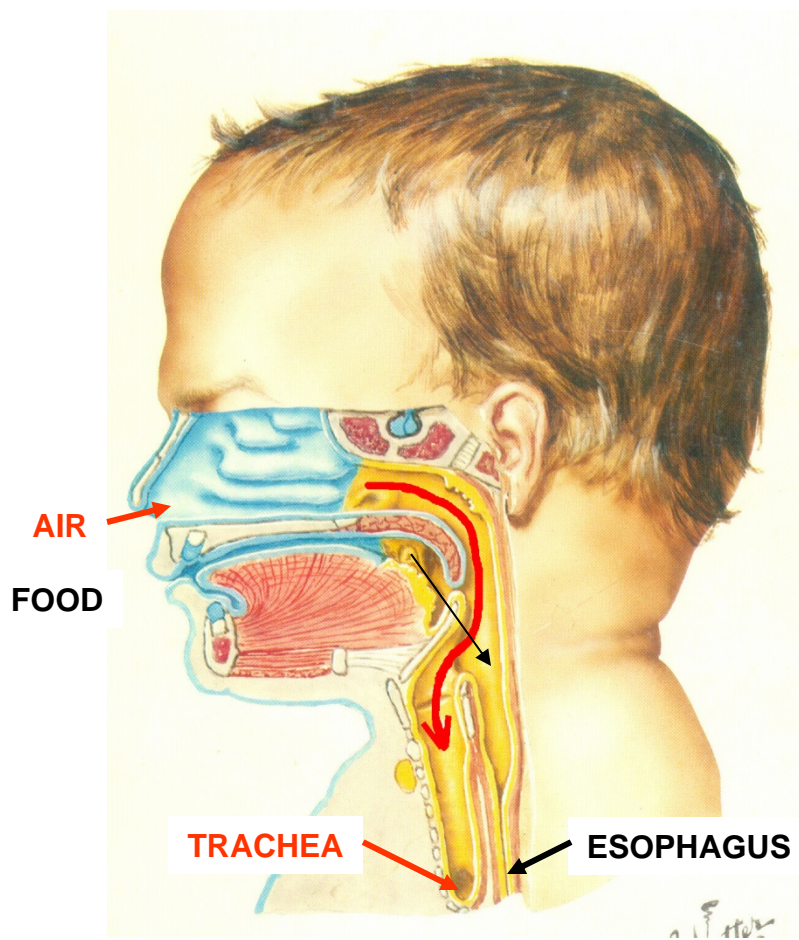


NASAL CAVITY



OUTLINE:

- I. NASAL CAVITY
- II. PARANASAL AIR SINUSES
- III. PALATE
- IV. PALATINE TONSILS

Problem: Nasal Cavity and Oral Cavity open to Pharynx; Path of air crosses path of food intake; Permits breathing when chewing

Solution: Soft Palate functions as flap valve

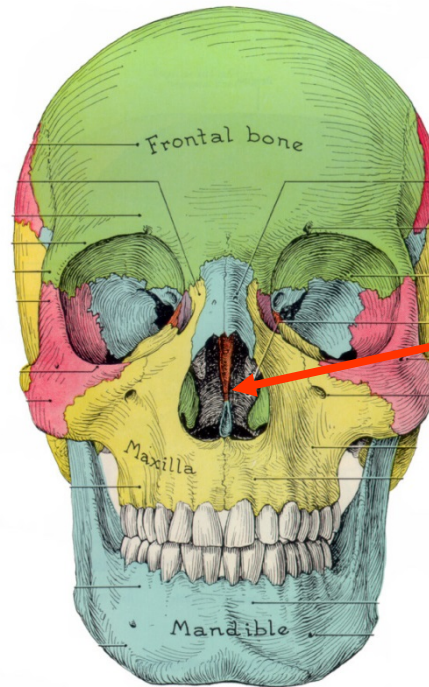
Clinical: Burrito story; Other - sinus infections, tonsillitis

NASAL CAVITY

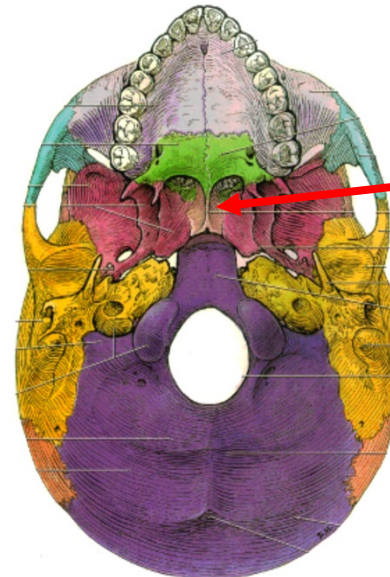
Upper most part of respiratory system

Functions:

- 1) **Modifies air** – warms, humidifies and filters
- 2) **Sense smell** – hunt animals, enjoy flowers, avoid noxious odors, allure of perfume

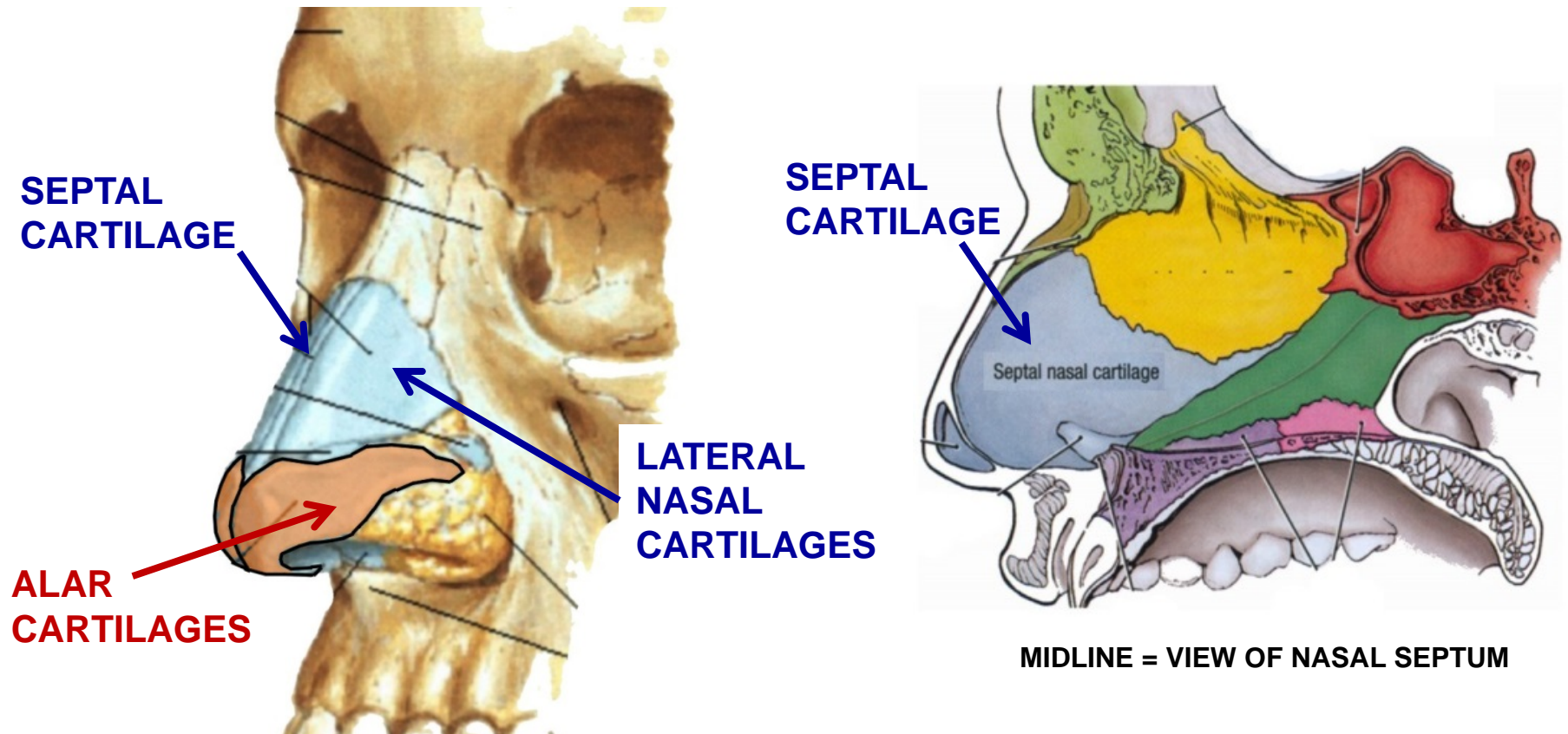


Ant.
Opening =
Anterior
Nares



Post opening =
Posterior Nares
=
Choanae
(ko'-an-ay)
(greek for
funnels)

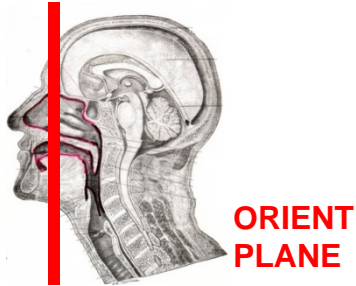
A. NASAL CARTILAGES



Nasal Cartilages -

- 1) Septal cartilage with fused Lateral Nasal Cartilages
- 2) Alar cartilages - surround medial side of nostrils

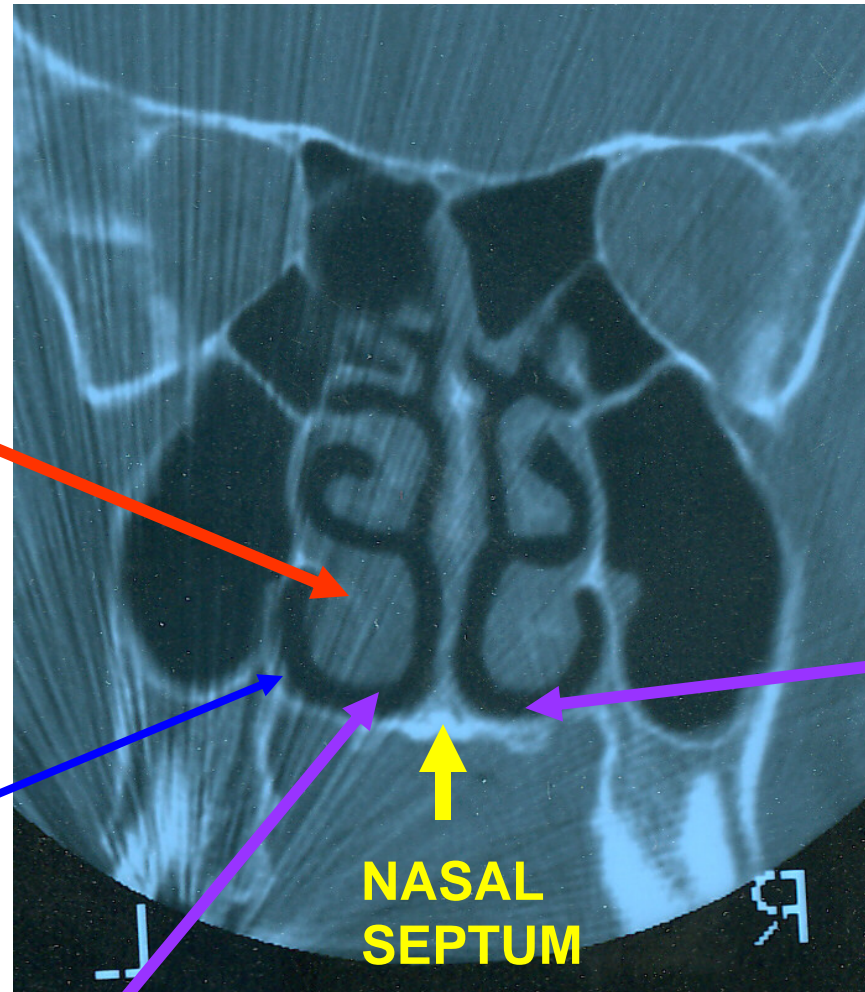
Function of Cartilages - flexible, **opening inferiorly directs inhalation toward mouth (smell what you eat)**



CORONAL CT of INTERIOR OF NASAL CAVITY

Projections that increase surface area called **Nasal Conchae** (con'-key)=
Turbinates

Cavity is lined with mucoperiosteum



AIR

SPACE BELOW CONCHA IS CALLED MEATUS (L. passage)

