

**HEAD AND NECK
AND NEURO
SIMULTANEOUSLY**



ATLAS HOLDING UP WORLD

HEAD AND NECK BLOCK 2 EXAM

1 - WRITTEN EXAM

18 Questions 4.90% of grade

2 - PRACTICAL EXAM

**15 Questions Gross Anatomy
2.72% of grade**

**1) Prosections – already in
lab; some correspond to photos;
some structures not labeled**

2) X-rays, Angiograms

**NO SKULL SESSIONS: no
questions on skulls**

ADVICE ON HOW TO TAKE THE HEAD AND NECK EXAM

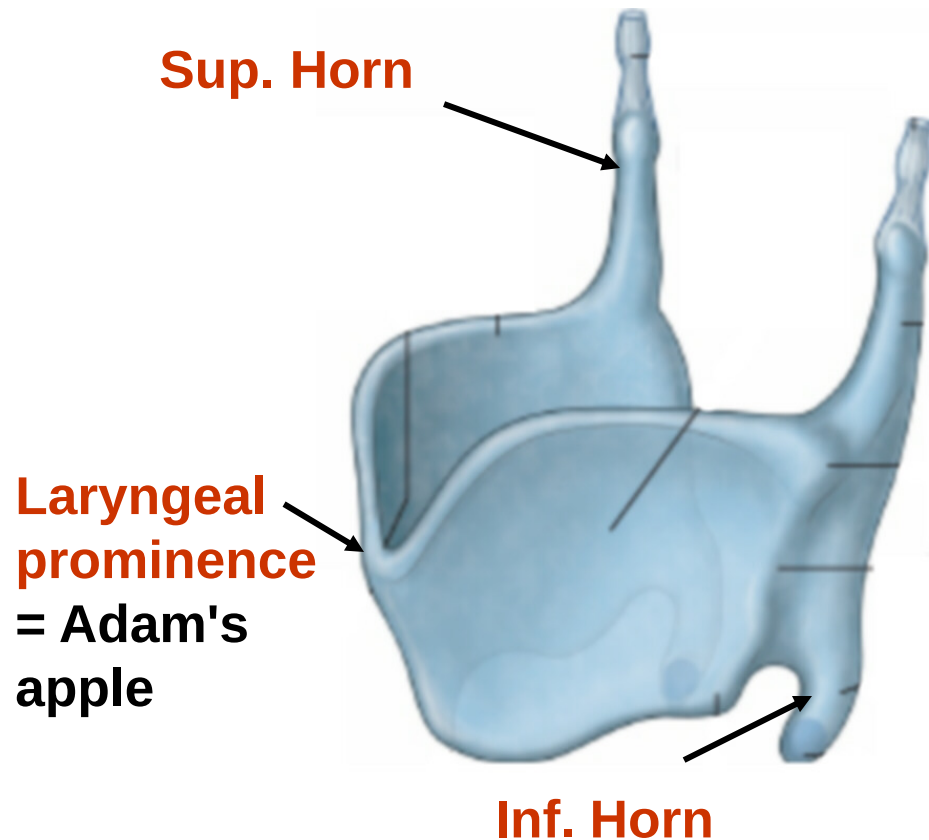
DRAW:

1. CRANIAL NERVE FUNCTIONAL COMPONENTS CHART
3. SVE MUSCLES - 'incantation'
4. BRANCHIAL ARCHES, POUCHES
5. GVE PARASYMPATHETICS - HITCHHIKING PATHWAYS - BRANCHES IX (VIDEO REVIEW)
- [6. BRANCHES OF MAXILLARY ARTERY]

REVIEW

1. LARYNX
2. NECK - Compartments, Carotid Artery
3. PHARYNX - TONSILS, POPCORN
4. ORAL CAVITY

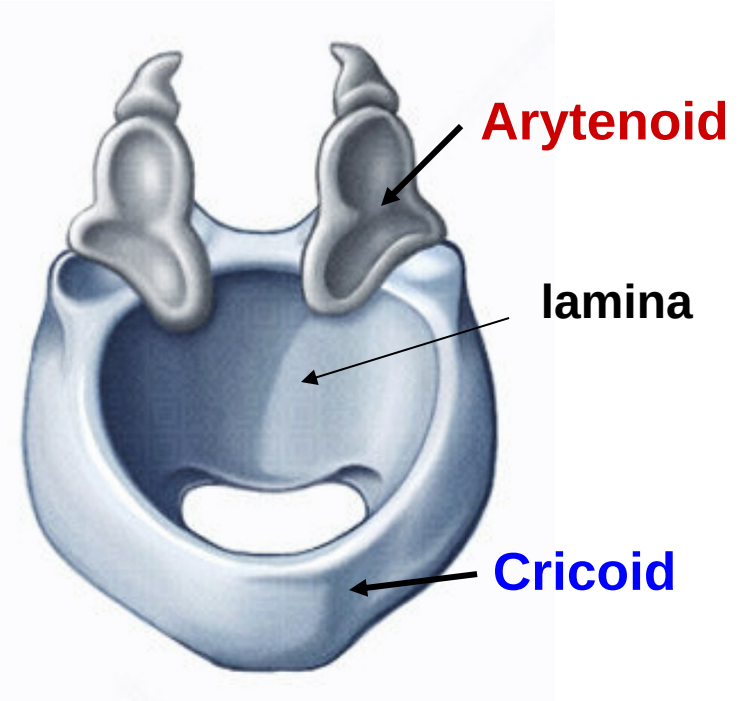
LARYNX REVIEW: CARTILAGES



THYROID CARTILAGE

- shield shaped
- has Sup. and Inf. Horns
- Laryngeal prominence

ARYTENOID - 2 pyramidal shaped cartilages above lamina of cricoid

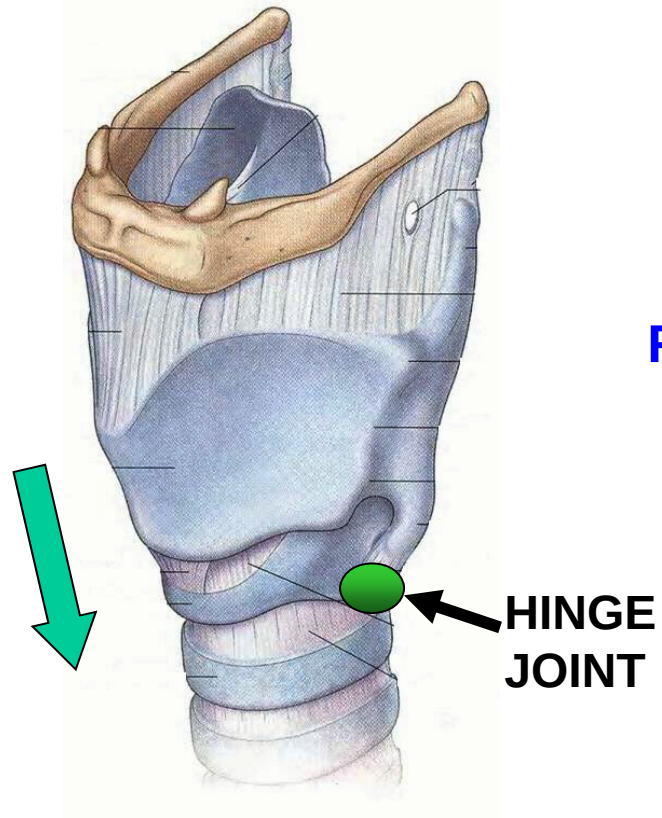


CRICOID = signet ring

- complete ring of cartilage
- narrow Arch ant., broad Lamina post.

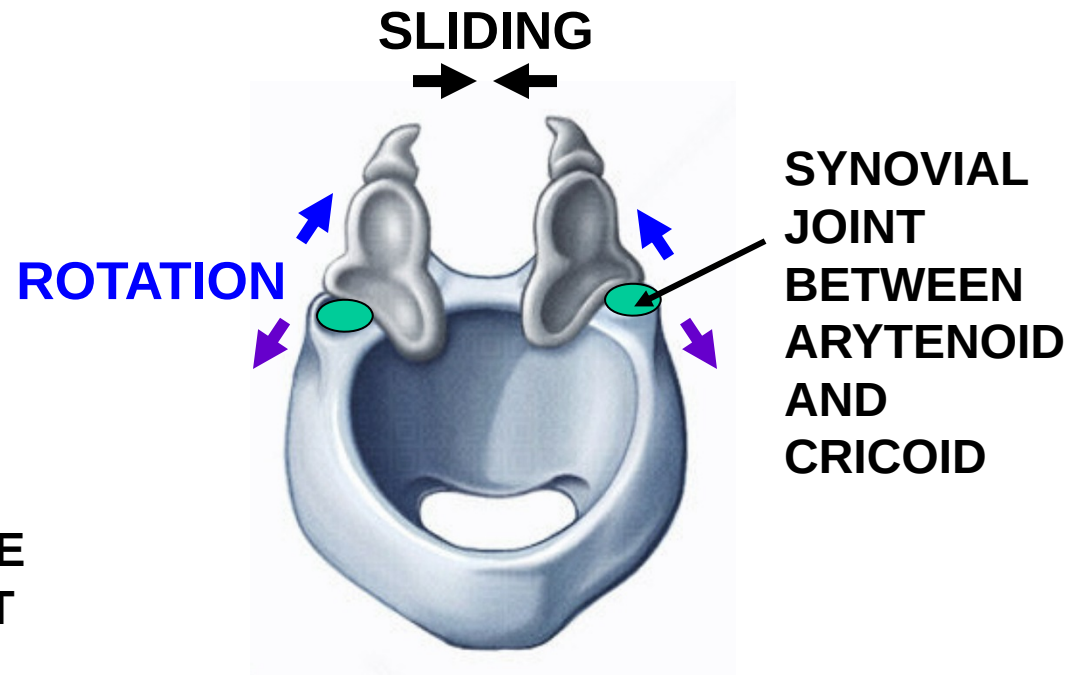
LARYNX REVIEW: SYNOVIAL JOINTS

THYROID and CRICOID



JOINTS PERMIT
TILTING OF
THYROID-CRICOID

ARYTENOID and CRICOID



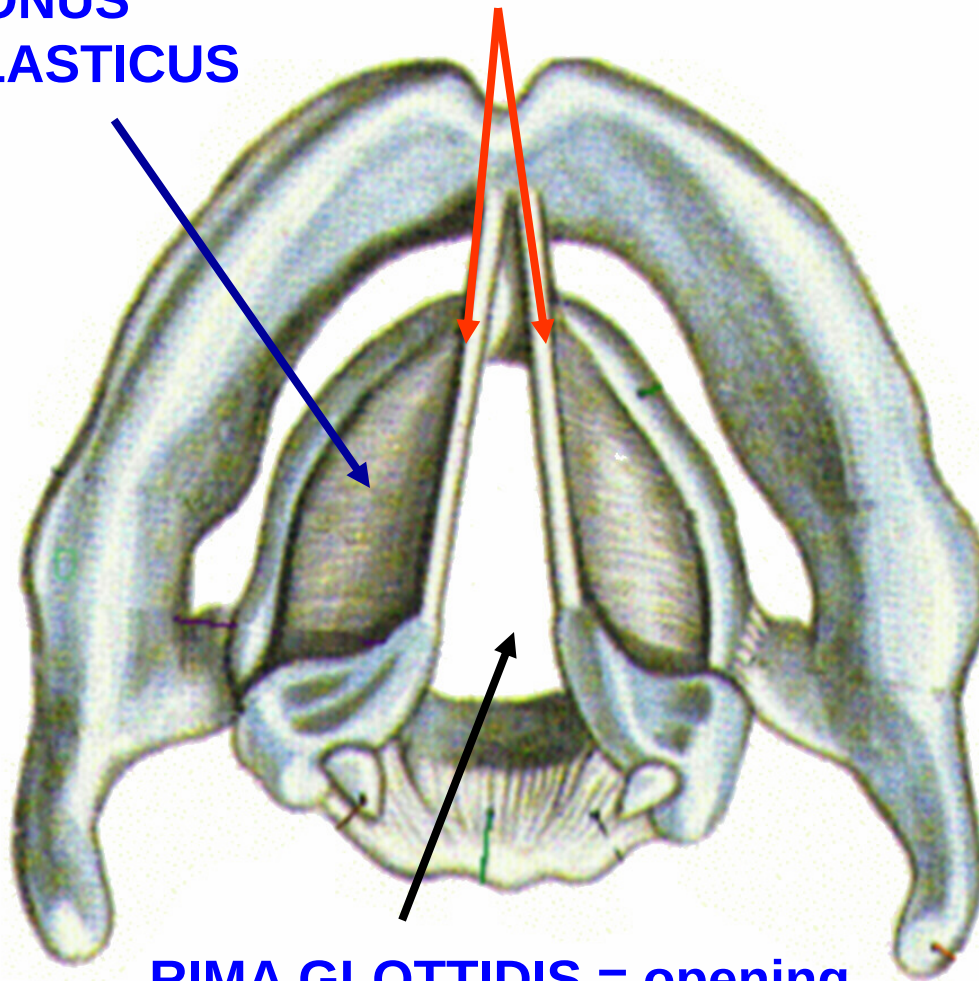
JOINTS PERMIT
ROTATION AND
SLIDING

SOUND PRODUCTION: CONUS ELASTICUS

top view

CONUS
ELASTICUS

VOCAL
LIGAMENTS



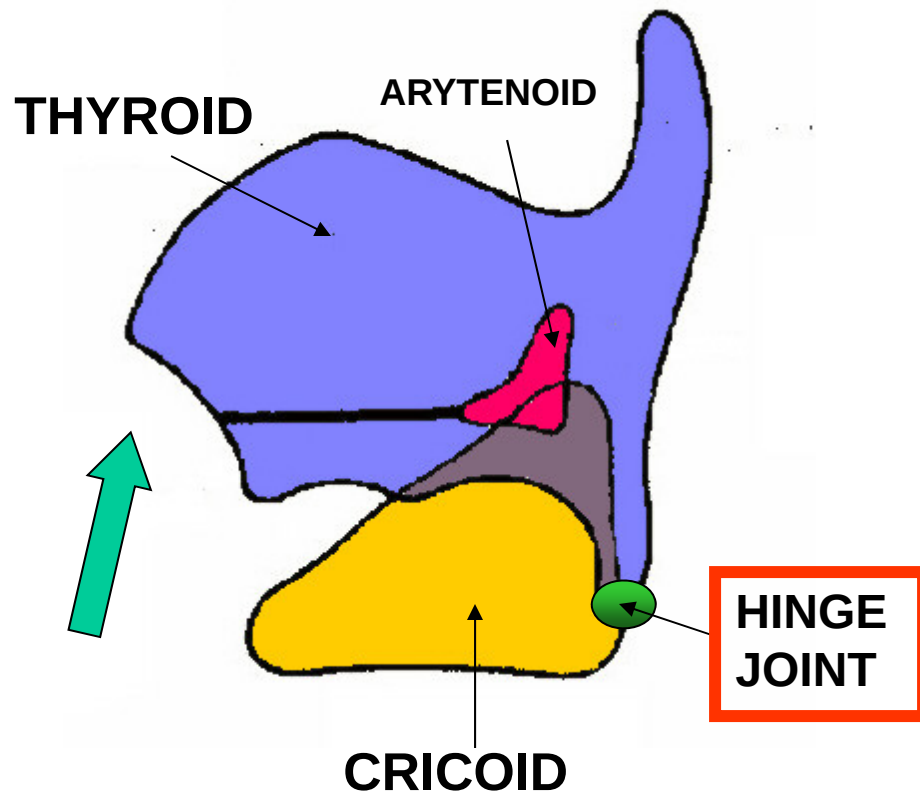
INTERNAL
ELASTIC
MEMBRANE
ATTACHED TO
CRICOID; UPPER
FREE
EDGES = VOCAL
LIGAMENTS

VOCAL
LIGAMENTS
EXTEND FROM
ARYTENOID TO
THYROID,
ACROSS
TWO JOINTS

RIMA GLOTTIDIS = opening

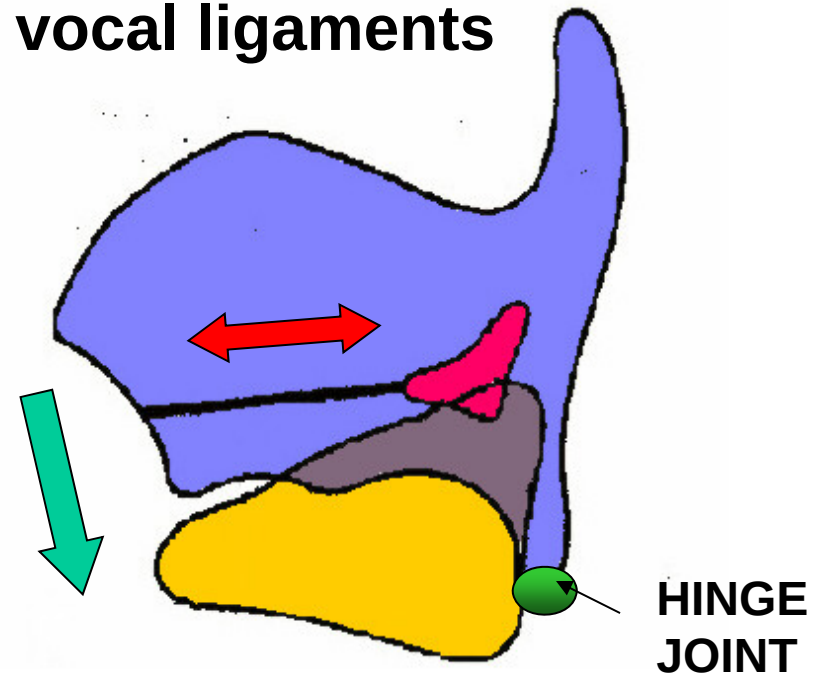
CHANGE PITCH BY TILTING AT HINGE JOINT –

Thyroid cartilage tilts down; cricoid tilts up



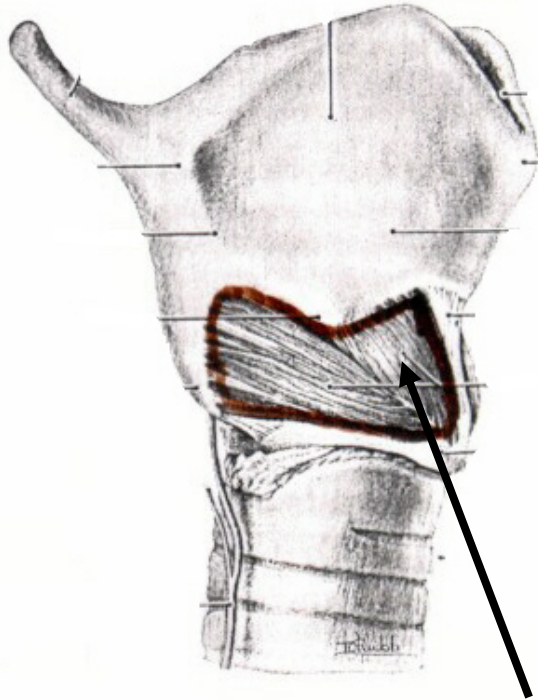
RELAX vocal ligament
DECREASE PITCH -
THYROARYTENOID

Tilting - **STRETCHES**
vocal ligaments



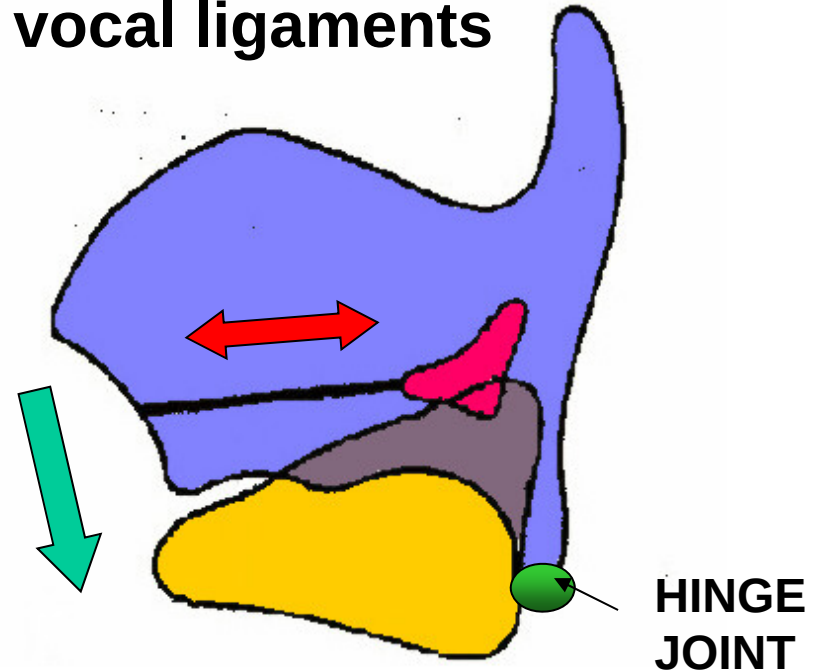
STRETCH vocal ligament
INCREASE PITCH -
CRICOTHYROID

MUSCLES OF LARYNX



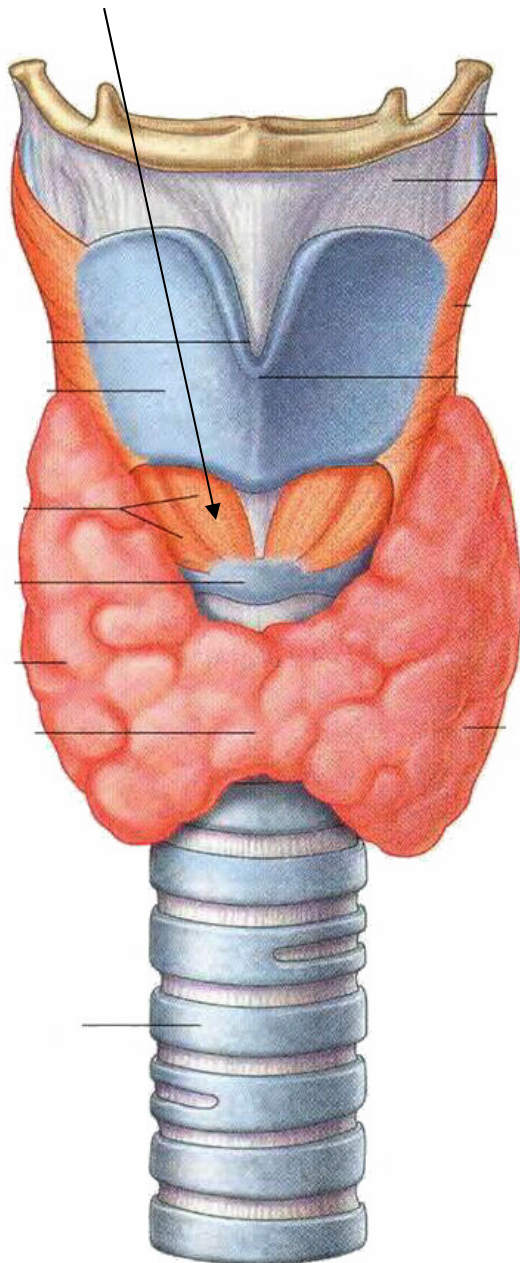
CRICOTHYROID M. -
Tenses
Vocal Ligament
Increasing Pitch

