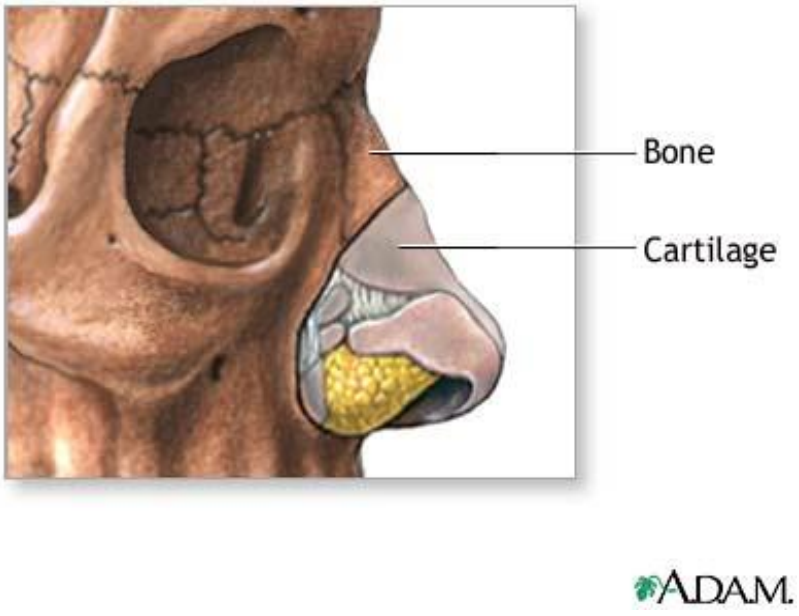
Anatomy of Nose and Paranasal Sinus

The Nose

- **consists of the *external nose* and the *nasal cavity***
- **Both are divided by a nasal septum into right and left halves.**
- **Each nasal cavity is divisible into an *olfactory area and a respiratory area.***



The functions of the nose and nasal cavities are:

- **Olfaction**
- **Respiration**
- **Filtration of dust**
- **Humidification of inspired air**
- **Reception and elimination of secretions from the nasal mucosa, paranasal sinuses, and nasolacrimal ducts.**

External Nose

- **The external nose varies considerably in size and shape, mainly because of differences in the nasal cartilages.**
- **The dorsum of the nose extends from its superior angle, the root, to the apex (tip) of the nose.**
- **The inferior surface of the nose is pierced by two piriform openings, the nares (nostrils, anterior nasal apertures), which are bound laterally by the alae (wings) of the nose and separated from each other by the nasal septum.**

The external nose consists of bony and cartilaginous parts.

The bony part of the nose consists of the:

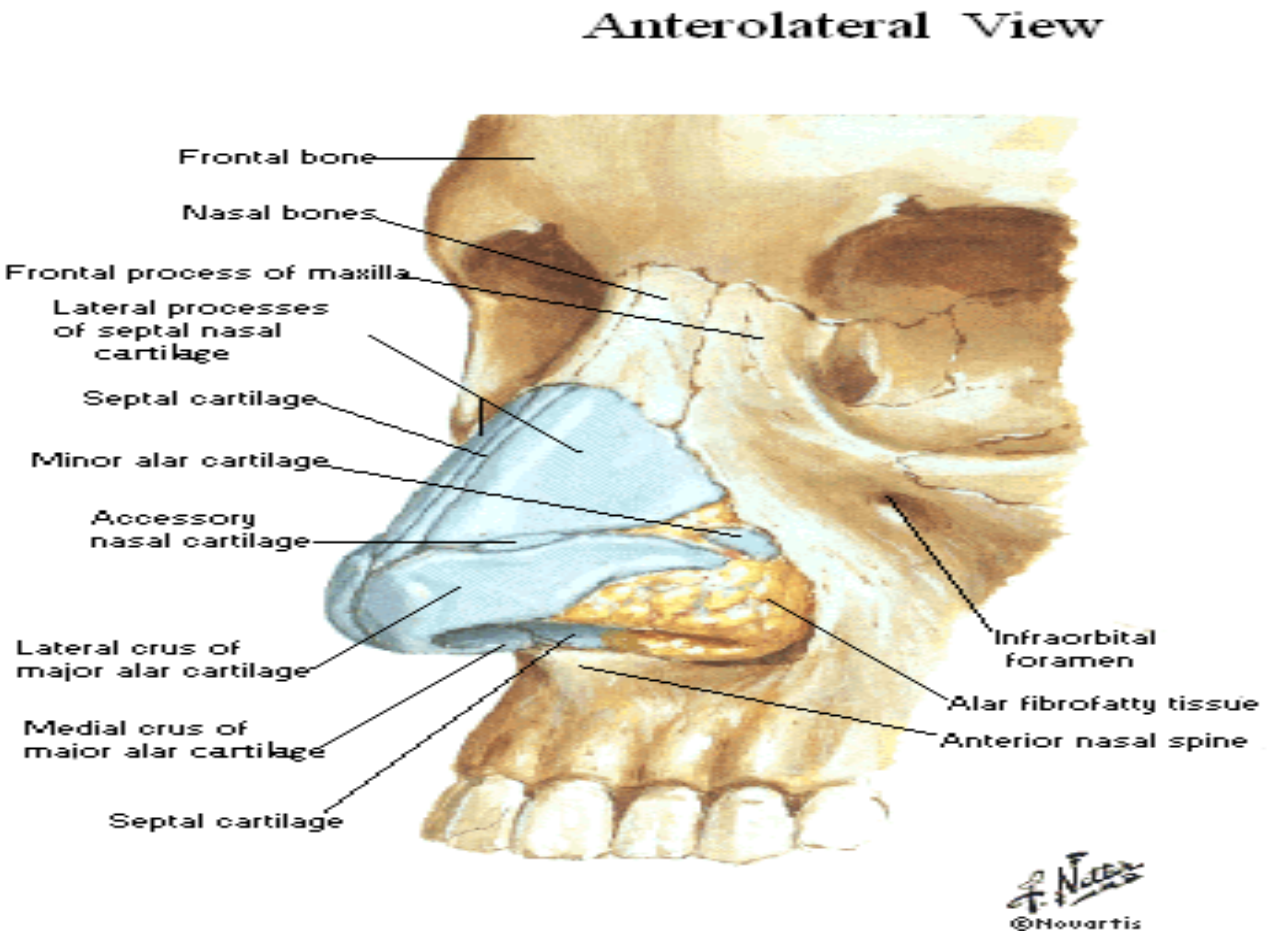
- **Nasal bones.**
- **Frontal processes of the maxillae.**
- **Nasal part of the frontal bone and its nasal spine.**
- **Bony part of the nasal septum.**

