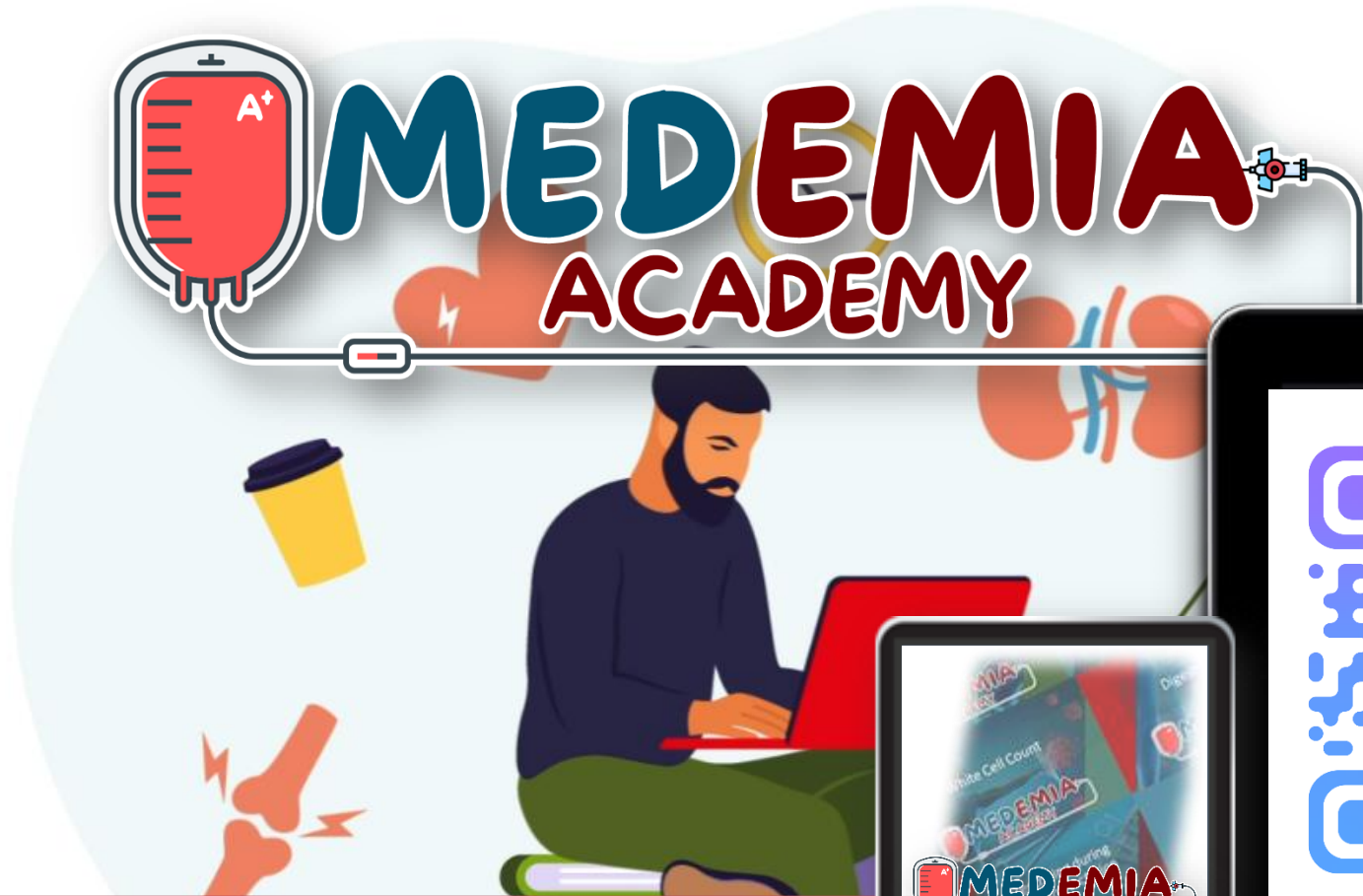


# Nose and Paranasal Sinuses





# MEDEmia ACADEMY



# Intended Learning Outcomes

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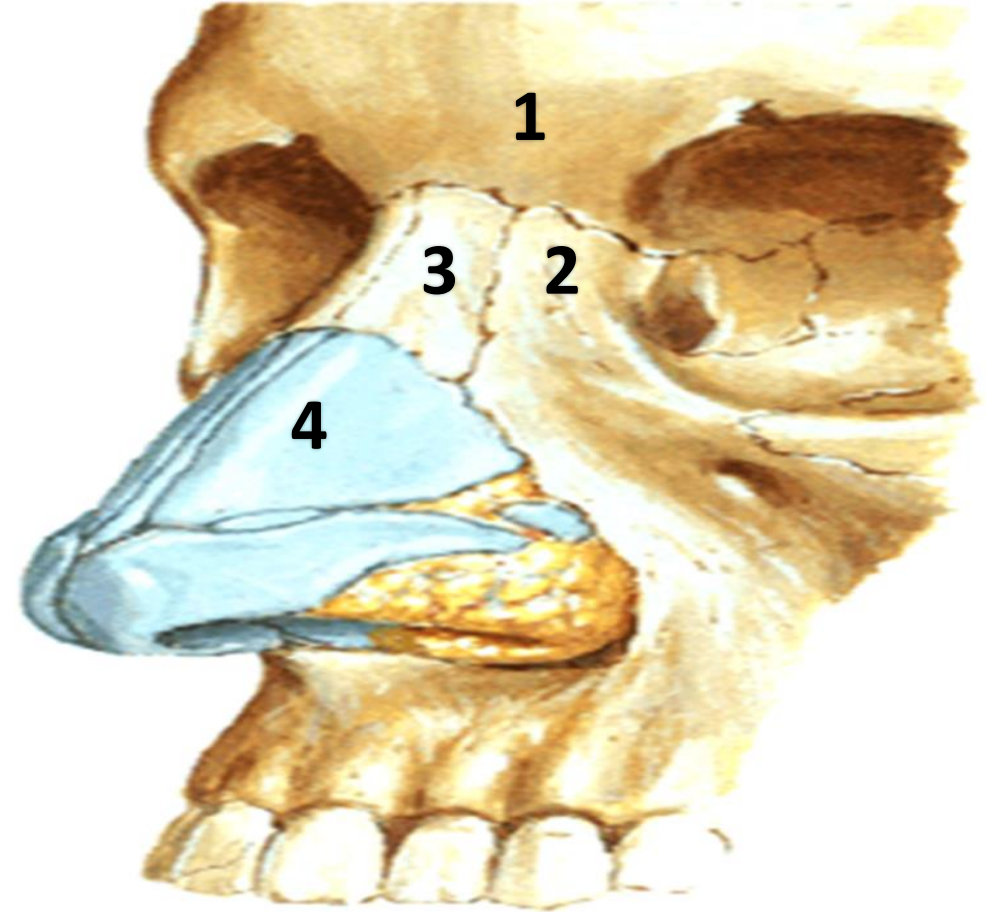
- ❖ Boundaries of the nasal cavity
- ❖ Features of the lateral wall of the nasal cavity
- ❖ Blood supply of the nose
- ❖ Little's area and Epistaxis
- ❖ Paranasal sinuses (openings, blood supply, nerve supply and lymphatic drainage)
- ❖ Clinical notes about the paranasal sinuses



# Boundaries External Nose

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1. Frontal bone
2. Frontal process of the maxilla
3. Nasal bone
4. Nasal cartilage



An anatomical illustration of the human head in profile, showing the skeletal structure and the underlying muscles and soft tissues. The nasal cavity is highlighted in a light blue color, and the surrounding structures like the sinuses and nasal passage are also visible. The illustration is set against a dark blue background with red diagonal accents.