B. BOUNDARIES OF NASAL CAVITY

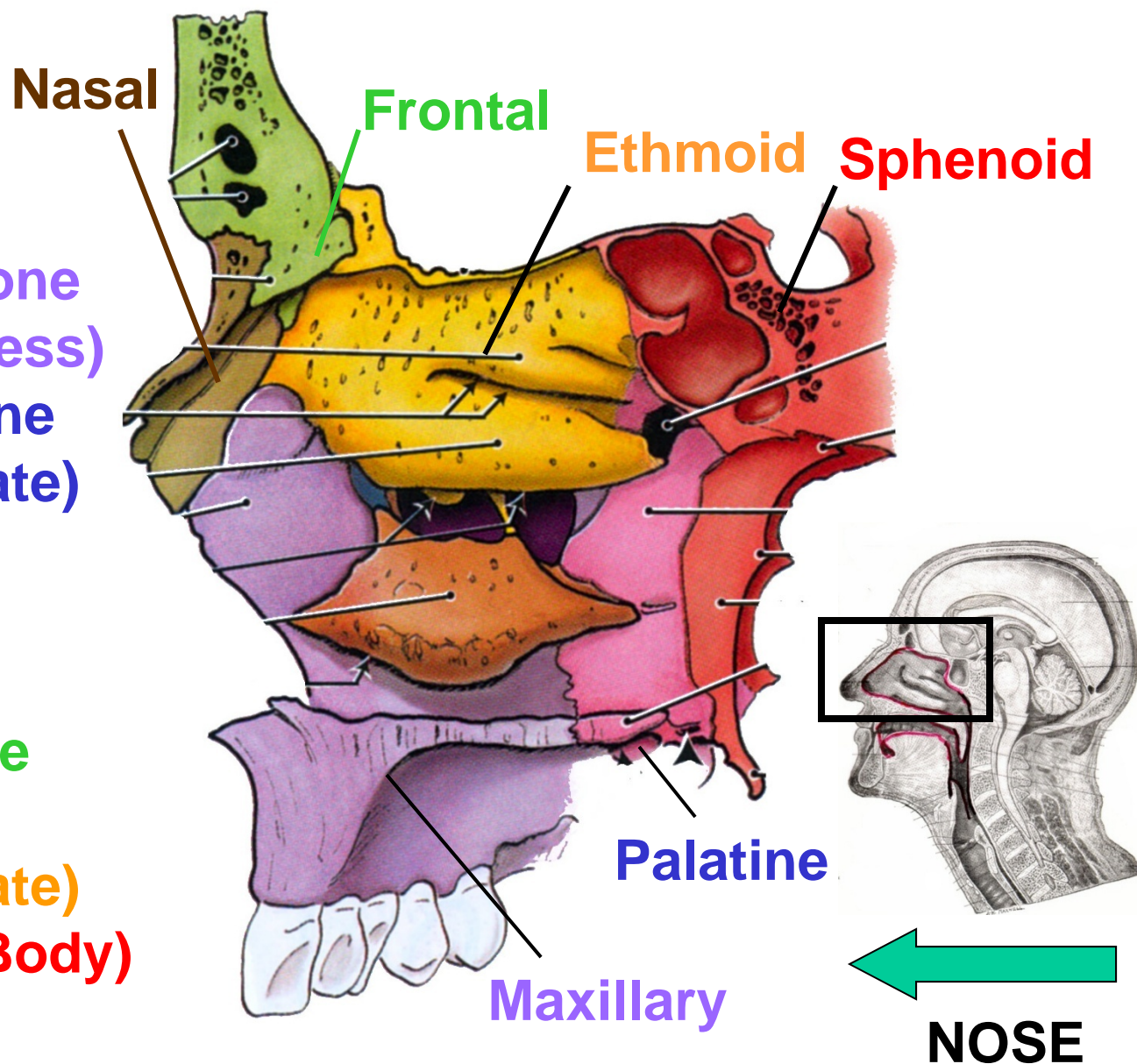
Boundaries

Floor = Palate

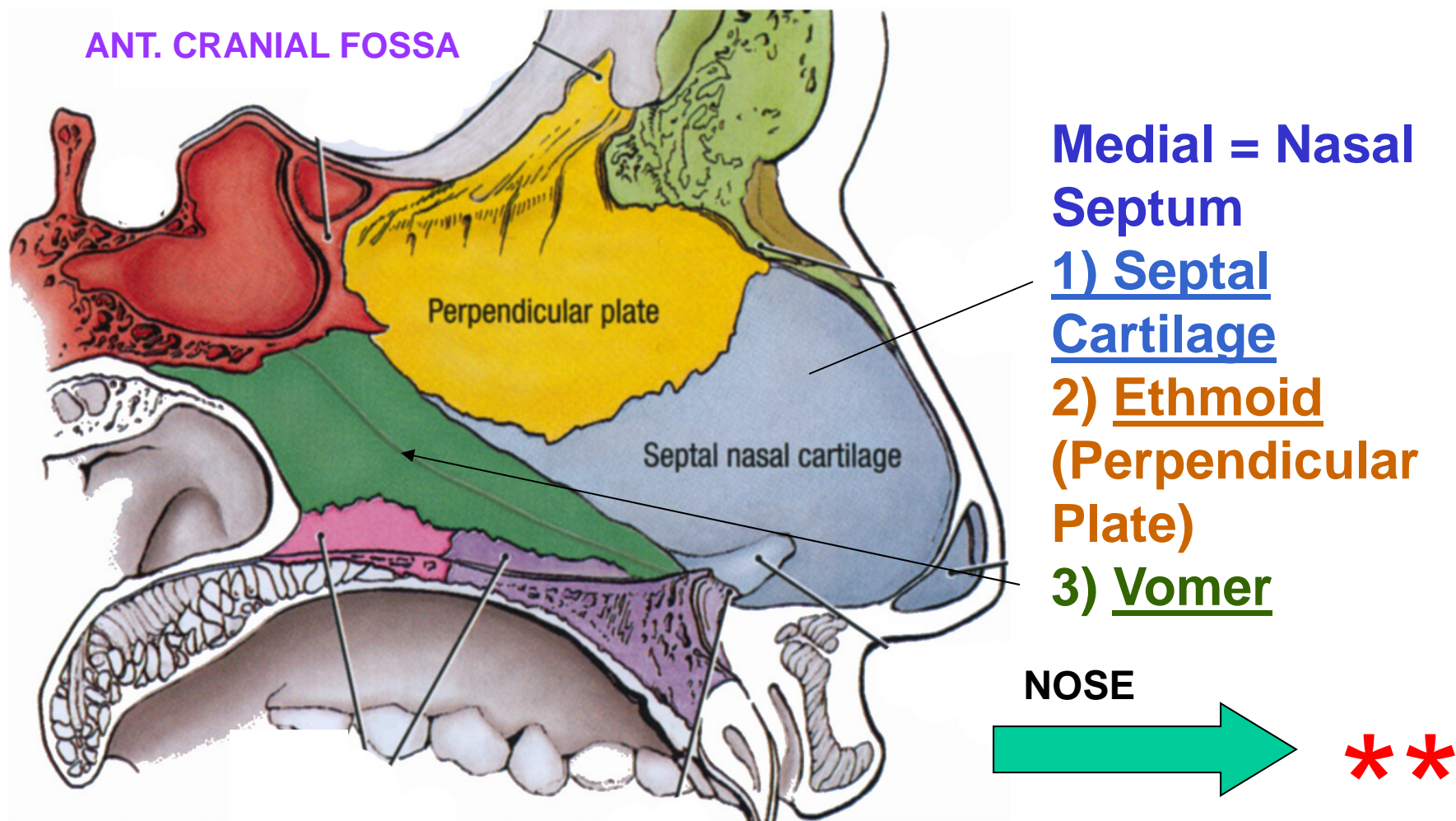
- 1) Maxillary Bone (Palatine Process)
- 2) Palatine Bone (Horizontal Plate)

Roof

- 1) Nasal Bone
- 2) Frontal Bone
- 3) Ethmoid (Cribriform Plate)
- 4) Sphenoid (Body)

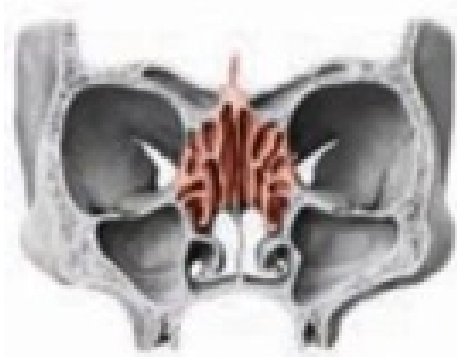


B. BOUNDARIES OF NASAL CAVITY



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

ETHMOID BONE (anterior view)



CRISTA GALLI

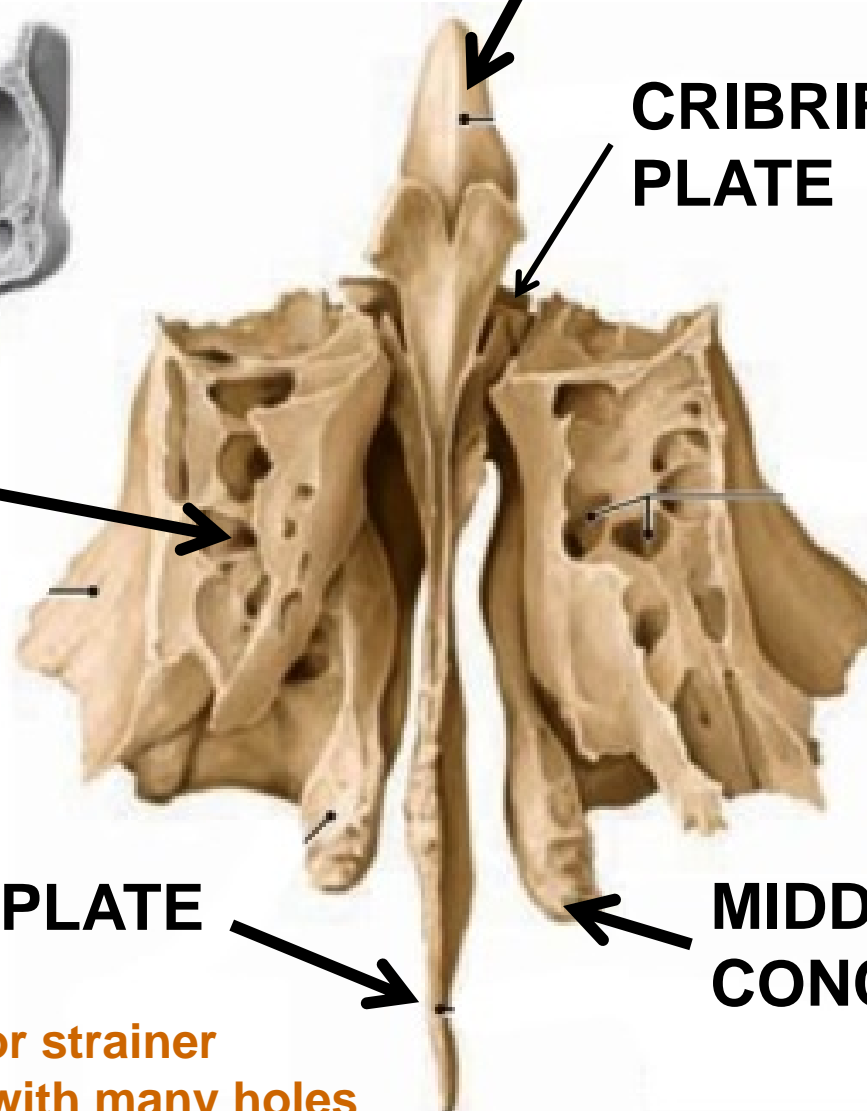
CRIBRIFORM PLATE

ETHMOID AIR CELLS (SINUS)

PERPENDICULAR PLATE

MIDDLE CONCHA

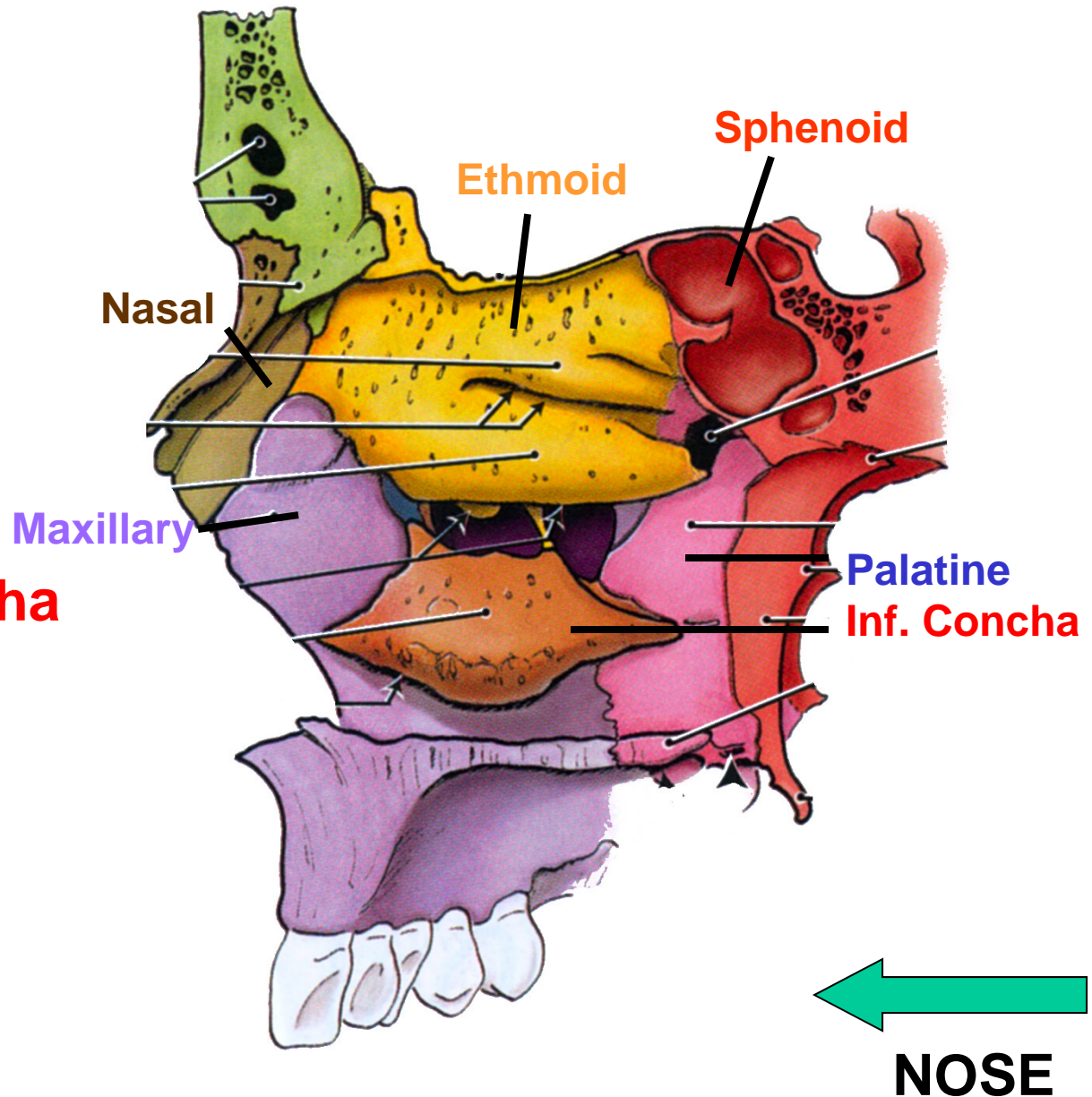
ETHMOID - Gk. for sieve or strainer
CRIBRIFORM - structure with many holes



C. LATERAL WALL OF NASAL CAVITY

Lateral Wall

- 1) Nasal Bone
- 2) Maxillary
- 3) Inferior Concha
- 4) Palatine
- 5) Ethmoid
- 6) Sphenoid



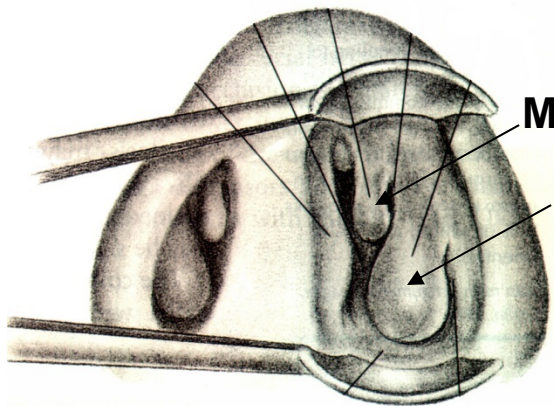
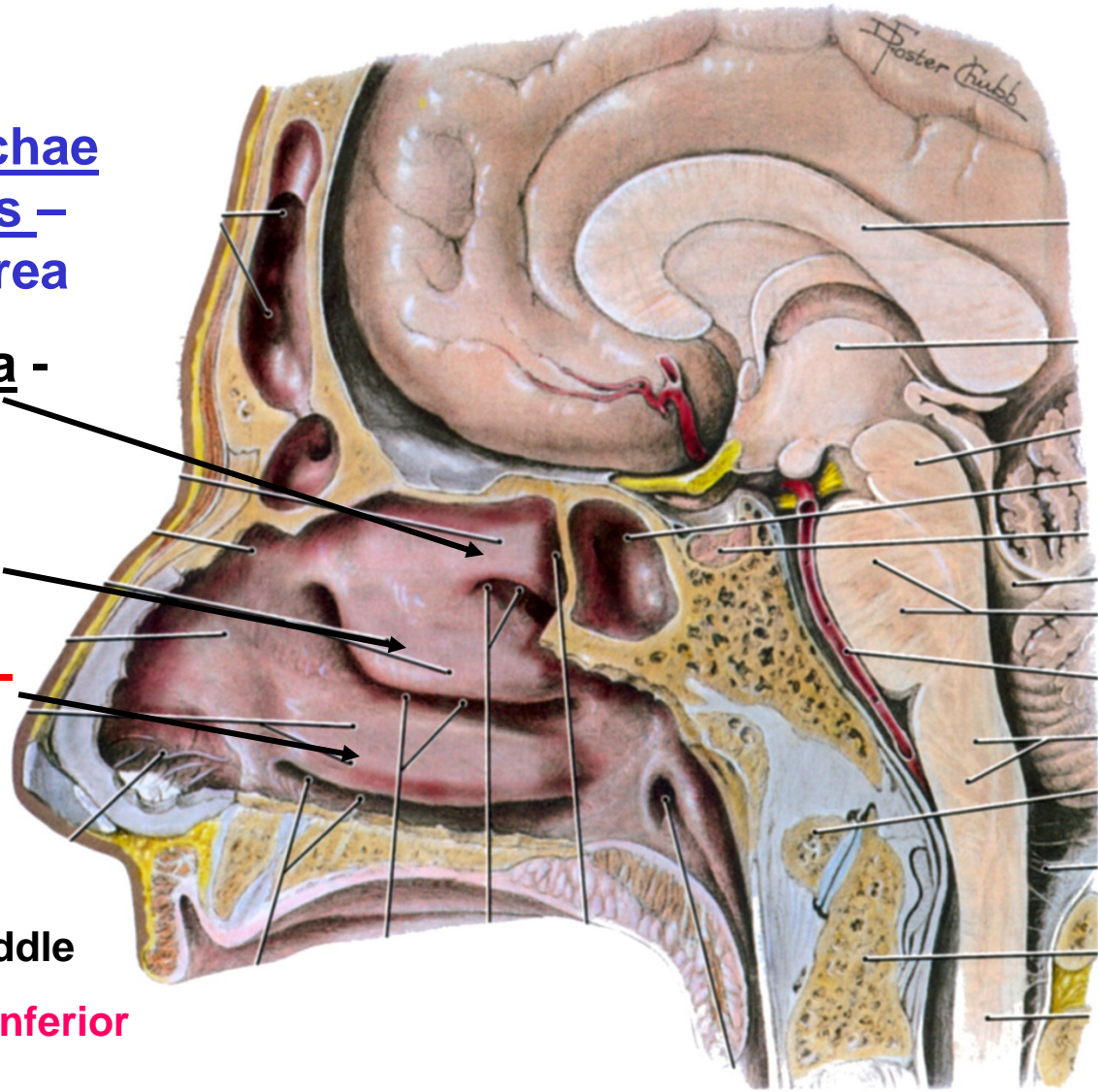
C. LATERAL WALL OF NASAL CAVITY