The **cartilaginous part of the nose consists of five main cartilages:**

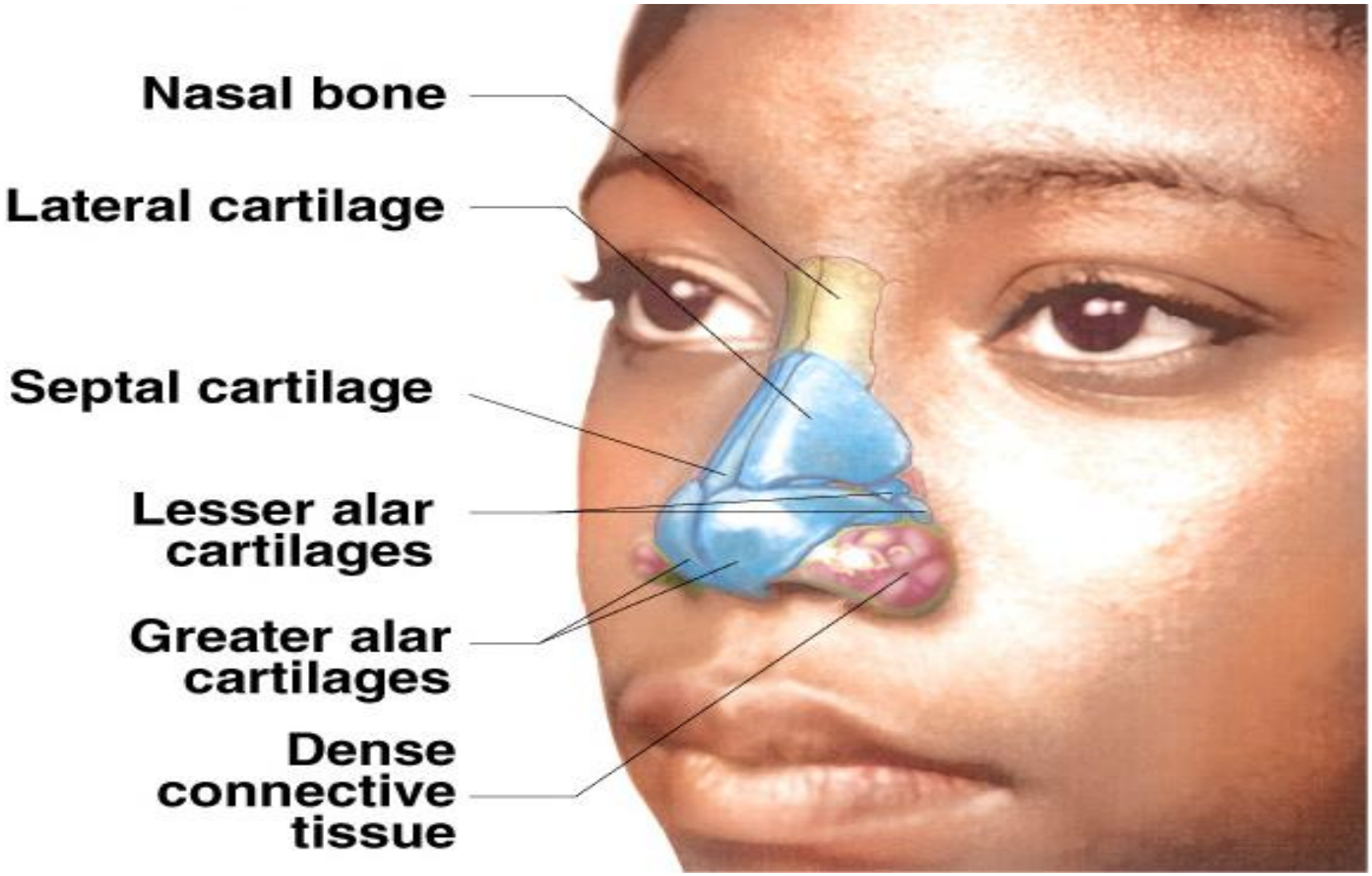
- **lateral cartilages-2**
- **alar cartilages-2**
- **septal cartilage-1**

External Nose

External Nose



External Nose



Blood Supply of the External Nose

- **The skin of the external nose is supplied by branches of the ophthalmic and the maxillary arteries.**
- **The skin of the ala and the lower part of the septum are supplied by branches from the facial artery.**

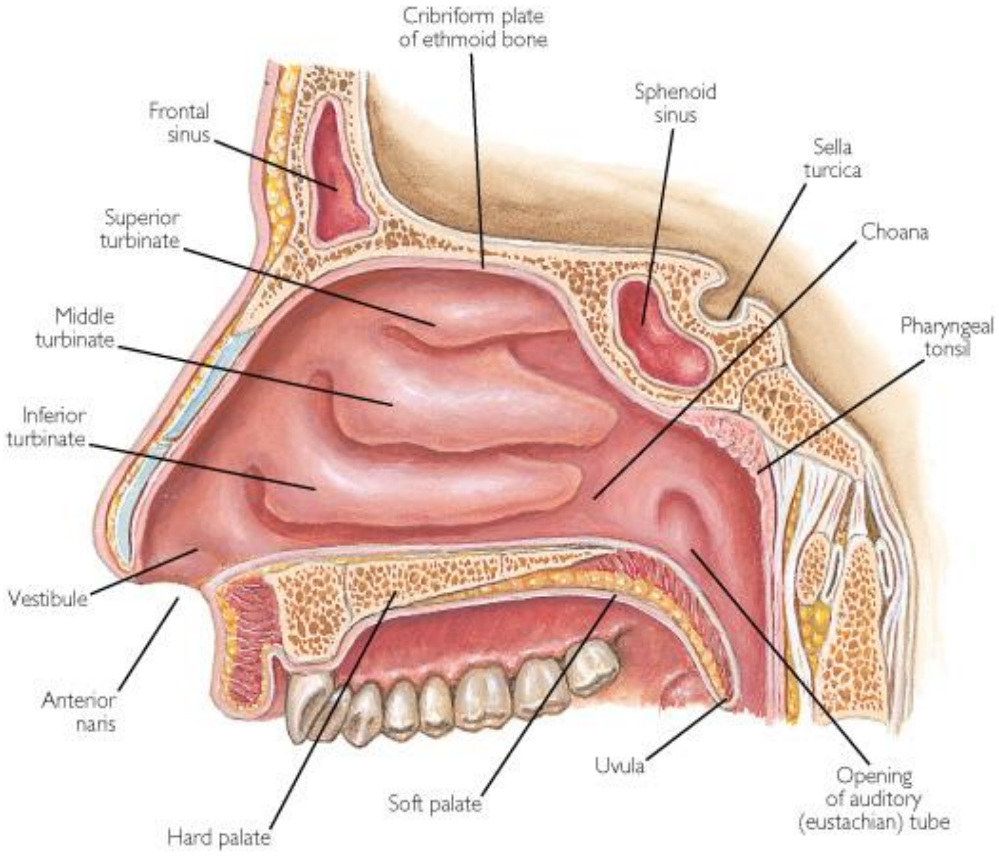
Nerve Supply of the External Nose

- **Infratrochlear and external nasal branches of the ophthalmic nerve**
- **Infraorbital branch of the maxillary nerve**

Nasal Cavity

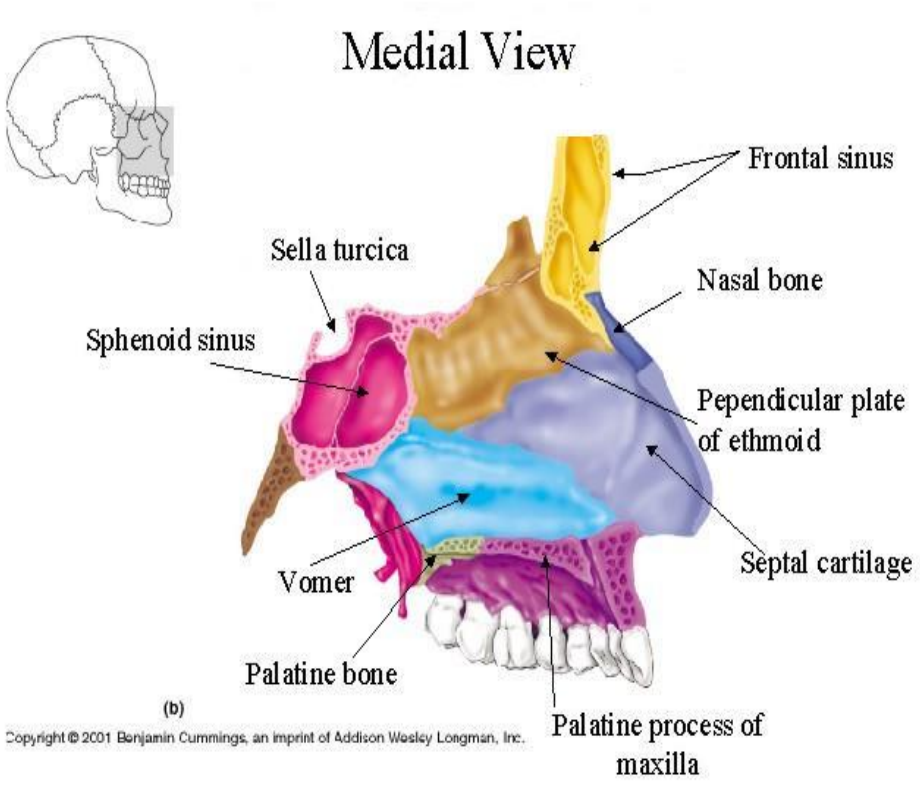
- **The nasal cavities, entered through the nares, open posteriorly into the nasopharynx through the *choanae.***
- **Mucosa lines *the* nasal cavities**

- **The nasal cavity has**
  - **a floor,**
  - **a roof,**
  - **a lateral wall,**
  - **a medial or septal wall.**