# Nasal Cavity

# Nasal Cavity

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- ❖ The cavity of the nose is dividing into right and left halves by the nasal septum.
- ❖ Each cavity opens:
  - Anteriorly on the face by the anterior nasal aperture (nostril).
  - Posteriorly into the nasopharynx by the posterior nasal aperture.



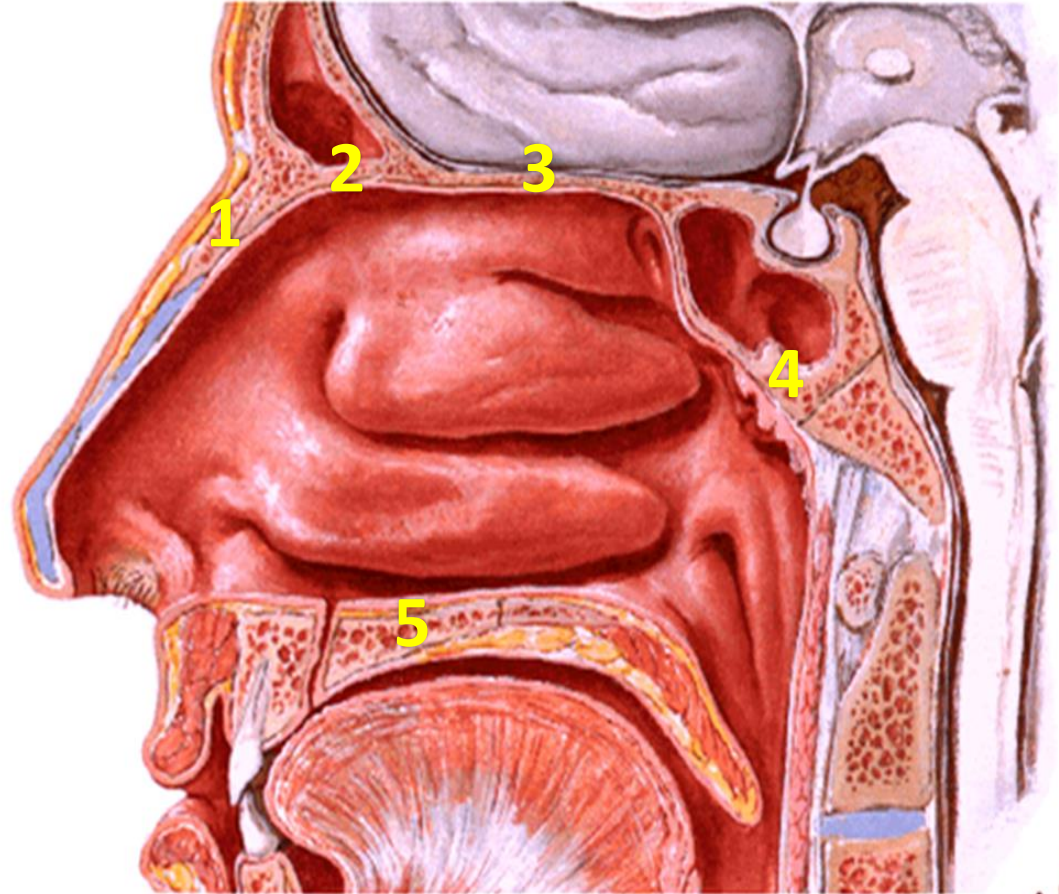
# Boundaries of the Nasal Cavity

## ❖ Roof

1. Nasal bone
2. Frontal bone
3. Cribriform plate of ethmoid bone
4. Body of the sphenoid

## ❖ Floor

5. Hard palate (separating the nasal cavity from the oral cavity)

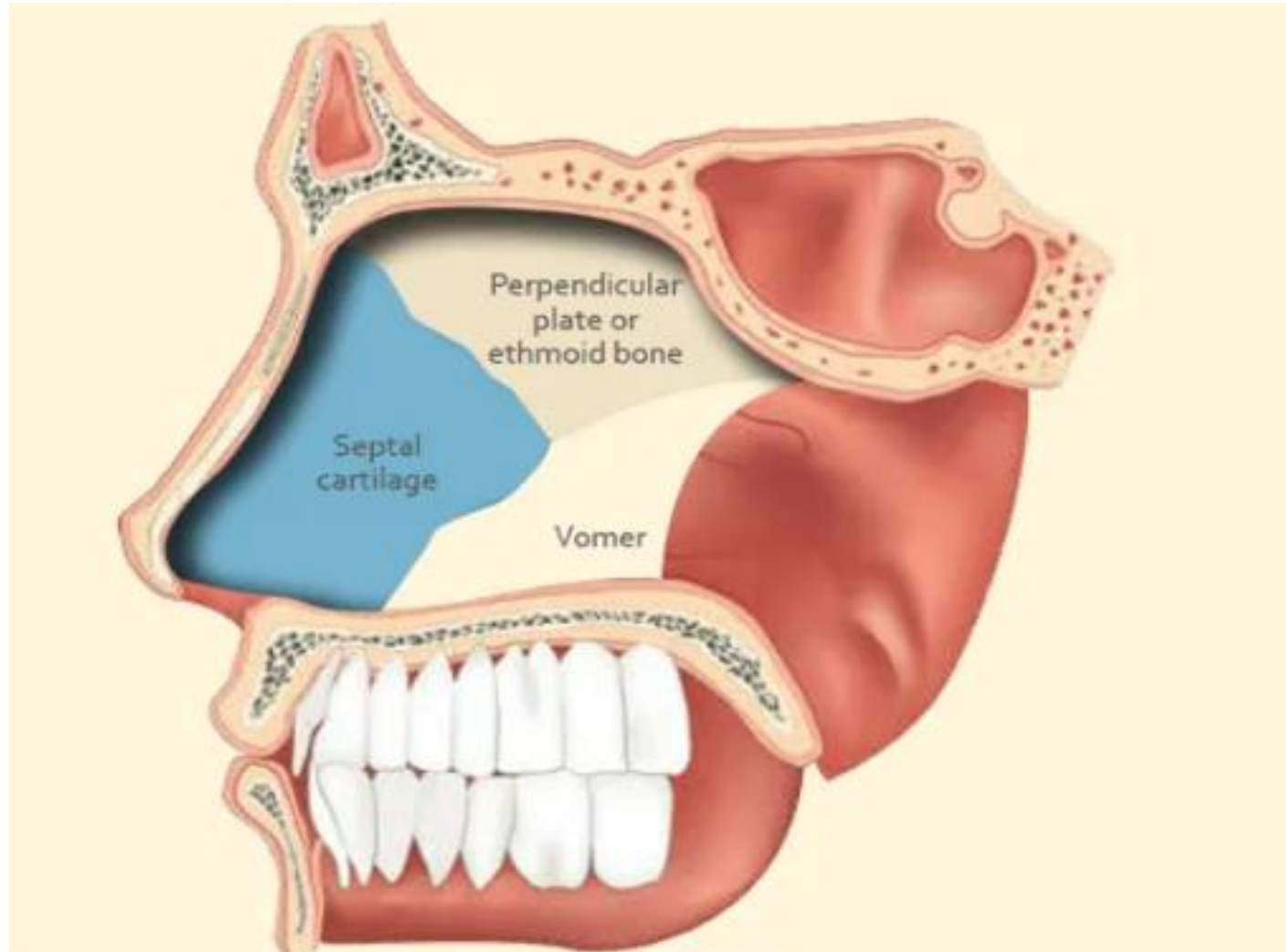


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# Nasal Septum (Medial Wall)