Tilting - STRETCHES
vocal ligaments



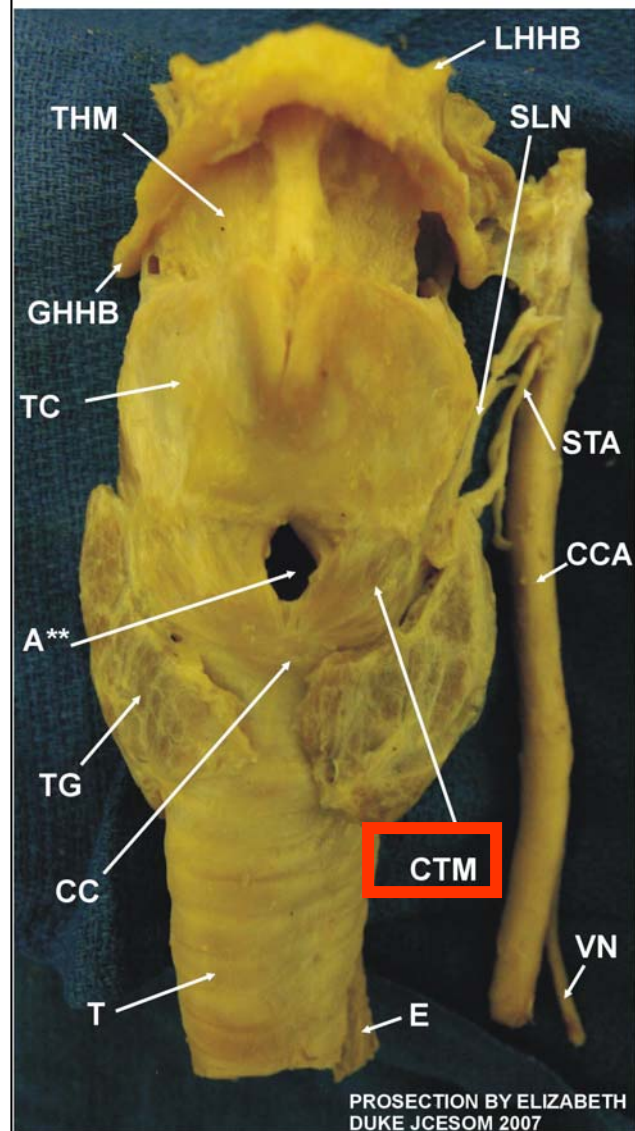
STRETCH vocal ligament
INCREASE PITCH -
CRICOTHYROID

CRICOTHYROID M.

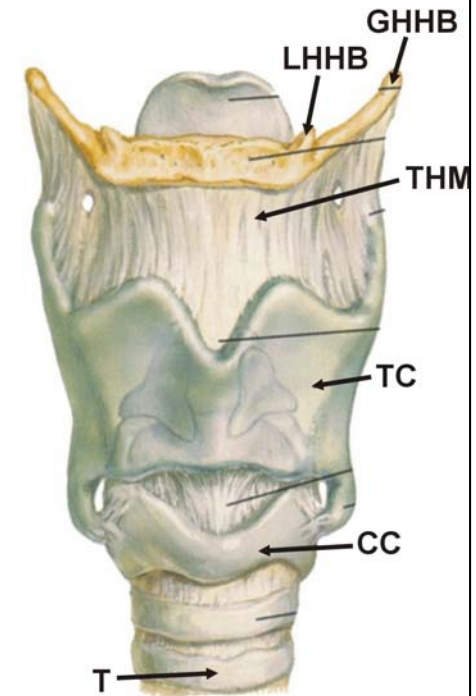


LARYNX: ANTERIOR VIEW

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PROSECTON BY ELIZABETH
DUKE JCESOM 2007



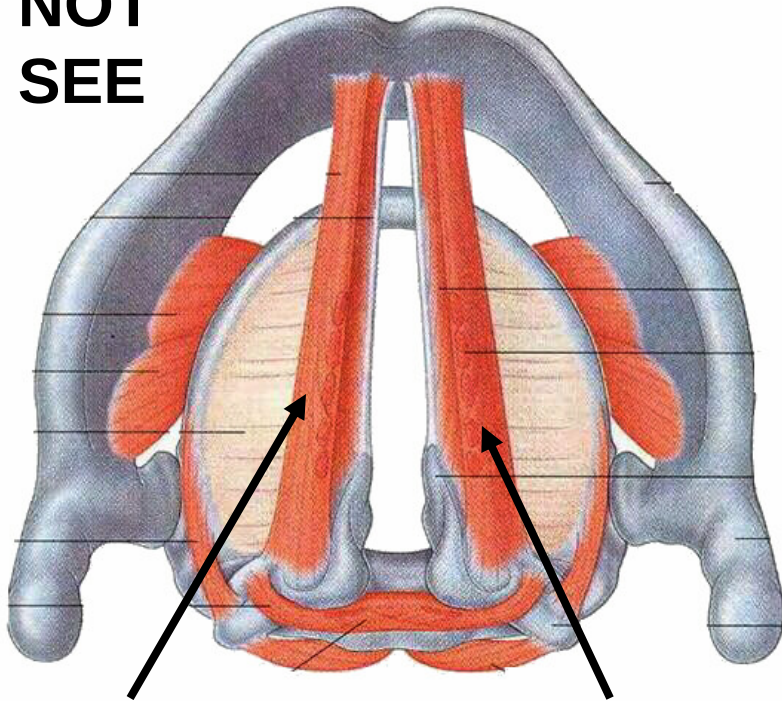
NOTE: A** - AIRWAY IS CUT IN
CRICOTHYROID MEMBRANE IN
CRICOTHYROTOMY; THIS
EMERGENCY PROCEDURE
AVOIDS BLEEDING THAT CAN
OCCUR IN TRACHEOTOMY

THM - THYROID MEMBRANE
GHHB - GREATER HORN OF HYOID BONE
LHHB - LESSER HORN OF HYOID BONE
STA - SUPERIOR THYROID ARTERY
TC - THYROID CARTILAGE
SLN - SUPERIOR LARYNGEAL NERVE
CTM - CRICOTHYROID MUSCLE

CC - CRICOID CARTILAGE
CCA - COMMON CAROTID ARTERY
TG - THYROID GLAND
T - TRACHEA
E - ESOPHAGUS
VN - VAGUS NERVE

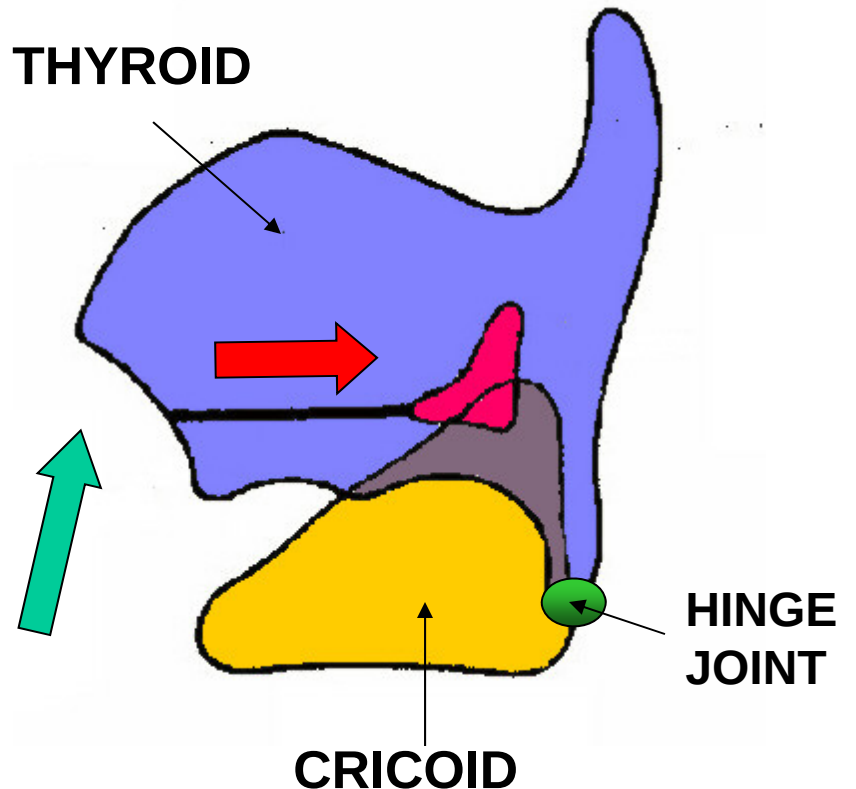
MUSCLES OF LARYNX

NOT
SEE



**THYROARYTENOID
MUSCLES** - adjacent to
vocal ligament -
Relaxes
Vocal Ligaments
Decreases pitch

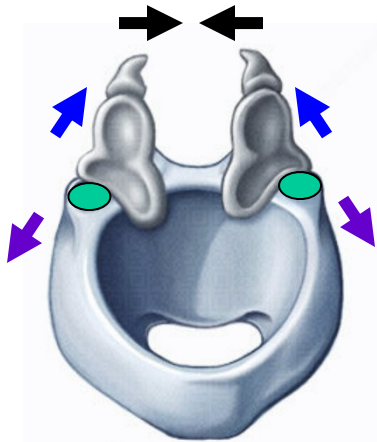
THYROID



RELAX vocal ligament
**DECREASE PITCH -
THYROARYTENOID**

OPEN AND CLOSE RIMA GLOTTIDIS BY ROTATING/SLIDING ARYTENOIDS -

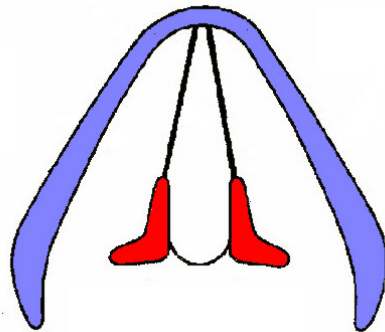
Rotate laterally opens; Rotate medially or slide closes



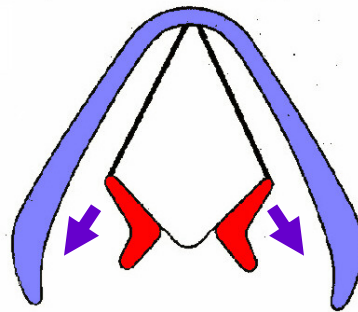
OPEN
ROTATE
LATERALLY

CLOSE
ROTATE
MEDIALY

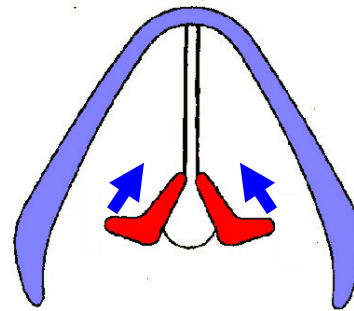
CLOSE
SLIDE



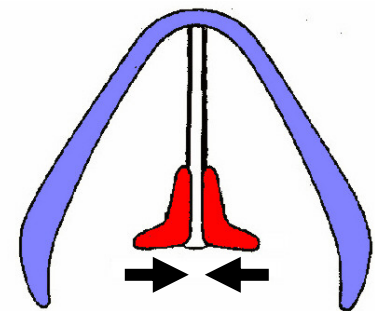
REST
POSITION



POSTERIOR
CRICO-
ARYTENOID

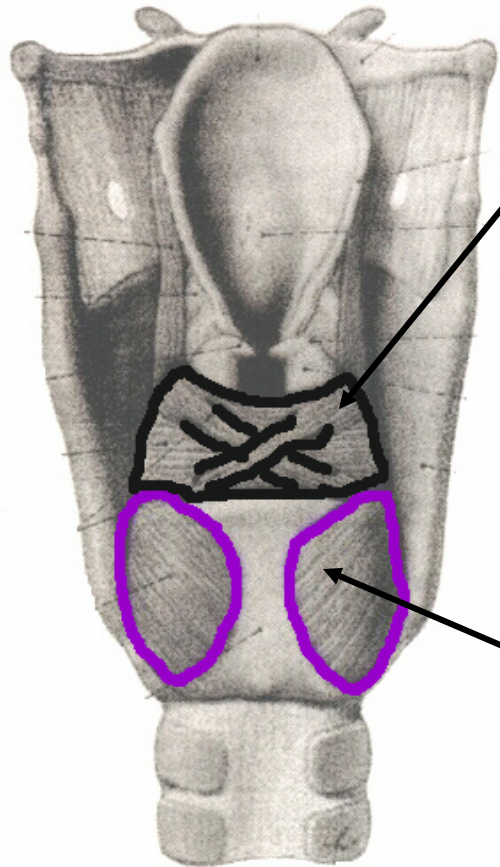


LATERAL
CRICO-
ARYTENOID



ARYT ENOIDEUS

MUSCLES OF LARYNX

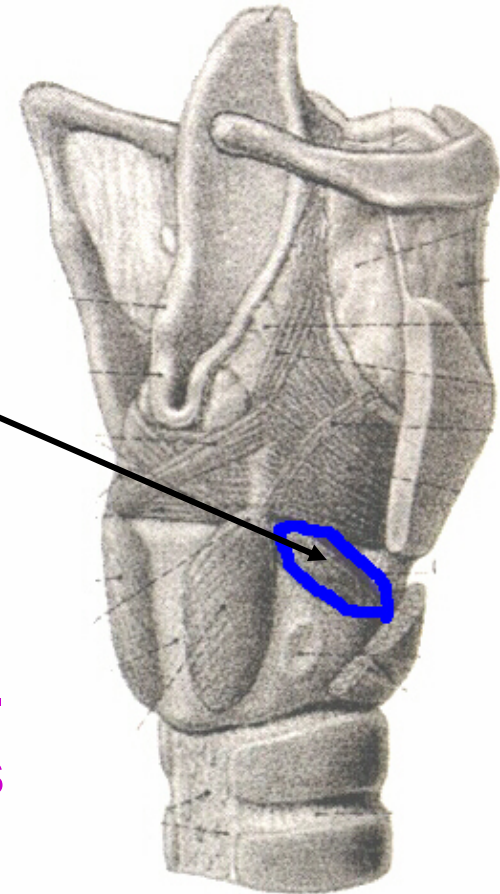


Arytenoids
Can rotate/slide

5) ARYTENOID
(Transverse and oblique arytenoid) -
Adduct vocal folds

4) LATERAL CRICO-
ARYTENOID - Adduct
vocal folds

3) POSTERIOR CRICO-
ARYTENOID – Abducts
vocal fold

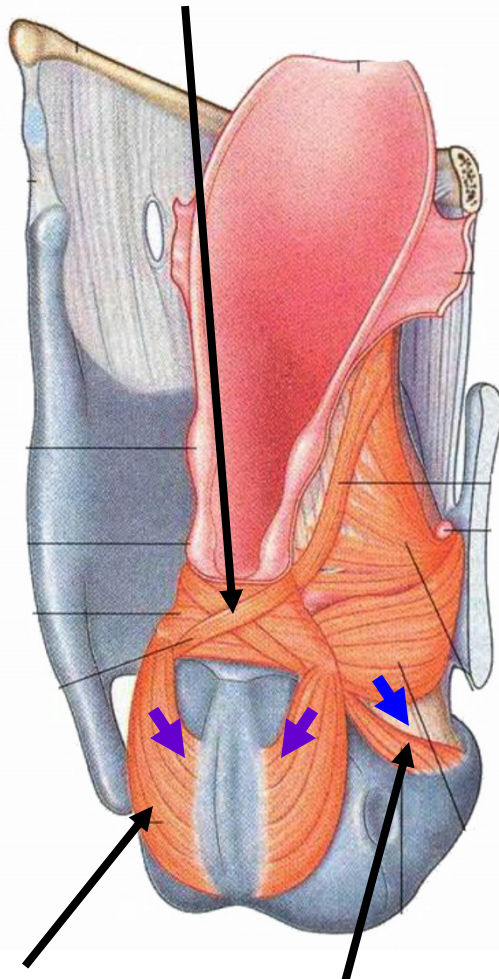


Adduct closes rima glottidis
Abduct opens rima glottidis

LARYNX: POSTERIOR VIEW

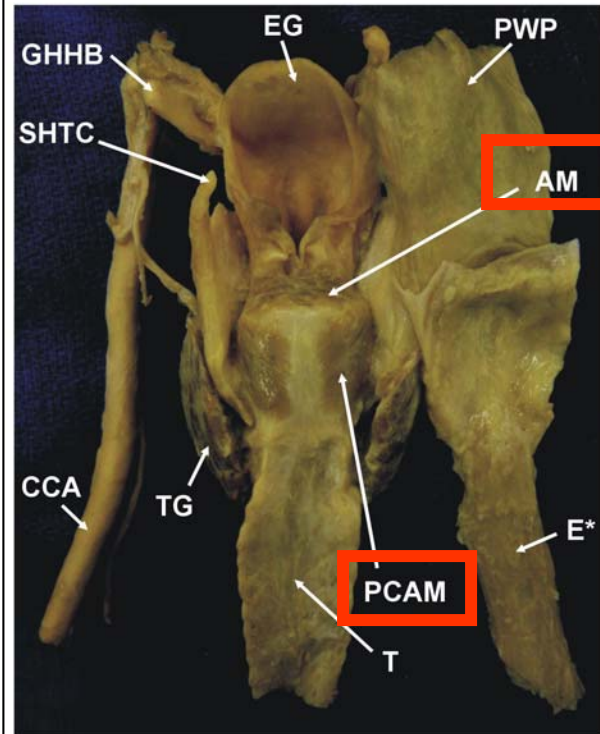
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ARYTENOIDEUS



POSTERIOR
CRICO-
ARYTENOID

LATERAL
CRICO-
ARYTENOID



ESOPHAGUS REFLECTED

GHHB - GREATER HORN OF HYOID
BONE

EG - EPIGLOTTIS

PWP - POSTERIOR WALL OF PHARYNX

AM - ARYTENOID MUSCLE

PCAM - POSTERIOR CRICOARYTENOID
MUSCLE

CC - CRICOID CARTILAGE

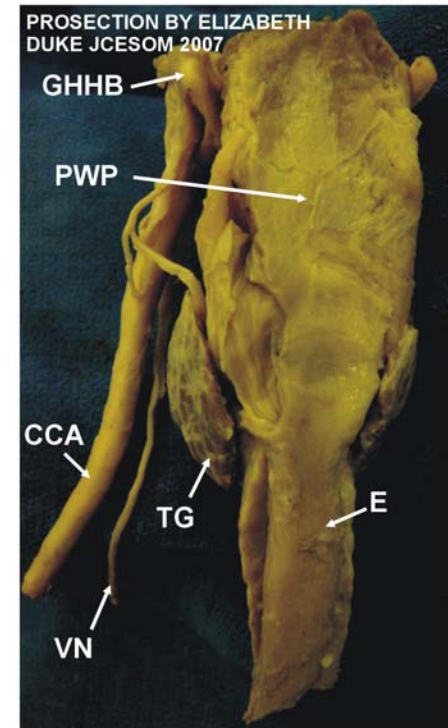
CCA - COMMON CAROTID ARTERY

TG - THYROID GLAND

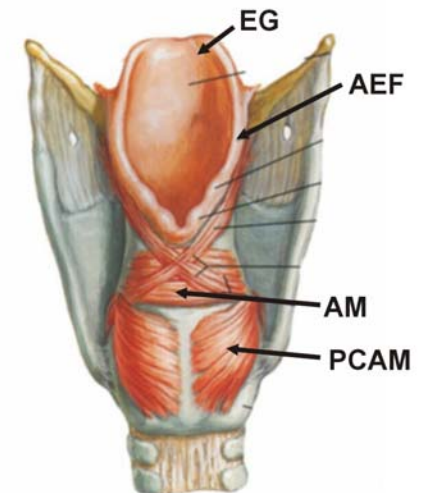
T - TRACHEA

VN - VAGUS NERVE

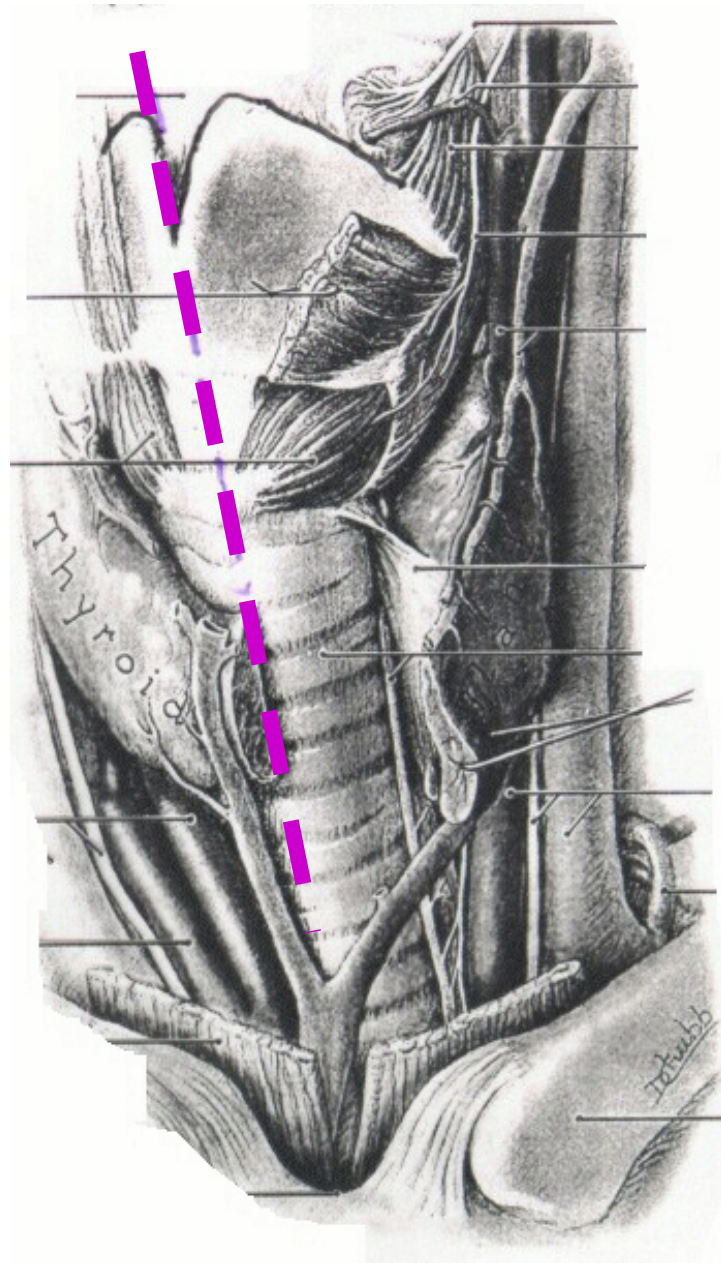
E* - ESOPHAGUS (REFLECTED)



