

# **DISCUSSION SESSION: GROSS ANATOMY**

## **ONN BLOCK**

**Tuesday Feb 9, 2021**

**Discuss Nasal Cavity**

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

# **NASAL CAVITY**

**Bones and fractures**

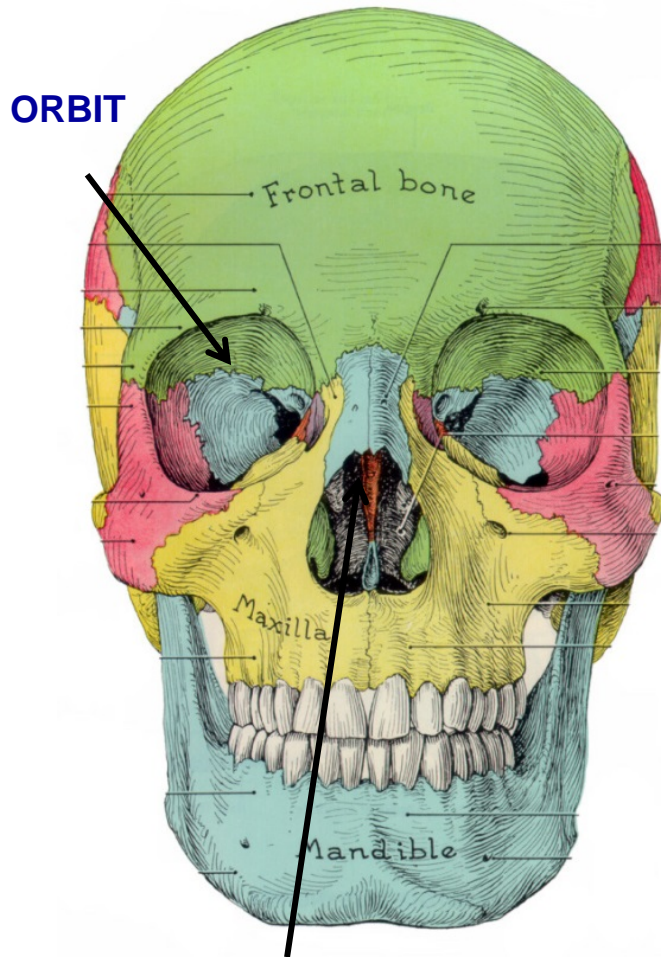
**Identification of sinuses CT projections**

**Nerves in sinuses**

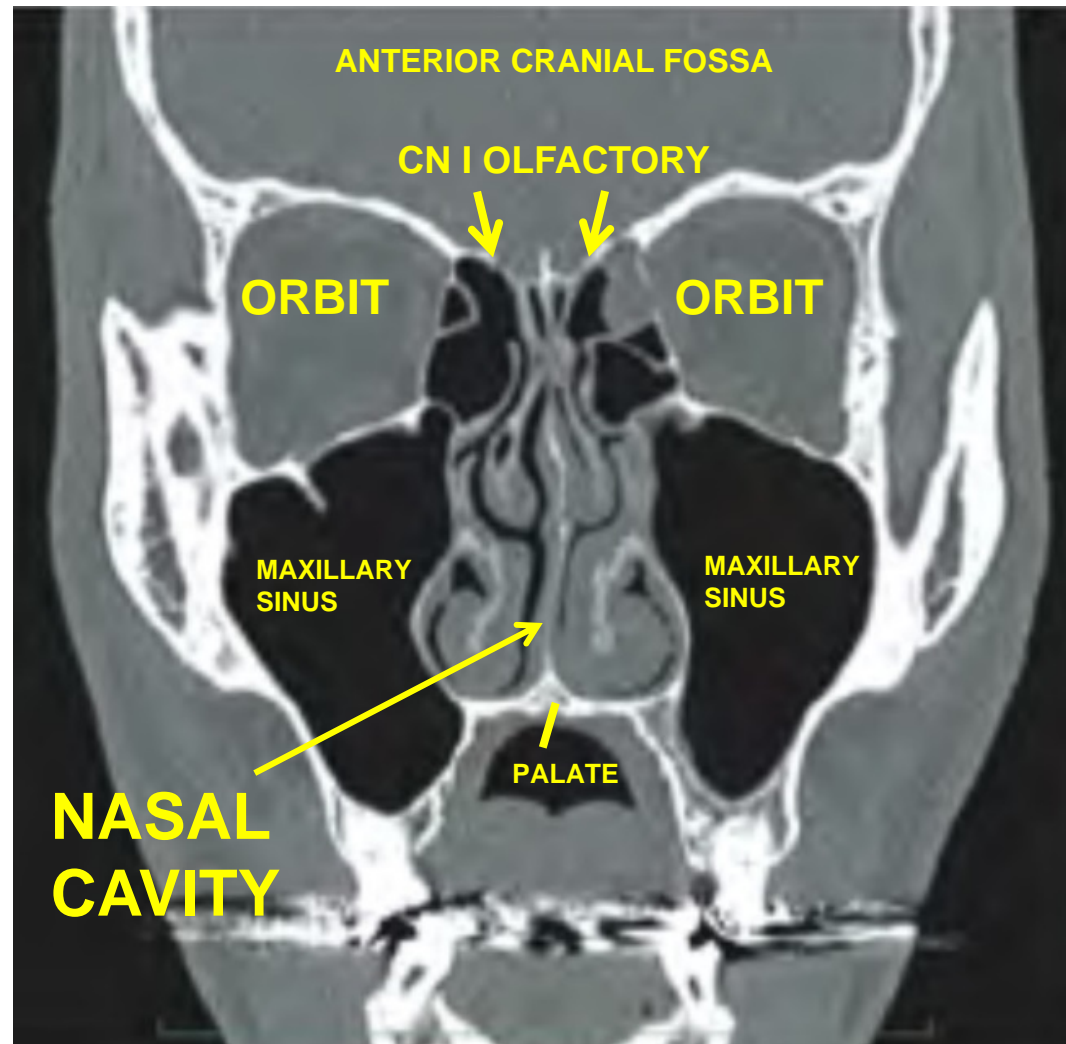
**Innervation/Blood Supply to Nasal Cavity**

**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**

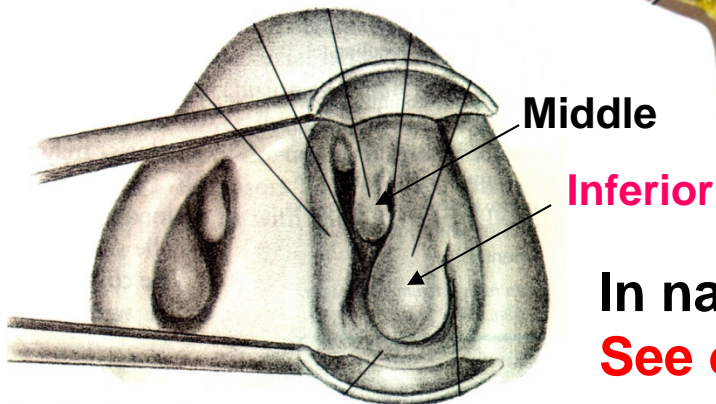
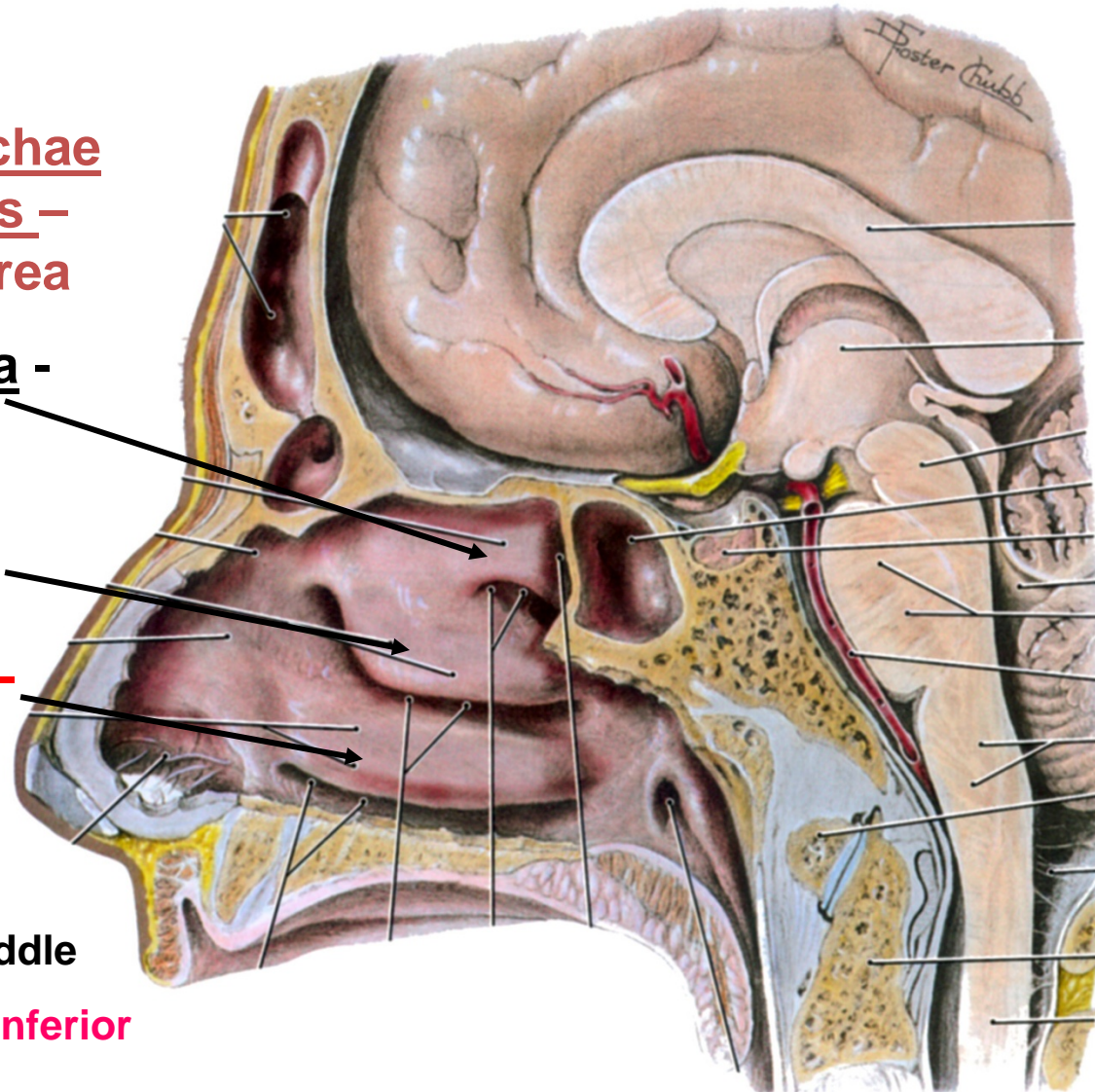
# LATERAL WALL OF NASAL CAVITY