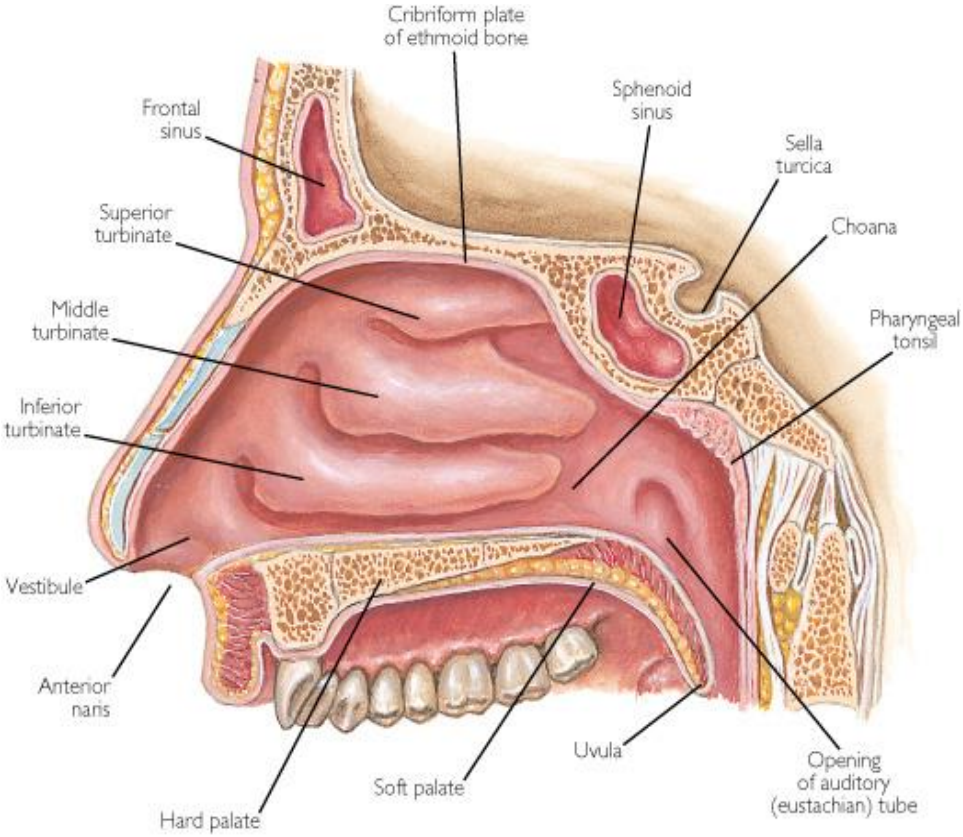
The Floor of Nasal Cavity

- **Palatine process of maxilla**
- **Horizontal plate of palatine bone**



The Roof of Nasal Cavity

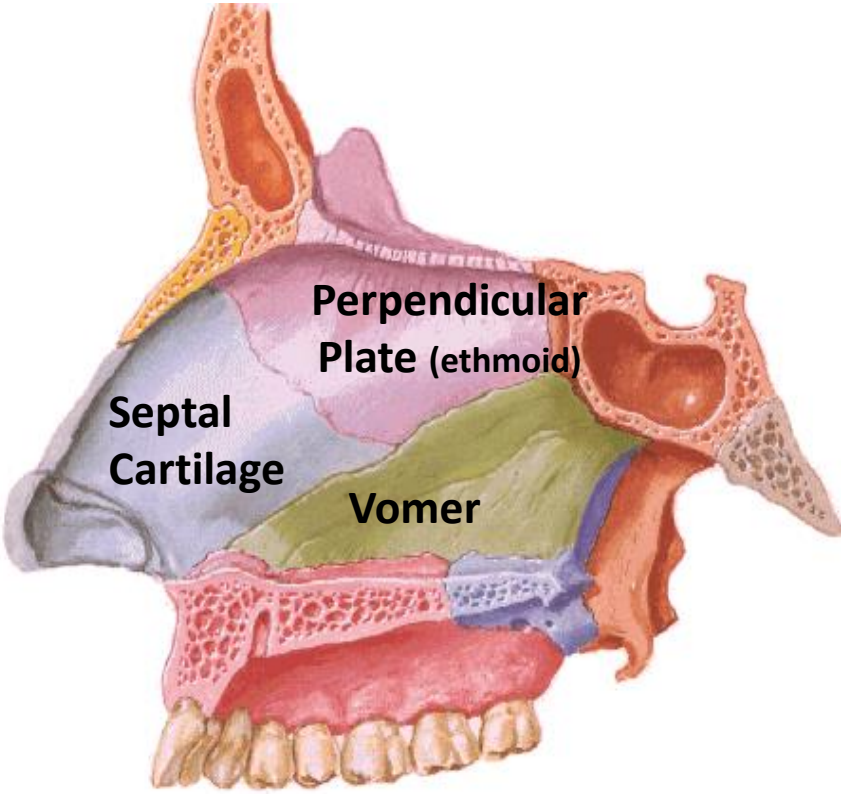
- **Narrow**
- **It is formed**
  - **anteriorly beneath the bridge of the nose by the nasal and frontal bones,**
  - **In the middle by the cribriform plate of the ethmoid,**
  - **posteriorly by the downward sloping body of the sphenoid**



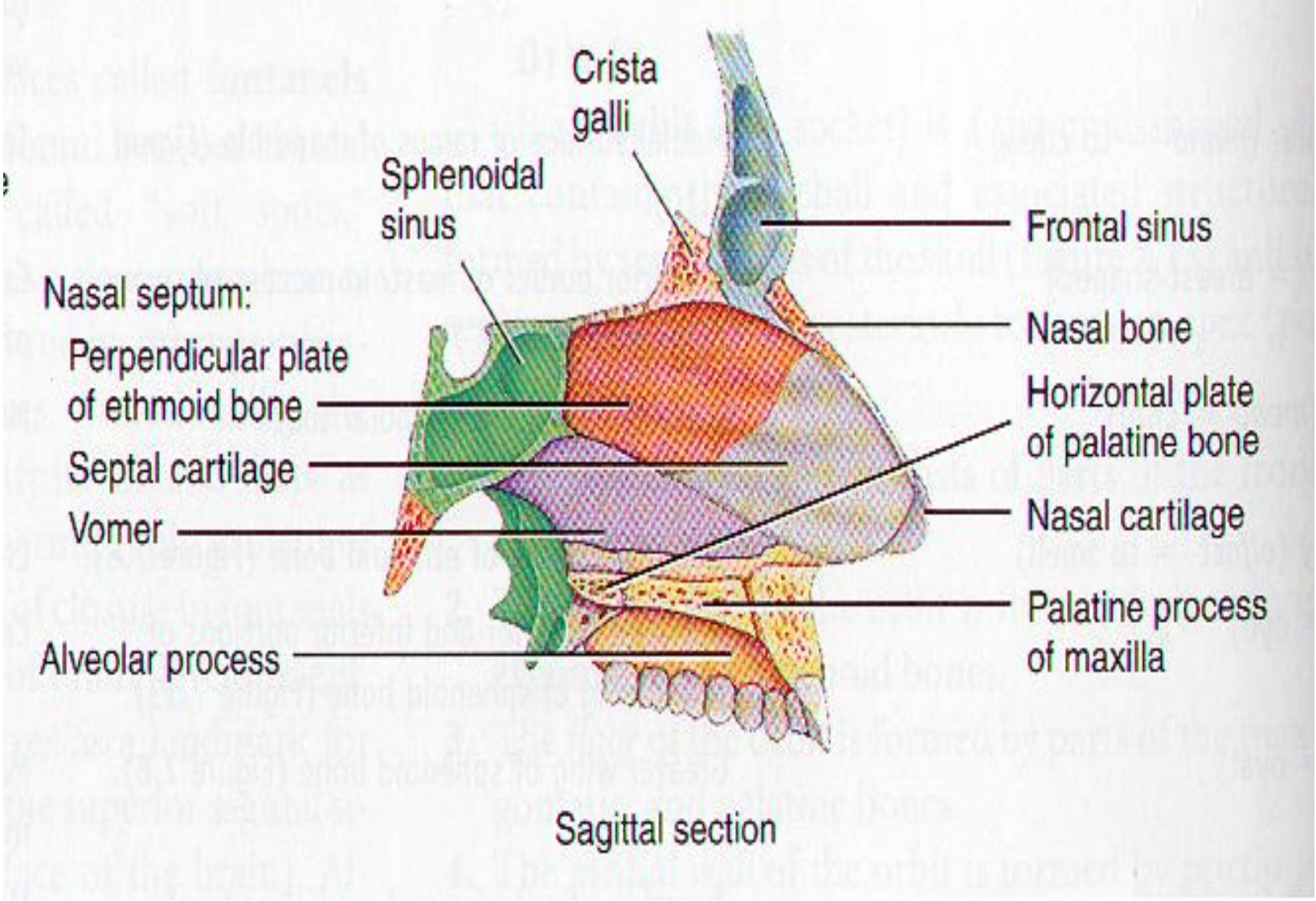
The Medial Wall of Nasal Cavity

- **The Nasal Septum Divides the nasal cavity into right and left halves. It has osseous and cartilaginous parts**