ESOPHAGUS IN POSITION



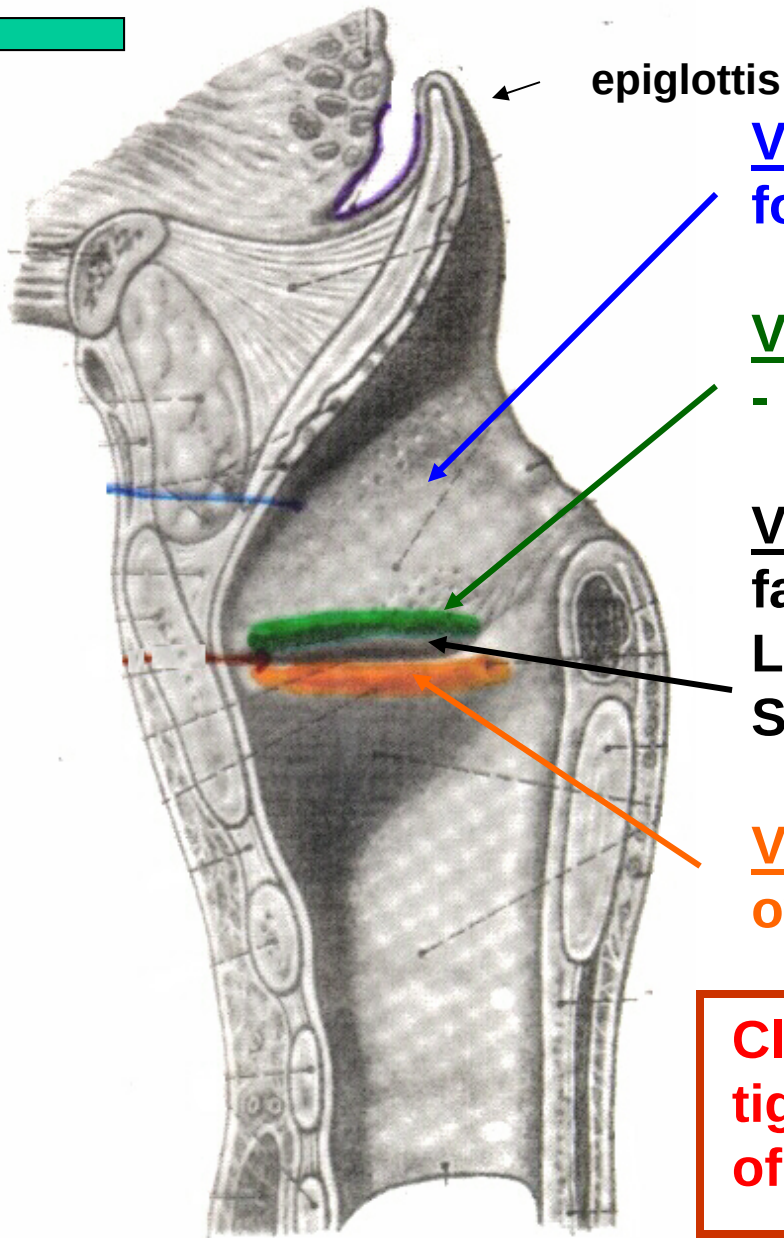
IV. TERMS ASSOCIATED WITH LARYNX



Bisect
Larynx to see
interior
structures

TERMS ASSOCIATED WITH LARYNX

NOSE



epiglottis

VESTIBULE - inlet above false vocal folds

VESTIBULAR (FALSE VOCAL) FOLDS
- overlie vestibular ligaments

VENTRICLE - area between true and false vocal folds; lateral extension is Laryngeal Sinus

VOCAL (TRUE VOCAL) FOLDS -
overlie vocal ligaments

Clinical - Anaphylactic shock - mucosa tightly attached at vocal folds; swelling of vestibular folds blocks airway

CORONAL SECTION

Quadrangular
membrane

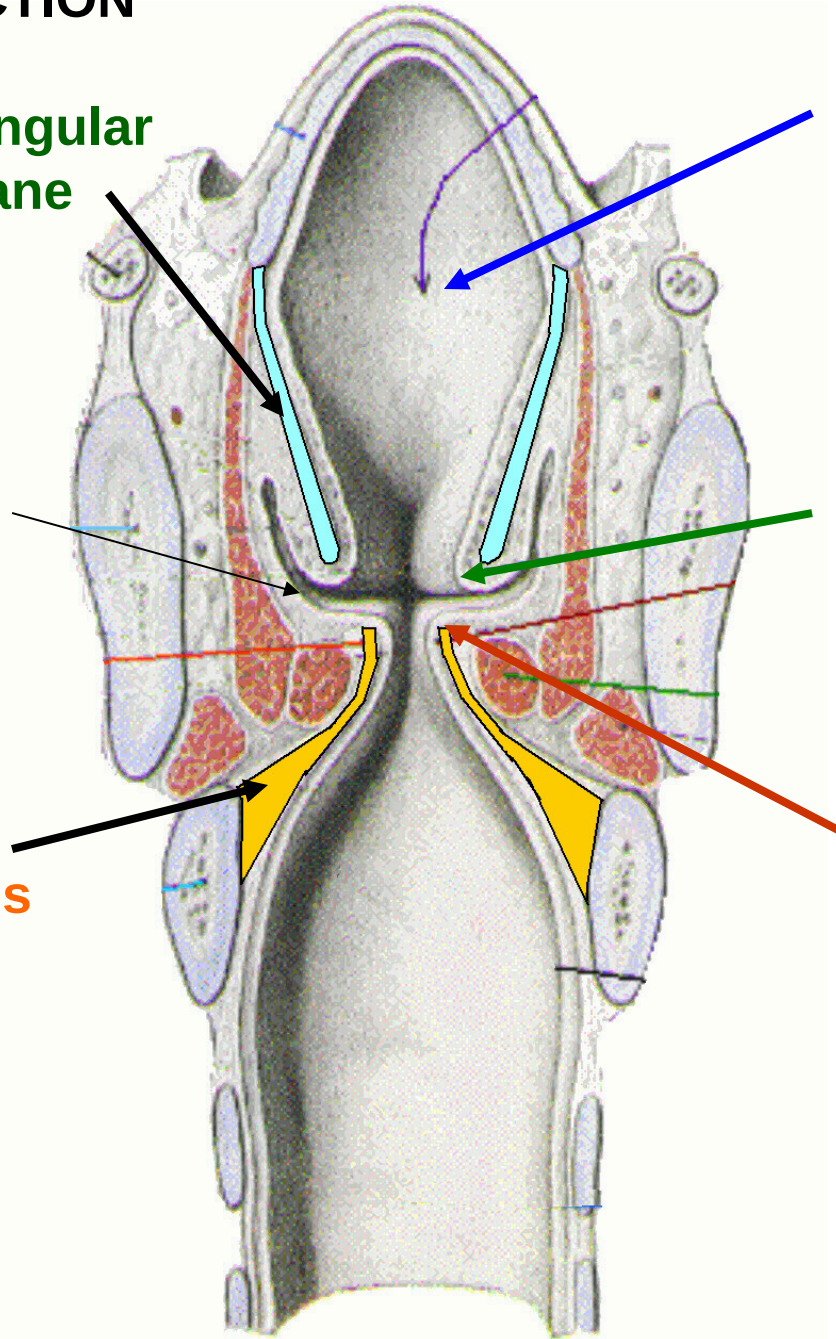
Ventricle

Conus
elasticus

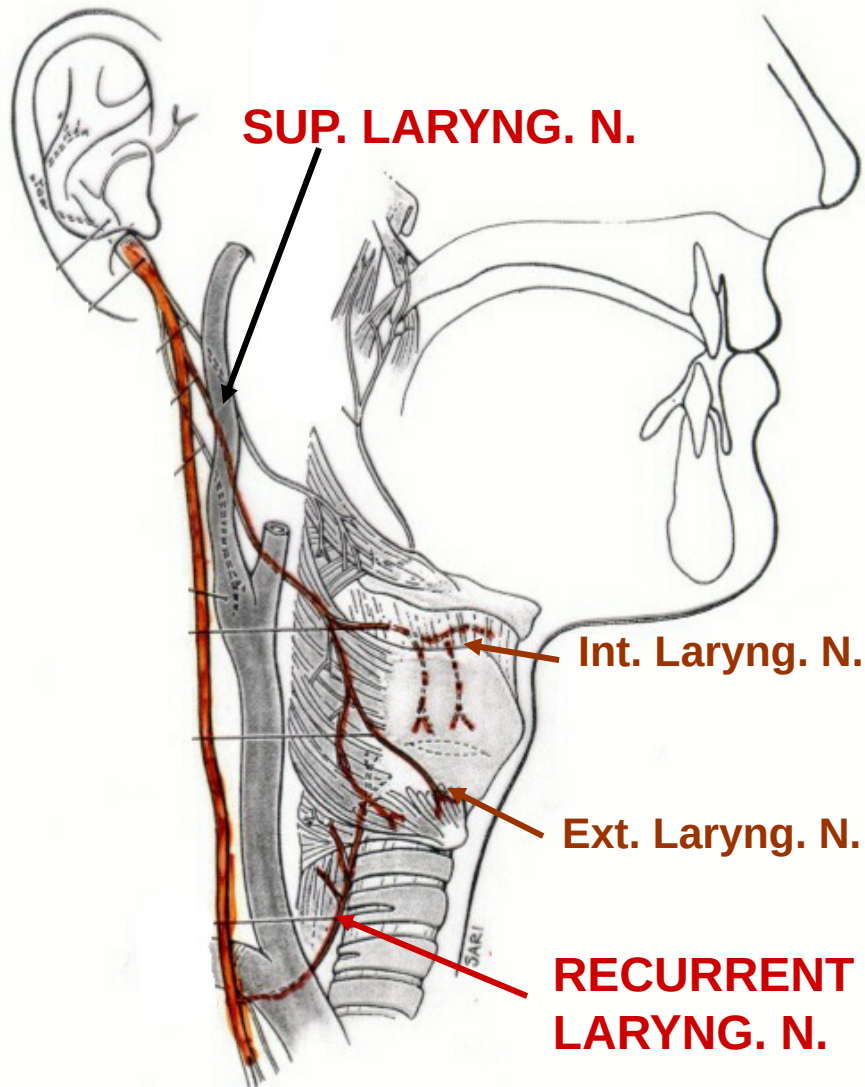
VESTIBULE - inlet
above false vocal
folds

VESTIBULAR (FALSE
VOCAL) FOLDS -
overlie vestibular
ligaments (lower
edge of
Quadrangular
membrane)

VOCAL (TRUE
VOCAL) FOLDS -
overlie vocal
ligaments (upper
edge of Conus
elasticus)



NERVES OF LARYNX – Branches of Vagus



- 1) Superior Laryngeal N.
 - a) Internal Laryngeal N.
GVA Sensory to Larynx
Above (true vocal folds)
 - b) External Laryngeal N.
SVE Motor to Cricothyroid

- 2) Recurrent Laryngeal n.
 - GVA Sensory to Larynx
True Vocal Folds
 - SVE motor to all other
Muscles of Larynx

Clinical - damage to Recurrent Laryngeal nerve in Thyroid surgery

NERVES OF LARYNX –

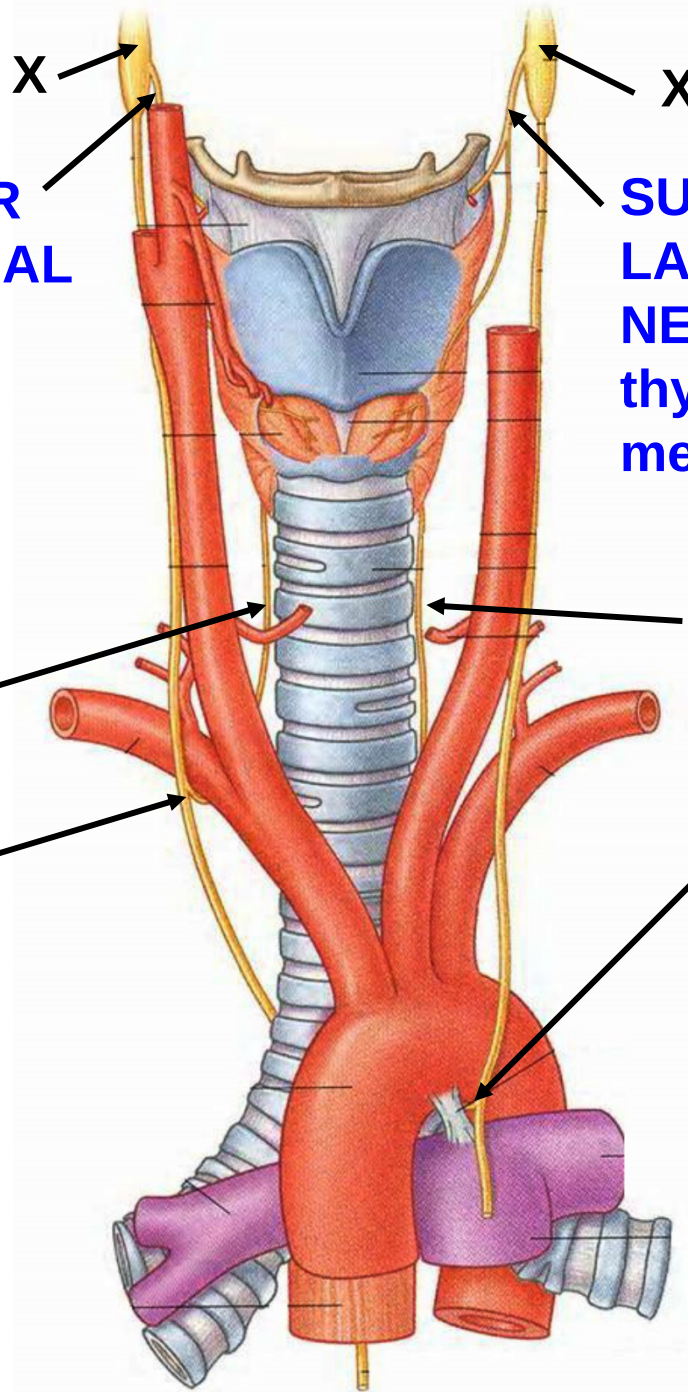
Branches of
Vagus

SUPERIOR
LARYNGEAL
NERVE

SUPERIOR
LARYNGEAL
NERVE - pierces
thyrohyoid
membrane

RIGHT
RECURRENT
LARYNGEAL
NERVE - passes
under
Subclavian
Artery

LEFT
RECURRENT
LARYNGEAL
NERVE - passes
under
Arch of
Aorta



FASCIA OF NECK

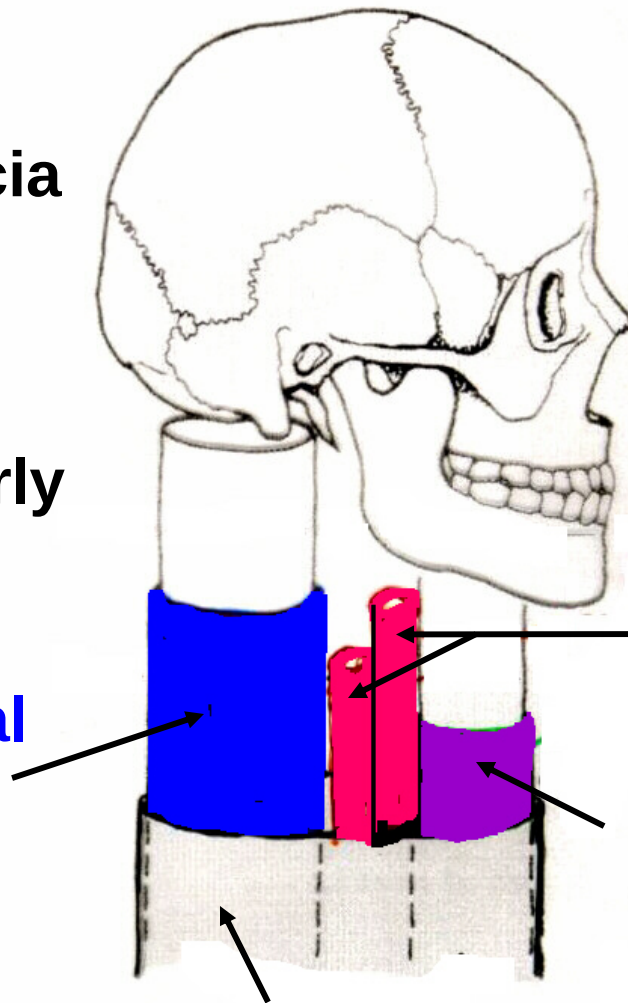
Deep Cervical fascia
- one layer
surrounds neck,
other layers form
tubes (names poorly
chosen)

**2. Prevertebral
Layer**

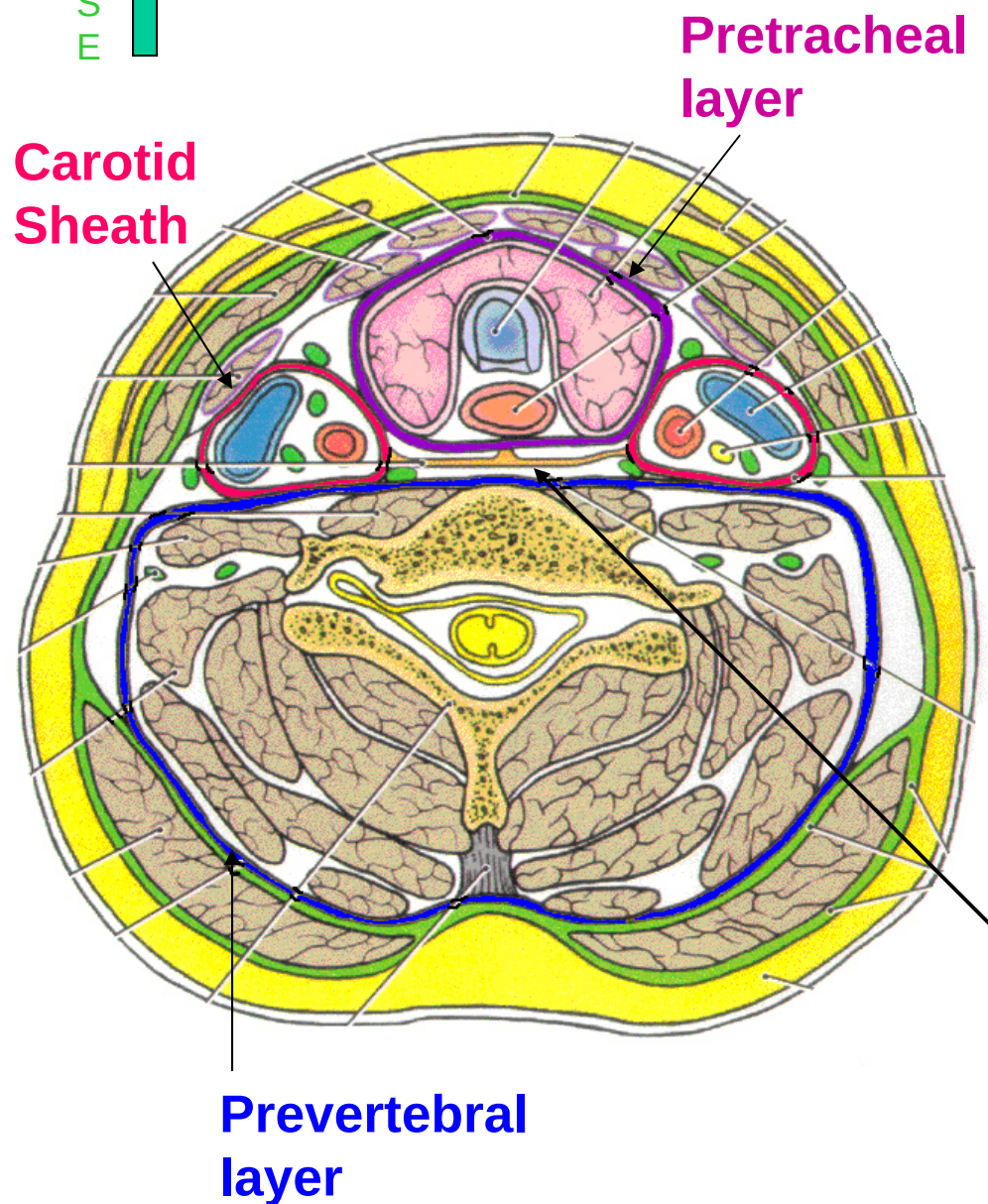
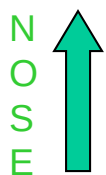
**4. Carotid
sheath**

**3. Pre-tracheal
layer**

1. Investing layer



FASCIA OF NECK



Prevertebral Layer- surrounds vert. column & muscles back of neck, prevertebral, lateral vertebral and suboccipital m.

