



Head & Neck Anatomy

The Nasal Region

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RESPIRATORY SYSTEM

Four major components of the respiratory system cross the head and neck: (1) the **nose**, (2) the paranasal **sinuses**, (3) the **larynx**, and (4) the **trachea**.

The Nose

The **nose** is the external and internal organ responsible for respiration, olfaction (sense of smell), humidifying air, and filtering particles.

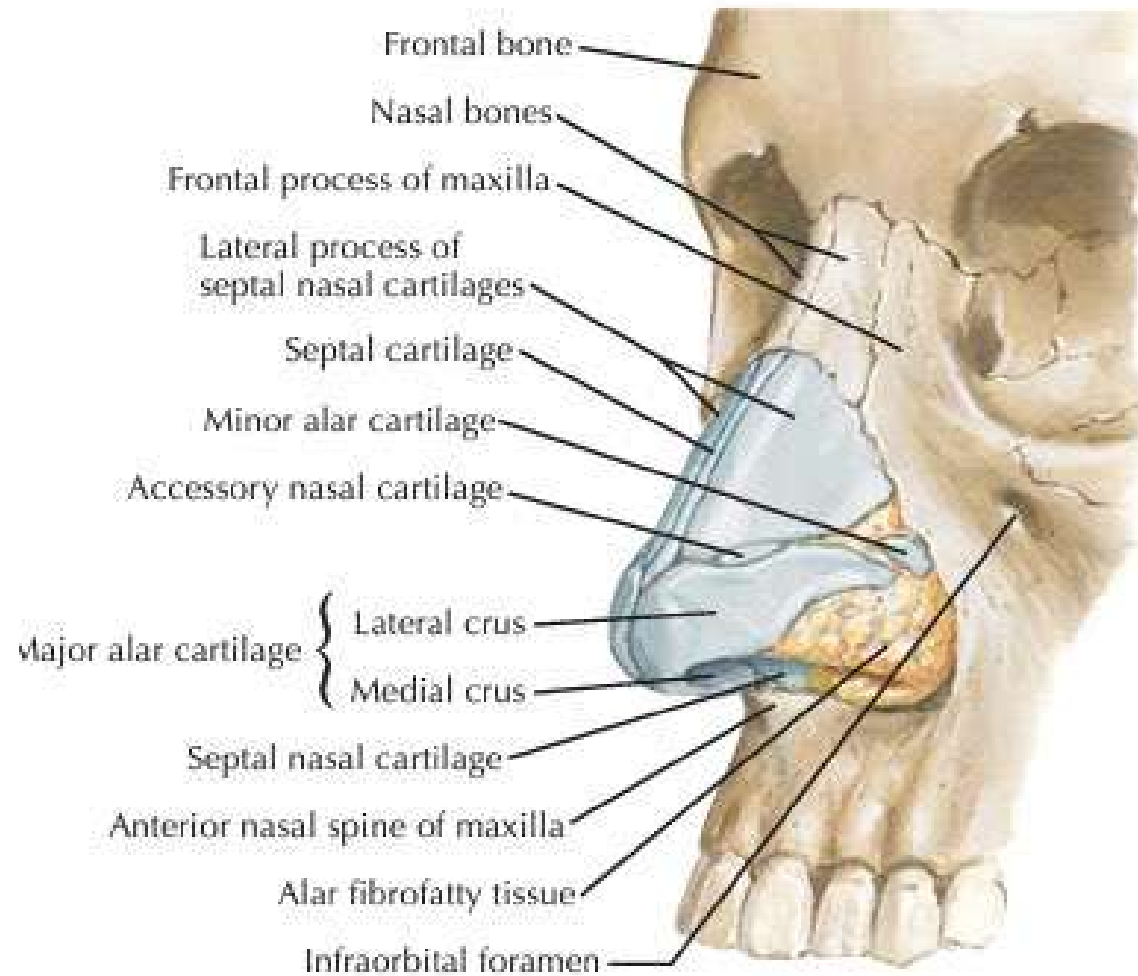
It has two main parts:

- **External Nose**
- **Nasal Cavity**

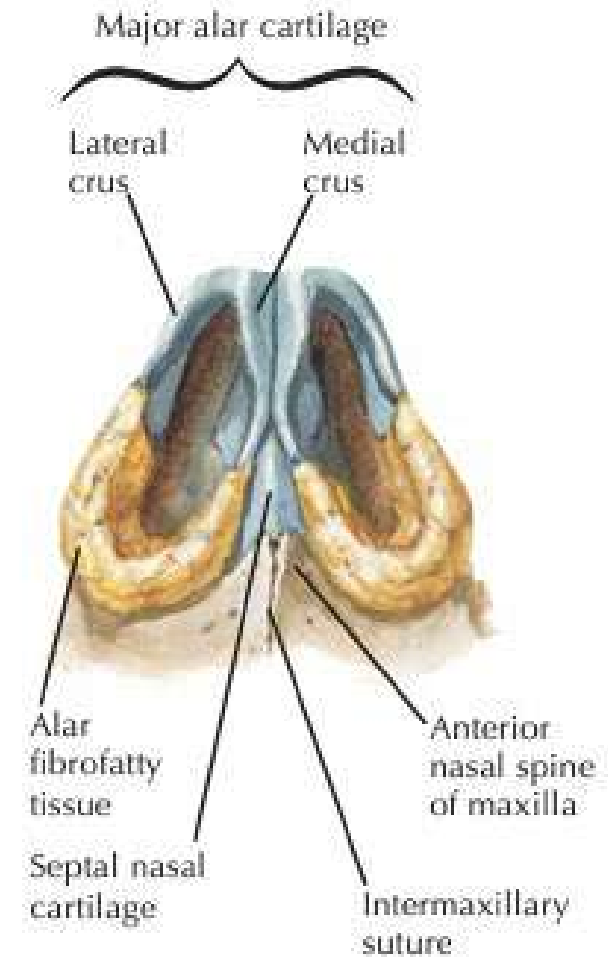
External Nose

- **Structure:** Pyramidal in shape, composed of bone (nasal bones, frontal process of maxilla) and cartilage (septal, lateral, and alar cartilages).
- **Alar cartilage** forms the lower lateral wall of the external nose
- **Features:** Includes the root, dorsum, apex (tip), nares (nostrils), and columella.