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

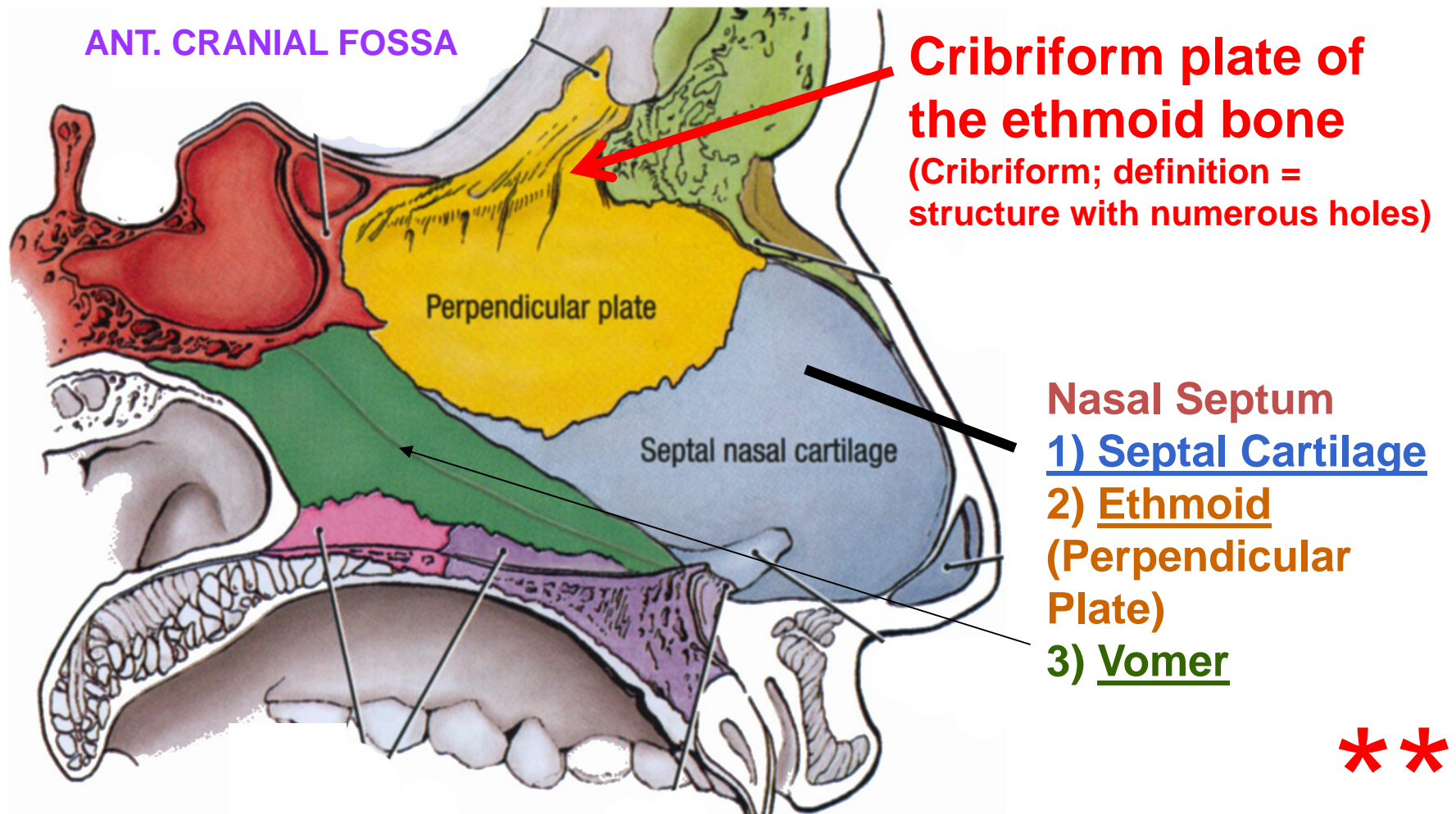


A 19 year old suffers a violent blow to the nose during a fist fight. Over the following week, the person notices that **a clear fluid persists in dripping from the nose** and goes to the local hospital emergency room. The physician orders a CT scan and finds a defect (arrow in image) in the floor of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