Pretracheal Layer- surrounds trachea, esophag. & thyroid continues to mediastinum

Carotid Sheath- surrounds common & int carotid, int jugular and X (not: Symp. Chain)

Retropharyngeal Space- between PreTrach & Pre Vert layers -infection from head (tonsillitis) can spread to mediastinum

HORIZONTAL SECTION THROUGH NECK AND CT IMAGE FROM CADAVER: LEVEL OF THYROID CARTILAGE

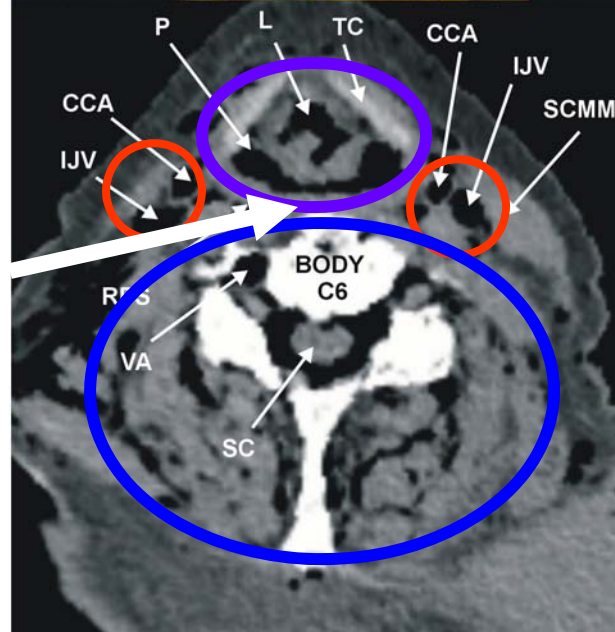
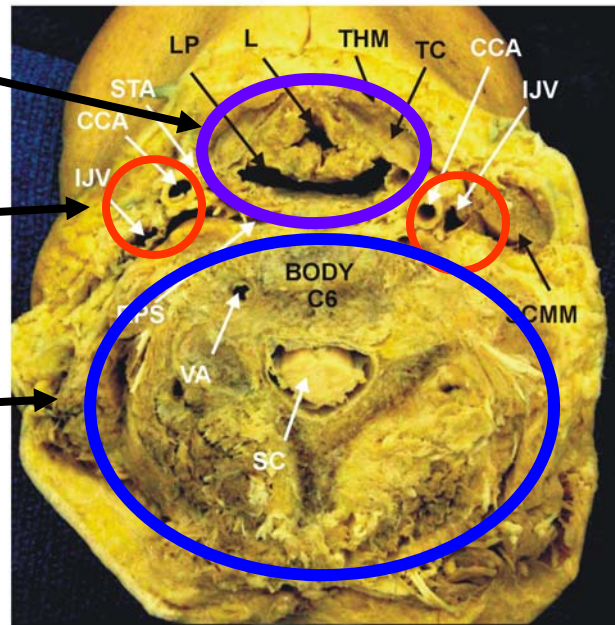
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Pretracheal
layer

Carotid
Sheath

Prevertebral
layer

Retropharyngeal
Space



L - LARYNX
LP - LARYNGOPHARYNX
TC - THYROID CARTILAGE
CCA - COMMON CAROTID
ARTERY
IJV - INTERNAL JUGULAR
VEIN
SCMM - STERNOCLEIDO-
MASTOID MUSCLE
RPS - RETROPHARYNGEAL
SPACE
VA - VERTEBRAL ARTERY
BODY C6 - BODY OF SIXTH
CERVICAL VERTEBRA
SC - SPINAL CORD
STA - SUPERIOR THYROID
ARTERY
THM - THYROHYOID
MUSCLE

Carotid sheath
is anterior to
vertebrae

A. MUSCLES OF NECK - NOT ATTACHED TO HYOID - move head & neck

1. STERNO- CLEIDOMASTOID

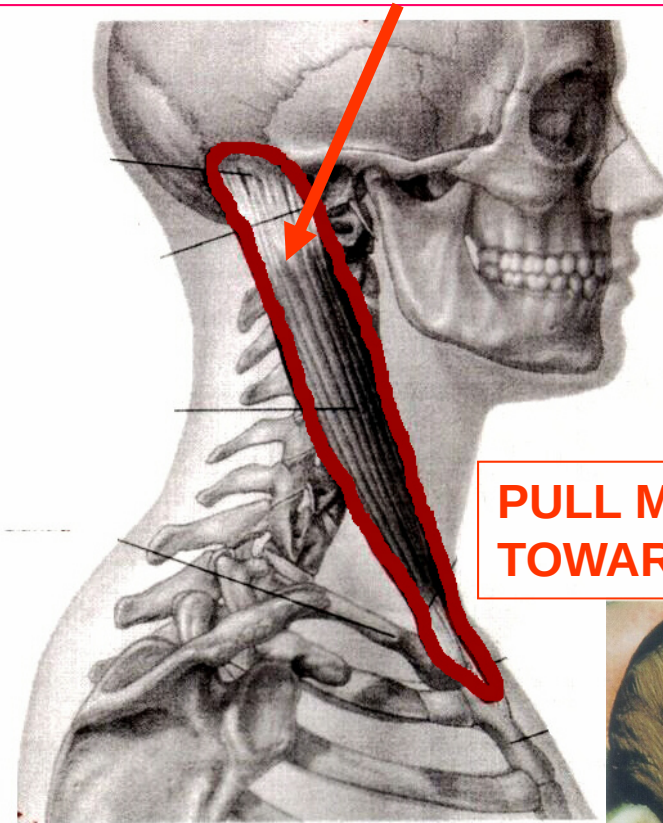
O - Two heads 1)
manubrium of sternum
2) clavicle- medial 1/3

I - mastoid process of
temporal bone

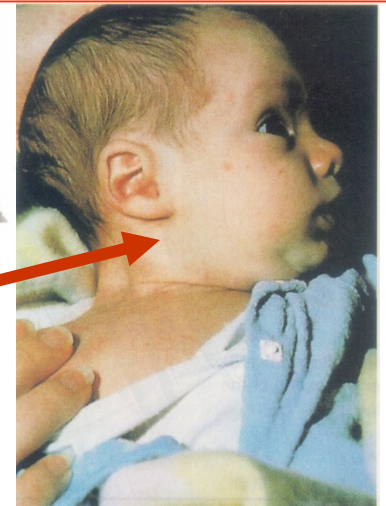
Act - bilateral - flex head;
unilateral rotate head,
face to directed opposite
side

Inn - CN XI Accessory n.

MOST IMPORTANT LANDMARK IN NECK



PULL MASTOID
TOWARD STERNUM



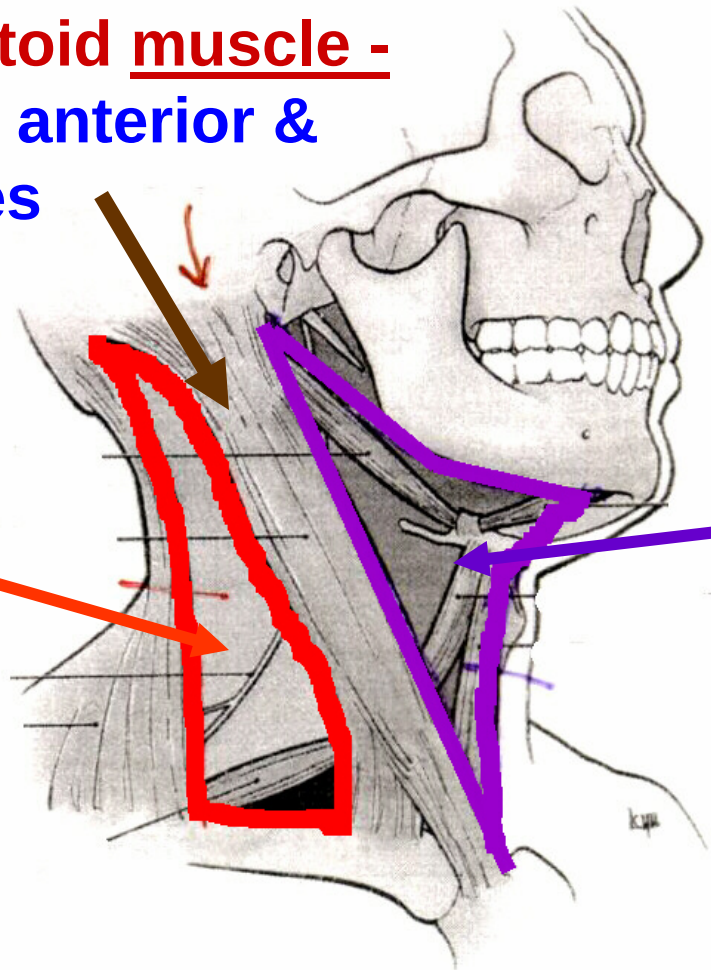
TORTICOLLIS –
Contracture of
Sternocleidomastoid

TRIANGLES OF NECK

Sternocleidomastoid muscle -
divides neck into anterior &
posterior triangles

Posterior
triangle -

Prevertebral
layer; Brachial
plexus, cervical
plexus (Phrenic
nerve);
Subclavian artery



Anterior
triangle -

Pretracheal
layer; Contents
of Lateral
compartment:
Carotid sheath

MUSCLES OF NECK - NOT ATTACHED TO HYOID

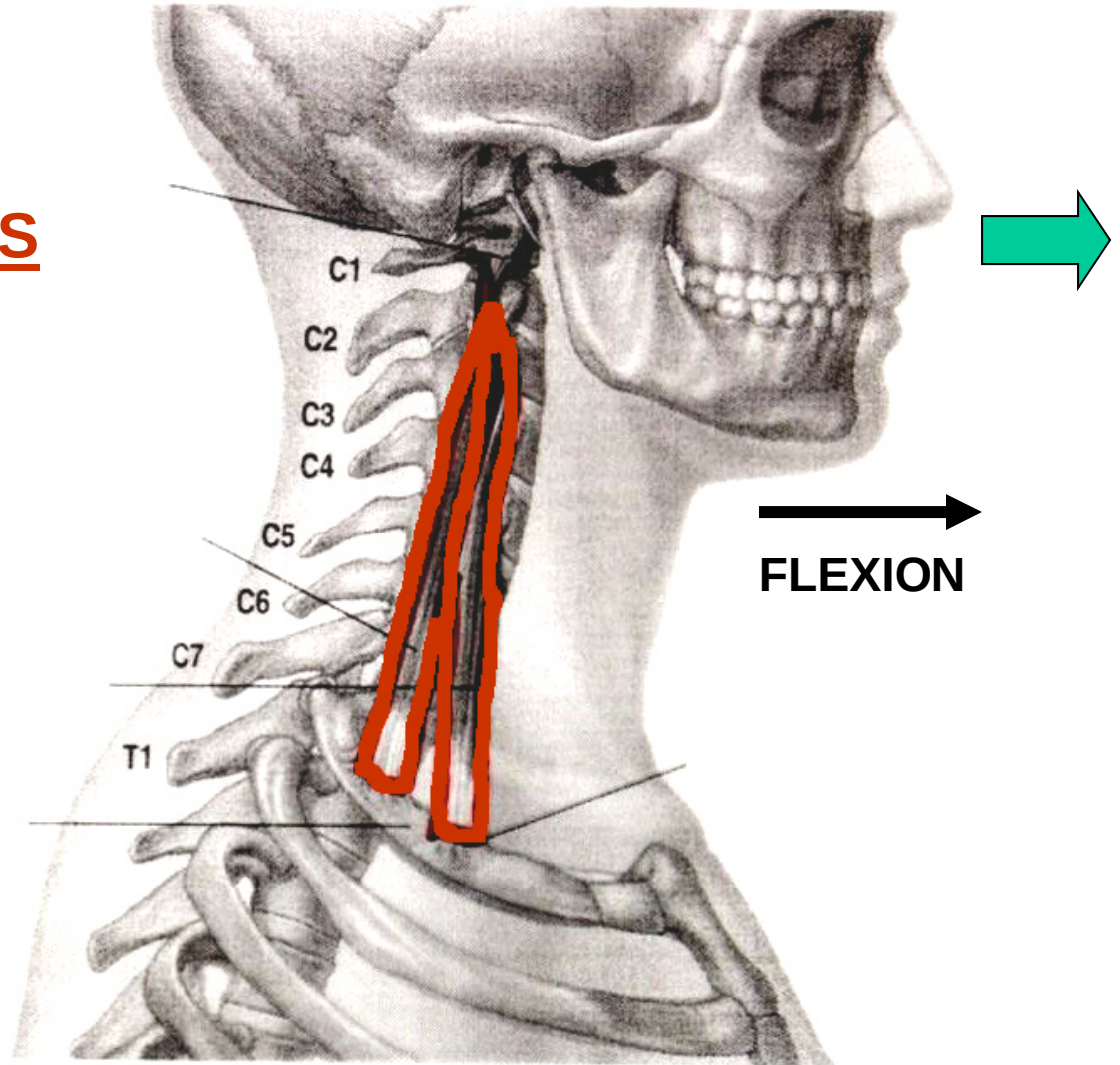
2. SCALENUS ANTERIOR AND SCALENUS MEDIUS

O - vertebrae-trans processes upper cervical

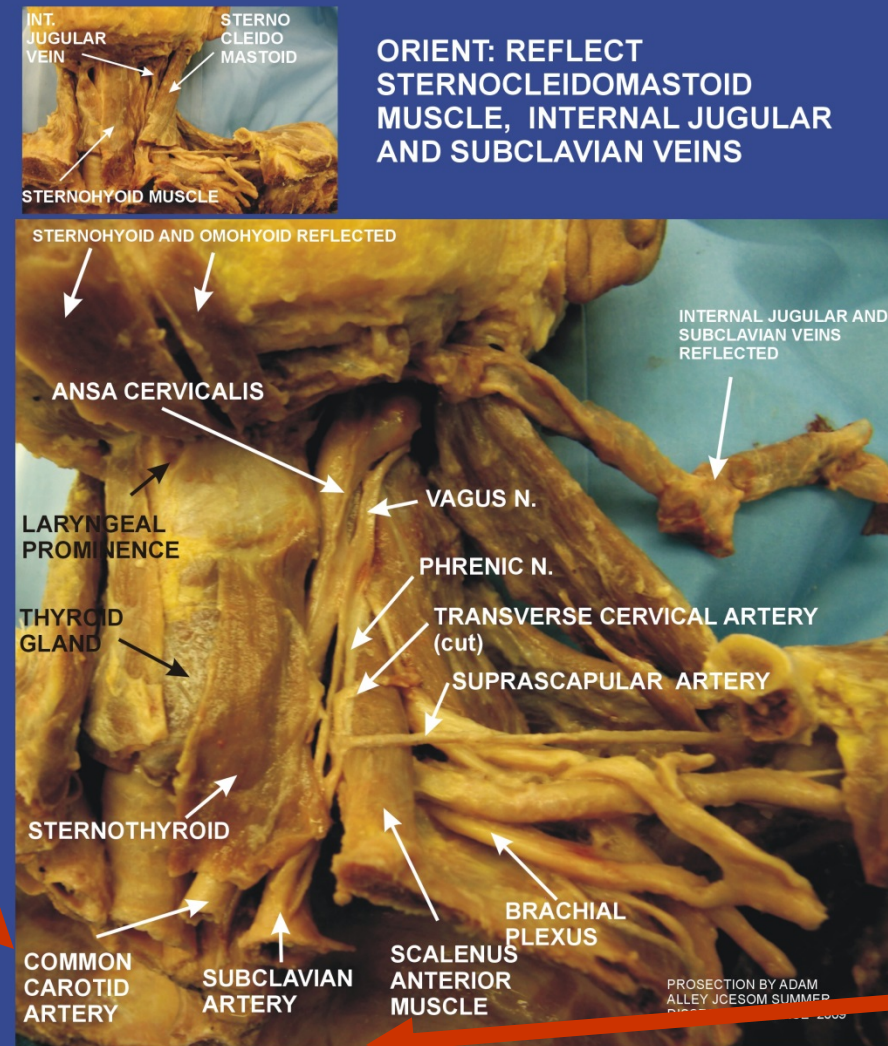
I - rib 1

A - flex neck & elevate rib 1

Inn - ventral rami of cervical spinal nerves



SECOND MOST IMPORTANT
LANDMARKS IN NECK



Anterior triangle -

Pretracheal layer;
Contents of Lateral
compartment:
Carotid sheath

Posterior triangle -

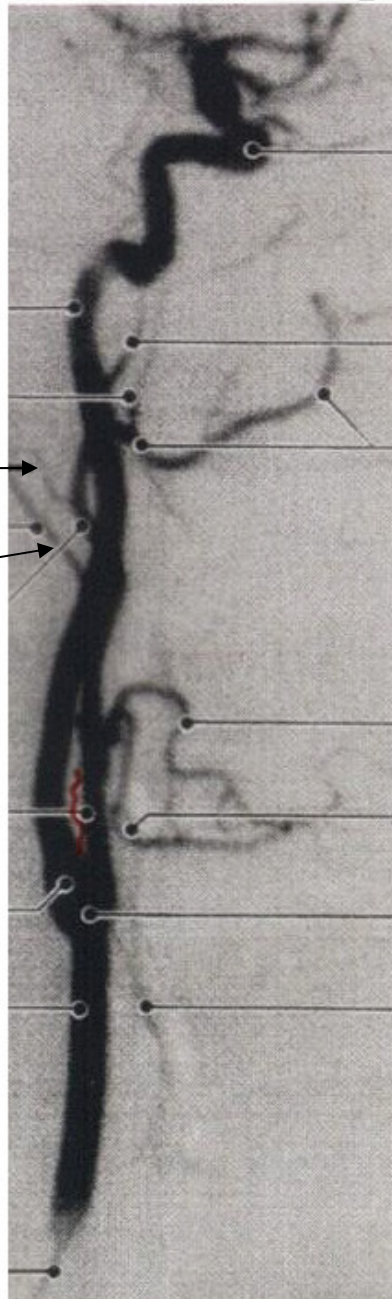
Prevertebral layer;
Brachial plexus,
cervical plexus
(Phrenic nerve);
Subclavian artery

carotid arteriogram

Post side

POST.
AURICULAR

OCCIPITAL



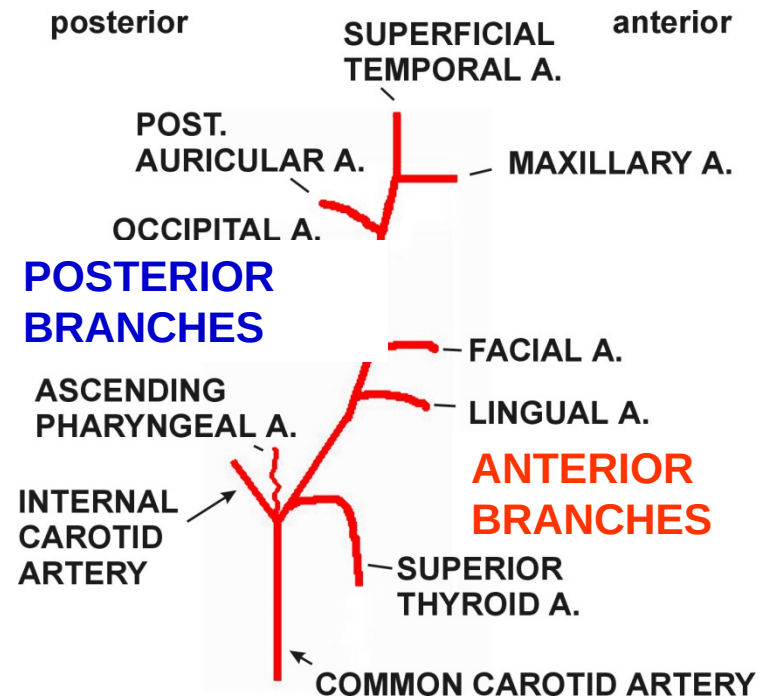
Ant side

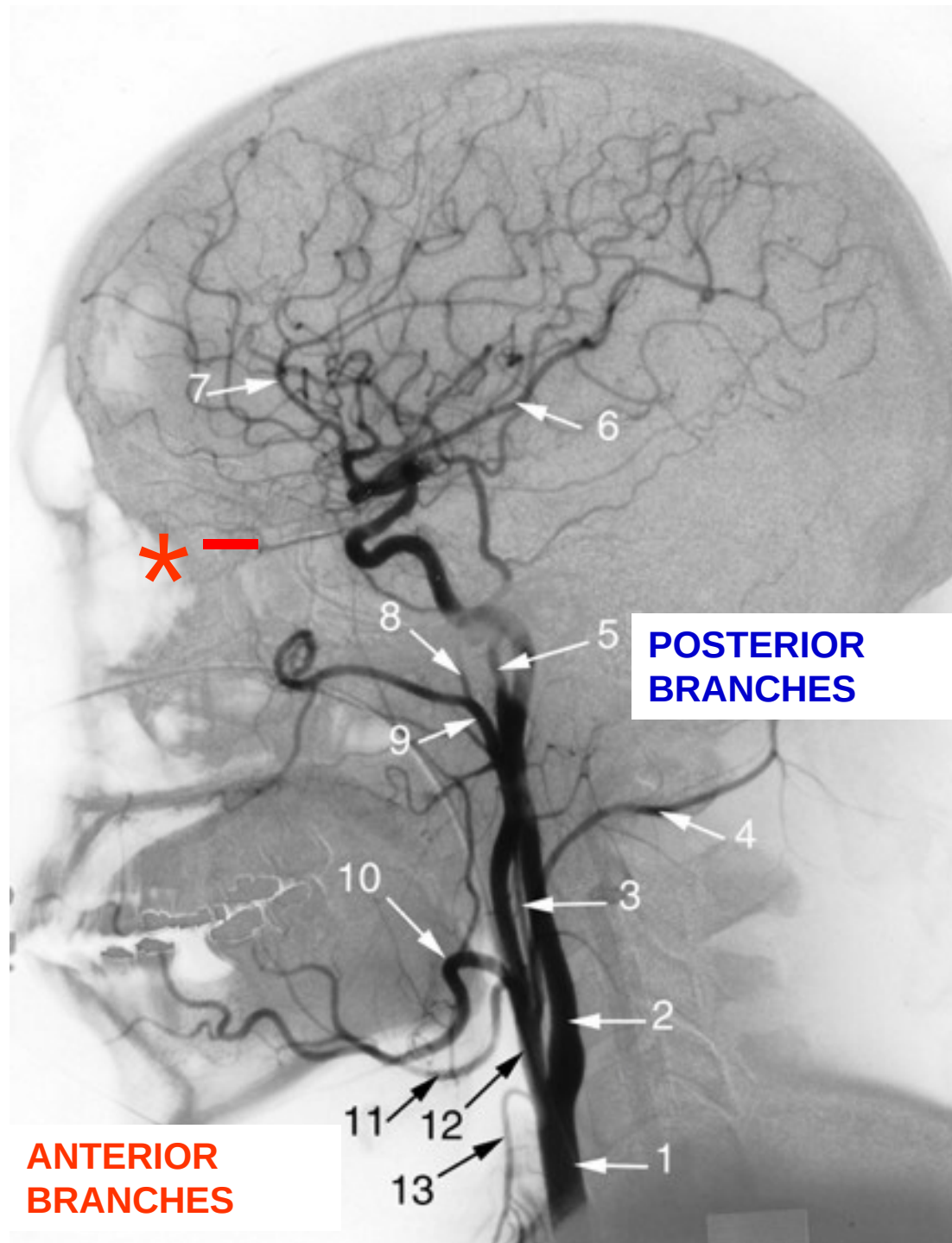
SUP.
TEMPORAL
MAXILLARY

FACIAL

LINGUAL

SUP.
THYROID





1. COMMON CAROTID
2. INTERNAL CAROTID
3. ASCENDING PHARYNGEAL
4. OCCIPITAL
5. SUPERFICIAL TEMPORAL
6. MIDDLE CEREBRAL
7. ANTERIOR CEREBRAL
8. MIDDLE MENINGEAL
9. MAXILLARY
10. FACIAL
11. LINGUAL
12. EXTERNAL CAROTID
13. SUPERIOR THYROID

*- OPHTHALMIC ARTERY
ARISING FROM CAROTID
SIPHON

CAROTID ARTERY, DIGASTRIC, STYLOHYOID

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PROSECTION BY ADAM
SWEENEY, JCESOM
CLASS 2010

FACIAL
ARTERY

INF.
ALVEOLAR
N. (Cut)

MANDIBLE
(cut)

STYLO-
HYOID

SUPERFICIAL
TEMPORAL
ARTERY

EXT.
CAROTID
A.