Anterolateral view

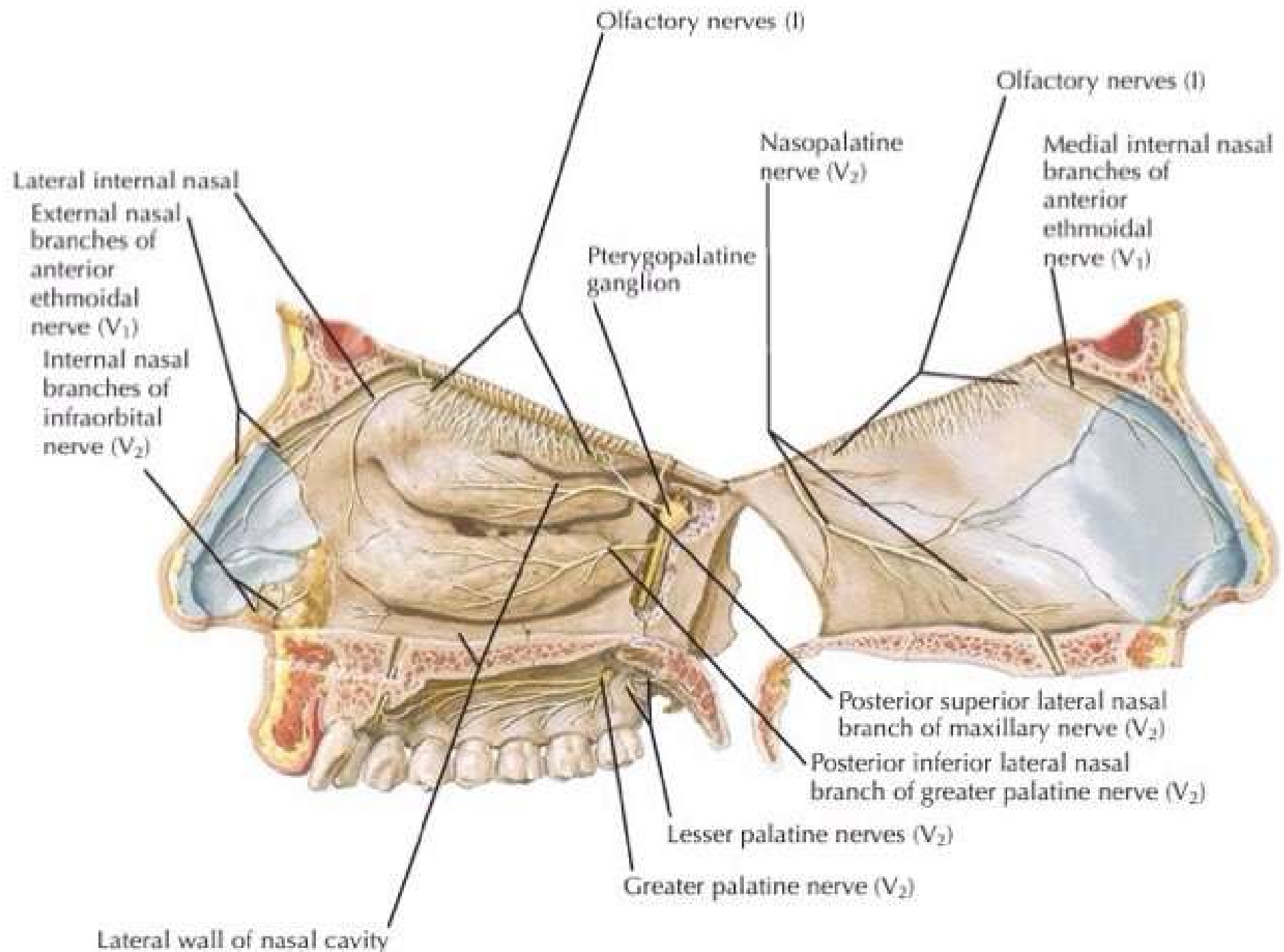


Inferior view



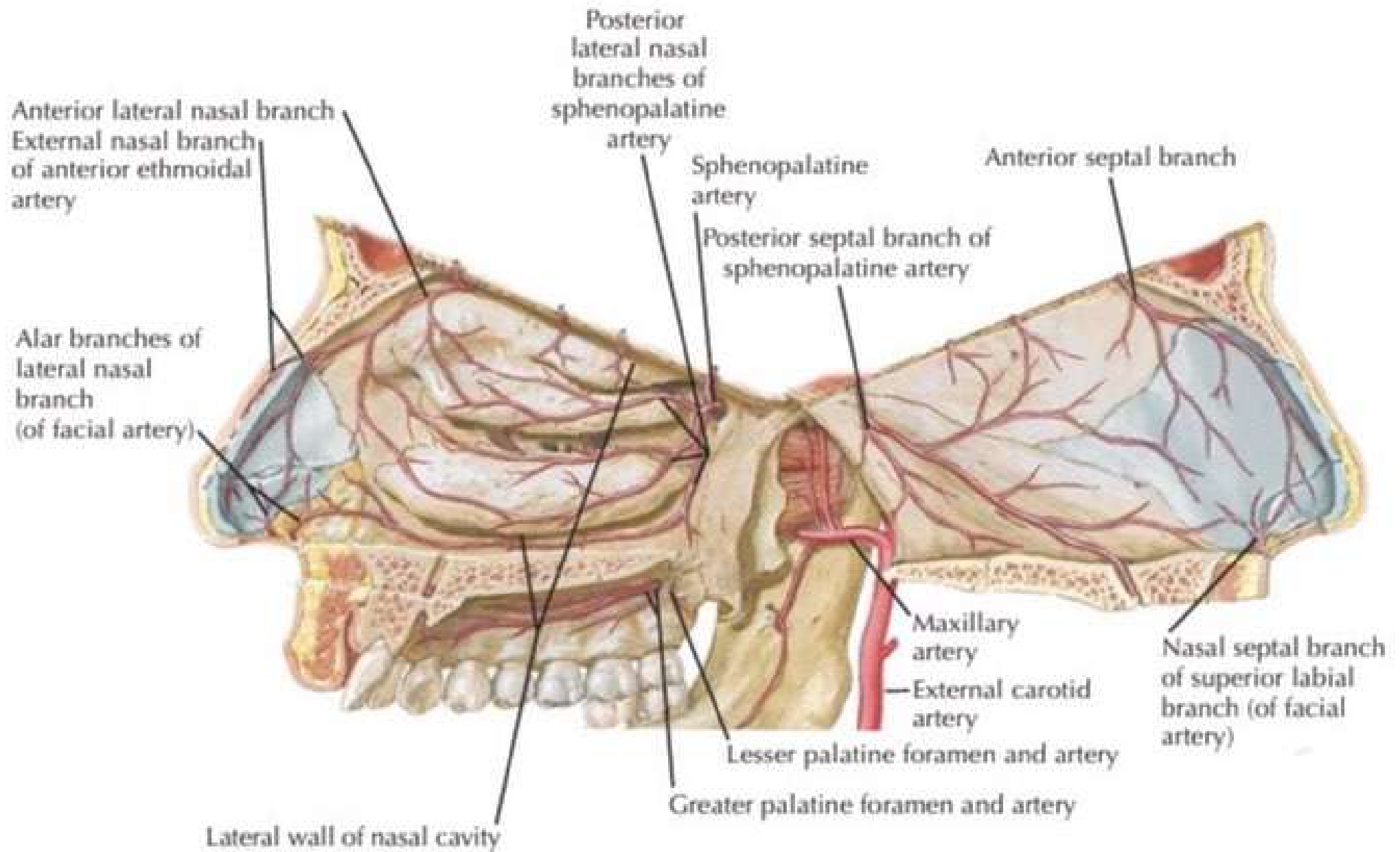
Nerve Supply of the External Nose

- **Sensory:**
 - *Dorsum and tip*: Infratrochlear and external nasal branches (from CN V1 – **ophthalmic division**).
 - *Sides*: Infraorbital nerve (from CN V2 – **maxillary division**).