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

1) Superior Concha - Ethmoid

2) Middle Concha - Ethmoid

3) Inferior Concha - separate bone



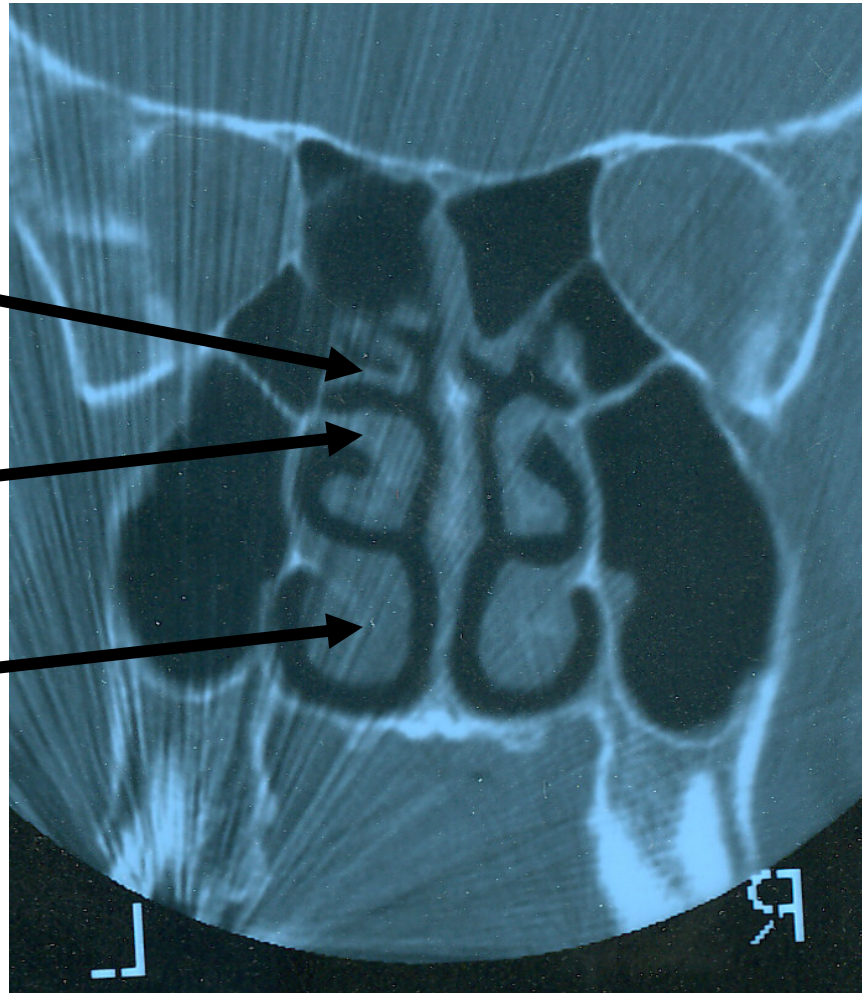
Middle

Inferior

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

CORONAL CT of NASAL CAVITY

- 1) Superior
Concha -
Ethmoid
- 2) Middle
Concha -
Ethmoid
- 3) Inferior
Concha -
separate bone



NASAL CAVITY: SPACES

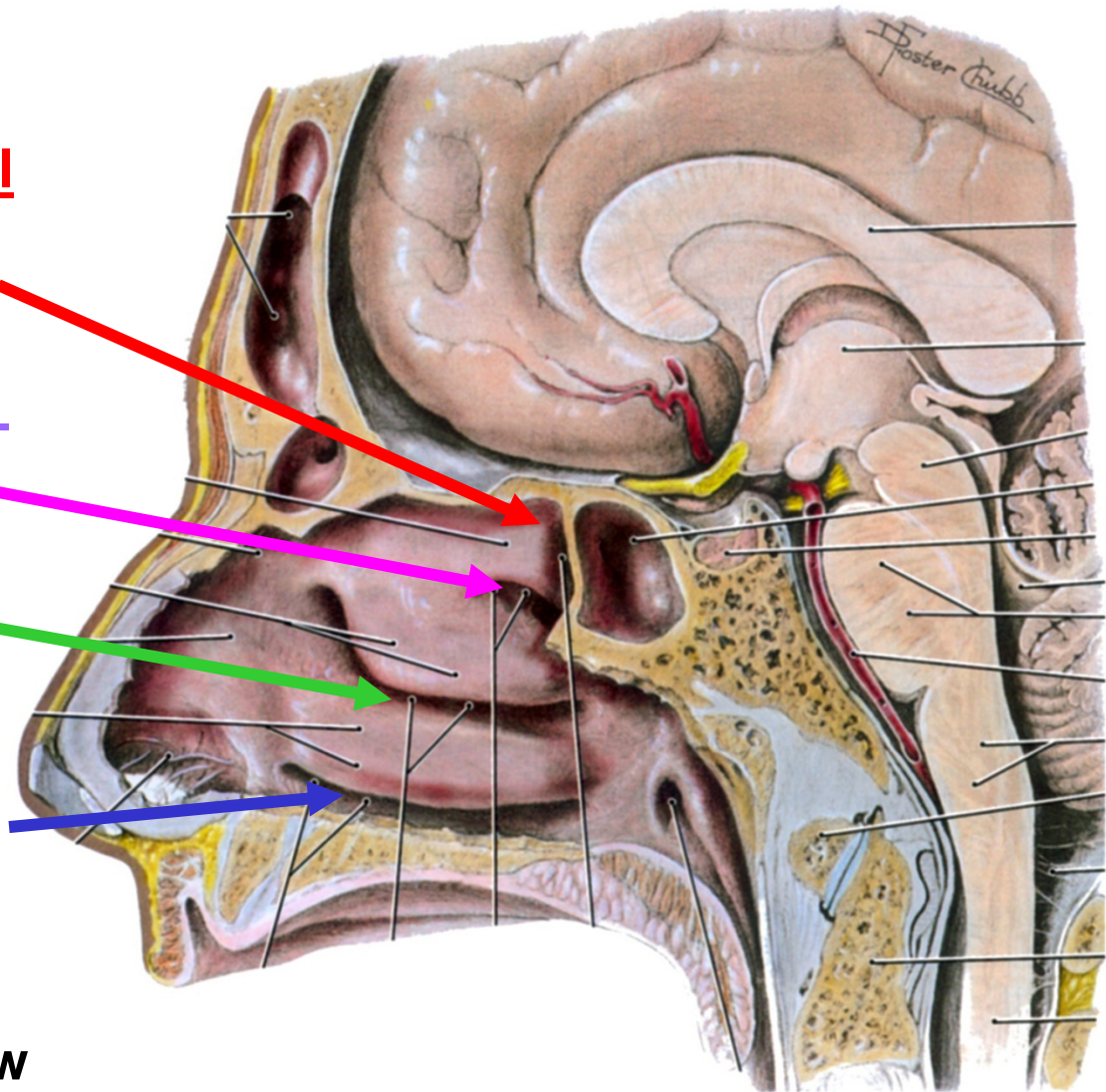
a. Spheno-Ethmoidal Recess - above Sup. Concha

b. Superior Meatus - Below Sup. Concha

c. Middle Meatus - Below Mid. Concha

d. Inferior Meatus - Below Inf. Concha

Meatus = Passage (Latin), located below concha

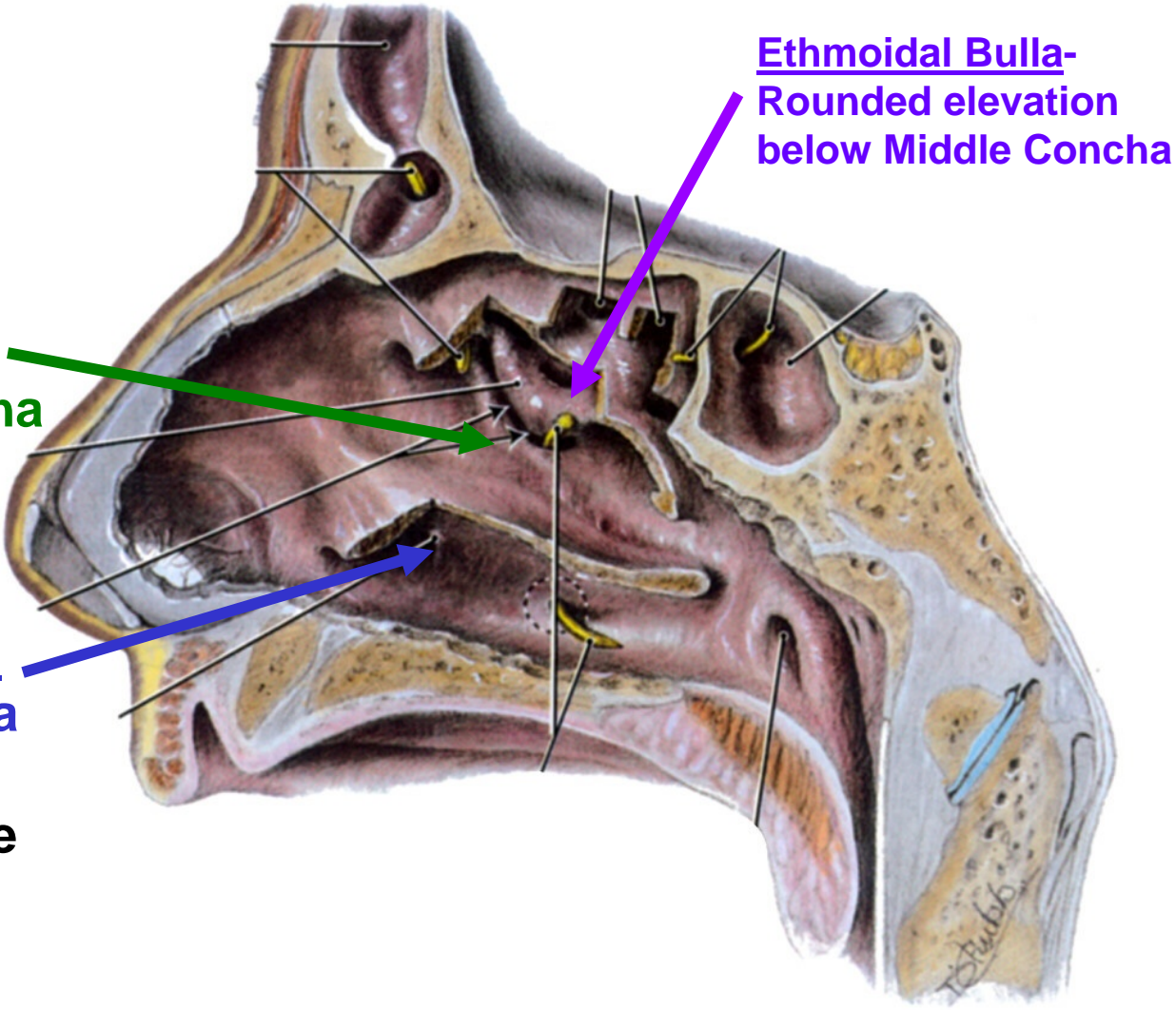


NASAL CAVITY: REMOVE (REFLECT) CONCHAE IN DISSECTION

3) Middle Meatus
Below Mid. Concha

4) Inferior Meatus
Below Inf. Concha

Meatus = Passage
(Lat.)

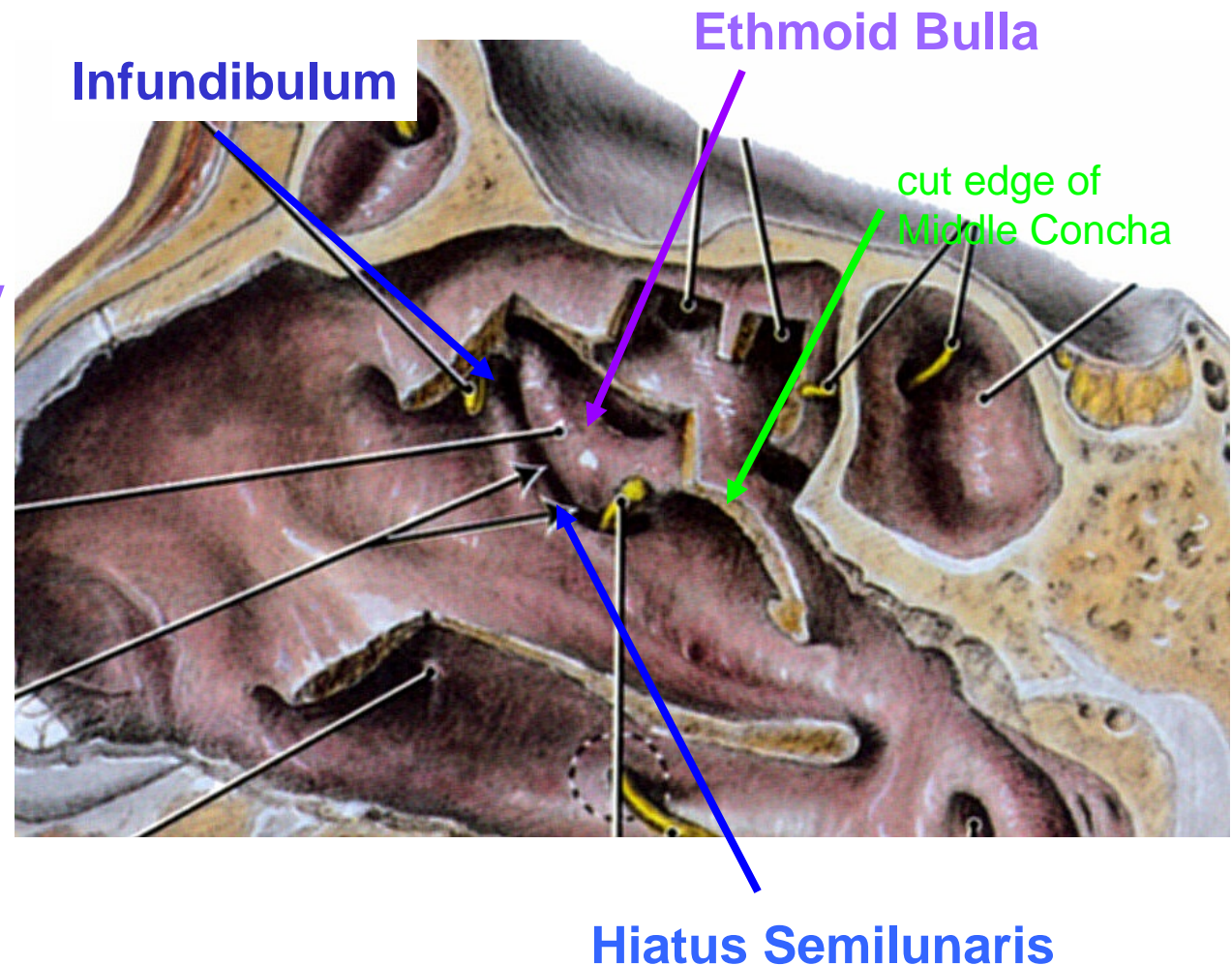


ORIENT/TERMINOLOGY: STRUCTURES IN MIDDLE MEATUS

Terms

1) Ethmoidal Bulla-
Rounded elevation
below Middle
Concha - Formed by
projection of Middle
Ethmoidal air cells

