DISCUSSION SESSION: GROSS ANATOMY

ONN BLOCK

Discuss Spinal Reflexes, Cranial Nerve Reflexes (including testing), Autonomics (including Horner's syndrome)

SPINAL AND CRANIAL NERVE REFLEXES

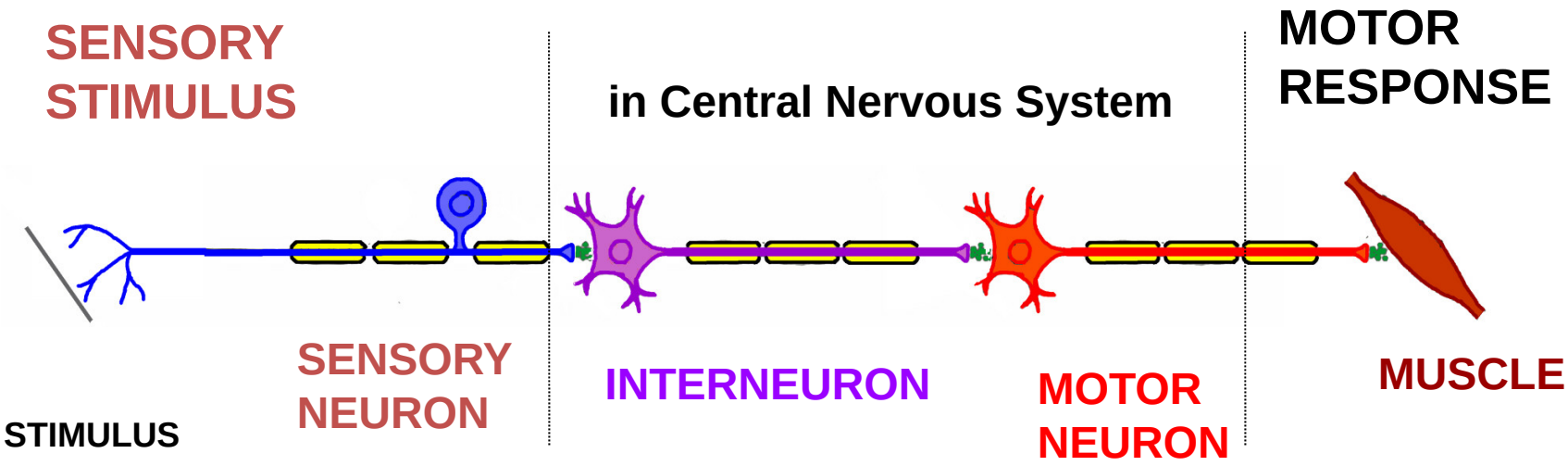
Review reflexes as clinical tools

Three basic Spinal Reflexes –

Stretch reflex – tap on tendon causes muscle to contract
Flexor reflex – aversive stimulus (ex. strong tactile stimulation of sole of foot) causes flexor muscles to contract
Autogenic inhibition – Large forces cause muscle to relax

Cranial nerve reflexes

TYPICAL REFLEX



Reflexes are clinical tools. For reflex to occur, all elements (sensory neuron, interneuron, muscle) must be functional:
If absent, diagnose where pathway is interrupted.
If abnormal, diagnose where pathway is compromised.

REFLEXES CAN BE USED TO TEST NERVOUS SYSTEM FUNCTION, LOCATE SITE OF LESION

SPINAL REFLEXES

SPINAL REFLEXES AND DISORDERS

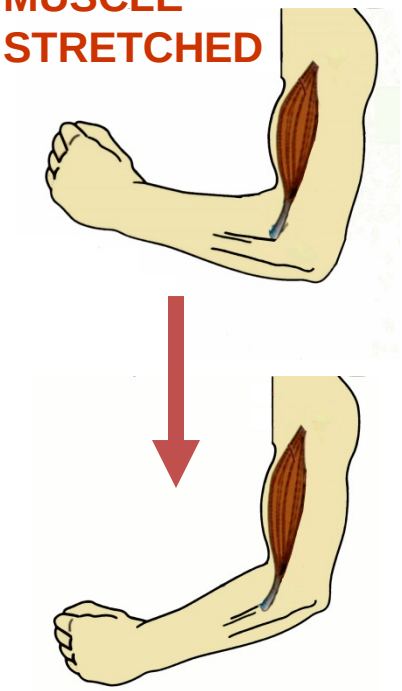
REFLEX	STIMULUS/SENSE ORGAN(S) EXCITED	NORMAL RESPONSE	UPPER MOTOR NEURON DISORDERS
Stretch (Myotatic, Deep Tendon) Reflex – Compensatory maintain position (ex. riding on moving bus)	Rapid Stretch of muscle (test: tap on muscle tendon) Excites Muscle Spindle Primary (Ia) and Secondary (II) sensory neurons (NOT Golgi Tendon Organ)	Stretched muscle contracts rapidly (monosynaptic connection); also Excite synergist and Inhibit antagonist Note: Gamma motor neurons can enhance stretch reflexes, tell patient to relax before test	Hyperreflexia - (increase) - characteristic of Upper Motor Neuron lesions (ex. spinal cord injury, damage Corticospinal tract); note: Clonus = hyperreflexia with repetitive or sustained contractions to single stimulus
Autogenic Inhibition - Limits Muscle Tension	Large force on tendon excites Golgi Tendon Organ Ib (test: pull on muscle when resisted)	Muscle tension decreases; Also inhibit synergist muscles; excite antagonist muscles	Clasped Knife Reflex - occurs in Upper Motor Neuron lesions - forceful stretch of muscle is first resisted then collapses
Flexor Reflex - Protective avoidance reflex	Sharp, painful stimulus, as in stepping on nail; Excites - Cutaneous and pain receptors (test: stroke foot with pointed object)	Limb is rapidly withdrawn from stimulus; protective reflex; also inhibit extensors of same limb and excite extensors of opposite limb (Crossed Extensor Reflex)	Babinski sign- toes extend (dorsiflex) to cutaneous stimulus of sole of foot (normally plantar flex); characteristic of Upper Motor Neuron lesion

STRETCH REFLEX

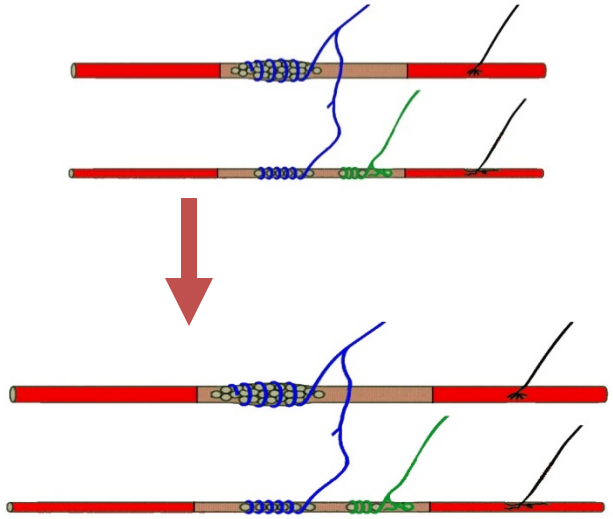
STIMULUS

RESPONSE

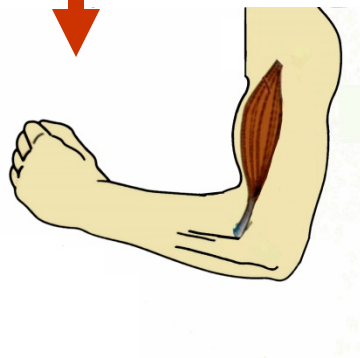
BICEPS MUSCLE STRETCHED



BICEPS MUSCLE SPINDLE



BICEPS MUSCLE CONTRACTS



1) Stimulus - <u>fast stretch</u> of muscle

2) Sense organ excited - Muscle spindle Ia and II sensory neurons

3) Primary response - muscle that is stretched <u>contracts rapidly</u>

OTHER COMPONENTS OF STRETCH REFLEX

**

1) Excite synergist muscles - spindle afferents also make excitatory monosynaptic connections with synergist muscles

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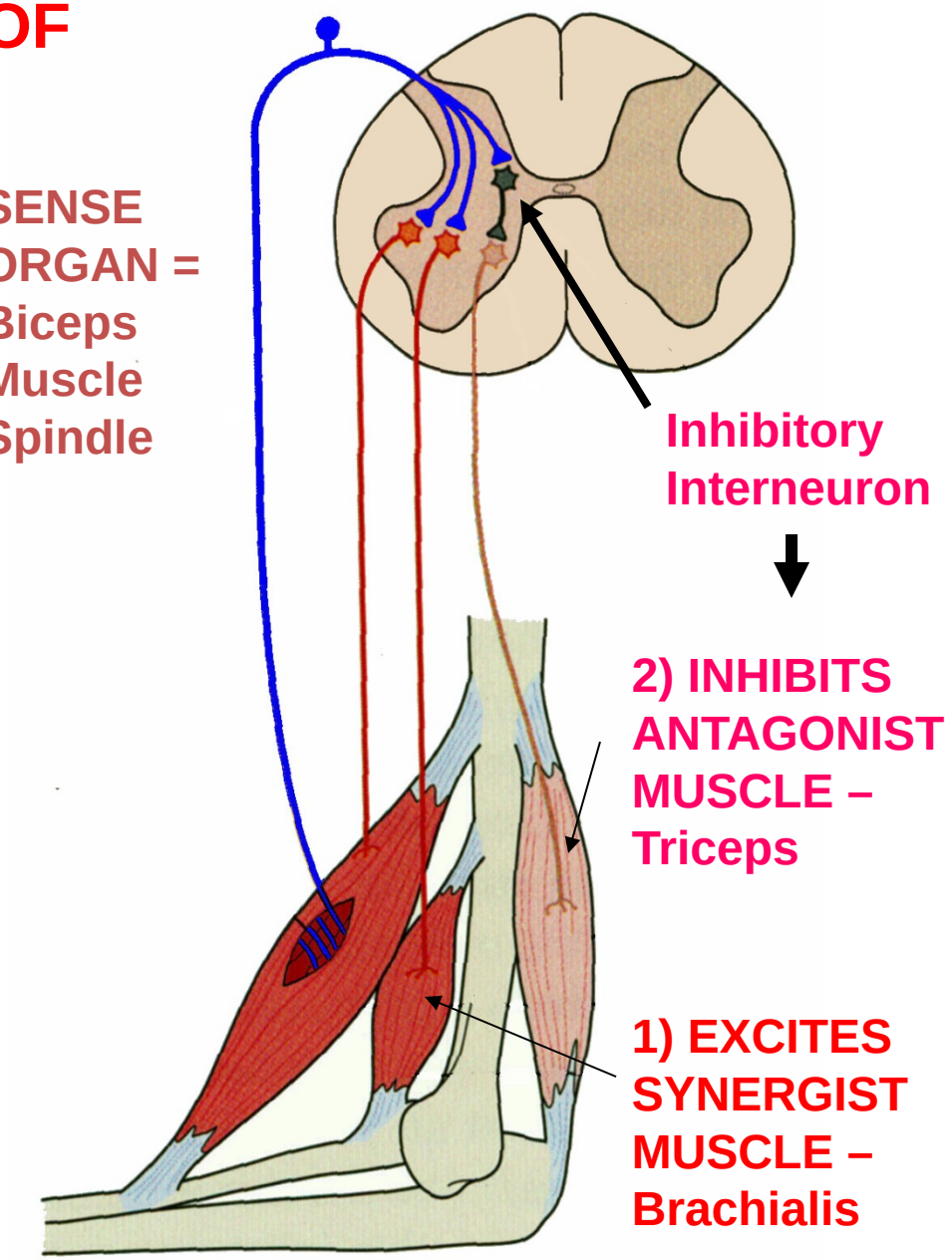
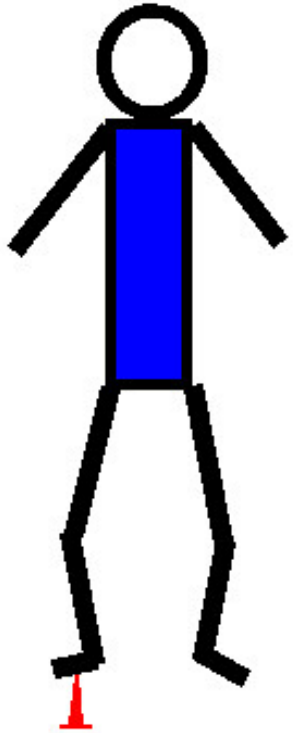
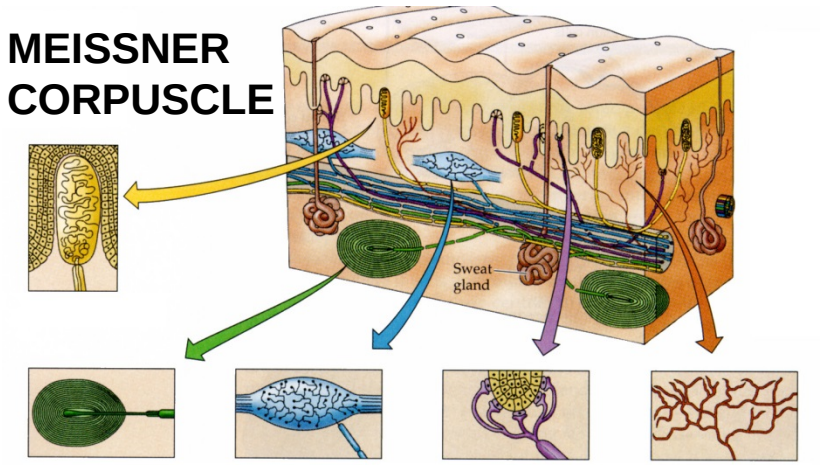
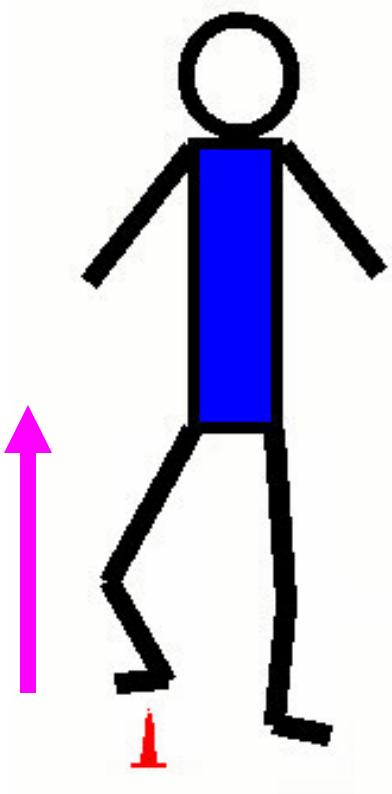
2) Inhibit antagonist muscles - RECIPROCAL INHIBITION - Spindle activity also excites interneurons that make inhibitory synapses on motor neurons to antagonist muscles (polysynaptic)



FLEXOR REFLEX





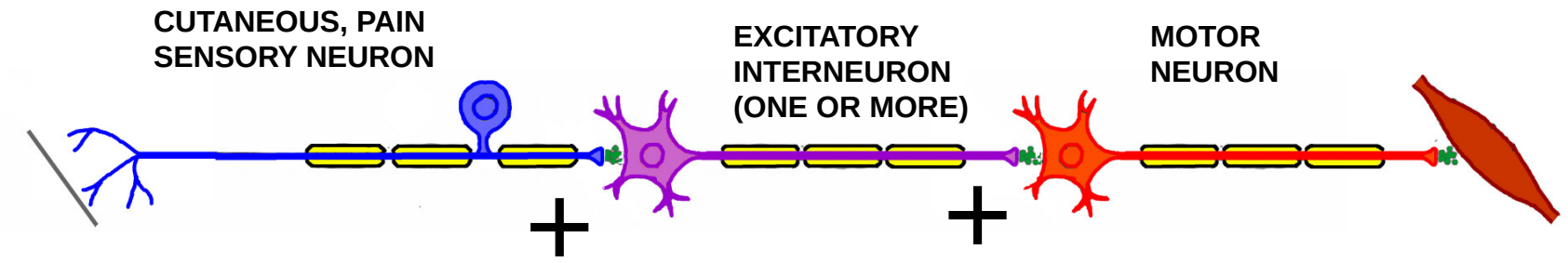


1) Stimulus - painful or noxious stimulus (stepping on nail)

2) Sense organ excited - Cutaneous receptors, Pain receptors (nociceptors)

3) Primary response - Protective withdrawal of limb

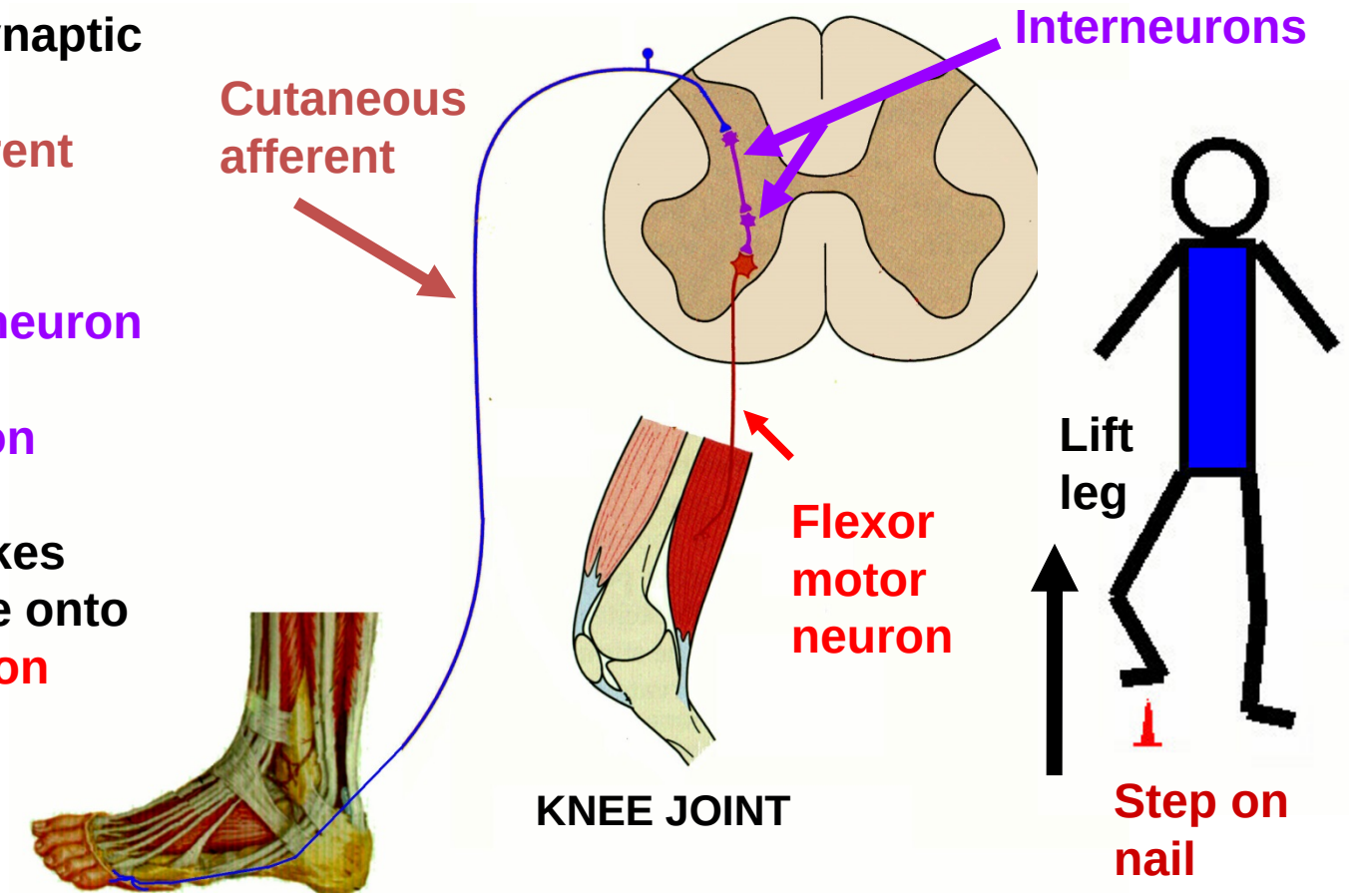
FLEXOR REFLEX: PATHWAYS



Synapses - Polysynaptic

1) Cutaneous afferent makes excitatory synapse onto Interneuron; Interneuron can synapse upon another interneuron

2) Interneuron makes excitatory synapse onto Flexor motor neuron



FLEXOR REFLEX: OTHER EFFECTS
ALL ARE POLYSYNAPTIC BY INTERNEURONS

1) Excite synergist muscles - excite other flexors in same leg (other joints)

2) Inhibit antagonist muscles - inhibit Extensors in same leg

3) CROSSED EXTENSION REFLEX - EXCITE EXTENSORS AND INHIBIT FLEXORS IN OPPOSITE LEG

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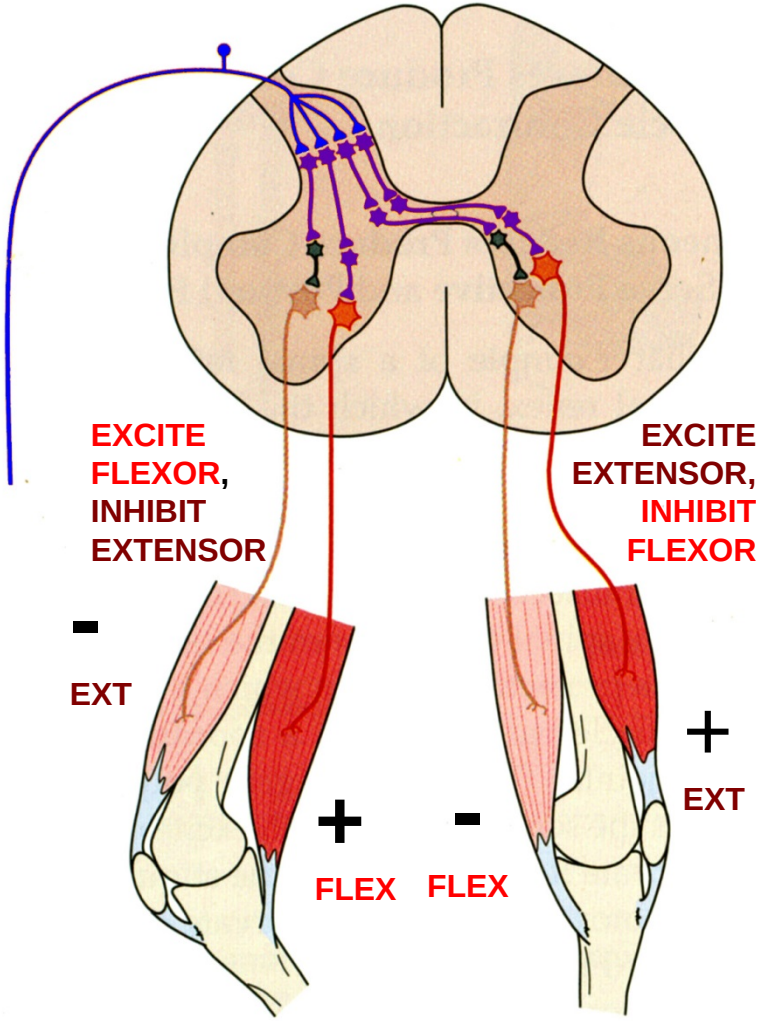

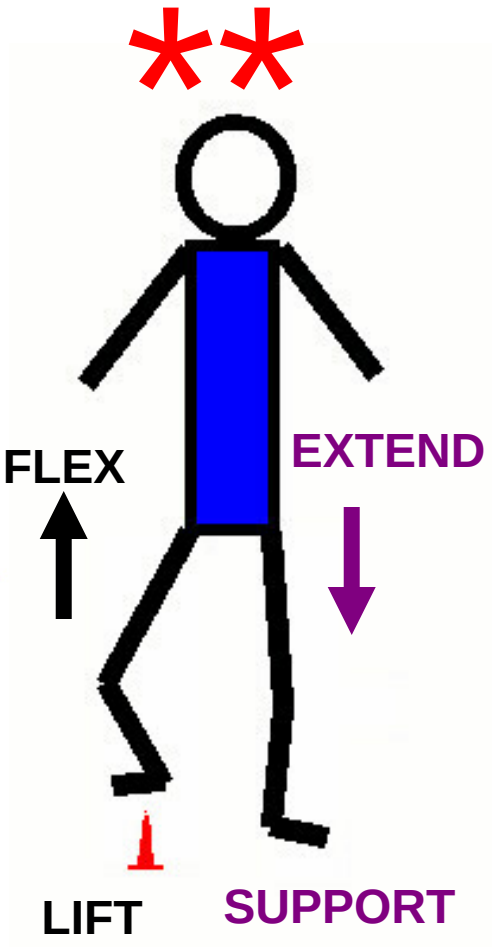

FUNCTION: OTHER LEG PROVIDES SUPPORT WHEN FIRST LEG IS LIFTED

FLEXOR REFLEXES CAN CHANGE AFTER LESIONS, DISEASE PROCESSES

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NORMAL RESPONSE

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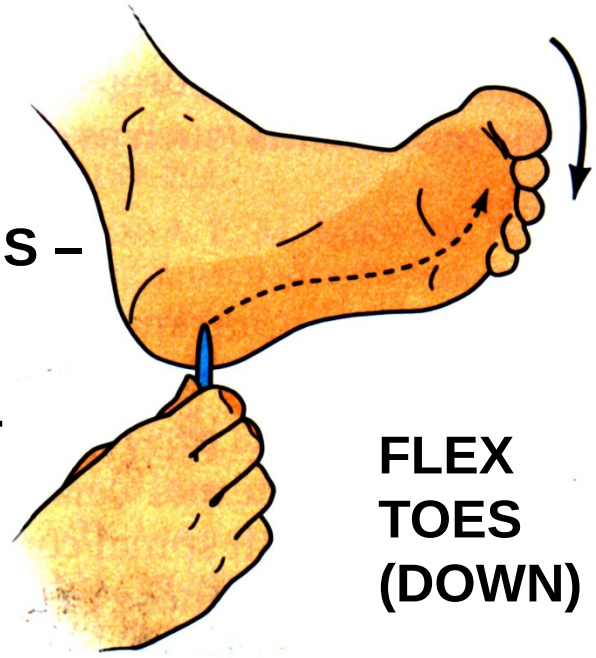
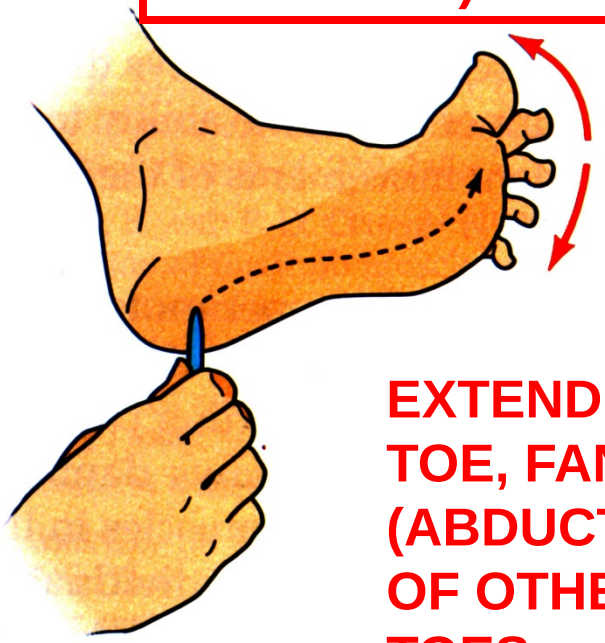
BABINSKI SIGN – (EXTENSOR PLANTAR RESPONSE)

STIMULUS – TO SKIN OF SOLE OF FOOT



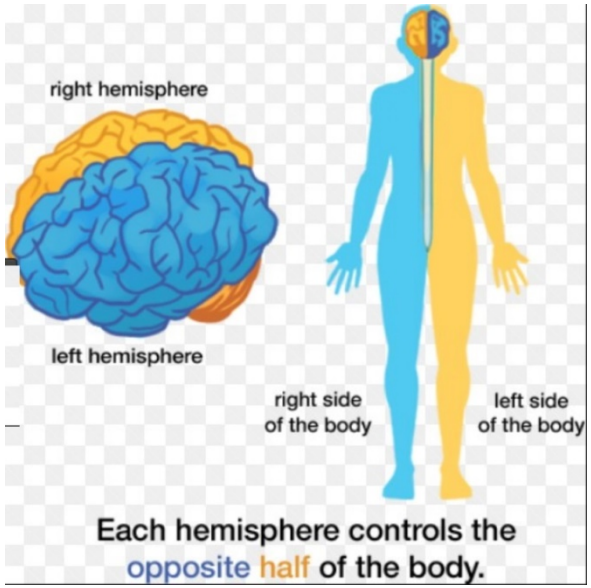
FLEX TOES (DOWN)

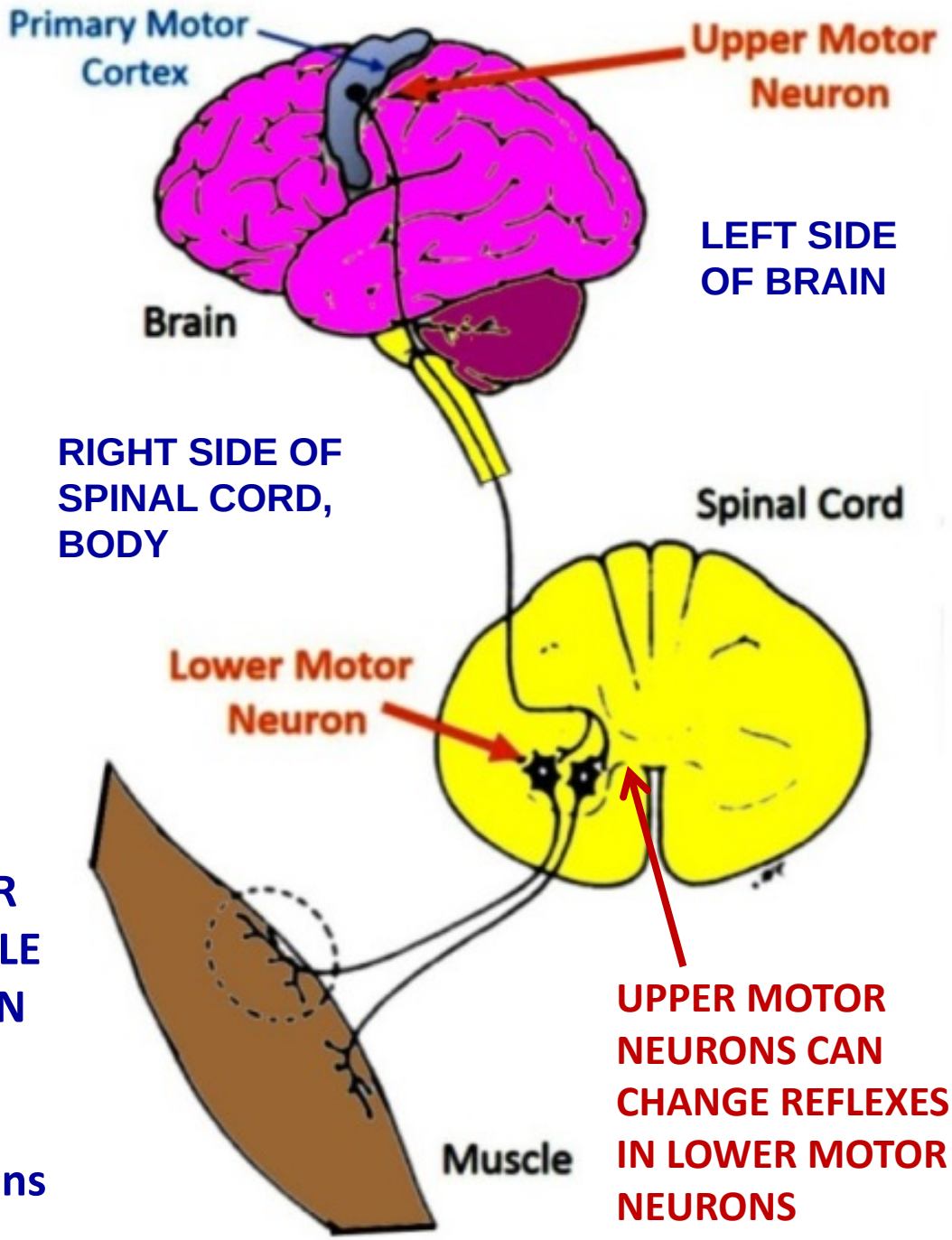


EXTEND BIG TOE, FANNING (ABDUCTION) OF OTHER TOES

Babinski sign - seen after **Upper Motor neuron lesion**
-direction of movement **changes from flexing toes to extending and fanning (abducting) toes**

UPPER VS LOWER MOTOR NEURON

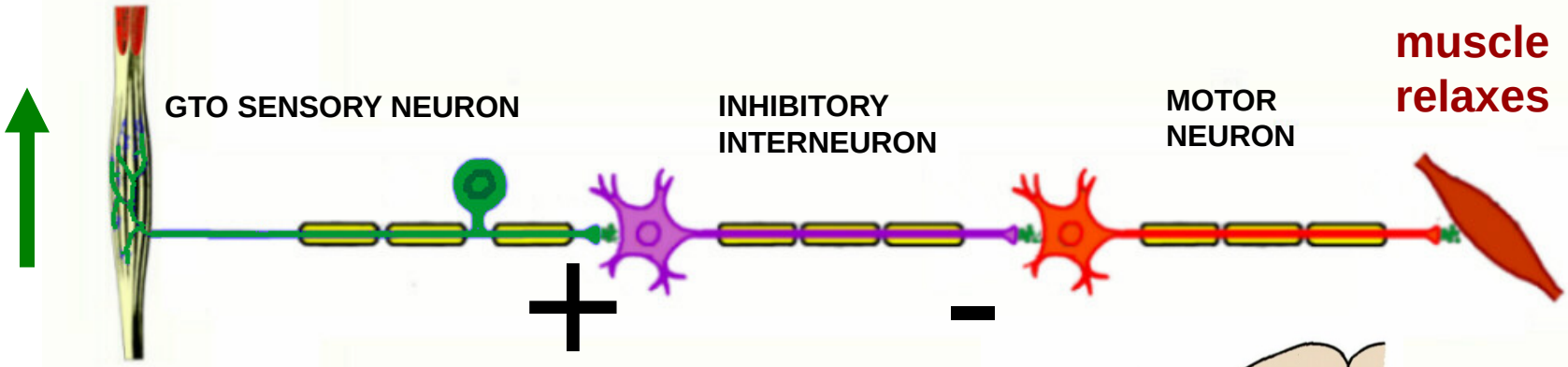




LOWER MOTOR NEURON = MOTOR NEURON THAT INNERVATES MUSCLE

UPPER MOTOR NEURON – NEURON IN CNS THAT CAN ACTIVATE OR INFLUENCE LOWER MOTOR NEURONS (ex. Corticospinal neurons in brain)

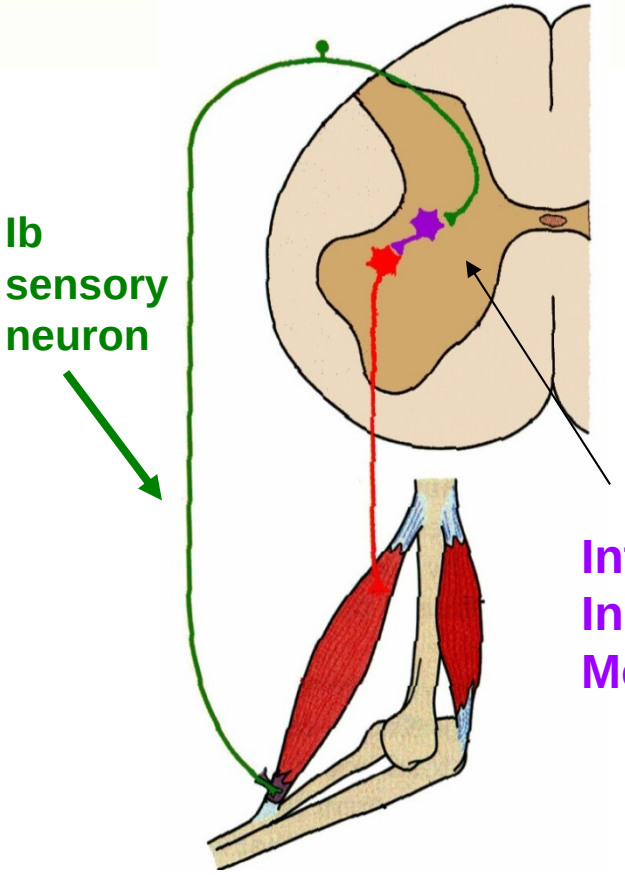
AUTOGENIC INHIBITION REFLEX: GOLGI TENDON ORGANS



PRIMARY RESPONSE
Synapses - polysynaptic

1) Ib sensory neuron (GTO) makes excitatory synapse onto interneuron
2) Interneuron makes inhibitory synapse onto motor neuron; Motor neuron decreases firing

Function of Autogenic inhibition - Regulating muscle tensions (protective, prevent damage to tendon)

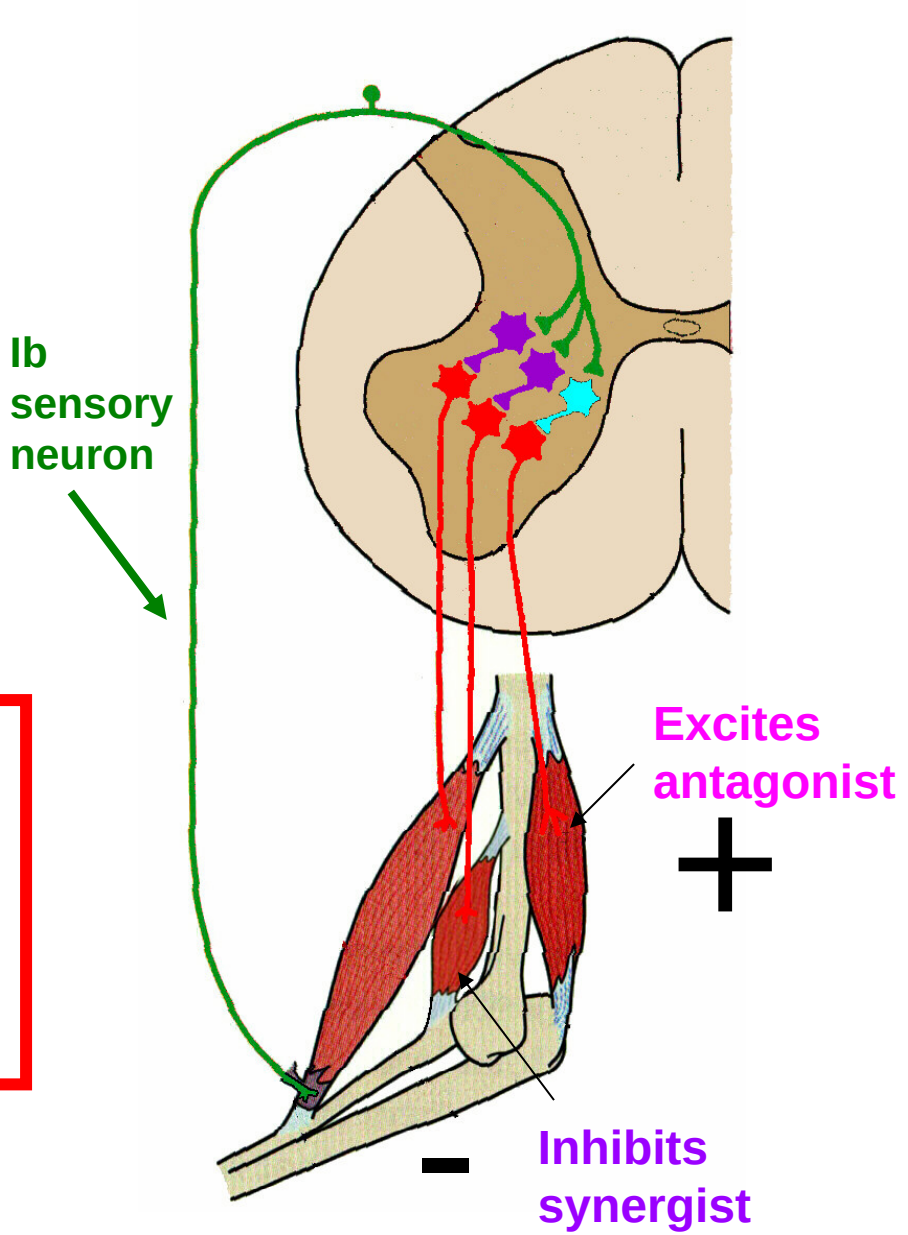


AUTOGENIC INHIBITION

Other effects

a. Inhibit synergist muscles
b. Excites antagonist muscles -

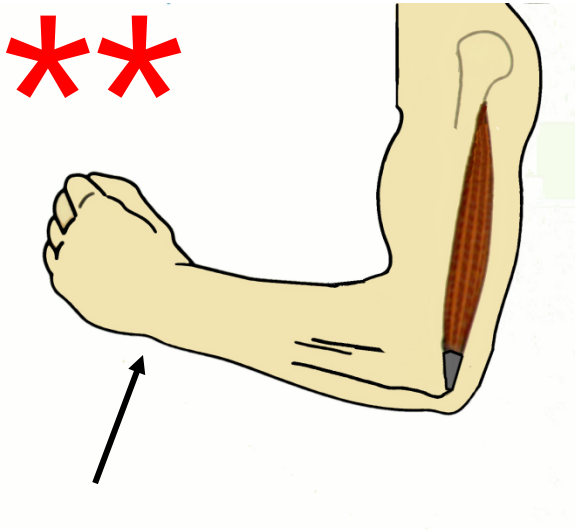
CLASPED KNIFE REFLEX: in Upper motor neuron lesions, tonus increases, resistance to stretch increases; if sufficient force is applied, limb resistance suddenly decreases (like pocket knife snapping shut)



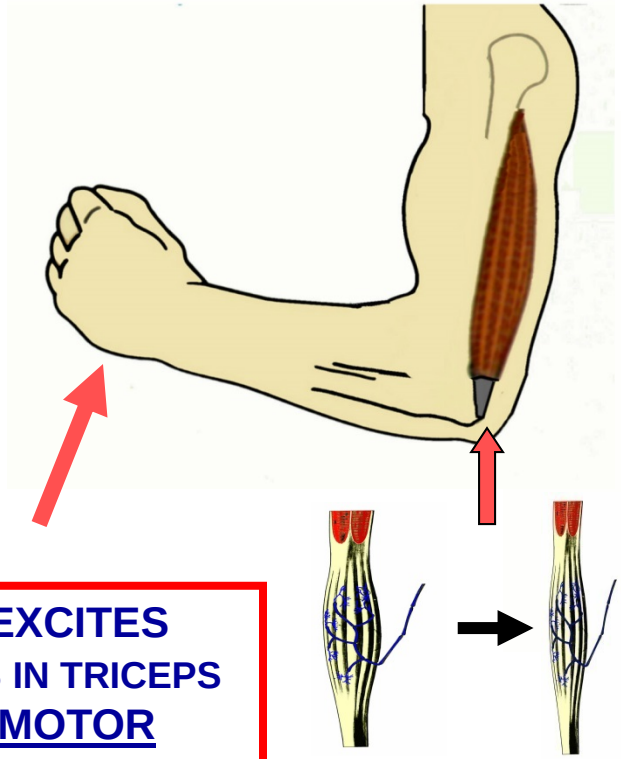
CLASPED KNIFE REFLEX: is an example of Autogenic inhibition.

It is elicited in patients with UMN lesions due to high tonus in muscle.