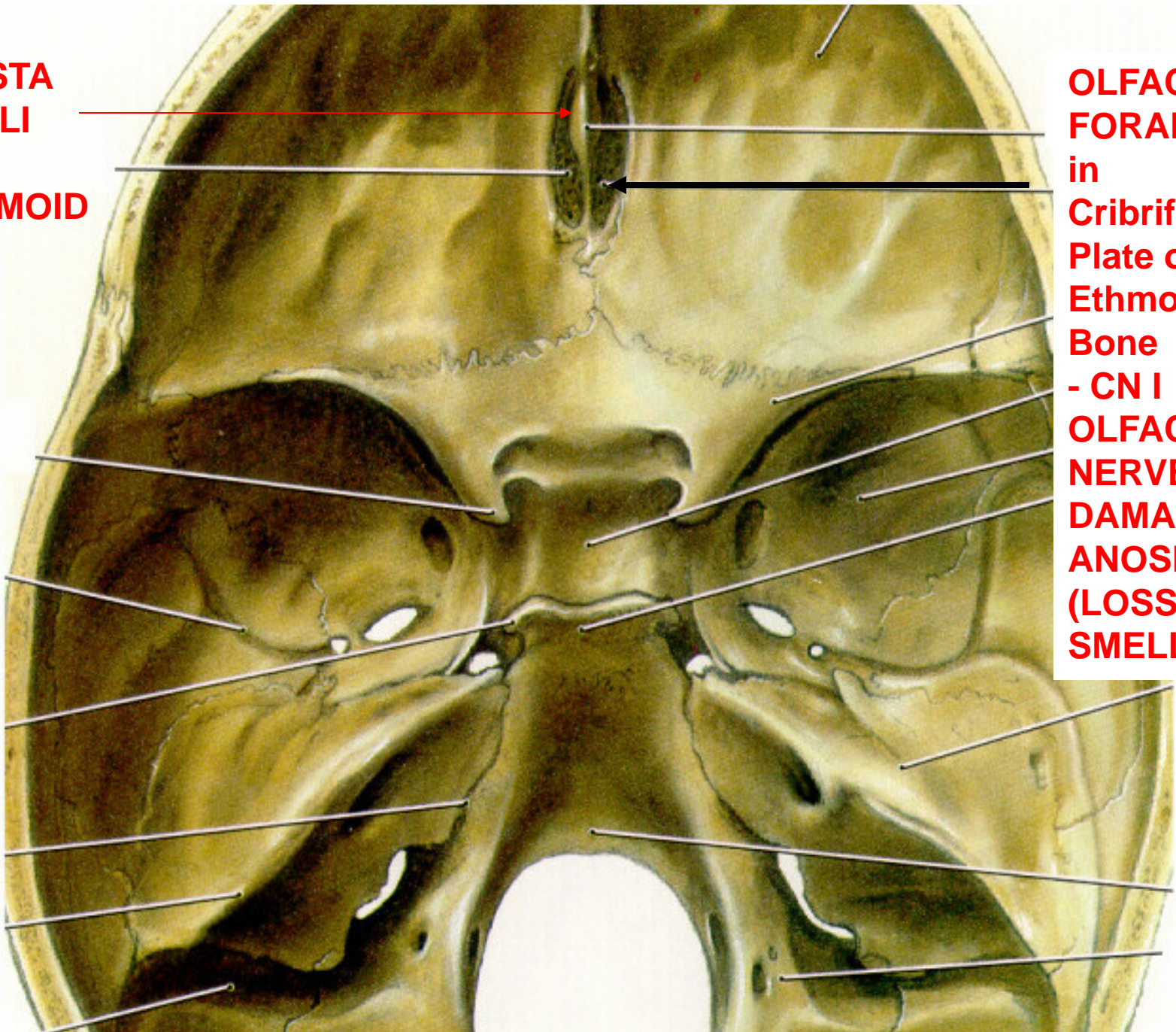
**WHAT IS THE CLEAR FLUID?**

# MEDIAL WALL OF NASAL CAVITY = NASAL SEPTUM



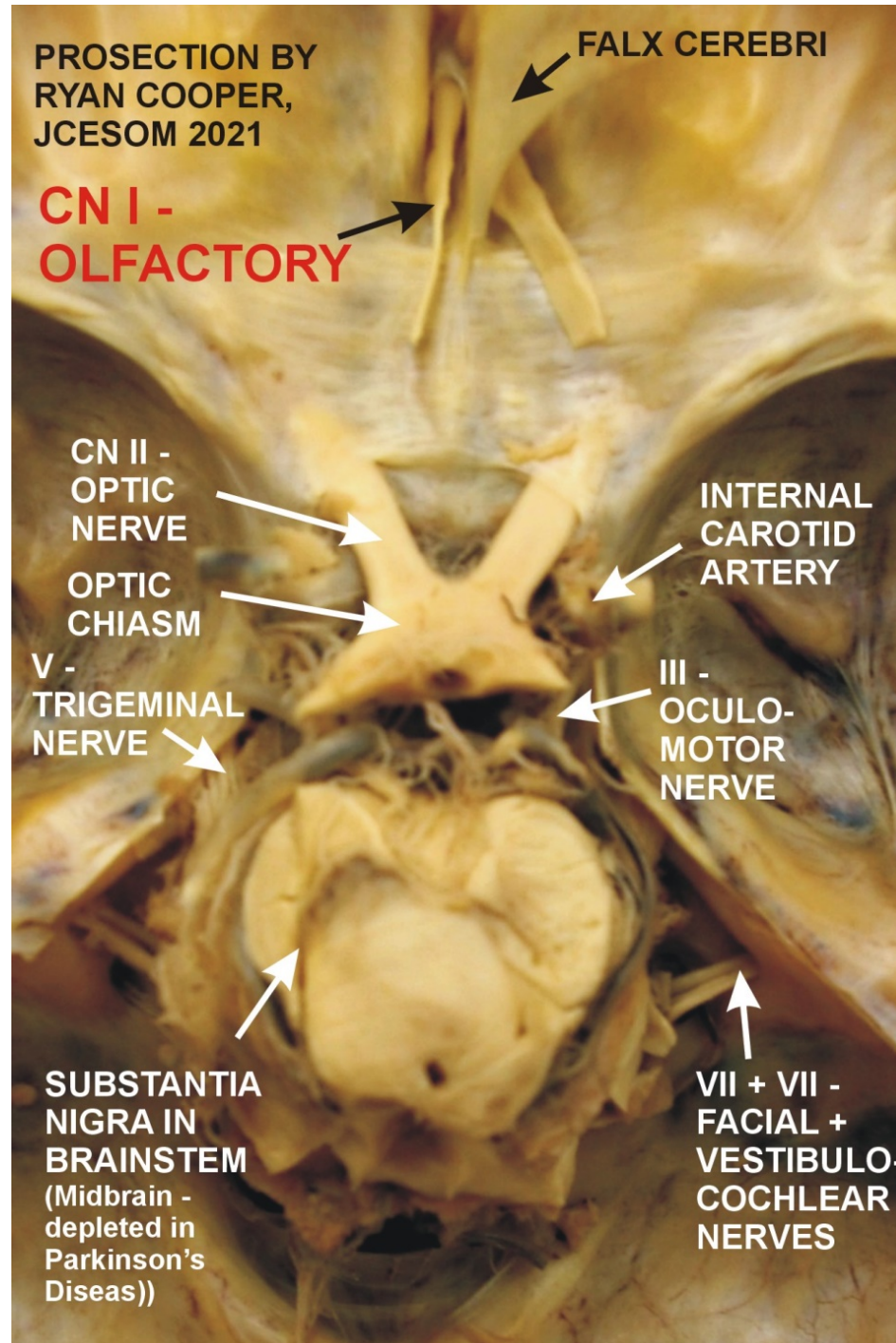
**CLINICAL** – Fracture of nose can break Cribriform plate, floor of Ant. Cranial fossa - **leak CSF from nose**; can result in Meningitis