2) Hiatus
Semilunaris = C-
shaped slit below
Bulla
- Infundibulum is
anterior part of
Hiatus



Bulla = L. rounded prominence, blister

NASAL CAVITY: OPENINGS

a. Sphenoethmoidal Recess

- 1) Olfactory Foramina
- 2) Sphenoid air sinus

b. Superior Meatus – Post. Ethmoidal air cells

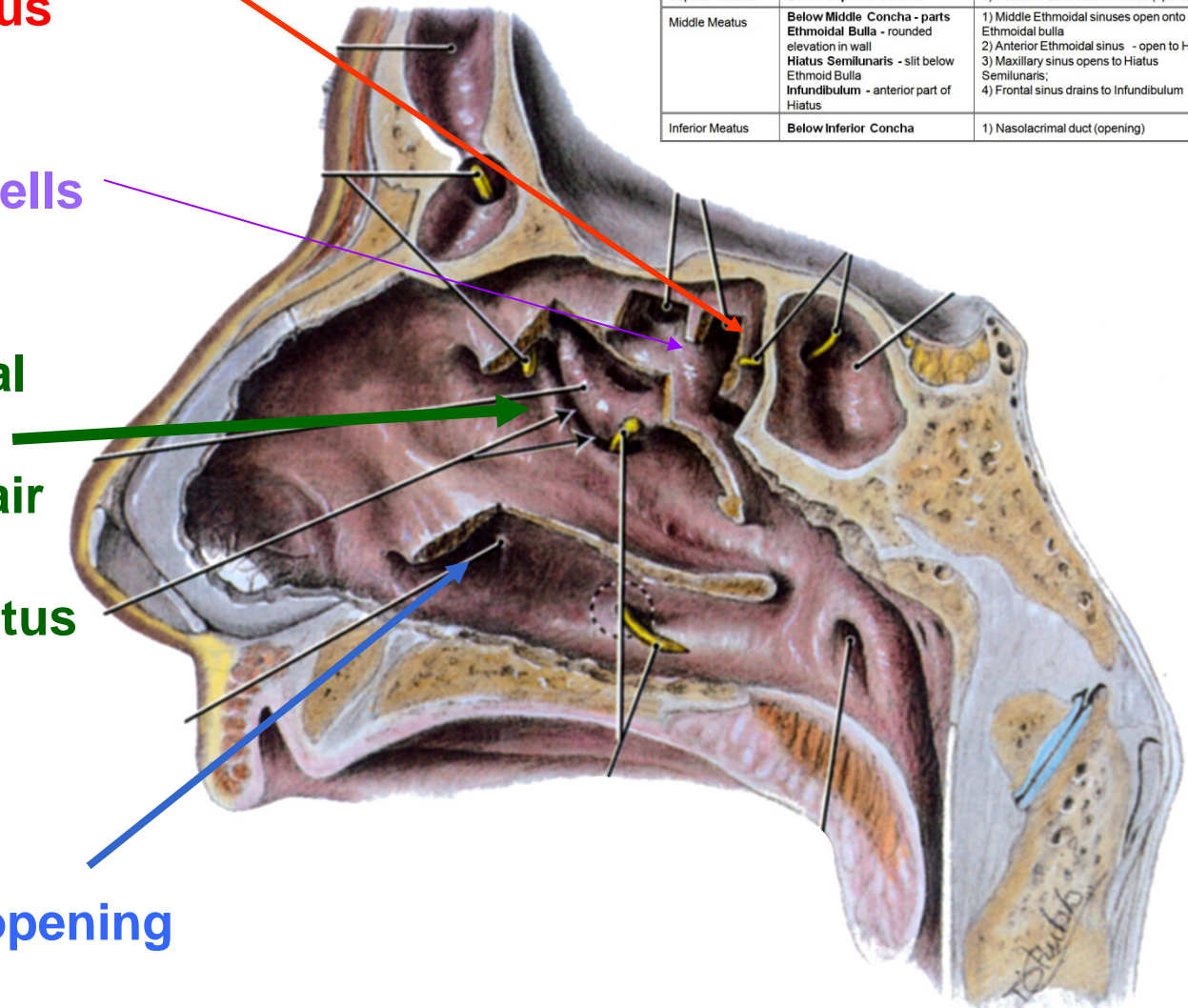
c. Middle Meatus

- 1) Middle ethmoidal air cells - Bulla
- 2) Ant. Ethmoidal air cells - Hiatus Sem.
- 3) Max. Sinus - Hiatus Semilunaris
- 4) Frontal Sinus - Infundibulum.

d. Inferior Meatus – opening of Nasolacrimal duct

SUMMARY CHART IN HANDOUT

Space	Location	Openings/Sinuses
Sphenoethmoidal Recess	Above Superior Concha	1) Olfactory foramina of cribriform plate and 2) Sphenoidal air sinus (opening)
Superior Meatus	Below Superior Concha	1) Posterior Ethmoidal Air sinus (opening)
Middle Meatus	Below Middle Concha - parts Ethmoidal Bulla - rounded elevation in wall Hiatus Semilunaris - slit below Ethmoid Bulla Infundibulum - anterior part of Hiatus	1) Middle Ethmoidal sinuses open onto Ethmoidal bulla 2) Anterior Ethmoidal sinus - open to Hiatus 3) Maxillary sinus opens to Hiatus Semilunaris; 4) Frontal sinus drains to Infundibulum
Inferior Meatus	Below Inferior Concha	1) Nasolacrimal duct (opening)



C. AND D. NERVES of NASAL CAVITY

Nerves

1. Olfactory N. - SMELL

Olfactory Area

2. General Sensation -

ALL SOMATIC SENSORY touch, pain, etc.

V1 + V2 *

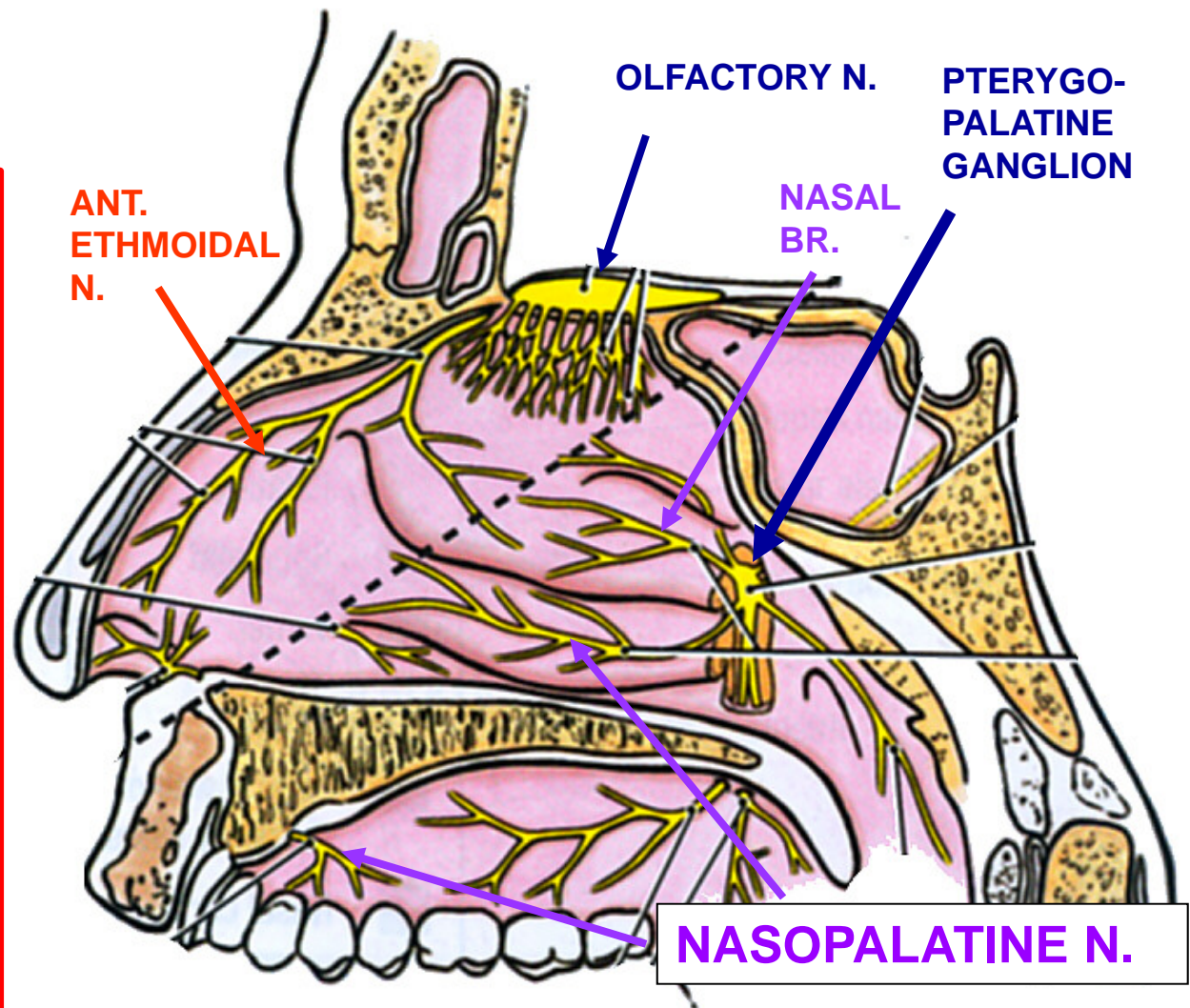
- V1 Anterior Ethmoidal N.

- V2 Nasal Branches

- V2 Nasopalatine N.

3. Mucous Glands of nose -

VISCERAL MOTOR PARASYMP. - VII - Facial N. by Pterygopalatine Ganglion *



OLFACTORY AREA = area of Olfactory nerve endings
RESPIRATORY AREA = rest of nasal cavity

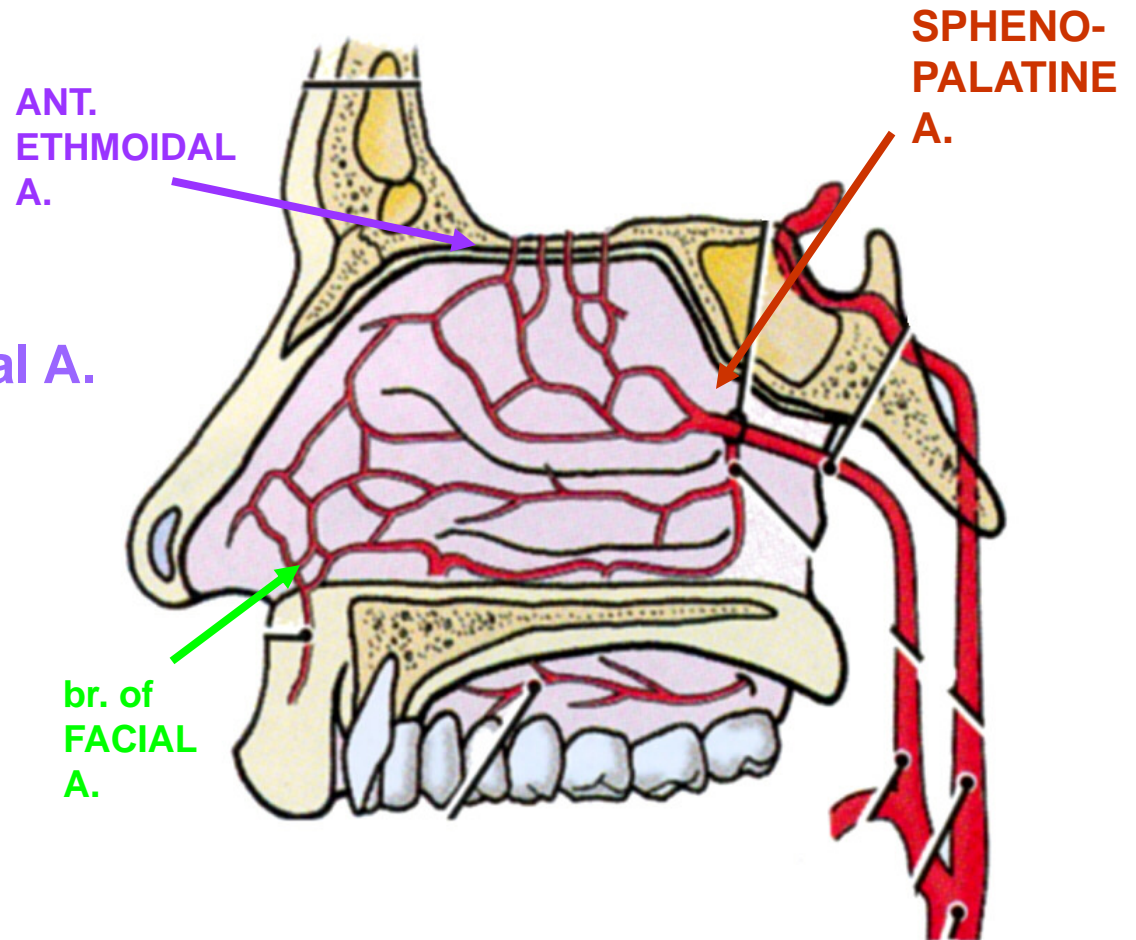
E. and F. ARTERIES/VEINS, LYMPHATICS

1. Arteries

- a. Sphenopalatine Artery
- from Maxillary A.
- b. Ant. and Post Ethmoidal A.
- from Ophthalmic A.
- c. Branches of Facial A.

2. Veins

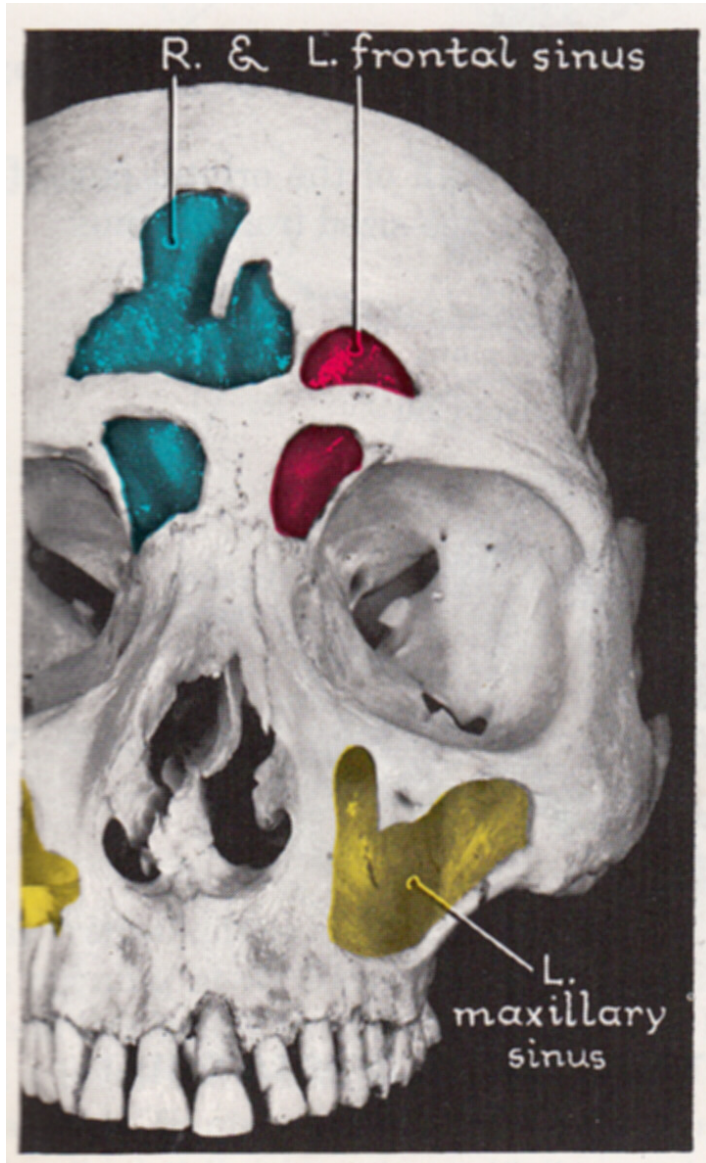
- a. Ethmoidal vein
drain to Ophthalmic v.
- b. Other branches to
Pterygoid Venous Plexus
- c. Facial Vein



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

F. Lymphatics-
Retro-
pharyngeal
Nodes

II. PARANASAL AIR SINUSES



1) Air filled extensions of Nasal Cavity

2) All Paired

- Develop and enlarge after birth

- Lined by mucous membrane

- Serve to lighten bones

3) A mistake of evolution?