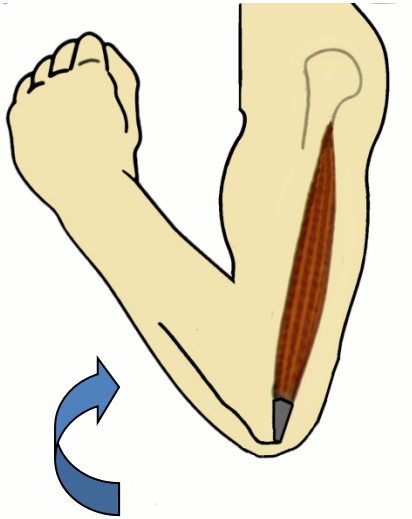
1) PHYSICIAN TRIES TO FLEX ELBOW JOINT OF PATIENT WITH UPPER MOTOR NEURON LESION



2) KEEP TRYING AND TENSION ON TRICEPS TENDON EXCITES GOLGI TENDON ORGANS



3) TRICEPS RELAXES AND RESISTANCE SUDDENLY DECREASES: ELBOW JOINT FLEXES



HIGH IMOSED FORCE EXCITES GOLGI TENDON ORGANS IN TRICEPS TENDON WHICH INHIBITS MOTOR NEURONS TO TRICEPS MUSCLE

ELBOW JOINT SNAPS SHUT LIKE A POCKET KNIFE = CLASPED KNIFE REFLEX

REFLEXES OF CRANIAL NERVES

REFLEXES OF CRANIAL NERVES

REFLEX	STIMULUS	SENSORY	RESPONSE	CLINICAL
Pupillary Light Reflex (II to III)	Test: Shine light in eye	Light detected by Optic Nerve	Excite Constrictor of pupil of eye (III Short Ciliary nerves (Ciliary Ganglion, parasympathetic)	Extensively used to check CN II; Absence of Pupillary Light Reflex can indicate catastrophe (brain herniation)
Corneal Reflex (V to VII)	Touch cornea of eye with cotton	Touch detected by Long Ciliary nerves (V1), Somatic sensory	Close eye (VII to Orbicularis Oculi muscle) Branchiomotor	Absence of Corneal Reflex; Test for damage to V1 sensory, VII motor
Gag Reflex (IX to X)	Test: Touch posterior tongue, oropharynx;	Excites Visceral Sensory endings in Glossopharyngeal N. (IX)	Excite muscles of pharynx, palate; Vagus N. (X), Branchiomotor	Other symptoms of Vagus damage (X); Patient Say's Ahh: soft palate not elevated on ipsilateral side (paralyze Levator Palati); uvula deviated away from side of lesion
Jaw Jerk Reflex Stretch (Deep Tendon) Reflex (V to V)	Test: tap down on mandible; Stretch muscles of mastication (ex. Masseter)	Excites Muscle Spindle sensory neurons in Trigeminal nerve (V)	Contract muscles that elevate mandible Motor - V3	Hyporeflexia - indicates Trigeminal nerve damage

1. PUPILLARY LIGHT REFLEX - II TO III

AFFERENT ARM OF REFLEX

SENSORY STIMULUS

LIGHT IN EYE

EFFERENT ARM OF REFLEX

MOTOR RESPONSE

CONSTRICT PUPIL

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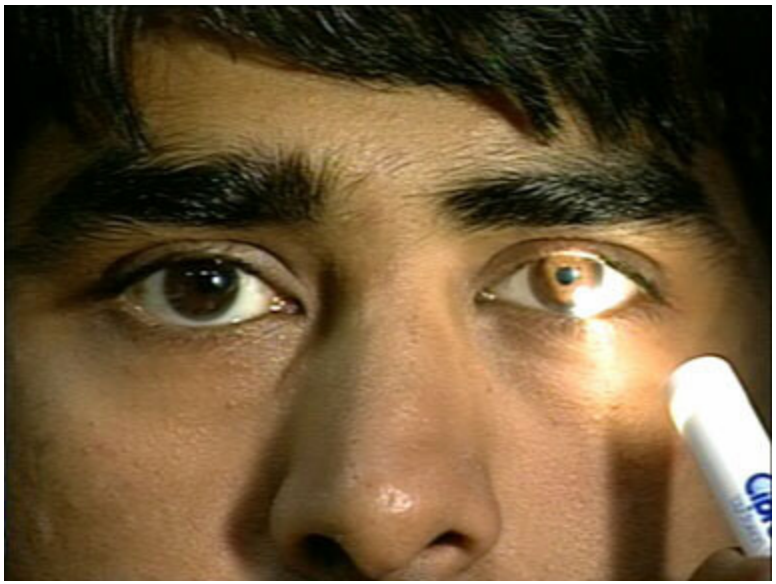
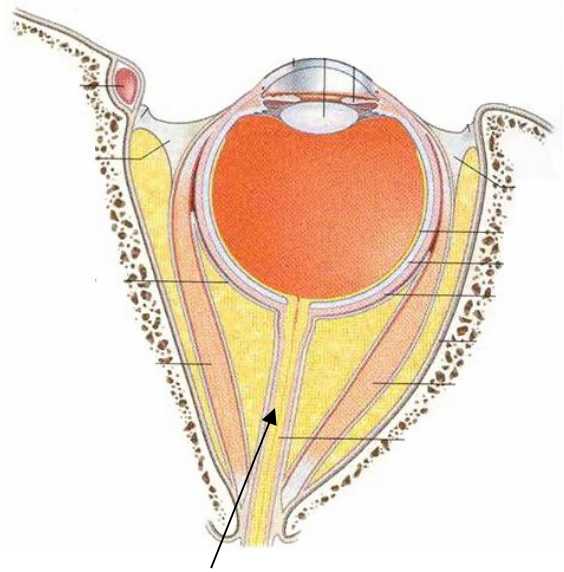


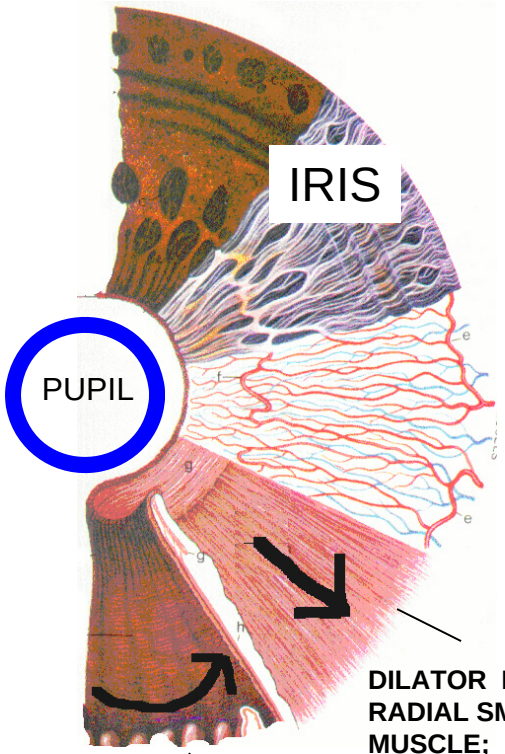
PUPILLARY LIGHT REFLEX

CN II - OPTIC NERVE - DETECTS LIGHT

CN III - OCULOMOTOR - parasympathetics from Ciliary Ganglion in Short Ciliary nerves

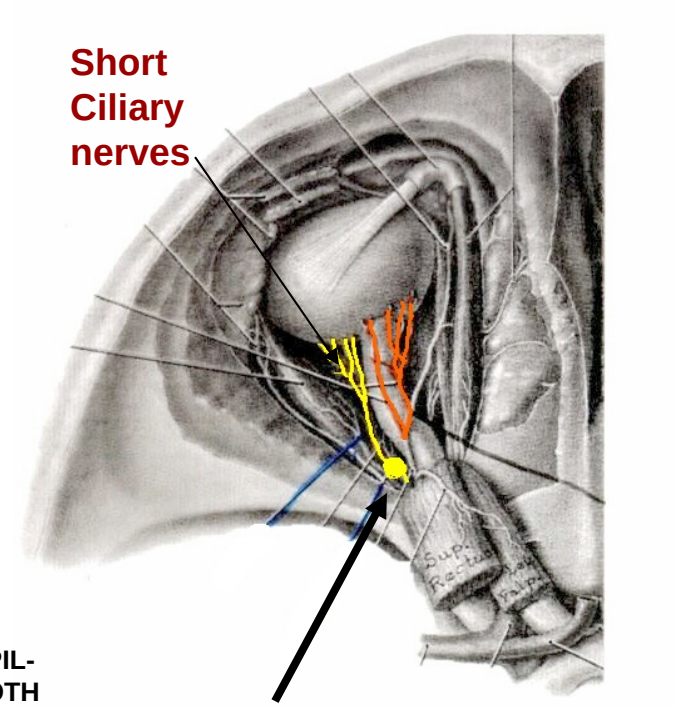


OPTIC NERVE - CN II VISION



DILATOR PUPIL- RADIAL SMOOTH MUSCLE; SYMPATHETICS

CONSTRICTOR PUPIL- CIRCULAR SMOOTH MUSCLE; PARASYMPATHETICS - CN III



Ciliary Ganglion of CN III

PUPILLARY LIGHT REFLEX

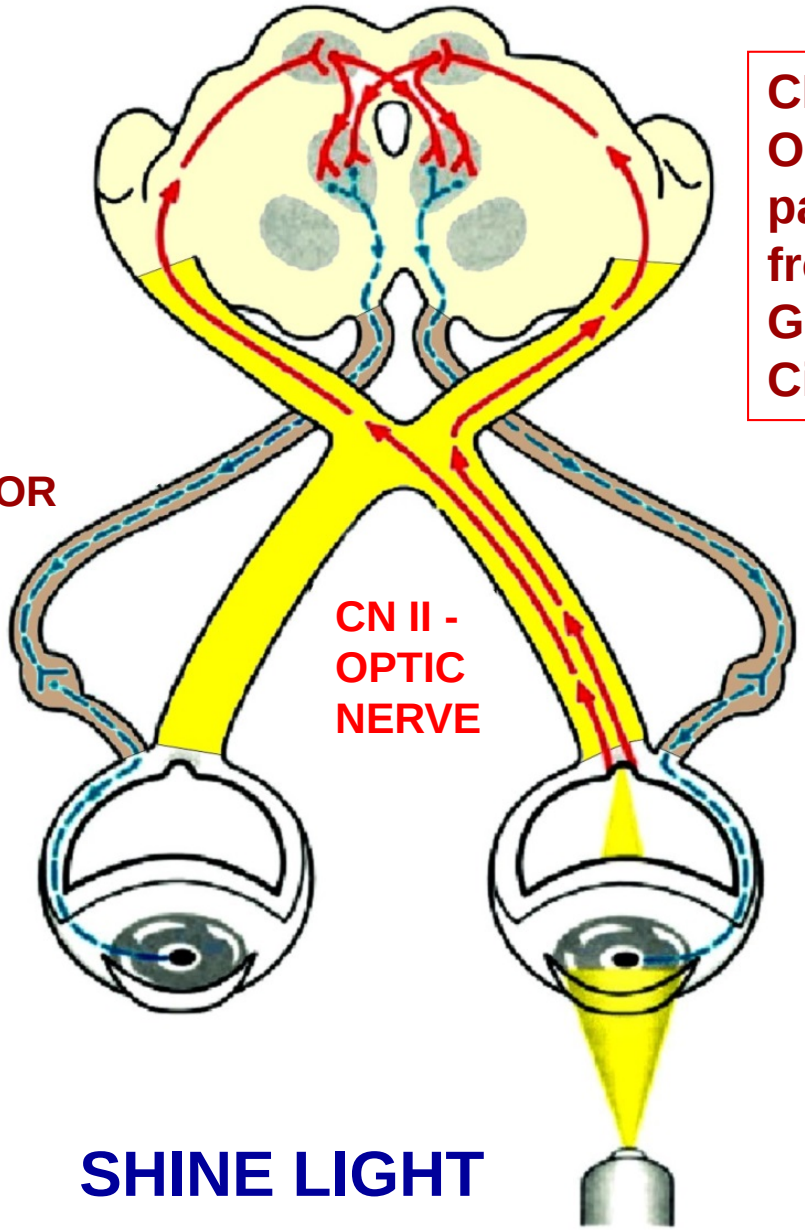
CN II - OPTIC NERVE - DETECTS LIGHT

CN III - OCULOMOTOR - parasympathetics from Ciliary Ganglion in Short Ciliary nerves

CN III - OCULOMOTOR

CN III - OCULOMOTOR

CN II - OPTIC NERVE



CONSENSUAL REFLEX – PUPIL CONSTRICTS IN OPPOSITE EYE

DIRECT REFLEX – PUPIL CONSTRICTS IN SAME EYE

SHINE LIGHT

2. CORNEAL REFLEX - V TO VII

AFFERENT ARM OF REFLEX

SENSORY STIMULUS

TOUCH CORNEA

TRIGEMINAL - V1 - LONG CILIARY NERVES TO CORNEA

EFFERENT ARM OF REFLEX

MOTOR RESPONSE

CLOSE EYELID

FACIAL - VII - MOTOR TO ORBICULARIS OCULI (SVE)

CORNEAL REFLEX - V to VII

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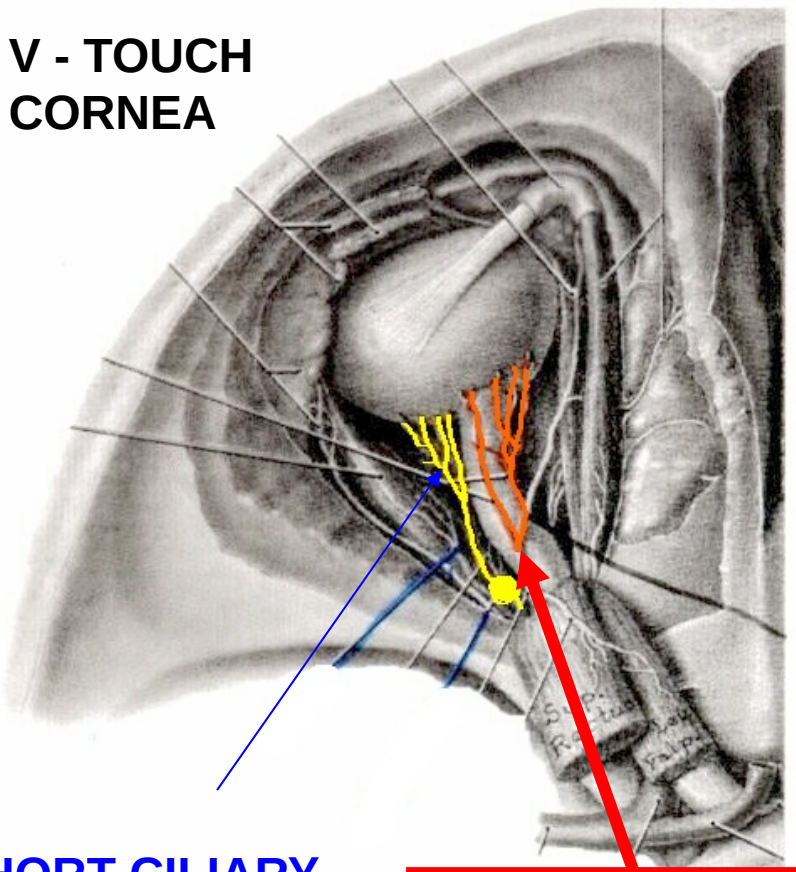
V - TOUCH CORNEA



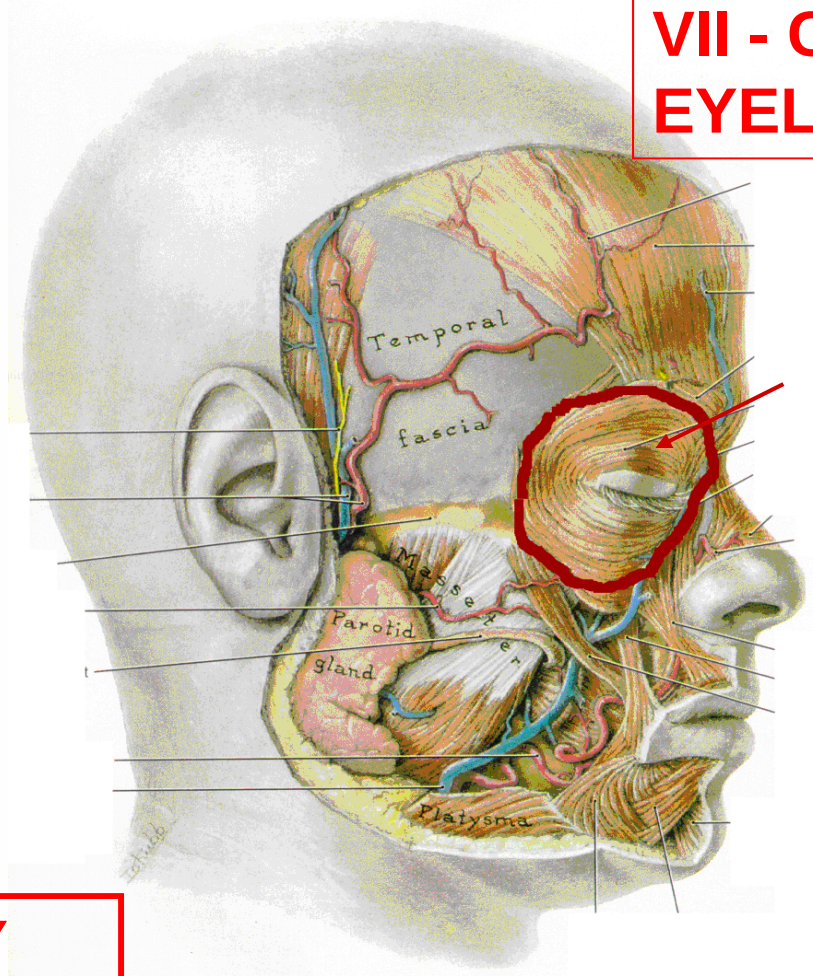
SHORT CILIARY NERVES (III),

CILIARY GANGLION

PARASYMPATHETIC

LONG CILIARY NERVES (V1) - SOMATIC SENSORY TO CORNEA

VII - CLOSE EYELID



ORBICU-LARIS OCULI M.

- Palpebral part - Close eyelids
- Orbital part - Buries eyelids, Ex. sandstorm
BRANCHIOMOTOR - VII

GAG REFLEX - IX to X

GO OVER NEXT BLOCK

AFFERENT ARM OF REFLEX

SENSORY STIMULUS

TOUCH ORO-PHARYNX

EFFERENT ARM OF REFLEX

MOTOR RESPONSE

PATIENT GAGS - CONTRACT PHARYNGEAL MUSCLES

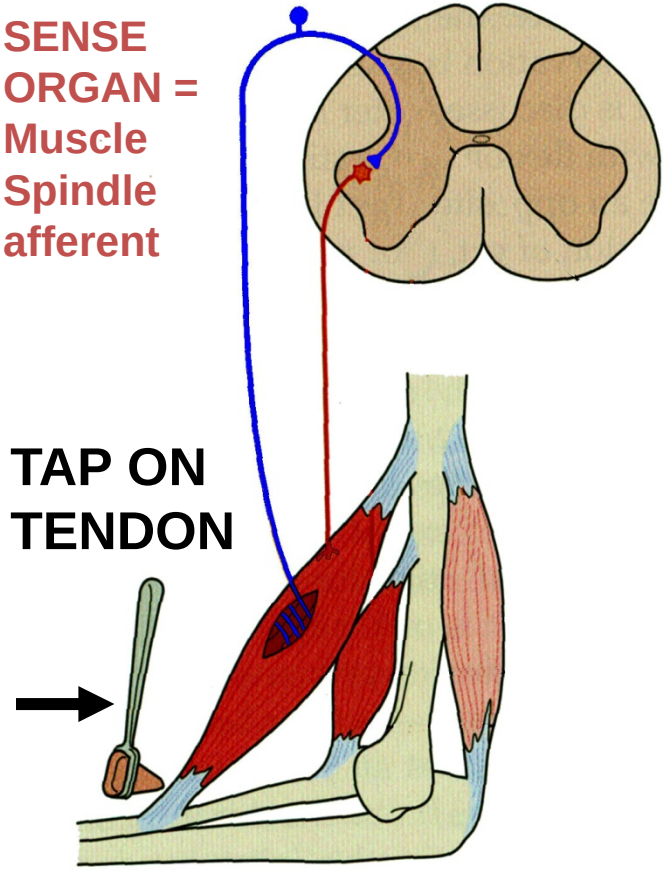
STRETCH REFLEX OF MUSCLES OF MASTICATION - JAW JERK REFLEX - sensory and motor in Trigeminal V3

GO OVER NEXT BLOCK

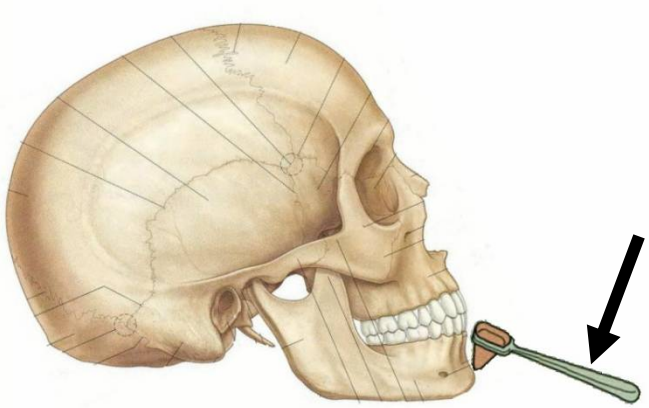
STRETCH REFLEX

SENSE ORGAN = Muscle Spindle afferent

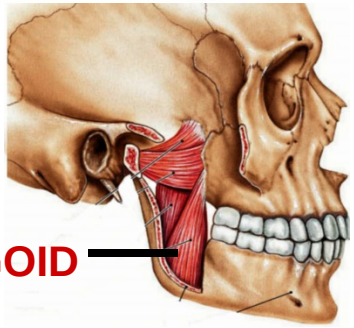
TAP ON TENDON



TAP DOWN ON CHIN

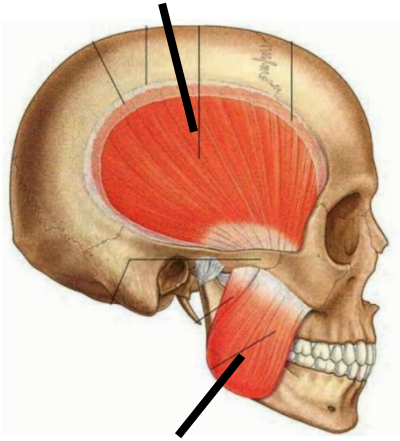


MEDIAL PTERYGOID



STRETCH MUSCLES THAT CLOSE MOUTH (ELEVATE MANDIBLE)

TEMPORALIS



MASSETER

DISCUSSION SESSION: GROSS ANATOMY

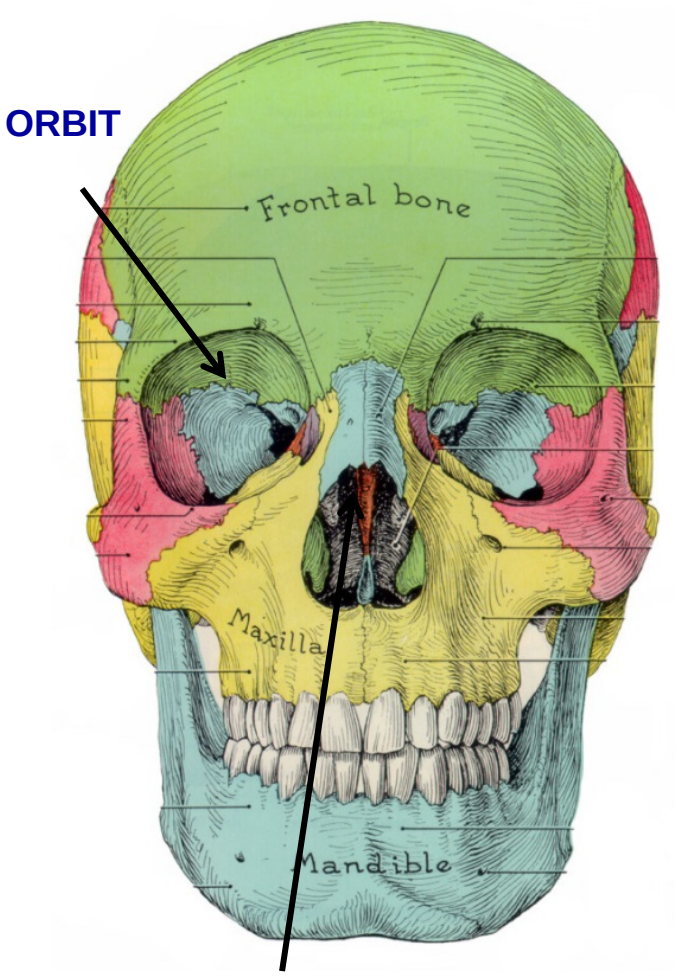
ONN BLOCK

Discuss Nasal Cavity
Note: Nasal Cavity part 2 will be discussed later in the ONN block

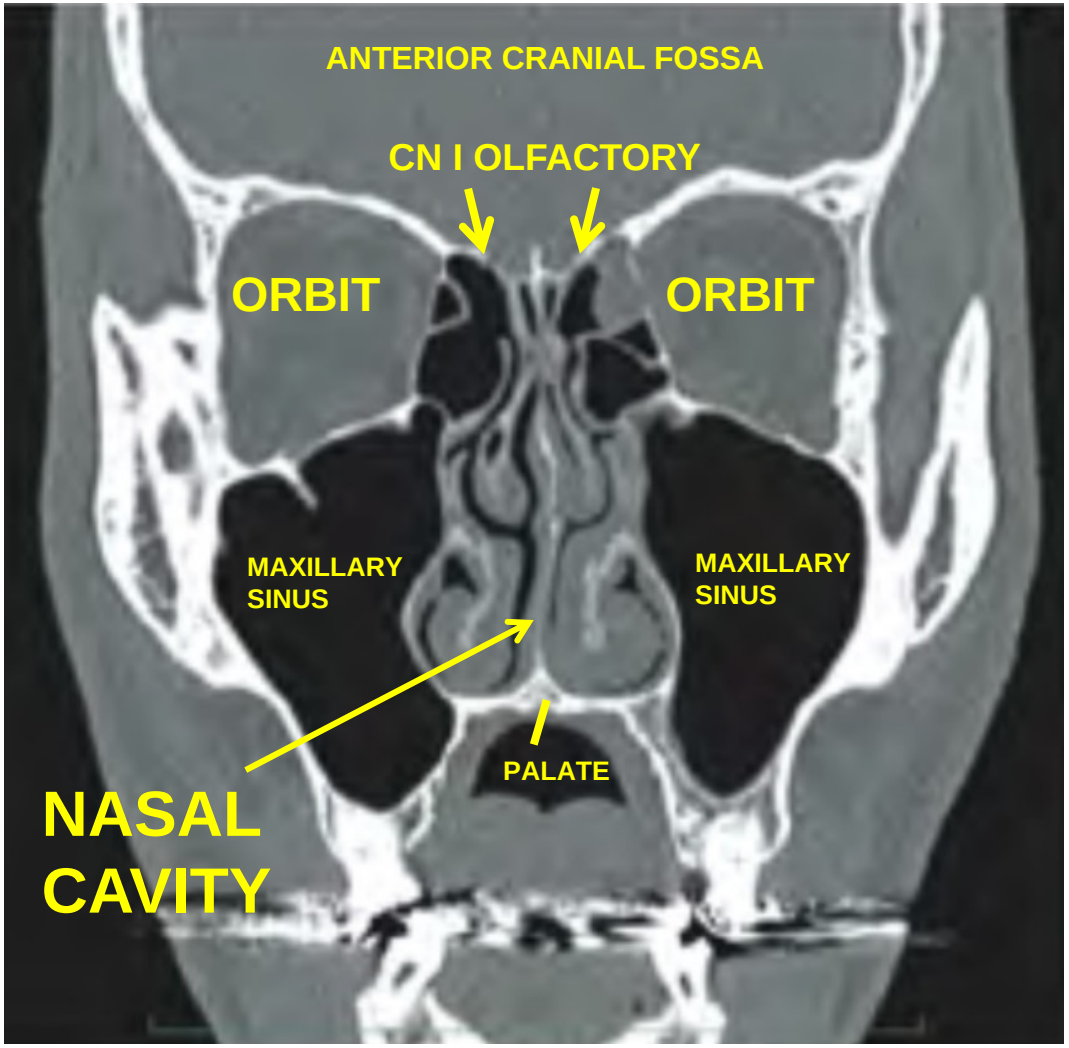
NASAL CAVITY

Bones and fractures
Identification of sinuses CT prosections
Nerves in sinuses
Innervation/Blood Supply to Nasal Cavity
Palatine tonsils (nerves/blood supply)

NASAL CAVITY – STRUCTURE COMPLEX – AIR SINUSES OPEN TO NASAL CAVITY, NERVES , ARTERIES FROM DIVERSE SOURCES (EX. ORBIT, CRANIAL CAVITY (ANTERIOR CRANIAL FOSSA)



NASAL CAVITY



CT – bones are white; air is black

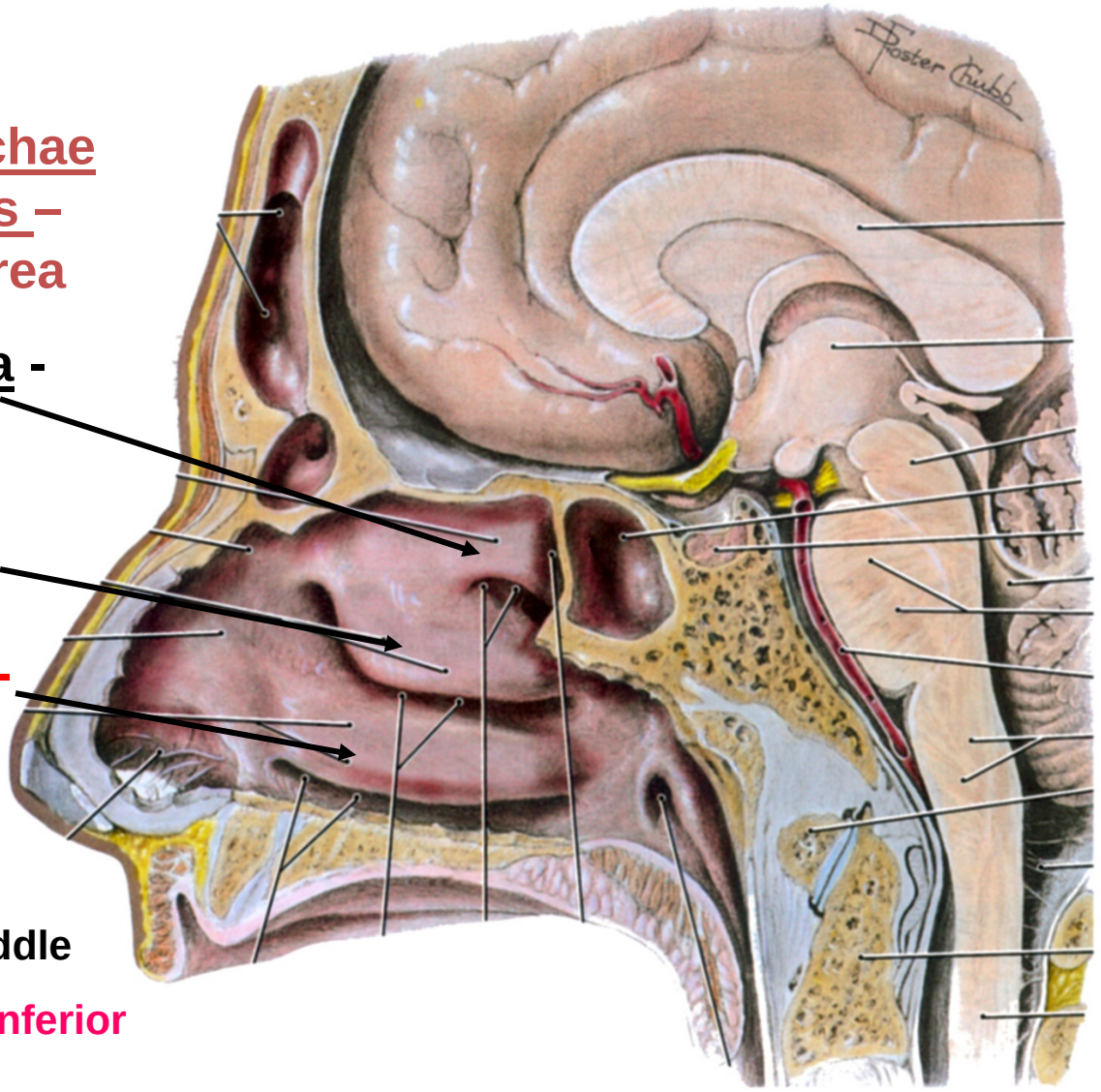
LATERAL WALL OF NASAL CAVITY

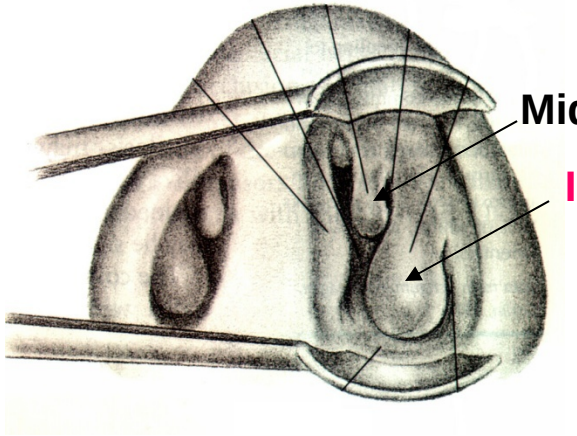
Projections = Conchae (shell) or turbinates – increase surface area

1) Superior Concha - Ethmoid

2) Middle Concha - Ethmoid

3) Inferior Concha - separate bone





In nasal speculum view,
See only Middle and Inferior Conchae (Turbinates)

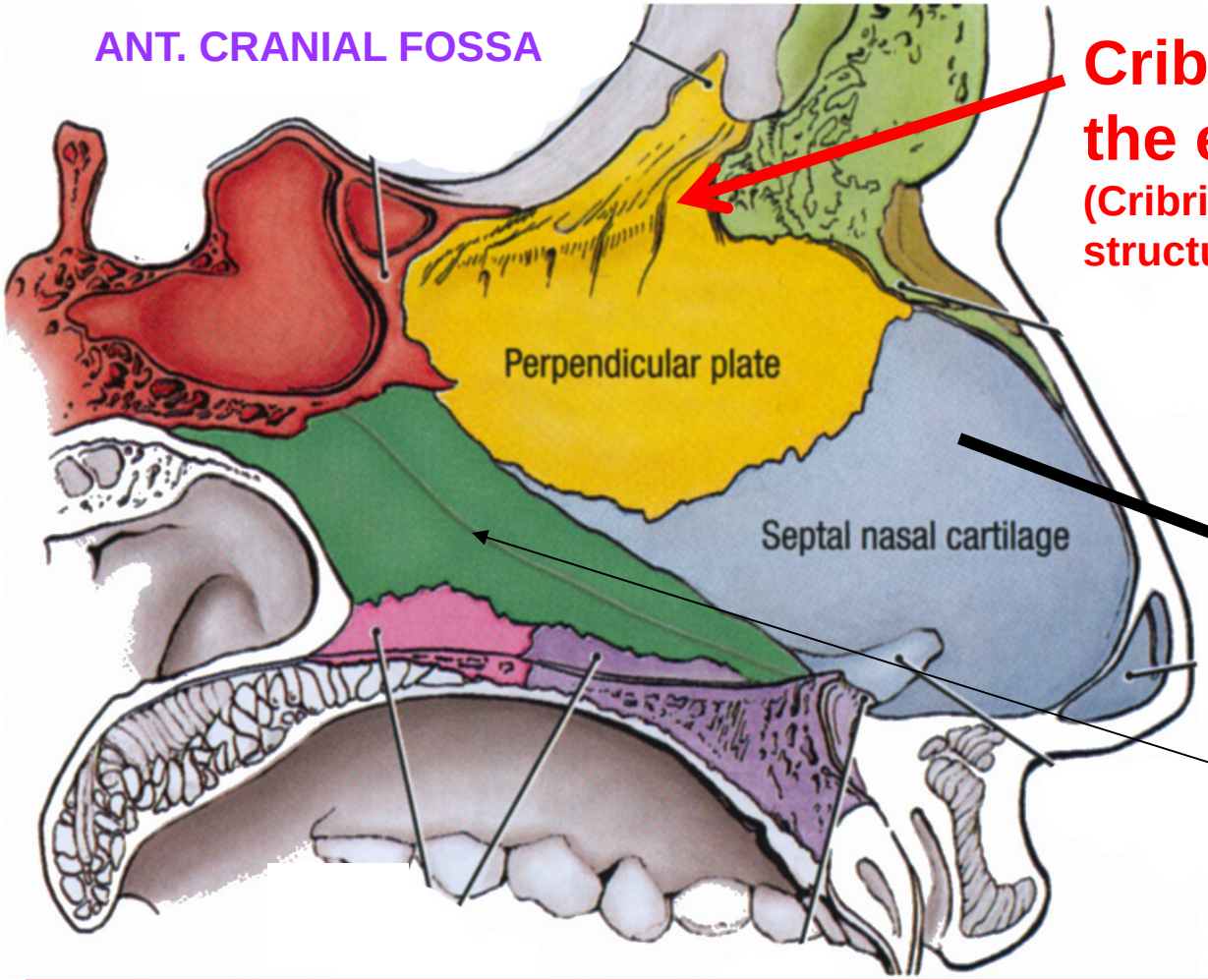
PRACTICE QUESTION CLINICAL VIGNETTE

A 19 year old suffers a violent blow to the nose during a fist fight. Over the following week, the person notices that a clear fluid persists in dripping from the nose and goes to the local hospital emergency room. The physician orders a CT scan and finds a defect (arrow in image) in the floor of anterior cranial fossa. This defect is likely a fracture of which of the following bones?

A. Maxillary bone
B. Vomer
C. Horizontal process of the frontal bone
D. Greater wing of the sphenoid bone
E. Cribriform plate of the ethmoid bone

WHAT IS THE CLEAR FLUID?