- **Nasal septum consists of the perpendicular plate of the ethmoid bone (superior), the vomer (inferior) and septal cartilage (anterior)**

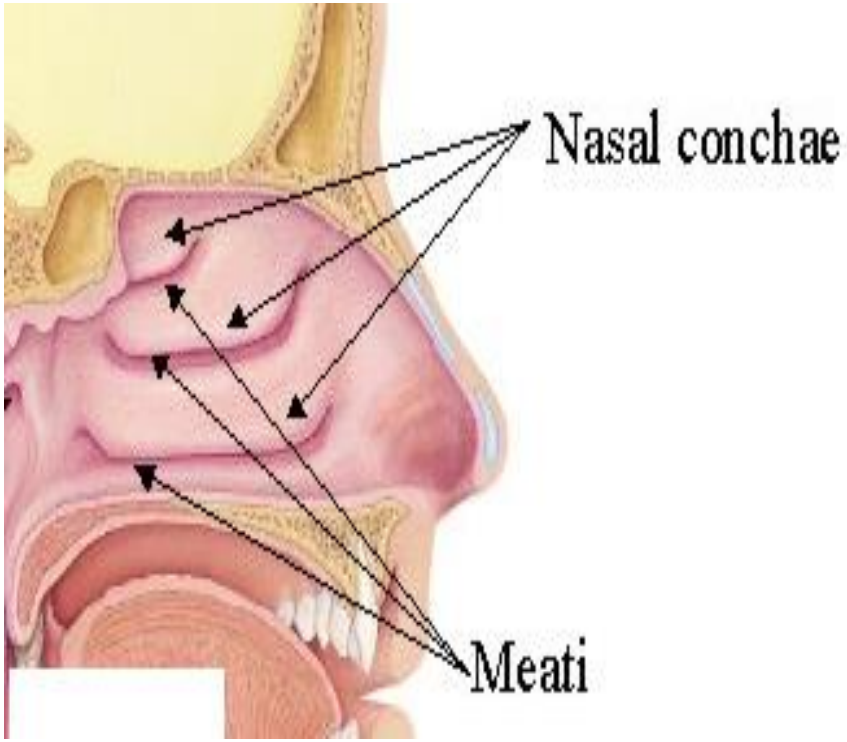


The Nasal Septum



The Lateral Walls of Nasal Cavity

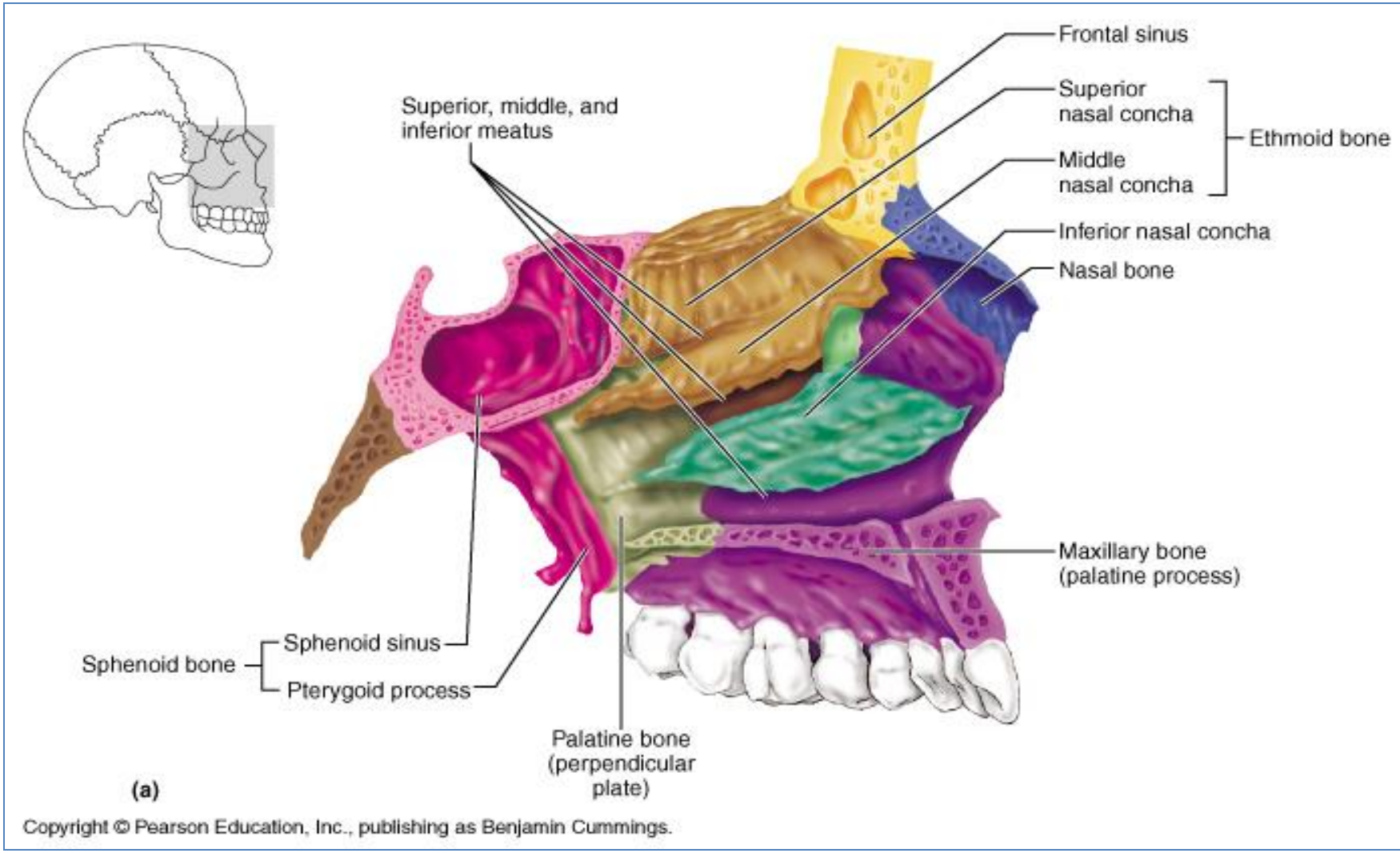
- **The lateral wall of the nasal cavity is uneven because of the nasal conchae (superior, middle, and inferior), three elevations that project inferiorly like scrolls.**
- **The conchae curve inferomedially, each forming a roof for a meatus, or recess.**