DIGASTRIC
(post. belly)

ANSA
CERVICALIS
(end cut)

OCCIPITAL
ARTERY

* — ASCENDING
PHARYNGEAL
ARTERY

X

STERNO-
HYOID

OMO-
HYOID

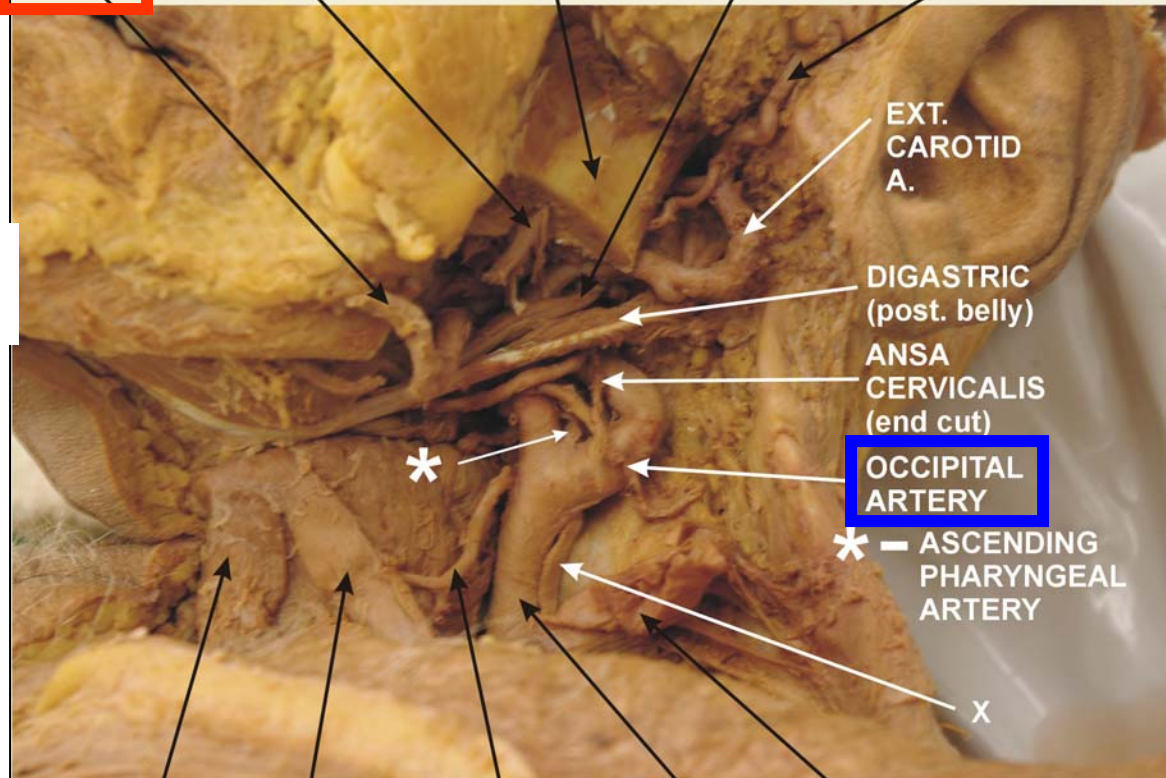
SUP.
THYROID
ARTERY

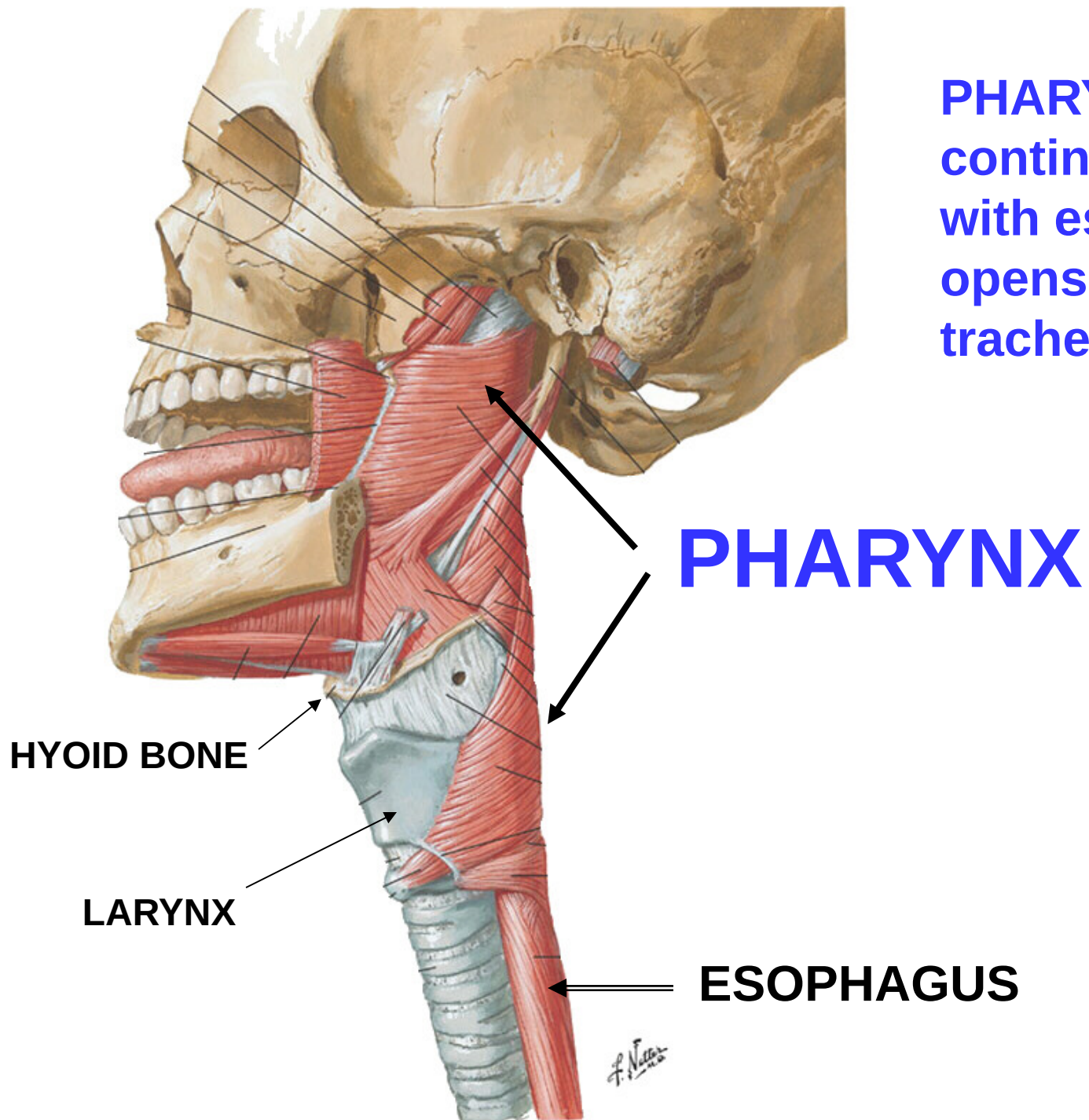
COMMON
CAROTID
ARTERY

INTERNAL
JUGULAR
VEIN

ANTERIOR
BRANCHES

POSTERIOR
BRANCHES





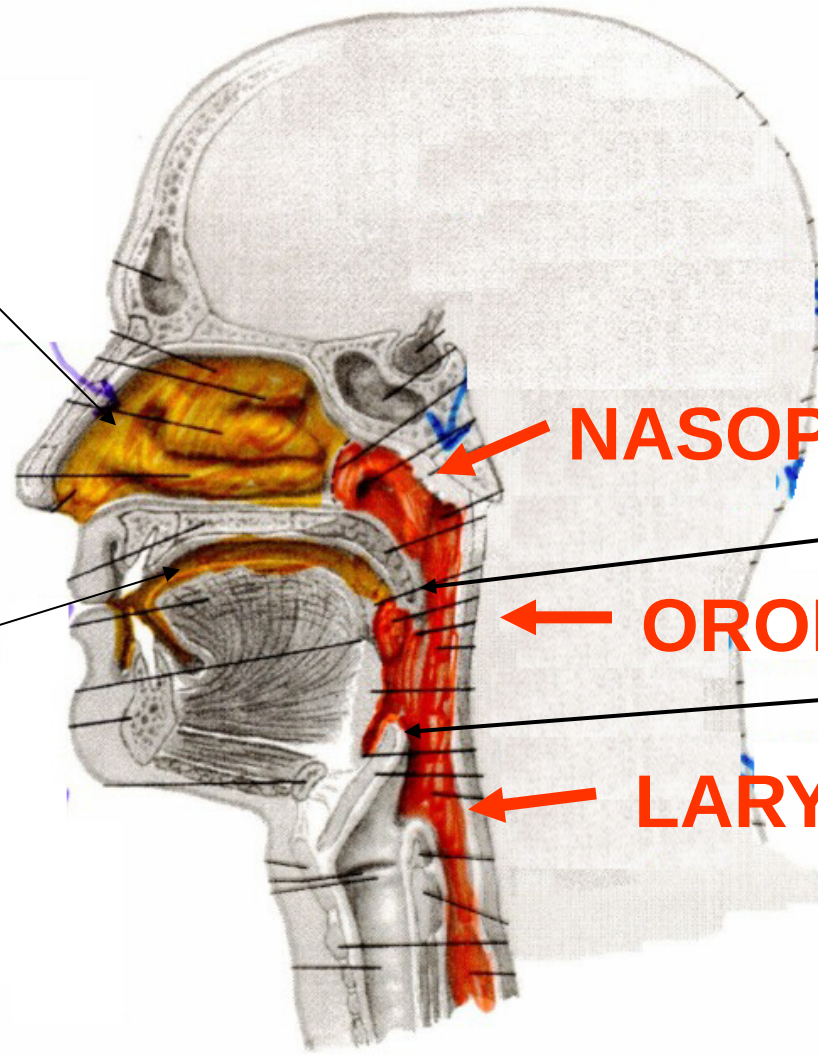
PHARYNX - is continuous with esophagus, opens to larynx trachea

PHARYNX

All Pharynx is GVA
In 3 Cranial Nerves

Nasal
Cavity
GSA

Oral
Cavity
GSA



NASOPHARYNX - VII

soft palate

OROPHARYNX - IX

epiglottis

LARYNGOPHARYNX - X

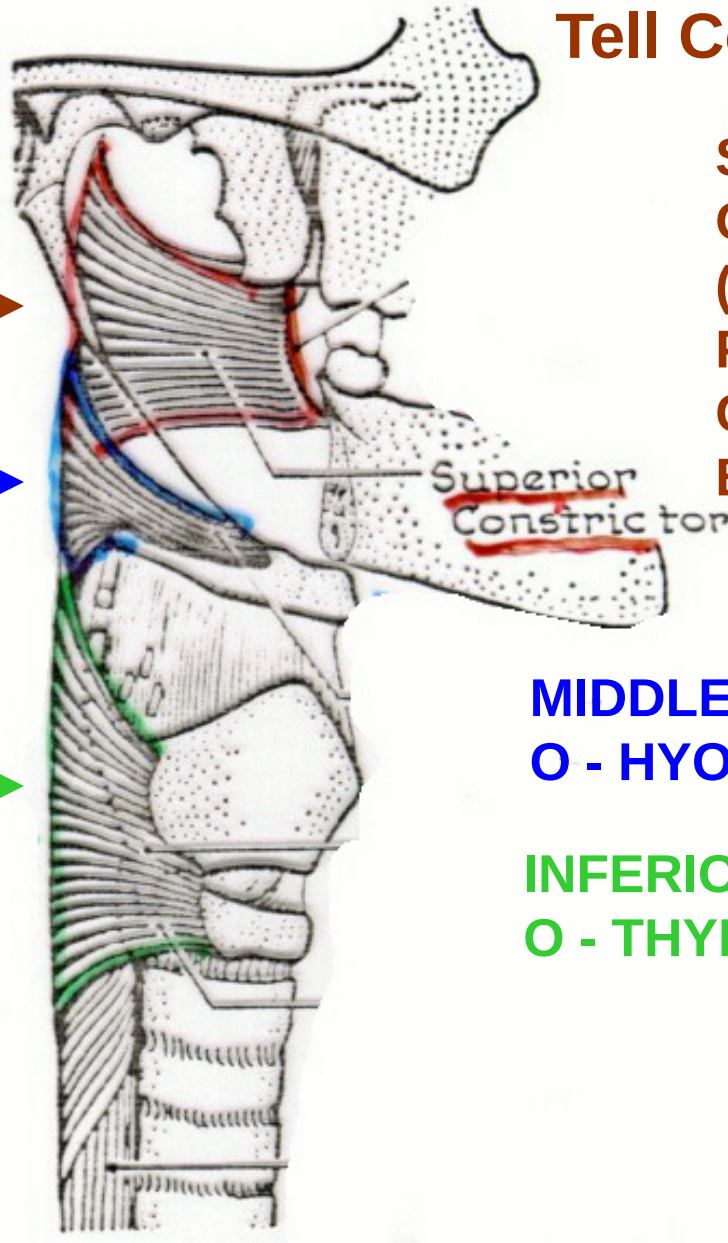
PHARYNX

Tell Constrictors Apart by level

Sup.
Const. →

Mid.
Const. →

Inf.
Const. →



SUPERIOR CONSTRICTOR
O - Pterygomandibular Raphe
(Conn. Tiss. Lig. from Med.
Pterygoid plate to Mandible -
CONTINUOUS ANT. WITH
BUCCINATOR)

MIDDLE CONSTRICTOR
O - HYOID

INFERIOR CONSTRICTOR
O - THYROID & CRICOID Cartilage

Structures Through Gaps In Constrictors

PHARYNX

1) Between Sup. Constrictor and Skull

Levator Veli Palatini M.

Auditory Tube

2) Between Sup. and Mid. Constrictor

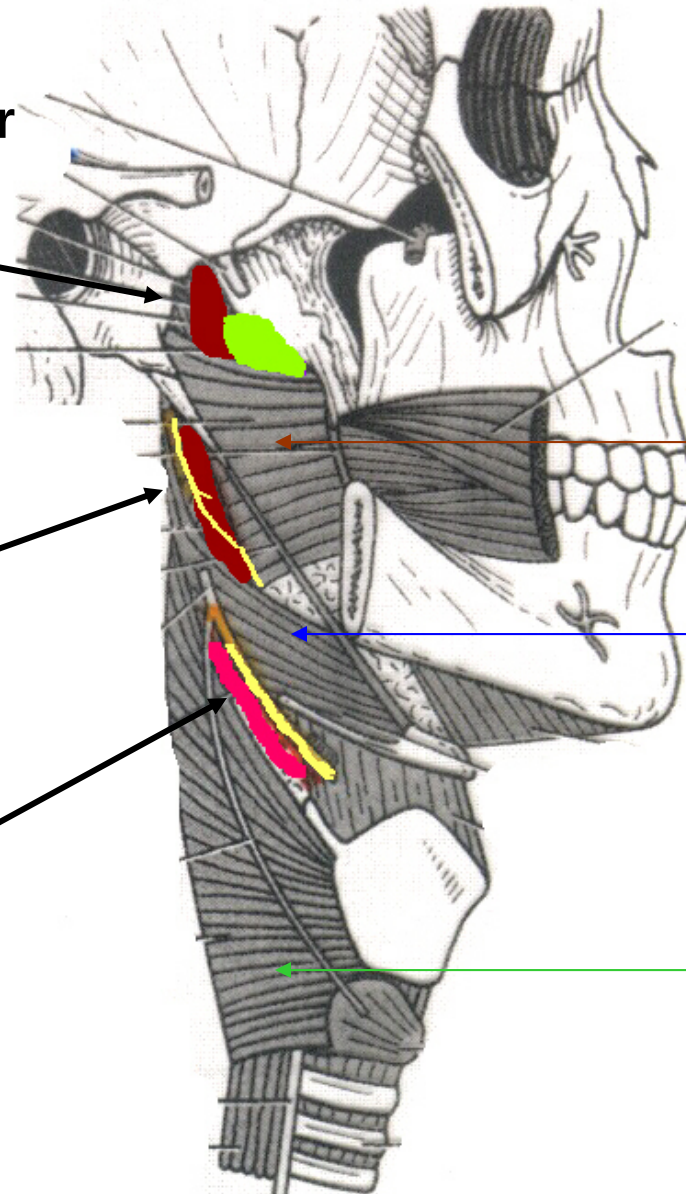
Glossopharyngeal N. (IX)

Stylopharyngeus M.

3) Between Mid. and Inf. Constrictor

Superior Laryngeal A.

Internal Laryngeal N.



