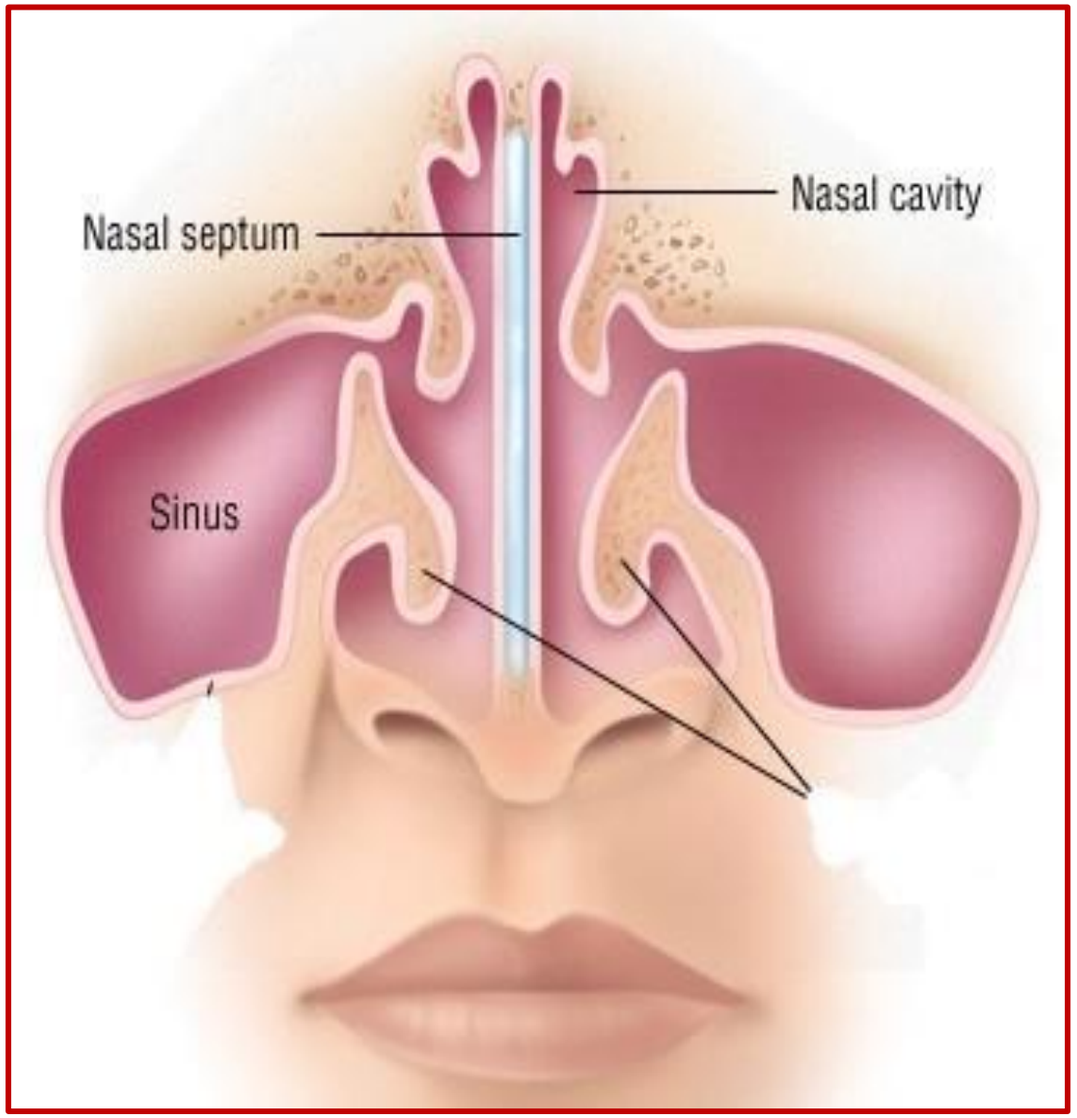
1ST WEEK ANATOMY LAB

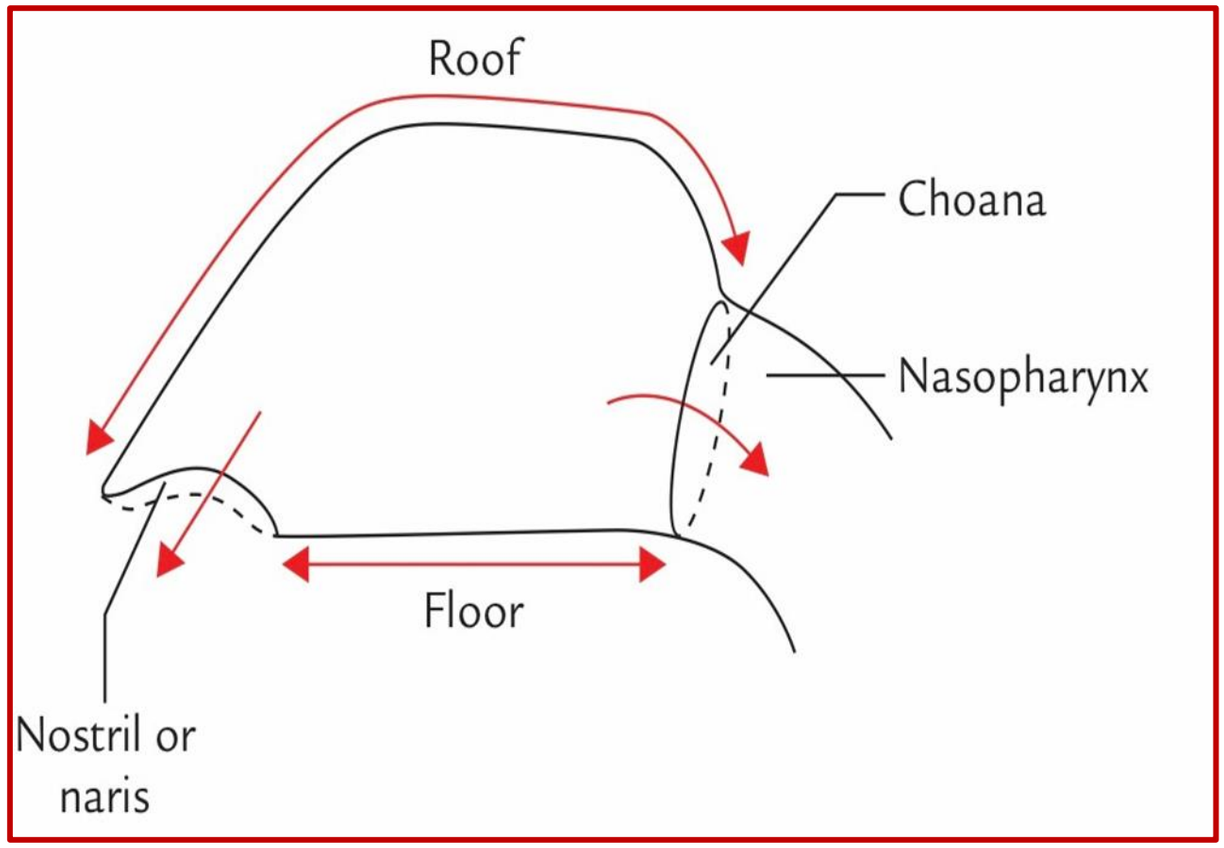
Covered topics:

- **Nasal Cavity**
- **Paranasal Sinuses**
- **Pterygopalatine Fossa**

1- Nasal Cavity boundaries.

- Students should know the boundaries of the cavity (floor, roof, lateral wall, medial/septal wall) along with its blood supply and innervation.