MEDIAL WALL OF NASAL CAVITY = NASAL SEPTUM

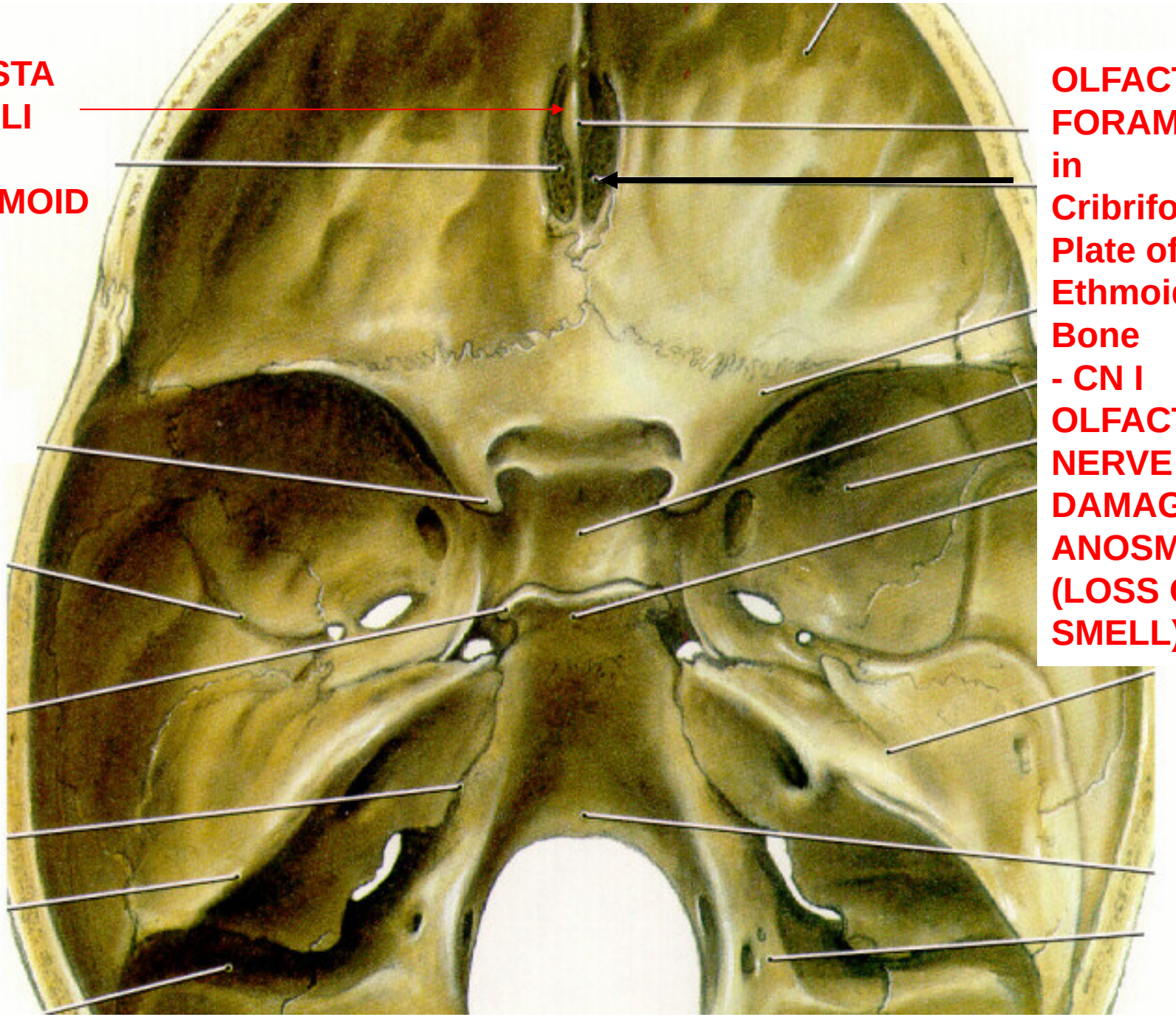


Cribriform plate of the ethmoid bone
(Cribriform; definition = structure with numerous holes)

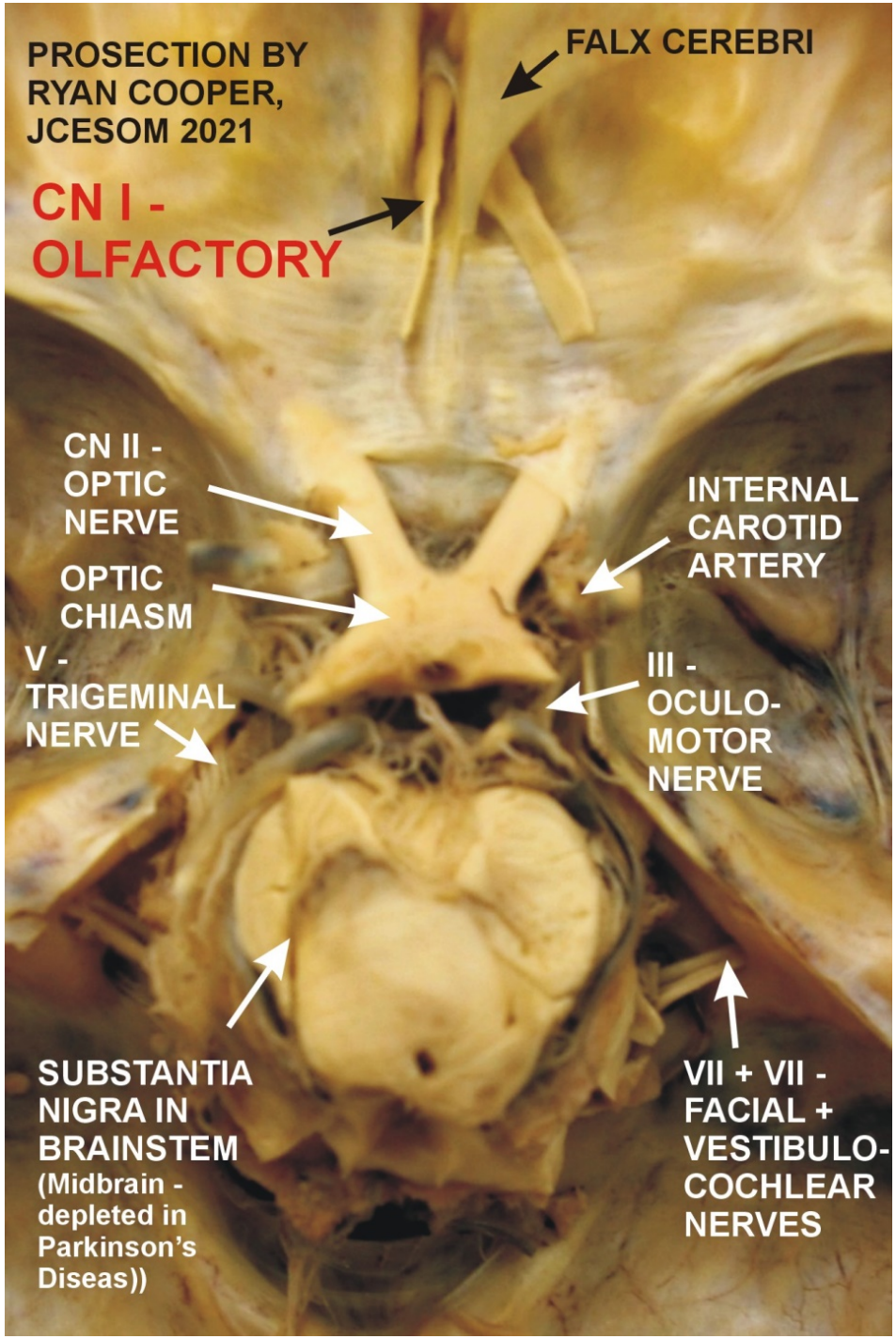
Nasal Septum
1) Septal Cartilage
2) Ethmoid (Perpendicular Plate)
3) Vomer

**

CLINICAL – Fracture of nose can break Cribriform plate, floor of Ant. Cranial fossa - leak CSF from nose; can result in Meningitis


CRISTA GALLI OF ETHMOID
OLFACTORY FORAMINA – in Cribriform Plate of Ethmoid Bone - CN I OLFACTORY NERVE DAMAGE - ANOSMIA (LOSS OF SMELL)

PROSECTION 77 - BRAINSTEM IN CRANIAL CAVITY



NERVES of NASAL CAVITY

Nerves

1. Olfactory N. - SMELL Olfactory Area

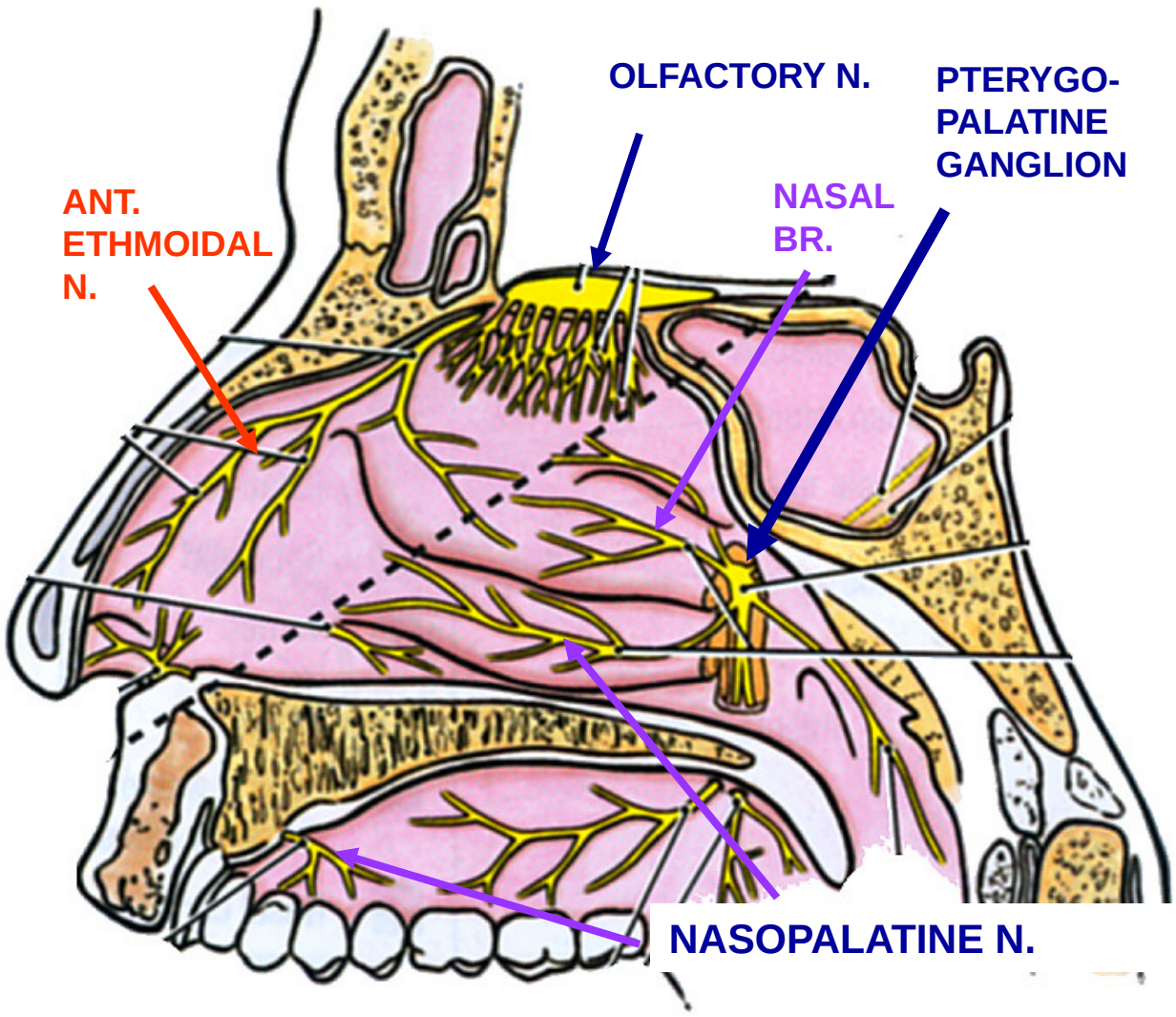
2. General Sensation -

ALL SOMATIC SENSORY touch, pain, etc.

V1 + V2 *

- V1 Anterior Ethmoidal N.
- V2 Nasal Branches
- V2 Nasopalatine N.

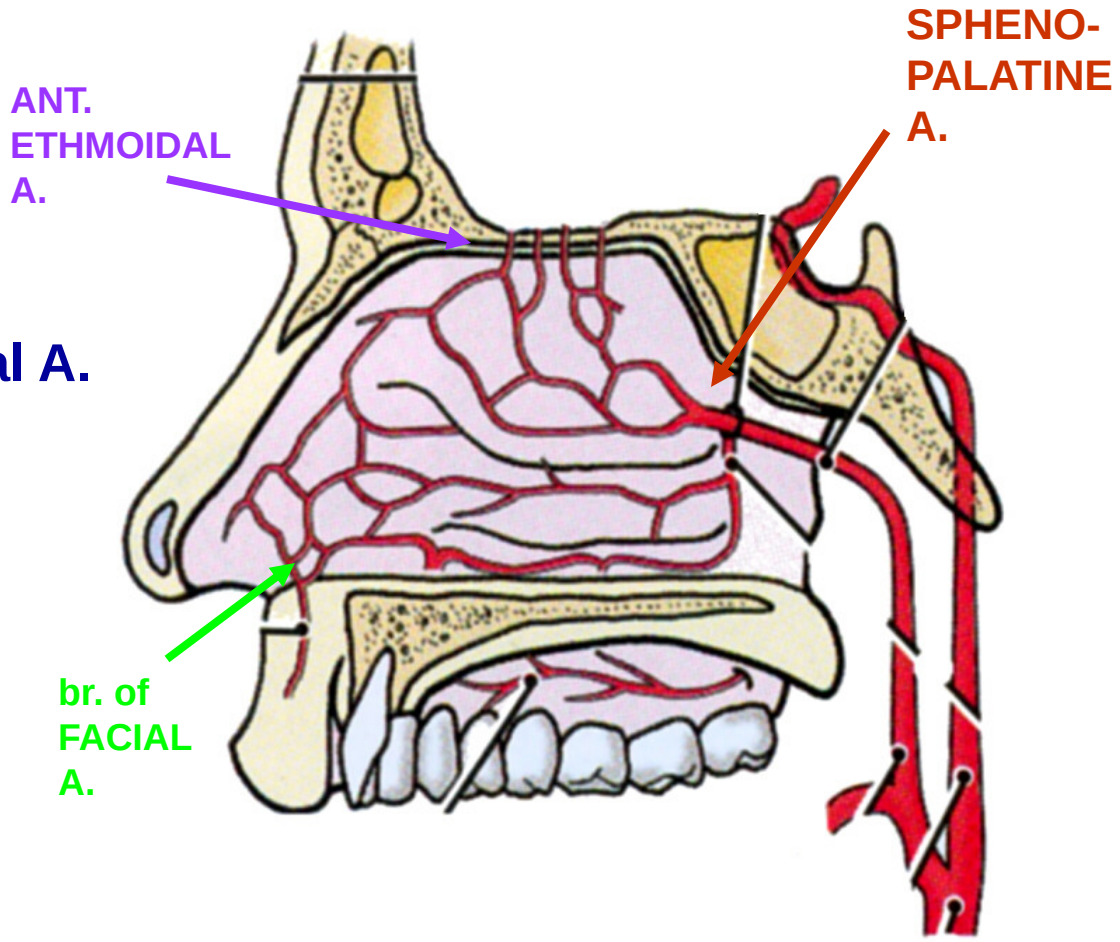
3. Mucous Glands of nose - VISCERAL MOTOR PARASYMP. - VII - Facial N. by Pterygopalatine Ganglion *



ARTERIES/VEINS OF NASAL CAVITY

1. <u>Arteries</u>
a. Sphenopalatine Artery
- from Maxillary A.
b. Ant. and Post Ethmoidal A.
- from Ophthalmic A.
c. Branches of Facial A.

2. <u>Veins</u>
a. Ethmoidal vein
drain to Ophthalmic v.
b. Other branches to
Pterygoid Venous Plexus
c. Facial Vein



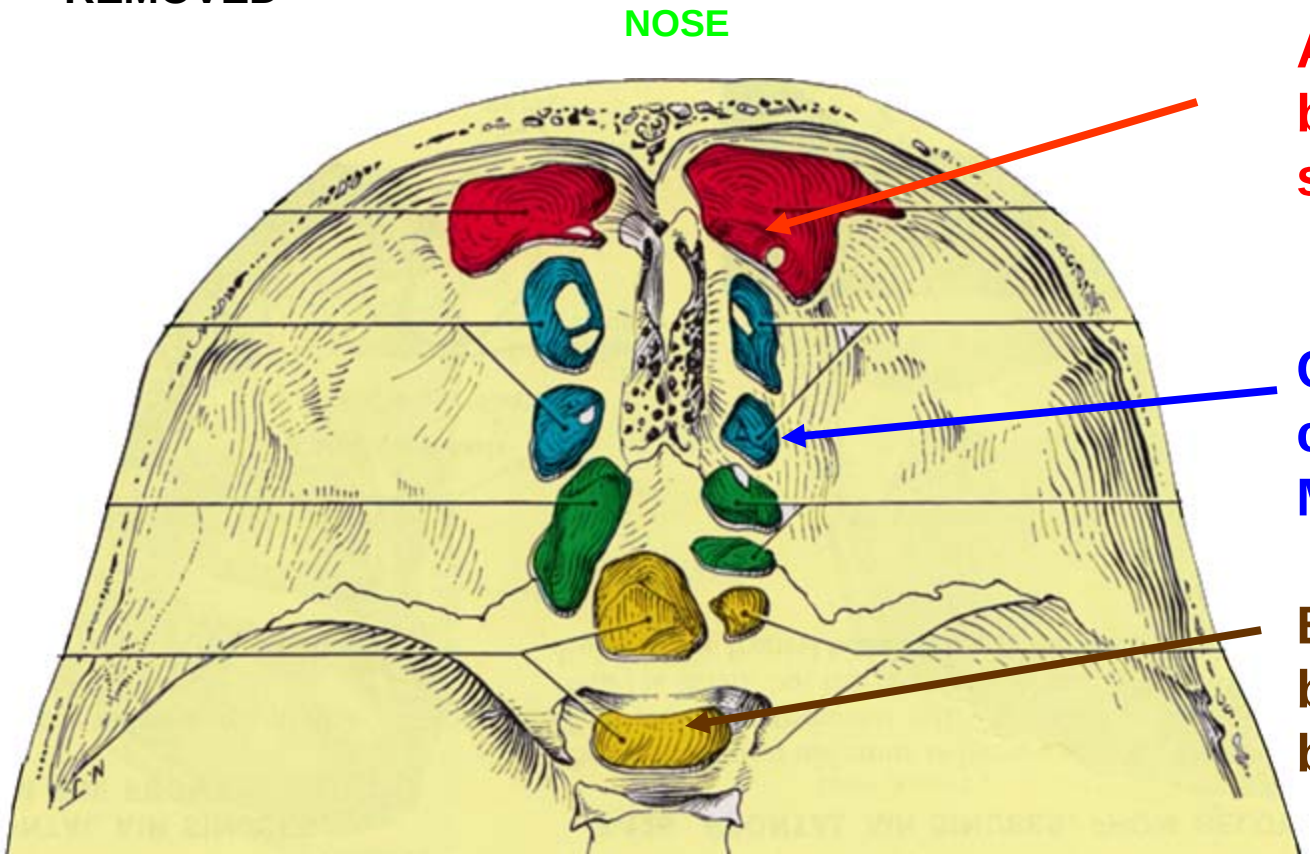
**

Note: Epistaxis (nosebleed) can be extensive due to Anastomoses – Spurting if arterial

PARANASAL AIR SINUSES

VIEW: FLOOR OF ANT. CRAN. FOSSA WITH BONE REMOVED

All usually paired



A. Frontal - separate by septum, variable size

C. Ethmoid- also called air cells (Ant., Mid., Post.)

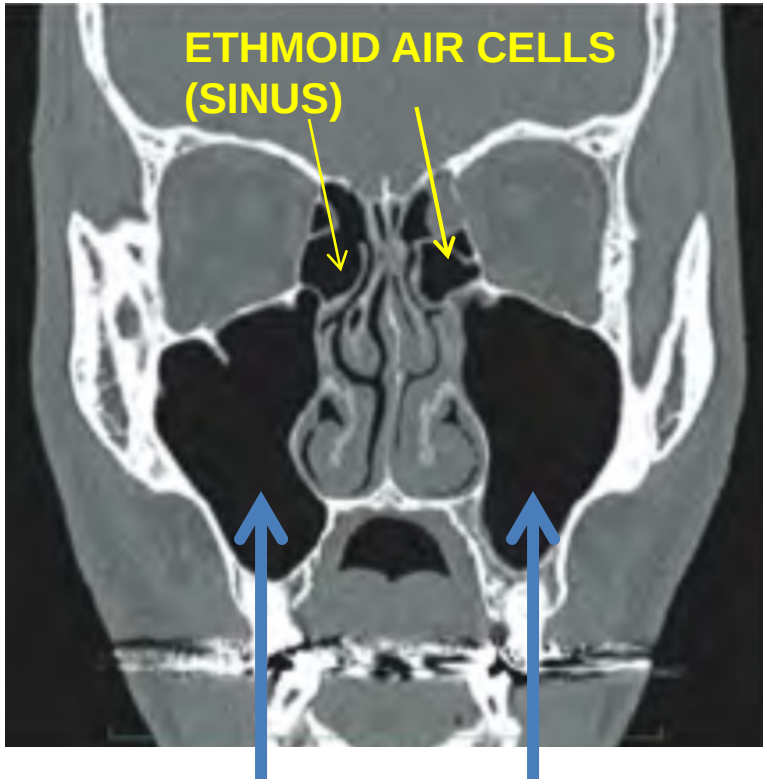
B. Sphenoid - in body of Sphenoid bone

*

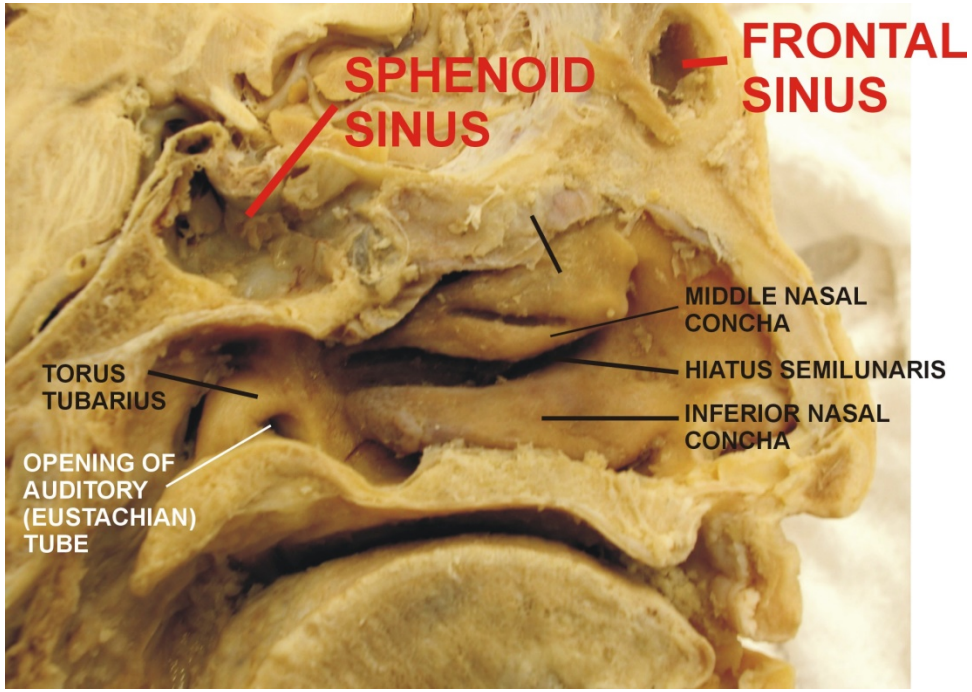
Ethmoid - Blocked Sinus Infection Can Spread to Orbit

SINUSES ON CT AND PROSECTION PICTURES

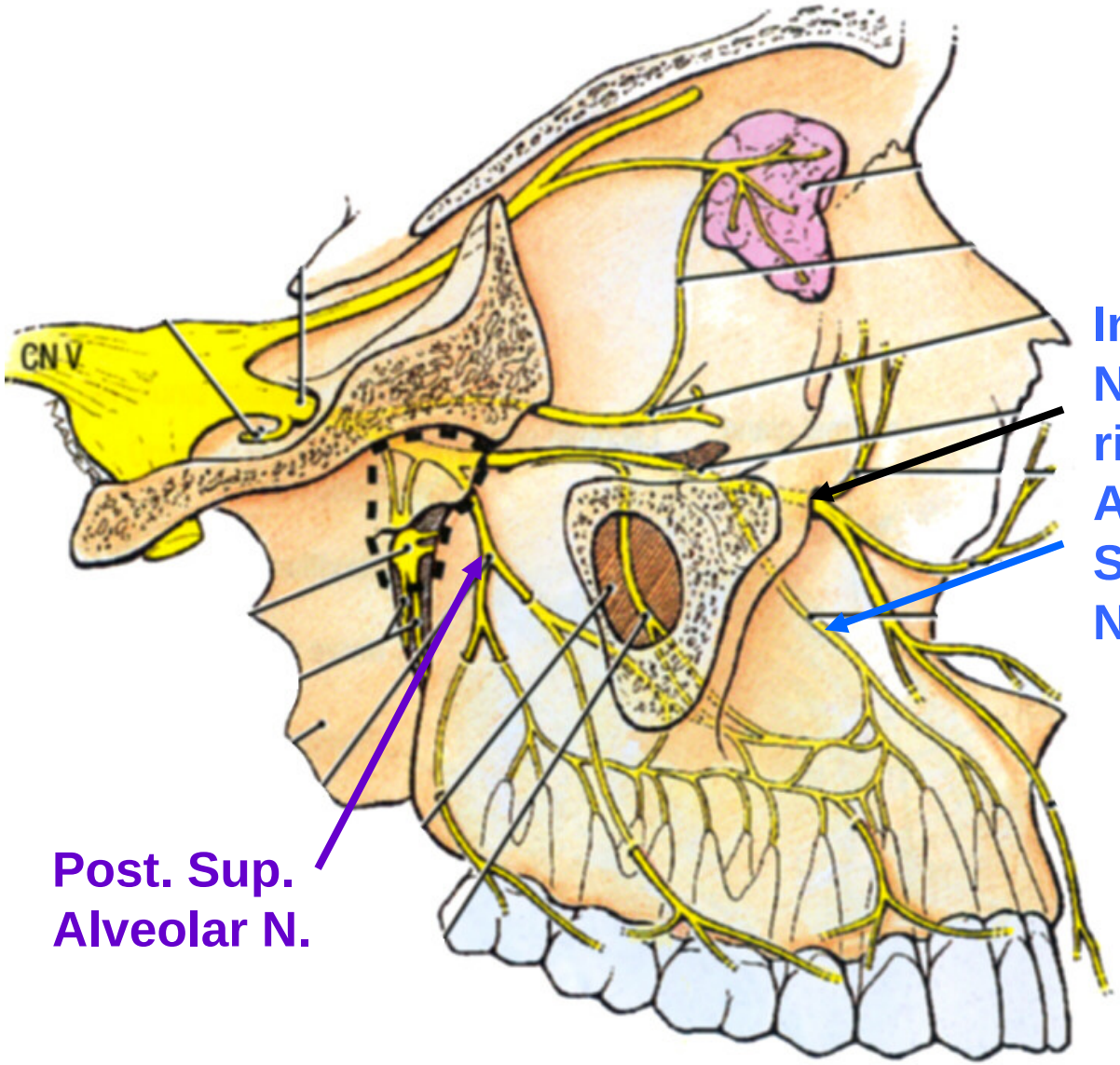
CT IN CORONAL PLANE



PROSECTION 75 – NASAL CAVITY



PARANASAL AIR SINUSES: NERVES



Infraorbital N. - gives rise to Ant. Sup Alveolar N.

Post. Sup. Alveolar N.

* *

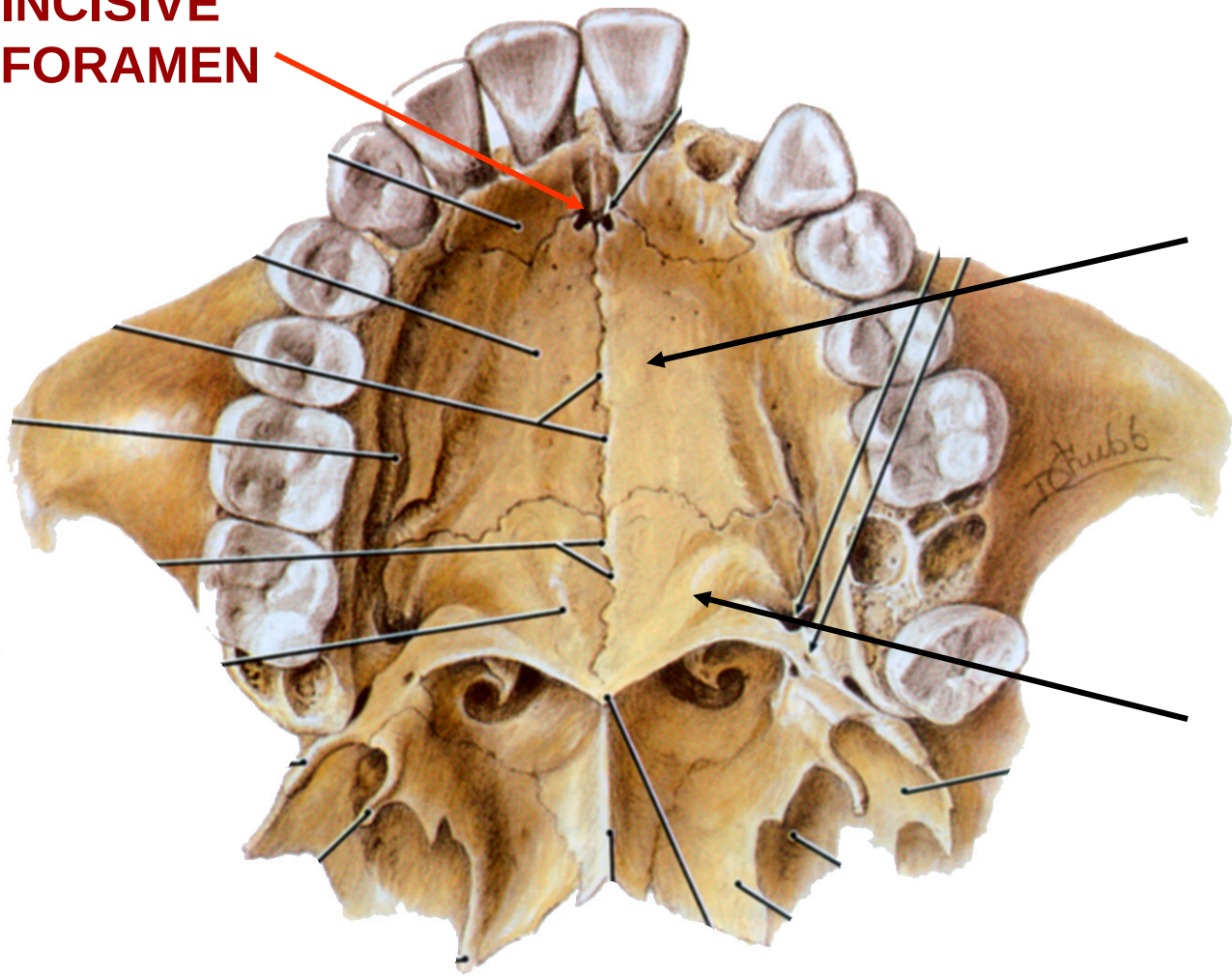
V2 - Ant. & **Post.** Sup. Alveolar N. supply Max Sinus & Teeth;
(Infected MAXILLARY sinus can feel like a tooth ache)

PRACTICE QUESTION CLINICAL VIGNETTE

A young boy is brought to a physician working in a field hospital. The mother of the boy says he has difficulty swallowing and that food is expelled through the nasal cavity. Upon examination, the physician finds a large defect in the hard and soft palates (photo above) and suspects that the child developed with a Posterior Cleft palate. Failure of fusion of which of the following structures produces a Posterior Cleft Palate?

a) medial nasal and maxillary process
b) maxillary processes of each side
c) lateral nasal process and maxillary processes d) medial and lateral nasal processes
e) lateral nasal process of each side

PALATE ANATOMY



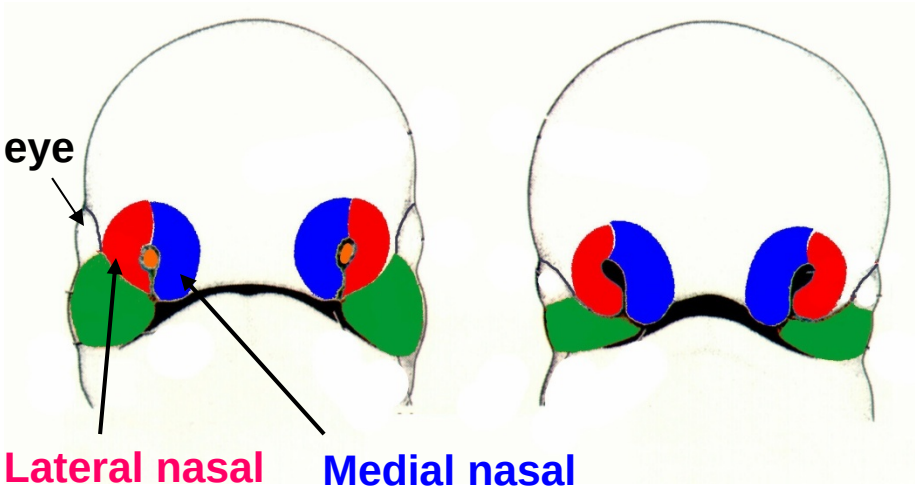
B. Anatomy

Hard Palate
a. Maxillary Bones (palatine process)

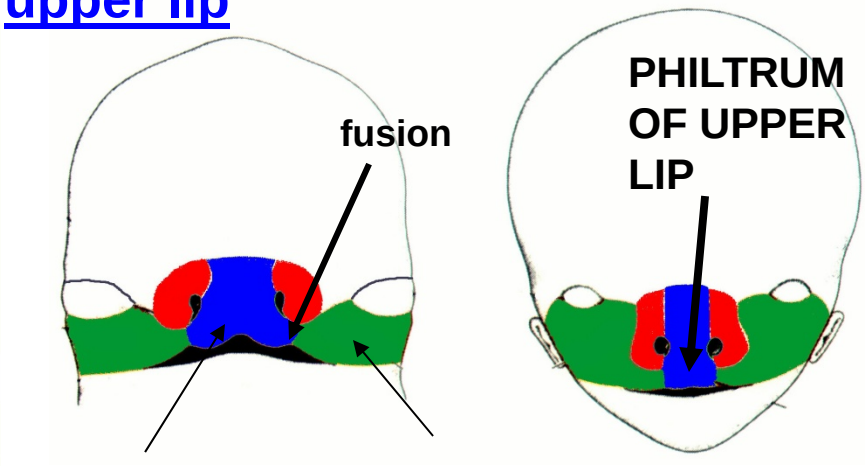
b. Palatine bones (horizontal plate)

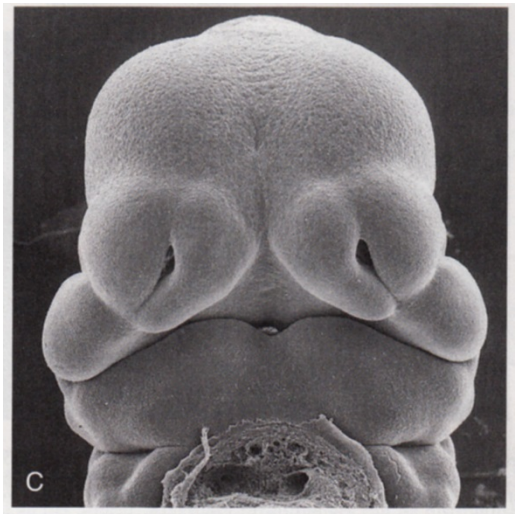
DEVELOPMENT OF FACE

2. Medial and Lateral Nasal Processes – form at margins of nasal placodes



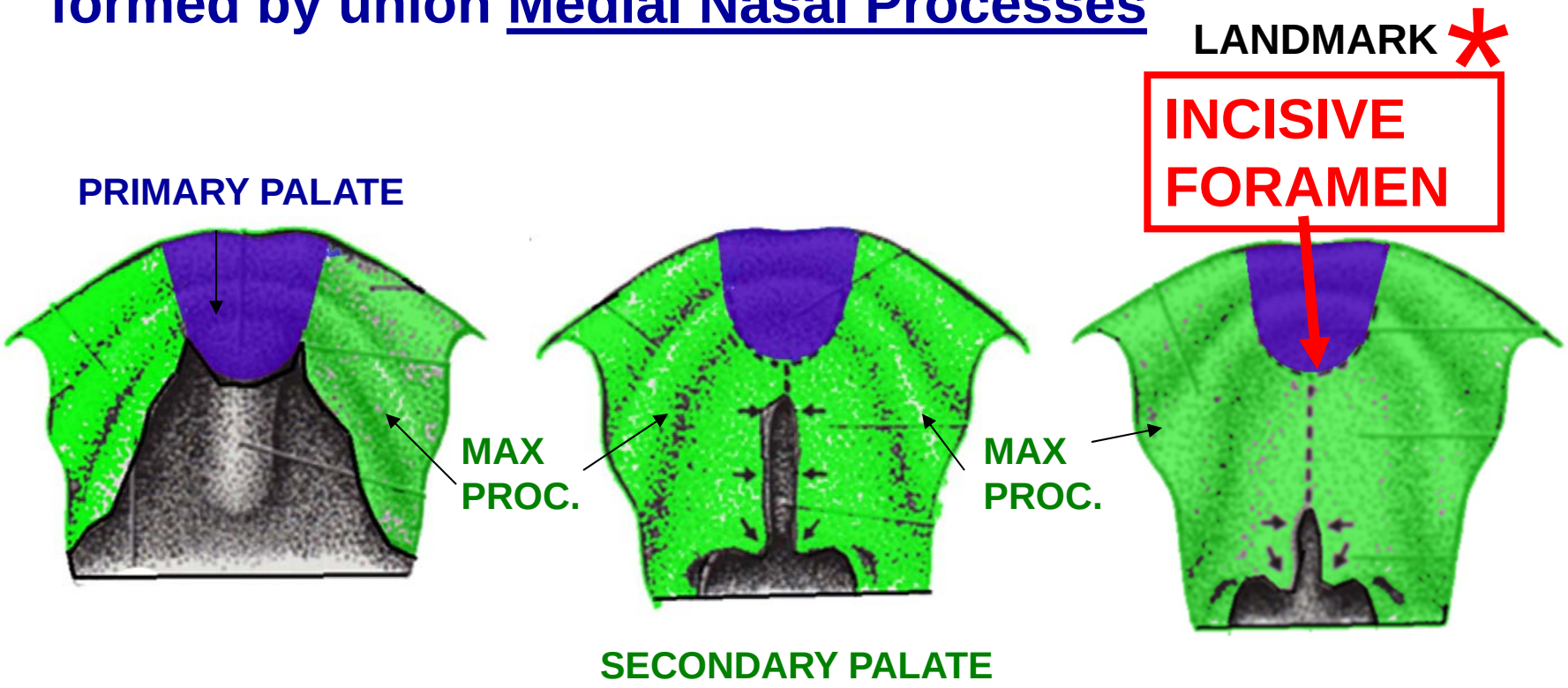
3. Medial nasal process and Maxillary Process – fuse to form upper lip





PALATE DEVELOPMENT

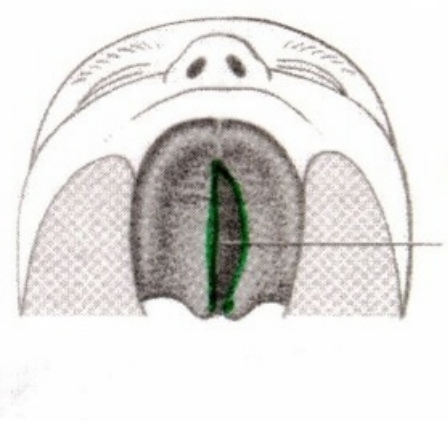
a. Primary Palate – Anterior to Incisive Foramen formed by union Medial Nasal Processes



b. Secondary Palate – Posterior to Incisive Foramen- formed by fusion of Maxillary processes

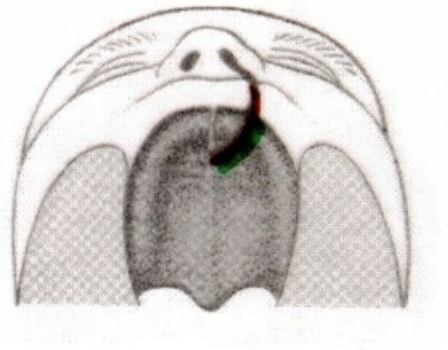
MALFORMATIONS: CLEFT PALATE

2) Posterior Cleft Palate - Not fuse Secondary palate (not fuse Maxillary Processes each side) *



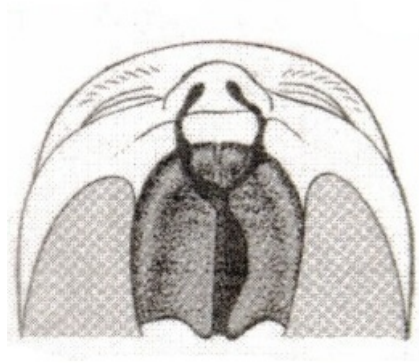
1:2500 births

1) Anterior Cleft Palate - Not fuse Medial Nasal Process and Maxillary Process *



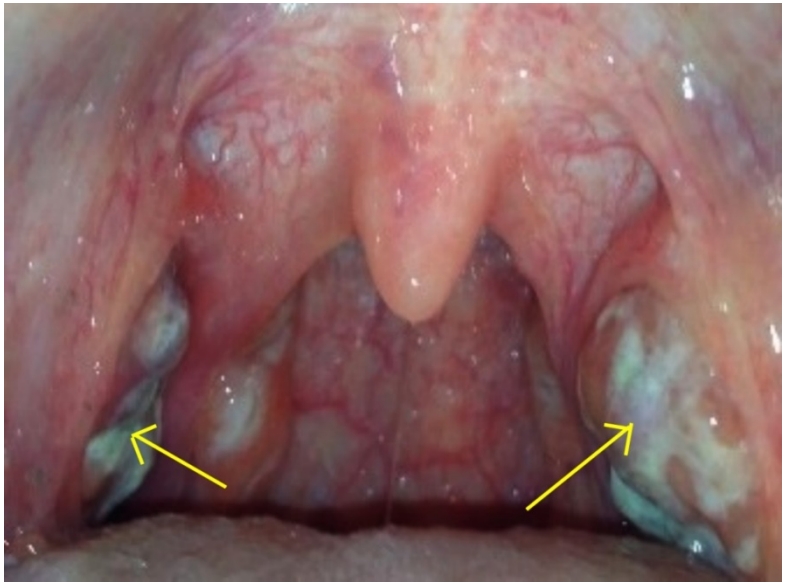
1:1000 Births

Can be unilateral or bilateral



Note: Ant. Cleft Palate is same as Cleft Lip

PRACTICE QUESTION CLINICAL VIGNETTE

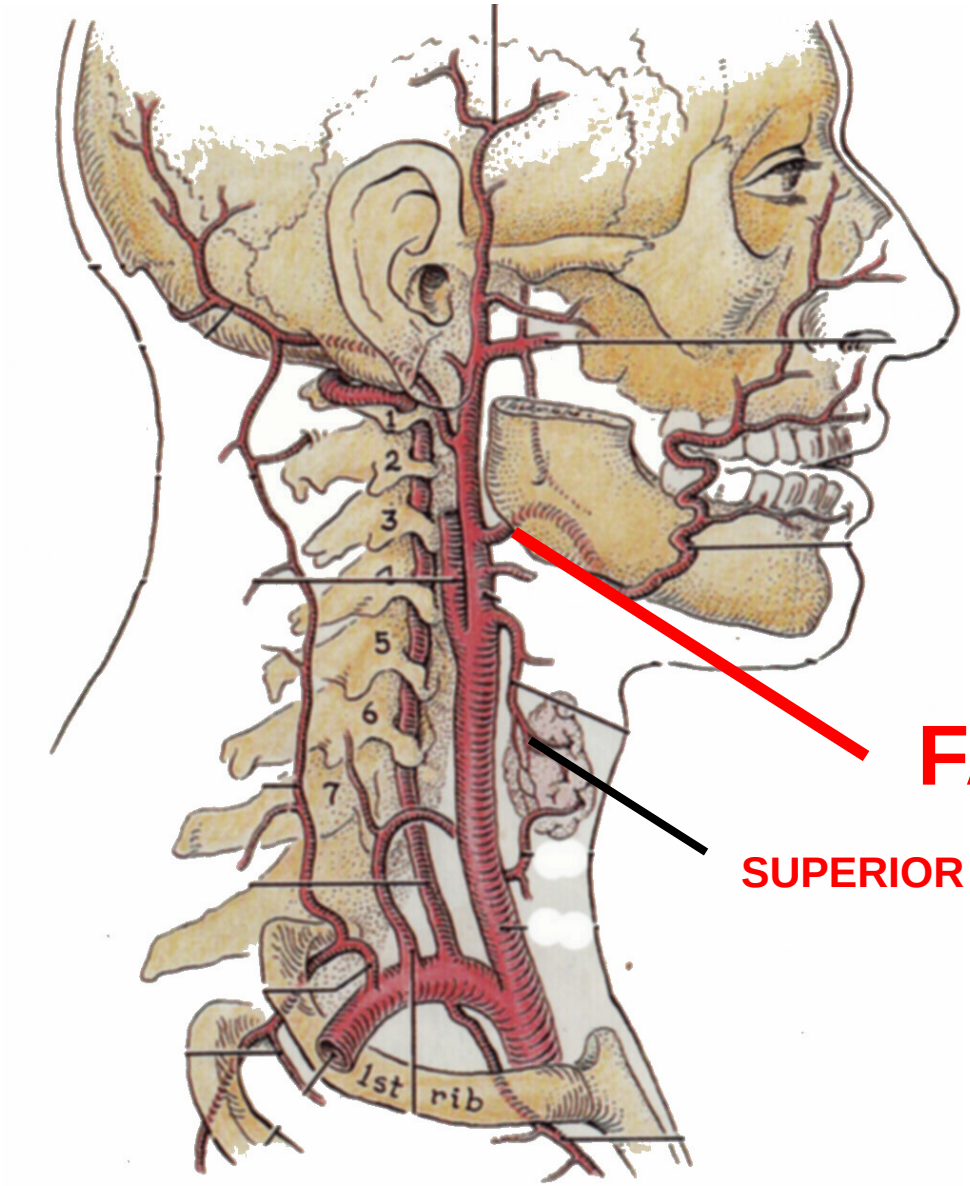


A patient is seen because of a very 'sore throat' Inspection of the soft palate (image above) shows enlarged masses in the lateral wall of the oropharynx. The masses are surgically removed and the patient returns home. However, that evening, there is extensive arterial hemorrhage in the oropharynx. This is most likely due to injury to a branch of which of the following arteries?

A. Superior Thyroid artery
B. Lingual artery
C. Facial artery
D. Posterior Auricular artery
E. Ophthalmic artery

ADDITIONAL QUESTION: WHAT CRANIAL NERVE CAN BE DAMAGED DURING TONSILLECTOMY?