- **The nasal conchae *divide the nasal cavity into four passages:***

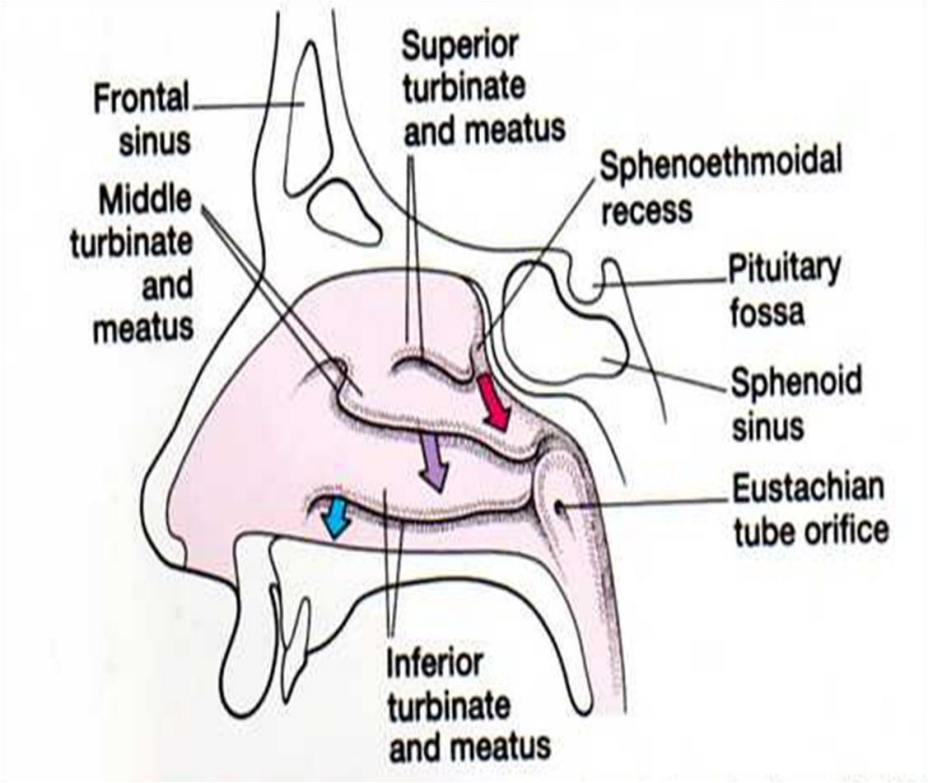
1. ***Spheno-ethmoidal recess***
2. ***Superior* nasal meatus**
3. **Middle nasal meatus**
4. **Inferior nasal meatus**

The Lateral Walls of Nasal Cavity

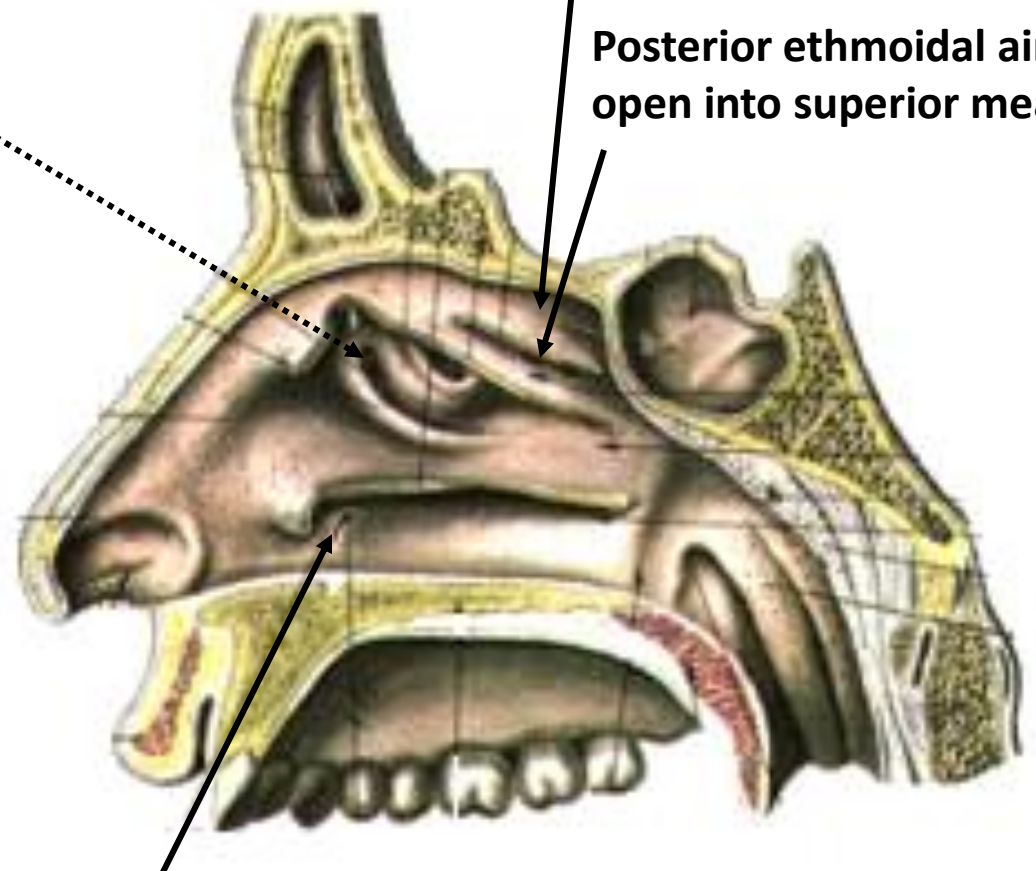


The Lateral Walls of Nasal Cavity

1. **Inferior meatus: nasolacrimal duct**
2. **Middle meatus:**
   - **Maxillary sinus**
   - **Frontal sinus**
   - **Anterior ethmoid sinuses**
3. **Superior meatus: posterior ethmoid sinuses**
4. **Sphenoethmoidal recess: sphenoid sinus**



Openings Into the Nasal Cavity



Blood Supply to the Nasal Cavity

From branches of the

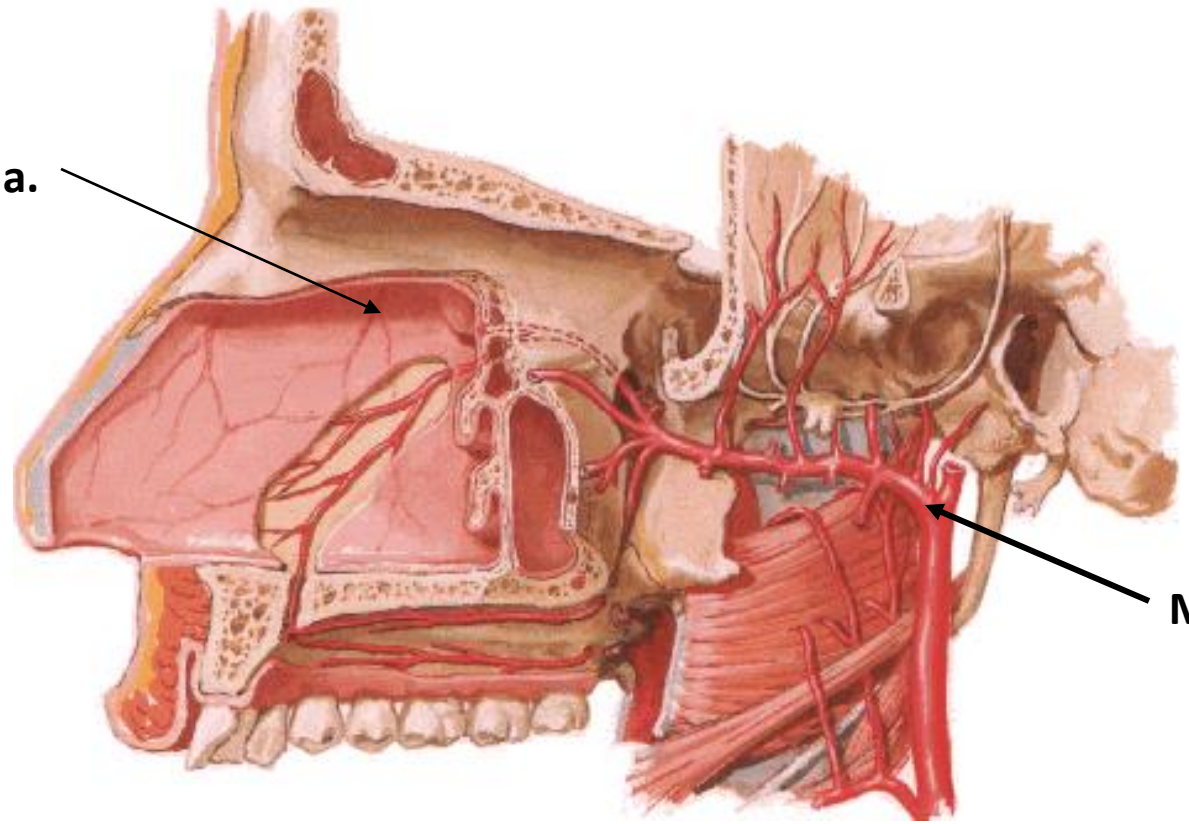
1. **sphenopalatine artery**
2. **anterior and posterior ethmoidal arteries**
3. **greater palatine artery**
4. **Superior labial artery**
5. **Lateral nasal branches of the facial artery .**