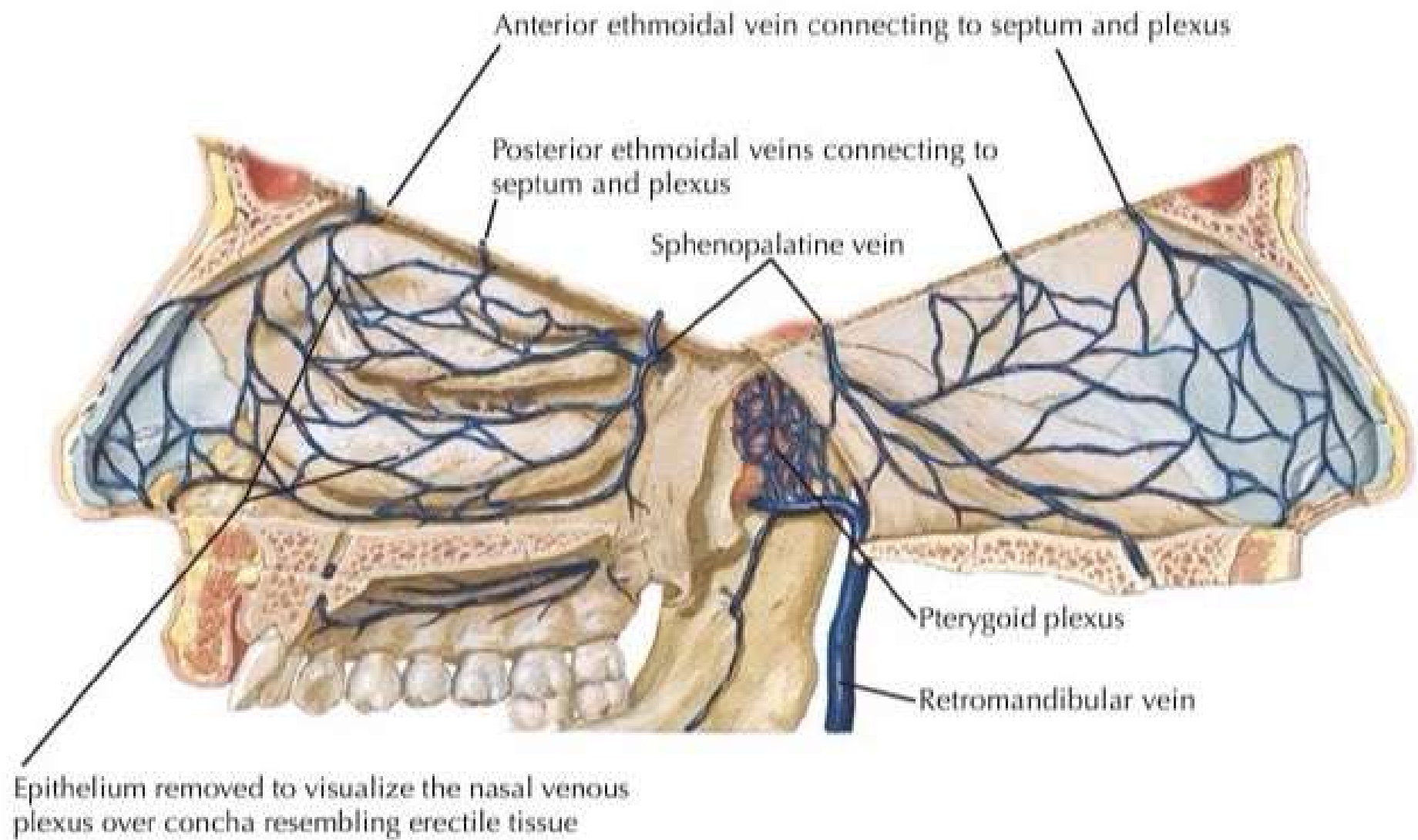
Blood Supply of the External Nose

- *Branches of facial artery*: Angular and lateral nasal arteries.
- *Dorsal nasal artery*: Branch of ophthalmic artery (from ICA).

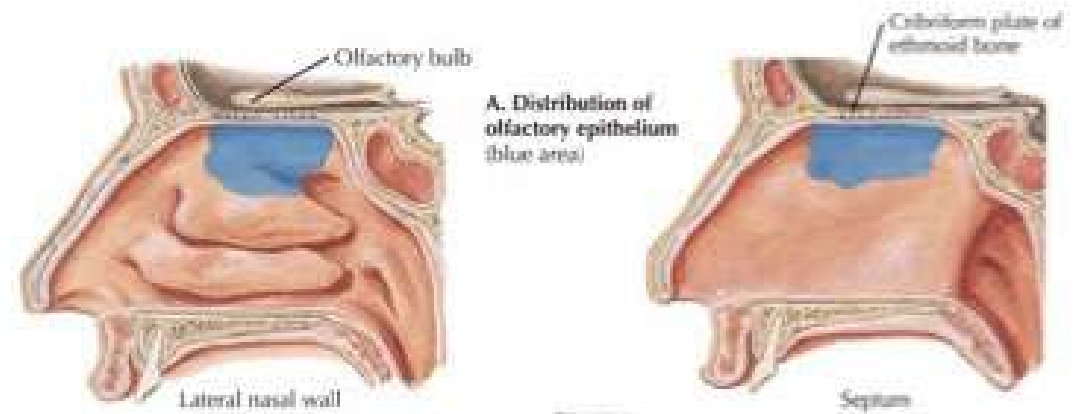


Venous Drainage of the External Nose

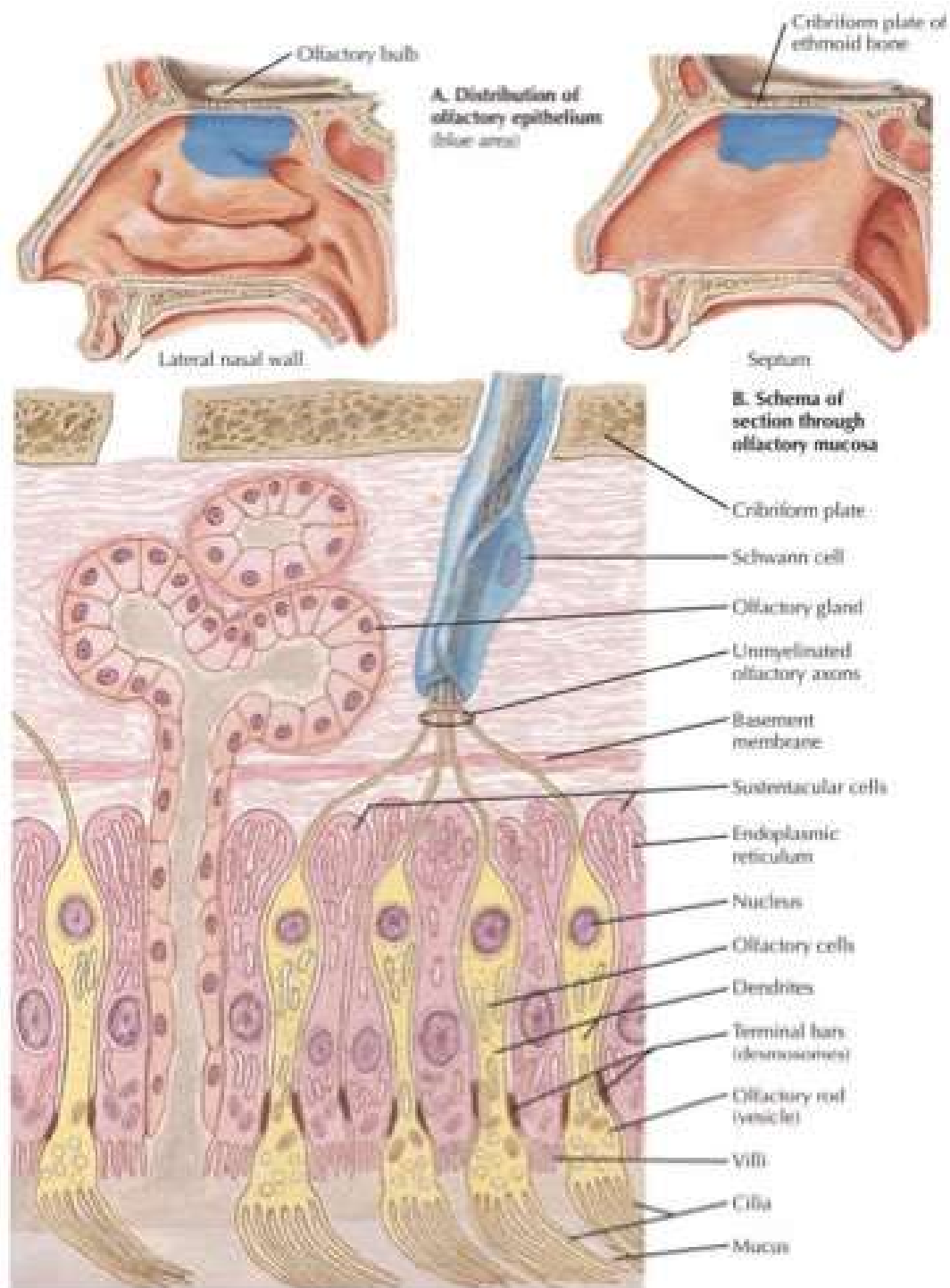
- Drains into *facial vein* (superficial route) and *ophthalmic vein* (deep route), which connects to the **cavernous sinus** → clinical relevance in infections (e.g., cavernous sinus thrombosis).