**CRISTA  
GALLI  
OF  
ETHMOID**



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

**PROSECTIONS  
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

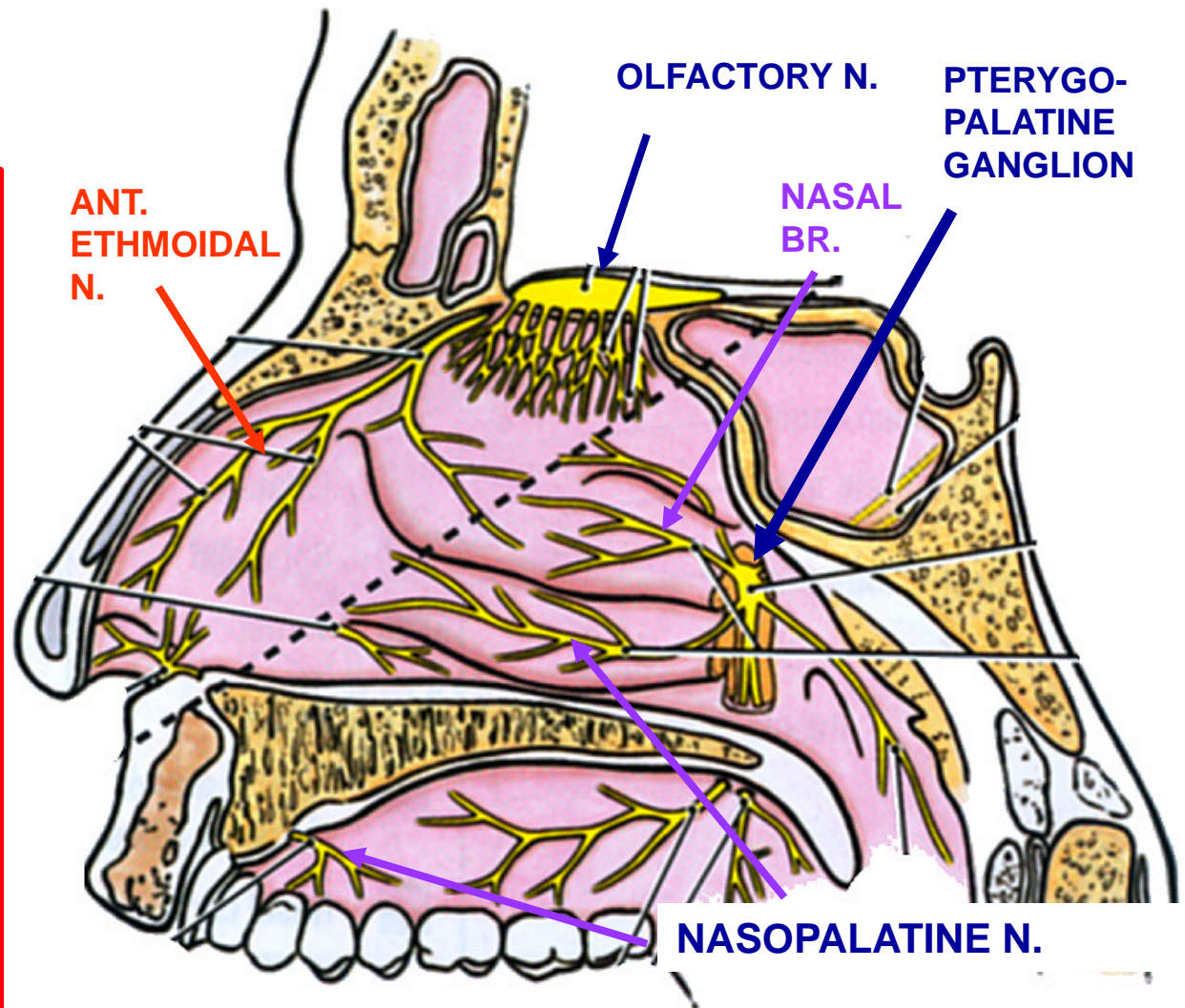
nose - VISCERAL

MOTOR PARASYMP. -

VII - Facial N. by

Pterygopalatine

Ganglion \*



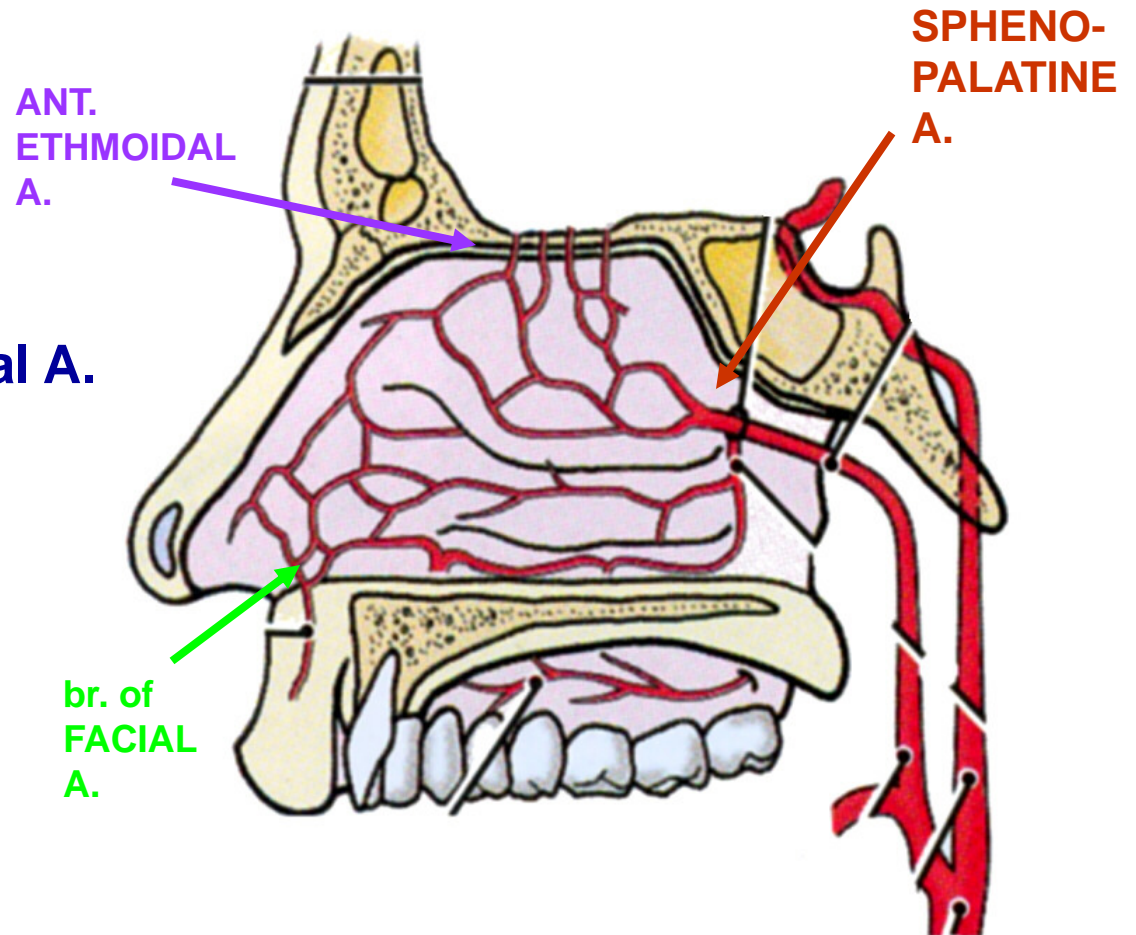
# ARTERIES/VEINS OF NASAL CAVITY

## 1. 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**

# PARANASAL AIR SINUSES

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

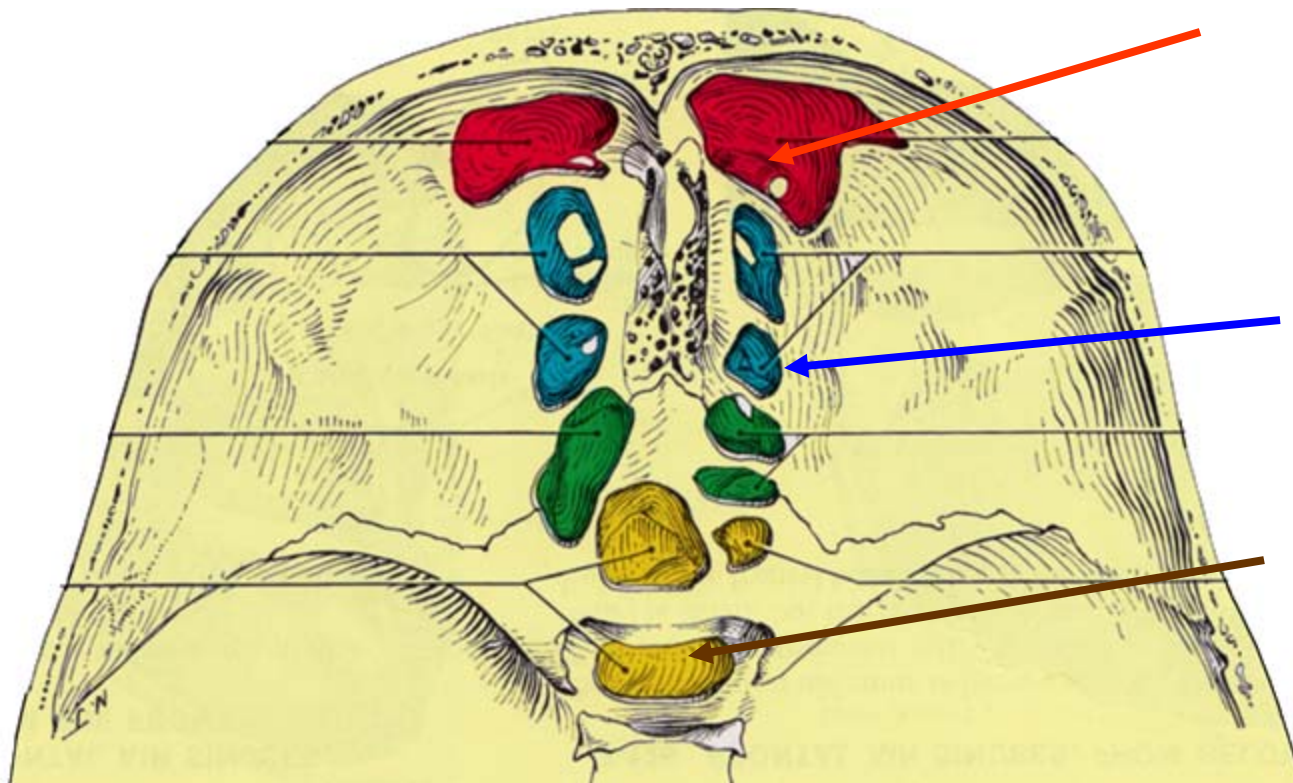
All usually paired

NOSE

A. Frontal - separate  
by septum, variable  
size

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

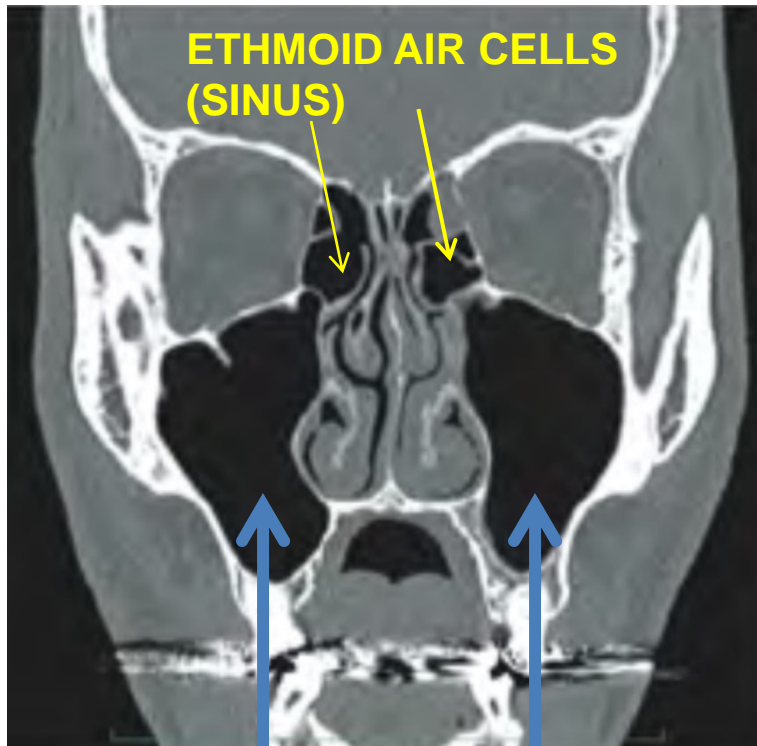
B. Sphenoid - in  
body of Sphenoid  
bone