FACIAL ARTERY



NOSE

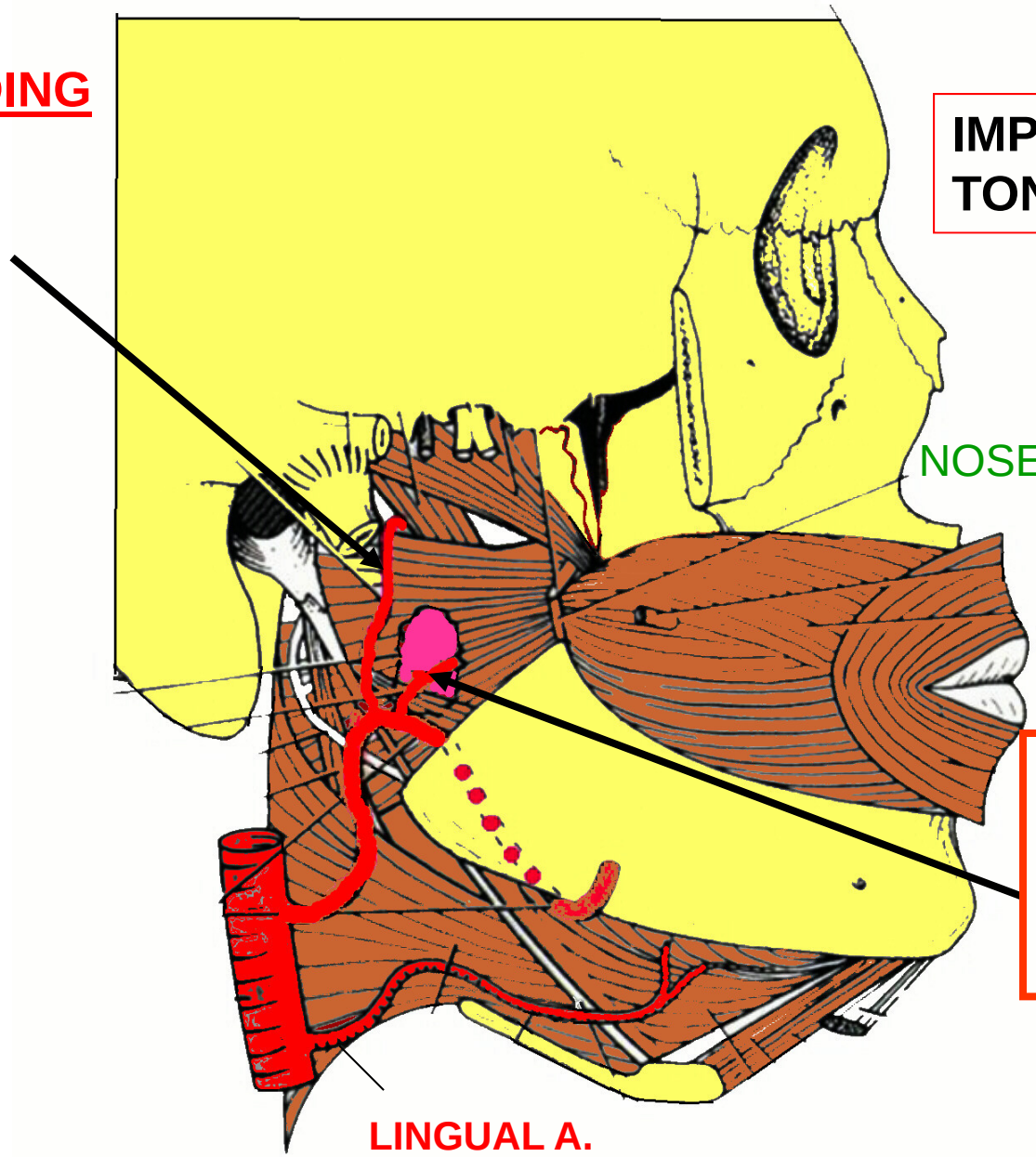
FACIAL A.

SUPERIOR THYROID A.

COURSE =
'WIGGLE' X 3

FACIAL ARTERY- BRANCHES MEDIAL TO MANDIBLE

a) ASCENDING PALATINE ARTERY - PALATE

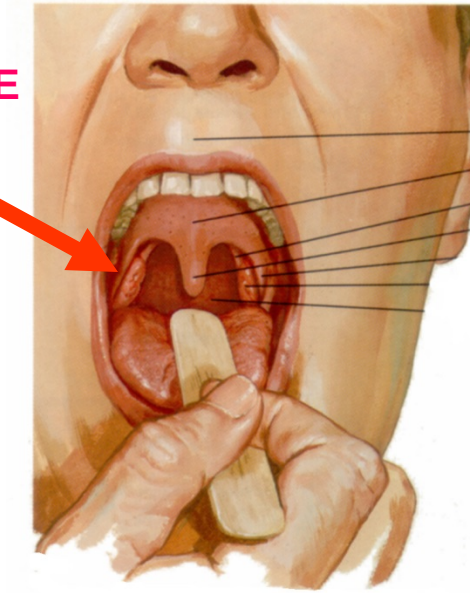


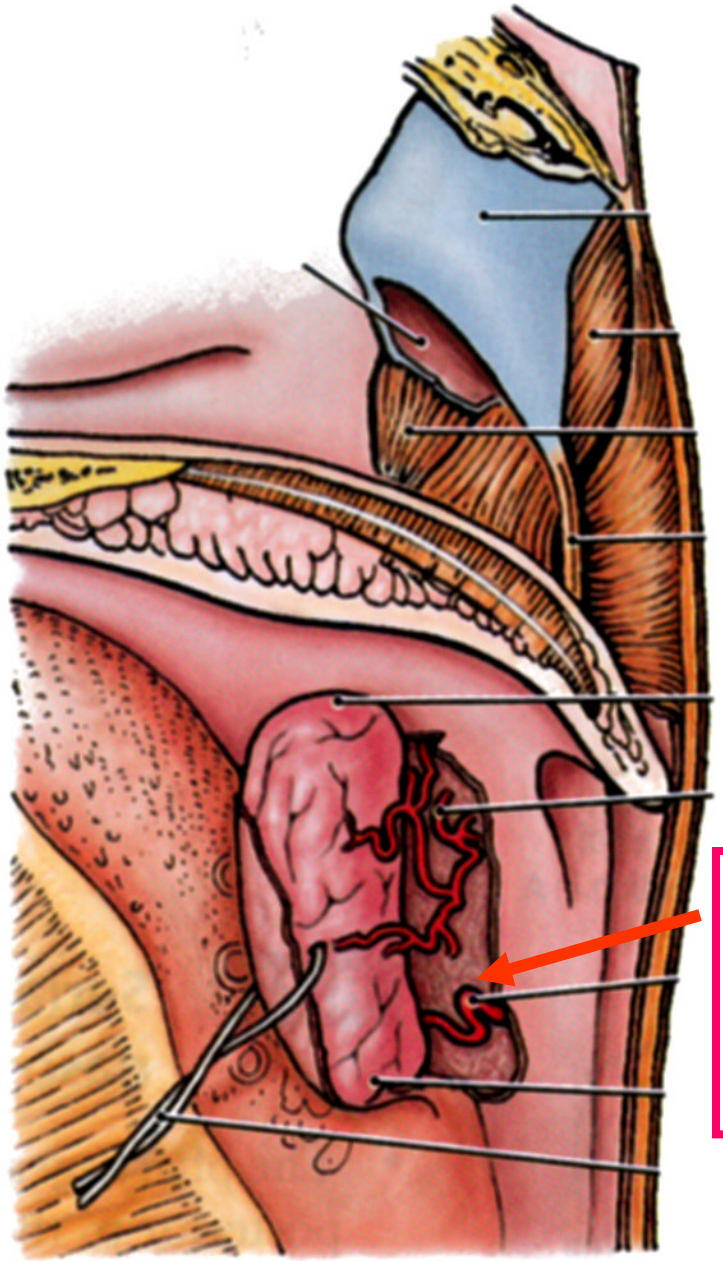
IMPORTANT IN TONSILLECTOMY

b) TONSILLAR BRANCH - PALATINE TONSIL

FACIAL ARTERY- BRANCHES MEDIAL TO MANDIBLE

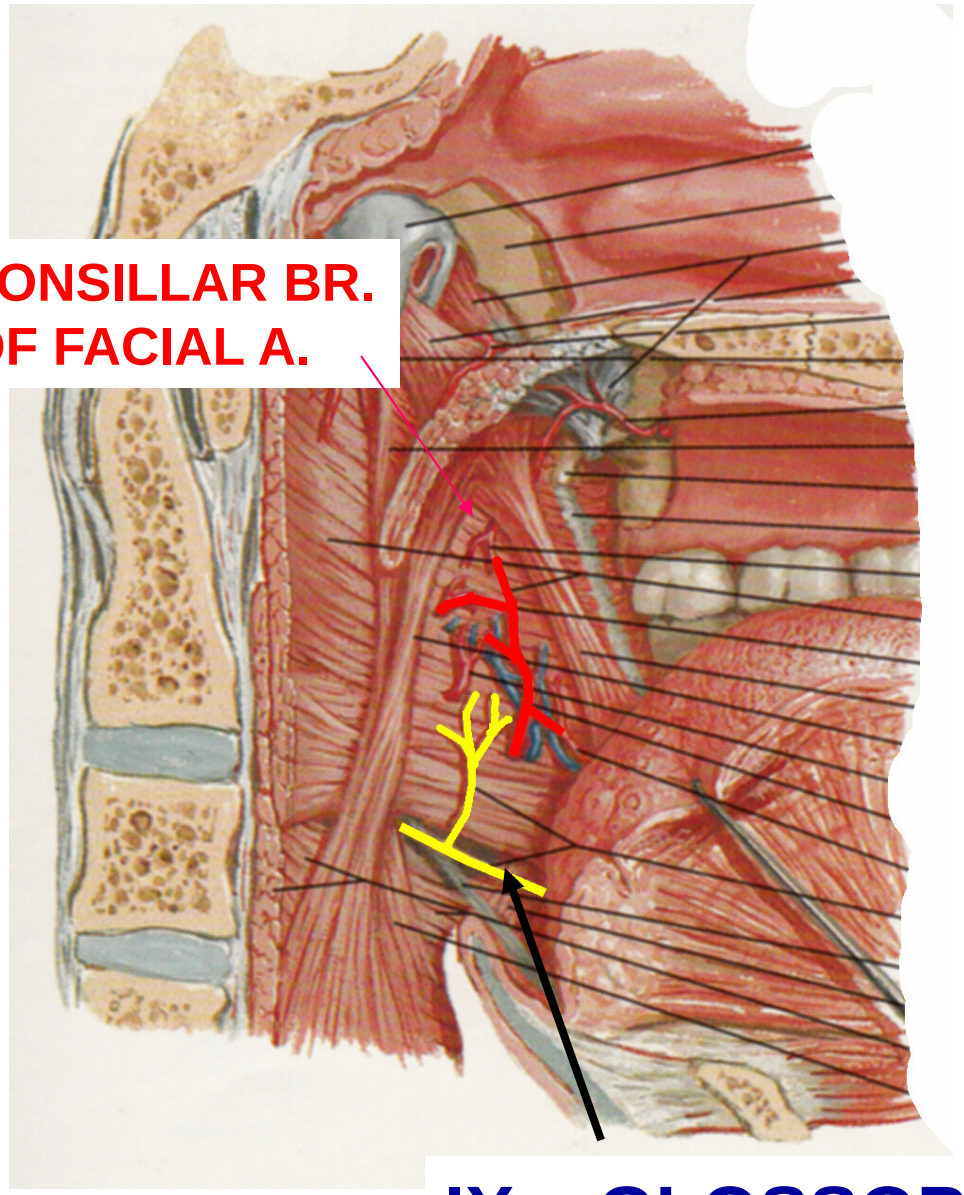
PALATINE TONSIL





NOTE: TONSILLECTOMY - Post-operative bleeding of Tonsillar branch of Facial artery is complication of removal of palatine tonsils; also damage IX **

b) **TONSILLAR BRANCH** - PALATINE TONSIL



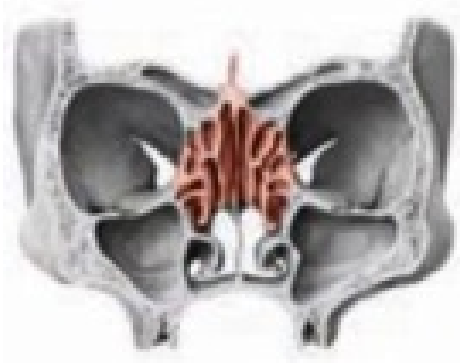
PALATINE TONSILS

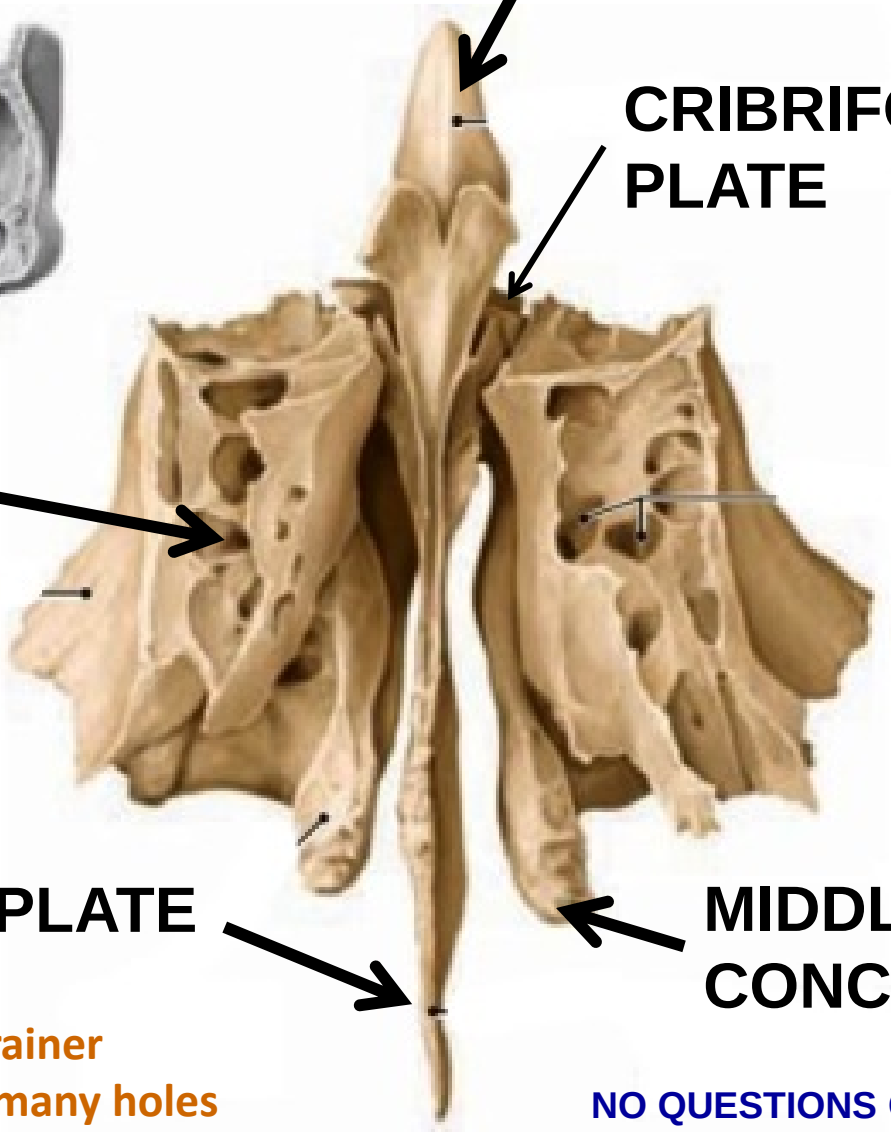
Arteries-
From Tonsillar branch of Facial Artery - can be large
Extensive bleeding after tonsillectomy

Note:
1) Glossopharyngeal Nerve only covered by Fascia; can be damaged in tonsillectomy

IX – GLOSSOPHARYNGEAL NERVE

FYI: ETHMOID BONE (anterior view)





CRISTA GALLI

CRIBRIFORM PLATE

ETHMOID AIR CELLS (SINUS)

PERPENDICULAR PLATE

MIDDLE CONCHA

ETHMOID - Gk. for sieve or strainer

CRIBRIFORM - structure with many holes

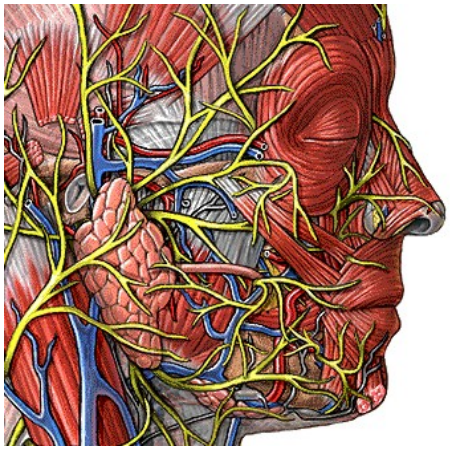
NO QUESTIONS ON THIS SLIDE

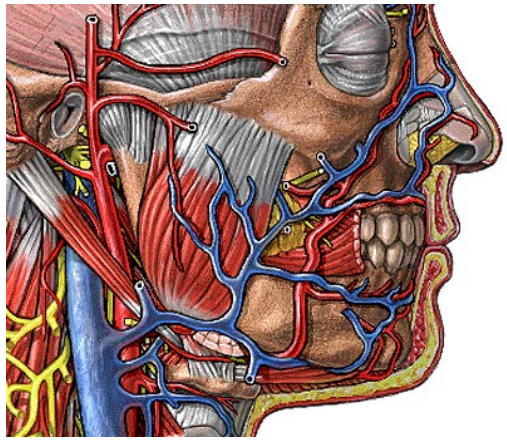
HEAD AND NECK
DISCUSSION SESSION: GROSS ANATOMY

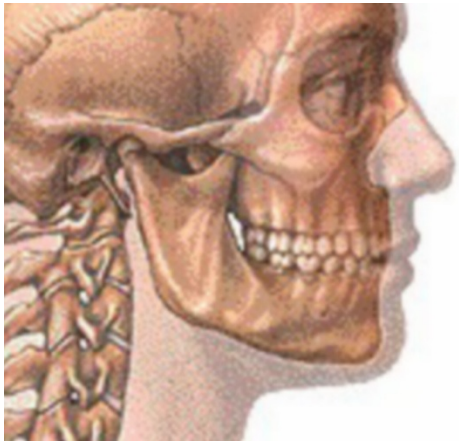
ONN BLOCK

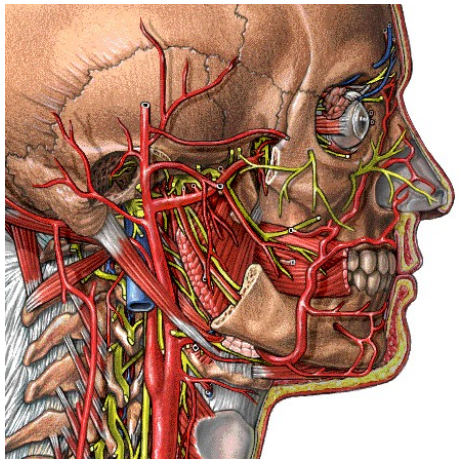
1) Parotid, Maxillary Artery, Muscles of Mastication
2) Oral cavity
3) Pharynx - Swallowing

PAROTID AND INFRATEMPORAL REGIONS







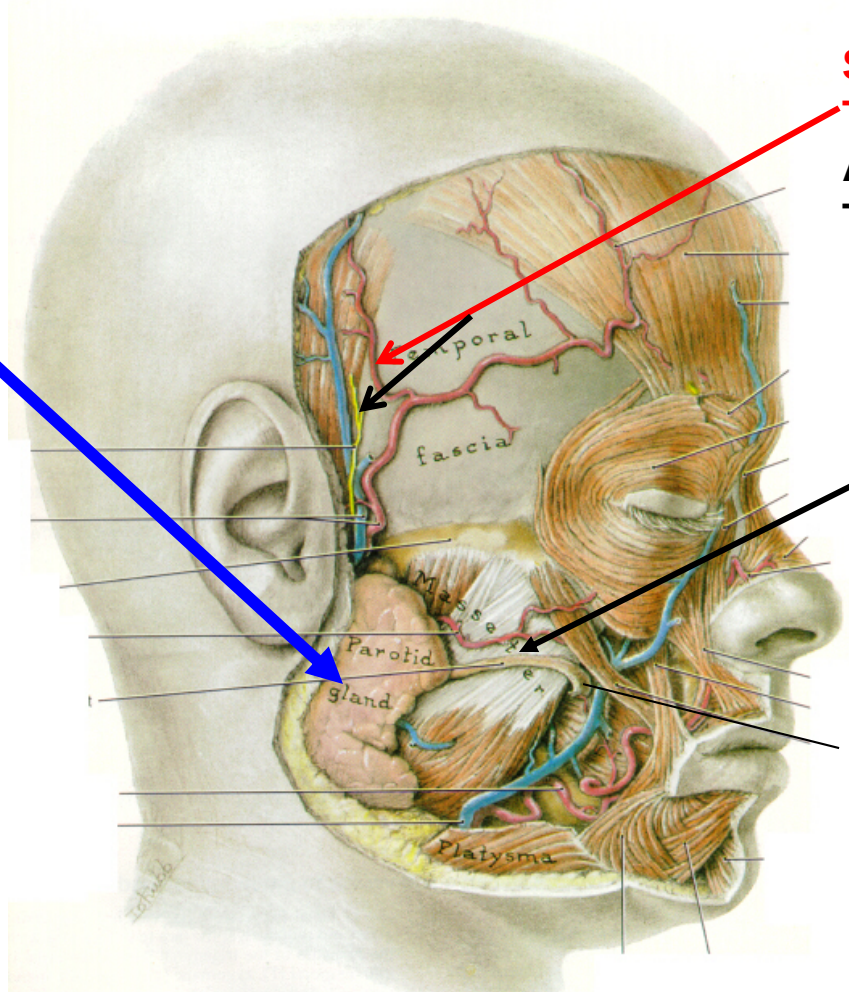


SUPERFICIAL – PAROTID GLAND, MUMPS
TMJ – MUSCLES OF MASTICATION (V3), EFFECTS DAMAGE CN V

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

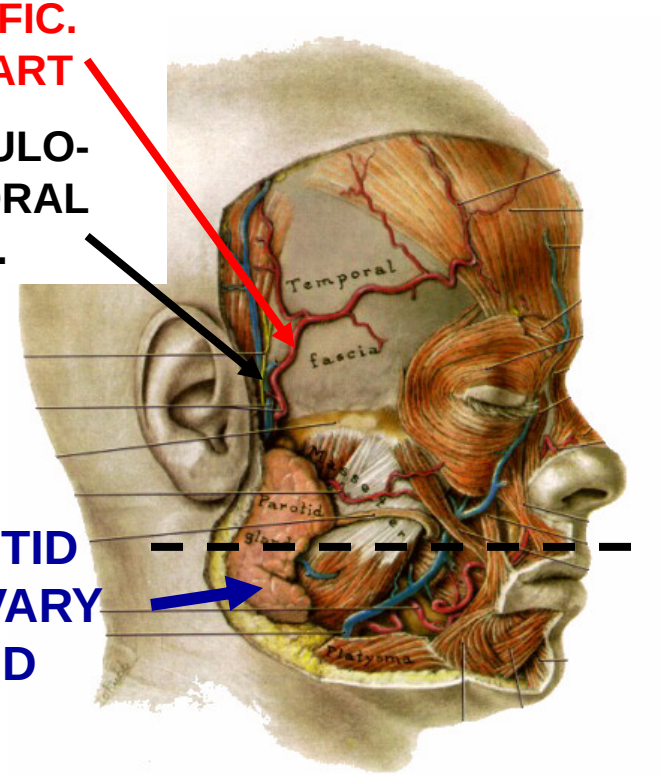
90 DEGREE TURN

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.

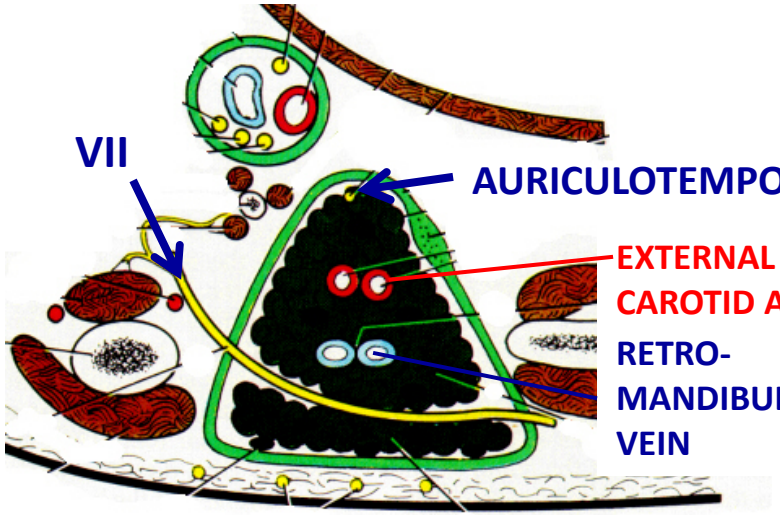


PAROTID SALIVARY GLAND

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-

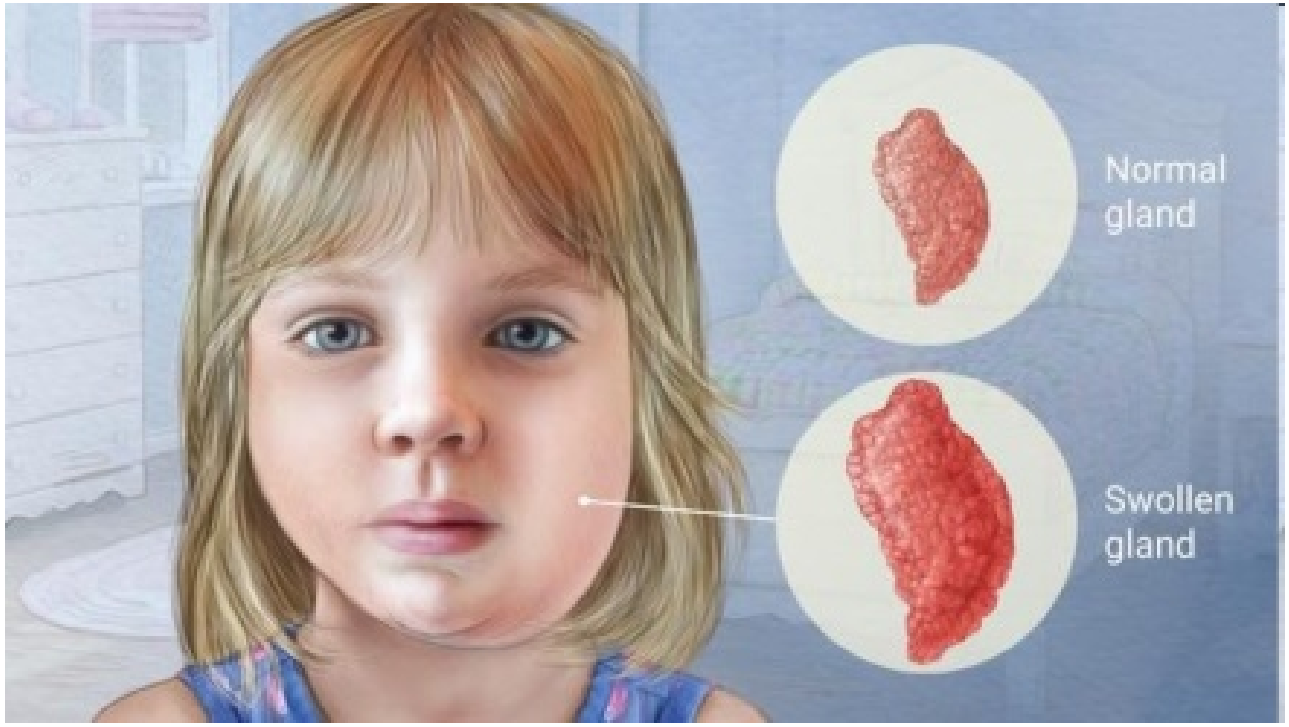
1) CN VII – FACIAL PARALYSIS IN PAROTID TUMORS

2) RETROMANDIBULAR VEIN,

3) EXT CAROTID A.,

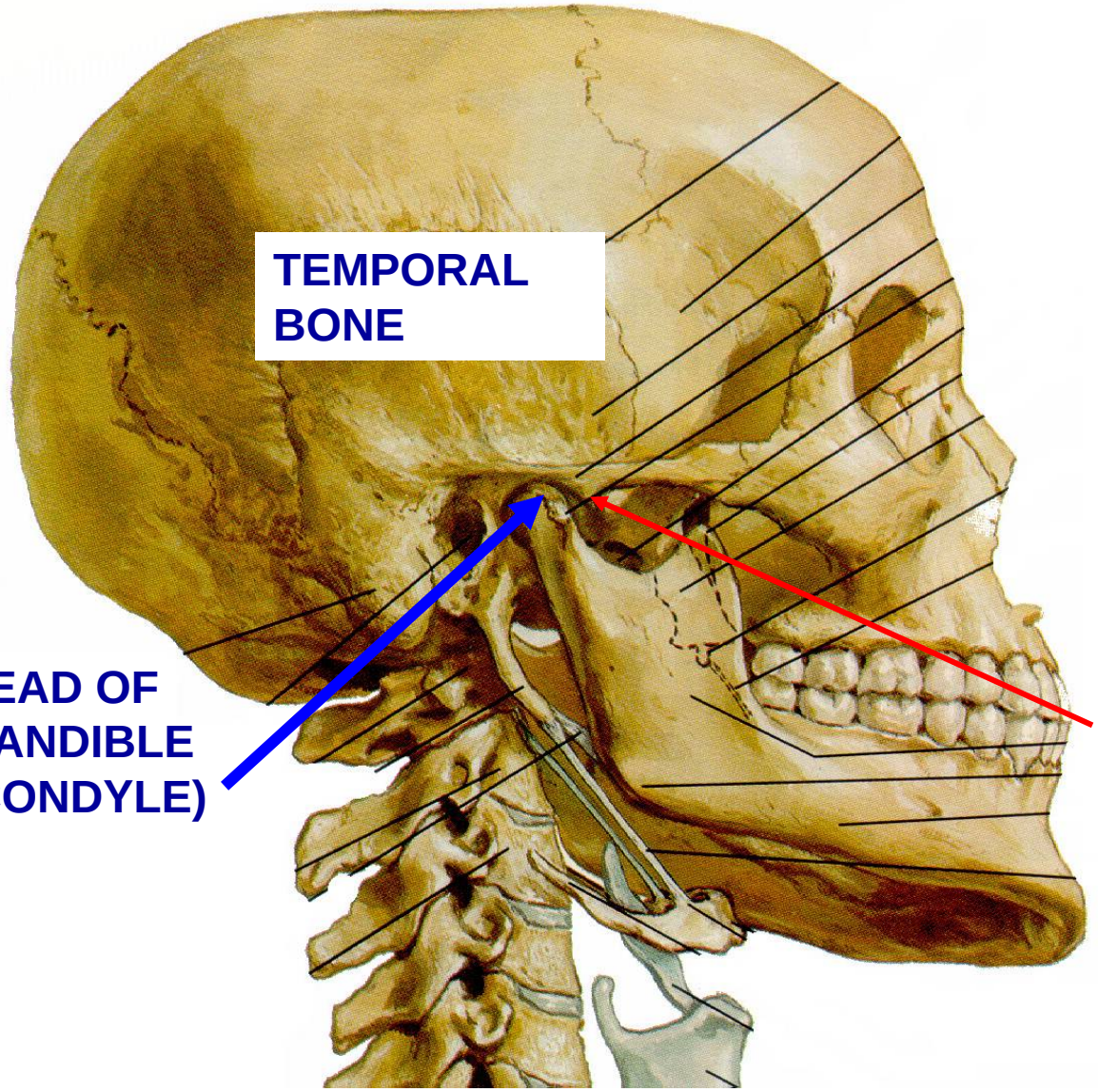
4) AURICULOTEMPORAL N.

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)

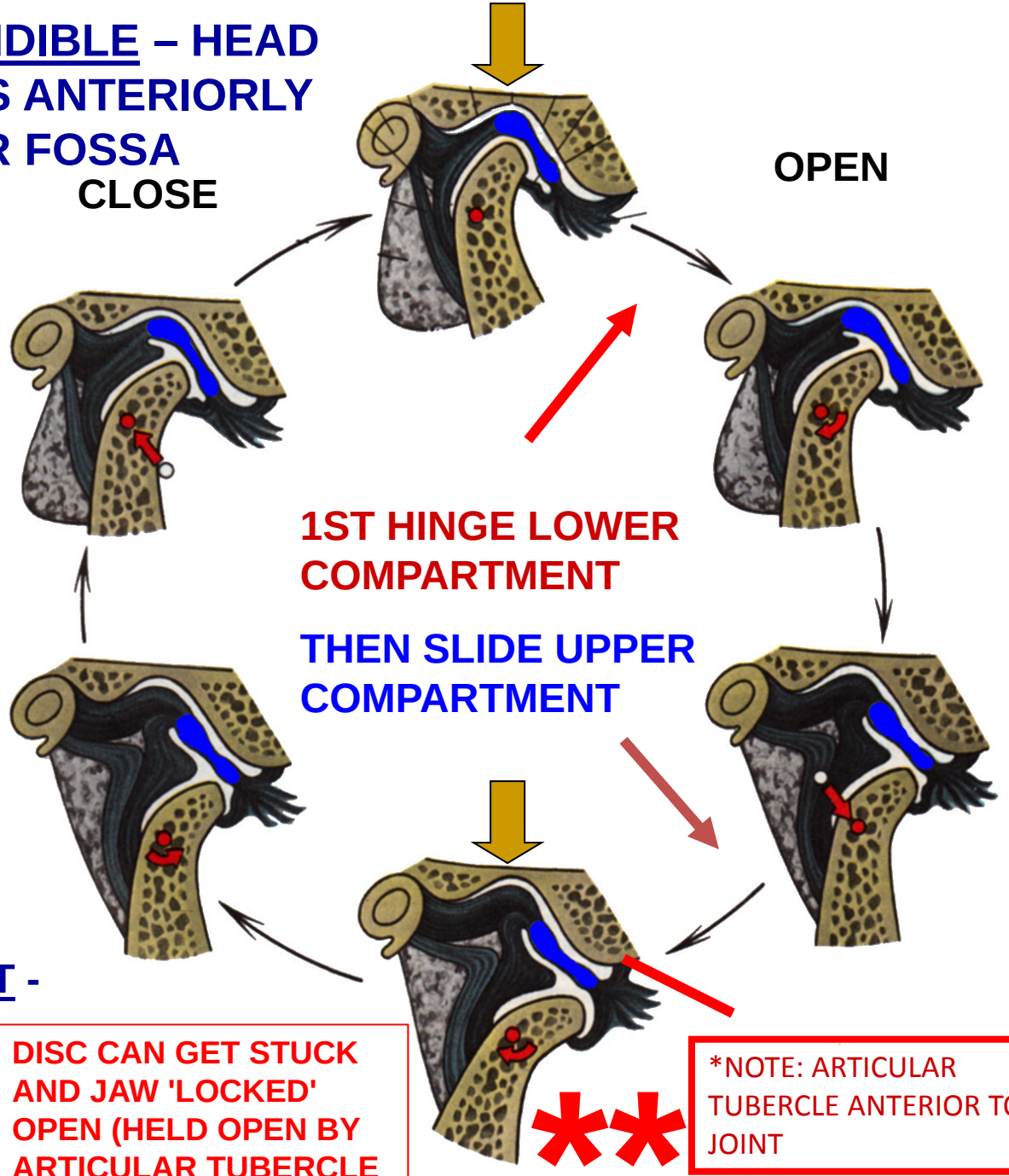
***NOTE: ARTICULAR TUBERCLE (EMINENCE) ANTERIOR TO JOINT** **

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

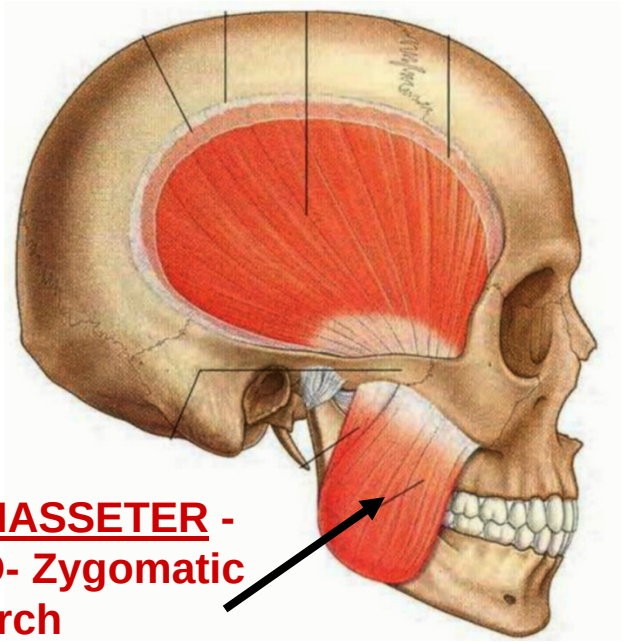


DISC CAN GET STUCK AND JAW 'LOCKED' OPEN (HELD OPEN BY ARTICULAR TUBERCLE

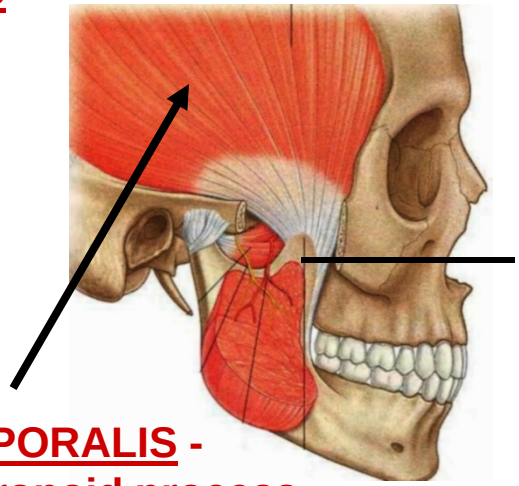
*NOTE: ARTICULAR TUBERCLE ANTERIOR TO JOINT

MUSCLES OF MASTICATION

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



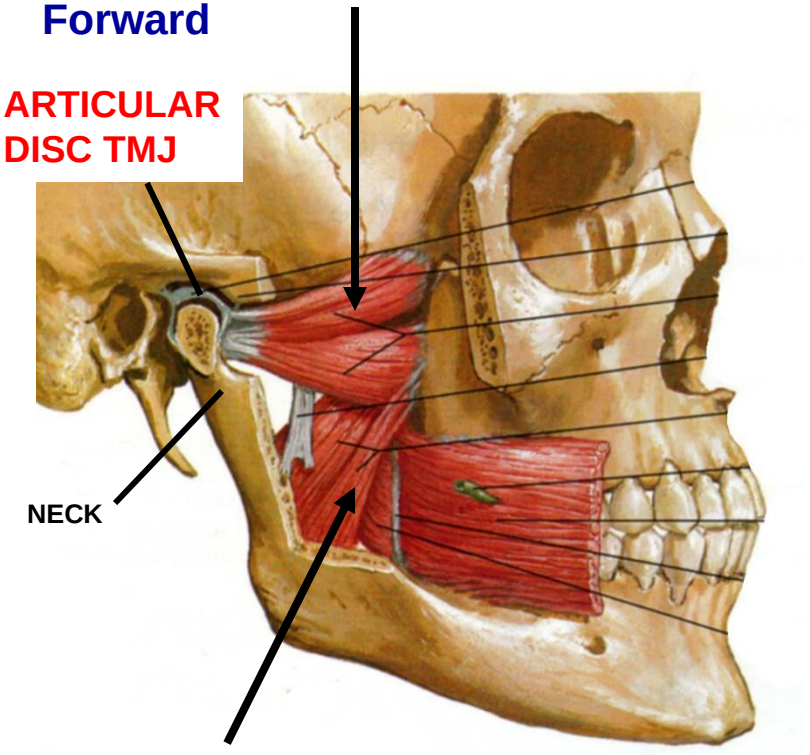
MASSETER -
O- Zygomatic arch
I Ramus, A - Elevate



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

MUSCLES INSIDE RAMUS OF MANDIBLE

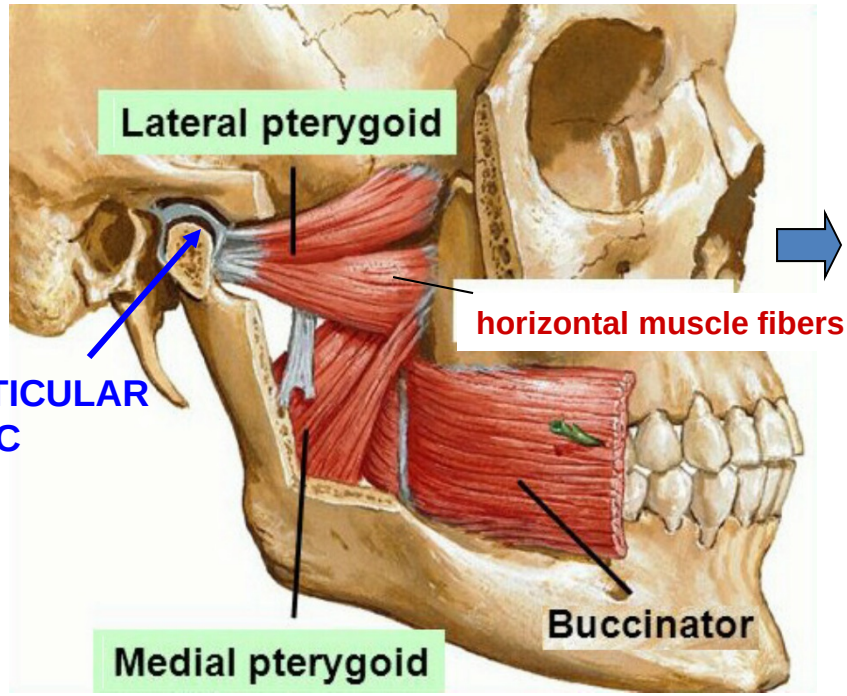
LAT. PTERYGOID - I - Neck, Articular Disc A - Depress, Protrude Pull Disc Forward

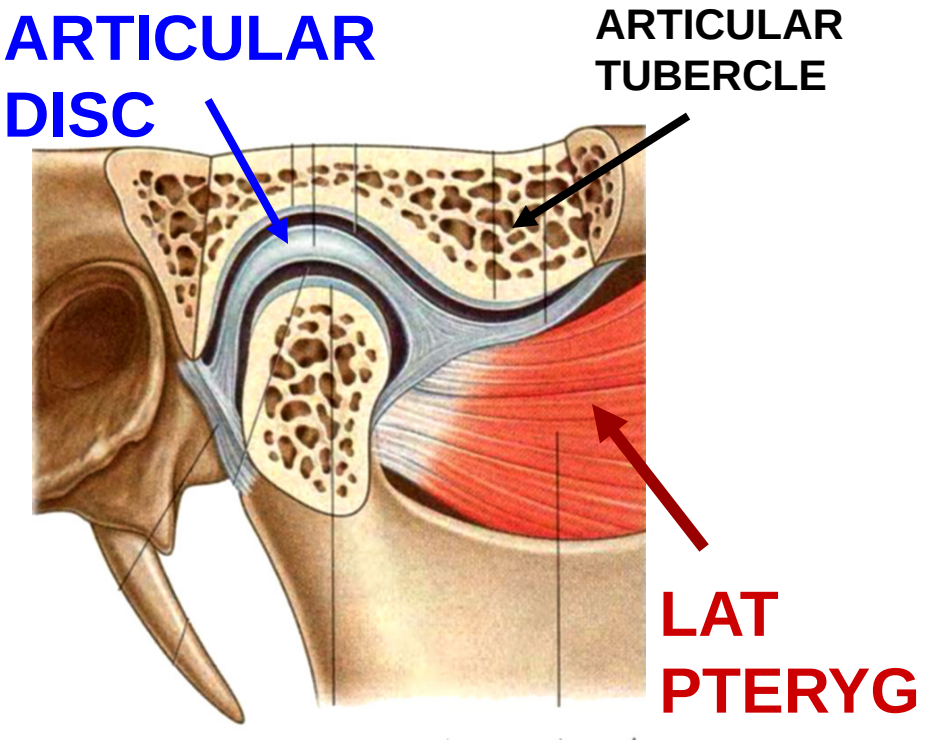


MED. PTERYGOID - I - Ramus, A - Elevate

MUSCLES OF MASTICATION

LATERAL PTERYGOID - ATTACHES TO ARTICULAR DISC OF TMJ



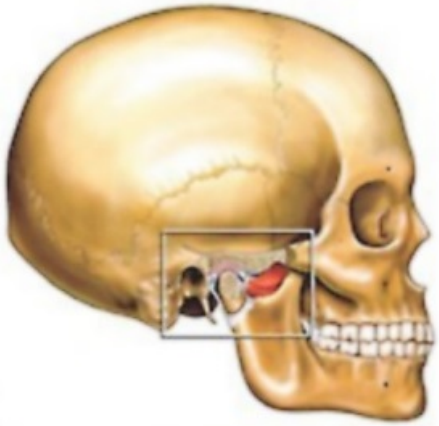


PULLS DISC ANTERIORLY WHEN OPEN MOUTH *

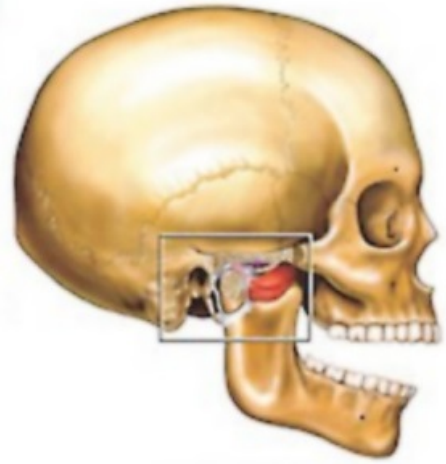
TMJ JAW LOCK - mandible stuck in partial depression