- **A rich *plexus of veins* drains deep to the nasal mucosa into the sphenopalatine, facial, and ophthalmic veins.**

Kiesselbach area

- **On the anterior part of the nasal septum is an area rich in capillaries (Kiesselbach area) where all five arteries supplying the septum anastomose. This area is often where profuse bleeding from the nose occurs.**

Blood Supply to the Nasal Cavity

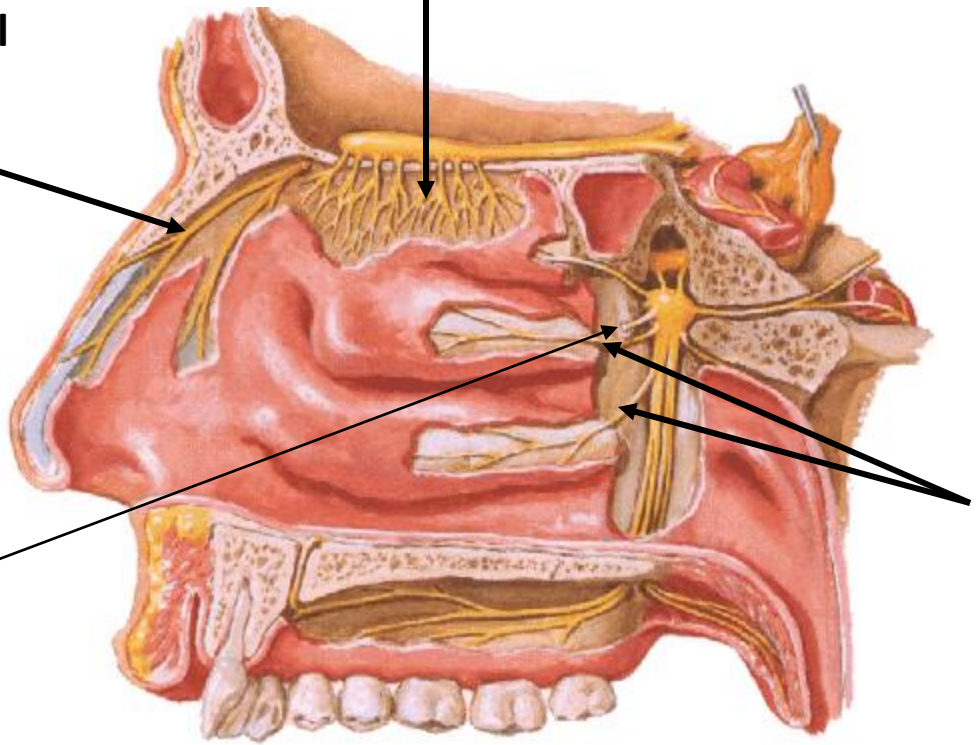


Netter, Frank H., Atlas of Human Anatomy. Ciba-Geigy Corporation, Summit, N.J. 1993. Plate 35.

Nerve Supply of the Nasal Cavity

- **The olfactory nerves from the olfactory mucous membrane ascend through the cribriform plate of the ethmoid bone to the olfactory bulbs .**
- **The nerves of ordinary sensation are branches of the ophthalmic division (V1) and the maxillary division (V2) of the trigeminal nerve.**

Nerve Supply of the Nasal Cavity

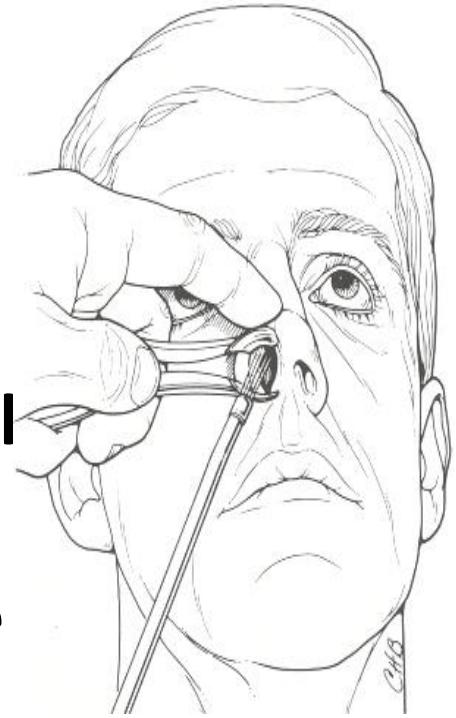


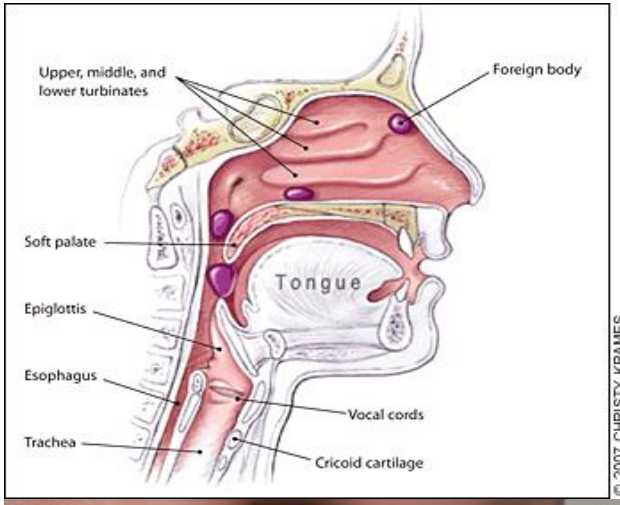
Lymph Drainage of the Nasal Cavity

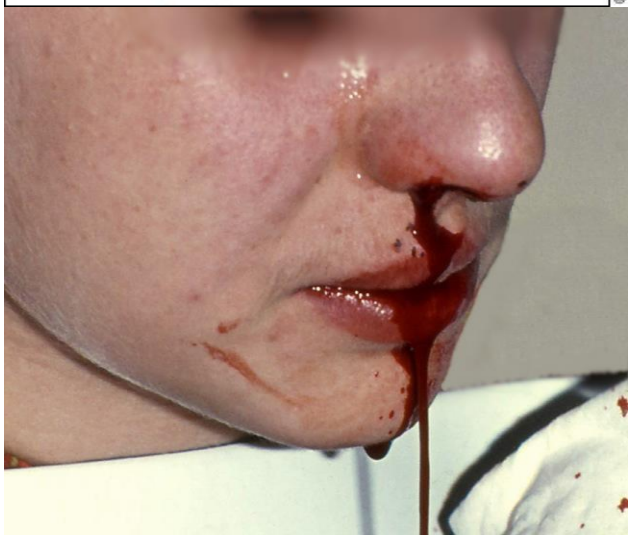
- in the ***submandibular nodes and upper deep cervical nodes***.