**Ethmoid - Blocked Sinus Infection Can Spread to Orbit**

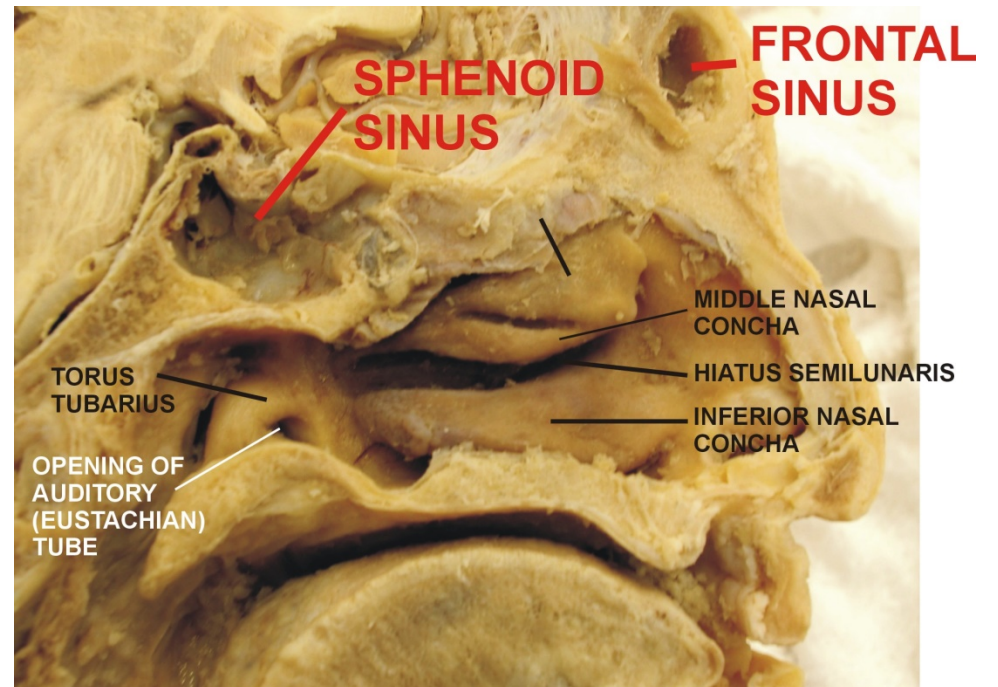
# SINUSES ON CT AND PROSECTION PICTURES

CT IN CORONAL PLANE

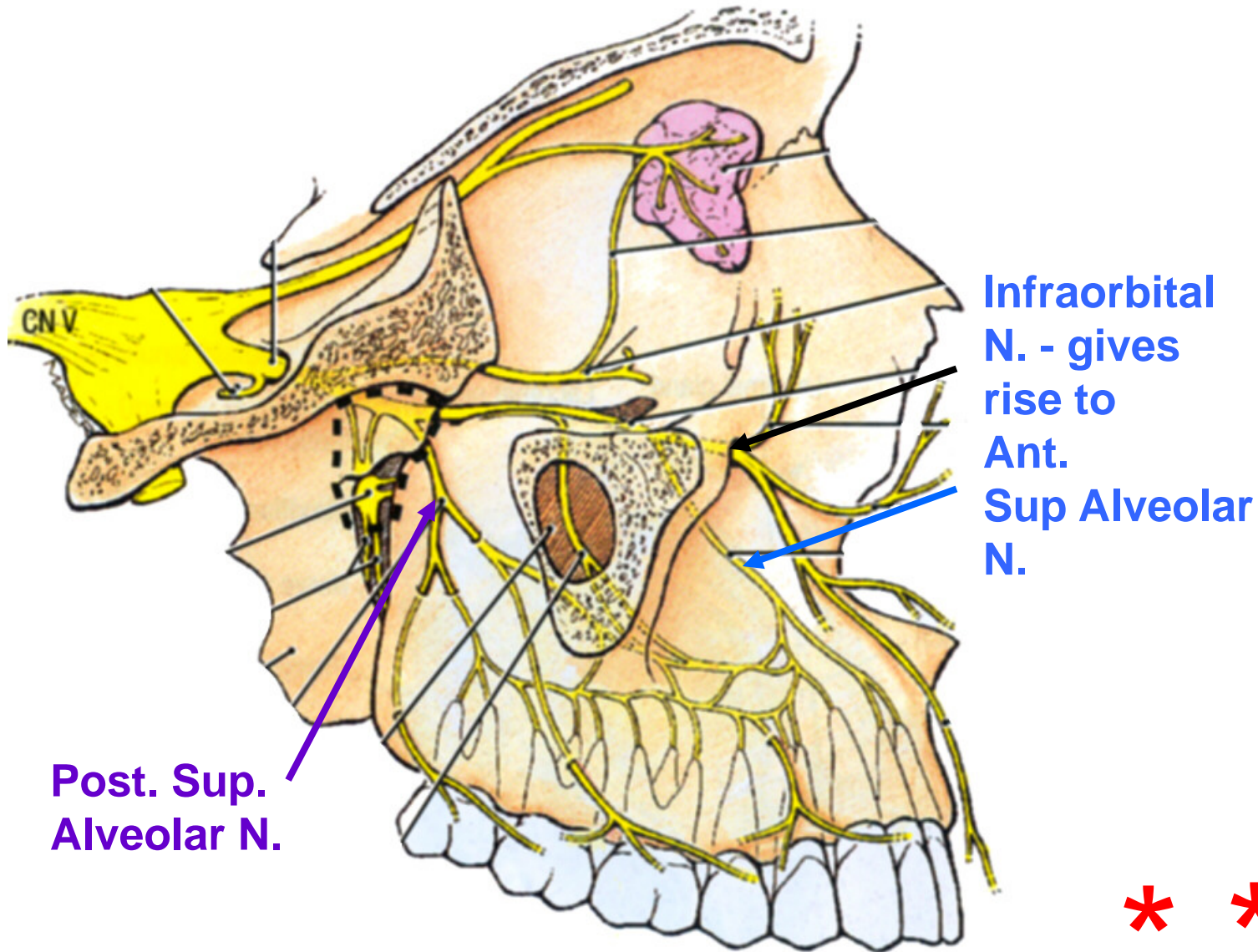


MAXILLARY SINUS

PROSECTION 75 – NASAL CAVITY



## PARANASAL AIR SINUSES: NERVES



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

## PRACTICE QUESTION CLINICAL VIGNETTE

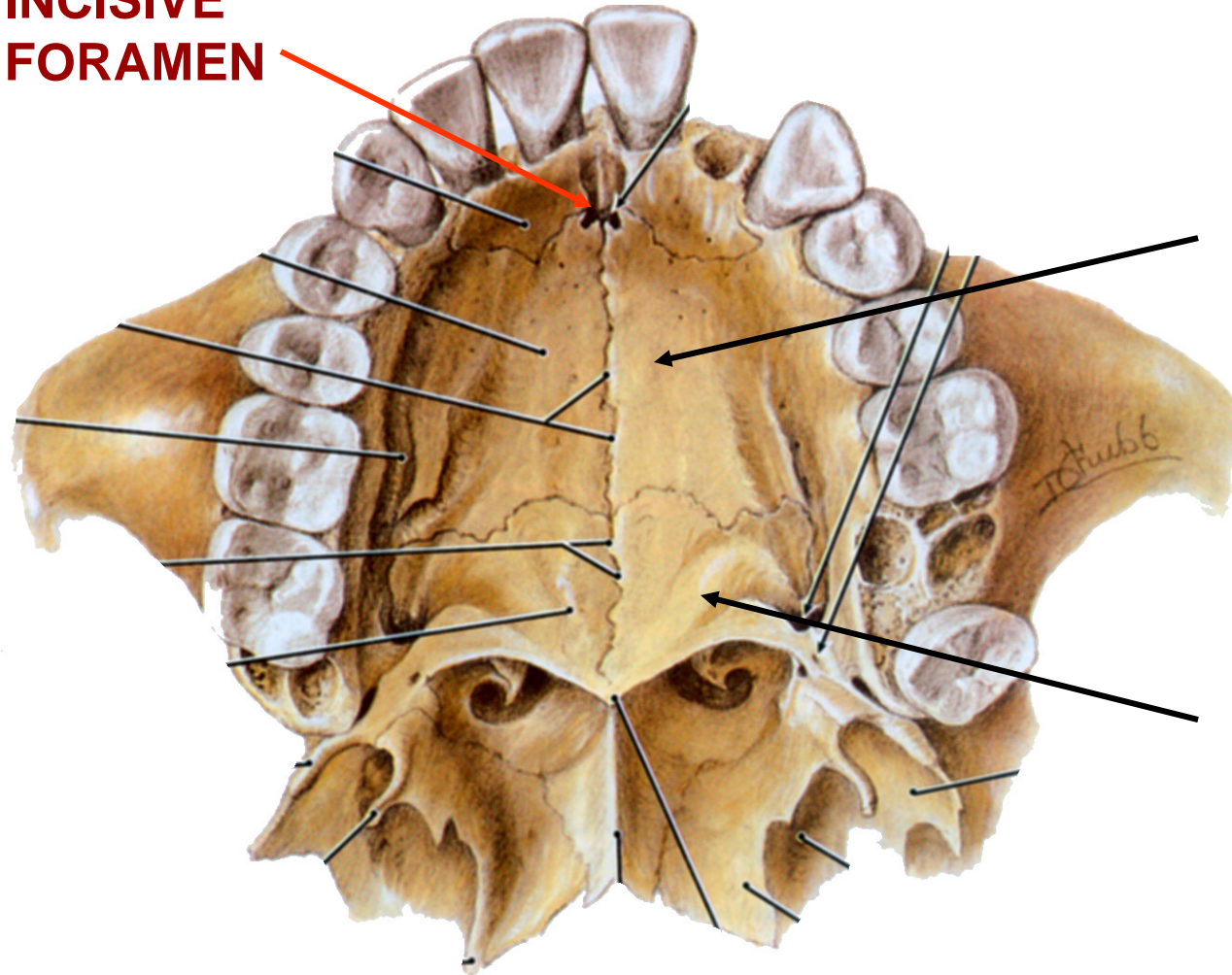


A young boy is brought to a physician working in a field hospital. The mother of the boy says he has difficulty swallowing and that food is expelled through the nasal cavity. Upon examination, the physician finds a large defect in the hard and soft palates (photo above) and suspects that the child developed 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