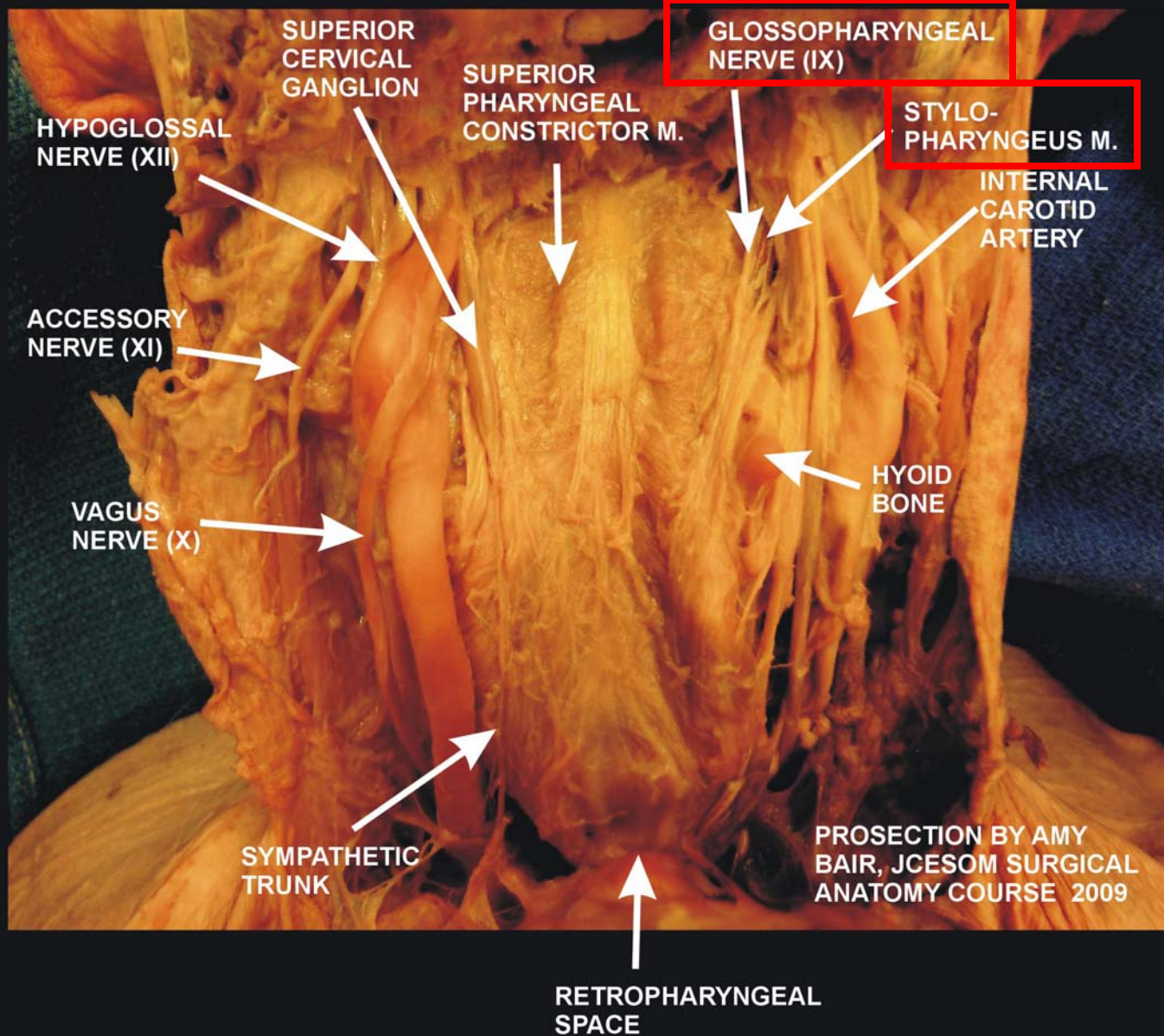
**Sup.
Const.**

**Mid.
Const.**

**Inf.
Const.**

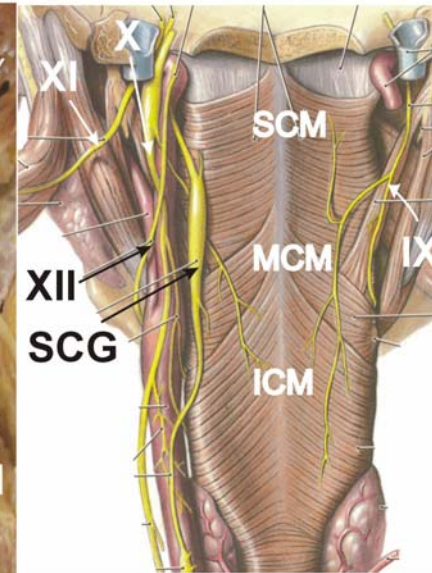
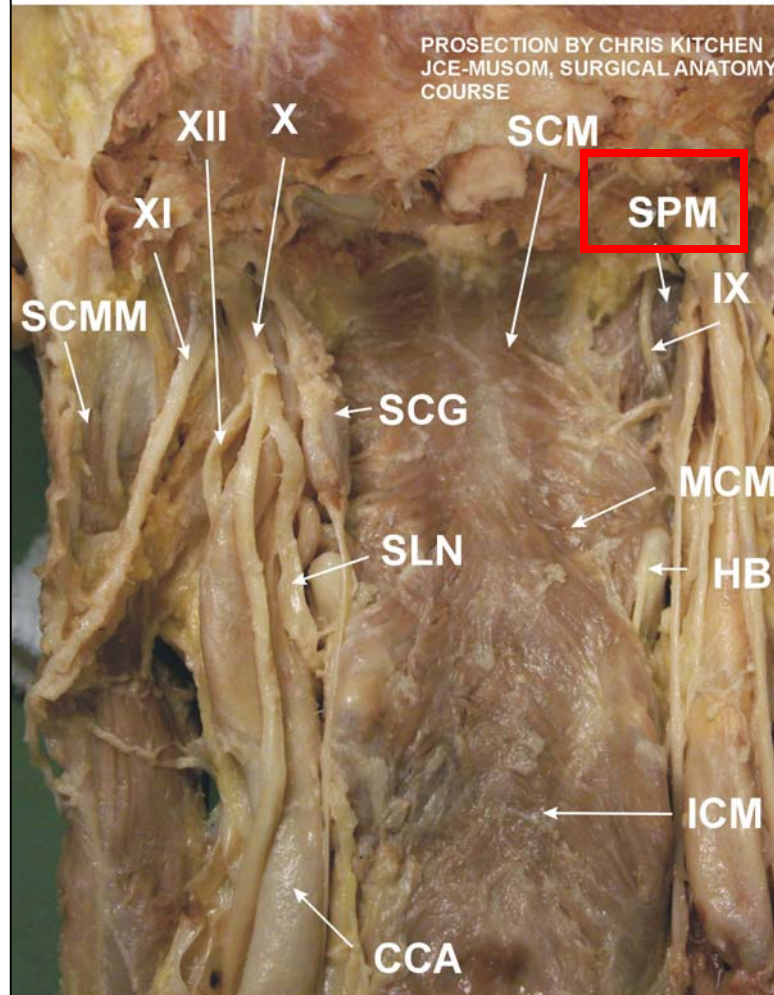
POSTERIOR PHARYNX AND RETROPHARYNGEAL SPACE

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POSTERIOR PHARYNX AND CRANIAL NERVES IX, X, XI AND XII

1037

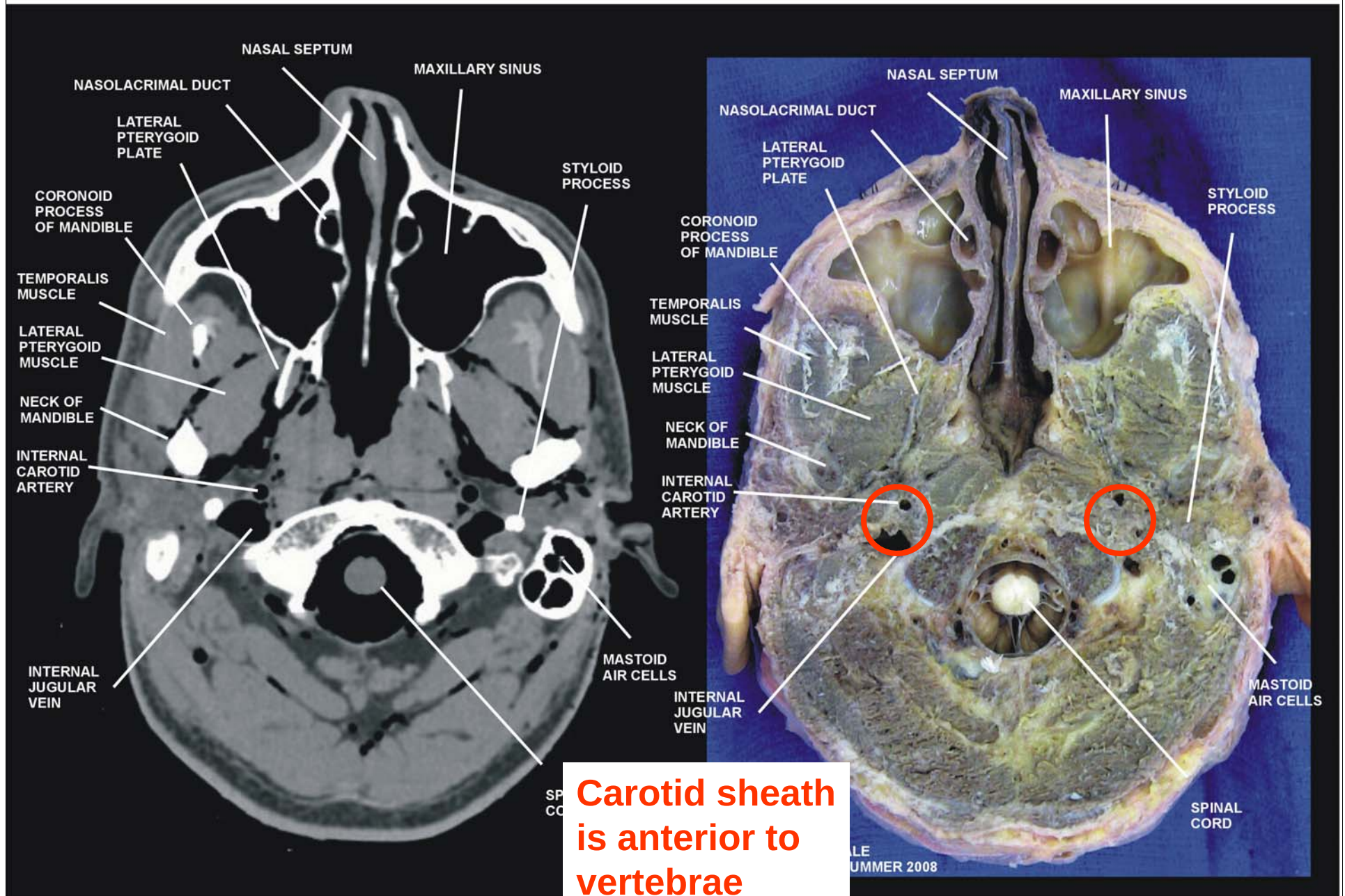


SPM - STYLO-
PHARYNGEUS
MUSCLE
IX - GLOSSO-
PHARYNGEAL N.
SCM - SUPERIOR
PHARYNGEAL
CONTRACTOR M.
MCM - MIDDLE
PHARYNGEAL
CONTRACTOR M.
HB - HYOID BONE
ICM - INFERIOR
PHARYNGEAL
CONTRACTOR M.

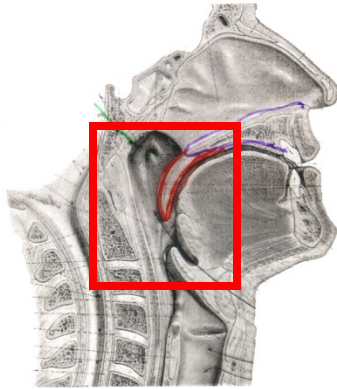
SCG - SUPERIOR CERVICAL GANGLION
X - VAGUS NERVE
XII - HYPOGLOSSAL NERVE
XI - ACCESSORY NERVE
SCMM - STERNOCLEIDOMASTOID MUSCLE
CCA - COMMON CAROTID ARTERY
SLN - SUPERIOR LARYNGEAL NERVE

CT SECTION OF HEAD THROUGH MAXILLARY SINUS AND PTERYGOID PLATES AND HORIZONTAL SECTION OF SAME SPECIMEN

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CONTENTS OF PHARYNX

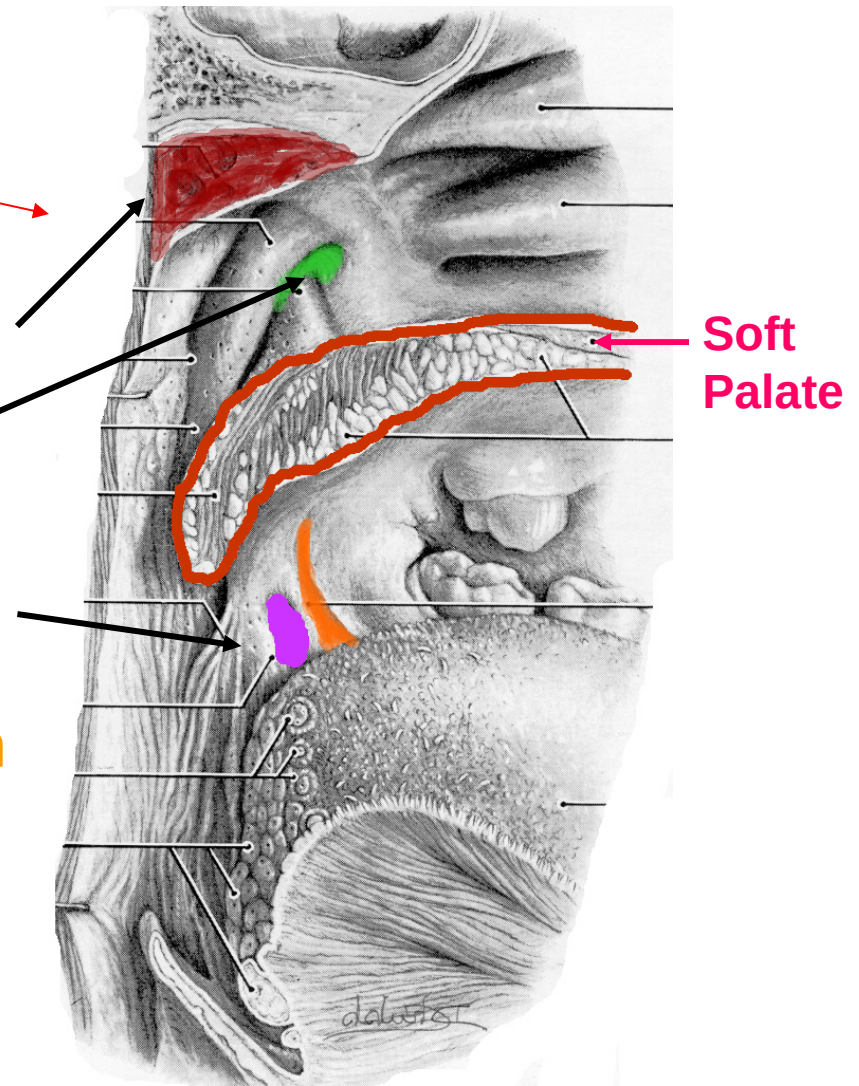


in Nasopharynx

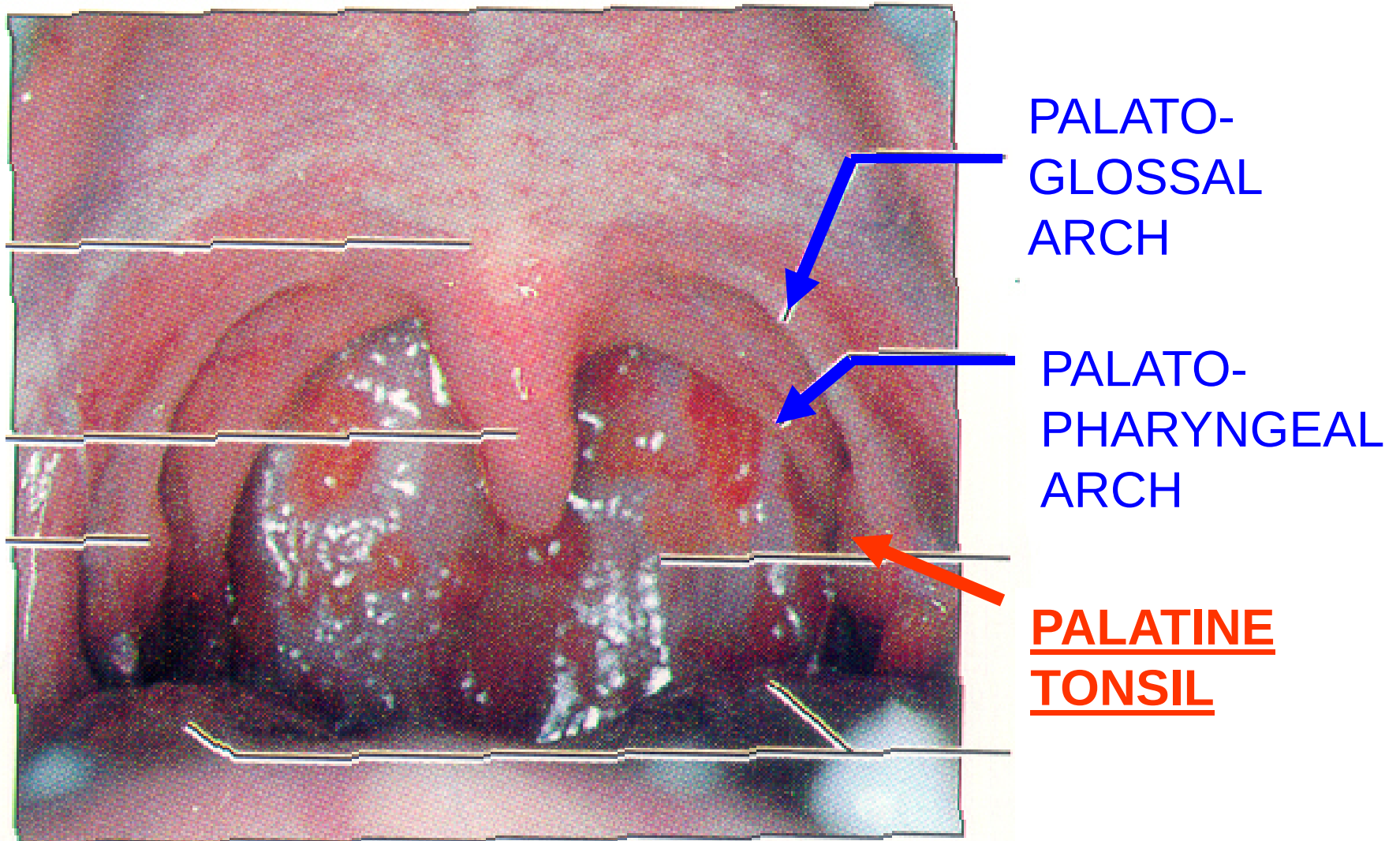
- Pharyngeal Tonsil (Adenoids)
- opening of Auditory Tube

in Oropharynx

- Palatine Tonsils (Tonsillitis)
- posterior to **Palatoglossal Arch**

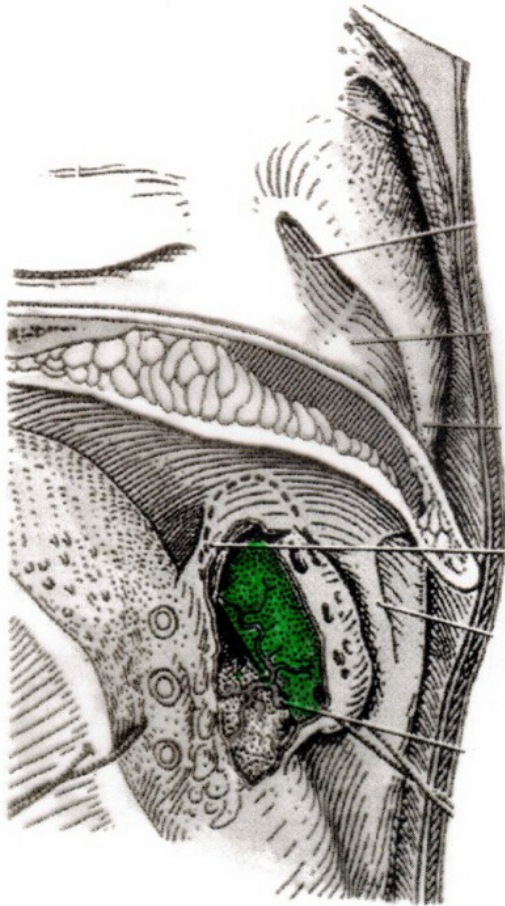


PALATINE TONSILS - LOCATION



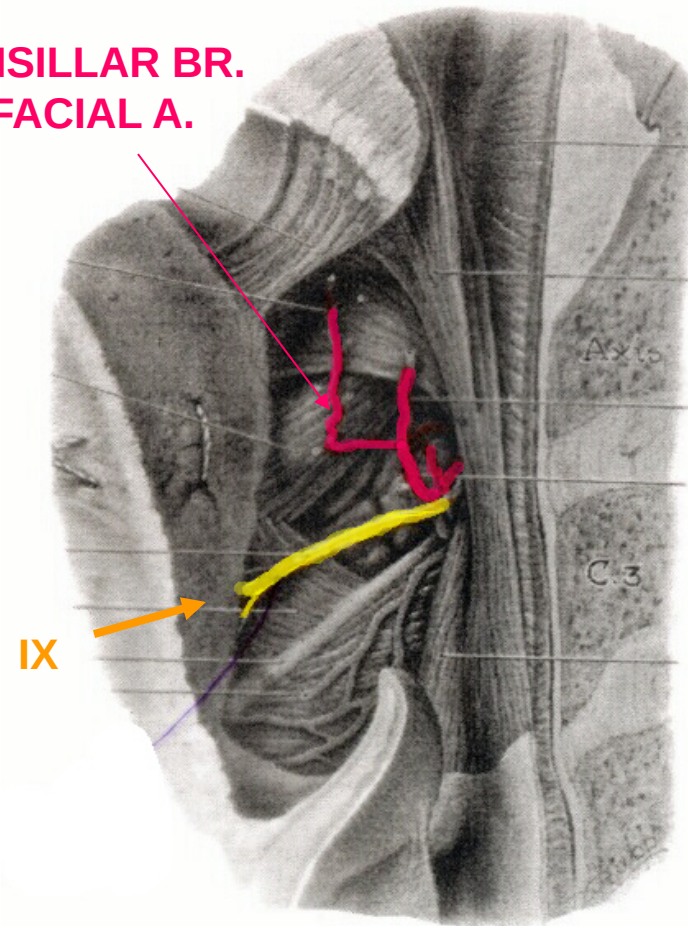
AAH!

PALATINE TONSILS - Tonsillectomy - incise mucosa



Tonsillar 'Bed' - Formed by
1) Superior Constrictor of pharynx and
2) Styloglossus

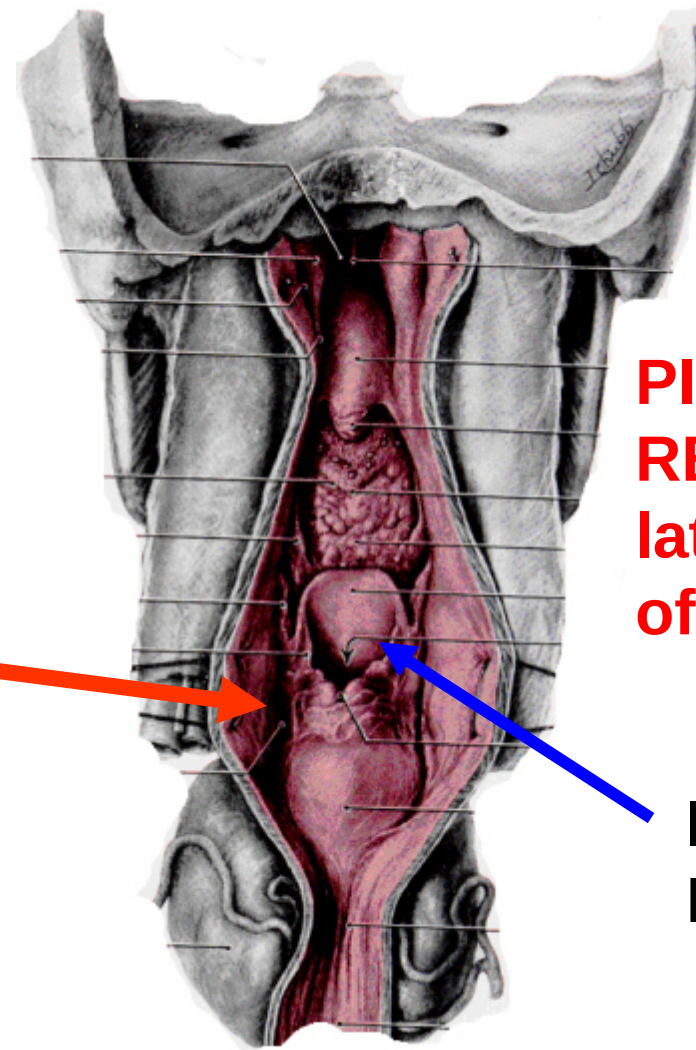
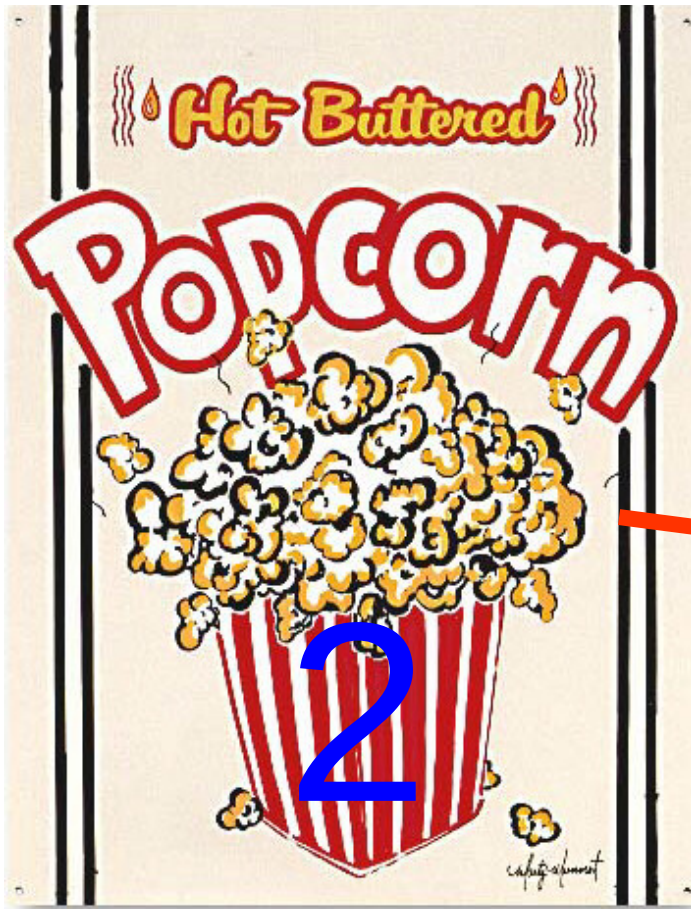
TONSILLAR BR.
OF FACIAL A.