- If filled bones with spongy (cancellous) bone, would not get infected

PARANASAL AIR SINUSES

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

All usually paired

NOSE

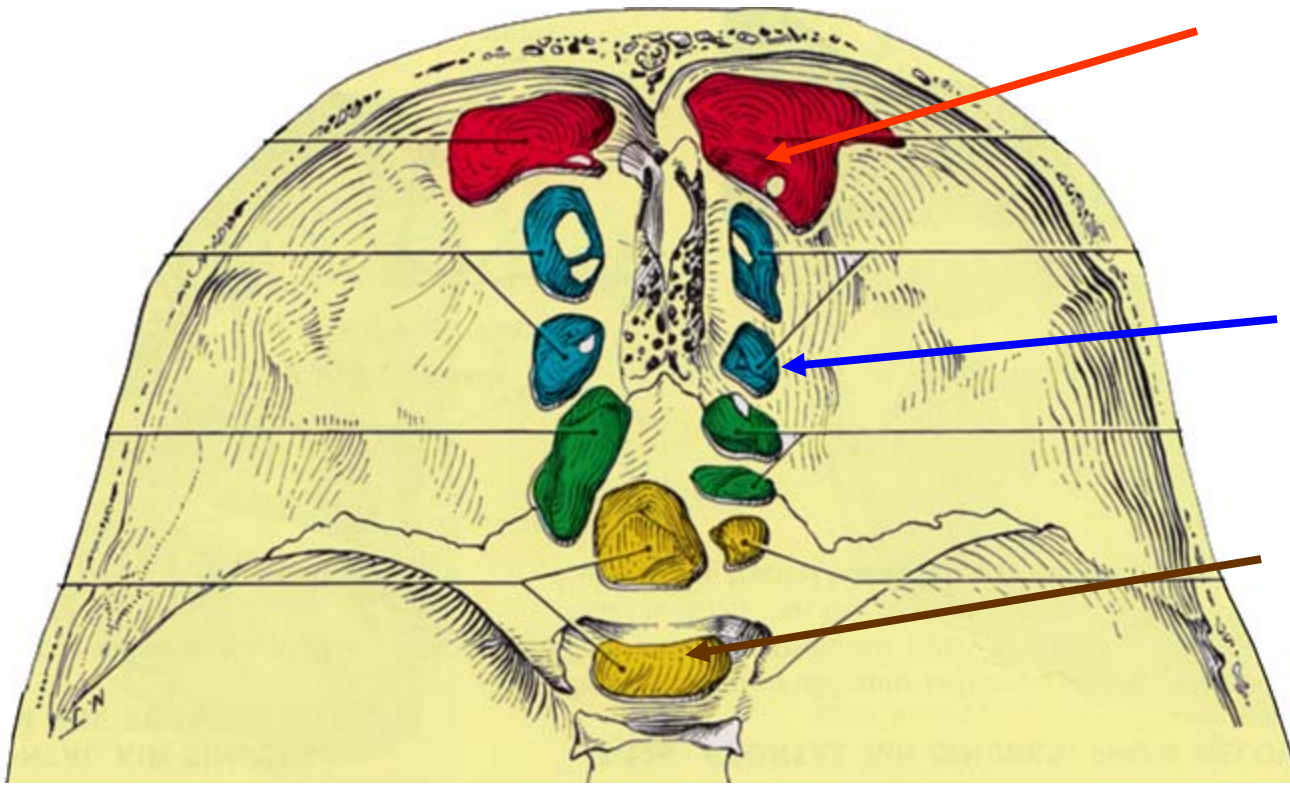
A. Frontal - separate
by septum, variable
size

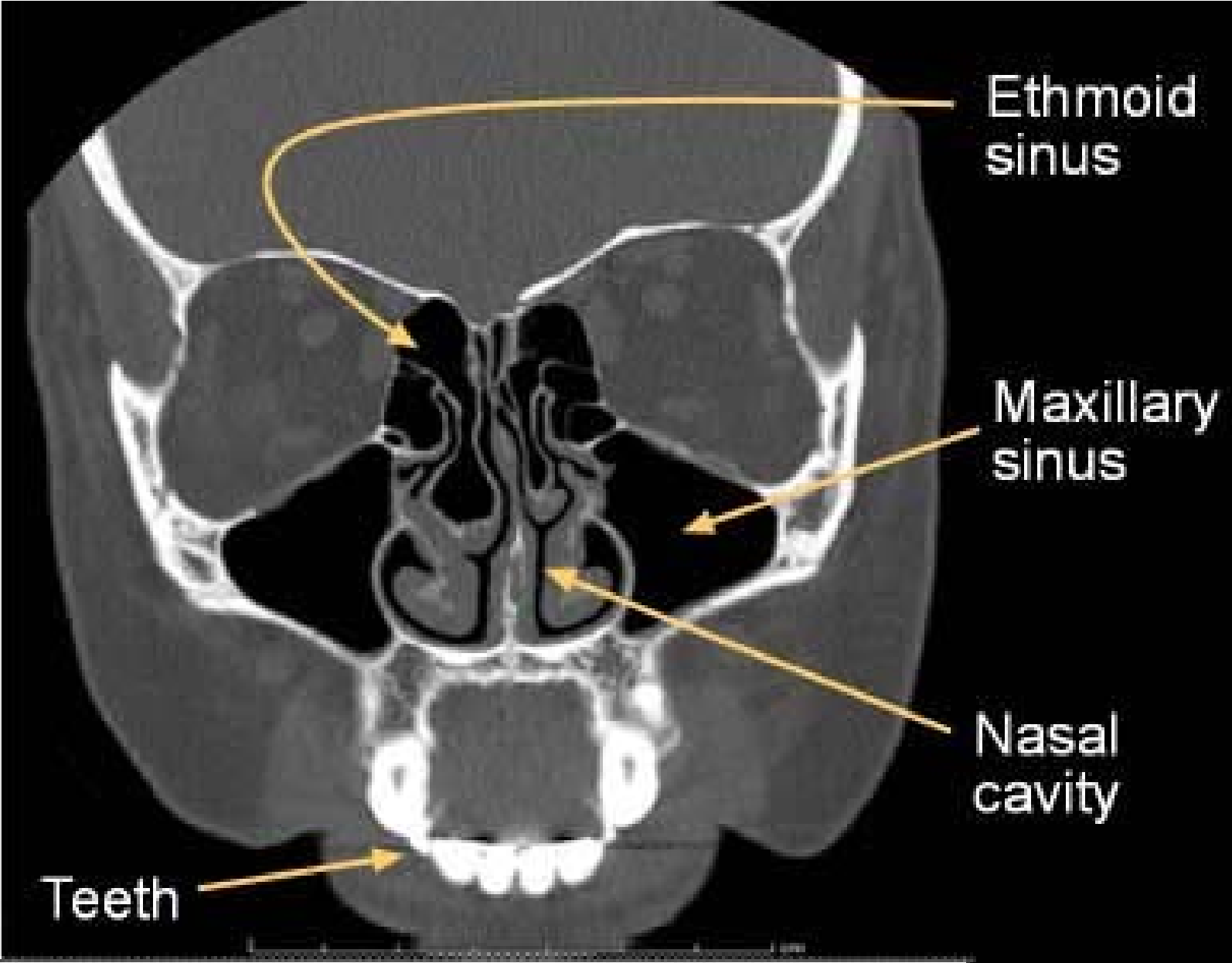
C. Ethmoid- also
called air cells (Ant.,
Mid., Post.)