Clinical Notes

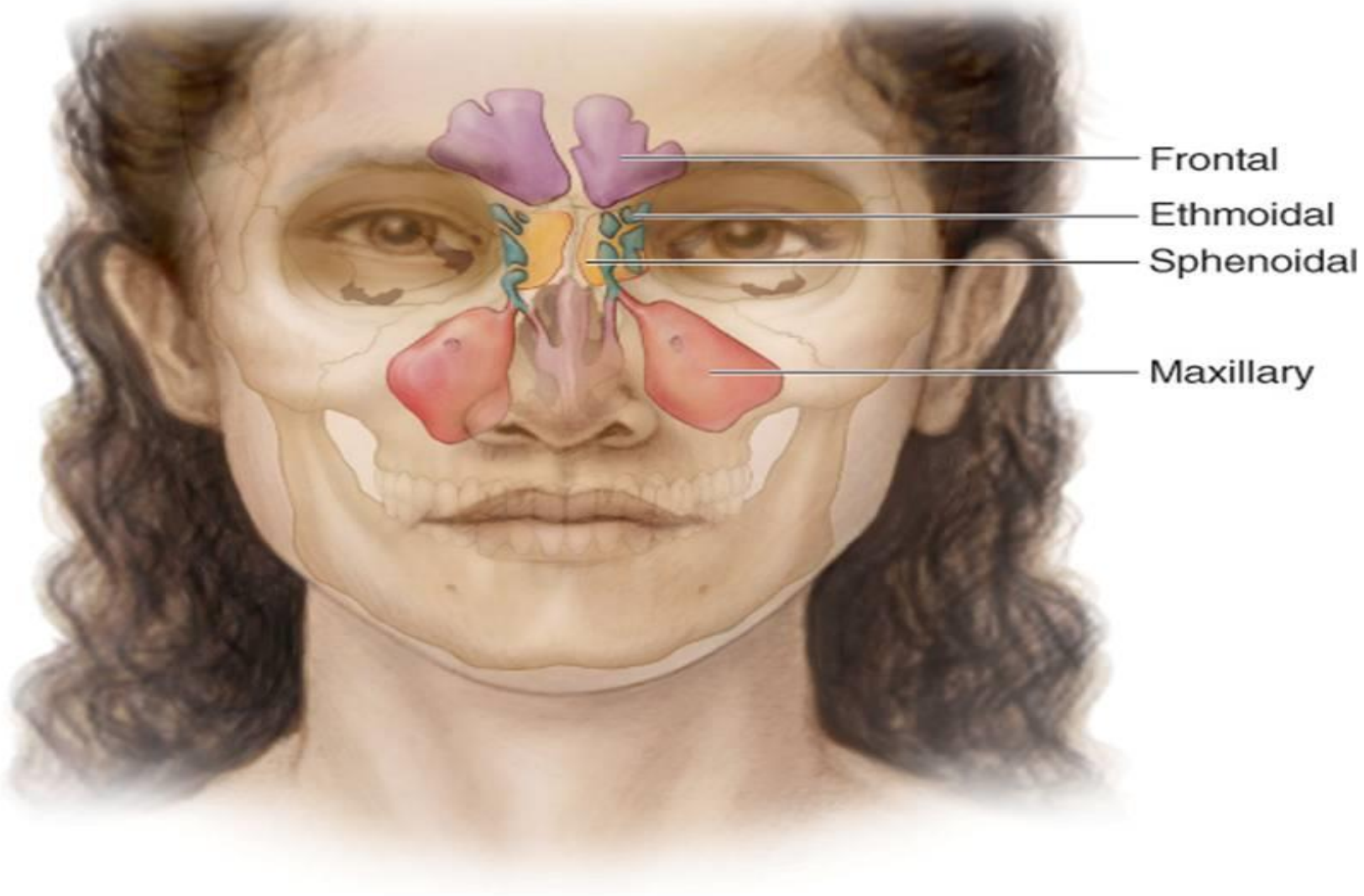
- **Examination of the Nasal Cavity**
- **Trauma to the Nose**
- **Infection of the Nasal Cavity**
- **Foreign Bodies in the Nose**
- **Nose Bleeding (Epistaxis)**





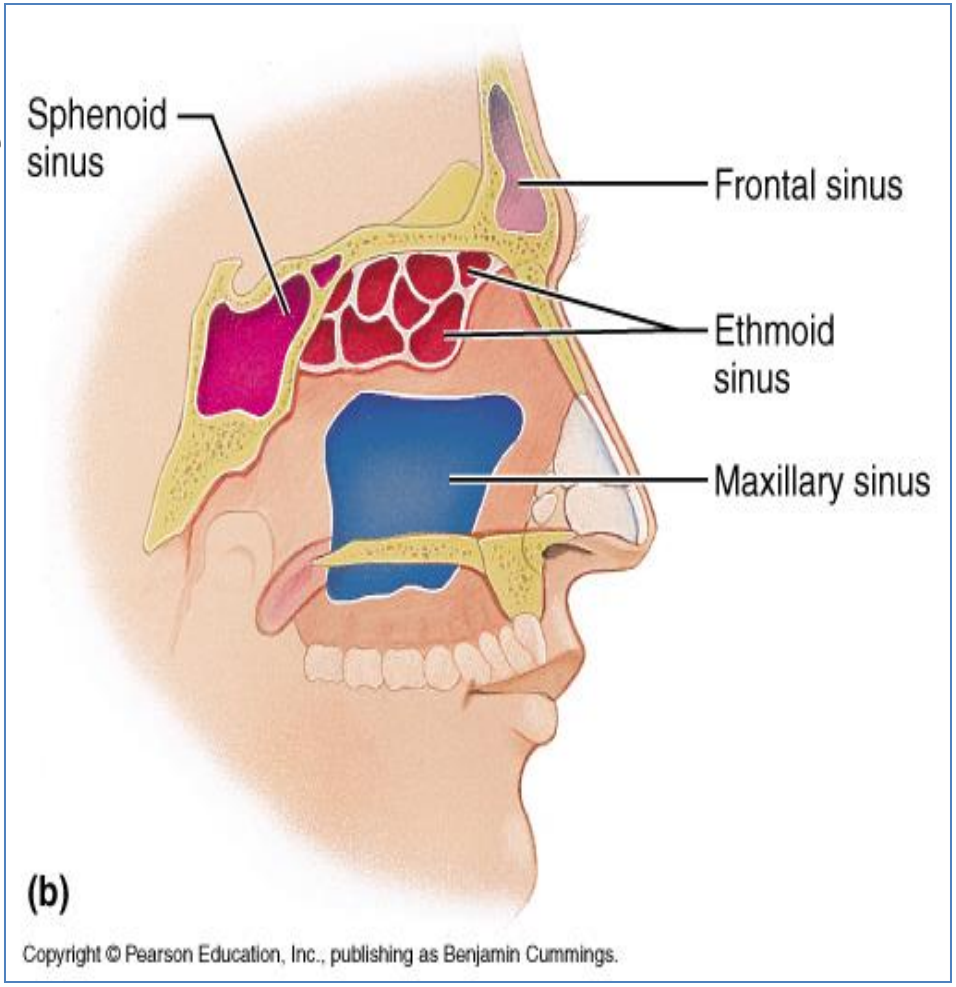


The Paranasal Sinuses



The Paranasal Sinuses

- **The paranasal sinuses are cavities found in the interior of the maxilla, frontal, sphenoid, and ethmoid bones .**
- **They are lined with mucoperiosteum and filled with air.**
- **They communicate with the nasal cavity through relatively small apertures.**

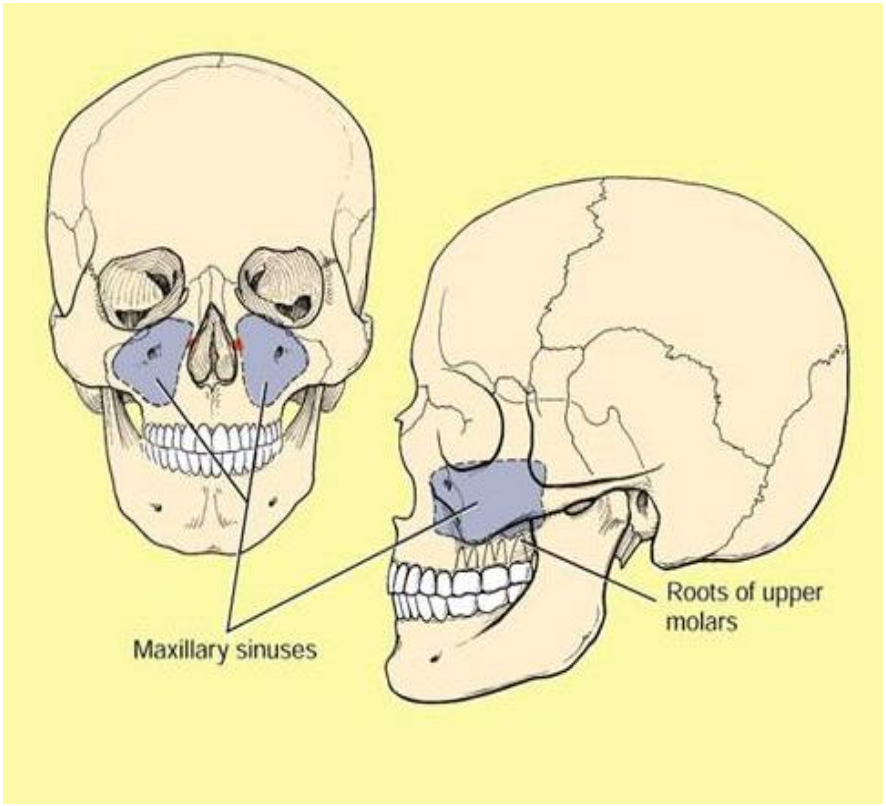


Function of Paranasal Sinuses

1. **Resonators of the voice**
2. **They also reduce the skulls weight**
3. **Help warm and moisten inhaled air**
4. **Act as shock absorbers in trauma**