Nasal Cavity

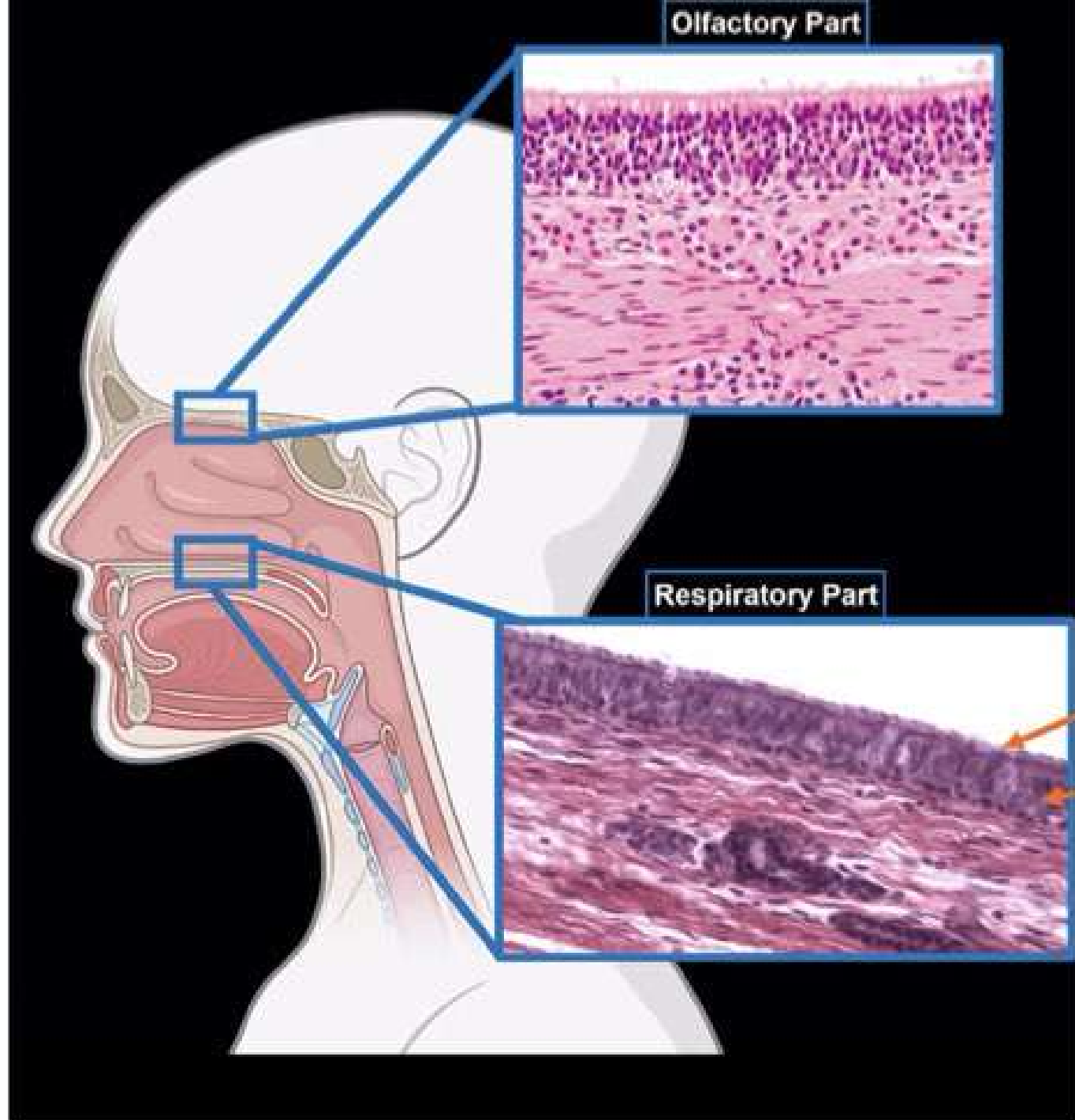


- Divided into:
 - **Nasal septum** (medial wall)
 - **Lateral wall** (with nasal conchae)
- Lined by **respiratory mucosa**, except for the **olfactory area** in the upper part.
- The **roof** of the nasal cavity is mainly formed by cribriform plate of ethmoid.



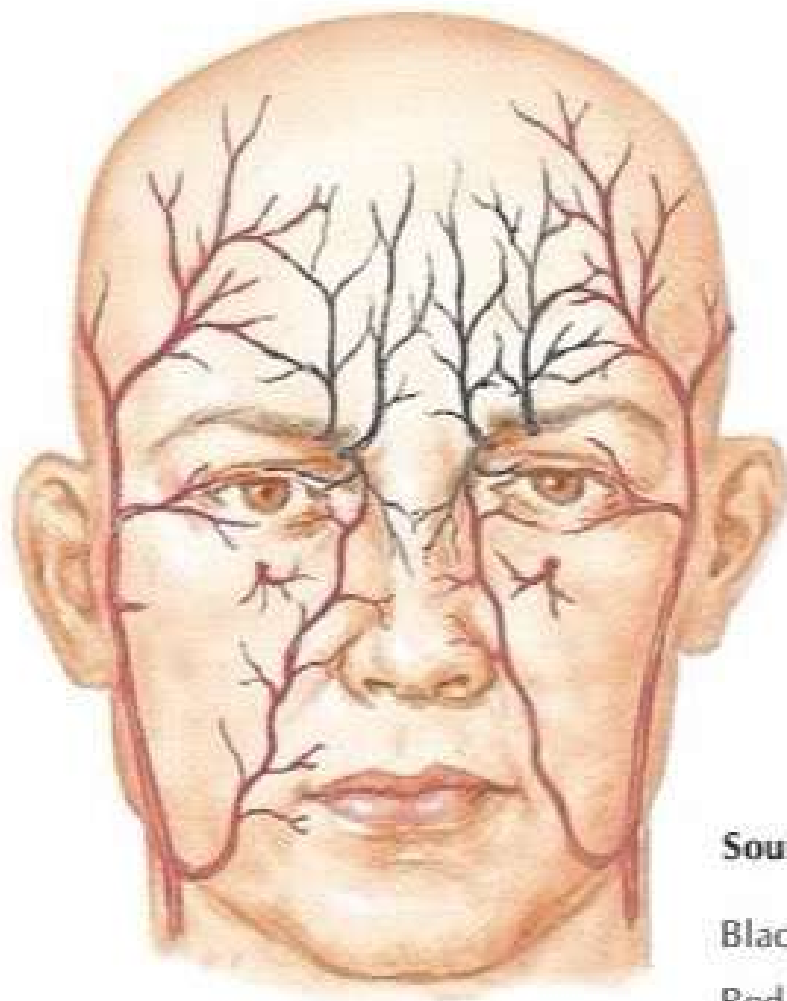
Mucous Membrane of the Nasal Cavity

- **Respiratory region:** Ciliated pseudostratified epithelium; warms and moistens air.
- **Olfactory region:** Contains olfactory receptor cells (bipolar sensory neurons) (CN I); located near the superior nasal concha and upper septum.