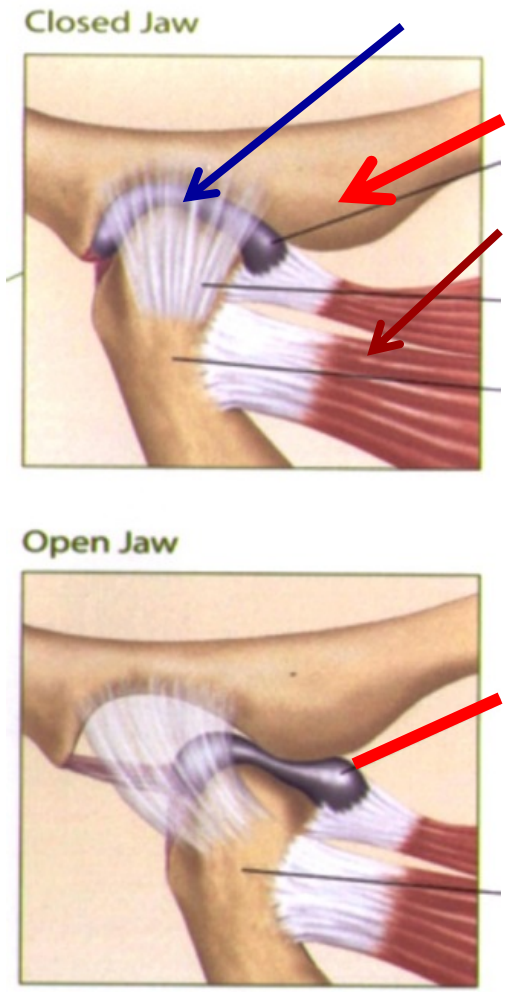
OPEN MOUTH =
depress mandible

FIRST HINGE LOWER COMPART MENT



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





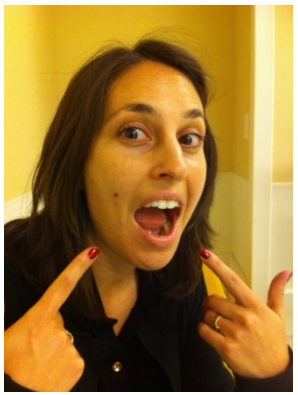
ARTICULAR DISC

ARTICULAR TUBERCLE

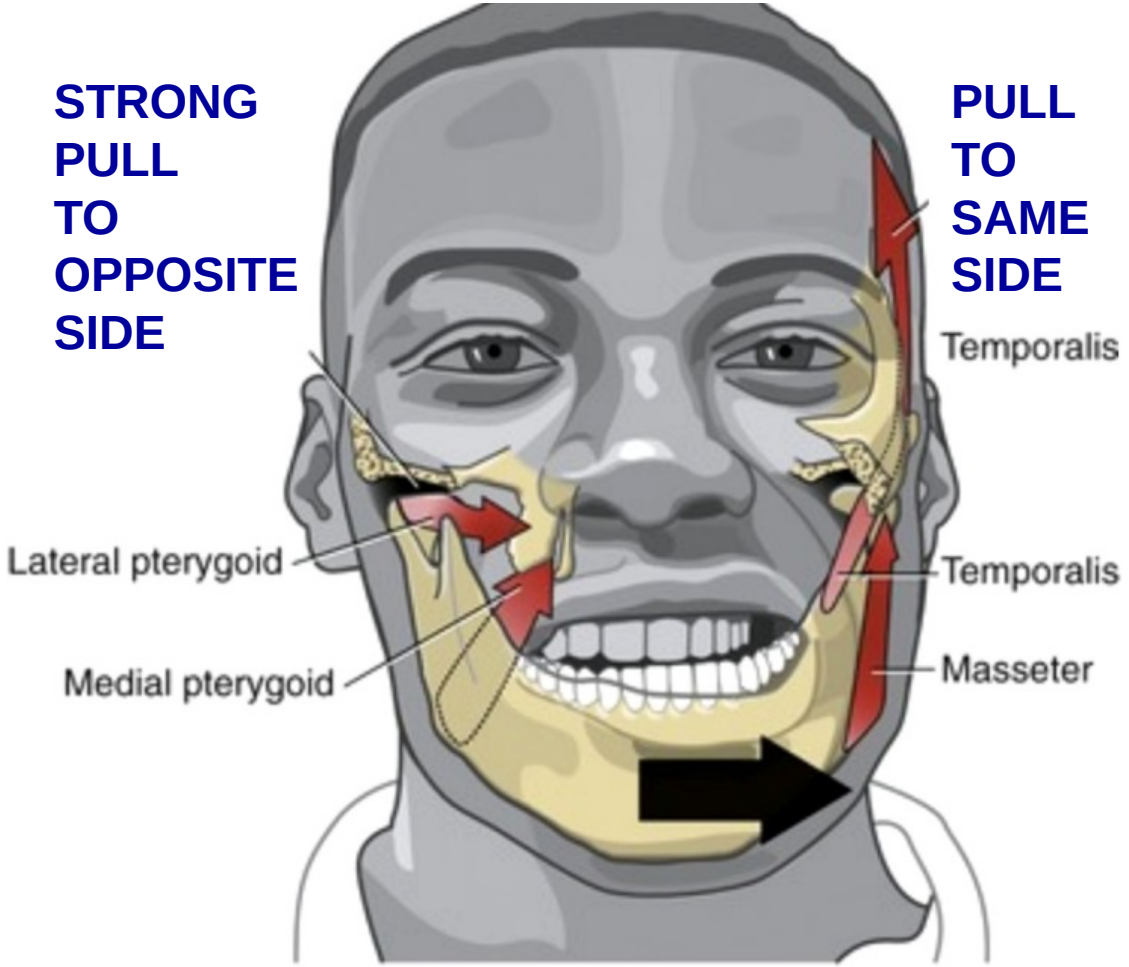
LATERAL PTERYGOID

* *

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

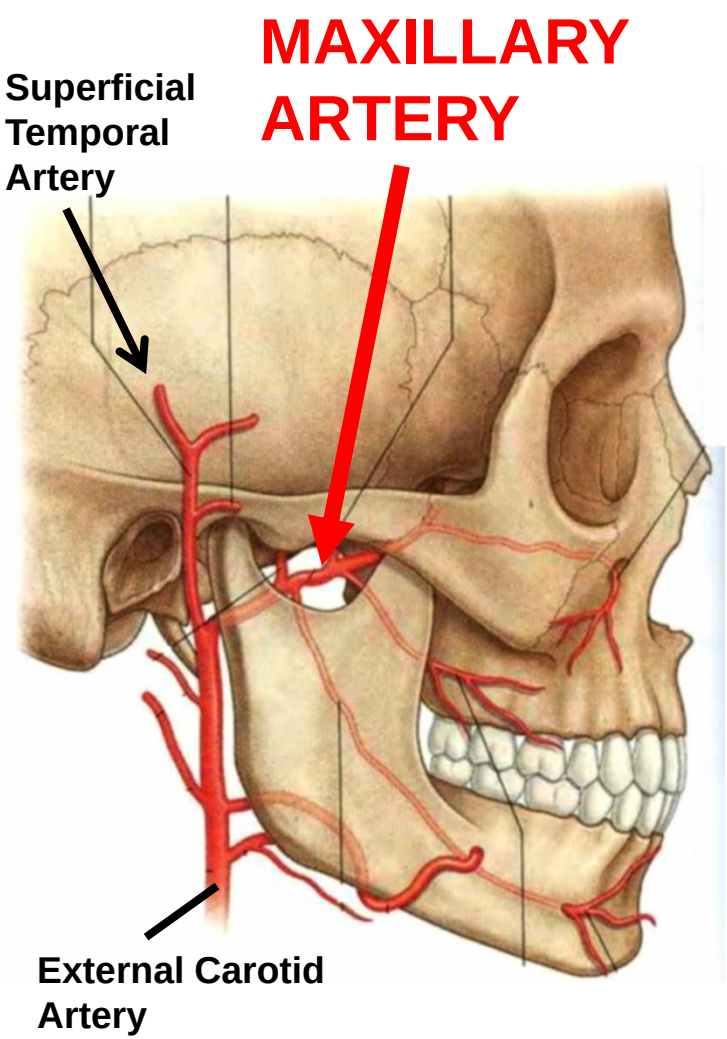
1) Lateral and Medial Pterygoid (inside mandible) pull toward opposite side

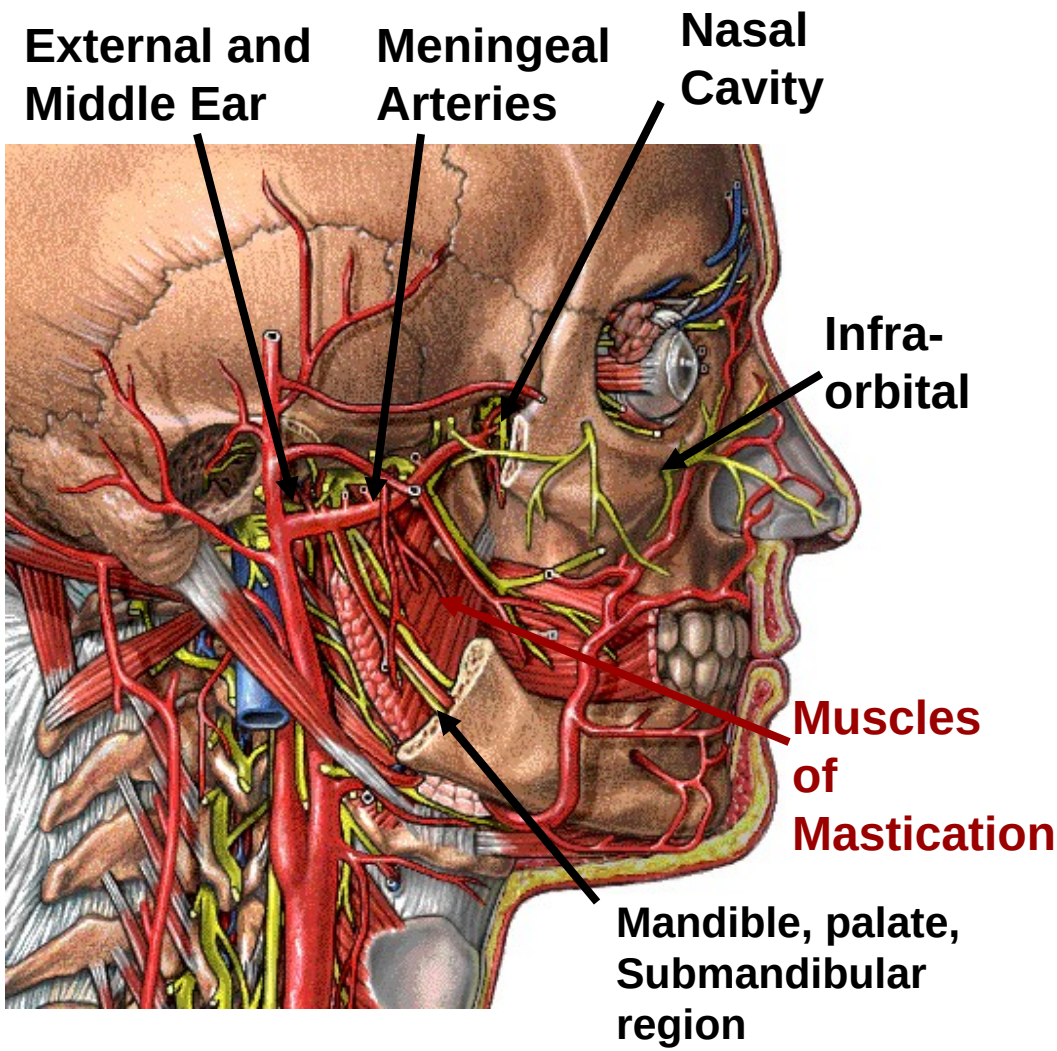
2) Temporalis and Masseter (outside mandible) pull toward same side

**

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

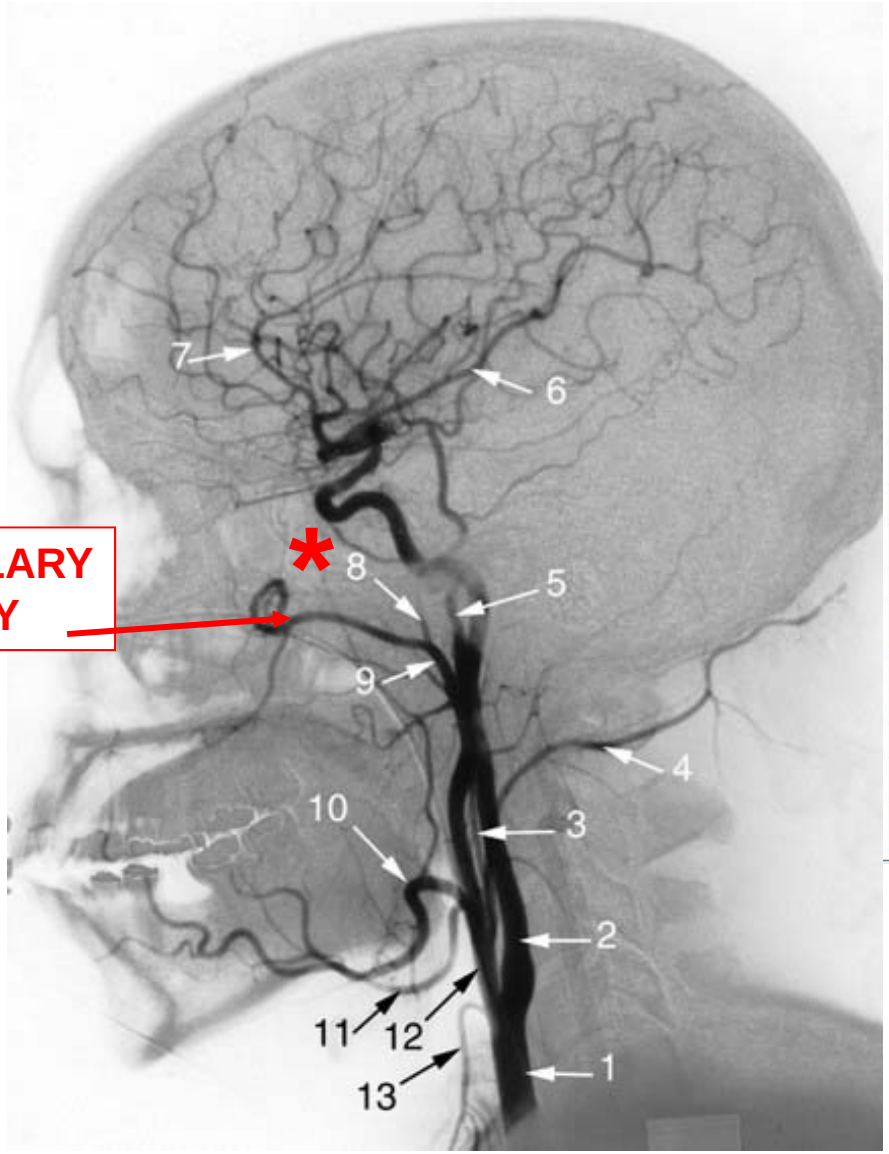
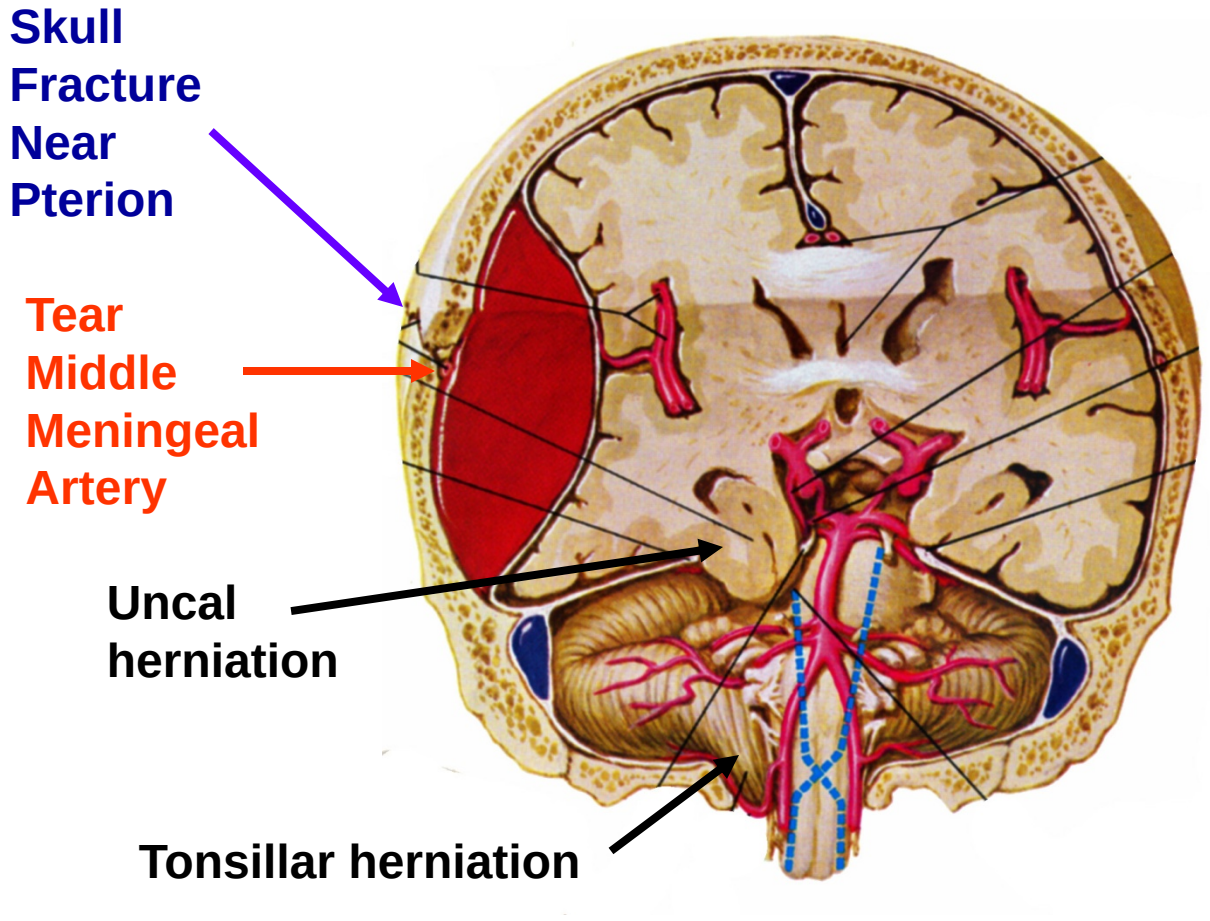


TABLE OF BRANCHES

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

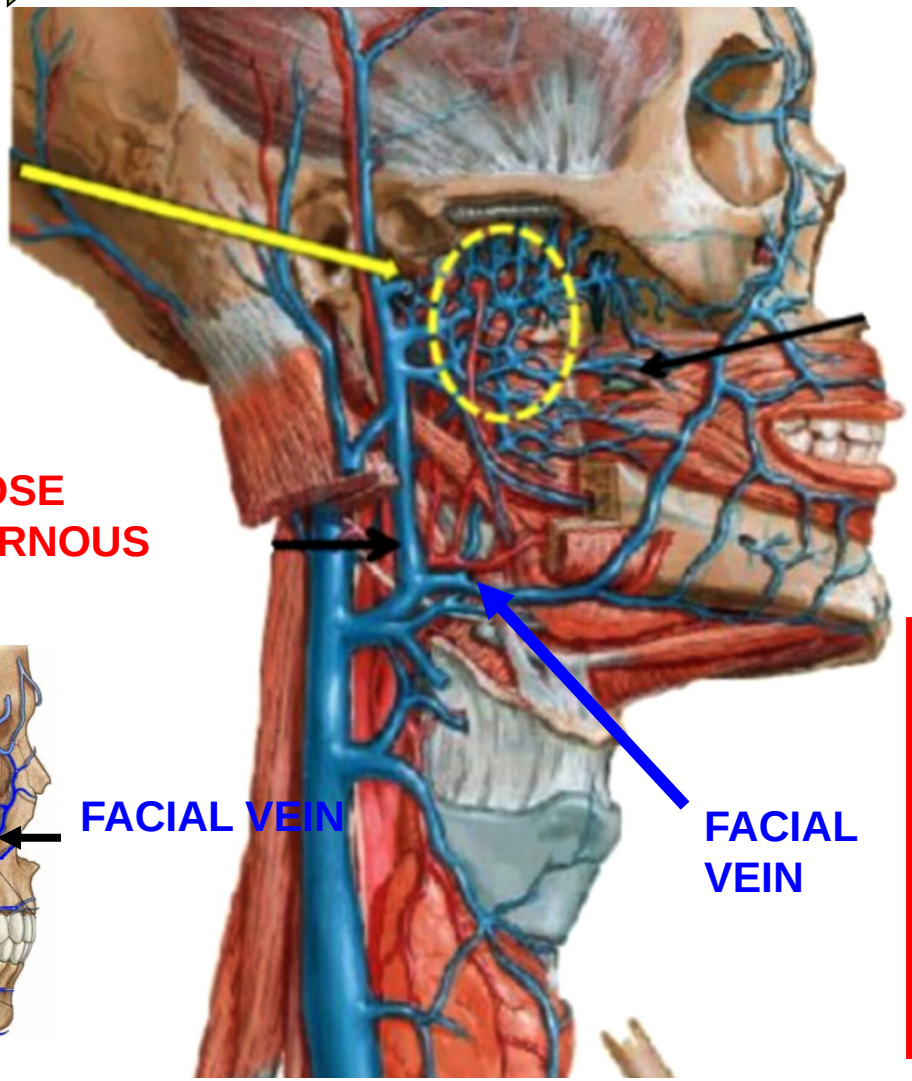
5) mass can displace brain

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

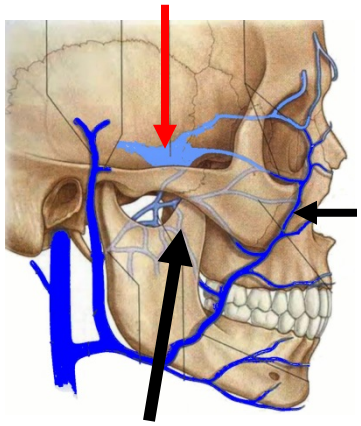
PTERYGOID VENOUS PLEXUS

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

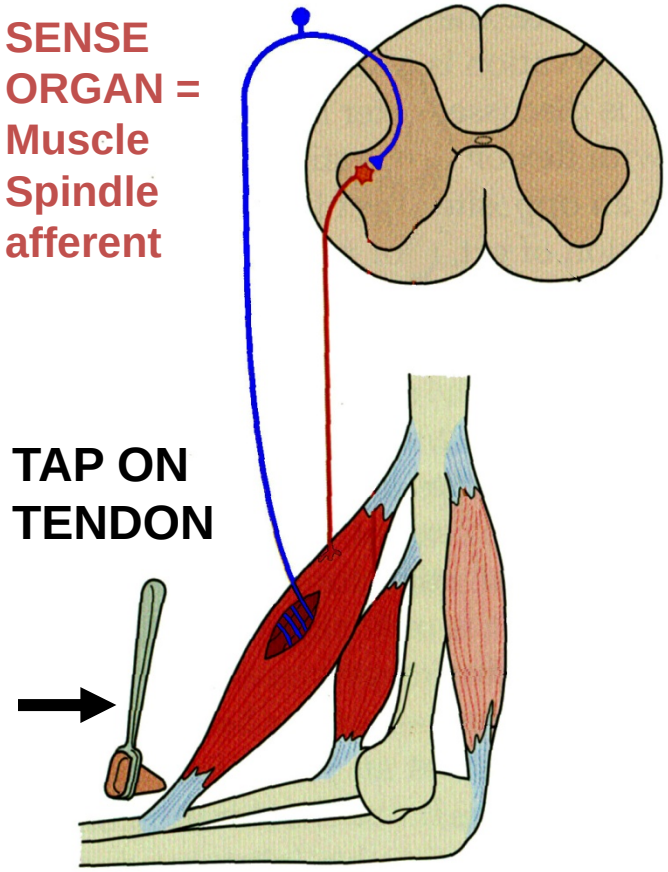
3) ANASTOMOSE WITH CAVERNOUS SINUS AND FACIAL VEIN

*

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).

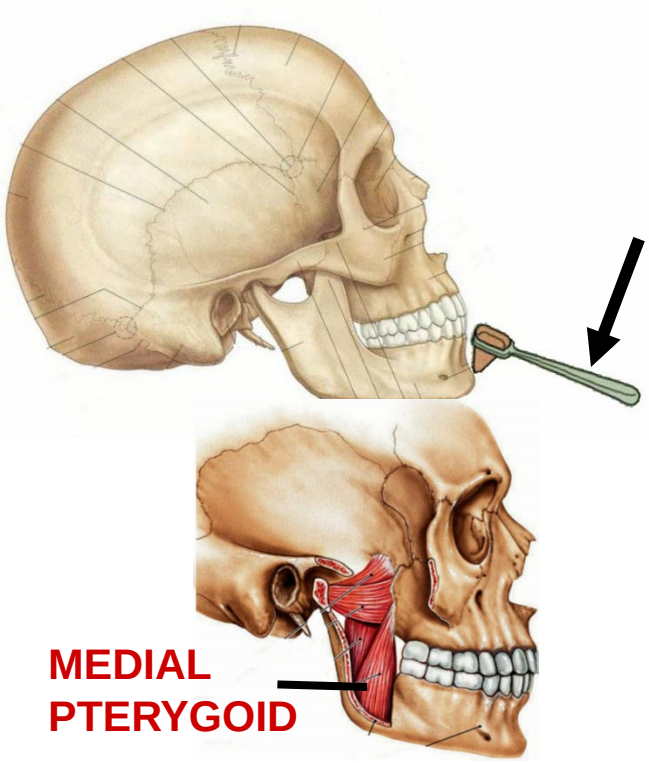
JAW JERK REFLEX = STRETCH REFLEX OF MUSCLES OF MASTICATION - sensory and motor in V3

STRETCH REFLEX IN BICEPS

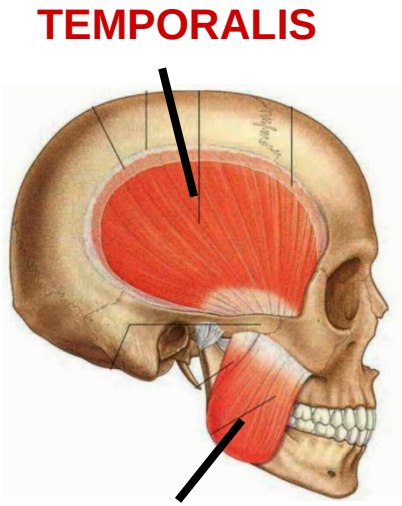


STRETCH REFLEX IN MUSCLES OF MASTICATION

TAP DOWN ON CHIN



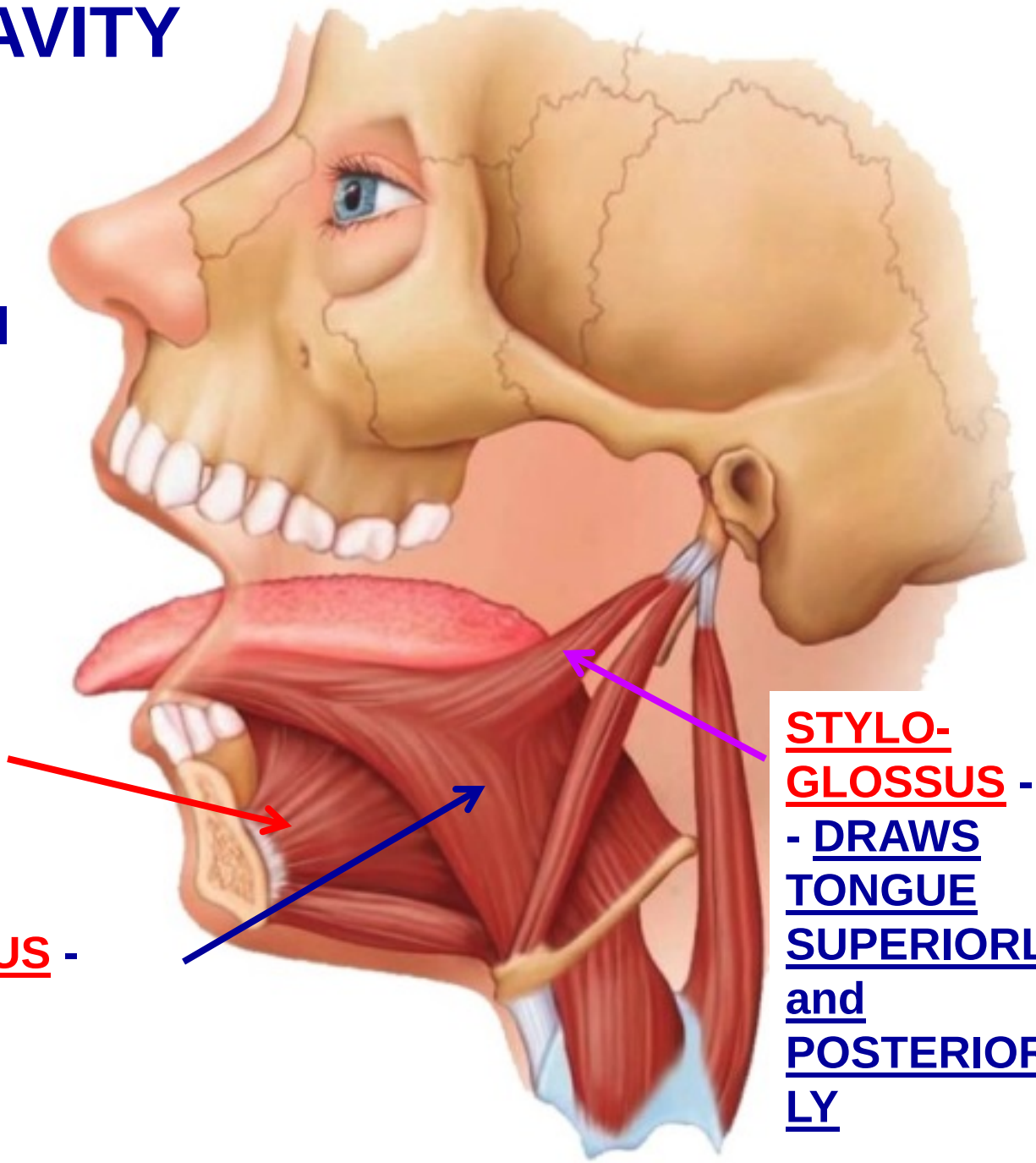
STRETCH MUSCLES THAT CLOSE MOUTH (ELEVATE MANDIBLE)



Hyperreflexia in Jaw Jerk – UMN lesion

ORAL CAVITY

MUSCLES OF TONGUE - all innervated by XII



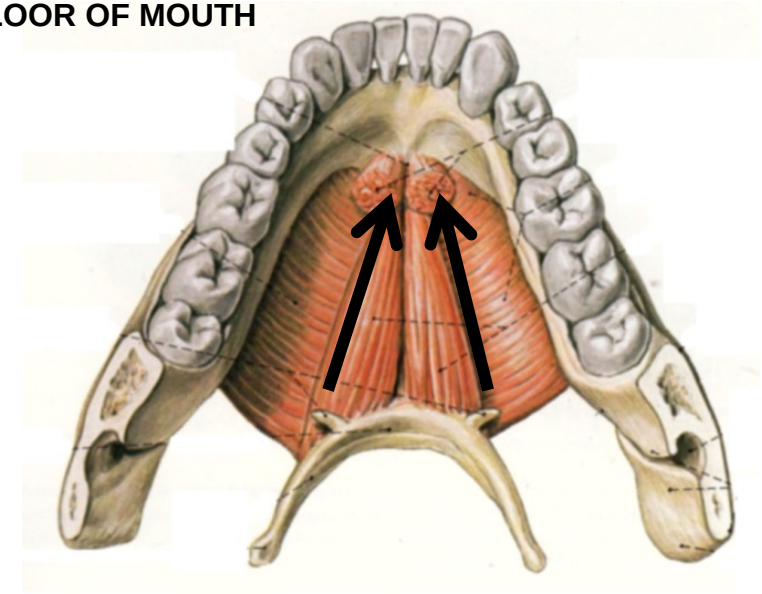
GENIOGLOSSUS - PROTRUDES (STICKS OUT) TONGUE

HYOGLOSSUS - - DEPRESS TONGUE

STYLO-GLOSSUS - - DRAWS TONGUE SUPERIORLY and POSTERIORLY

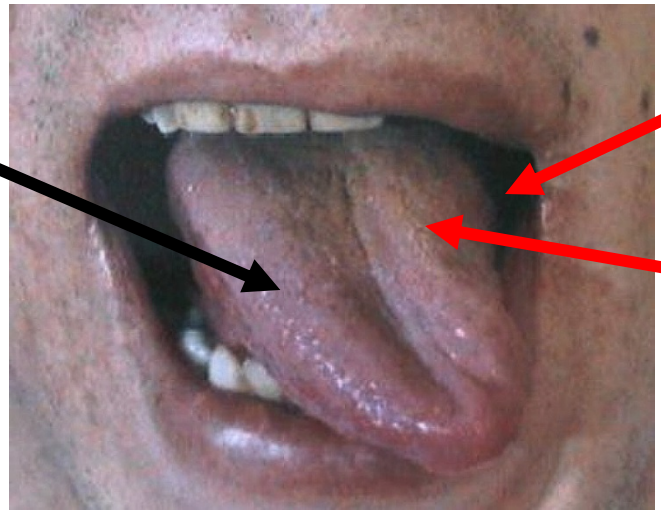
VIEW OF FLOOR OF MOUTH

GENIO-GLOSSUS DIRECTION OF ACTION



CLINICAL SIGN OF DAMAGE TO HYPOGLOSSAL NERVE (XII)