Clinical -
1) Damage IX
2) Bleeding

PHARYNX - INTERNAL STRUCTURES

CLINICAL VIGNETTE



**PIRIFORM
RECESS:
lateral to inlet
of larynx**

**Inlet of
Larynx**

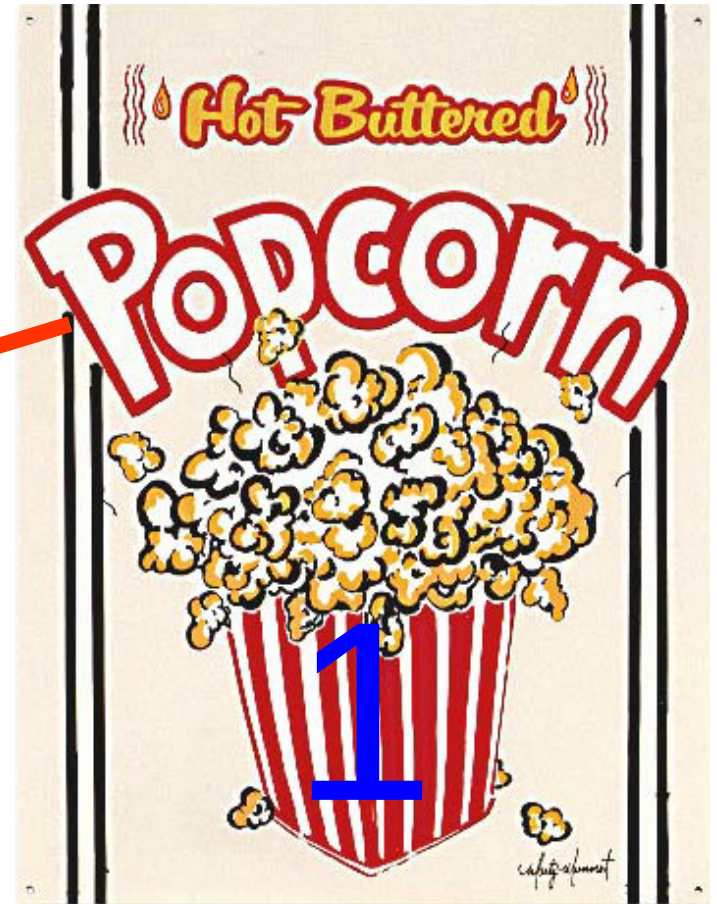
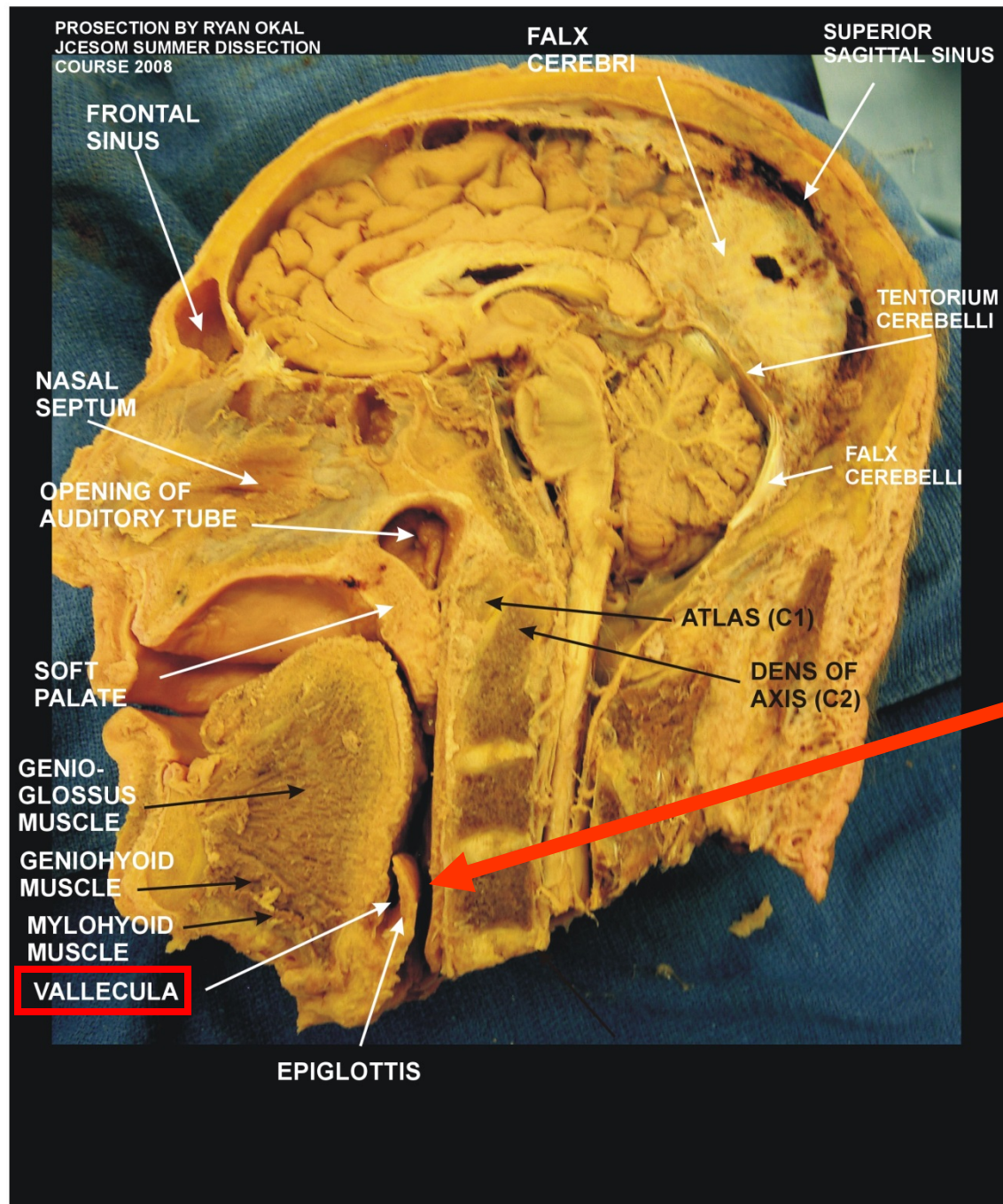
A child complains that he has popcorn stuck in his throat. Examination shows that it is lodged in the laryngopharynx, lateral to the inlet of the larynx. The popcorn is in the _____.

MEDIAL VIEW OF BISECTED HEAD

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PHARYNX - INTERNAL STRUCTURES

VALLECULAE - in Oropharynx



ORAL CAVITY - TONGUE

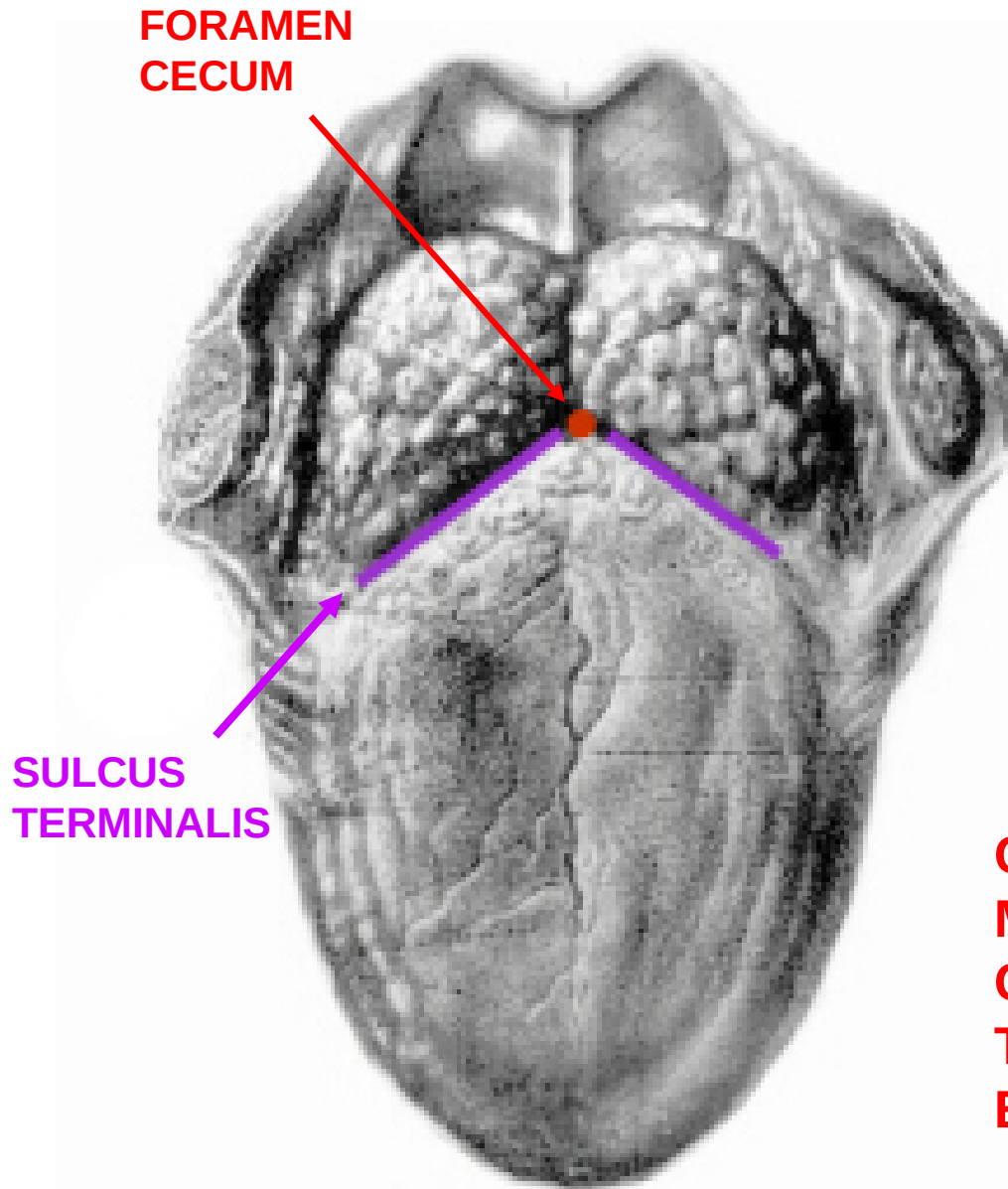
A. SUPERFICIAL STRUCTURES

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

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

INVAGINATION OF THYROID GLAND

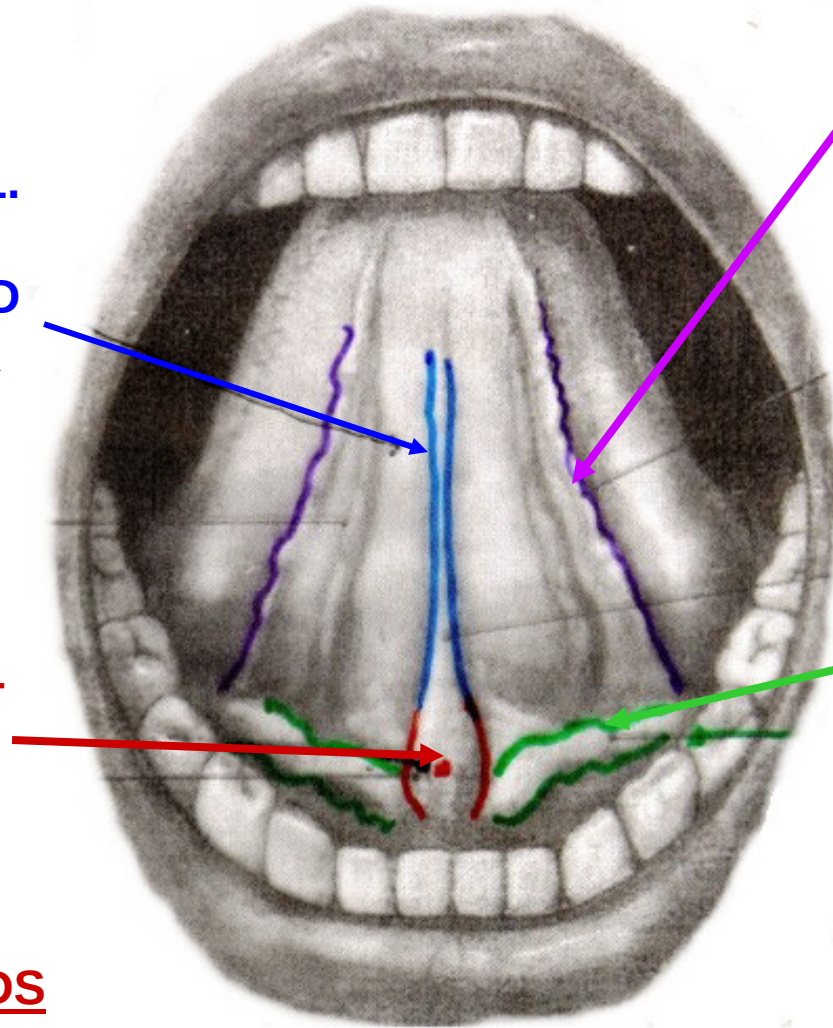
**CLINICAL QUESTION:
MASS IN POSTERIOR TONGUE;
CHECK IF IT IS THYROID
TISSUE BEFORE SURGICAL
EXCISION**



FOLDS, LANDMARKS BENEATH TONGUE

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

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



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

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

MUSCLES OF TONGUE - all innervated by XII

A) GENIOGLOSSUS

O - GENIAL TUBERCLE OF MANDIBLE

I - TONGUE TO ITS DORSAL SURFACE

A - PROTRUDE

1. EXTRINSIC MUSCLES - ATTACH TONGUE TO BONES

C) STYLOGLOSSUS -

O-STYLOID PROCESS OF
TEMP. BONE

I - LAT. SIDE OF TONGUE

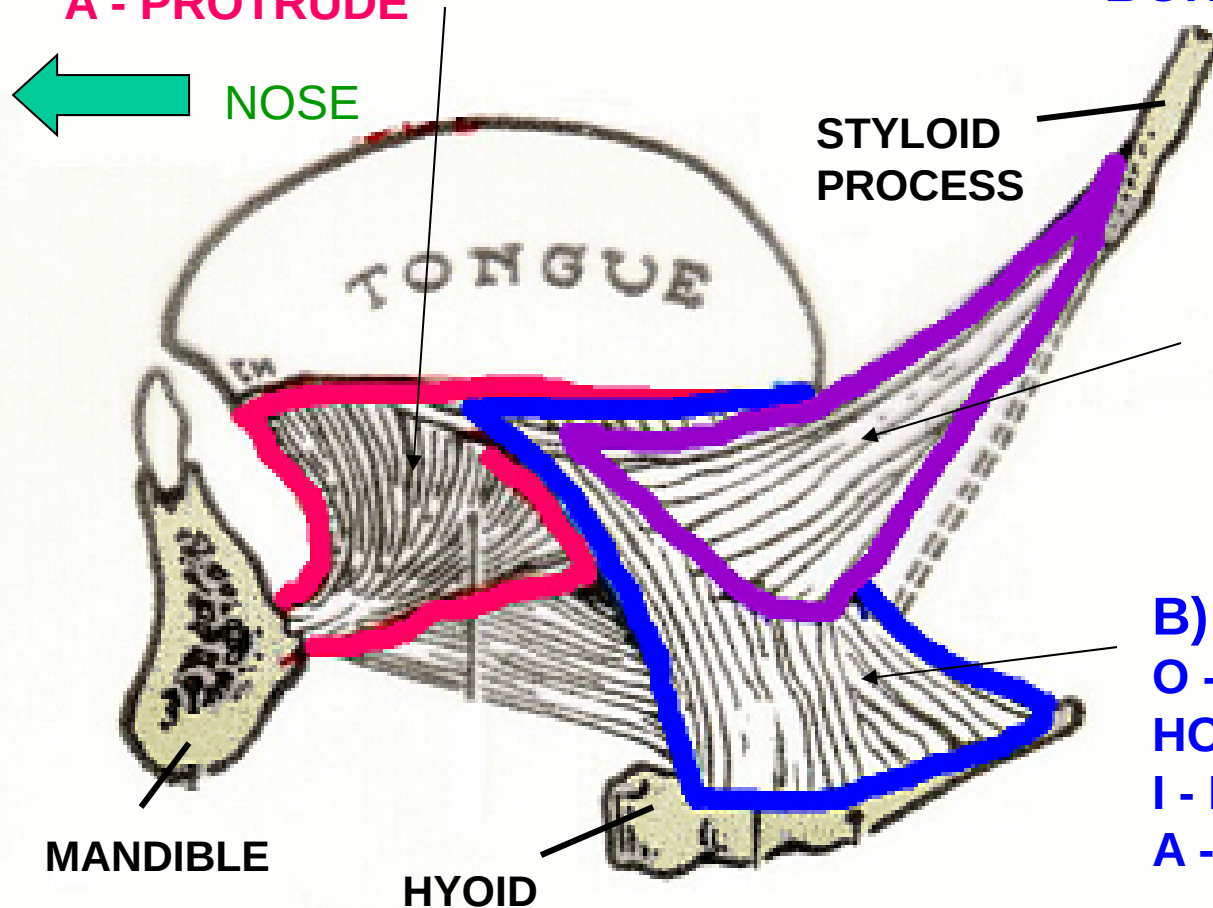
A - DRAWS TONGUE
SUPERIORLY &
POSTERIORLY