Blood Supply to the Nasal Cavity

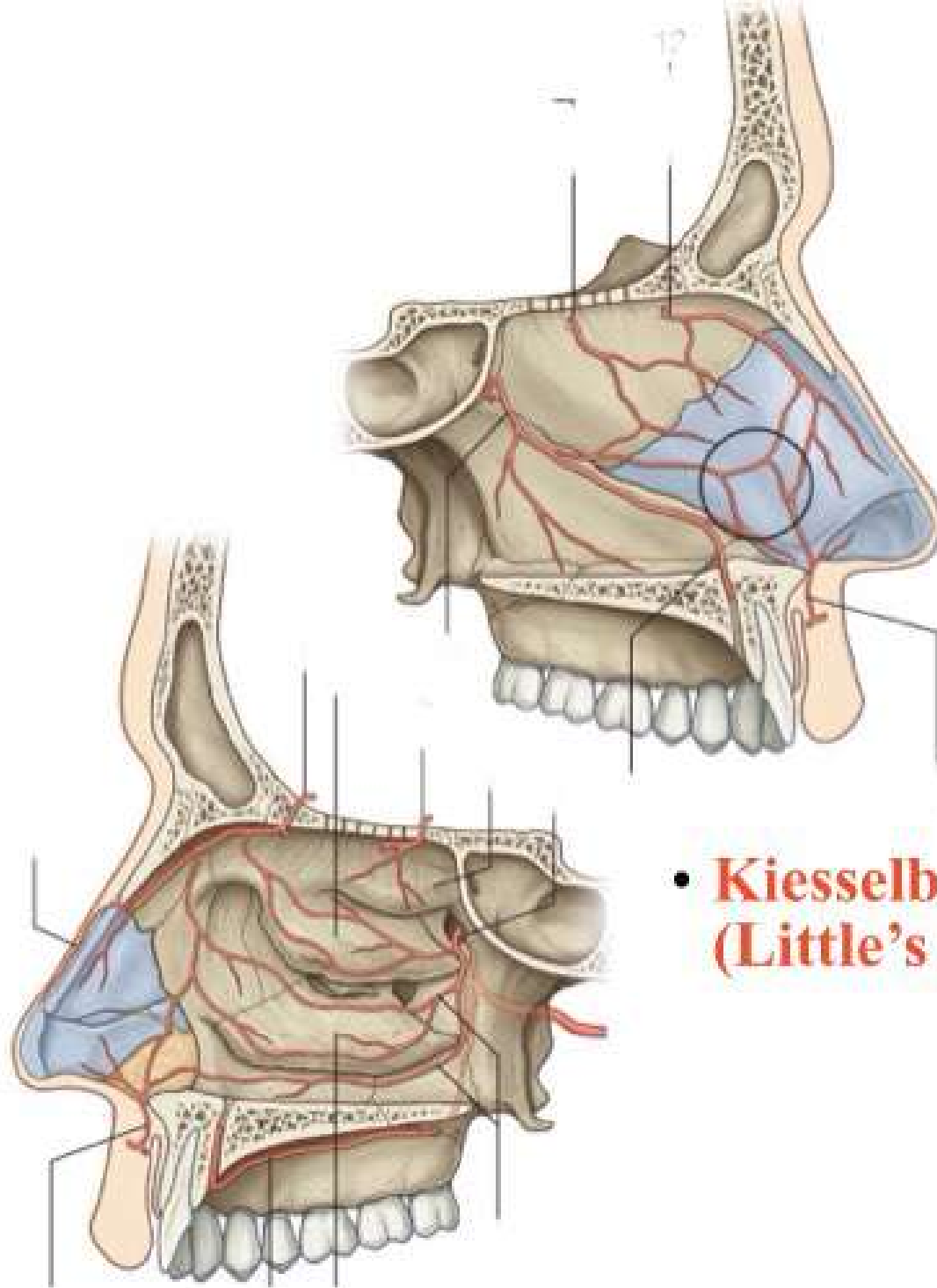
- Supplied by both internal and external carotid arteries:
 - **ICA**: Anterior and posterior ethmoidal arteries.
 - **ECA**: Sphenopalatine, greater palatine, superior labial.
- **Kiesselbach's plexus (Little's area)**: Common site for epistaxis (nosebleeds).



Sources of arterial supply of face

Black: from internal carotid artery (via ophthalmic artery)

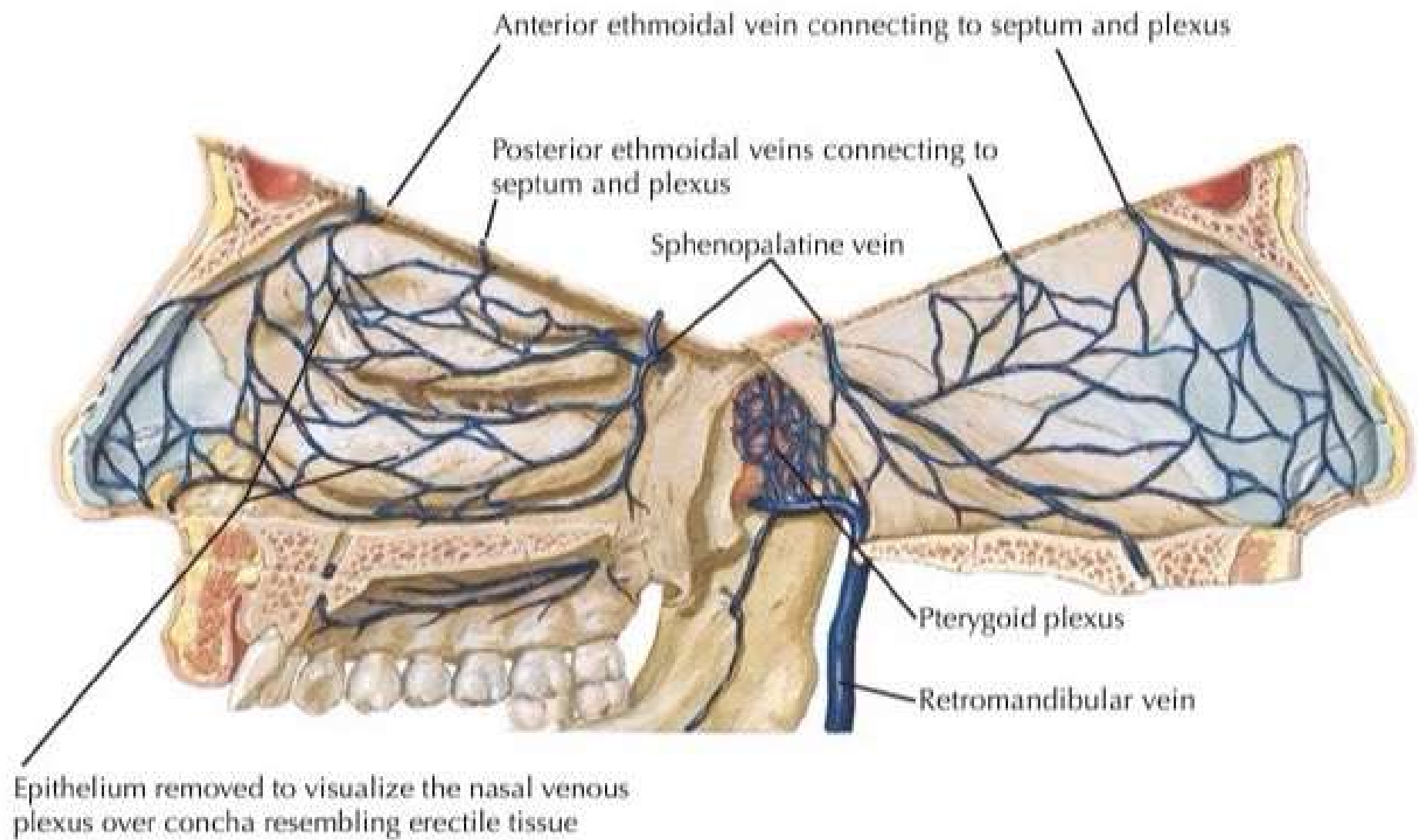
Red: from external carotid artery



- **Kiesselbach's plexus
(Little's area)**

Venous Drainage of the Nasal Cavity

- Drains into:
 - *Facial vein* (superficial)
 - *Pterygoid venous plexus*
 - *Ophthalmic vein* → risk of infection spreading to *cavernous sinus*.