GENIO-GLOSSUS INTACT



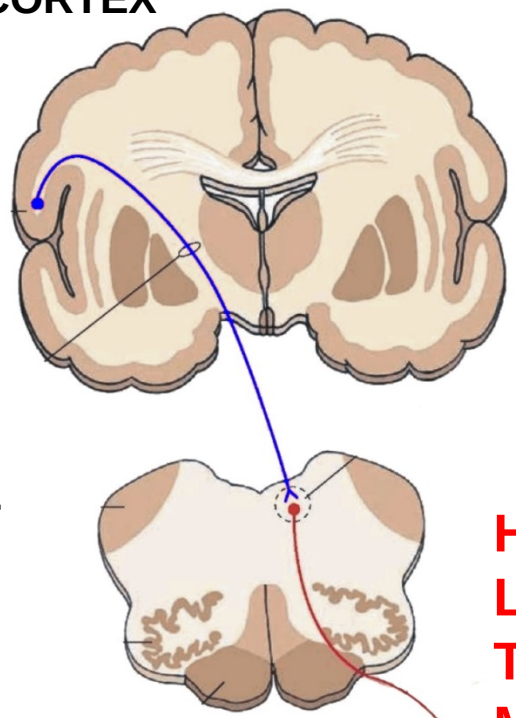
DAMAGE HYPOGLOSSAL NERVE ON ONE SIDE

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



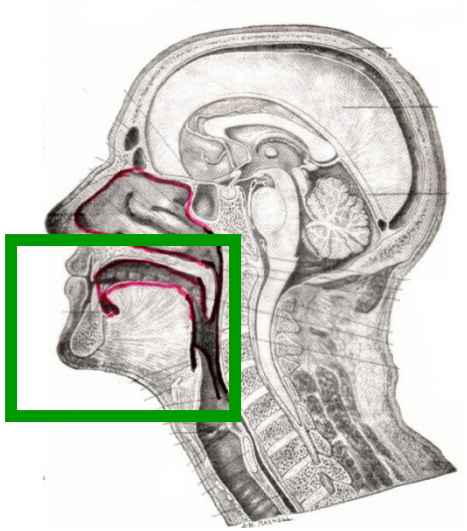
BRAINSTEM - MEDULLA

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

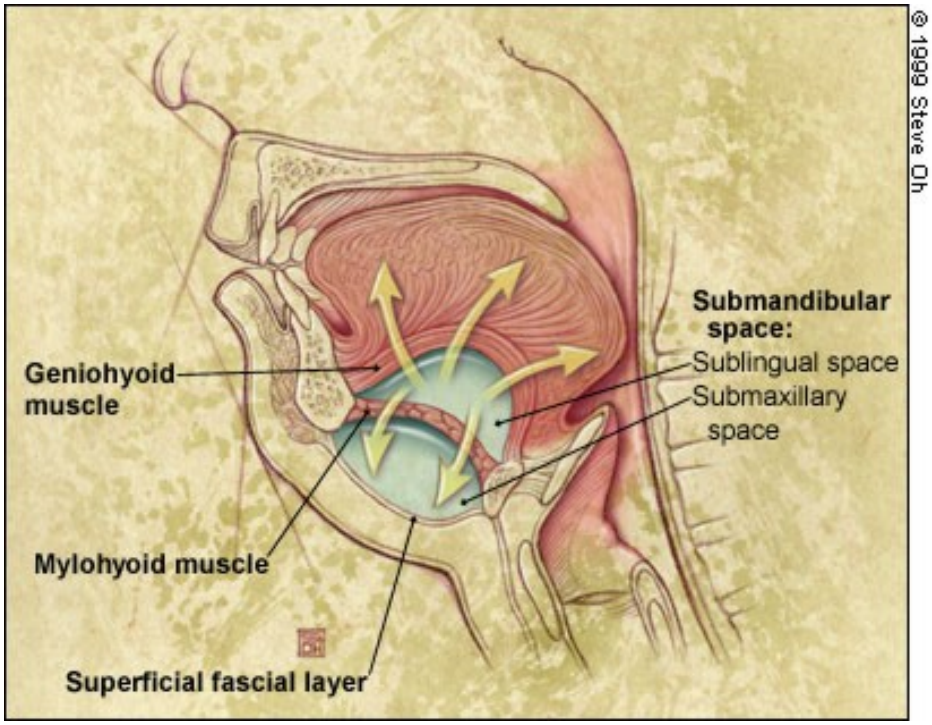
MYLOHYOID
- cut on end

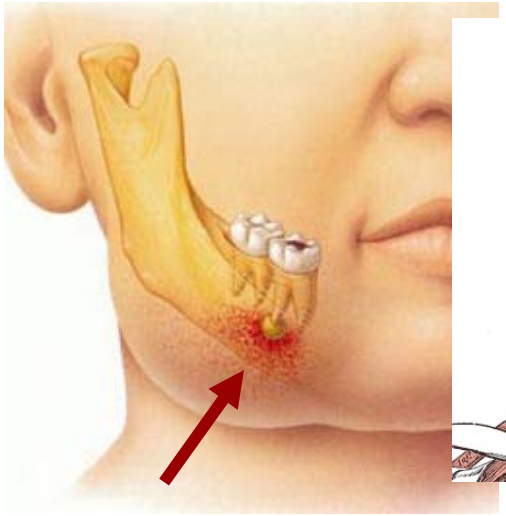
DIGASTRIC

HYOID BONE

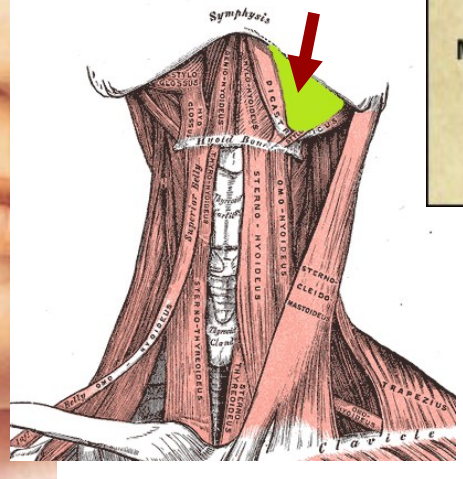
MUSCLES VIEWED ON BISECTED HEAD

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





tooth abscess

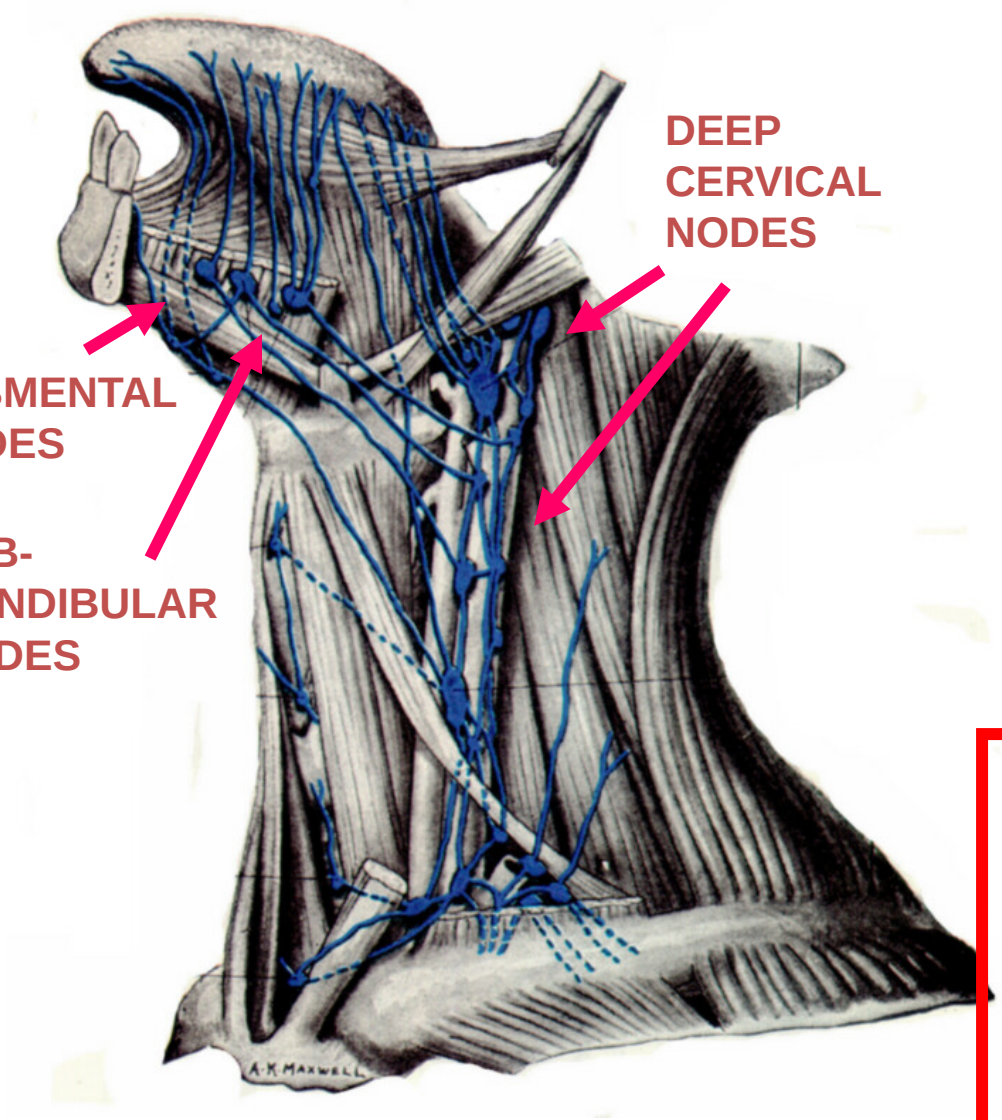


Submandibular Space - in AnteriorTriangle of neck

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

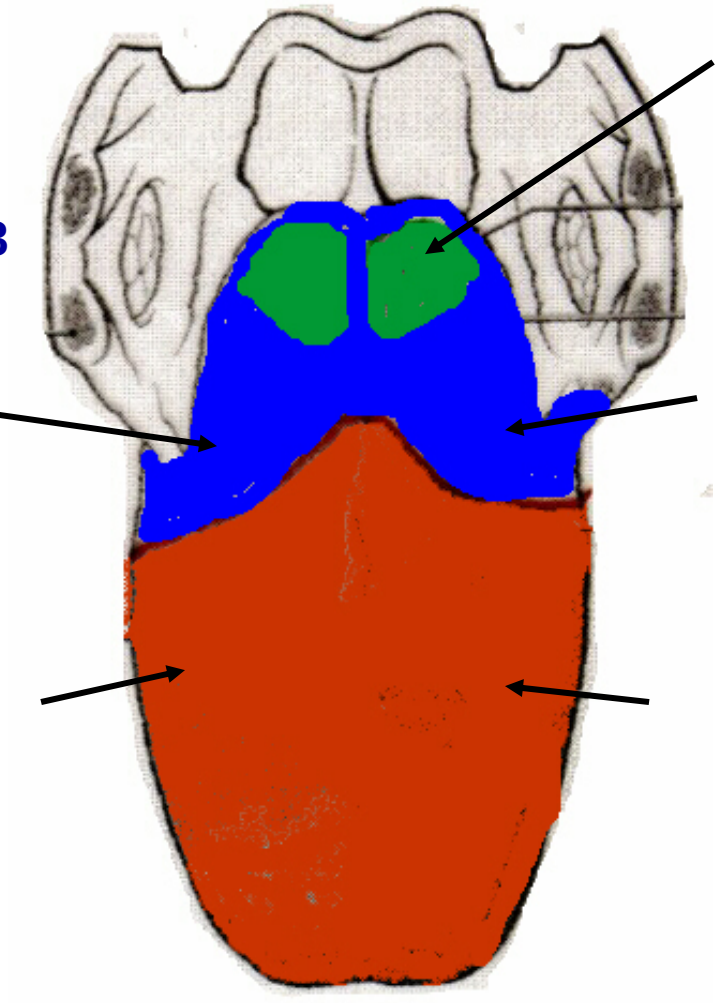
*

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



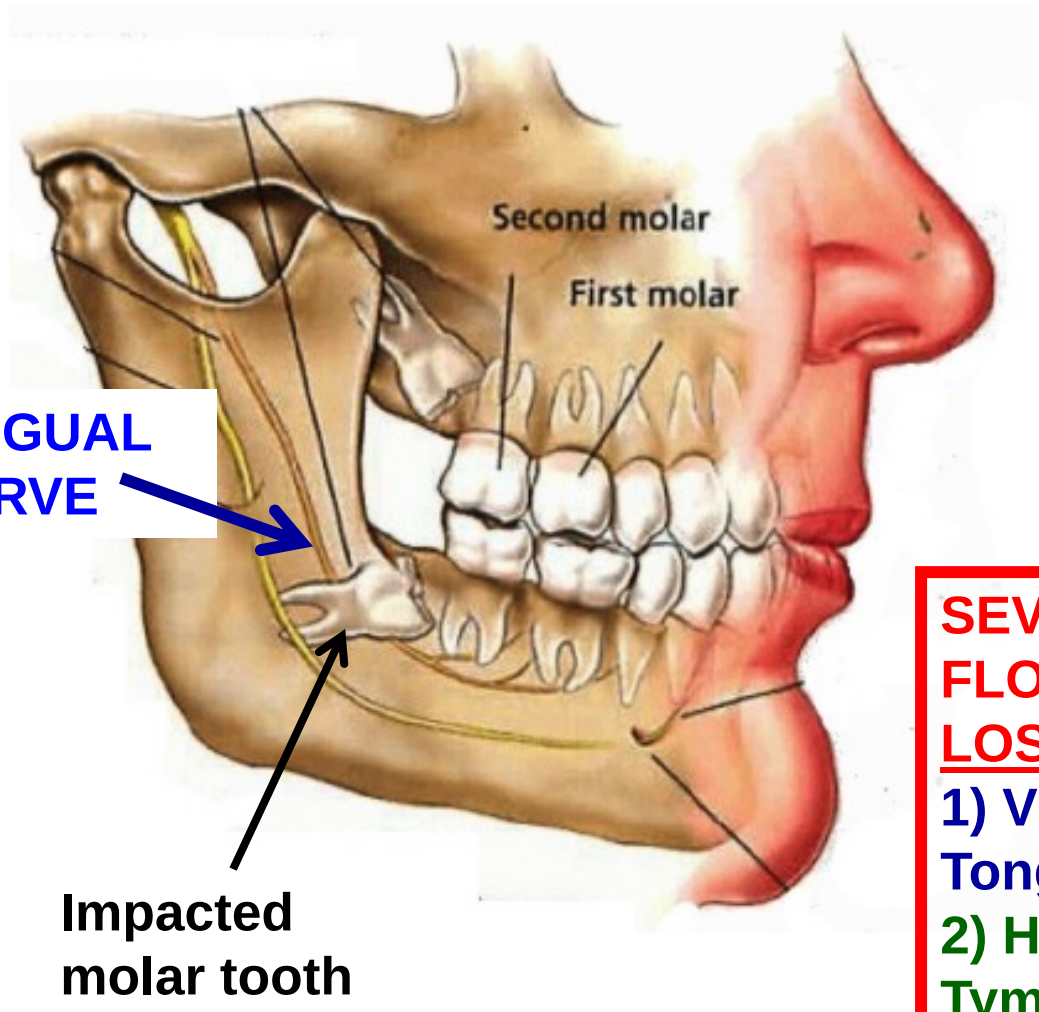
ANT. TO EPIGLOTTIS -
1) X- VAGUS- VISCERAL SENSORY TOUCH AND TASTE

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



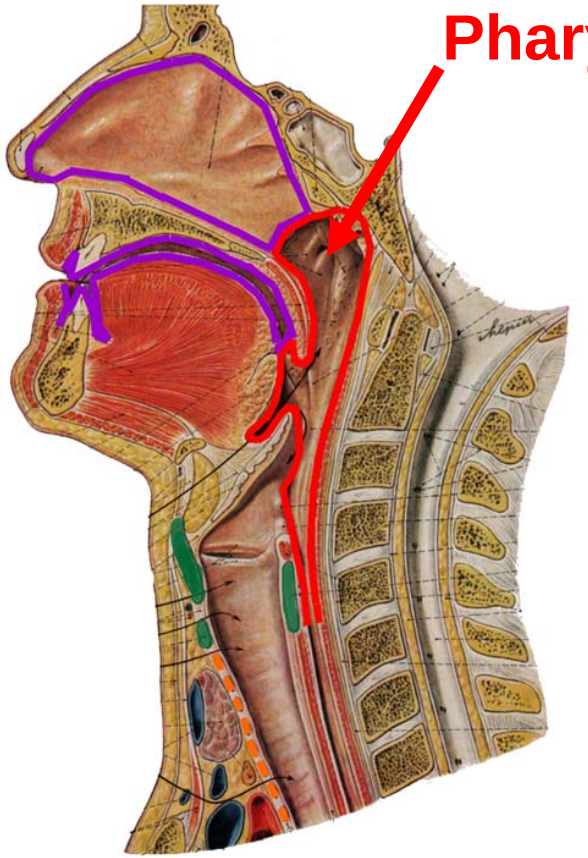
- Lingual nerve courses below mucosa in floor of mouth
- Can readily be damaged during dental extraction of impacted molar tooth
- Also damaged in children: ex. fall with glass pop bottle in mouth

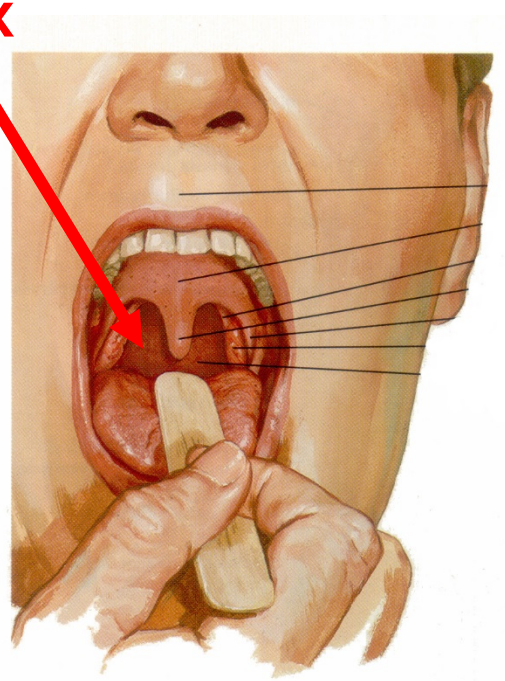
SEVERING LINGUAL NERVE IN FLOOR OF MOUTH - LOSE TOUCH AND TASTE:

1) V - General sensation to Ant. Tongue AND

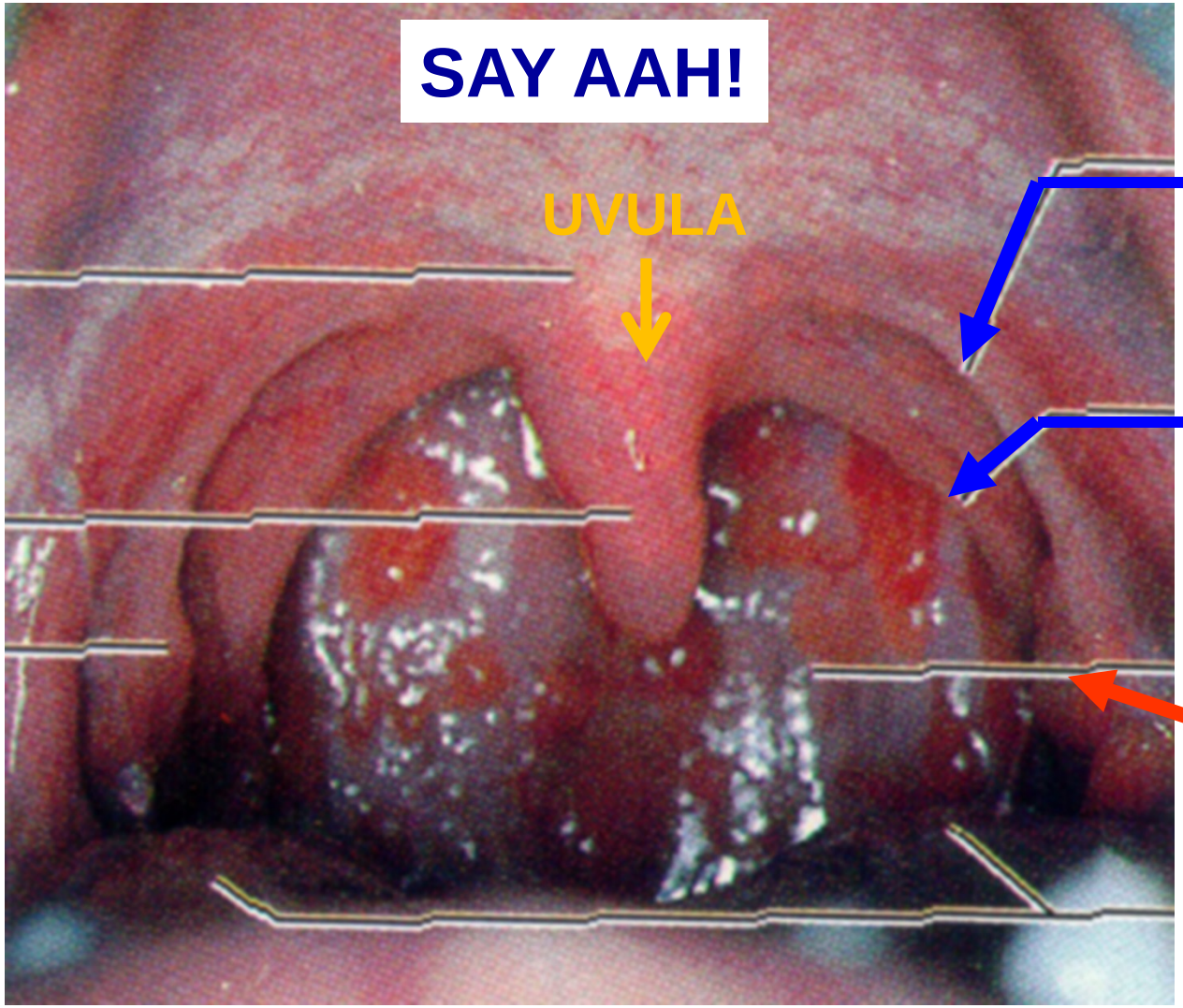
2) Hitchhiking VII – (Chorda Tympani Taste fibers to Anterior Tongue **

PHARYNX





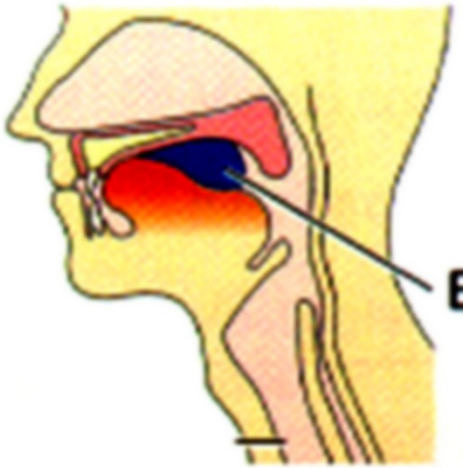
SAY
AAHH!



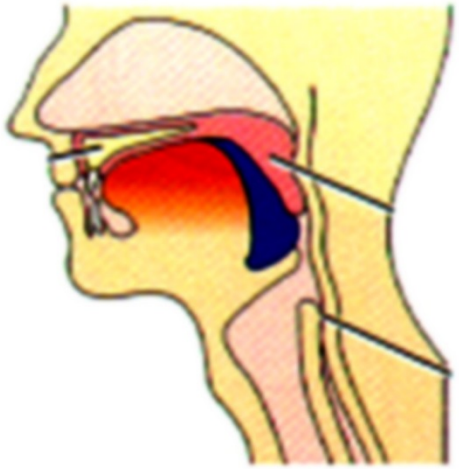
CLINICAL - PALATOGLOSSAL ARCH = SITE OF THE OROPHARYNGEAL MEMBRANE = BOUNDARY BETWEEN ORAL CAVITY (PRECISE SOMATIC SENSORY) AND PHARYNX (IMPRECISE VISCERAL SENSORY)

OVERVIEW OF SWALLOWING

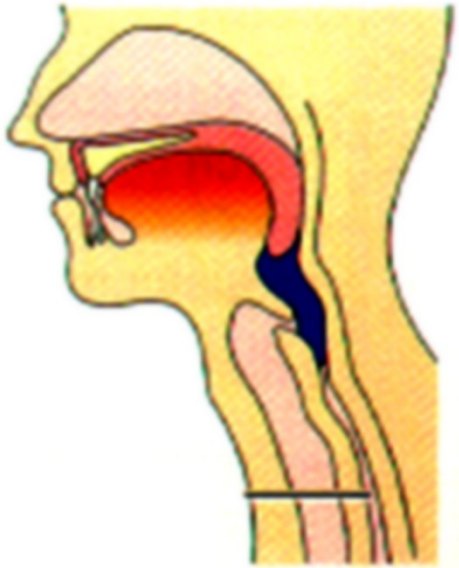
PHARYNX ACTS TO PROPEL FOOD IN SWALLOWING

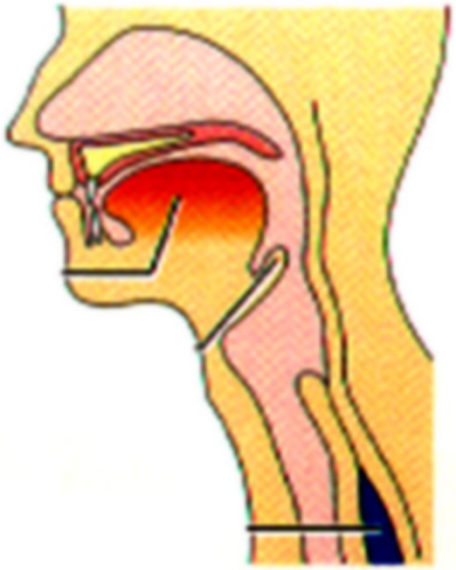


Voluntary phase



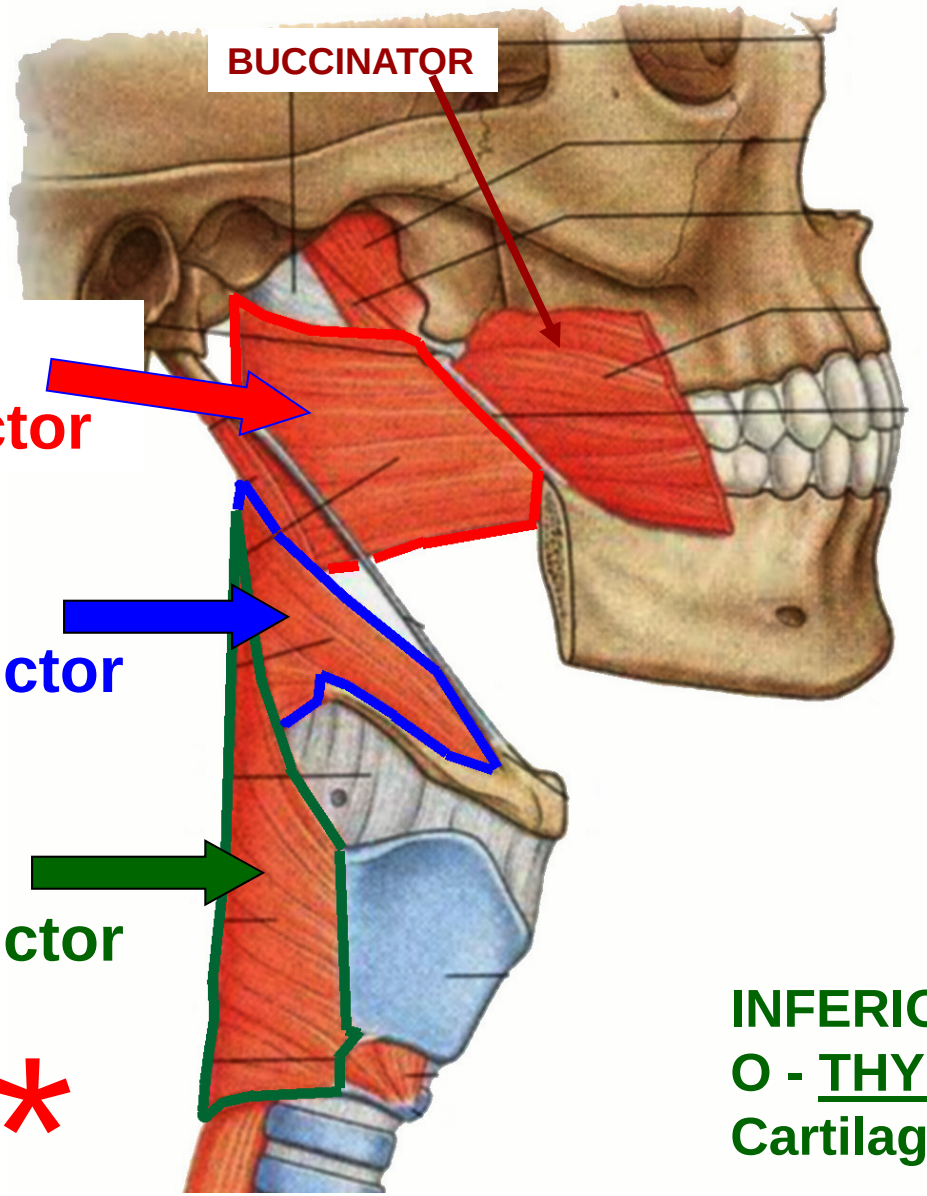
Involuntary phase 1





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

***

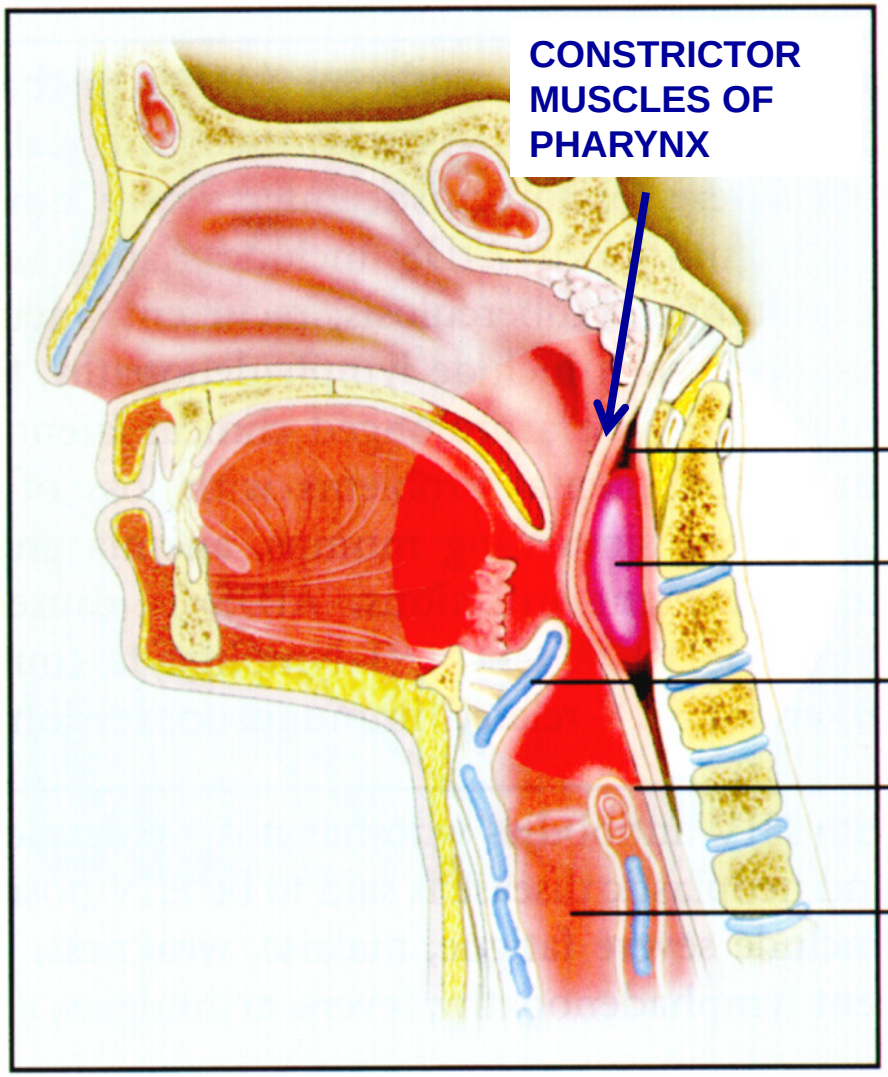
SUPERIOR CONSTRICTOR *

CONTINUOUS ANT. WITH BUCCINATOR)

MIDDLE CONSTRICTOR
O - HYOID

INFERIOR CONSTRICTOR
O - THYROID & CRICOID Cartilage

RETROPHARYNGEAL ABSCESS

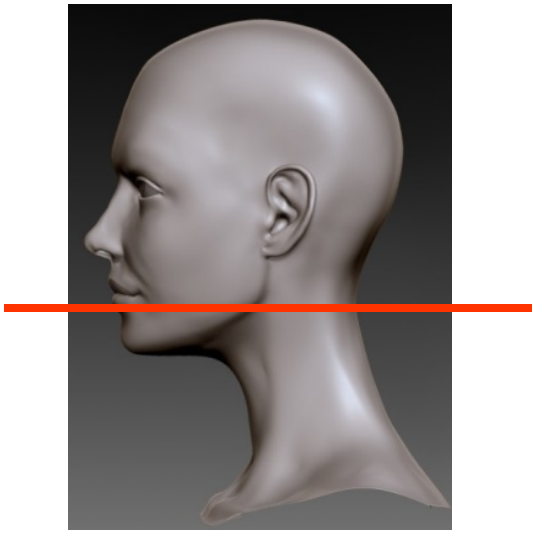


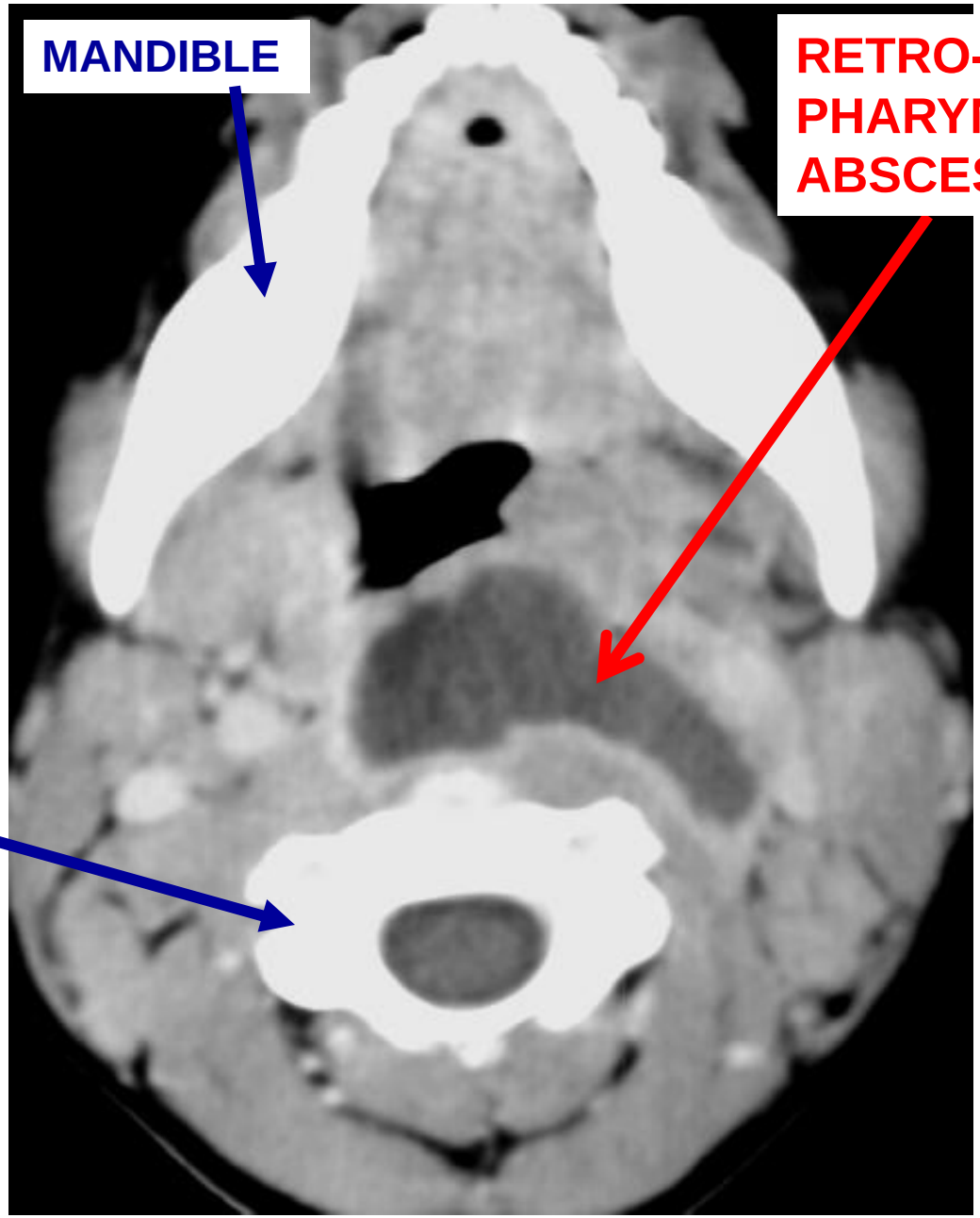
Retropharyngeal space – potential space between pharynx (" pretracheal " fascial layer) and vertebrae ("prevertebral ") layer of fascia

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

**

Note: George Washington may have died from this



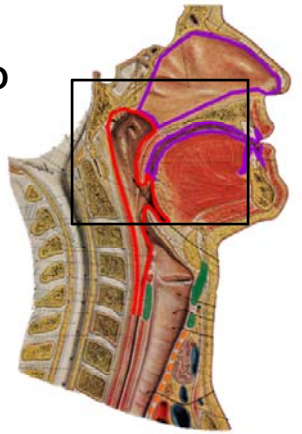


POST. COMPARTMENT -

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

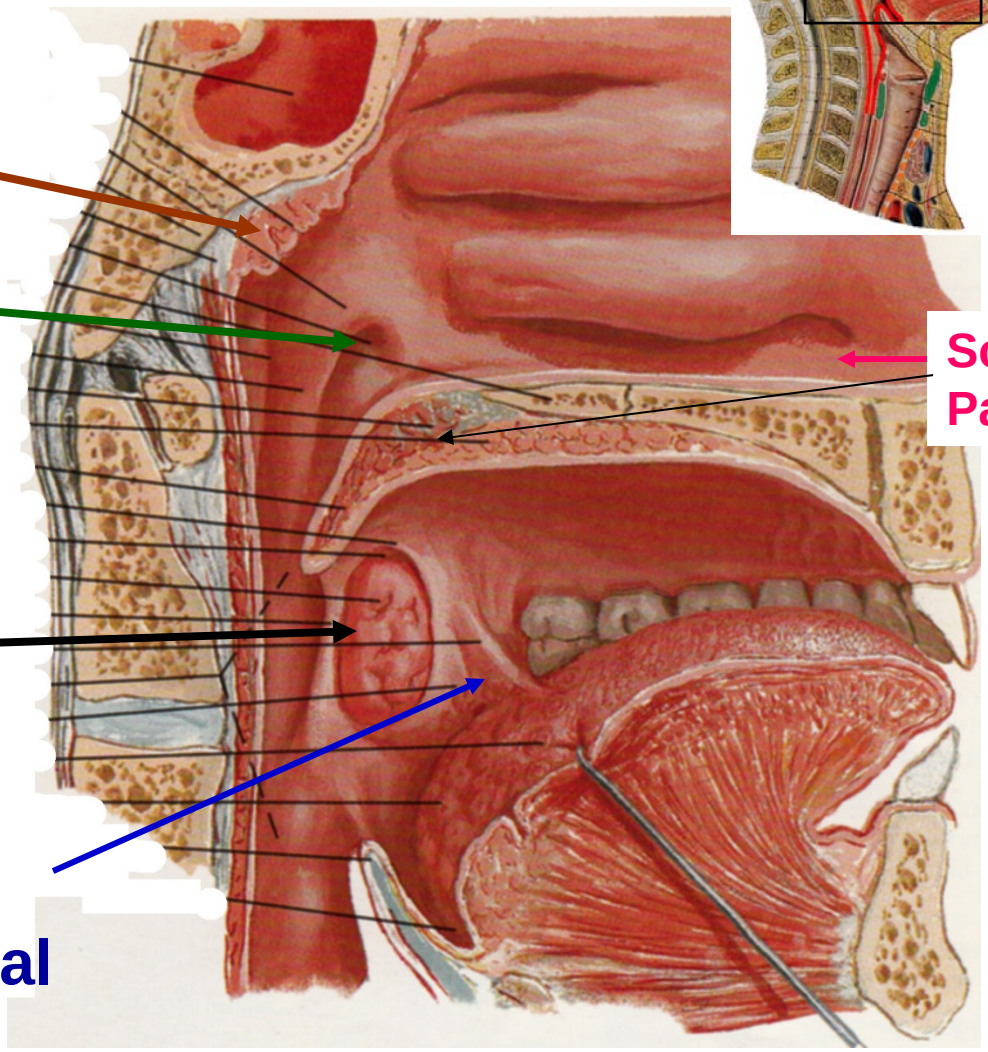
STRUCTURES IN PHARYNX

ORIENT TO PALATE



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

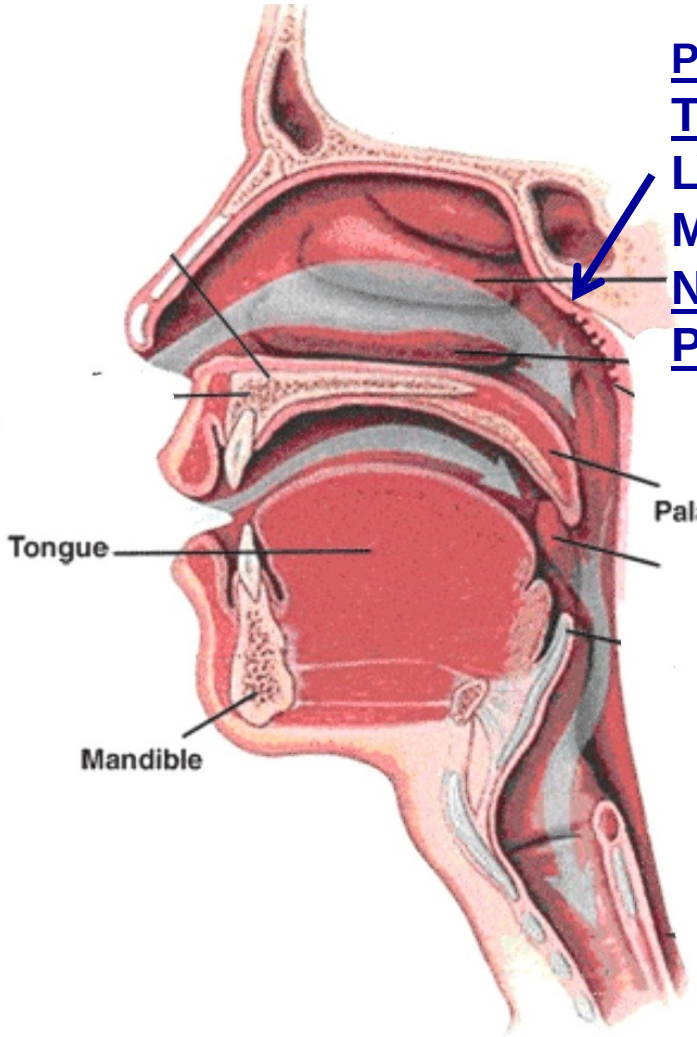
in Oropharynx
- Palatine Tonsils (Tonsillitis)
posterior to Palatoglossal Arch (boundary between Oral Cavity and Oropharynx)



Soft Palate

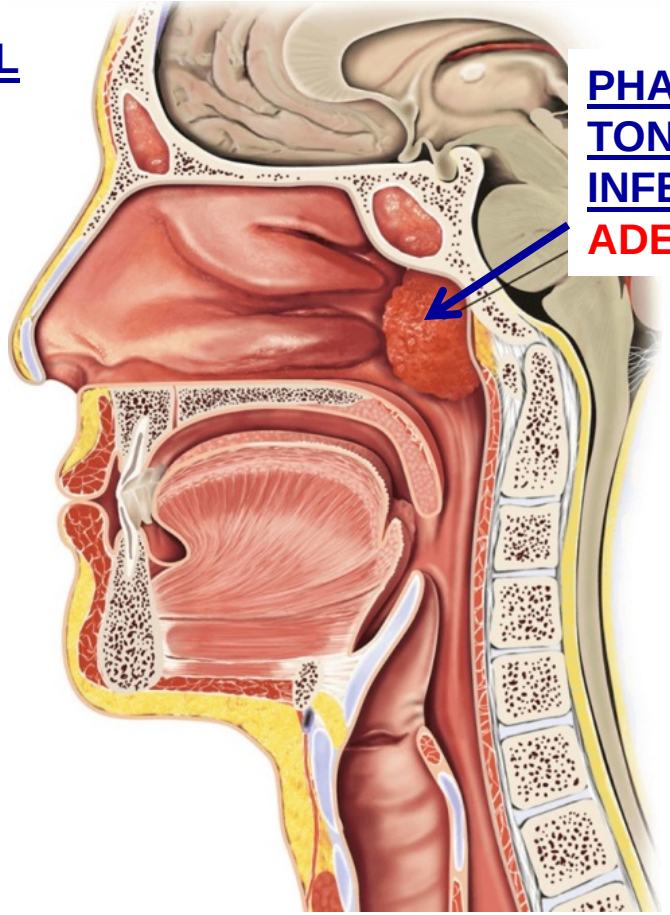
–**TORUS** - donut shape

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

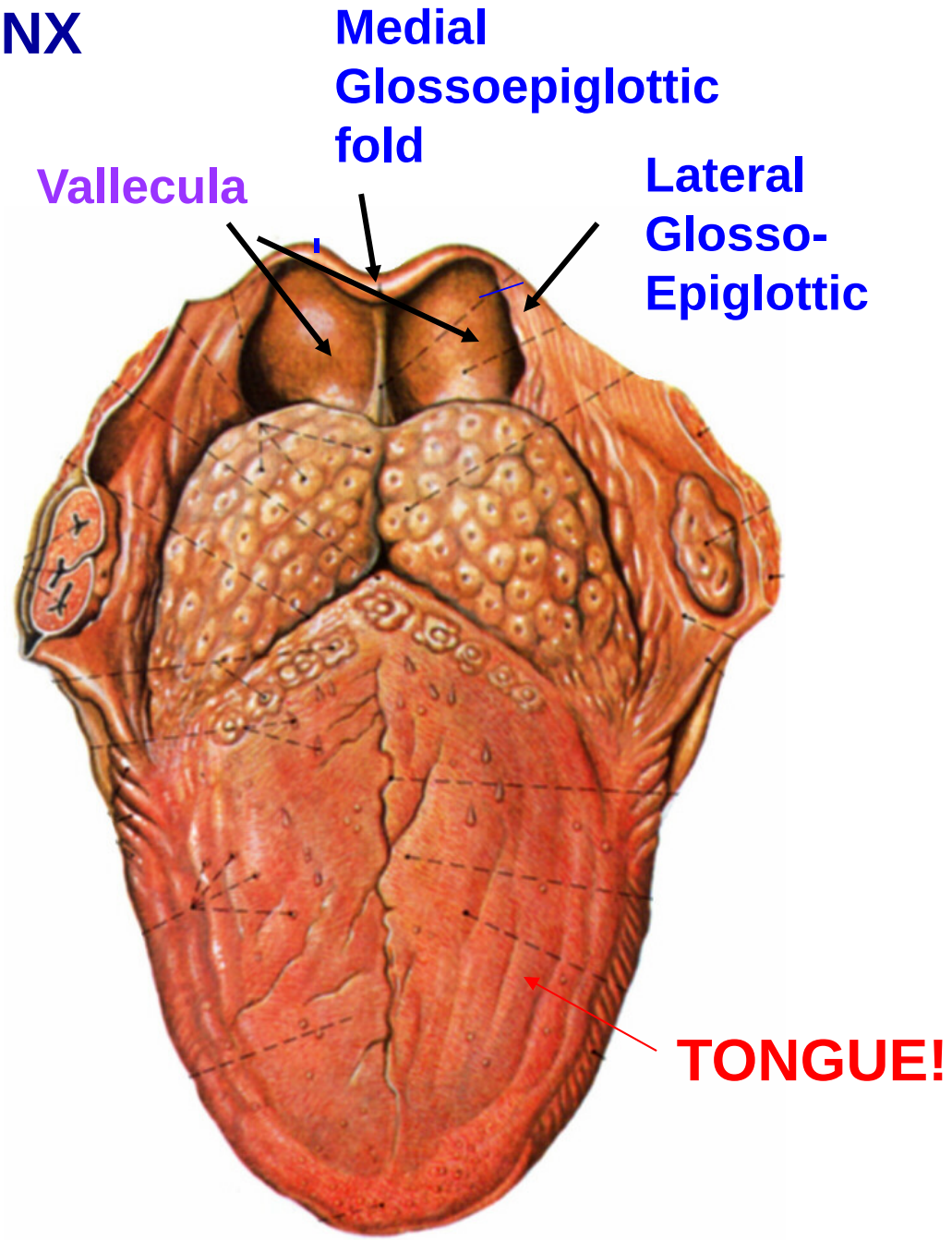
ADENOIDS CAN BLOCK PASSAGE OF AIR THROUGH NASAL CAVITY – SYMPTOM: NASAL VOICE

‘POCKETS’ IN PHARYNX

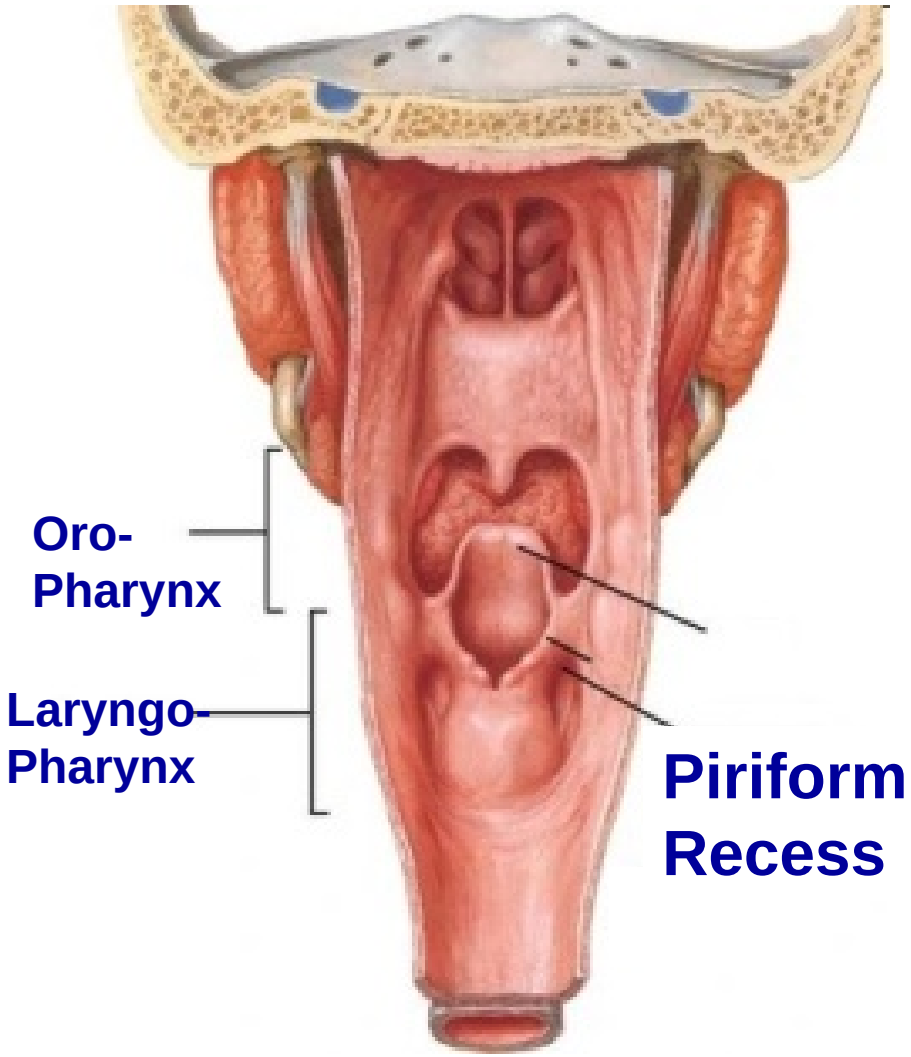
in Oropharynx
- Valleculae = depressions (2) Between Med., Lat. Glossoepiglottic Folds; Food/objects Lodge in Valleculae