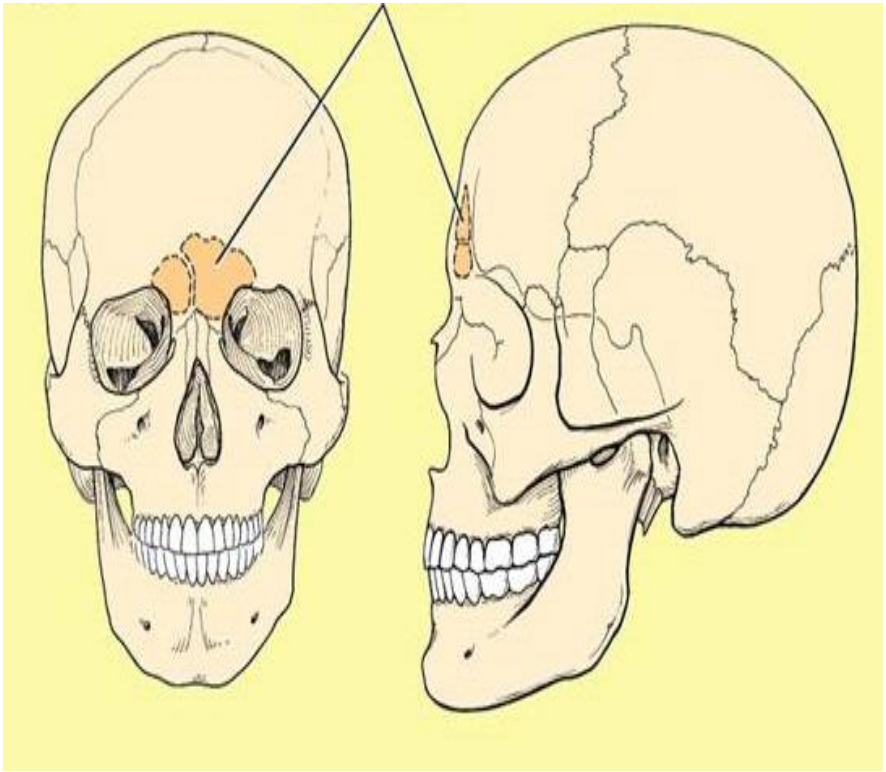
Maxillary Sinus

- **Pyramidal in shape**
- **Paired & symmetric**
- **Located within the body of the maxilla behind the skin of the cheek.**
- **The roof is formed by the floor of the orbit, and the floor is related to the roots of the 2nd premolars and 1st molar teeth.**
- **The maxillary sinus opens into the middle meatus of the nose**



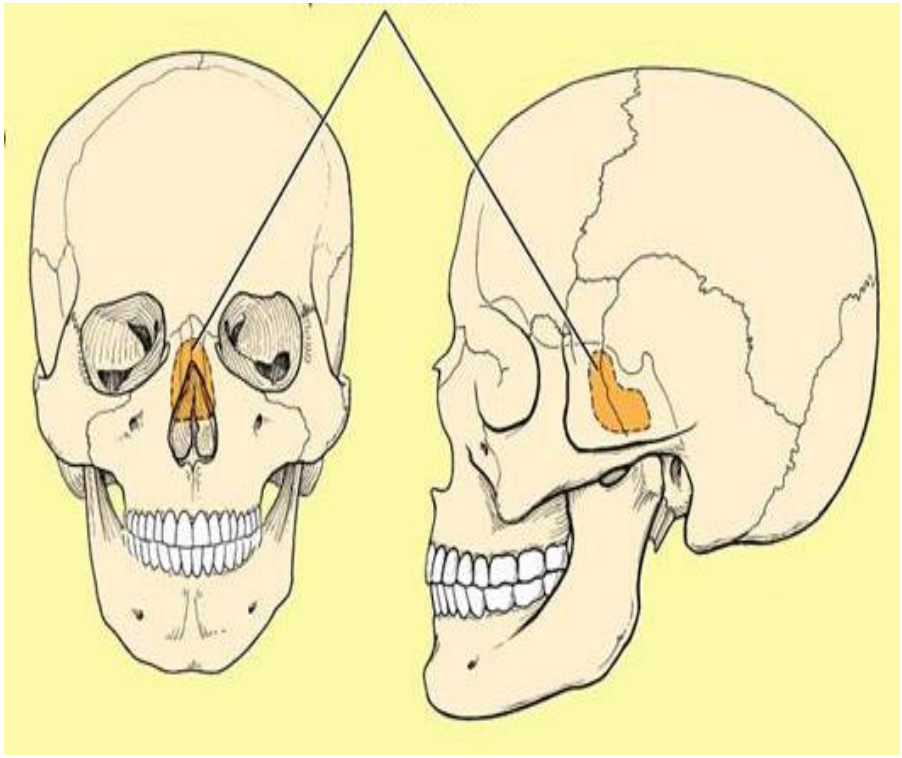
Frontal Sinuses

- **Rarely symmetrical**
- **located within the frontal bone .**
- **Separated from each other by a bony septum.**
- **Each sinus is roughly triangular**
- **Opens into the middle meatus**



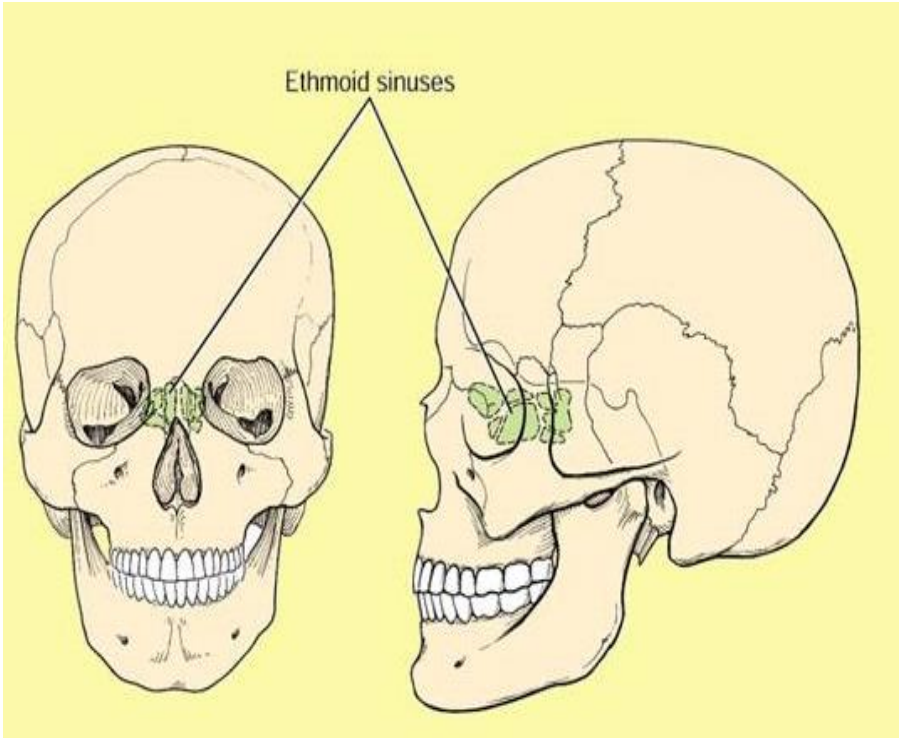
Sphenoidal Sinuses

- **Lie within the body of the sphenoid bone**
- **Below sella turcica**
  - **Extends between dorsum sellae and post clinoid processes**
- **Opens into the sphenoethmoidal recess above the superior concha**



Ethmoid Sinuses

- **They are anterior, middle, and posterior**
- **They are contained within the ethmoid bone, between the nose and the orbit**
- **Anterior & middle**
  - **Drains into middle nasal meatus**
- **Posterior**
  - **Drain into superior nasal meatus**
- **Separated from the orbit by a thin plate of bone so that infection can readily spread from the sinuses into the orbit**




Thank you