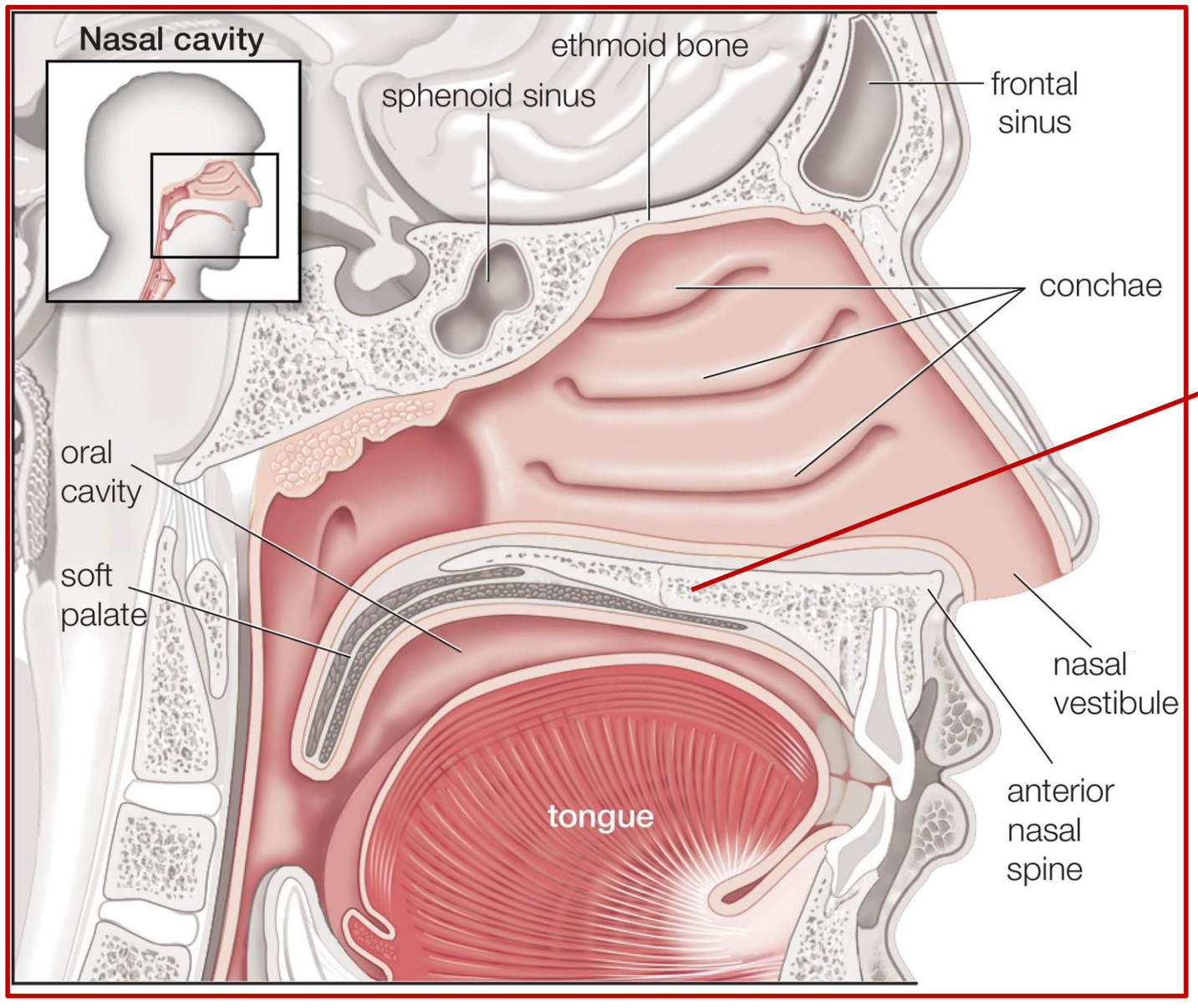




1. Floor

(Upper surface of the hard palate)

- Formed by:
  - **Anteriorly:** Palatine process of the **maxilla.**
  - **Posteriorly:** Horizontal plate of the **palatine bone.**