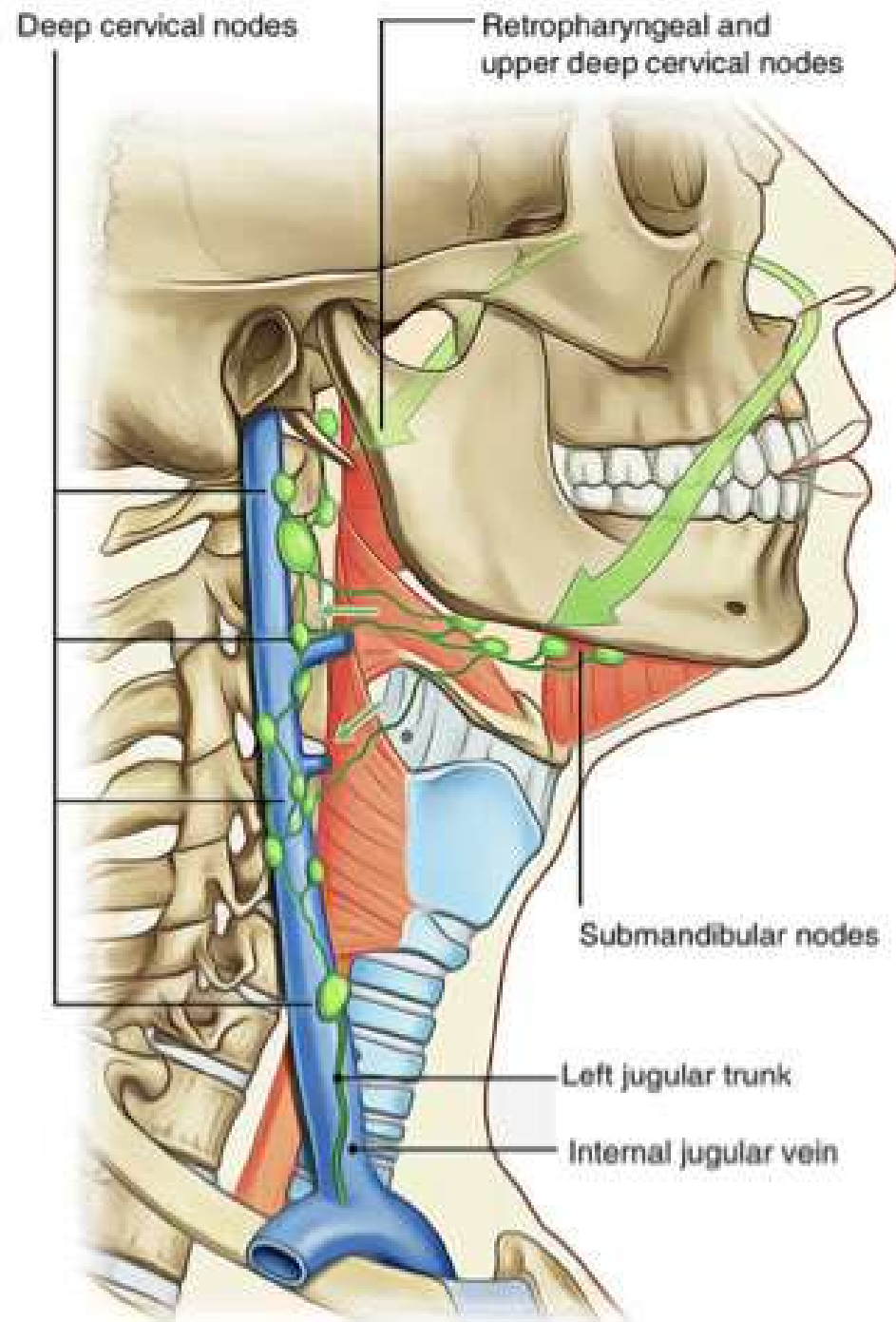


Nerve Supply of the Nasal Cavity

- **Olfactory nerve (CN I):** Special sense of smell.
- **Trigeminal nerve (CN V):**
 - *Anterior-superior part:* V1 (anterior ethmoidal branch).
 - *Posterior-inferior part:* V2 (nasopalatine and greater palatine nerves).

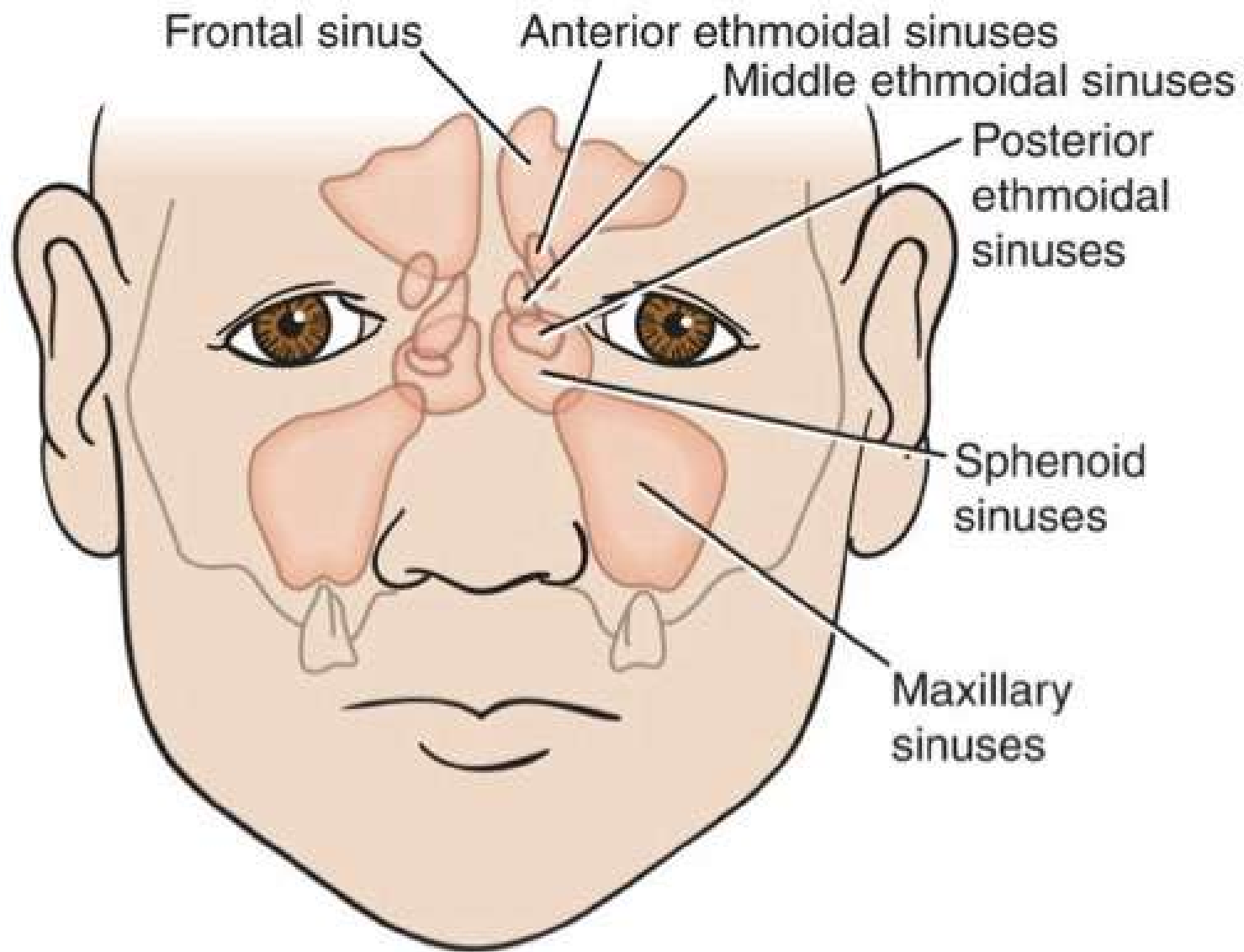
Lymphatic Drainage of the Nasal Cavity

- **Anterior part** → Submandibular nodes
- **Posterior part** → Retropharyngeal and deep cervical nodes



Paranasal Sinuses

The paranasal sinuses are cavities 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.