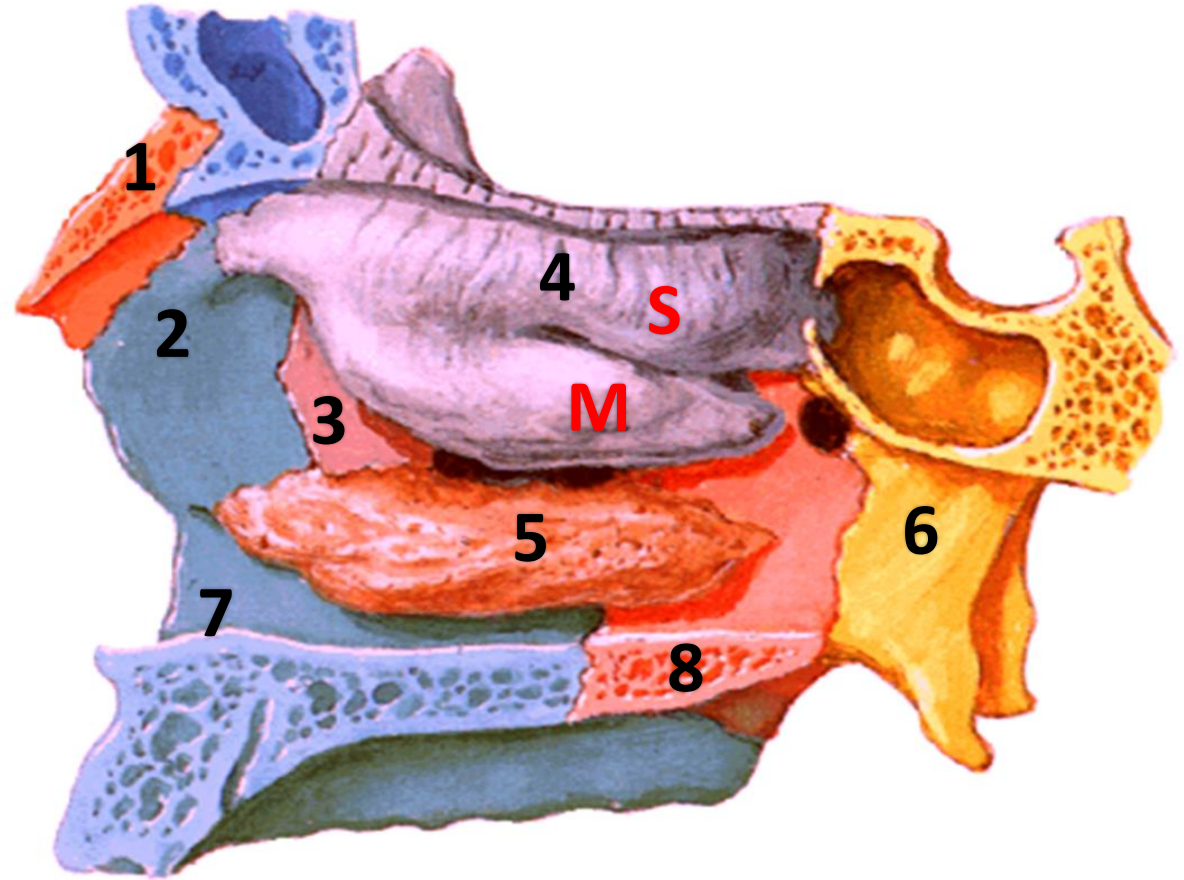
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# Lateral Wall

1. Nasal cartilage and bone
2. Frontal process of the maxilla
3. Lacrimal bone
4. Ethmoid bone
  - Superior concha
  - Middle concha
5. Inferior concha
6. Medial pterygoid plate of the sphenoid bone
7. Maxillary bone
8. Palatine bone



# Boundaries of the Nasal Cavity

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## ❖ The floor:

- hard palate separating it from the oral cavity (palatine process of maxilla & horizontal plate of palatine bone).

## ❖ The roof:

- Anterior sloping part: formed by the nasal and frontal bones.
- Middle horizontal part: formed by cribriform plate of ethmoid.
- Posterior Sloping part: formed by body of sphenoid.

## ❖ The medial wall (nasal septum) :

- Anteriorly: septal cartilage.
- Postero-superiorly: perpendicular plate of ethmoid.
- Postero-inferiorly: Vomer bone (single bone).

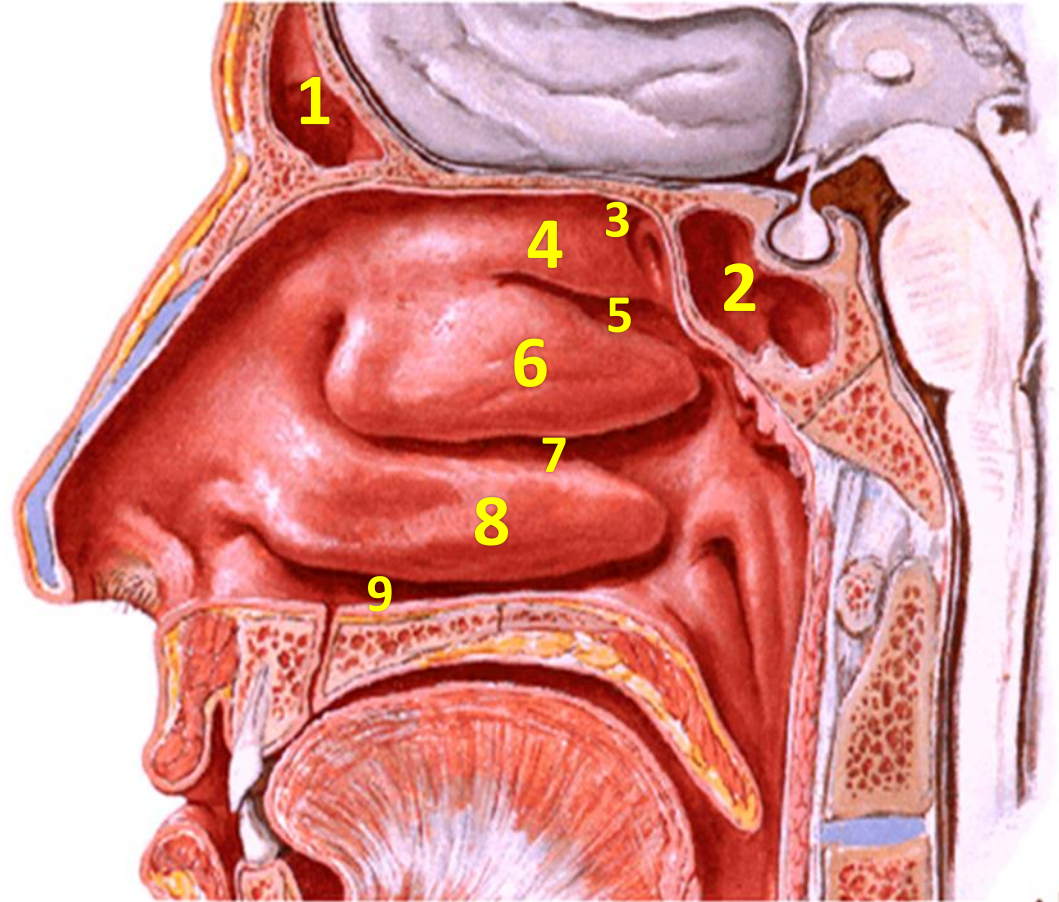
## ❖ Lateral wall of the nasal cavity

- Anteriorly:
  - Cartilage, nasal bone and frontal process of maxilla.
- Posteriorly
  - Upper part: ethmoid bone, lacrimal bone.
  - Lower part: inferior concha, maxilla, palatine bone, and medial pterygoid plate



# Lateral Wall

1. Frontal sinus
2. Sphenoid air sinus
3. Sphenoethmoidal recess
4. Superior concha
5. Superior meatus
6. Middle concha
7. Middle meatus
8. Inferior concha
9. Inferior meatus



*F. Net*



# Lateral Wall

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- ❖ **Nasal conchae (turbinates):** 3 shelves-like elevations separated by spaces called meatuses.
  - **Superior Concha:** is the smallest one and is part of the ethmoid bone (superior meatus below it).
  - **Middle Concha:** is medium sized and also part of the ethmoid bone (middle meatus below it).
  - **Inferior Concha:** is the largest one and is a separate bone (inferior meatus below it).



