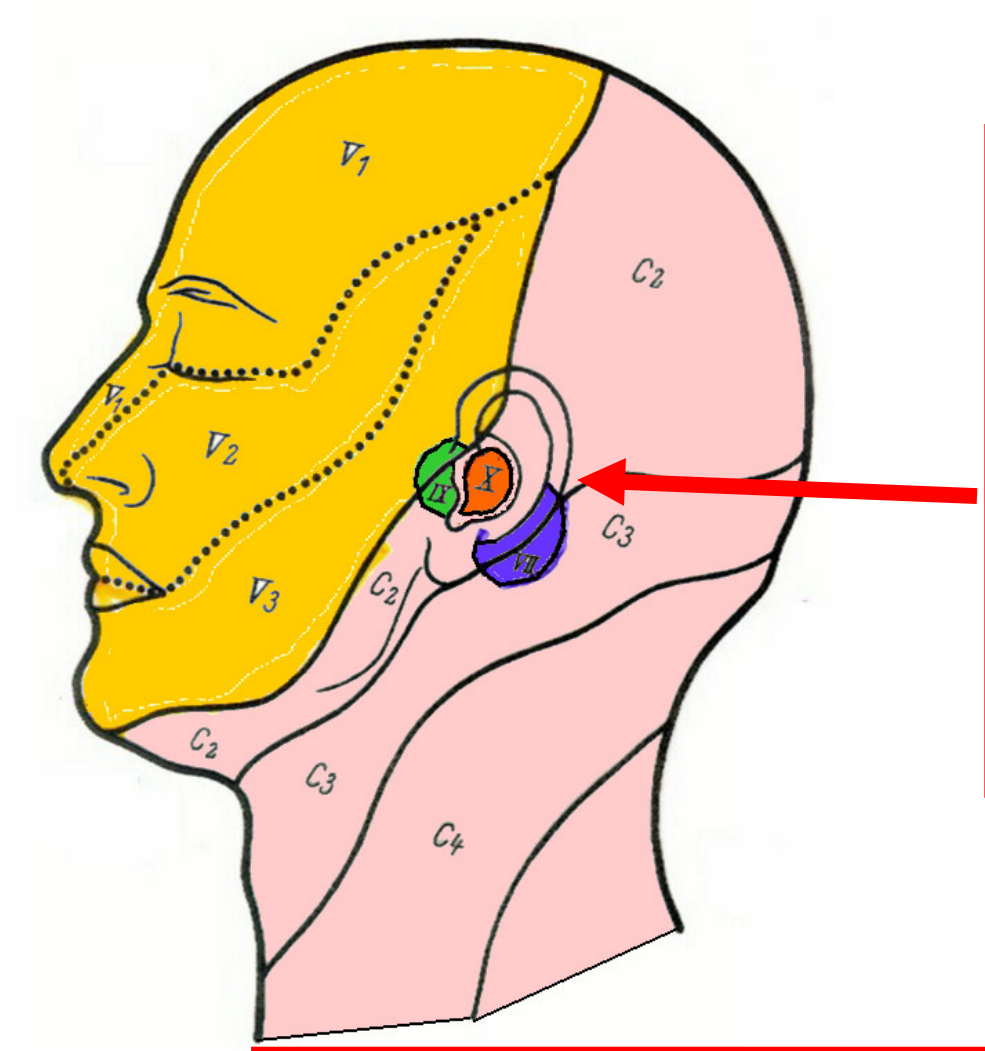
Umbo

Cone of light

CLINICAL*

Lose taste if pierce ** tympanic membrane

SOMATIC SENSORY TO OUTER EAR



ALMOST ALL TRIGEMINAL V EXCEPTION:
SKIN OF OUTER EAR – <u>FOUR CRANIAL NERVES</u>
1) V - TRIGEMINAL
2) VII- FACIAL
3) IX - GLOSSO-PHARYNGEAL
4) X - VAGUS

**

BELL'S PALSY (VII) - PARALYSIS OF FACIAL MUSCLES; IN RECOVERY, PATIENTS COMPLAIN OF EARACHES