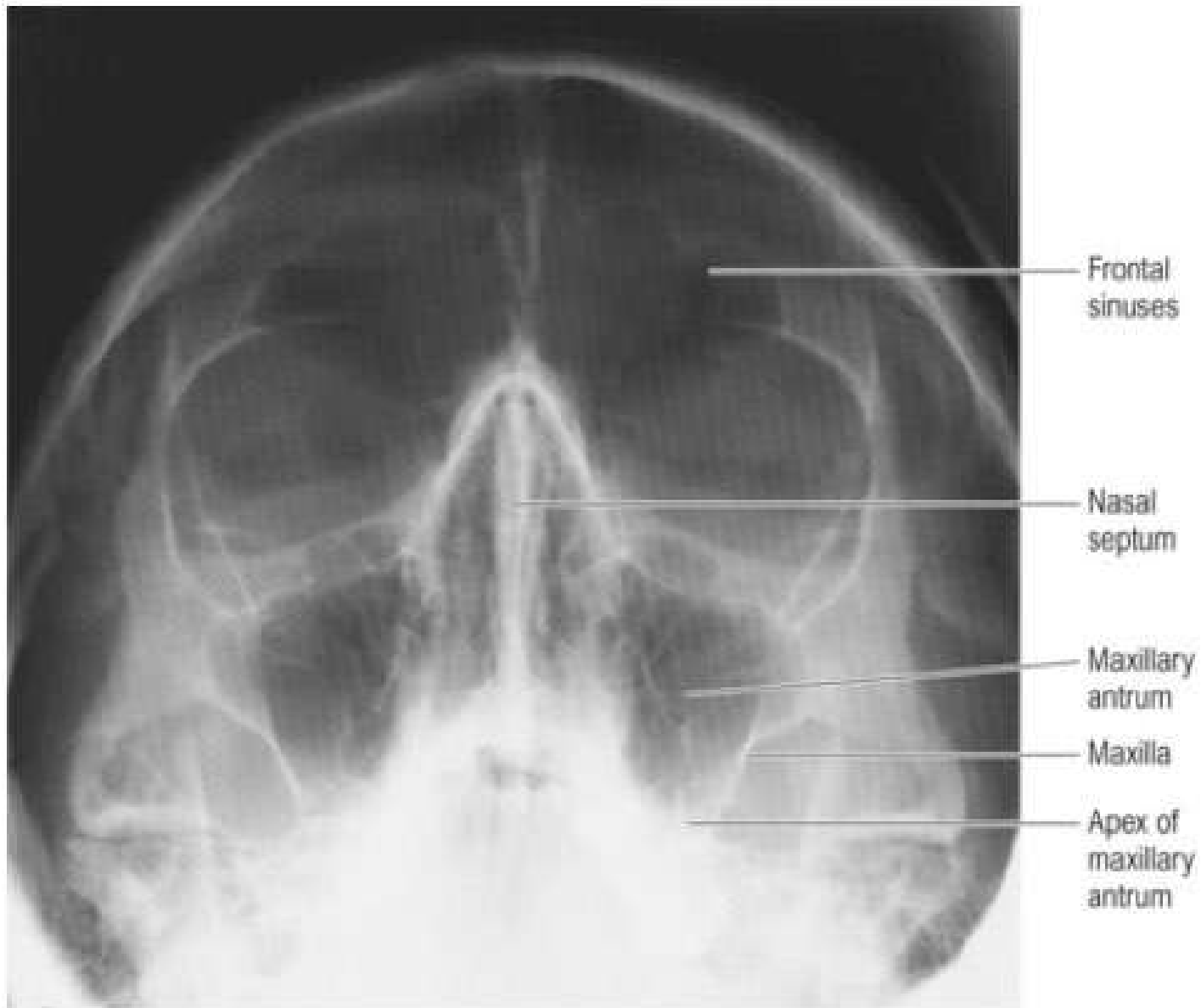
The Paranasal Sinuses

- Maxillary
- Frontal
- Ethmoidal
- Sphenoidal

All lined with respiratory epithelium and communicate with the nasal cavity.

Functions of Paranasal Sinuses

- Lighten skull
- Increase voice resonance
- Humidify and warm inhaled air
- Provide mucus for nasal cavity



Drainage of Mucus of Paranasal Sinuses

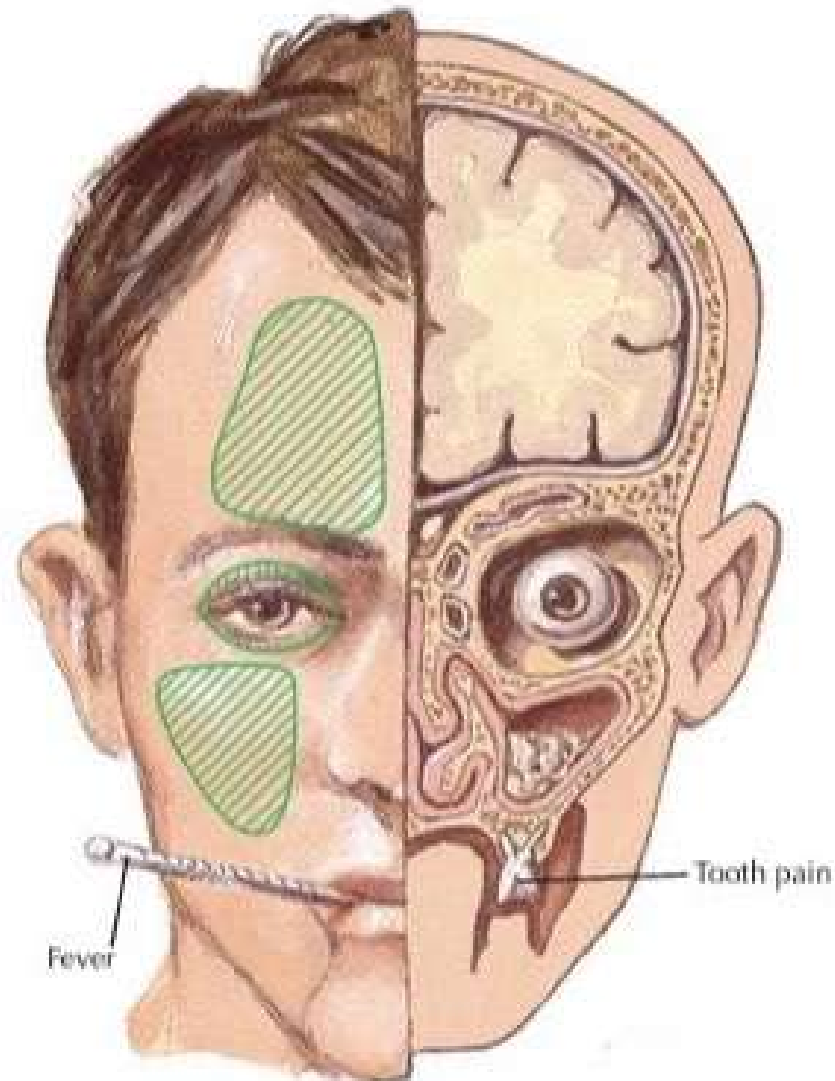
- Maxillary, frontal, and anterior ethmoid → *Middle meatus*
- Posterior ethmoid → *Superior meatus*
- Sphenoid → *Sphenoethmoidal recess*