# Lateral Wall

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## ❖ Openings in the nasal meatuses of the lateral wall:

- Sphenoethmoidal recess: above the superior concha.

- It receives the opening of the **sphenoidal air sinus**.

- **S**uperior meatus: below superior concha

- It receives the opening of the **poSterior ethmoidal air sinus**.

- Middle meatus: below middle concha and shows:

- Bulla ethmoidalis: a rounded elevation overlies the **middle ethmoidal air sinus** and receives its opening.

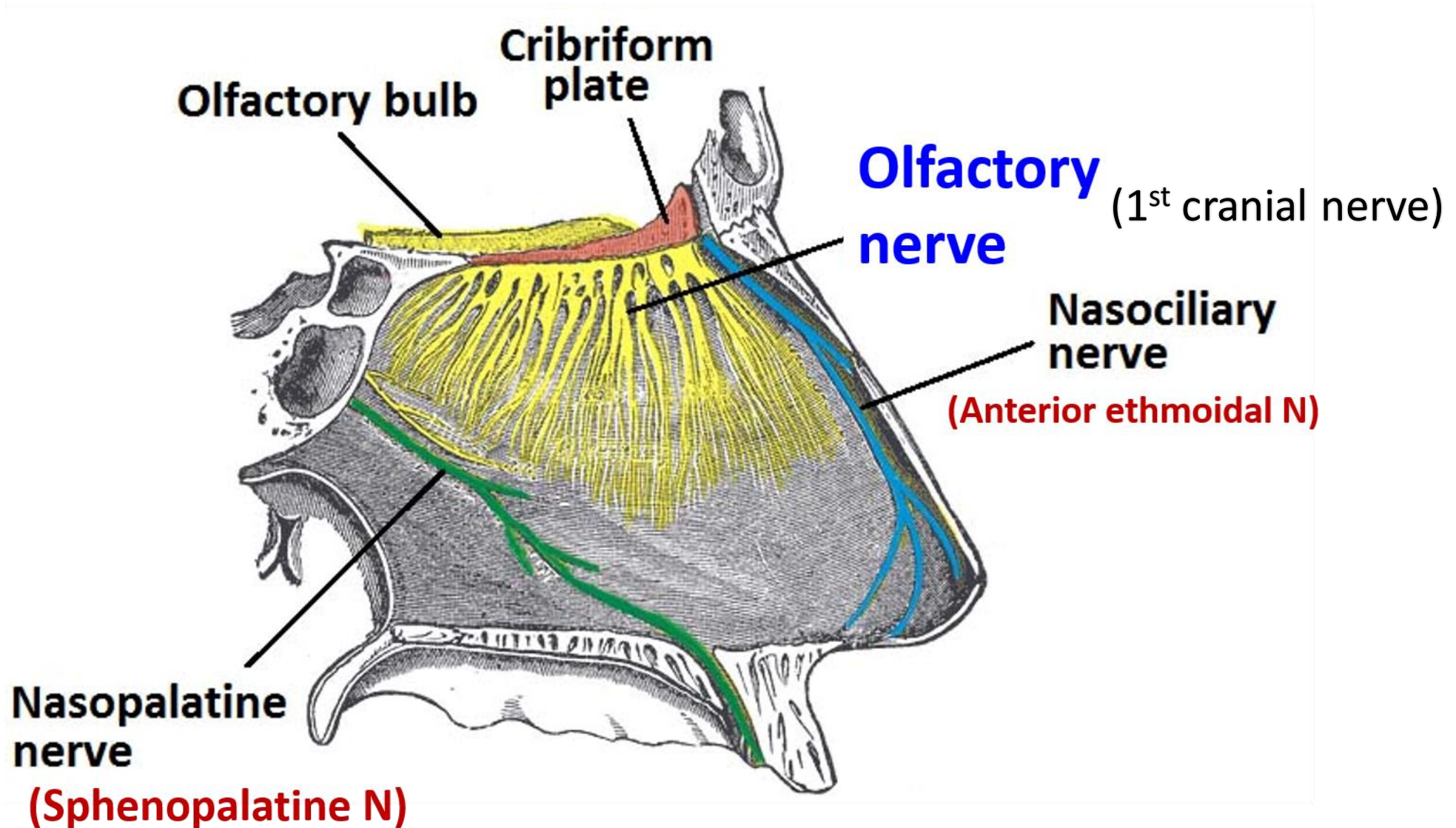
- Hiatus semilunaris: a crescent groove below the bulla ethmoidalis receiving the opening of

- **Frontal air sinus** opens into the anterior end.
- **Anterior ethmoidal air sinuses**.
- **Maxillary air sinus** opens near the posterior end.

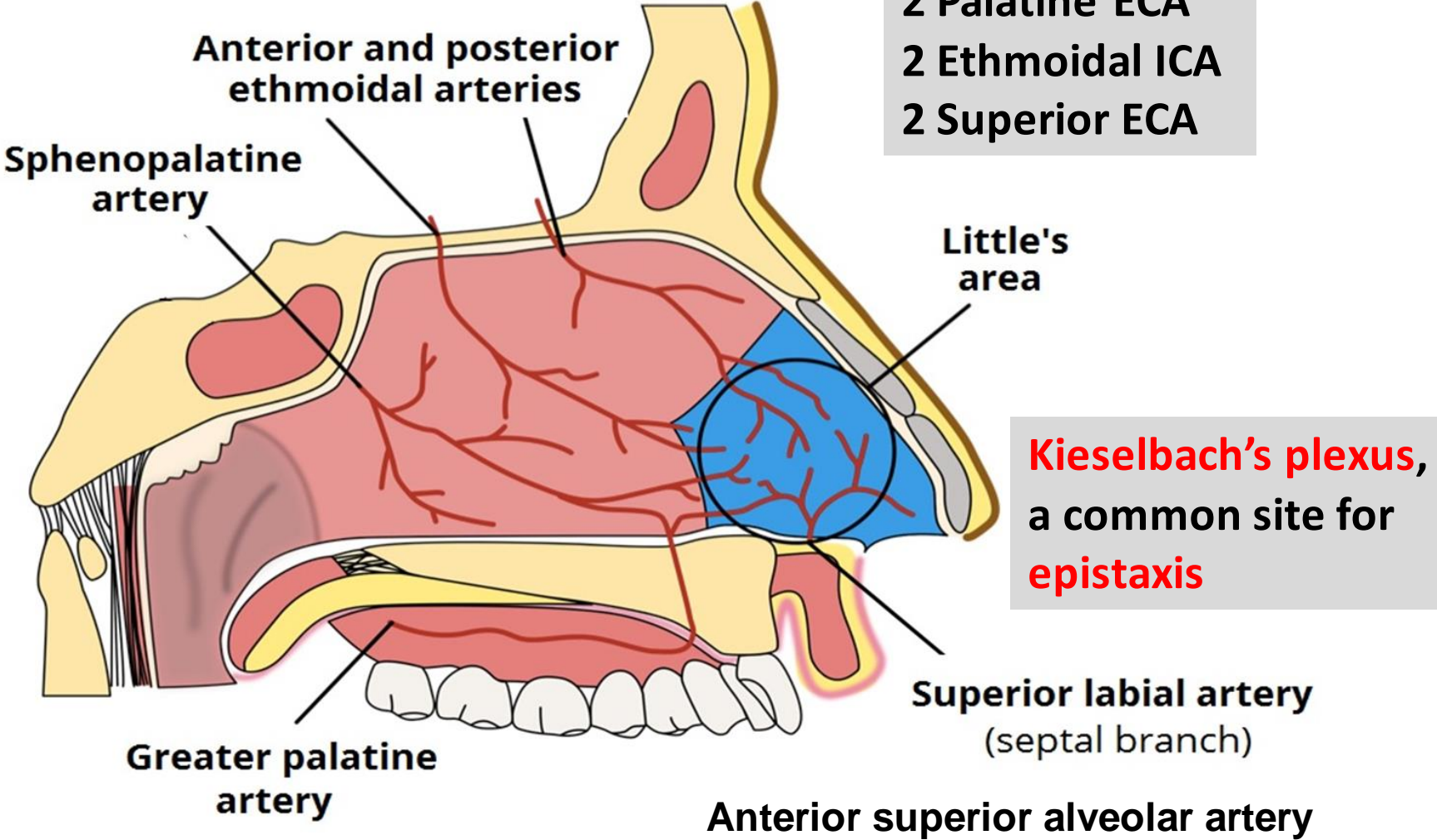
- Inferior meatus: below inferior concha and receives the opening of **nasolacrimal duct**.