Clinical: **Valleculae = Popcorn 1**

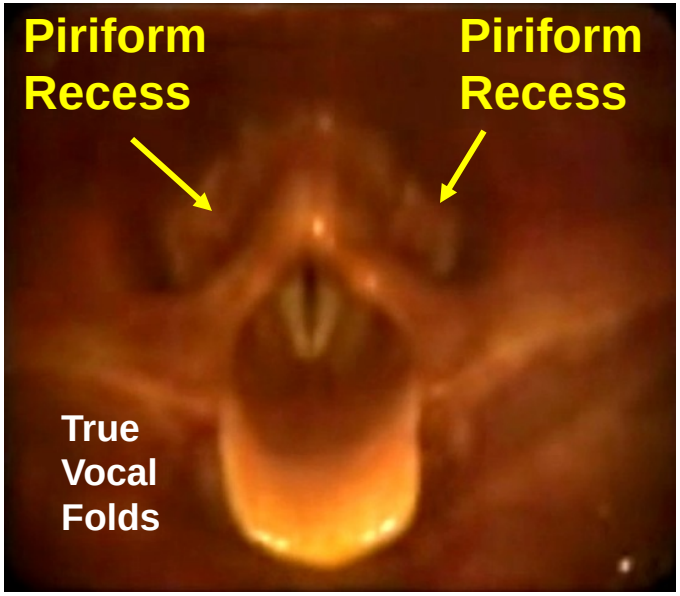
***



‘POCKETS’ IN PHARYNX



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



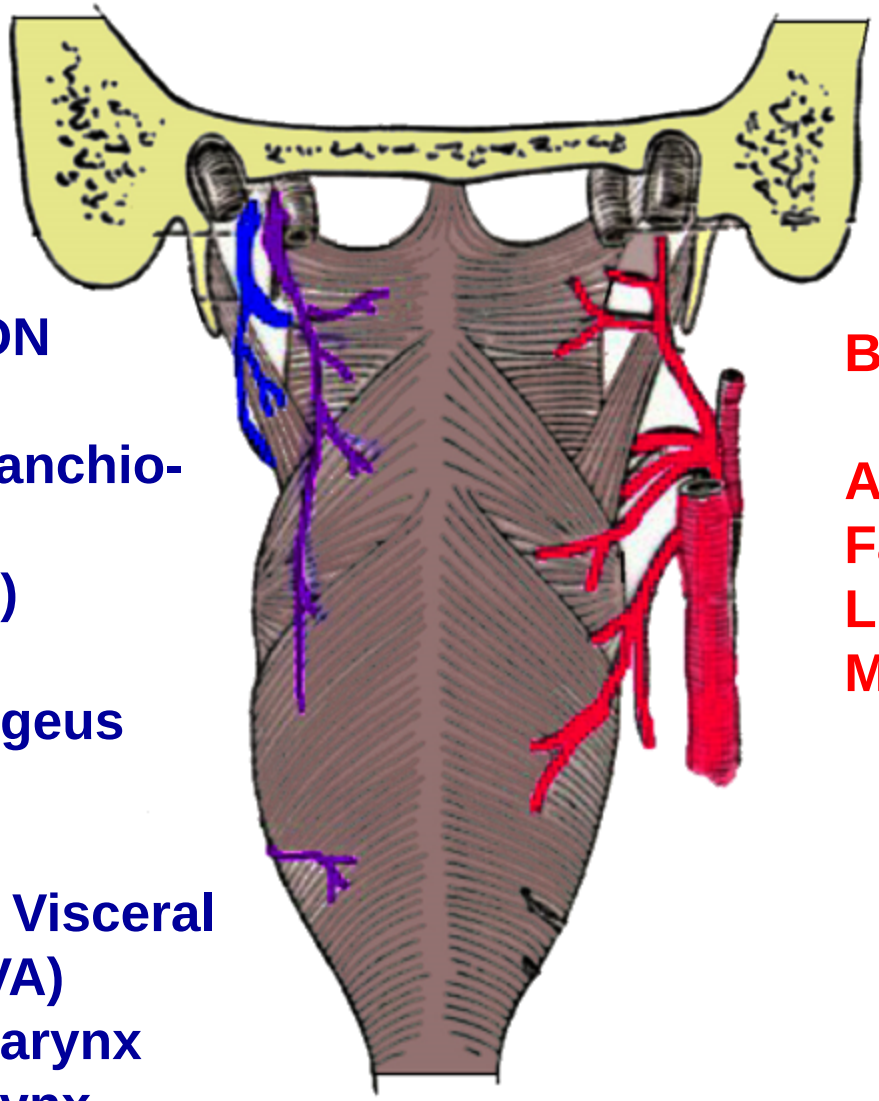
Clinical: **Piriform Recess = Popcorn 2 – food lodge in Laryngo-Pharynx**

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

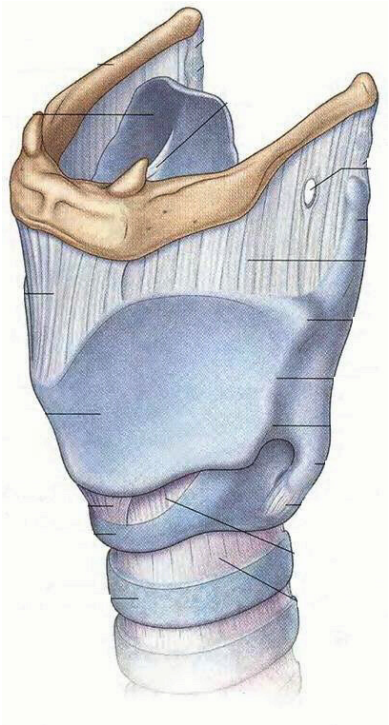
LARYNX

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

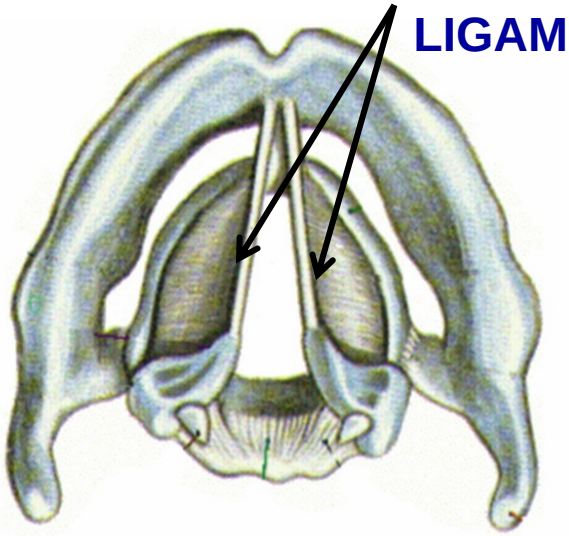
ARYTENOID CARTILAGES

CRICOID CARTILAGE

View with Thyroid Cartilage Removed

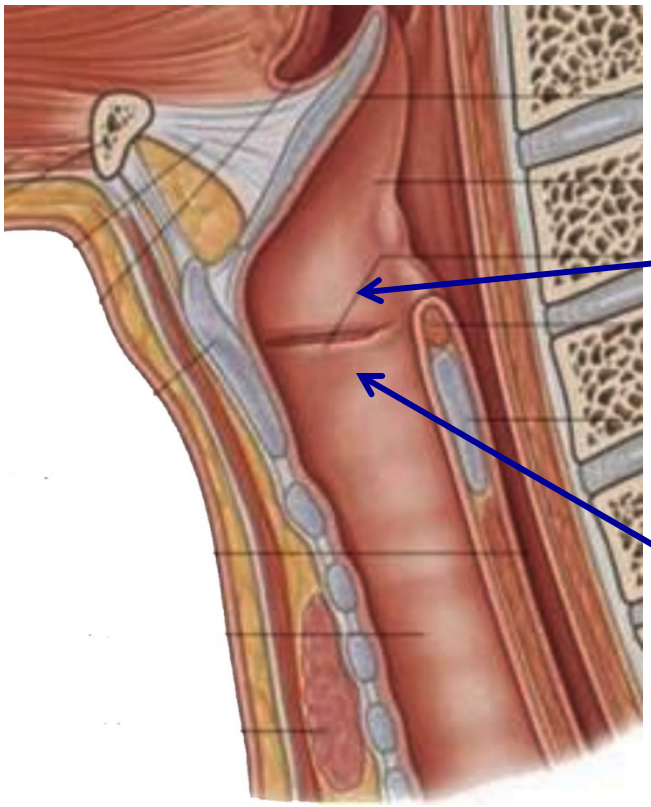
SOUND IS PRODUCED BY FORCING AIR THROUGH VIBRATING INTERNAL LIGAMENTS (VOCAL LIGAMENTS (extend from Thyroid to Arytenoid Cartilages)

VOCAL LIGAMENTS



Vocal ligaments act like lips of a trumpet player

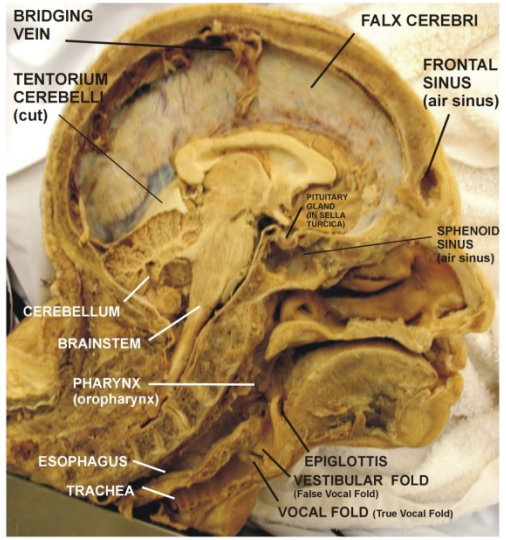
INTERNAL VIEW OF LARYNX



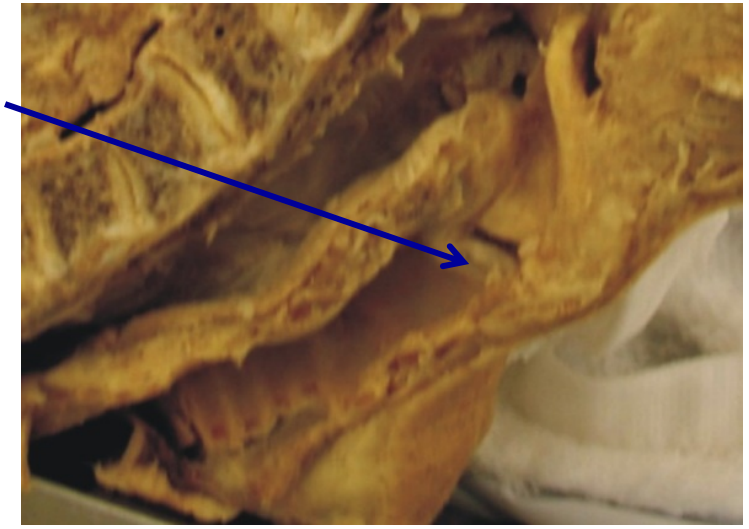
VESTIBULAR (FALSE VOCAL) FOLDS - overlie vestibular ligaments

VOCAL (TRUE VOCAL) FOLDS - overlie vocal ligaments

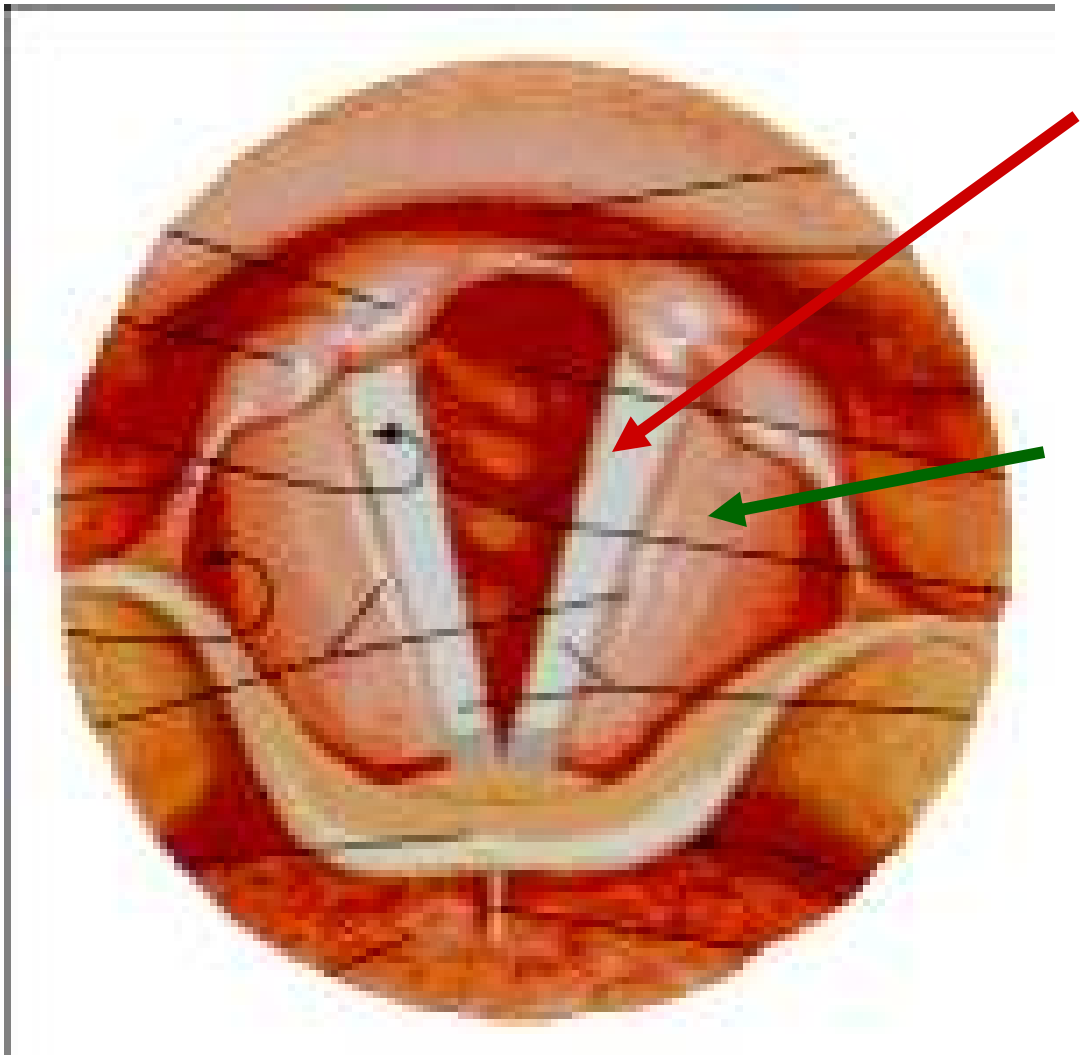
BISECTED HEAD WITH INTACT FALX CEREBRI 75



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

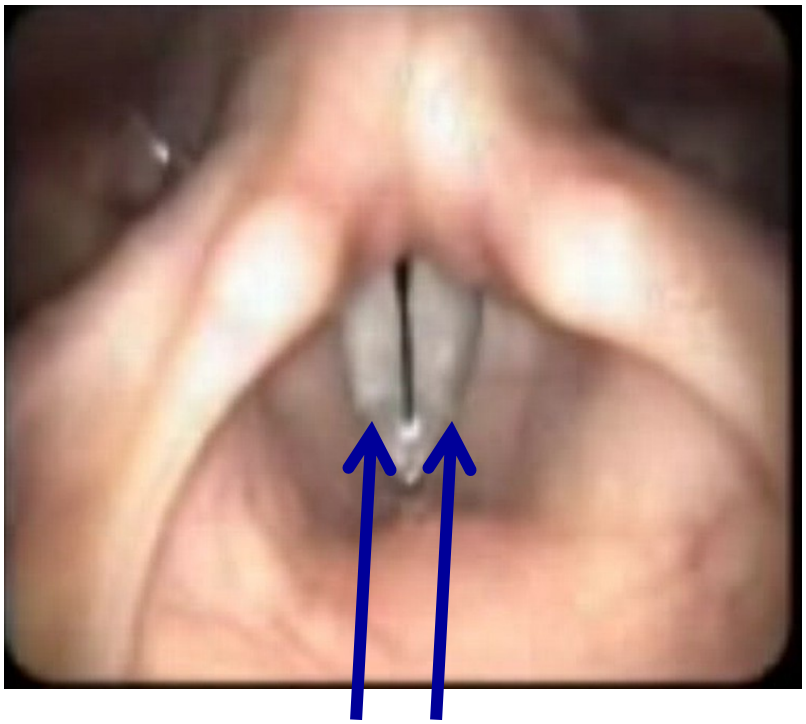
FALSE VOCAL FOLDS - overlie vestibular ligaments

LARYNGOSCOPE VIEW OF LARYNX

DEEP BREATHING

TRUE VOCAL FOLDS SPREAD APART – OPEN LARYNX

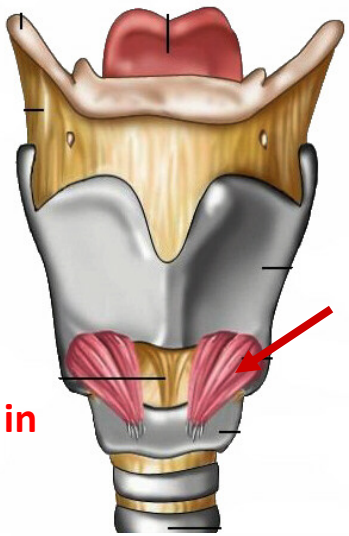
PRODUCE SOUND



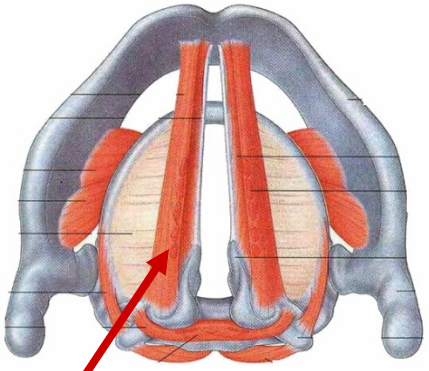
TRUE VOCAL FOLDS BROUGHT TOGETHER – VIBRATE AND PRODUCE SOUND

MUSCLES OF LARYNX: RAISE/LOWER PITCH

ADAM'S APPLE - longer vocal folds in males

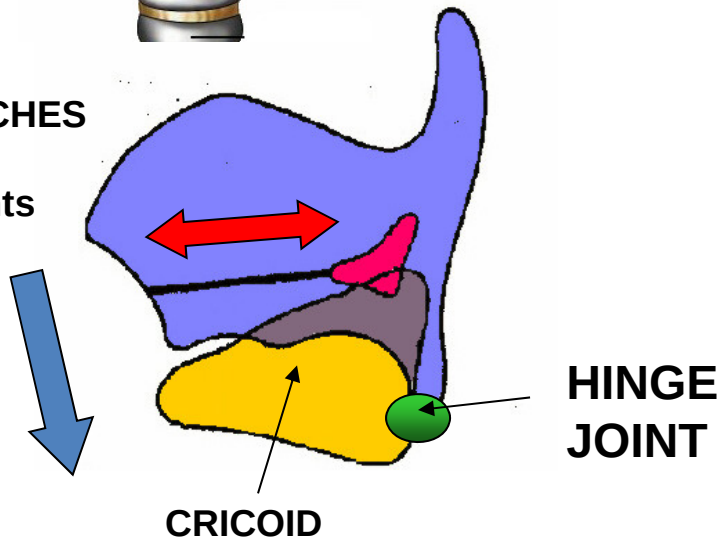


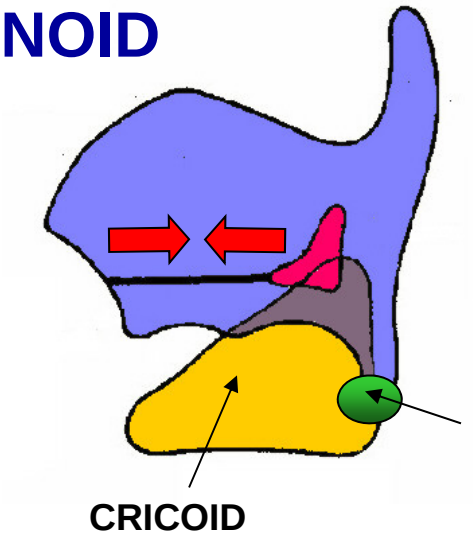
CRICO-THYROID



THYRO-ARYTENOID

Tilting - STRETCHES vocal ligaments



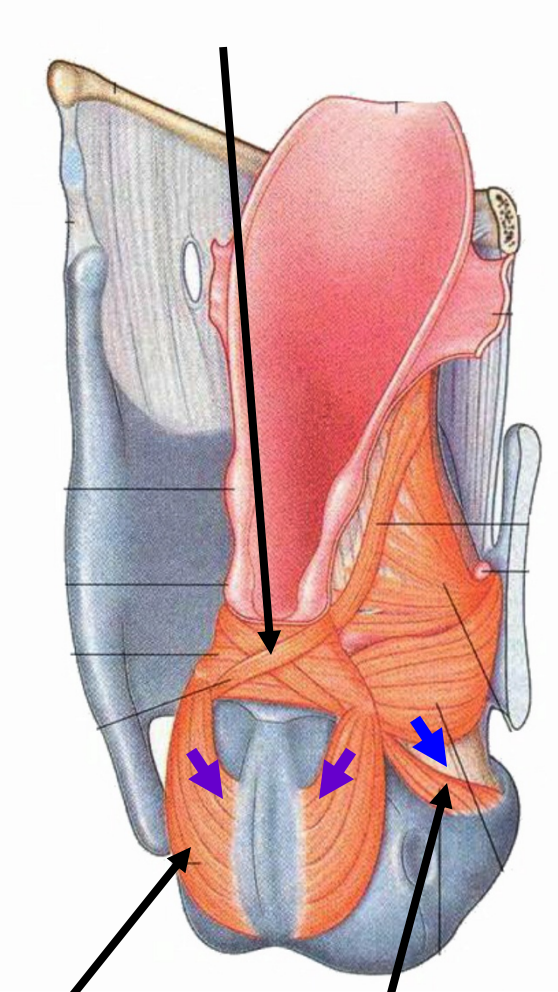


STRETCH vocal ligament
INCREASE PITCH -
CRICOTHYROID

RELAX vocal ligament
DECREASE PITCH -
THYROARYTENOID

OPEN AND CLOSE LARYNX –
(OPENING CALLED RIMA GLOTTIDIS)

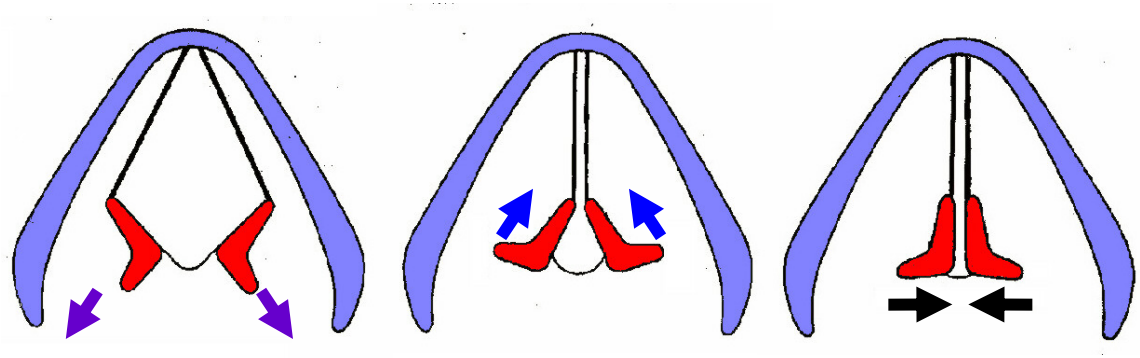
ARYTENOIDEUS



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)

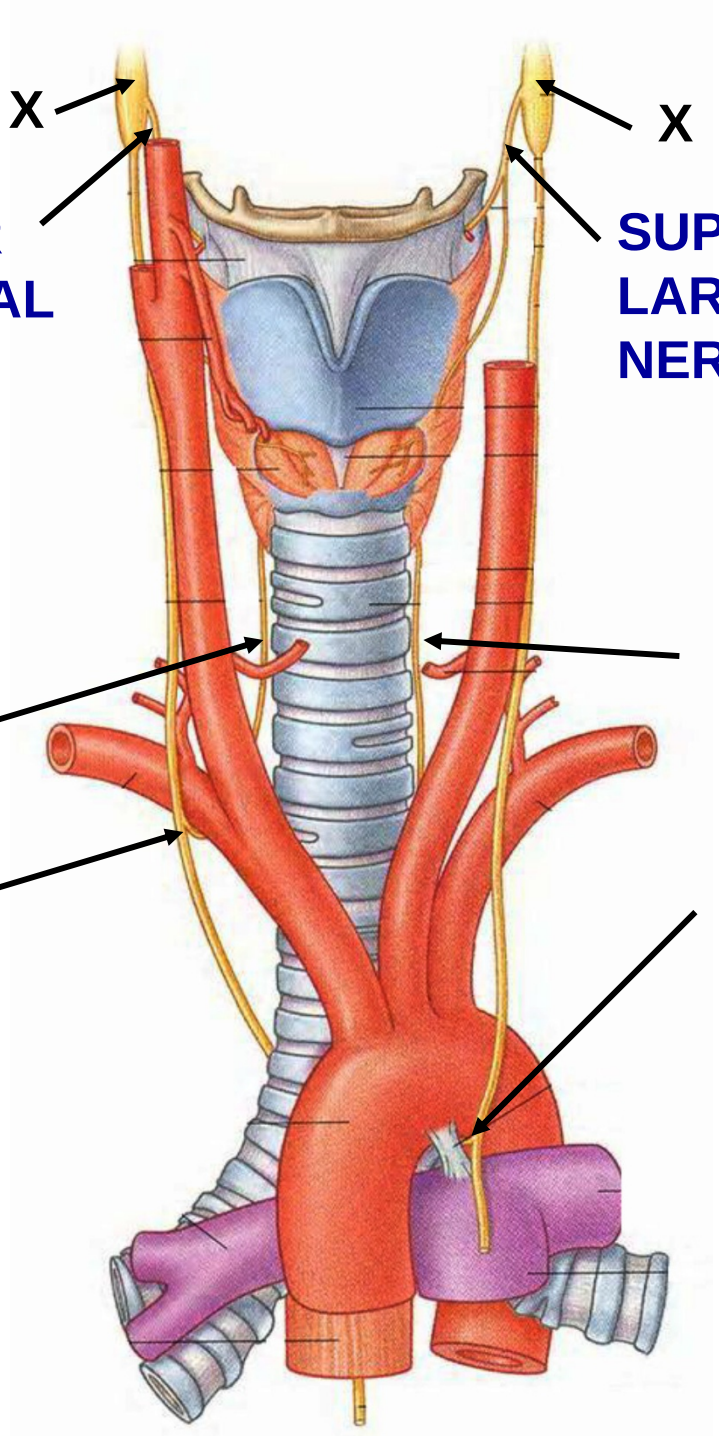
CHART: ACTIONS OF LARYNGEAL MUSCLES

**

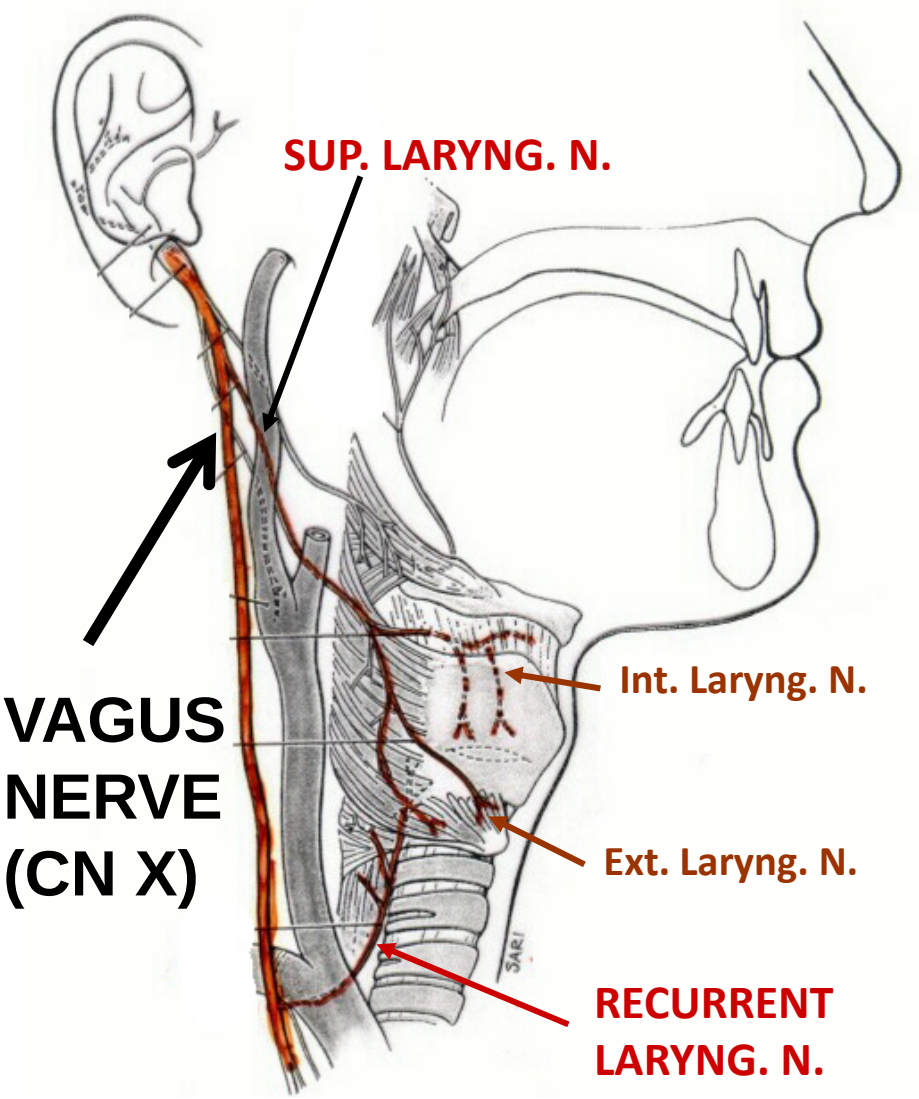
MUSCLE	ACTION	NERVE
Cricothyroid	Tenses vocal fold, Raises pitch of sound	External Laryngeal n. (X)
Thyroarytenoid	Relaxes vocal fold, Decreases pitch of sound	Recurrent Laryngeal n. (X)
Posterior cricoarytenoid	Abducts vocal folds, opens rima glottides (open larynx)	Recurrent Laryngeal n. (X)
Lateral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

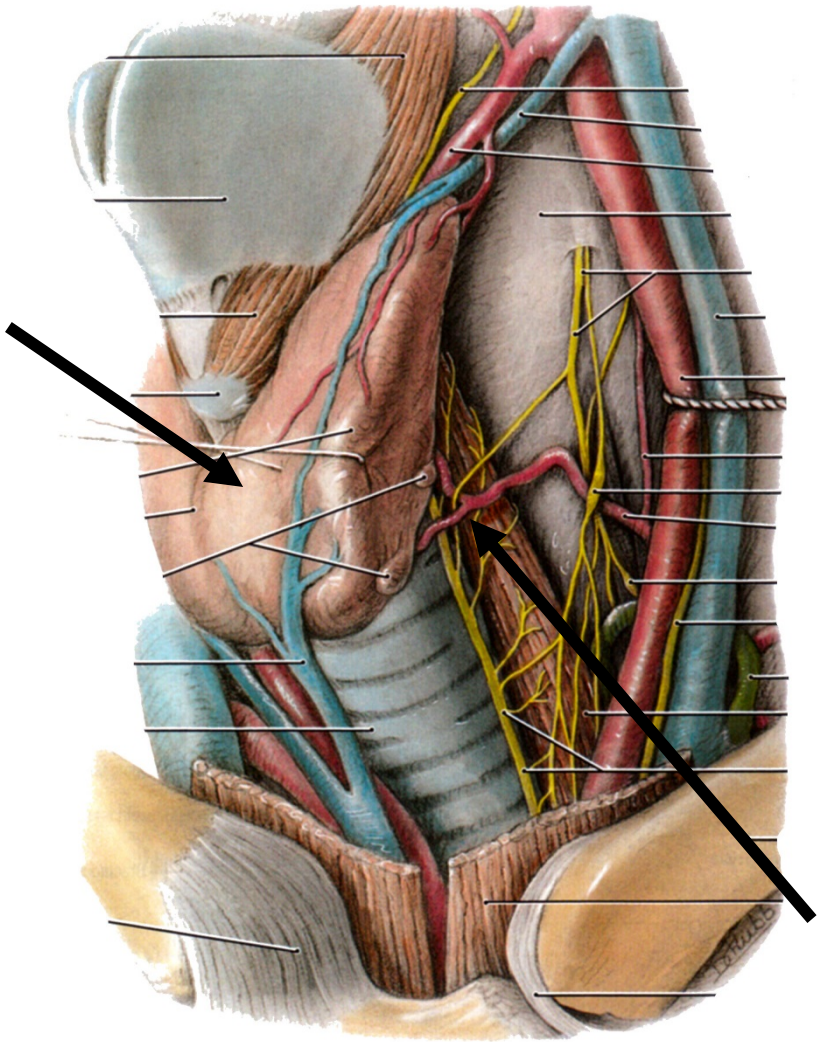
B. **Recurrent Laryngeal N.** motor to **All other Muscles of Larynx**

**

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



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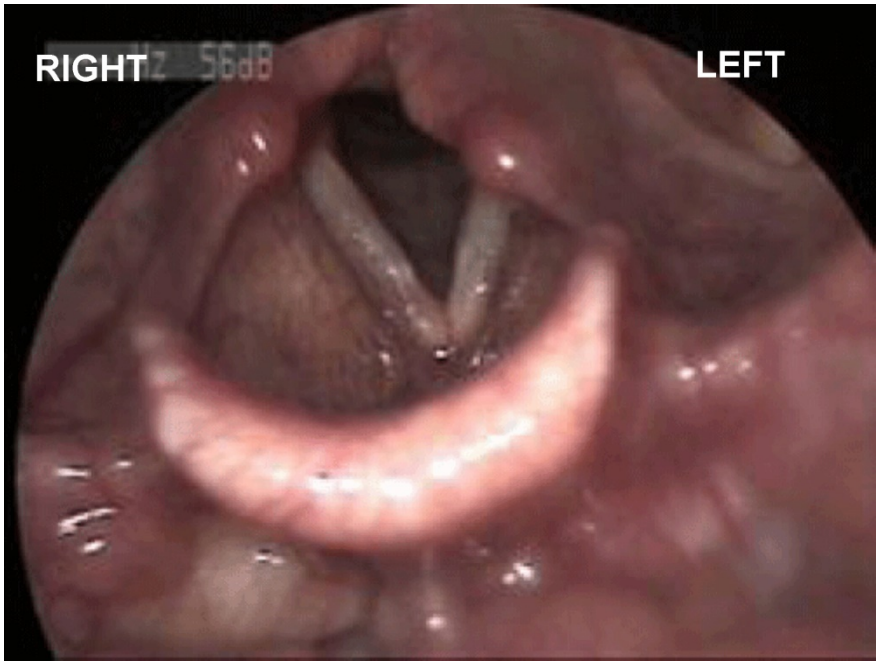
DAMAGE TO RECURRENT LARYNGEAL NERVE - can occur in Thyroid Surgery; paralyze all muscles one side except Cricothyroid; permanent hoarse voice

Recurrent Laryngeal Nerve

PRACTICE QUESTION CLINICAL VIGNETTE

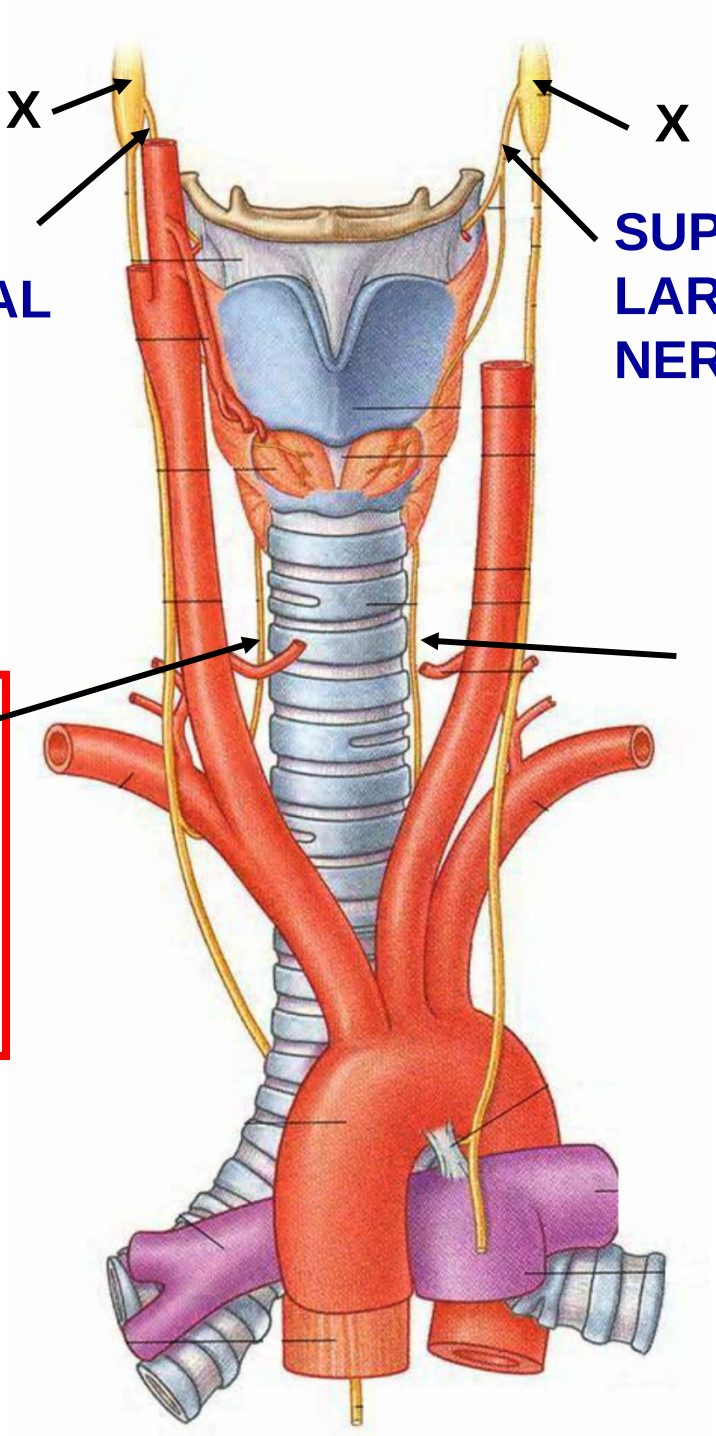


A patient undergoes surgery for removal of thyroid nodules. The nodules are found to be noncancerous but post-operatively the patient has a 'hoarse' voice. Laryngoscopic examination (photo left) shows asymmetry in position of the vocal folds when the patient is told to breathe deeply. The physician suspects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

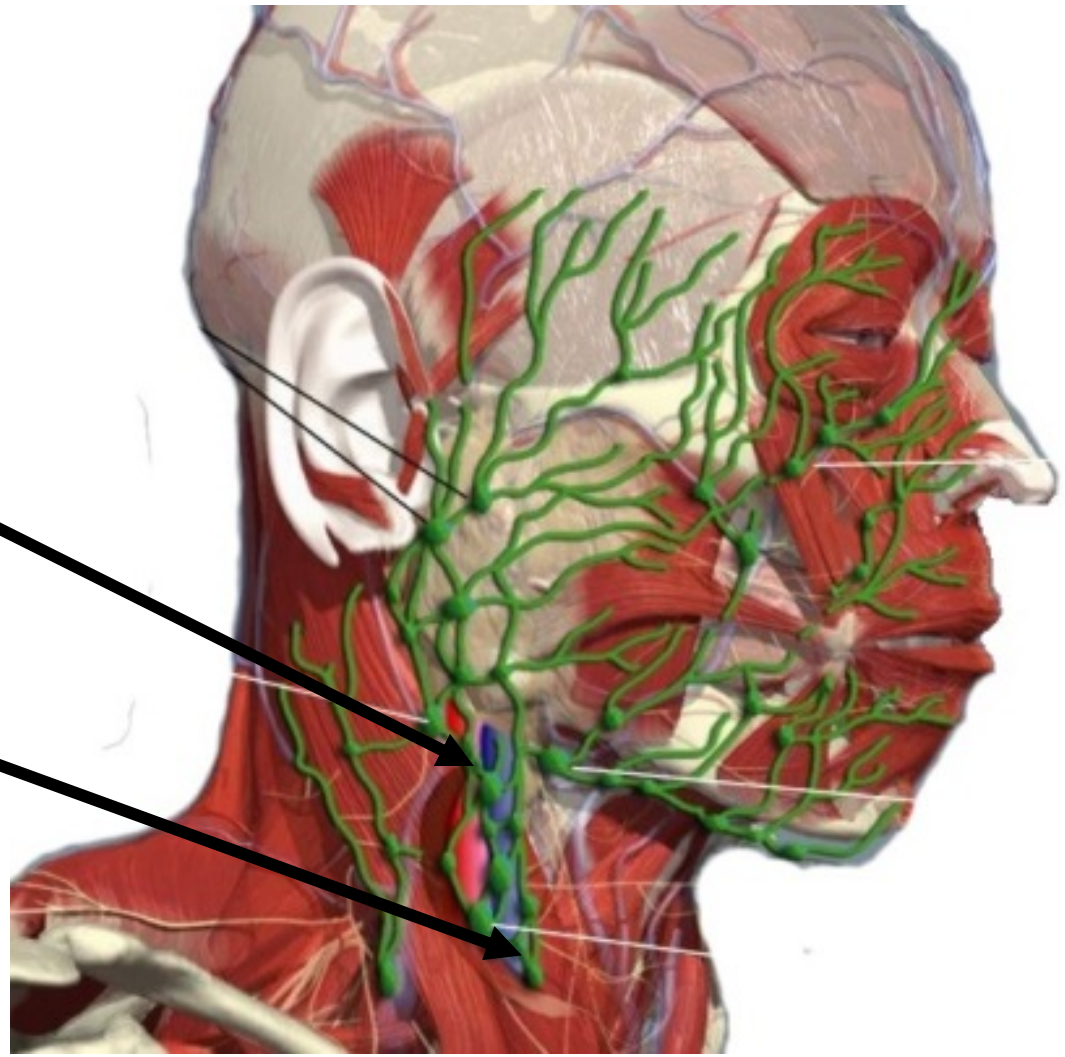
All are Branches of Vagus CN X



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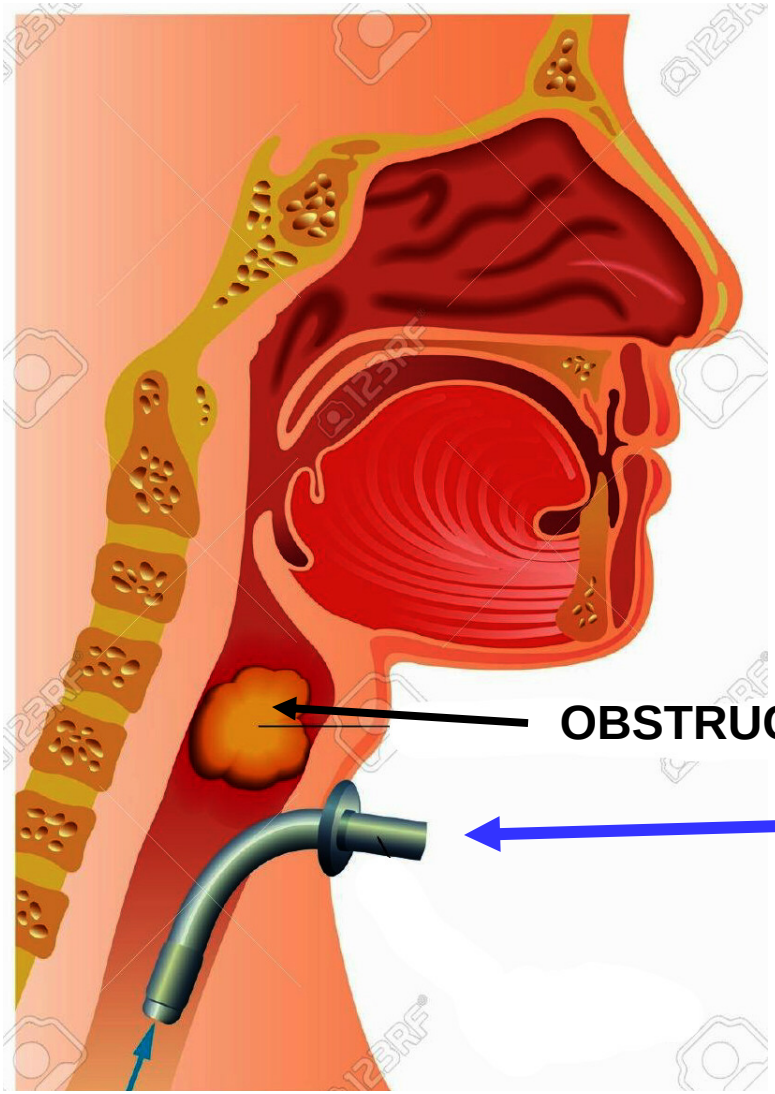
CLINICAL Note: Mucosa is tightly attached to vocal folds; in Anaphylactic Shock (acute allergic reaction) swelling of Vestibular folds can constrict airway and lead to Suffocation