**INCISIVE  
FORAMEN**



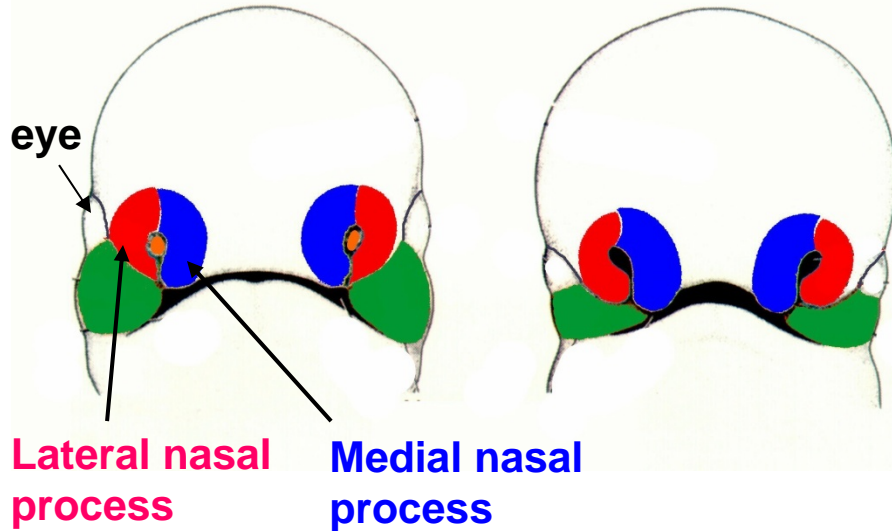
**B. Anatomy**

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

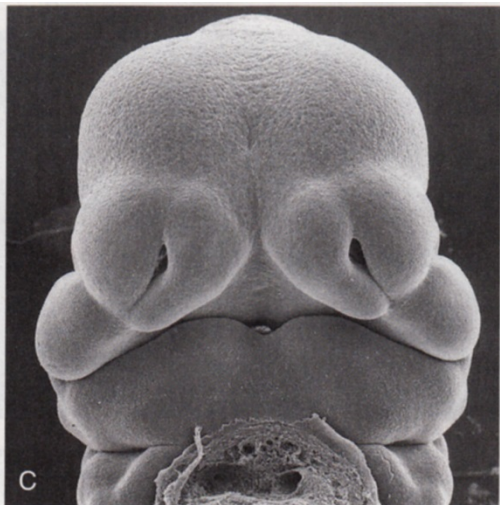
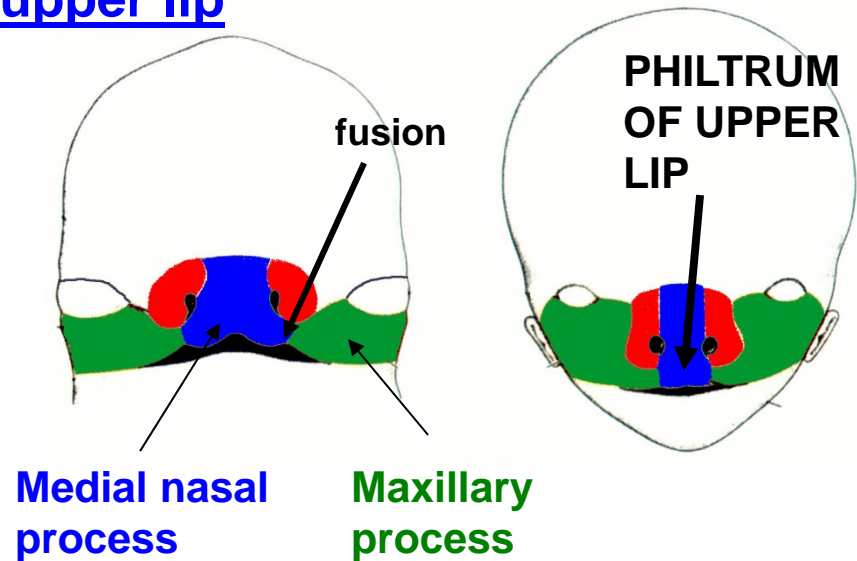
**b. Palatine  
bones  
(horizontal  
plate)**

# DEVELOPMENT OF FACE

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



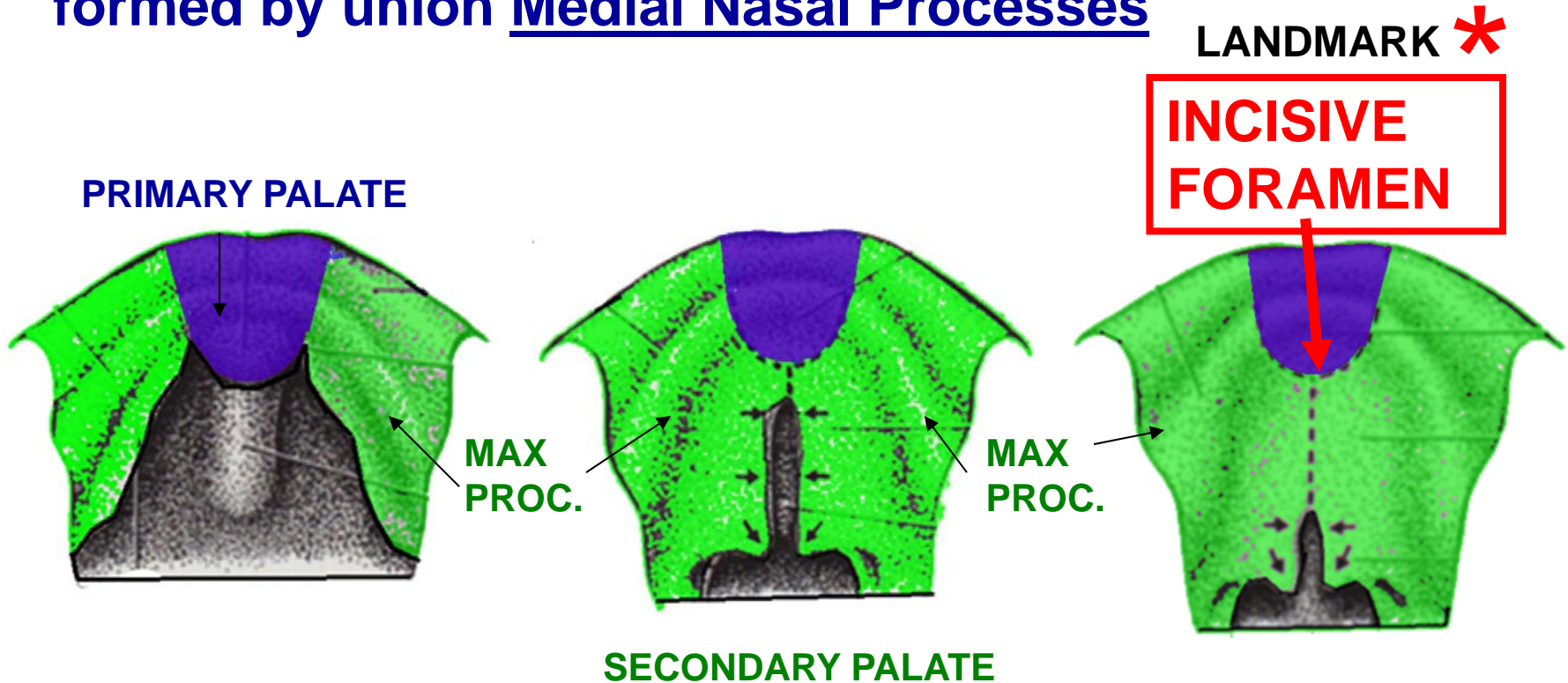
3. Medial nasal process and Maxillary Process – fuse to form upper lip





# PALATE DEVELOPMENT

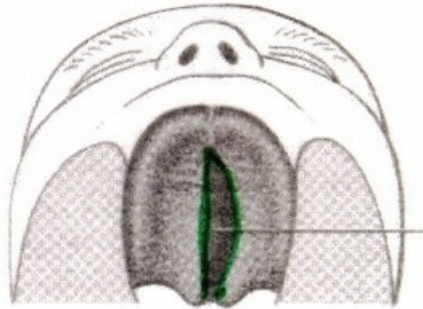
a. Primary Palate – Anterior to Incisive Foramen formed by union Medial Nasal Processes