# Nerve supply of the nose



# Arterial blood supply of the Nose



# Vascular supply and drainage of the Nose

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## ❖ Arterial supply of the nose:

- **Sphenopalatine artery:** from the 3rd part of maxillary artery (**main source of blood supply**).
- **Greater palatine** from the 3rd part of maxillary artery,
- **Anterior and posterior ethmoidal** from ophthalmic artery.
- **Septal branch of the superior labial artery** (facial artery).
- **Anterior superior alveolar artery** from the 3rd part of maxillary artery.

## ❖ Venous drainage:

- The veins drain into the pterygoid and pharyngeal venous plexus and facial vein.

## ❖ Lymphatic drainage

- Anterior Part: drains into the submandibular lymph nodes.
- Posterior Part: drains into the retropharyngeal and upper deep cervical lymph nodes.





# Applied Anatomy

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- ❖ **Little's area** is an area on the inferior and anterior part of the nasal septum showing rich arterial anastomosis (**Kieselbach's plexus**). This anastomosis is formed by:
  - Sphenopalatine artery.
  - Greater palatine artery.
  - Anterior and posterior ethmoidal arteries.
  - Septal branch of superior labial artery.
- ❖ This area is a common site for epistaxis (bleeding from the nose).
- ❖ To stop the bleeding:
  - Sit down and firmly pinch the soft part of the nose for 10-15 min, **not lean backward** because blood drains to throat
  - Nasal pack soaked with adrenaline in the vestibule.
  - Cauterization of the bleeding arteries.
  - Ligation of the 3rd part of the maxillary artery.



# Anastomosis between ECA & ICA in the nose

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## ❖ Internal carotid artery branches:

- Anterior and posterior ethmoidal from ophthalmic artery

## ❖ External carotid artery branches:

- Sphenopalatine artery: from the 3rd part of maxillary artery (main source of blood supply).
- Greater palatine branch of the 3rd part of maxillary artery.
- Septal branch of the superior labial artery (facial artery).
- Anterior superior alveolar artery (from infra orbital artery) from 3rd part of maxillary artery.



An anatomical illustration of the human face, showing the skull, muscles, and paranasal sinuses. The sinuses are highlighted in a light green color. The illustration is set against a dark blue background with red diagonal accents on the left and right sides.

# Paranasal Sinuses

# Paranasal Sinuses

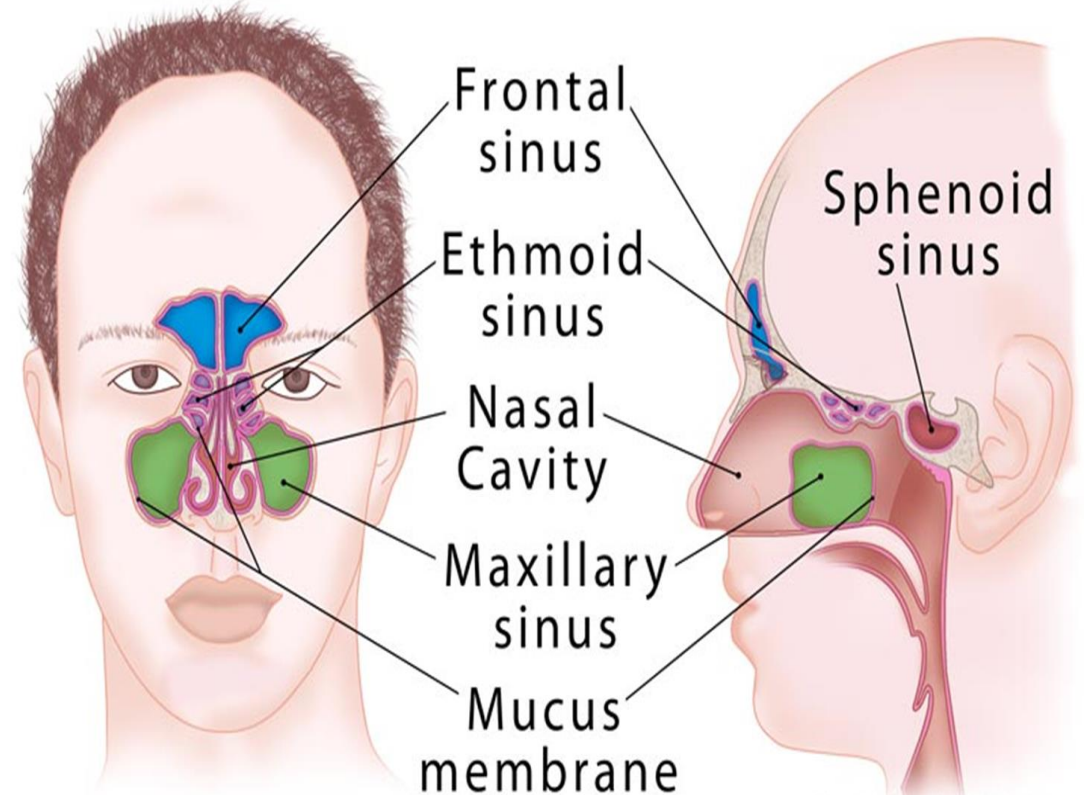
## ❖ Definition:

- They are air filled spaces inside the skull bones related to the nose and opens in the lateral wall of the nasal cavity