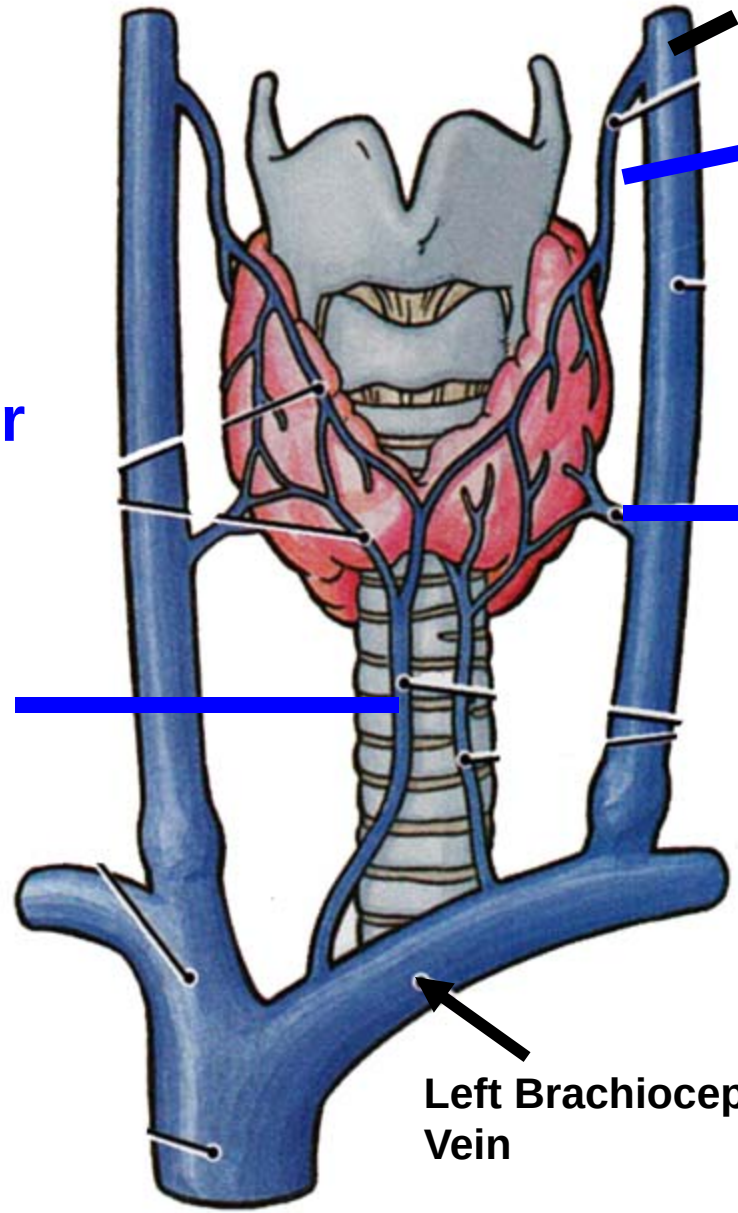
OBSTRUCTION OF LARYNX: TRACHEOTOMY



open airway to lungs below obstructed larynx OR swollen vestibular folds

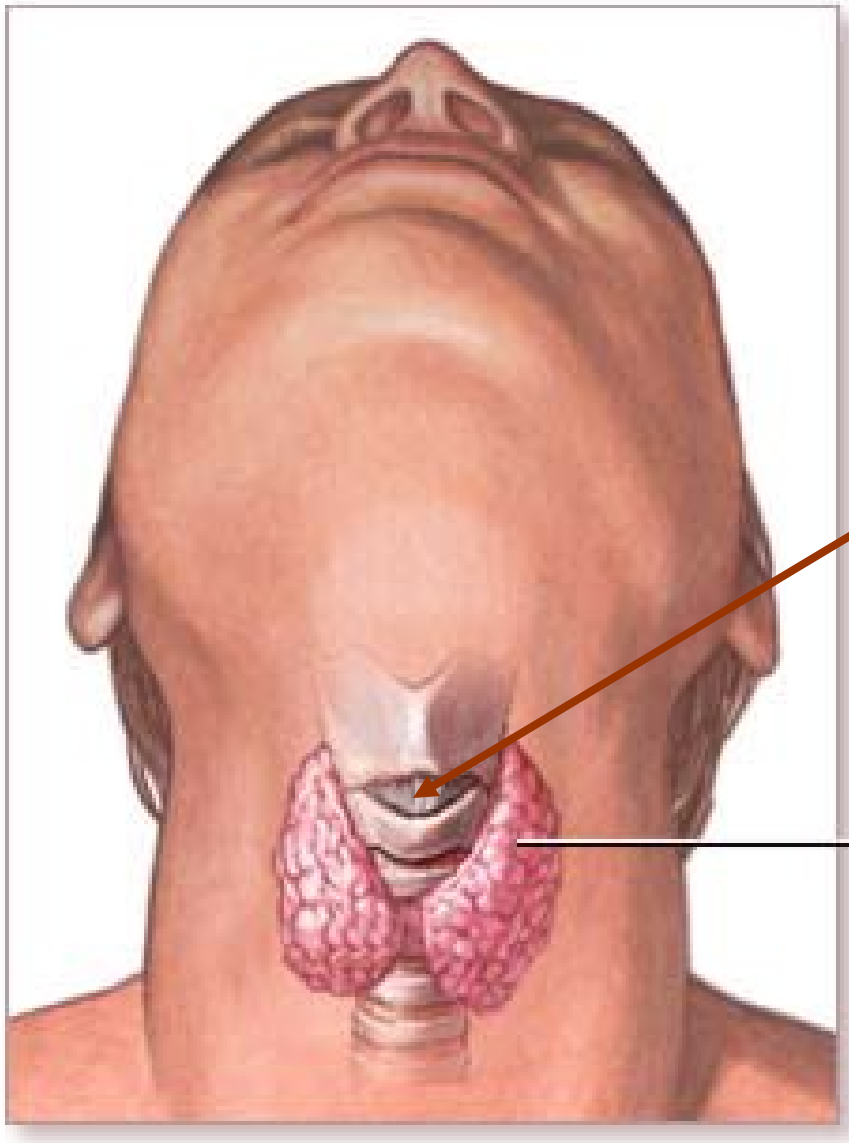
Tracheotomy - cut between 1st and 2nd or 2nd and 3rd Tracheal cartilages

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

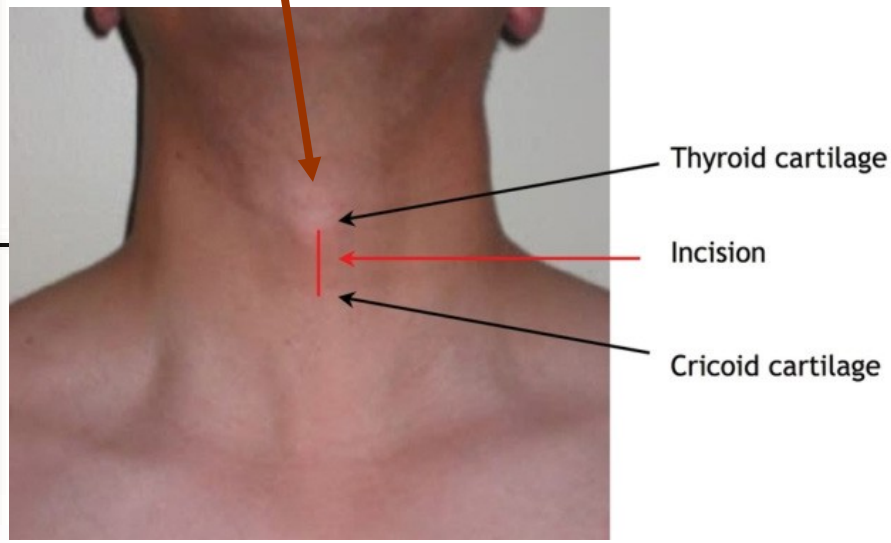
OBSTRUCTION OF LARYNX: CRICOTHYROTOMY



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

Cricothyroid Membrane

**

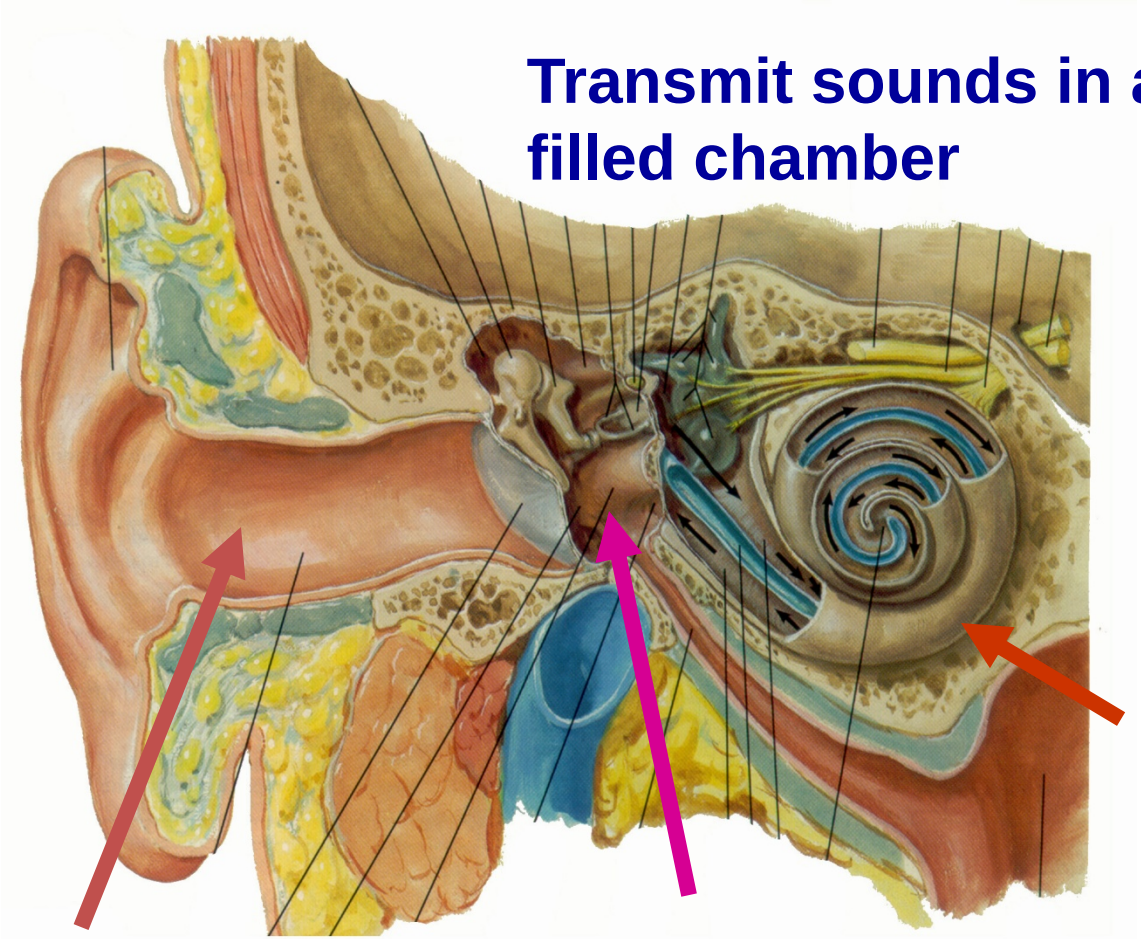


EAR

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

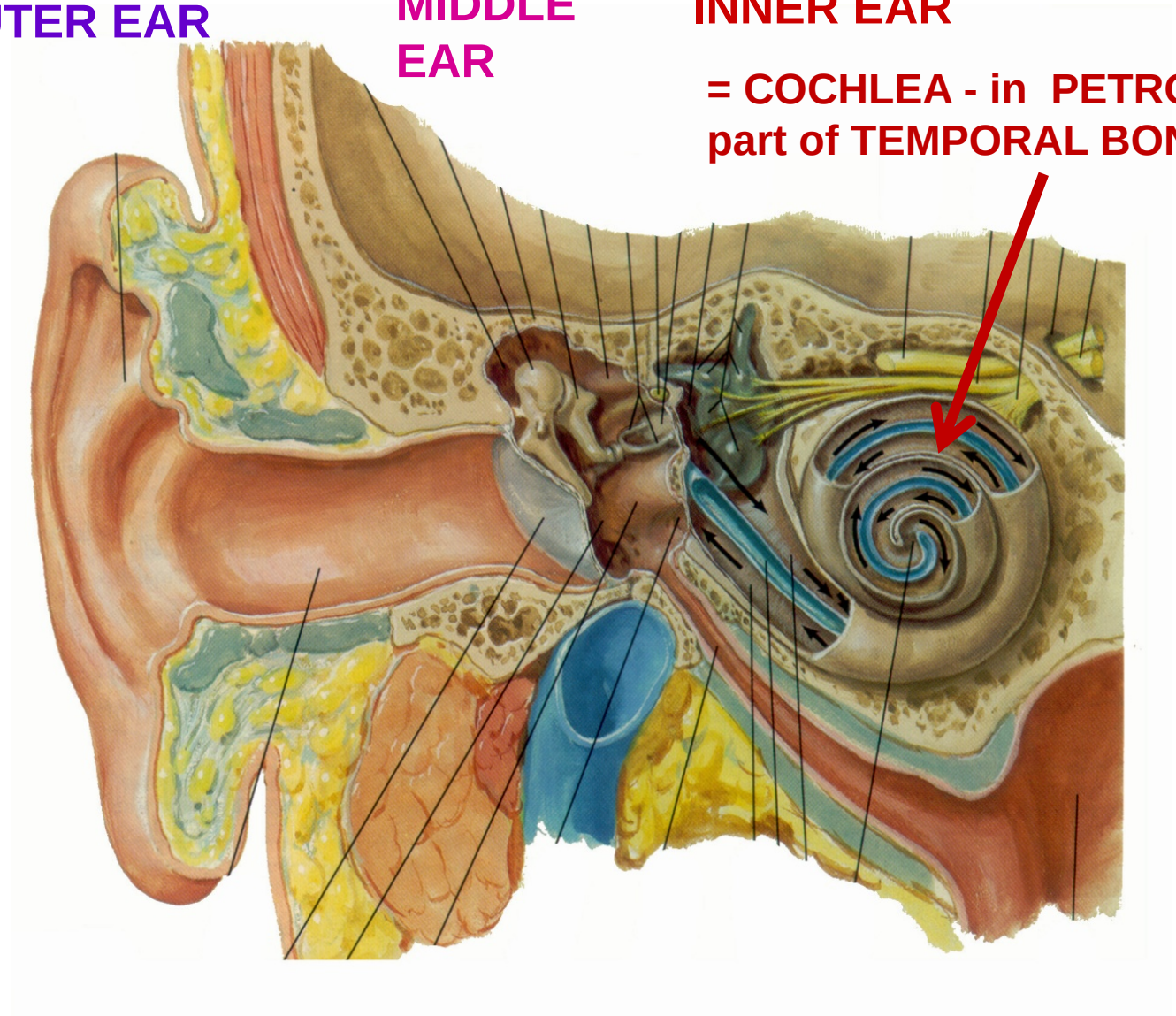
(= SENSORINEURAL PART)

OUTER EAR

MIDDLE EAR

INNER EAR

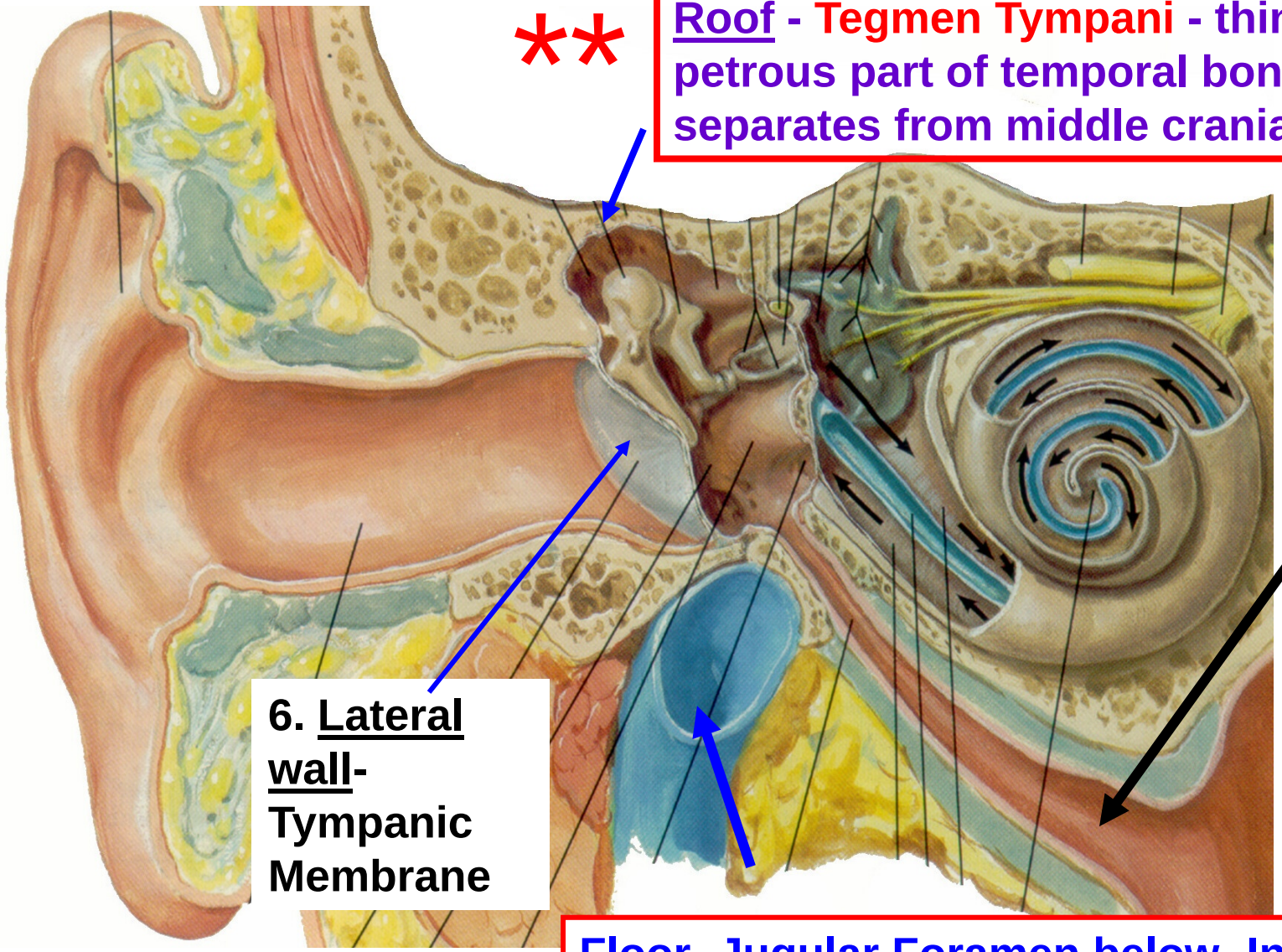
= COCHLEA - in PETROUS part of TEMPORAL BONE



MIDDLE EAR - BOUNDARIES

**

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

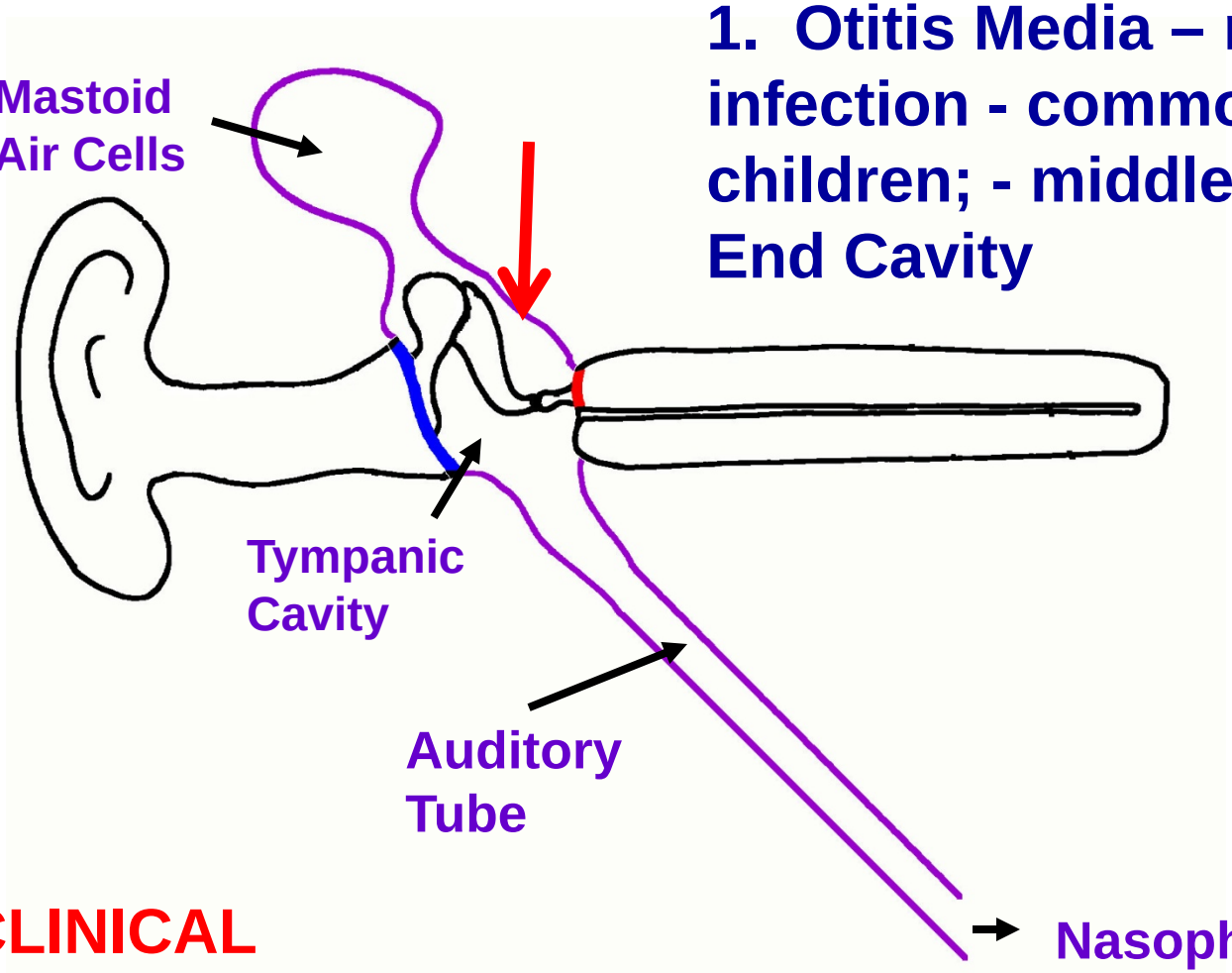
6. Lateral wall- Tympanic Membrane

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

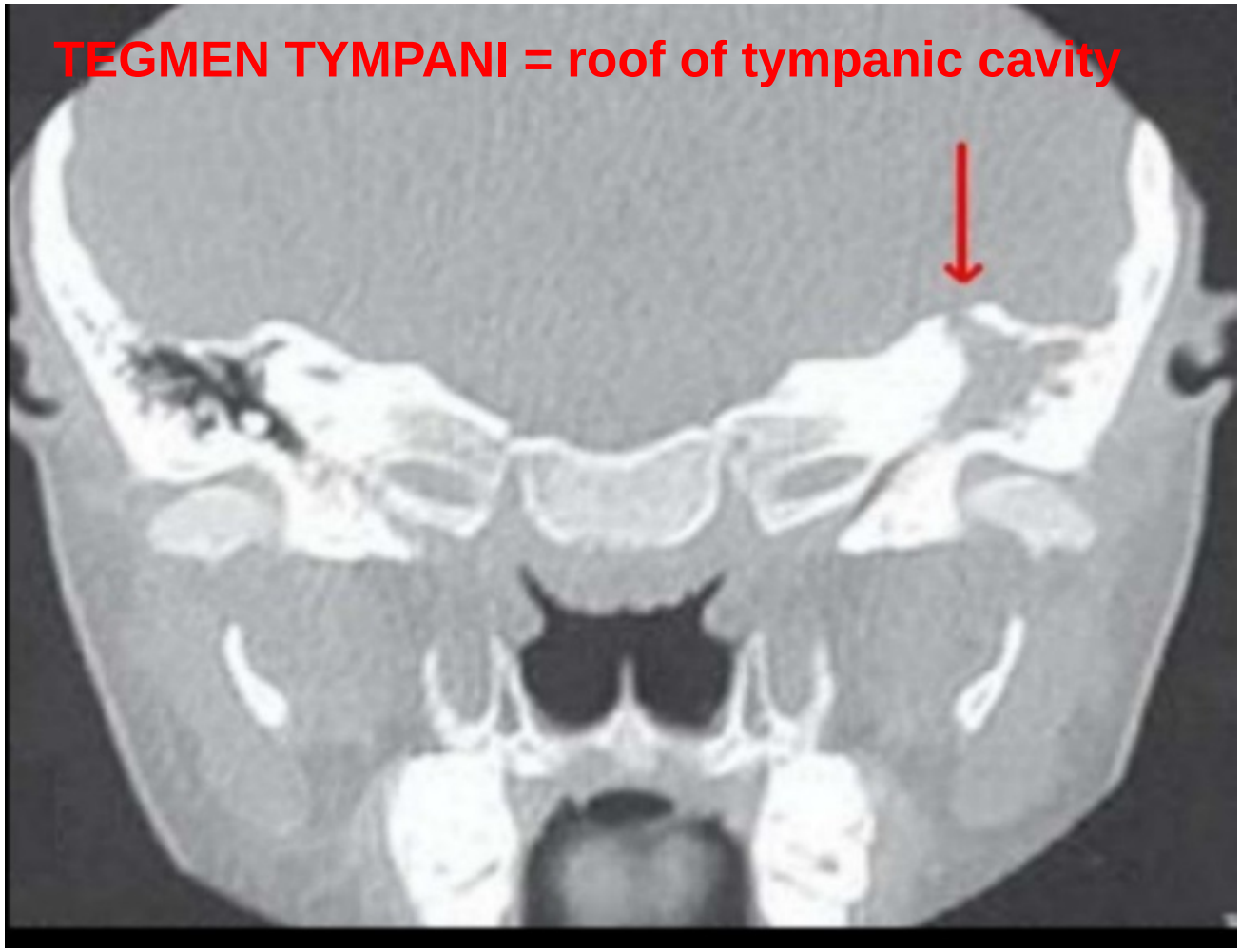


CLINICAL **

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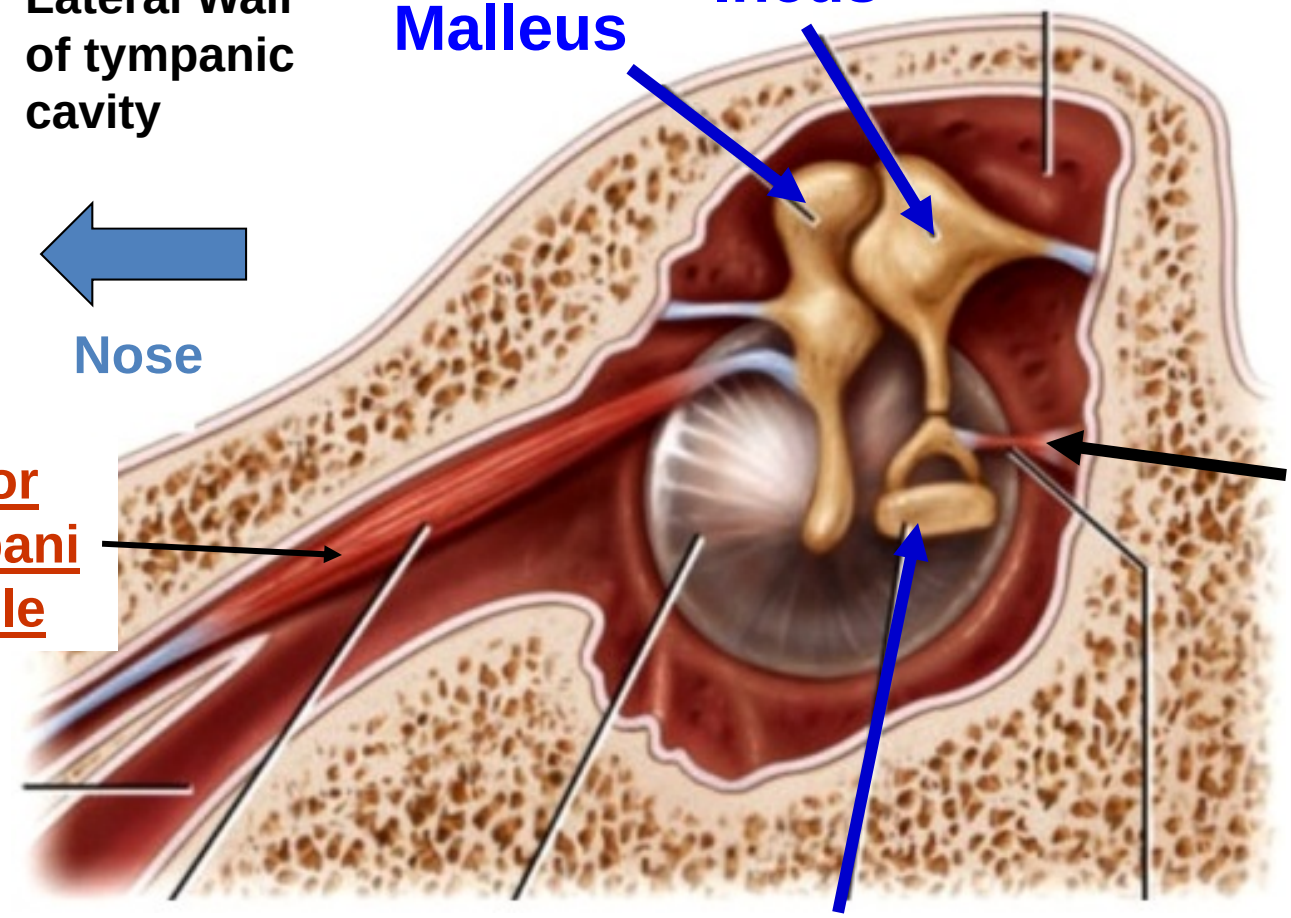
In prolonged Otitis media, infection can spread to Middle Cranial Fossa by eroding Tegmen Tympani (roof of tympanic cavity, middle ear)

MUSCLES OF MIDDLE EAR - dampen sound

View of Lateral Wall of tympanic cavity



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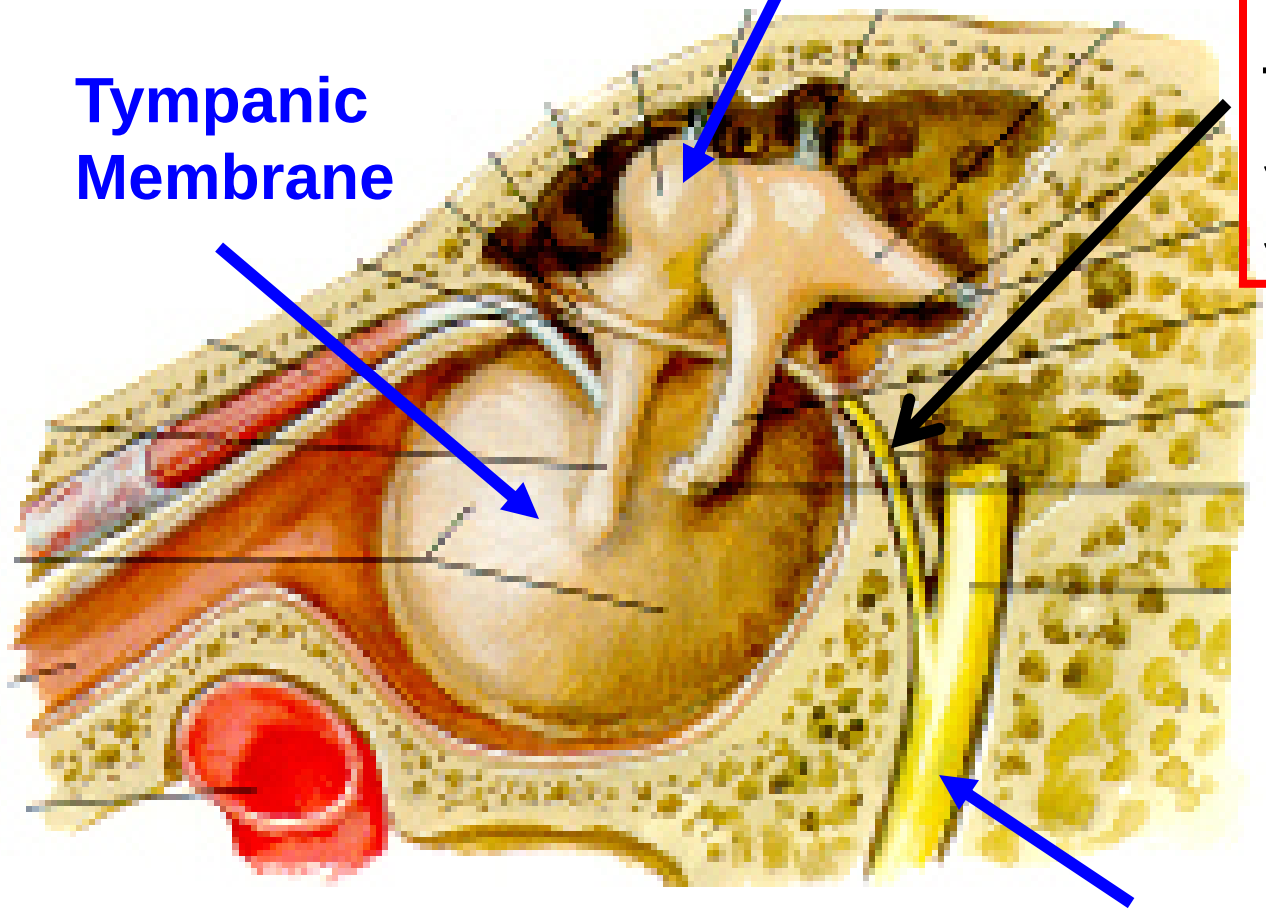
Damage to VII - Hyperacousia - sounds seem too loud

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

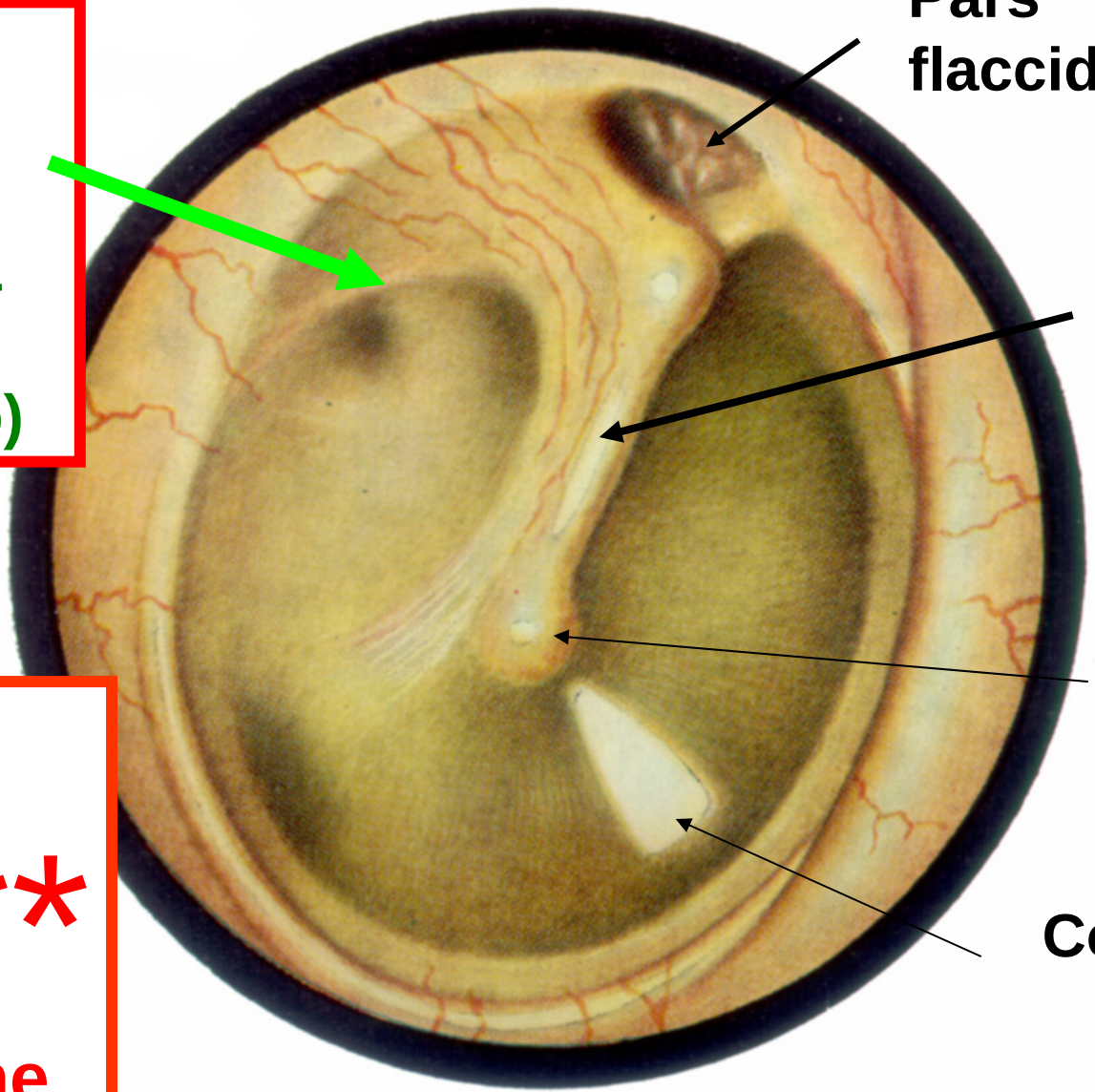


CLINICAL

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)

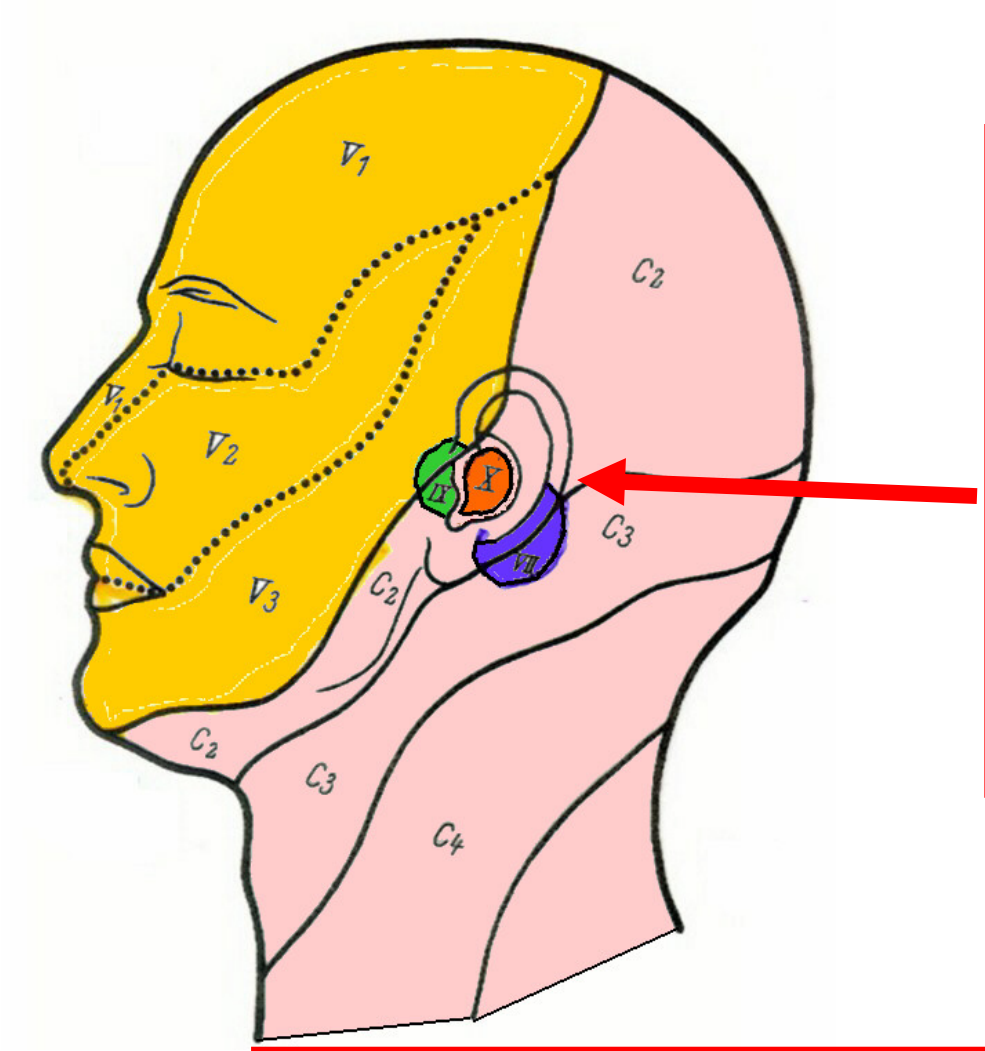
Umbo

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