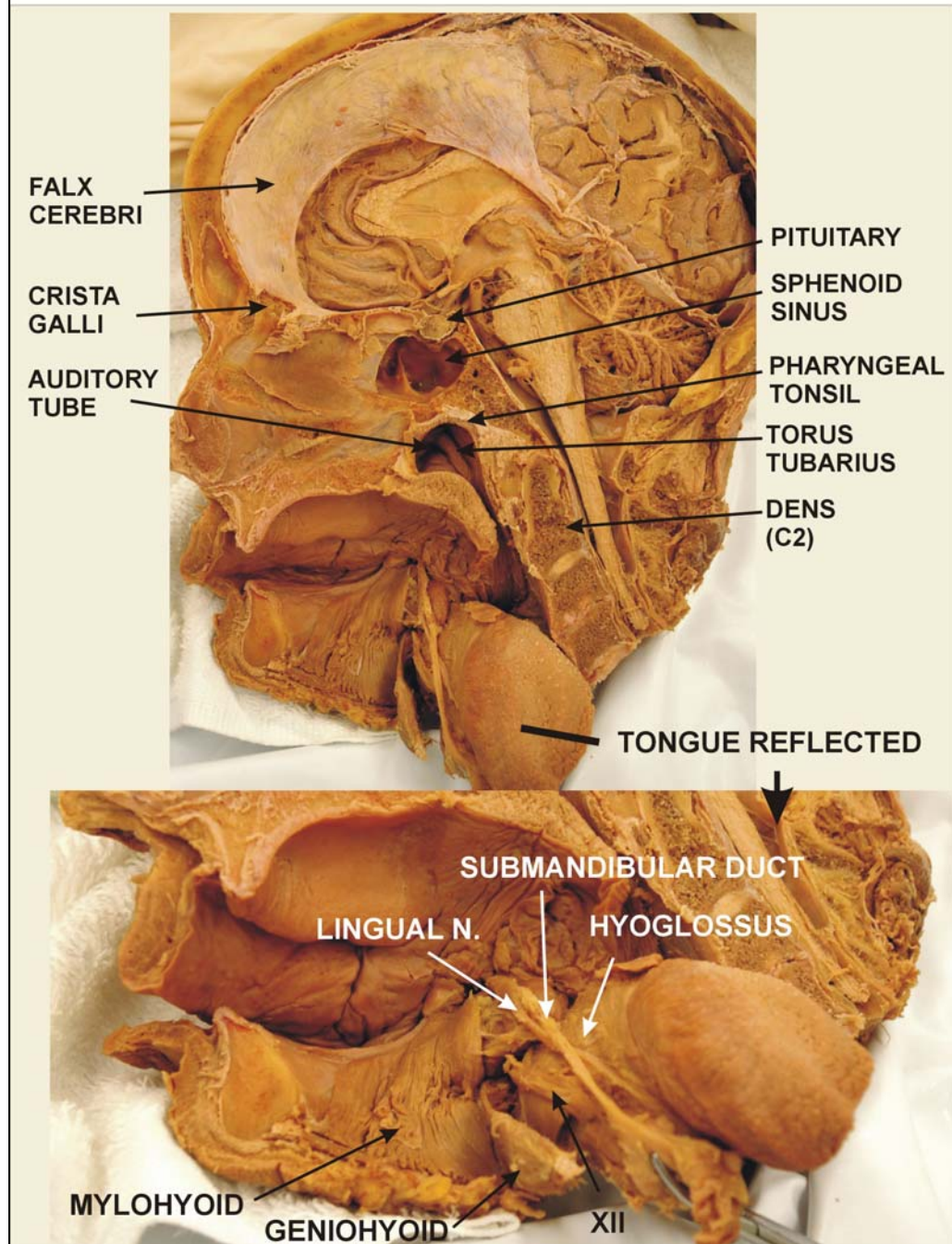
B) HYOGLOSSUS -

O - GREATER & LESSER
HORNS OF HYOID BONE

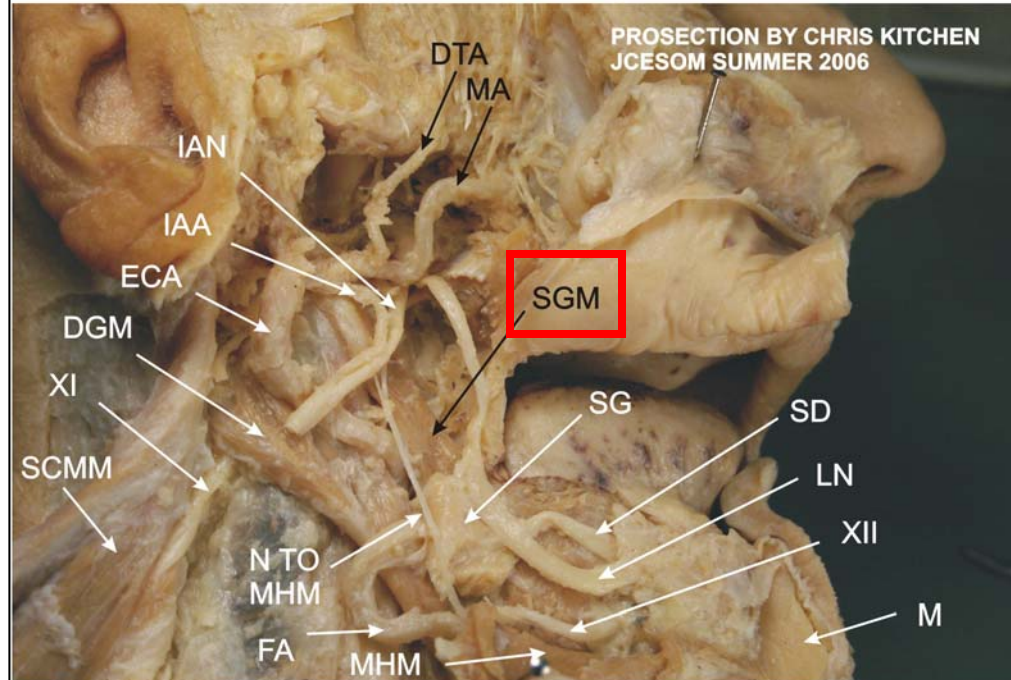
I - LAT. SIDE OF TONGUE

A - DEPRESS

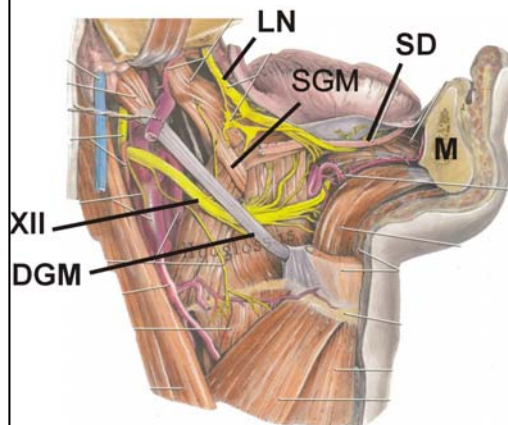




PROSECTION OF ORAL CAVITY



**ORIENT:
LIFT SKIN OF
CHEEK TO
VIEW ABOVE**



SD - SUBMANDIBULAR DUCT
LN - LINGUAL NERVE
XII - HYPOGLOSSAL NERVE
M - MANDIBLE (CUT)
MHM - MYLOHYOID MUSCLE
FA - FACIAL ARTERY
N TO MHM - NERVE TO MYLOHYOID MUSCLE
MA - MAXILLARY ARTERY
DGM - DIGASTRIC MUSCLE
SCMM - STERNOCLEIDOMASTOID MUSCLE
XI - ACCESSORY NERVE
ECA - EXTERNAL CAROTID ARTERY
IAA - INFERIOR ALVEOLAR ARTERY
IAN - INFERIOR ALVEOLAR NERVE
DTA - DEEP TEMPORAL ARTERY
SG - SUBMANDIBULAR GLAND
SGM - STYLOGLOSSUS MUSCLE

PROSECTION BY RYAN OKAL
JCESOM SUMMER DISSECTION
COURSE 2008



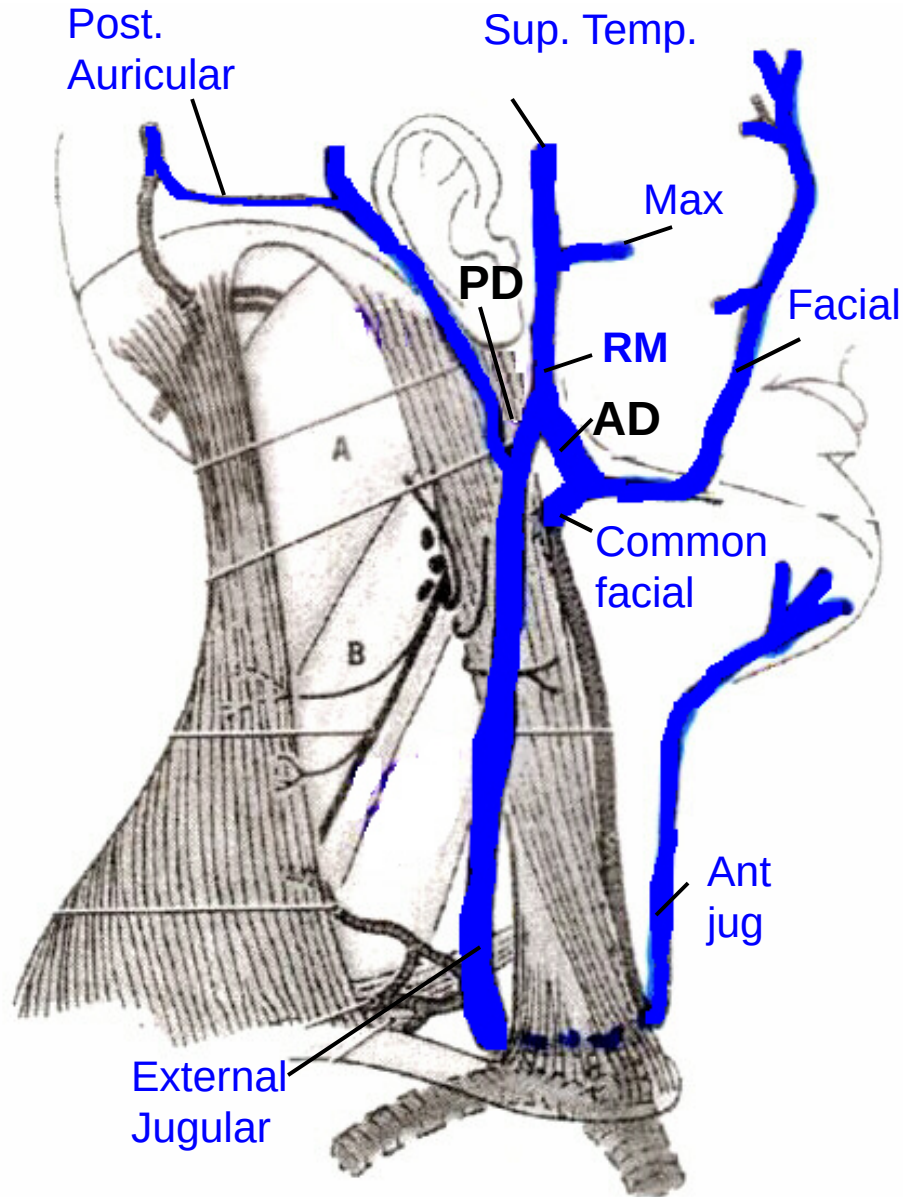
GENIO-GLOSSUS
INTACT

GENIO-GLOSSUS
LESION



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

VEINS OF NECK



1. Superficial Temporal & Maxillary vv. form Retromandibular V. (RM)

2. Retromand. V. Divides Ant. (AD) and Post. (PD) divisions

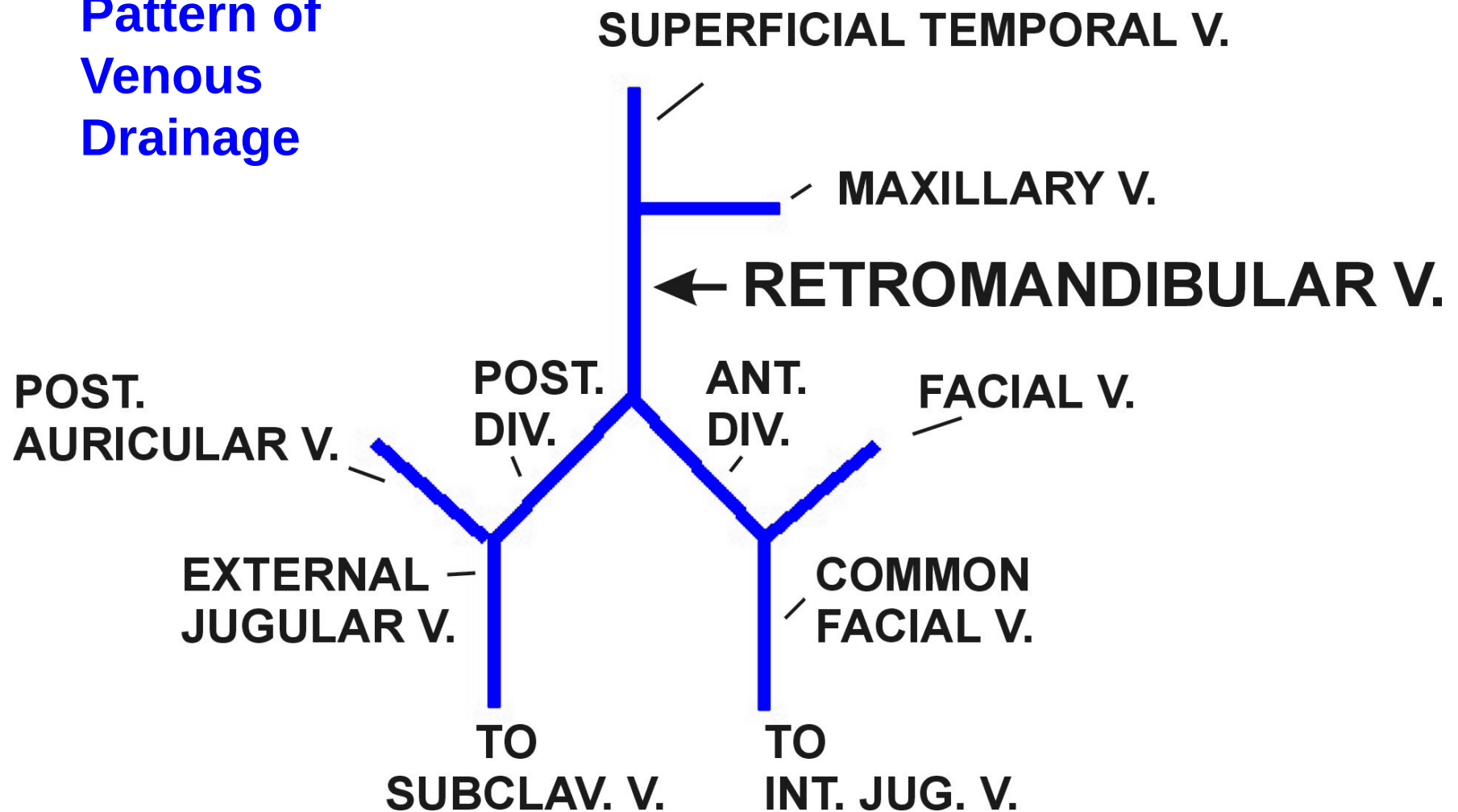
3. Ant. Division joins Facial V. to form Common Facial V. -> Int. jugular V.

4. Post. Division joins Post. Auricular V. to form External Jugular V.-> Subclavian V.

5. Ant. Jugular from veins below mandible -> Ext. Jugular above clavicle

VEINS OF NECK

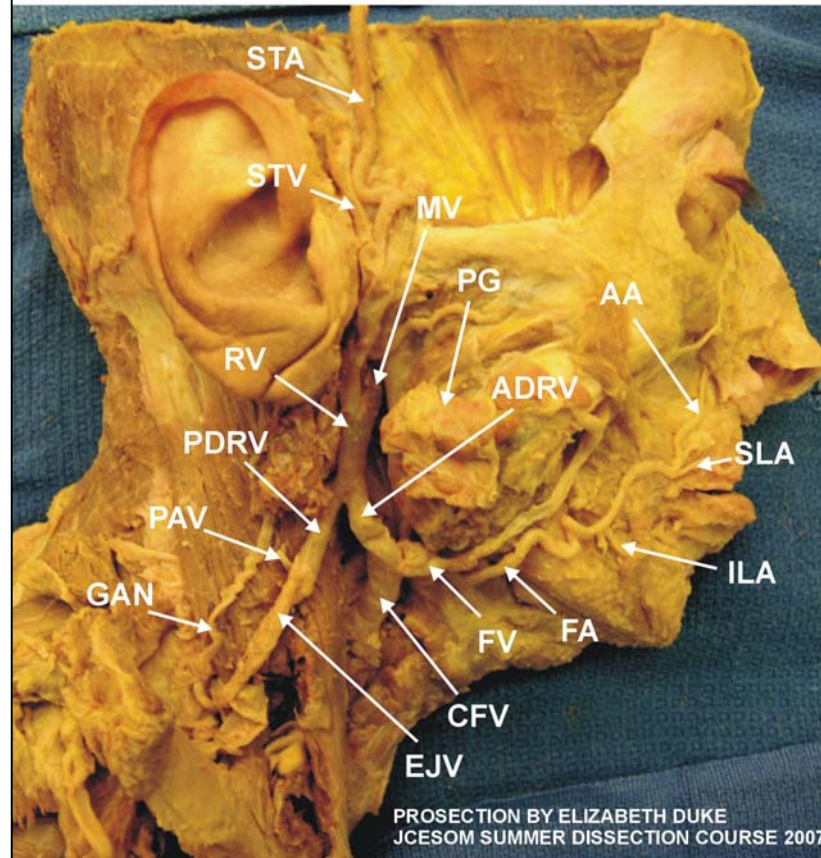
Pattern of
Venous
Drainage



DEEP STRUCTURES IN PAROTID GLAND: FORMATION OF RETROMANDIBULAR VEIN

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NOTE: PAROTID GLAND DISSECTED AND REFLECTED

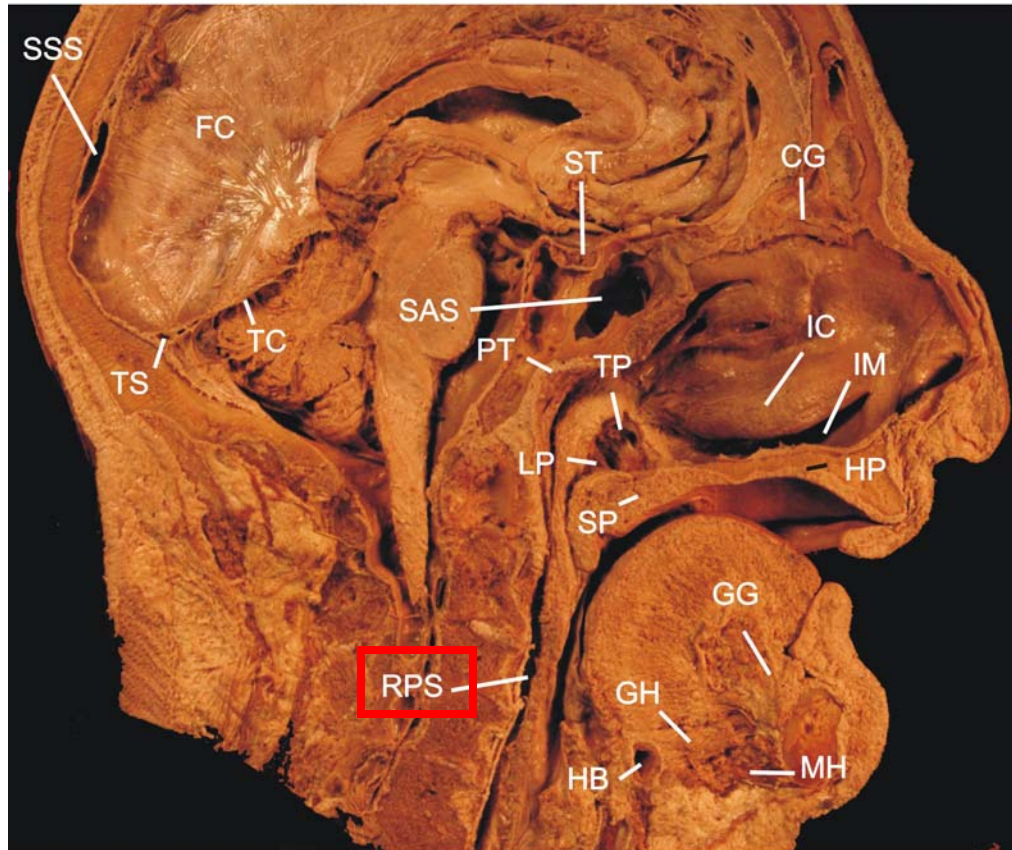


RV - RETROMANDIBULAR V
ADRV - ANTERIOR DIVISION OF RV
PDRV - POSTERIOR DIVISION OF RV
FA - FACIAL ARTERY
AA - ANGULAR ARTERY
SLA - SUPERIOR LABIAL ARTERY
ILA - INFERIOR LABIAL ARTERY
FV - FACIAL VEIN
GAN - GREAT AURICULAR NERVE
STV - SUPERFICIAL TEMPORAL VEIN
STA - SUPERFICIAL TEMPORAL ARTERY
PAV - POSTERIOR AURICULAR VEIN (CUT)

MV - MAXILLARY VEIN
CFV - COMMON FACIAL
VEIN
EJV - EXTERNAL
JUGULAR VEIN
PG - PAROTID GLAND
(cut and reflected)

Good luck!

PROSECTION OF TENSOR AND LEVATOR OF PALATE



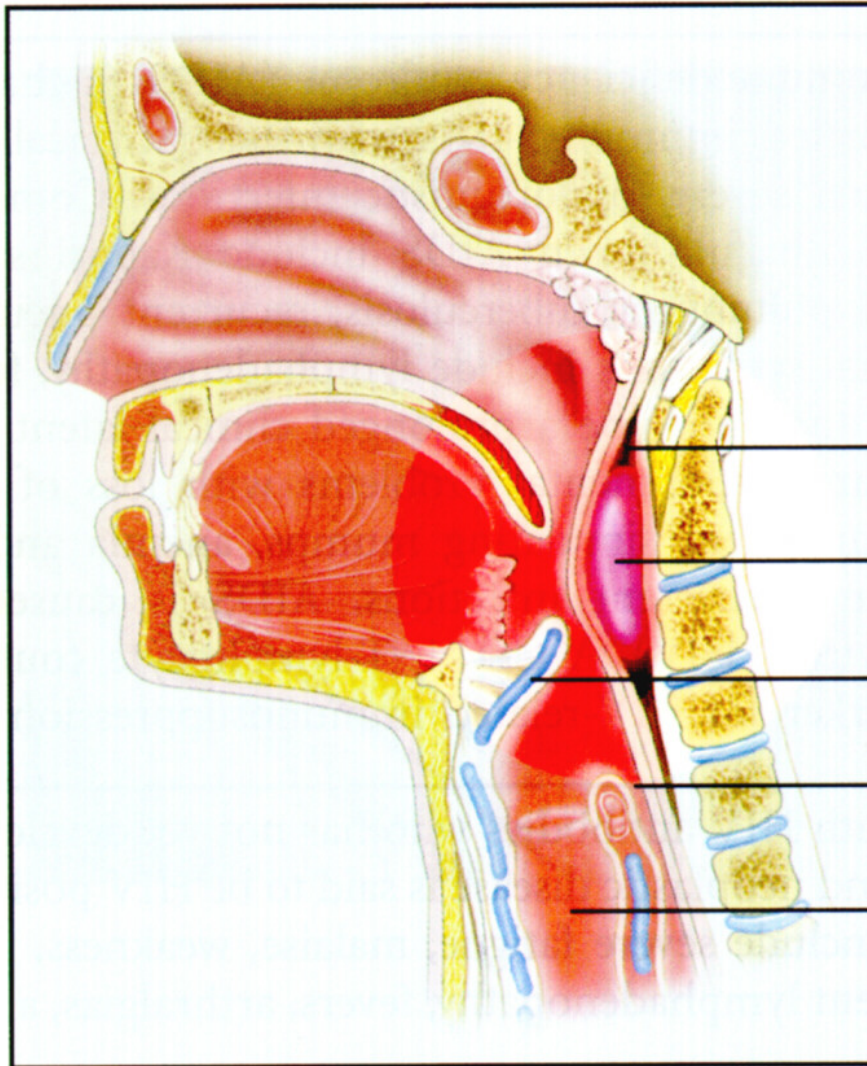
231

**RETROPHARYNGEAL SPACE -
posterior to Constrictors;
anterior to Prevertebral
muscles**

TP - TENSOR PALATI M.
LP - LEVATOR PALATI M.
PT - PHARYNGEAL TONSIL
HP - HARD PALATE
SP - SOFT PALATE
IM - INFERIOR MEATUS
IC - INFERIOR CONCHA
CG - CRISTA GALLI
FC - FALX CEREBRI
ST - SELLA TURCICA

TC - TENTORIUM CEREBELLI
TS - TRANSVERSE SINUS
SAS - SPHENOID AIR SINUS
SSS - SUPERIOR
SAGITTAL SINUS
GG - GENIOGLOSSUS M.
GH - GENIOHYOID M.
MH - MYLOHYOID M.
HB - HYOID BONE
RPS - RETROPHARYNGEAL
SPACE

RETROPHARYNGEAL ABSCESS



Infection in retropharyngeal space can spread unimpeded to mediastinum

Retropharyngeal space

Abscess

Epiglottis

Esophagus

Trachea