## ❖ Function:

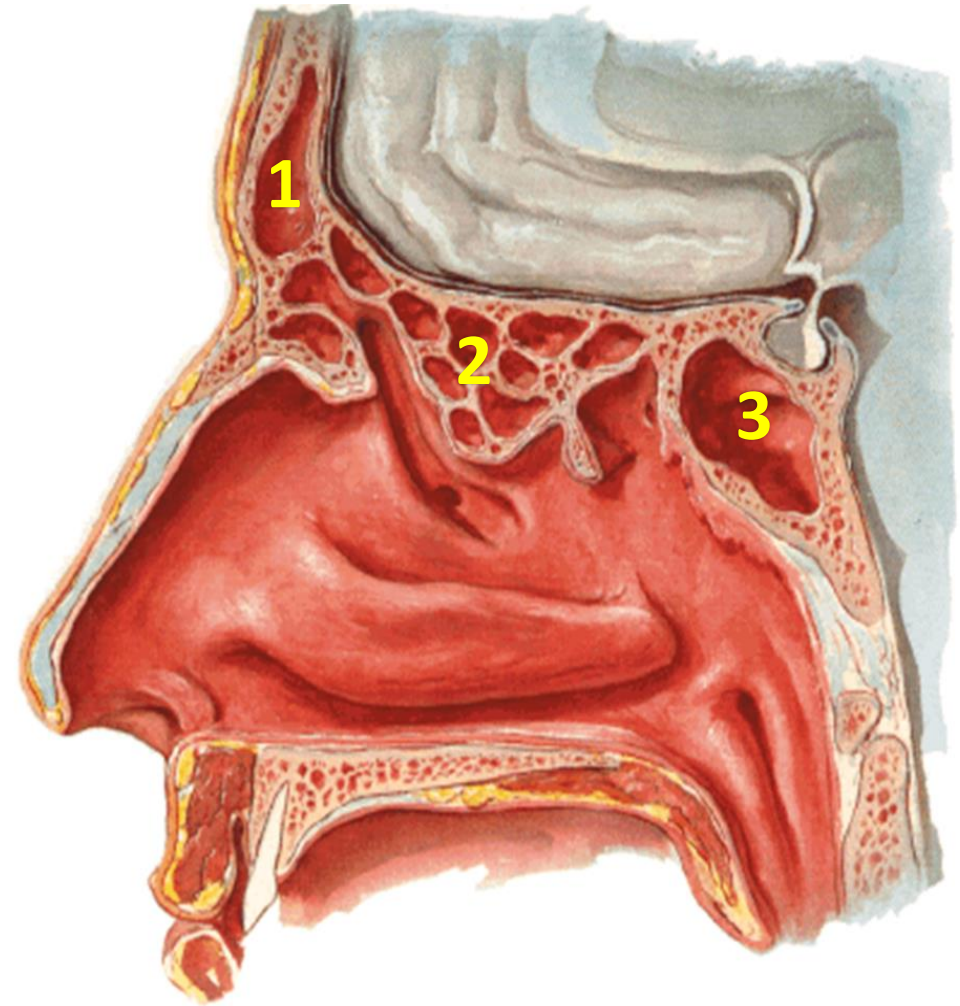
- Lighten the weight of the skull
- Give resonance to the voice
- Warming and humidification of inspired air

## Paranasal Sinuses



# Paranasal Sinuses

1. Frontal sinus
2. Ethmoidal air sinuses (between nose and orbit)
  - Anterior
  - Middle
  - Posterior
3. Sphenoidal sinus

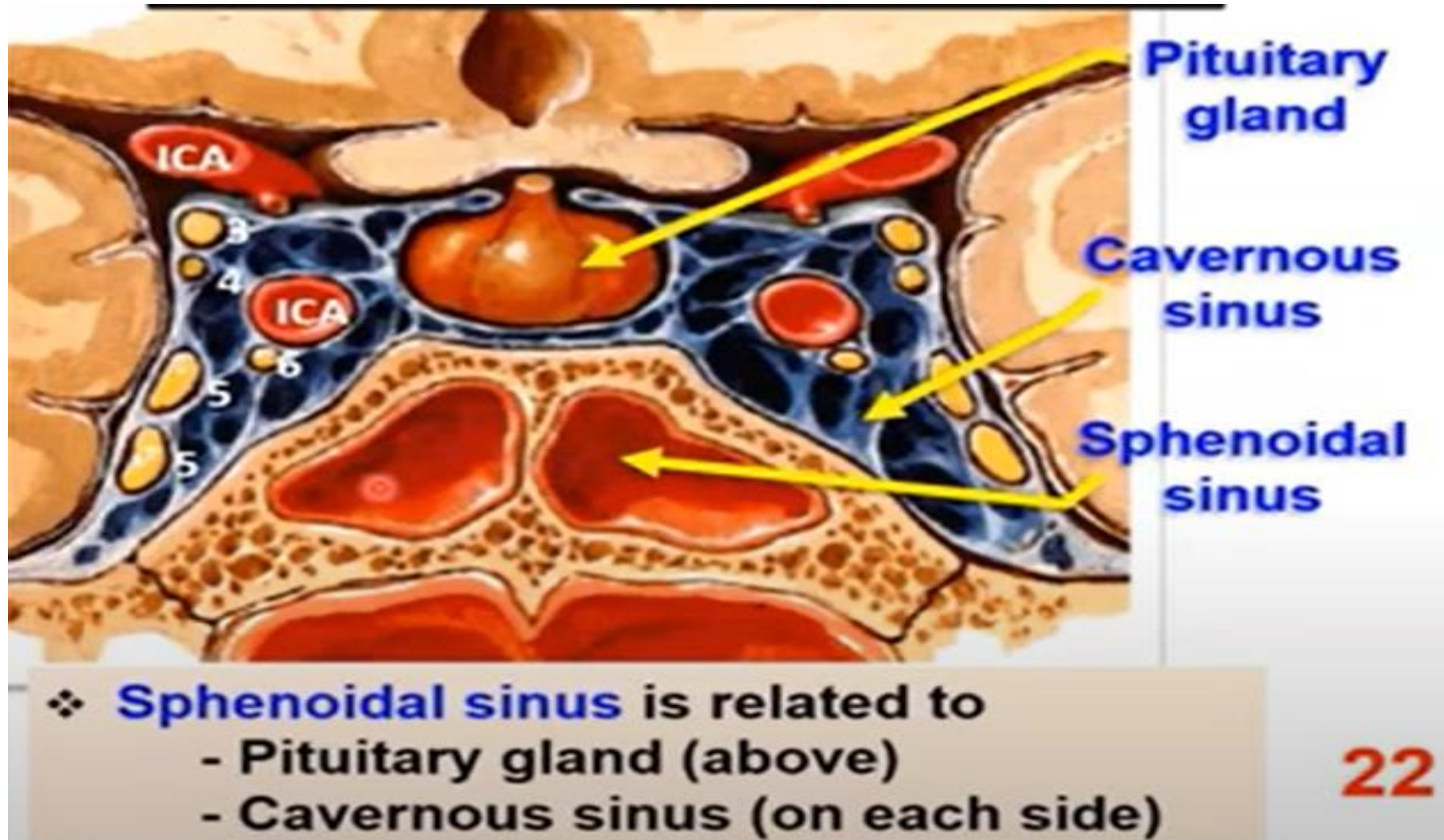


# Paranasal Sinuses

	<b>Frontal</b>	<b>Sphenoidal</b>	<b>Ethmoidal</b>	<b>Maxillary</b>
<b>Site</b>	Frontal bone	Body of sphenoid	Ethmoid bone	Maxilla
<b>Opening</b>	Hiatus semilunaris of middle meatus	Sphenoethmoidal recess	<ul style="list-style-type: none"> <li>- Posterior into superior meatus</li> <li>- Middle into bulla ethmoidalis</li> <li>- Anterior into hiatus semilunaris</li> </ul>	Hiatus semilunaris of middle meatus
<b>Nerve and blood vessels</b>	Supratrochlear and supraorbital (Ophthalmic N&VS)	Posterior ethmoidal (Ophthalmic N&VS)	<ul style="list-style-type: none"> <li>- Posterior by posterior ethmoidal</li> <li>- Anterior &amp; middle by anterior ethmoidal N&amp;VS</li> </ul>	Superior alveolar N&VS (maxillary)
<b>Lymph nodes</b>	Submandibular	Retropharyngeal	<ul style="list-style-type: none"> <li>- Posterior into retropharyngeal</li> <li>- Anterior &amp; middle into submandibular</li> </ul>	Submandibular