SINUS	SITE OF DRAINAGE
Maxillary sinus	Middle meatus through hiatus semilunaris
Frontal sinuses	Middle meatus via infundibulum
Sphenoid sinuses	Sphenoethmoidal recess
Ethmoid sinuses	
Anterior group	Infundibulum and into the middle meatus
Middle group	Middle meatus on or above bulla ethmoidalis
Posterior group	Superior meatus

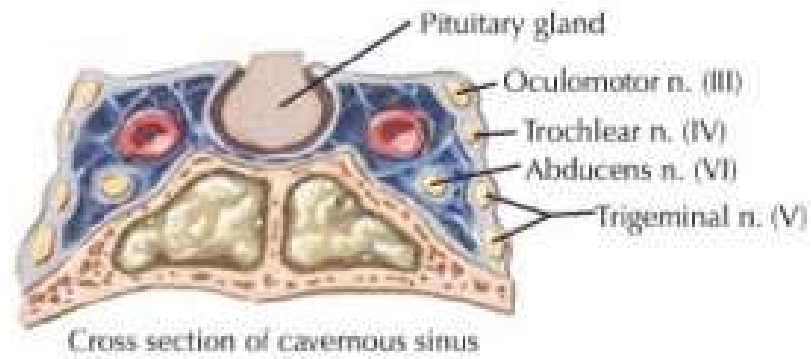
Clinical Notes

- **Epistaxis (nose bleeds):** Common in Little's area.
- **Sinusitis:** Inflammation of sinuses; maxillary sinus is most commonly affected.
- **Deviated Nasal Septum:** Can obstruct airflow or drainage.
- **Cavernous Sinus Thrombosis:** Due to infection from "danger triangle" of the face.
- **Nasal polyps:** Non-cancerous growths due to chronic inflammation.
- **CSF Rhinorrhea:** Leakage from anterior cranial fossa fracture.

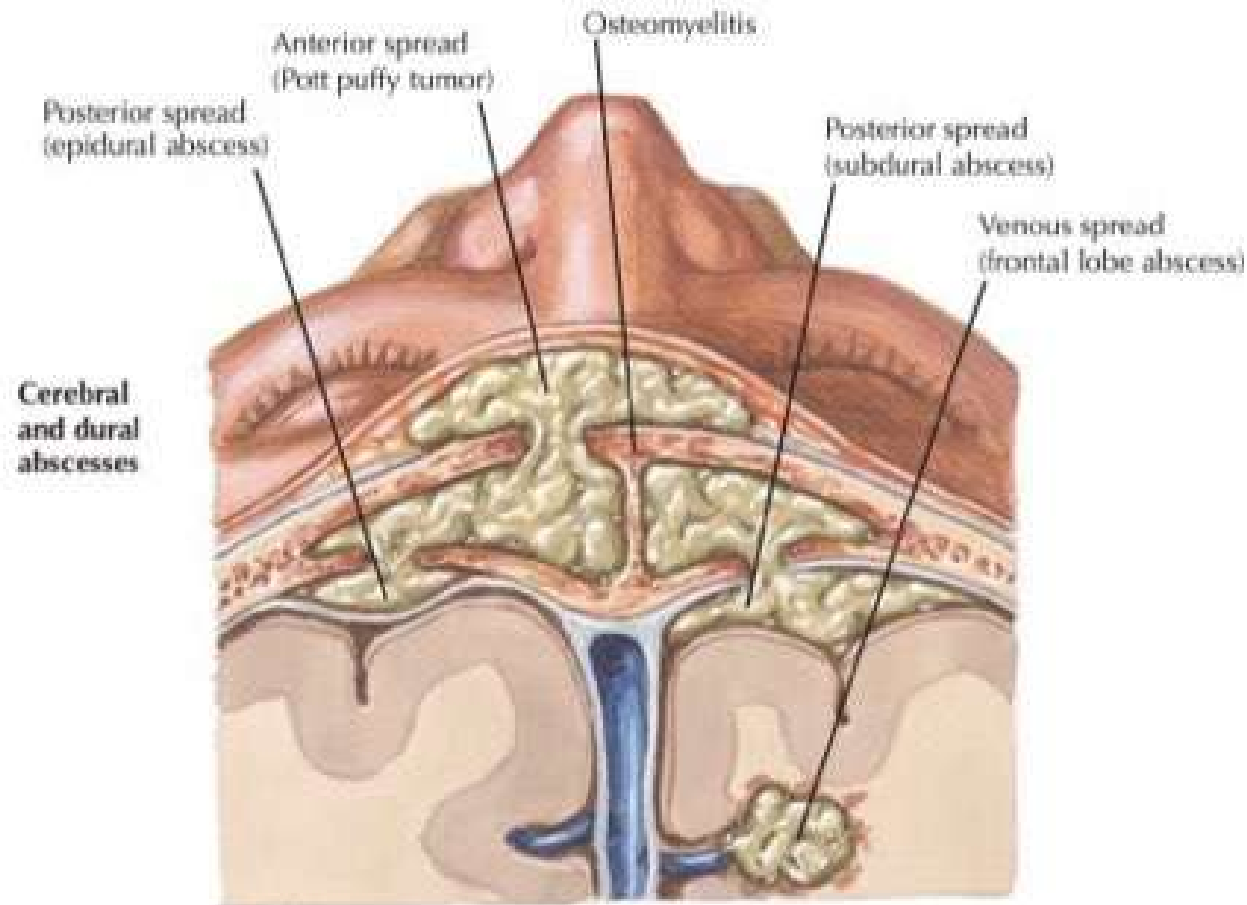
- **Sinusitis**



Areas of pain and tenderness (green). Pain caused by pressure in obstructed sinus



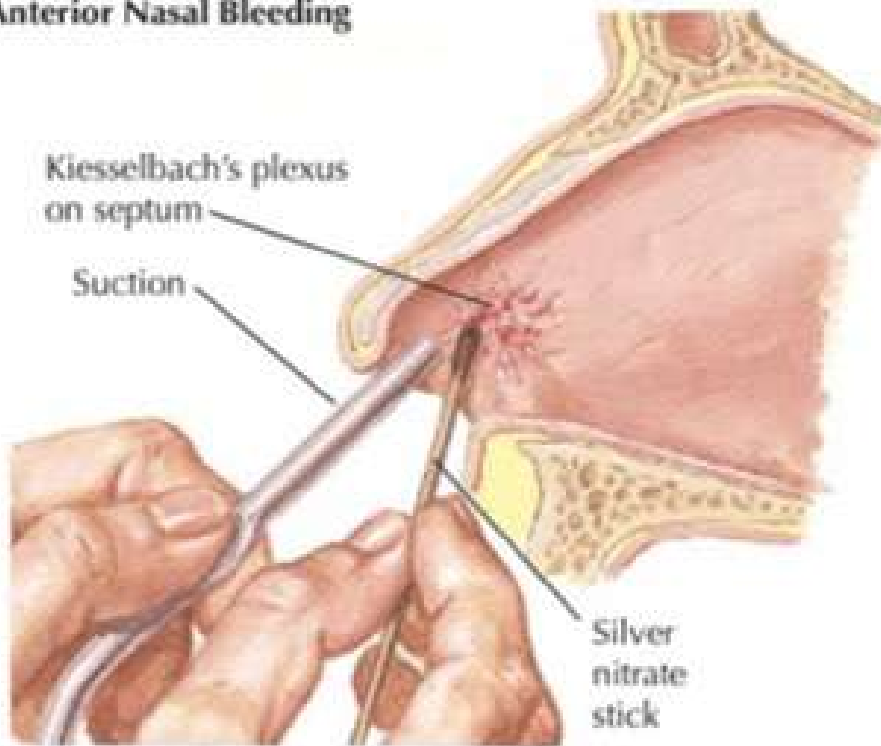
- **Cavernous Sinus Thrombosis**



Routes of intracranial spread of frontal sinusitis

- **Epistaxis (nose bleeding):** Common in Little's area.

Cauterization of Anterior Nasal Bleeding



Placement of Anterior Pack