B. Sphenoid - in
body of Sphenoid
bone

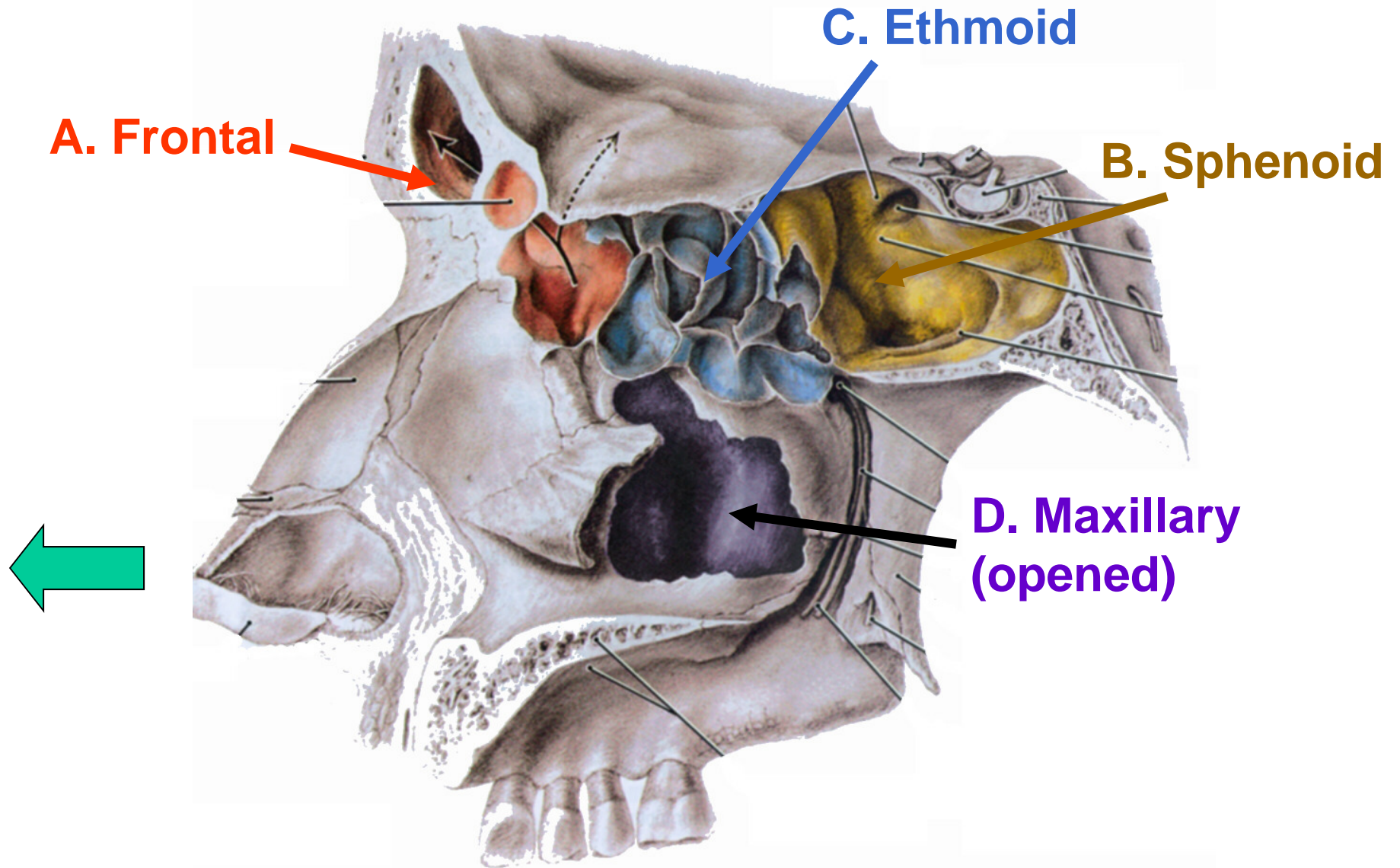


Ethmoid - Blocked Sinus Infection Can Spread to Orbit

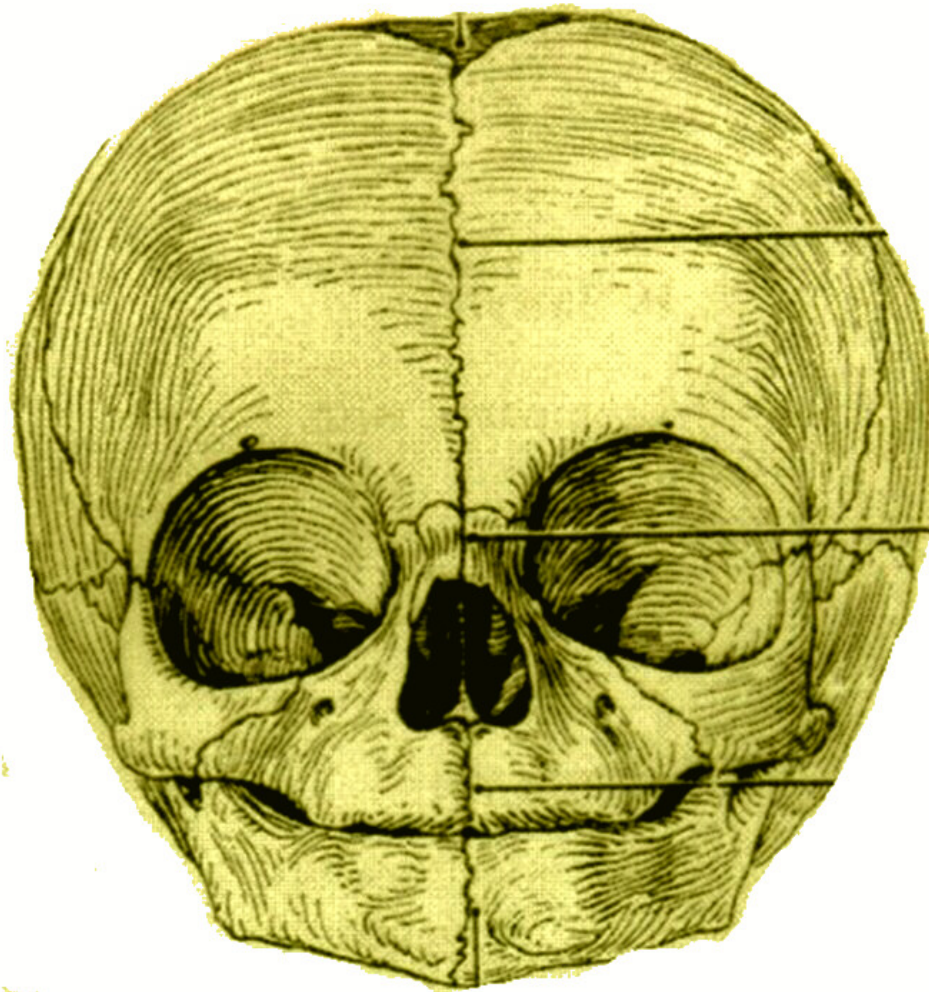




PARANASAL AIR SINUSES



PARANASAL AIR SINUSES



No (or small)
Sinuses at
birth = Baby
Face

Maxilla – Small
- No Maxillary
Air
Sinus
- No Teeth
Mouth is under
eyes

Google search - cute baby
1.5 billion results



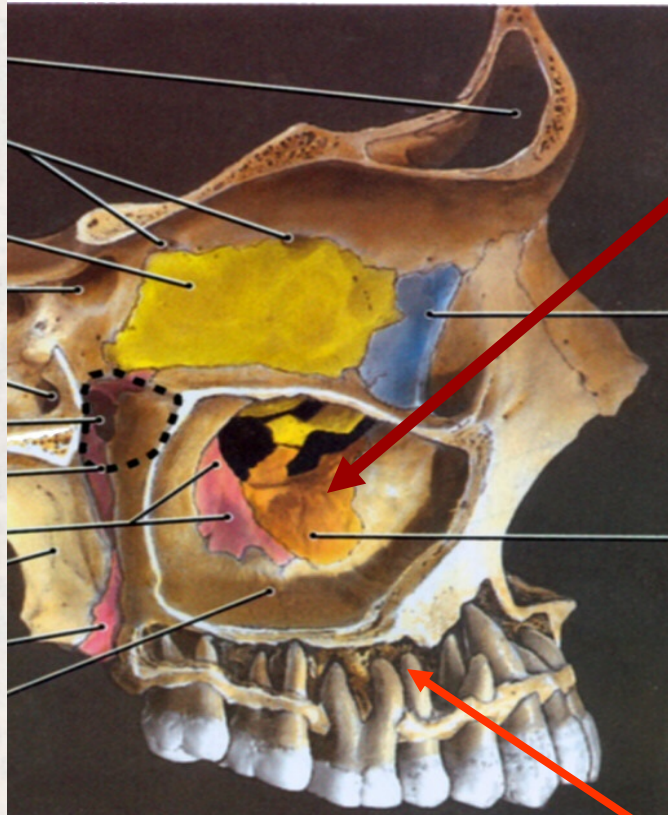
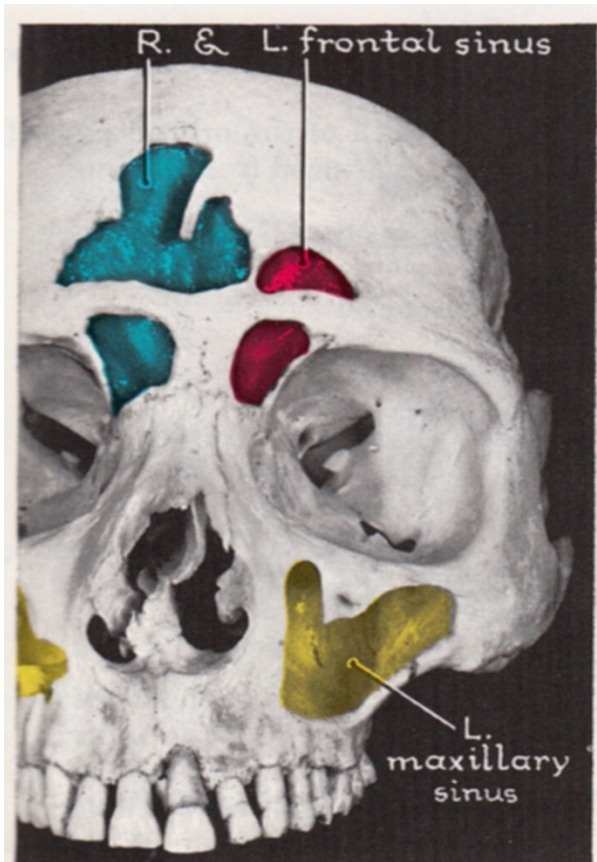
CUTE BABY



3 YEAR OLD BOY

Cute - correlated with undeveloped maxillary sinus
(also teeth not erupted)?

PARANASAL AIR SINUSES



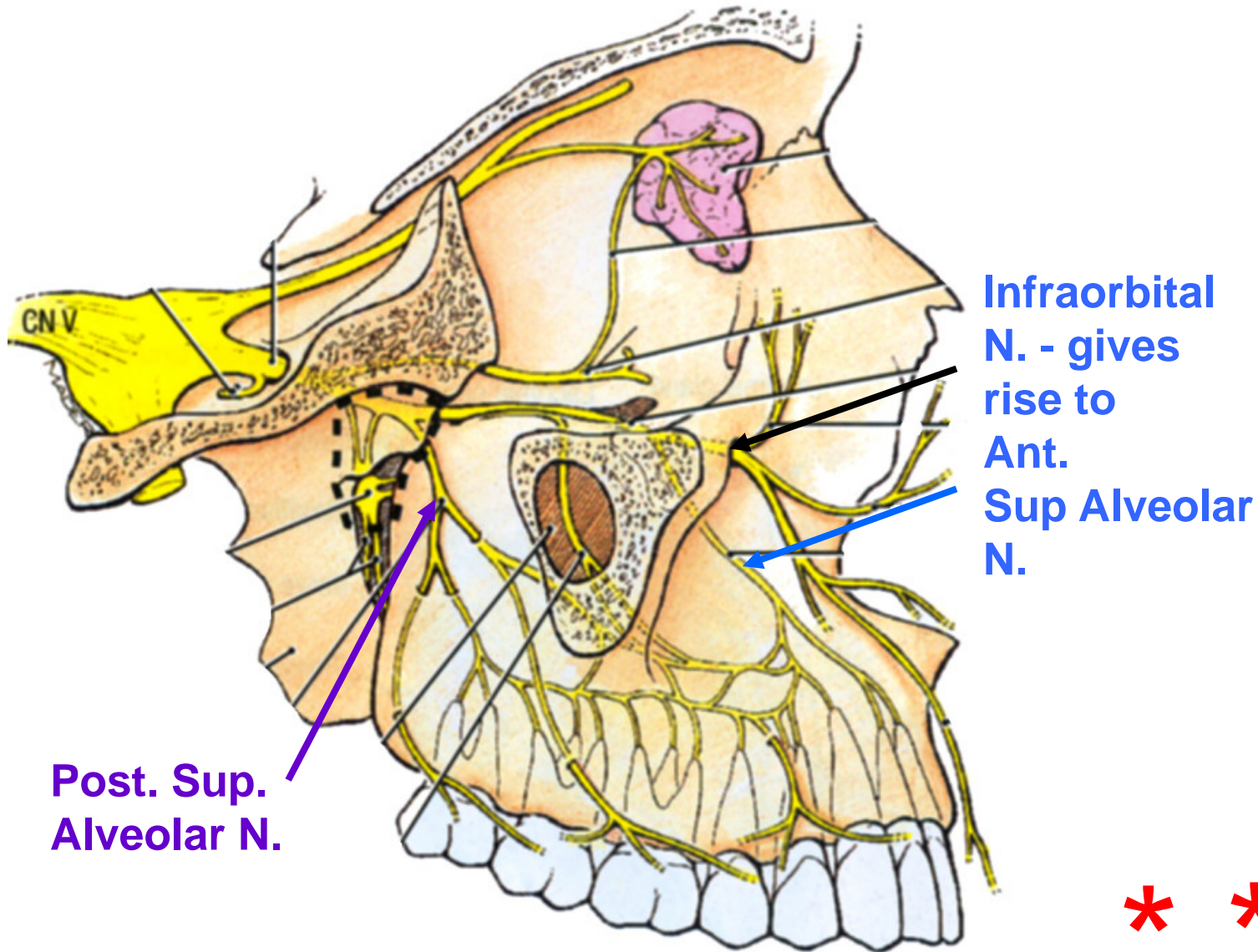
D. Maxillary Sinus

- Largest
- Occupies entire Body of Maxilla
- Roof = Floor of Orbit
- Nasal Cavity is medial to sinus

CLINICAL - Roots of Maxillary Teeth are in Floor of Sinus - can damage by tooth extraction



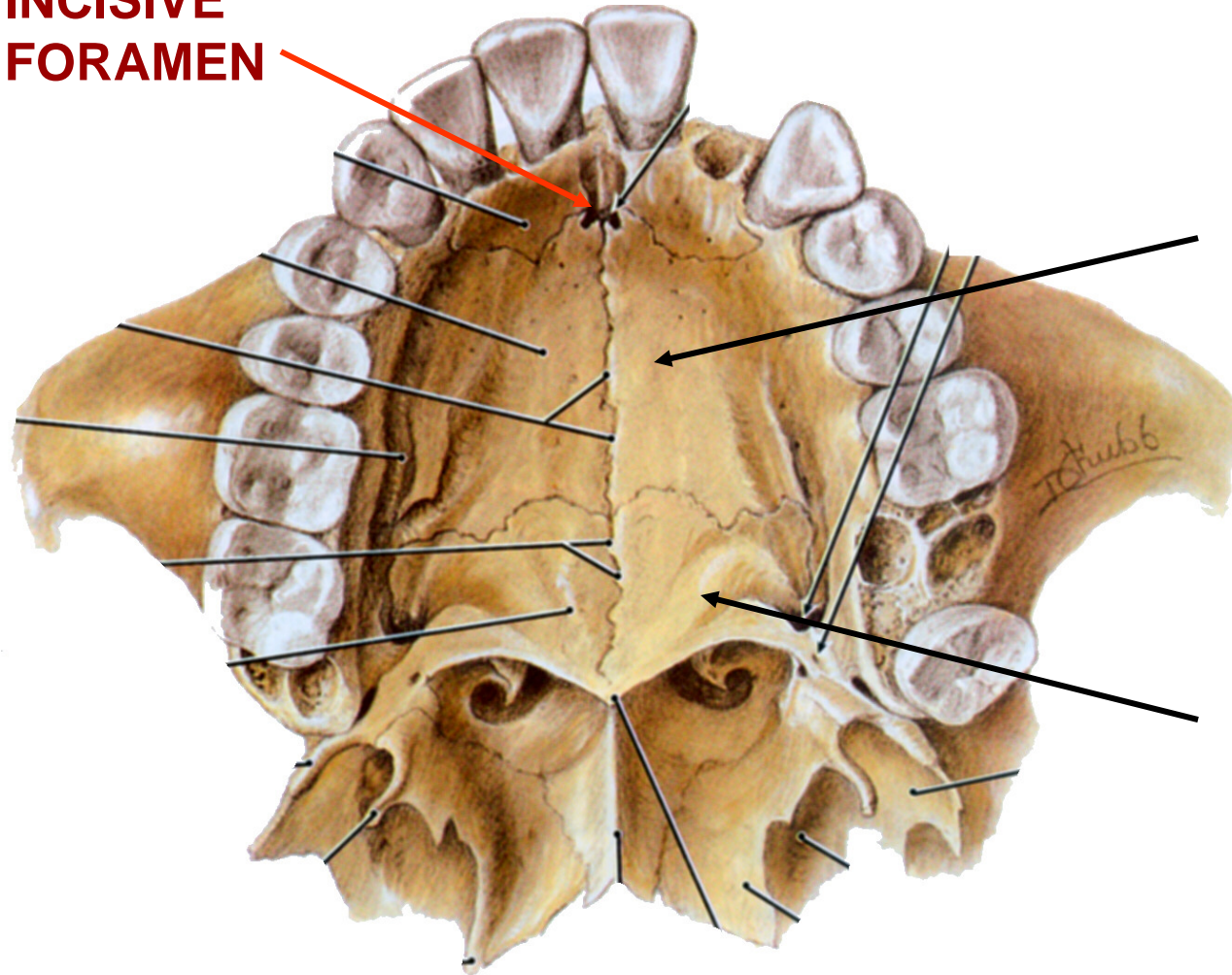
PARANASAL AIR SINUSES: NERVES



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

III. PALATE DEVELOPMENT

INCISIVE FORAMEN



B. Anatomy

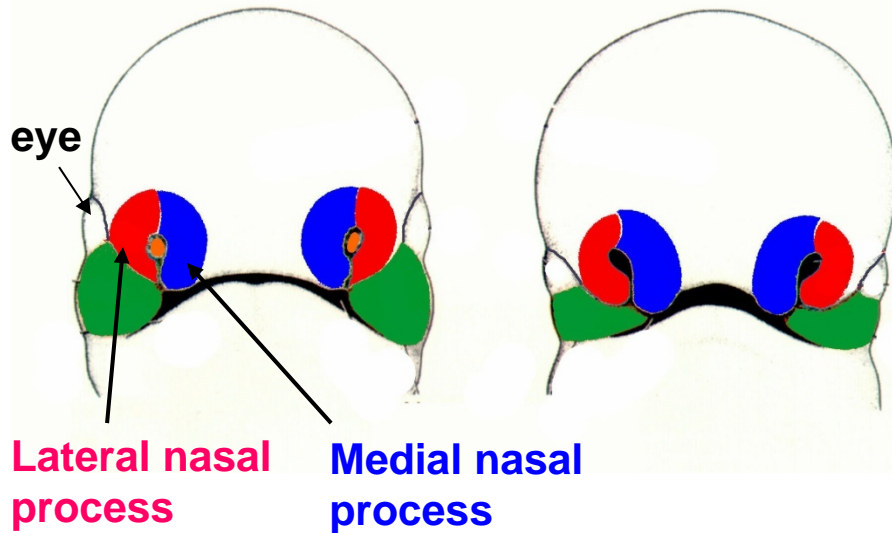
**1. Hard
Palate**

**a. Maxillary
Bones
(palatine
process)**

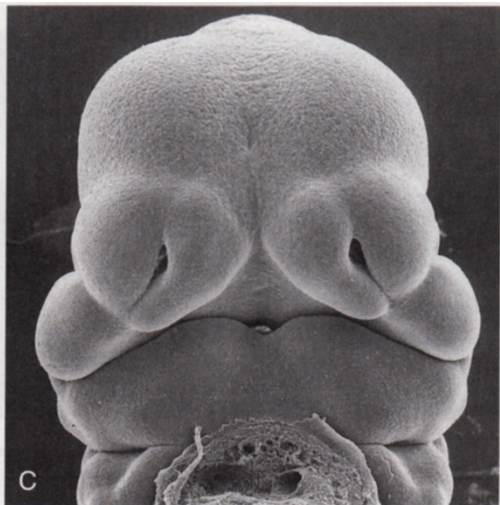
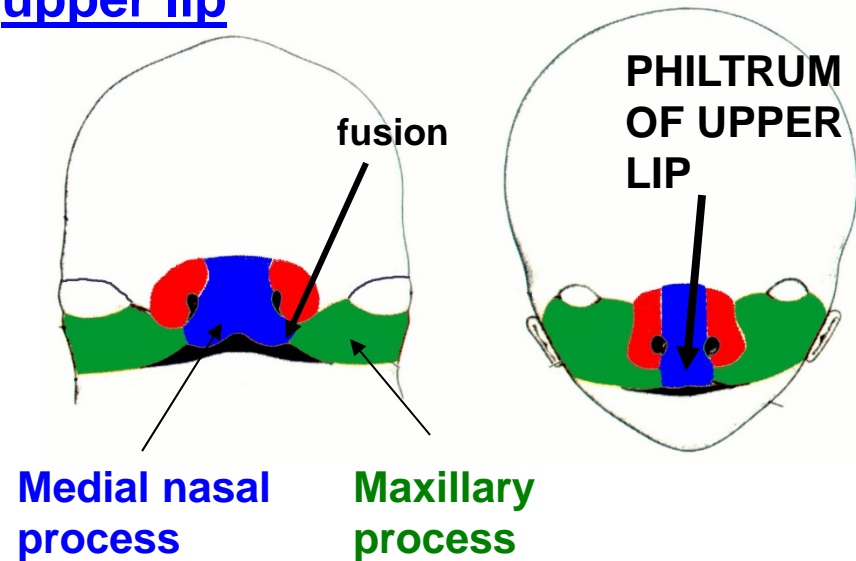
**b. Palatine
bones
(horizontal
plate)**