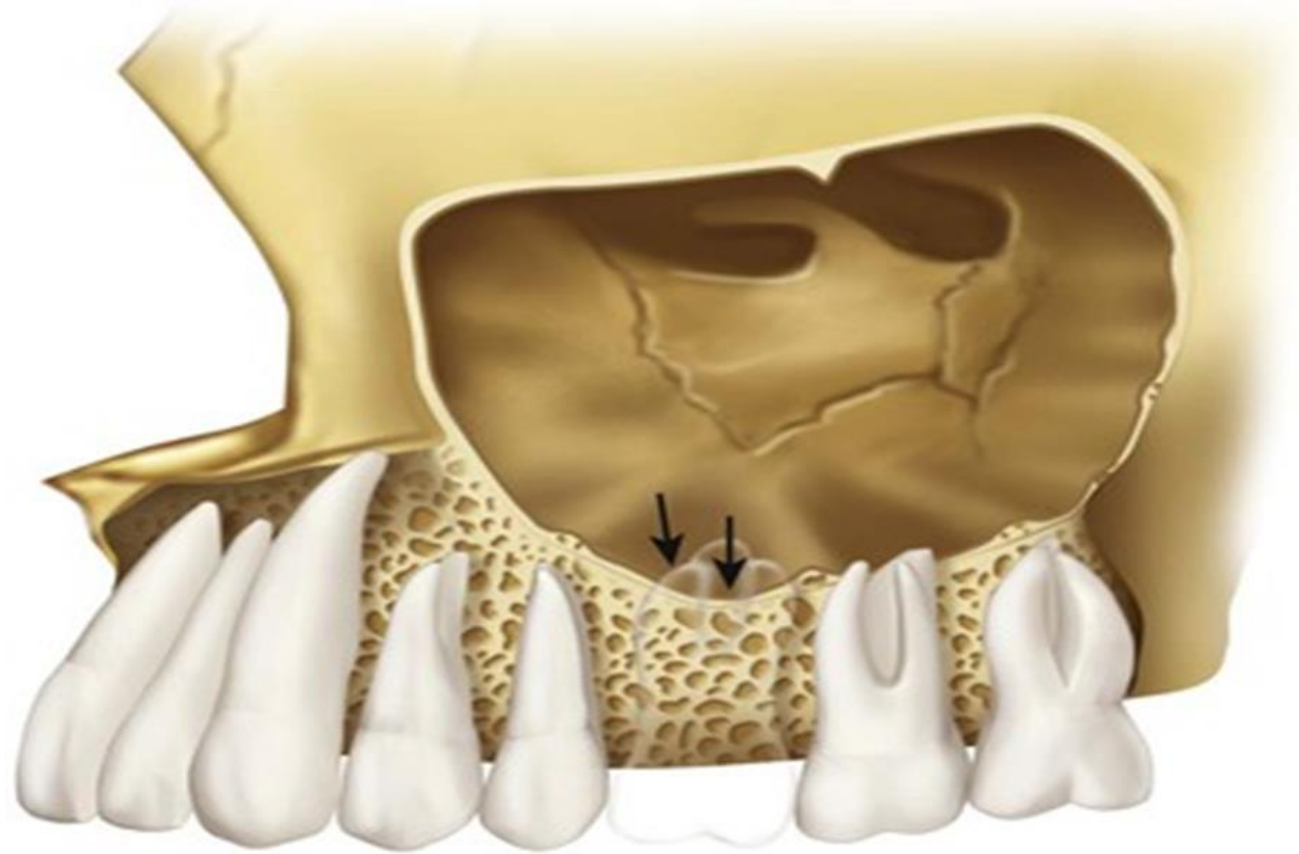


# Sphenoid Sinus



# Maxillary Sinus

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# Maxillary Sinus

1. Roof (the floor of the orbit)
2. Apex (zygomatic process of maxilla)
3. Base (the lateral wall of nasal cavity)
4. Floor (Alveolar process of maxilla)
5. Roots of upper teeth



# Maxillary Sinus

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❖ Pyramidal in shape

❖ Relations:

- **Apex:** directed laterally and lies at the zygomatic process of maxilla.
- **Base:** directed medially and formed by the lateral wall of the nasal cavity and contains the opening of the sinus.
- **Roof:** formed by the floor of the orbit. The roof is traversed by the infra orbital canal containing infra-orbital nerve and vessel.
- **Floor:** formed by the alveolar process of maxilla (Roots of molar and premolar teeth).



# Clinical notes about Maxillary Sinus

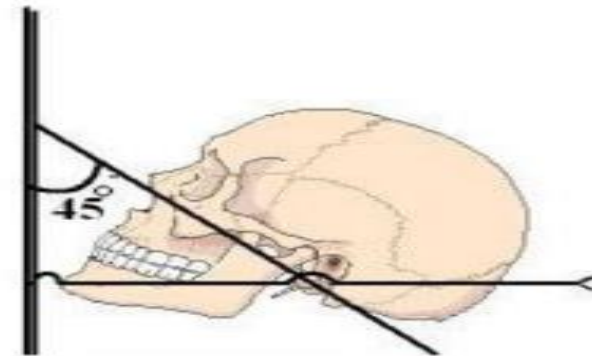
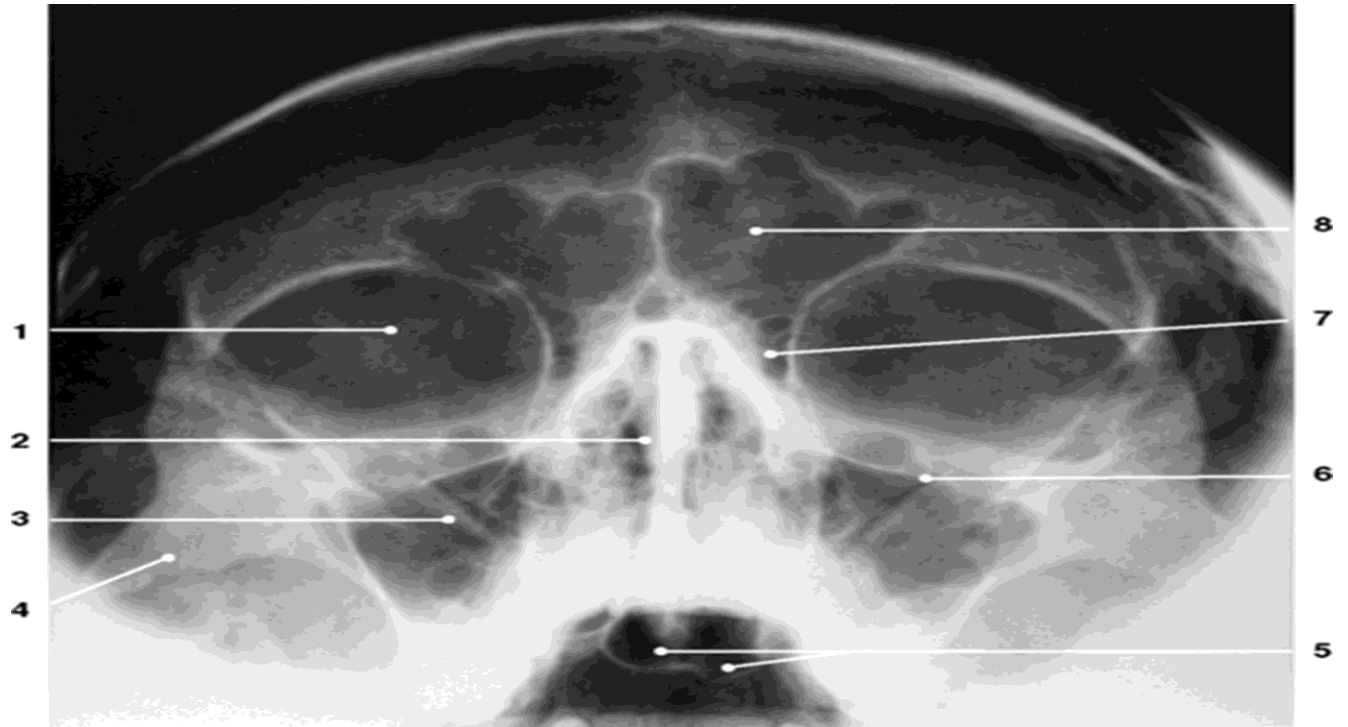
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- ❖ Opening of the sinus in the **upper part of the base** so the higher position makes the drainage difficult leading to **sinusitis**.
- ❖ Superior alveolar nerve supply both sinus and upper teeth and gum, so inflammation of the sinus can be confused with toothache (Referred pain).
- ❖ The roots of the upper molars bulge into the floor of the sinus but not perforated. During Dental Extraction must be care to avoid fraction of the root because the fractured root may be driven into the maxillary sinus forming communication between the sinus and oral cavity.