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

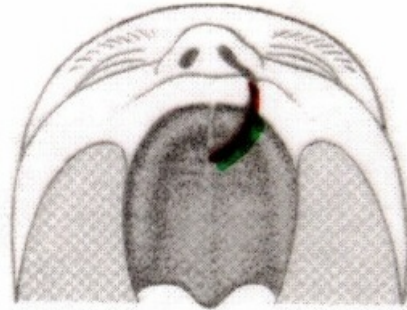
# MALFORMATIONS: CLEFT PALATE

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



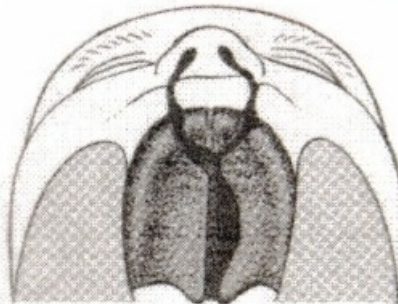
1:2500  
births

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



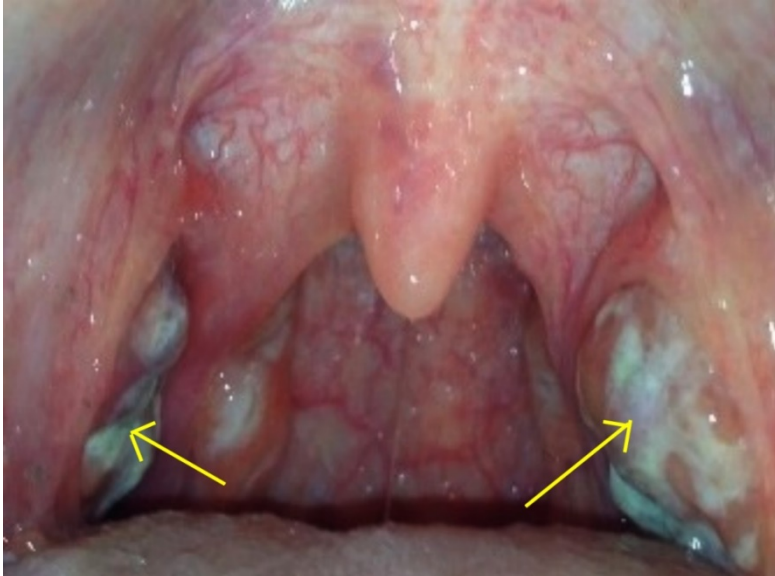
1:1000  
Births

Can be unilateral  
or bilateral



Note: Ant. Cleft Palate is same as Cleft Lip

## **PRACTICE QUESTION CLINICAL VIGNETTE**

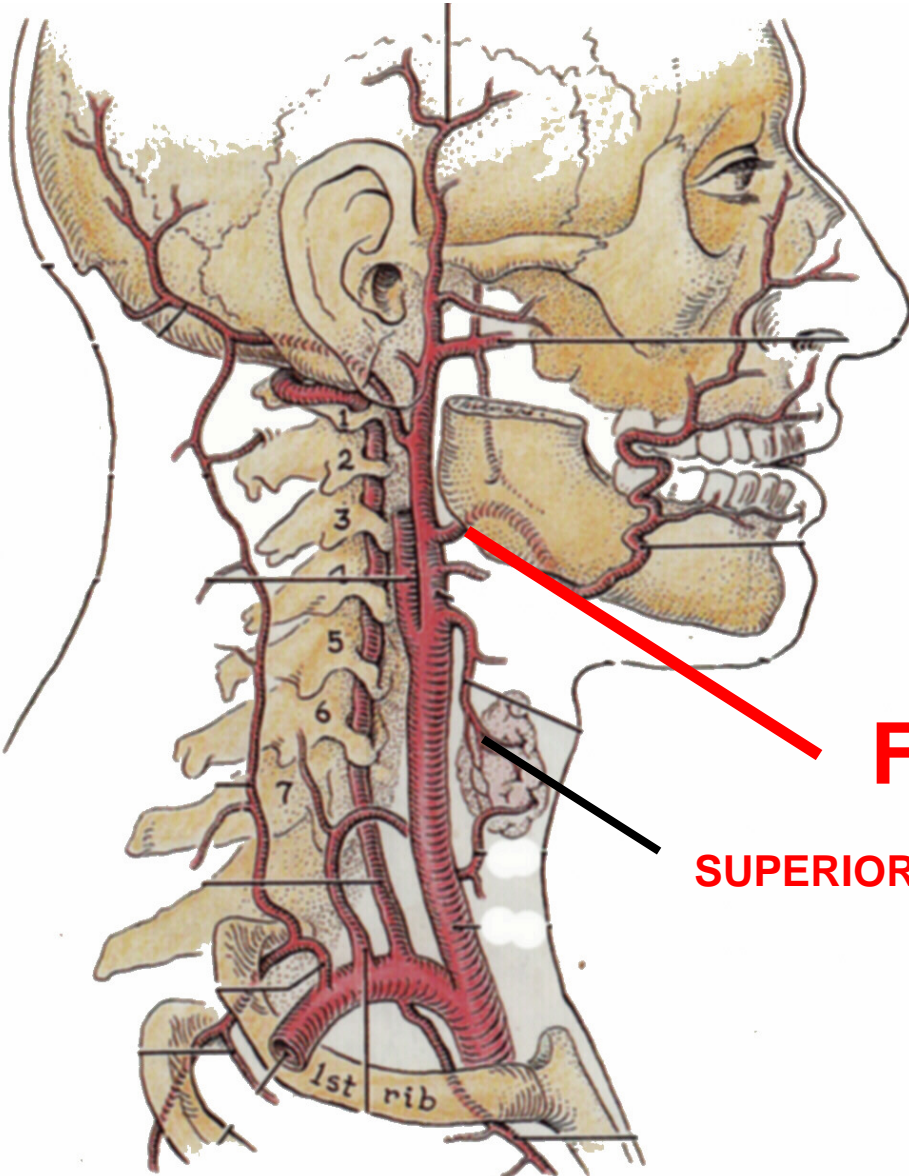


A patient is seen because of a very 'sore throat' Inspection of the soft palate (image above) shows enlarged masses in the lateral wall of the oropharynx. The masses are surgically removed and the patient returns home. However, that evening, there is extensive arterial hemorrhage in the oropharynx. This 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.**