DEVELOPMENT OF FACE

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

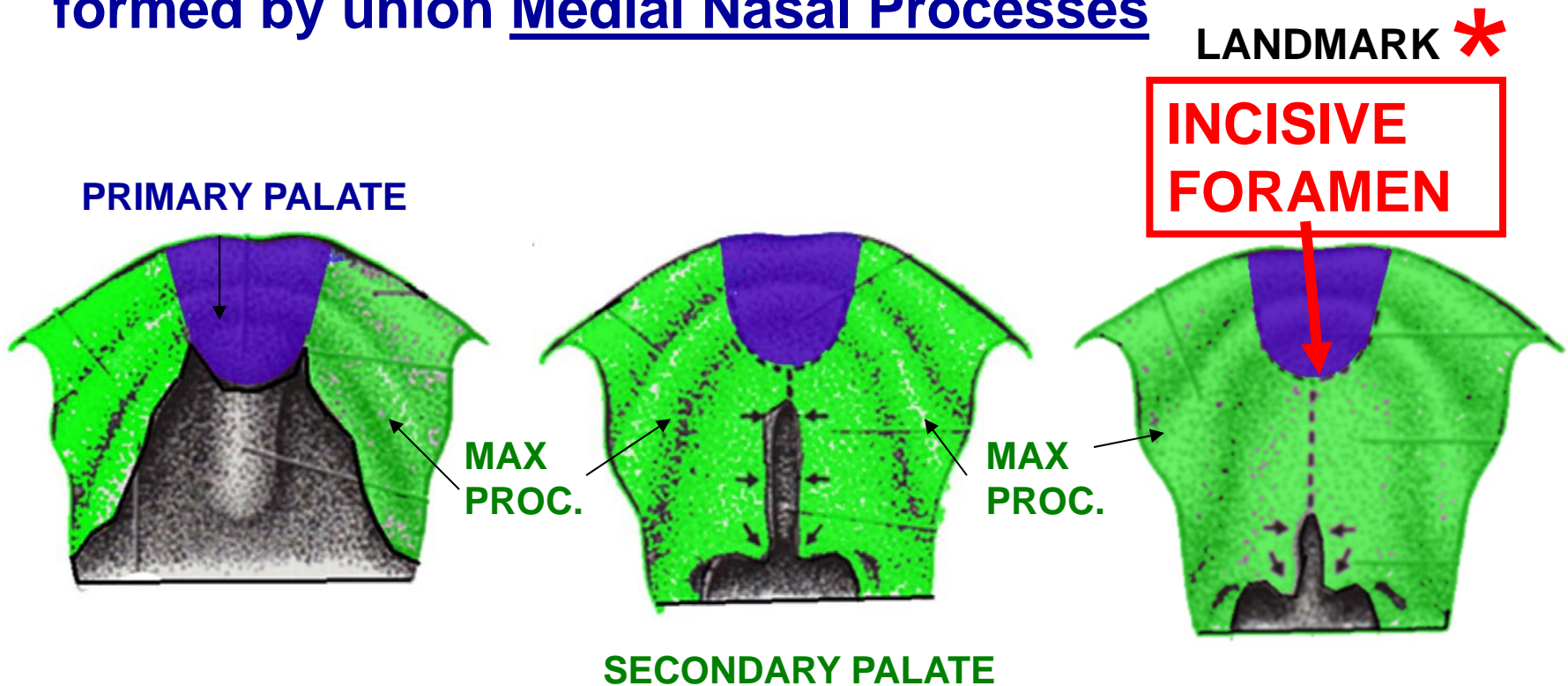


3. Medial nasal process and Maxillary Process – fuse to form upper lip



A. PALATE DEVELOPMENT

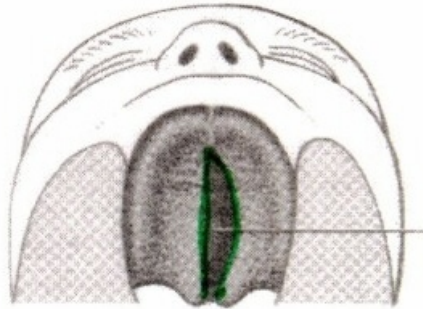
a. Primary Palate – Anterior to Incisive Foramen formed by union Medial Nasal Processes



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

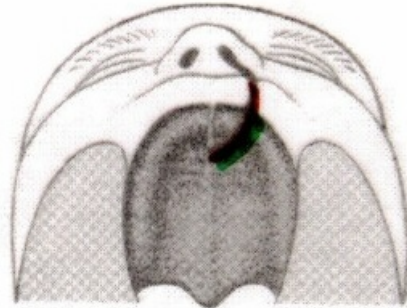
MALFORMATIONS: CLEFT PALATE

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



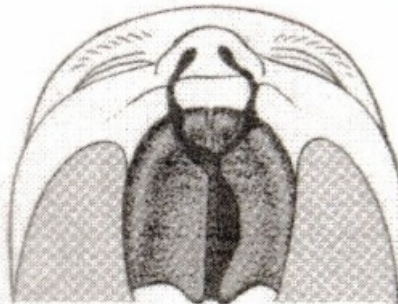
1:2500
births

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



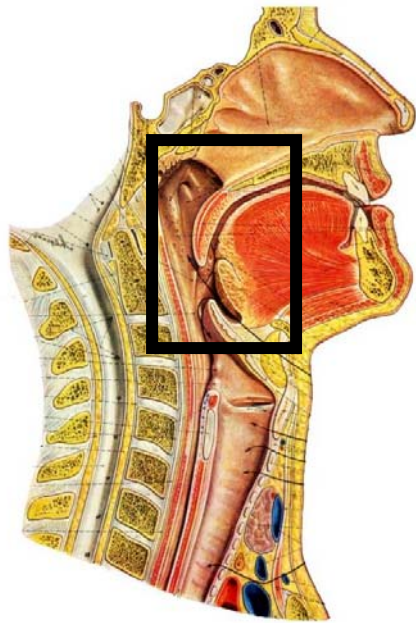
1:1000
Births

Can be unilateral
or bilateral



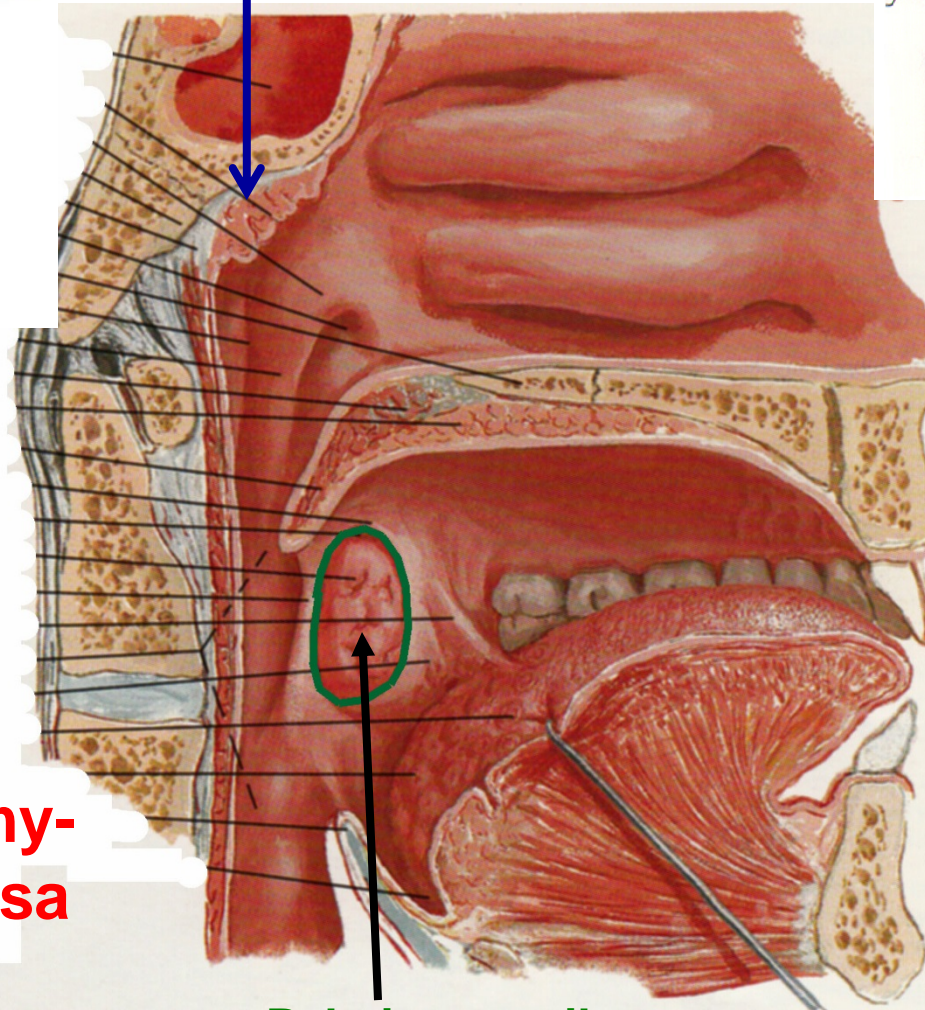
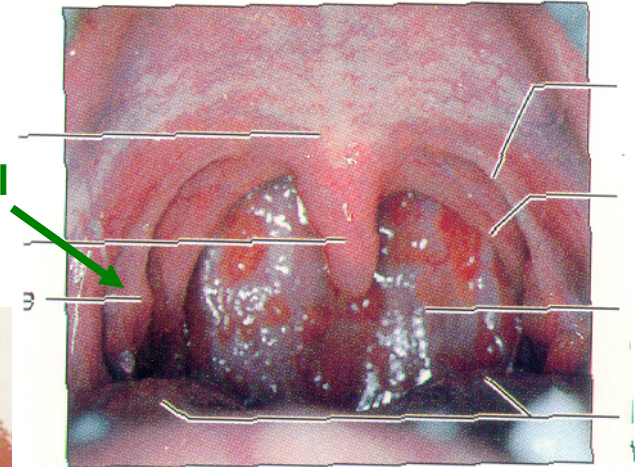
Note: Ant. Cleft Palate is same as Cleft Lip

VI. PALATINE TONSILS



PHARYNGEAL
TONSIL =
ADENOIDS

Palatine Tonsil



Tonsillectomy-
incise mucosa
to remove
Palatine tonsil

Palatine tonsil

Palatine Tonsil -
lymphoid tissue
In oropharynx
between
Palatoglossal
and
Palatopharyngeal
Arches

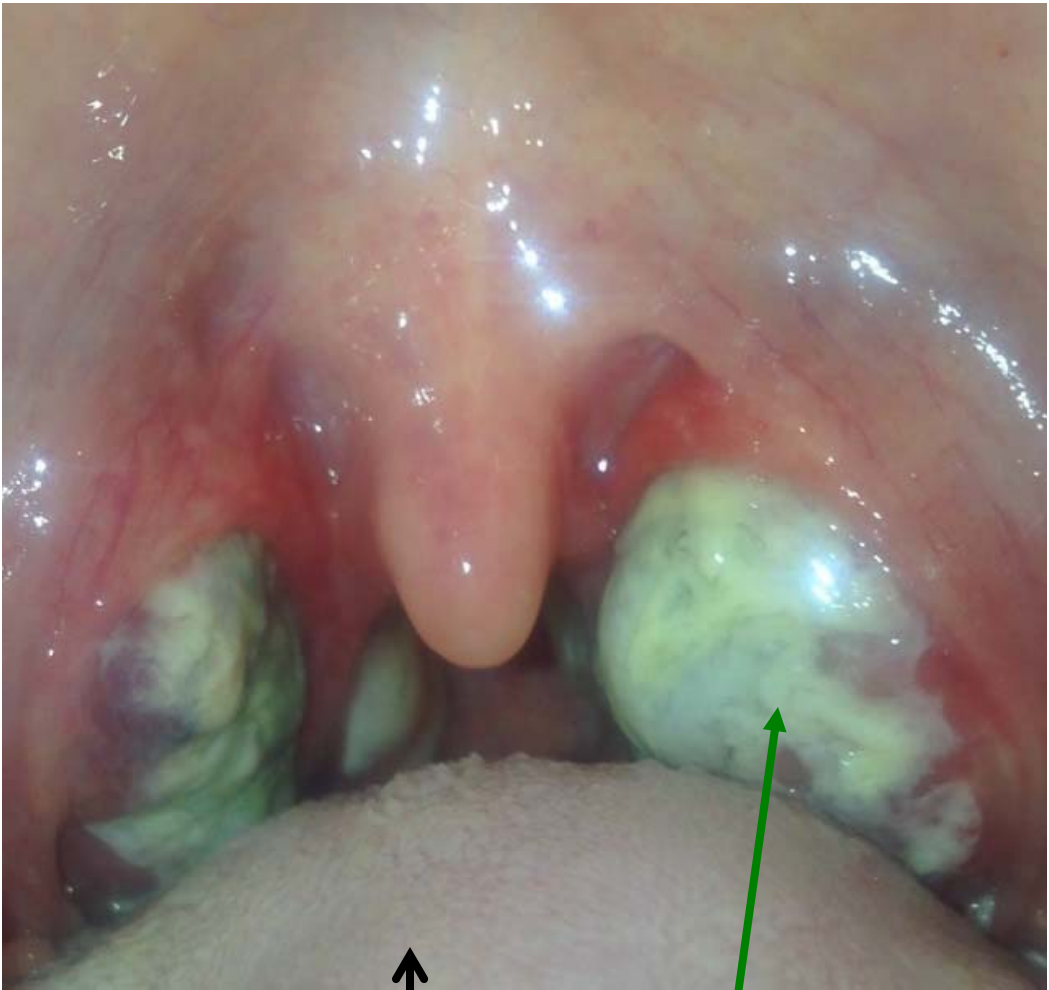
TONSILLITIS = inflammation of (Palatine) tonsils

Cause - bacterial (Streptococcus) or viral infection

UVULA



Palatine Tonsils



hi mag image:
tilt head

Palatine Tonsil

PALATINE TONSILS

A. Arteries-

From Tonsillar branch of Facial Artery - can be large

B. Veins – join Pharyngeal Plexus of Veins – Drain to Facial lingual or Inf. Jugular

C. Lymphatics – Deep cervical nodes

*Jugulo-Digastric- Enlarged

Note:

1) Glossopharyngeal Nerve only covered by Pharyngo-Basilar Fascia can be

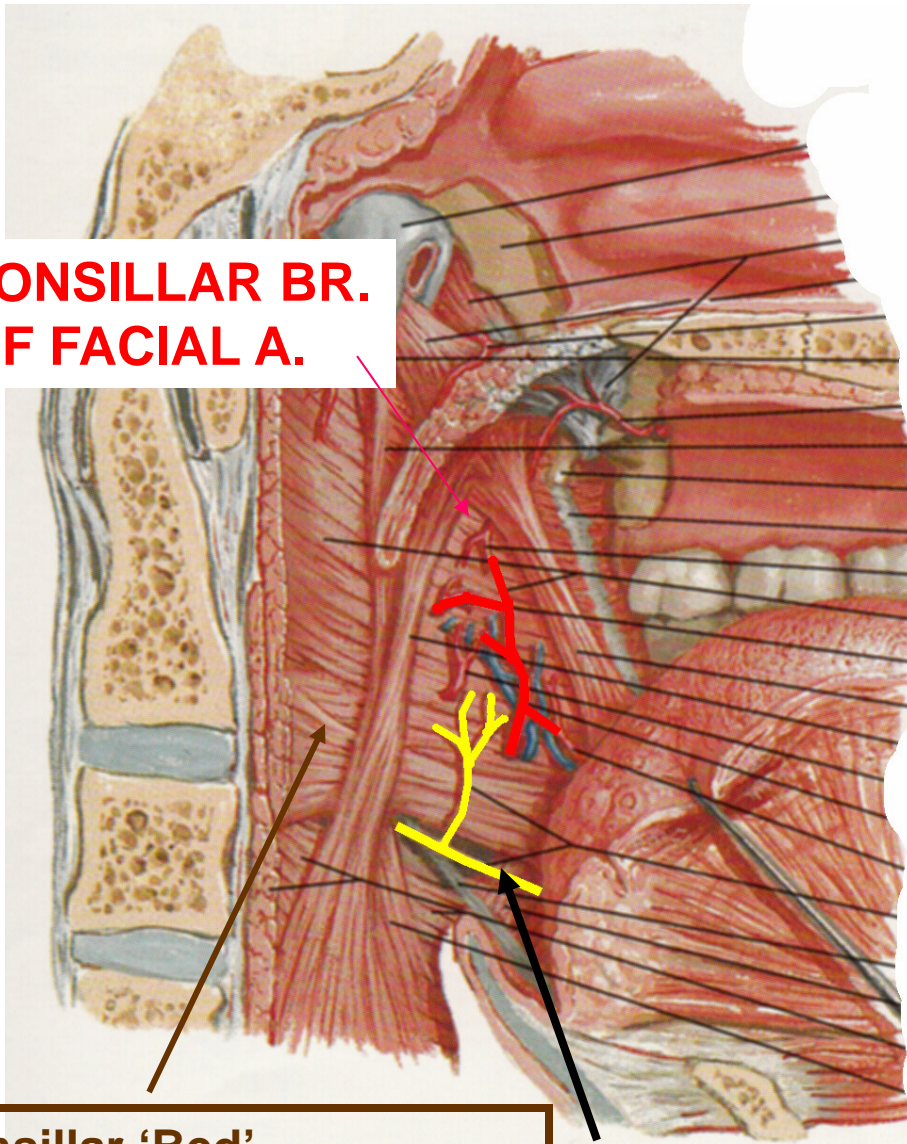
damaged ***

2) Extensive bleeding after tonsillectomy - tonsillar branch of Facial Artery

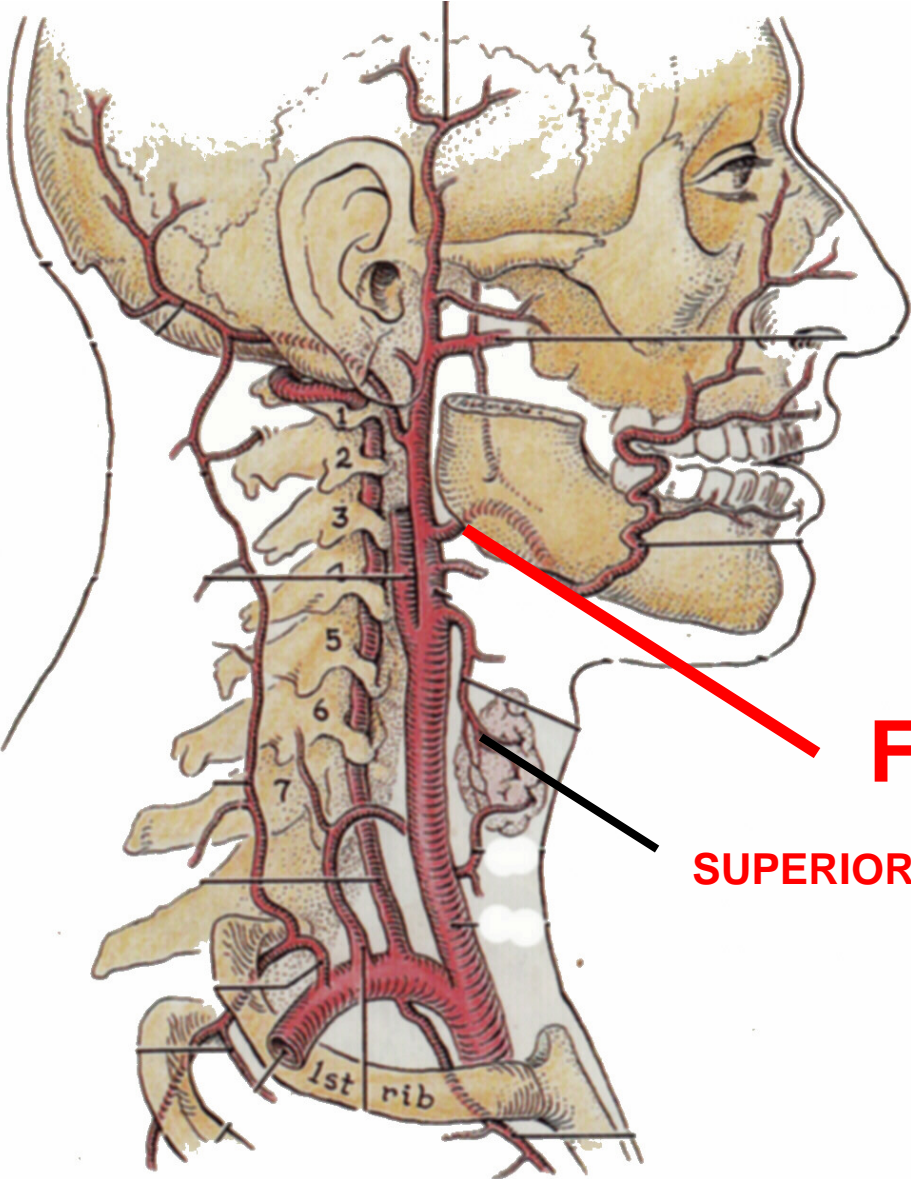
TONSILLAR BR.
OF FACIAL A.

Tonsillar 'Bed' –
Formed by
1) Superior Constrictor of Pharynx
2) Styloglossus

IX



FACIAL ARTERY



NOSE →

FACIAL A.

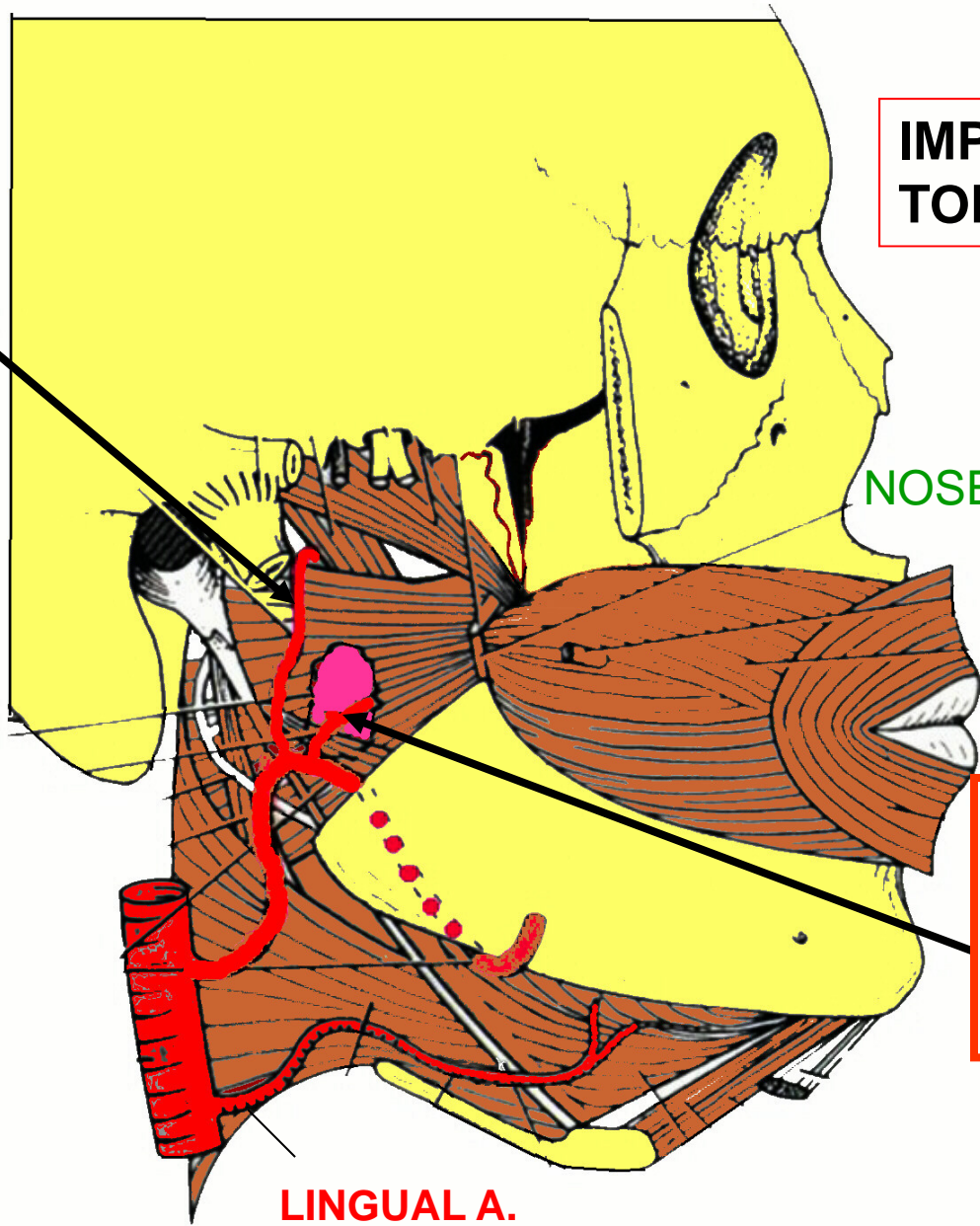
**COURSE =
'WIGGLE' X 3**

SUPERIOR THYROID A.

FACIAL ARTERY- BRANCHES MEDIAL TO MANDIBLE

a) ASCENDING PALATINE ARTERY - PALATE

IMPORTANT IN TONSILLECTOMY



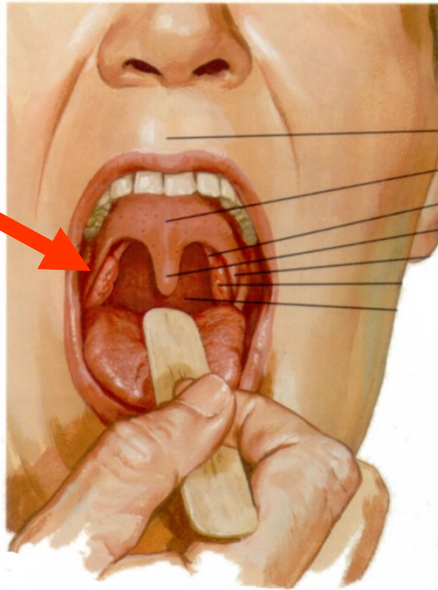
NOSE →

b) TONSILLAR BRANCH - PALATINE TONSIL

LINGUAL A.

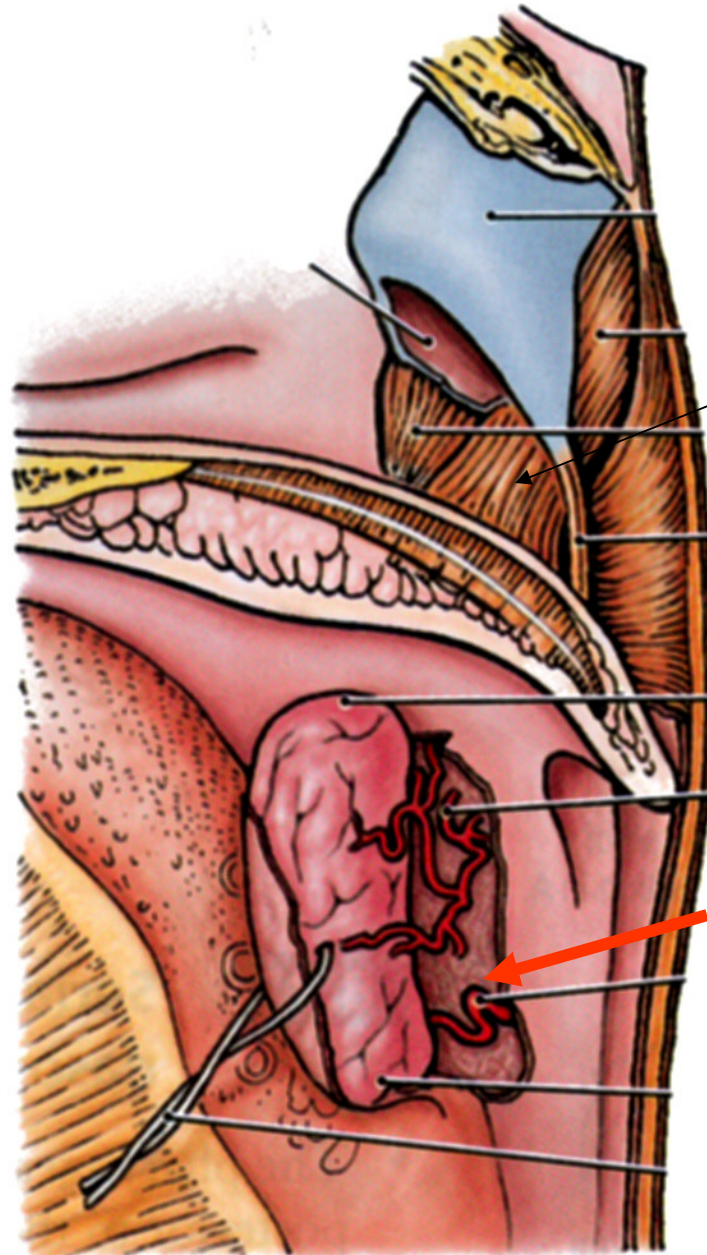
FACIAL ARTERY- BRANCHES MEDIAL TO MANDIBLE

PALATINE
TONSIL



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

note: Board question



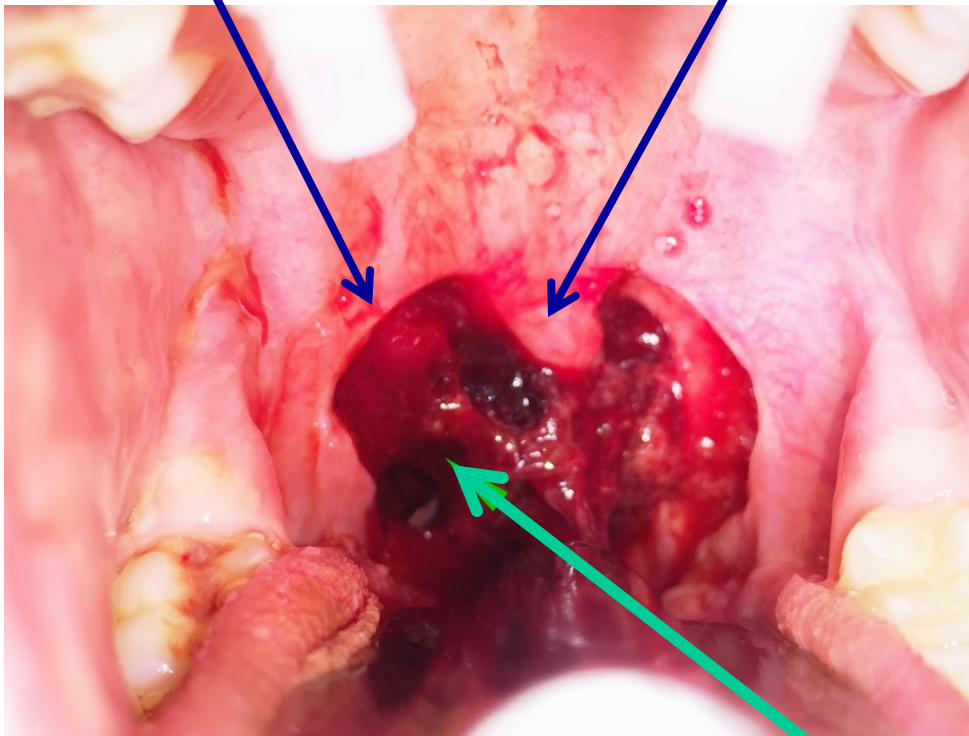
what
muscle?

b) TONSILLAR
BRANCH -
PALATINE
TONSIL

POSTOPERATIVE BLEEDING FOLLOWING TONSILLECTOMY

Palatoglossal arch

Uvula



Blood clot

Palliative Technique: Eat ice cream without spoon



Note: define Palliative - relieving pain without dealing with the cause of the condition.