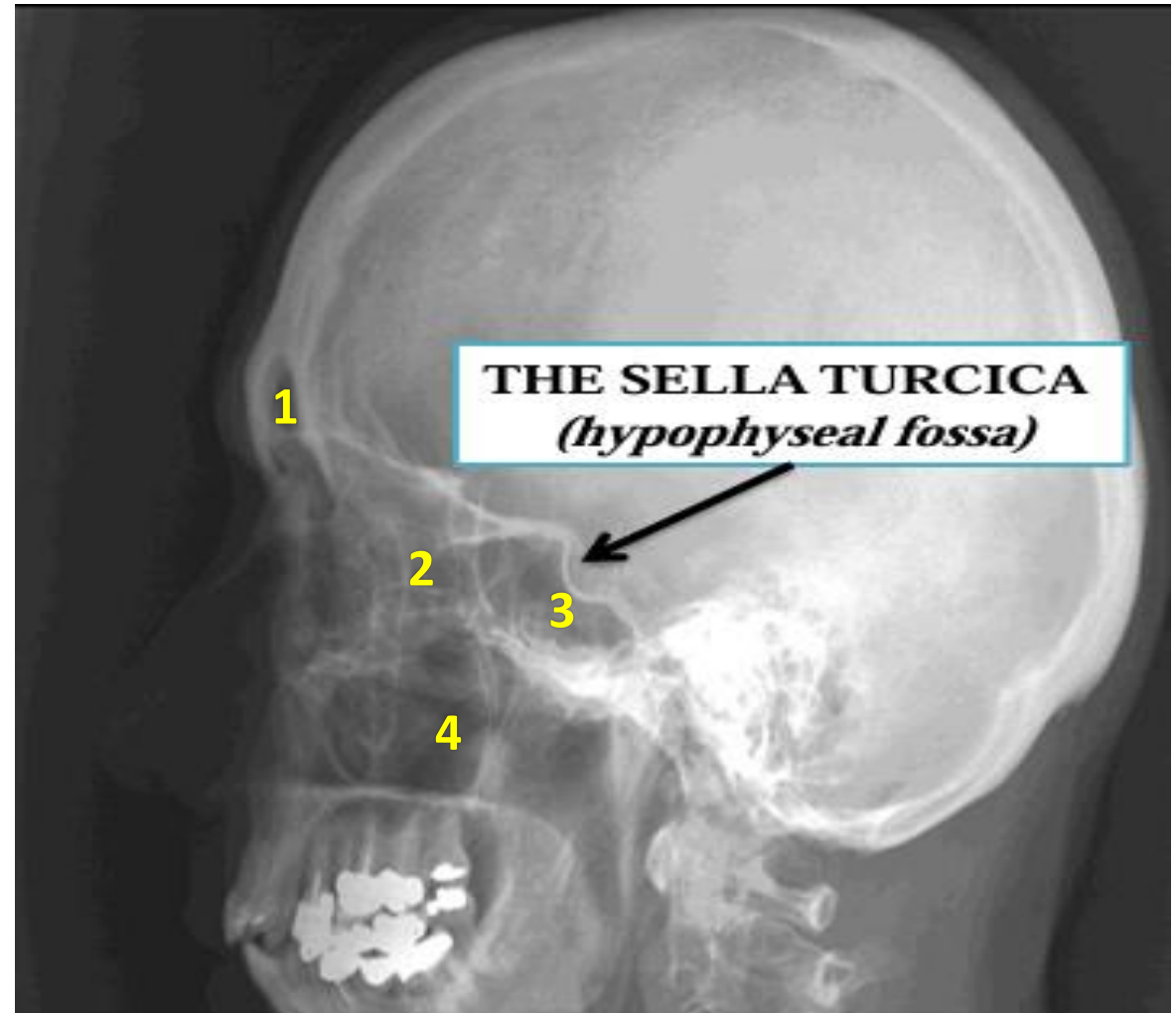
# Water's view x-ray of paranasal sinuses

1. Orbit
2. Nasal septum
3. Maxillary sinus
4. Zygomatic arch
5. Sphenoidal sinuses
6. Floor of orbit
7. Ethmoid sinus
8. Frontal sinus



# Lateral x-ray of paranasal sinuses

1. Frontal sinus
2. Ethmoidal sinus
3. Sphenoidal sinus
4. Maxillary sinus





Archive

# Archive

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## 1. Sphenoid air sinus opens into?

- A. Superior meatus
- B. Middle meatus
- C. Sphenoethmoidal recess
- D. Bulla ethmoidalis
- E. Inferior meatus



# Archive

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- 2. Which of the following paranasal sinuses communicates with the nasal cavity in the superior meatus?**
- A. Posterior ethmoidal sinuses
  - B. Middle ethmoidal sinuses
  - C. Frontal sinus
  - D. Sphenoidal sinus
  - E. Anterior ethmoidal sinus





# Archive

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## 3. The bulla ethmoidalis is formed by?

- A. a. Anterior ethmoidal sinuses
- B. b. Middle ethmoidal sinuses
- C. c. Maxillary sinuses
- D. d. Sphenoid sinuses
- E. e. Posterior ethmoidal sinuses



# Archive

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- 4. The main blood supply of the Litle's area from?**
- A. The first part of the maxillary artery
  - B. The second part of the maxillary artery
  - C. The third part of the maxillary artery
  - D. The facial artery
  - E. The ophthalmic artery



# Archive

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## 5. Maxillary air sinus opens into?

- A. Superior meatus
- B. Middle meatus
- C. Sphenoethmoidal recess
- D. Bulla ethmoidalis
- E. Inferior meatus



# Archive

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- 6. The definitive nasal cavity is separated from the oral cavity by?**
- A. Primary palate
  - B. Nasal septum
  - C. Secondary palate
  - D. Nasal placodes
  - E. Hard palate



# Archive

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## 7. The sphenoid sinuses?

- A. Are in the bone directly beneath the pituitary gland
- B. Drain into the middle nasal meatus
- C. Drain the pterygopalatine fossa via the sphenopalatine foramen
- D. Are not connected directly to the nasal cavity
- E. Supplied by middle ethmoidal nerve



# Answers

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1. C
2. A
3. B
4. C
5. B
6. E
7. A