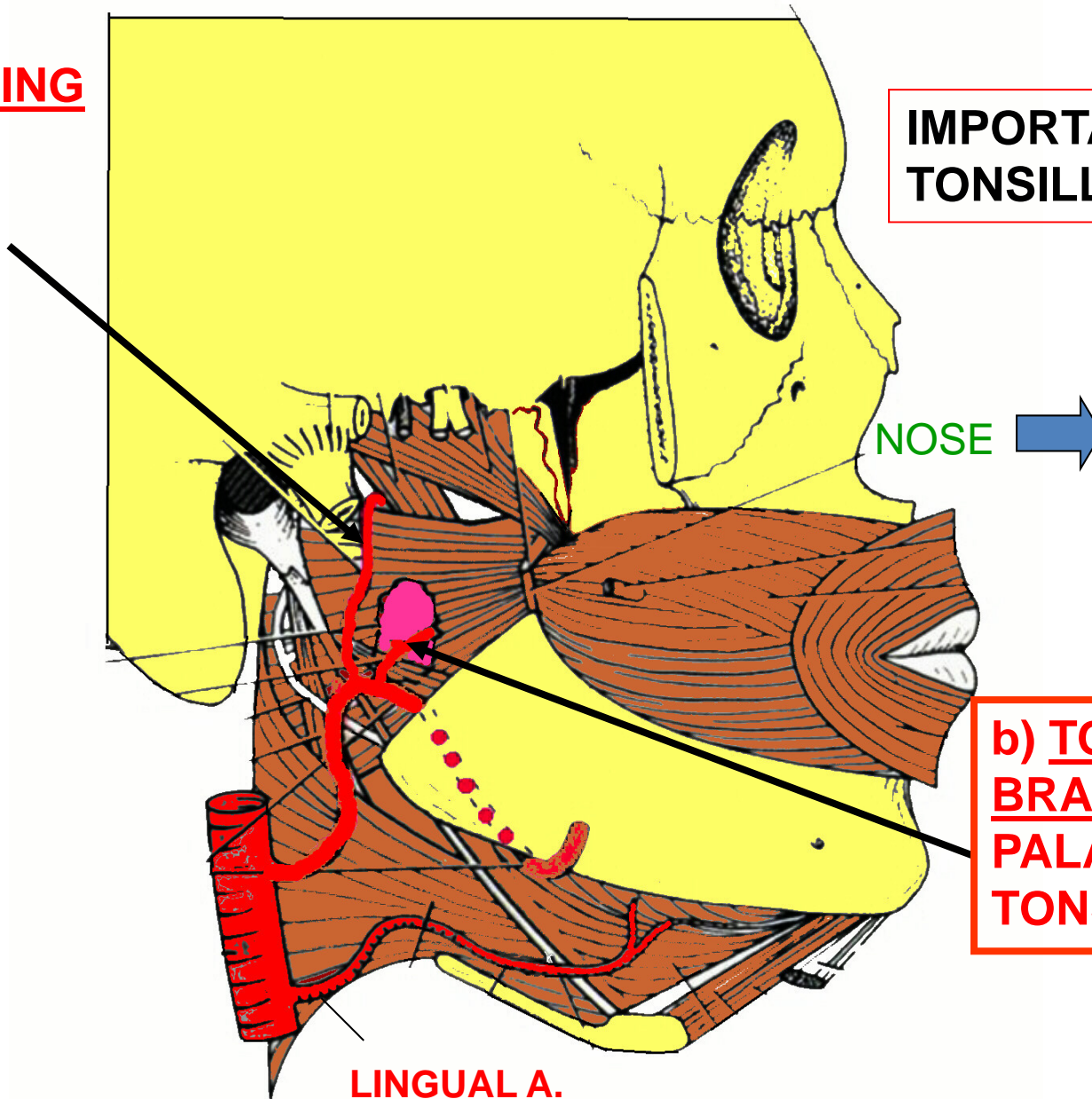
**COURSE =  
'WIGGLE' X 3**

**SUPERIOR THYROID A.**

# FACIAL ARTERY- BRANCHES MEDIAL TO MANDIBLE

a) ASCENDING PALATINE ARTERY - PALATE

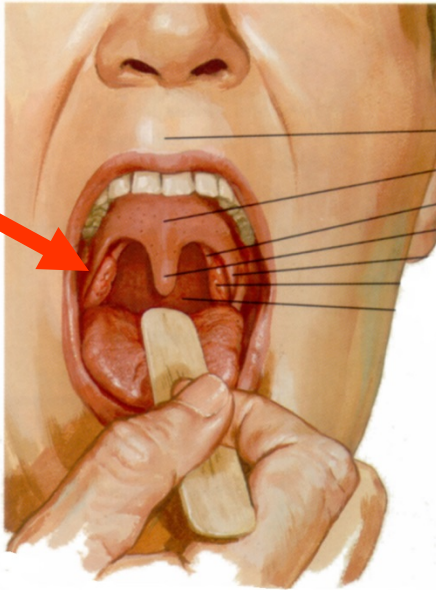
IMPORTANT IN TONSILLECTOMY



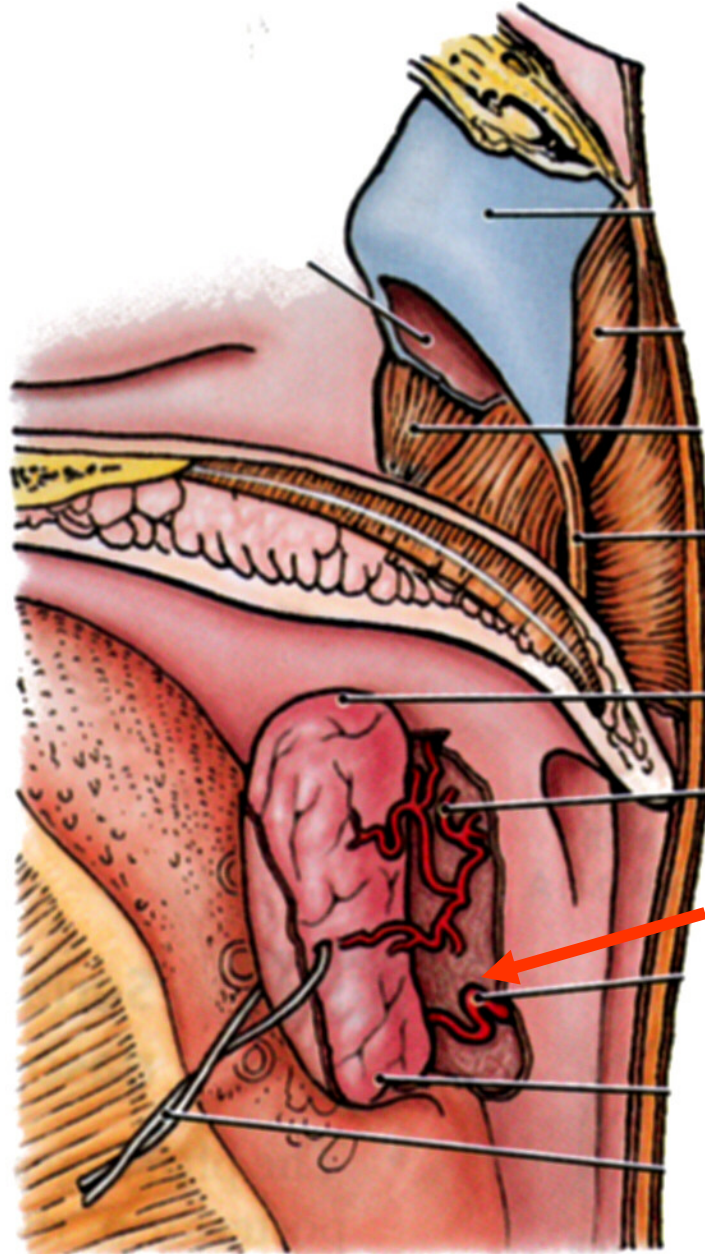
b) TONSILLAR BRANCH - PALATINE TONSIL

# 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**



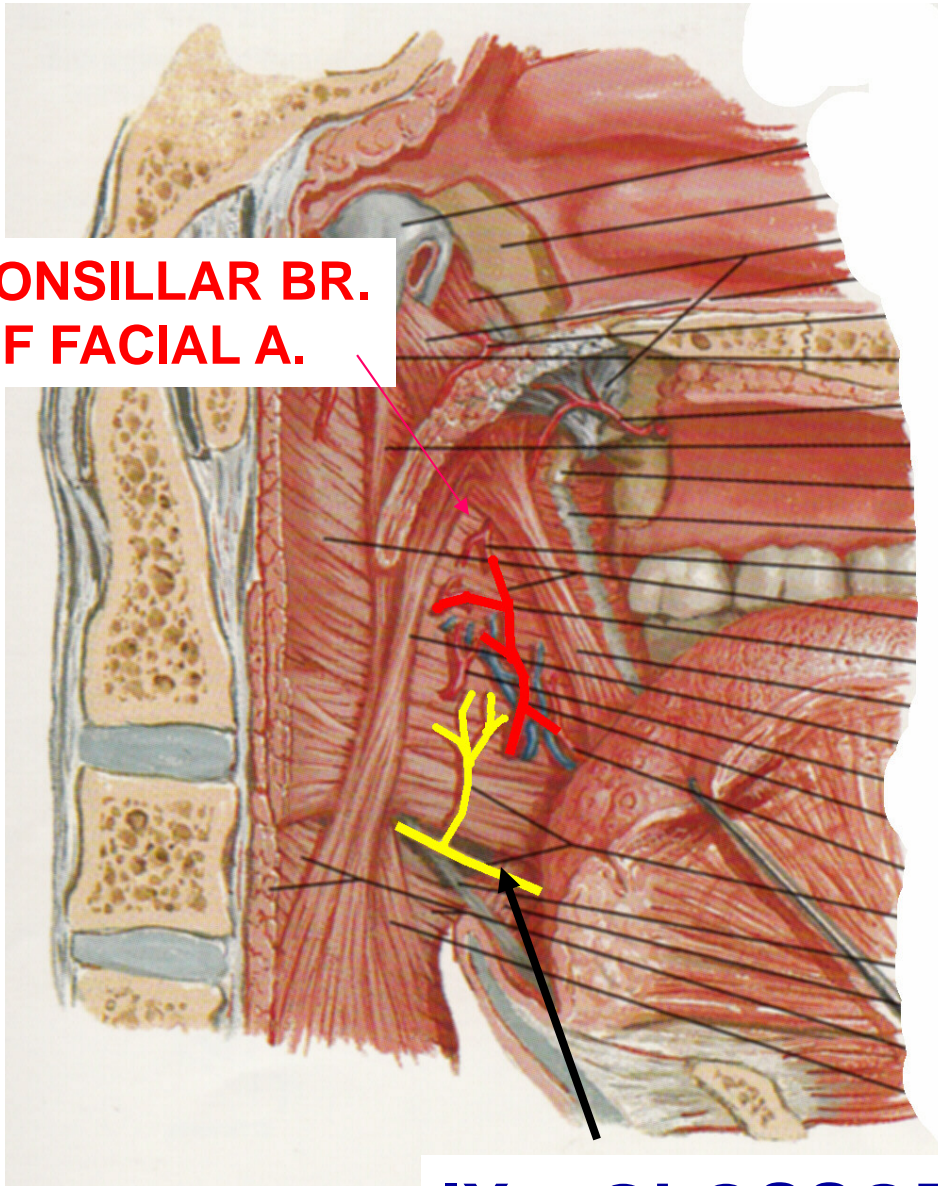
**b) TONSILLAR  
BRANCH -  
PALATINE  
TONSIL**

## ▶ PALATINE TONSILS

### Arteries-

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

**TONSILLAR BR.  
OF FACIAL A.**

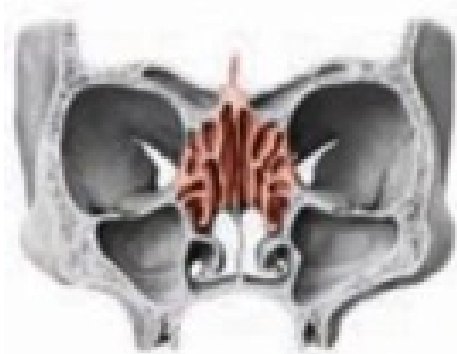


### **Note:**

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

**IX – GLOSSOPHARYNGEAL NERVE**

## FYI: ETHMOID BONE (anterior view)



**ETHMOID AIR  
CELLS (SINUS)**



**CRISTA GALLI**



**CRIBRIFORM  
PLATE**



**PERPENDICULAR PLATE**



**MIDDLE  
CONCHA**



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

**NO QUESTIONS ON THIS SLIDE**