2. Roof

Divided into **three parts**:

a) Anterior sloping part

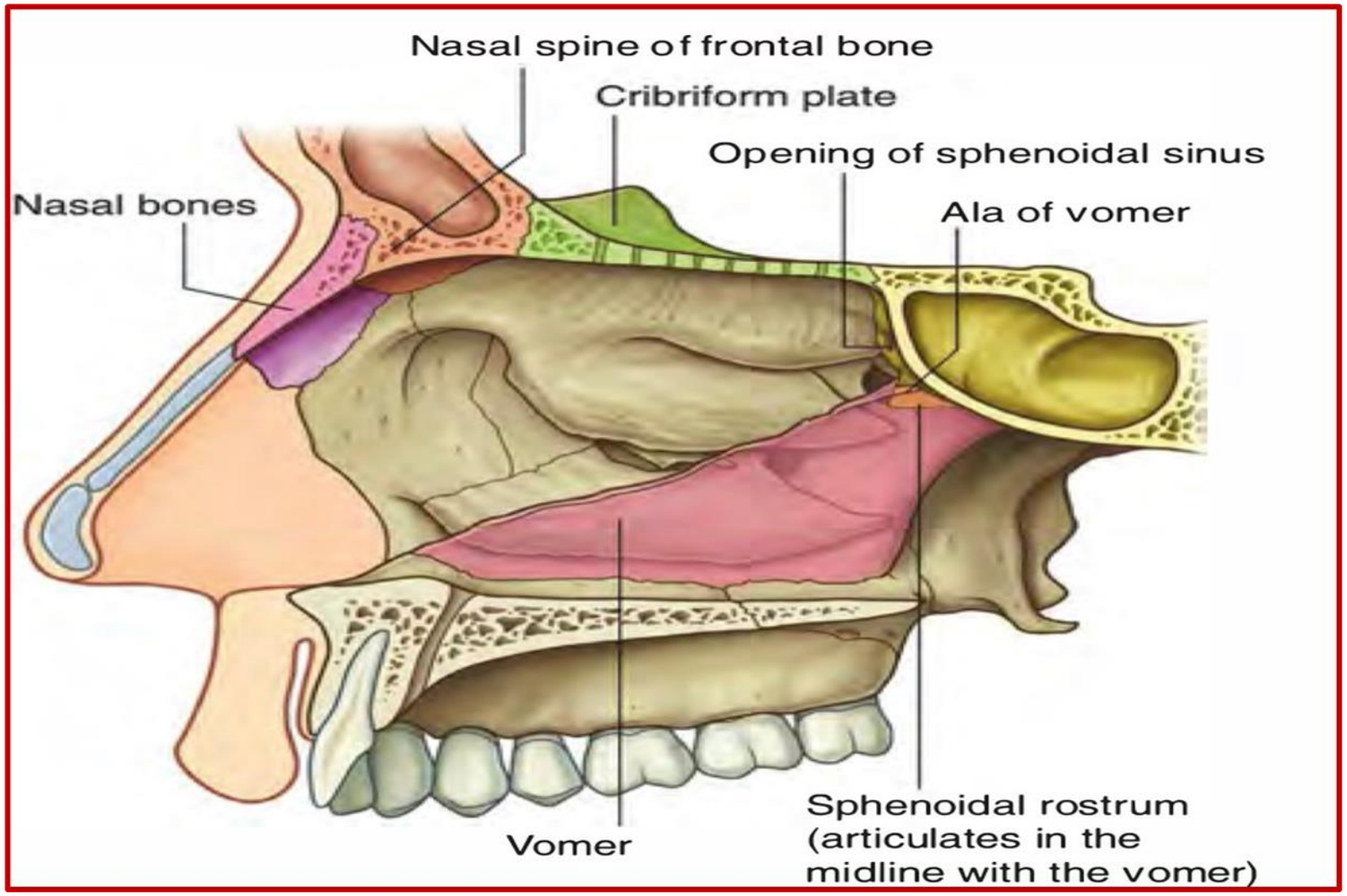
- **Nasal bone**
- **Nasal spine of the frontal bone**

b) Middle horizontal part

- **Cribriform plate of the ethmoid bone**
  - Perforated by **olfactory nerve filaments (CN I)** for smell

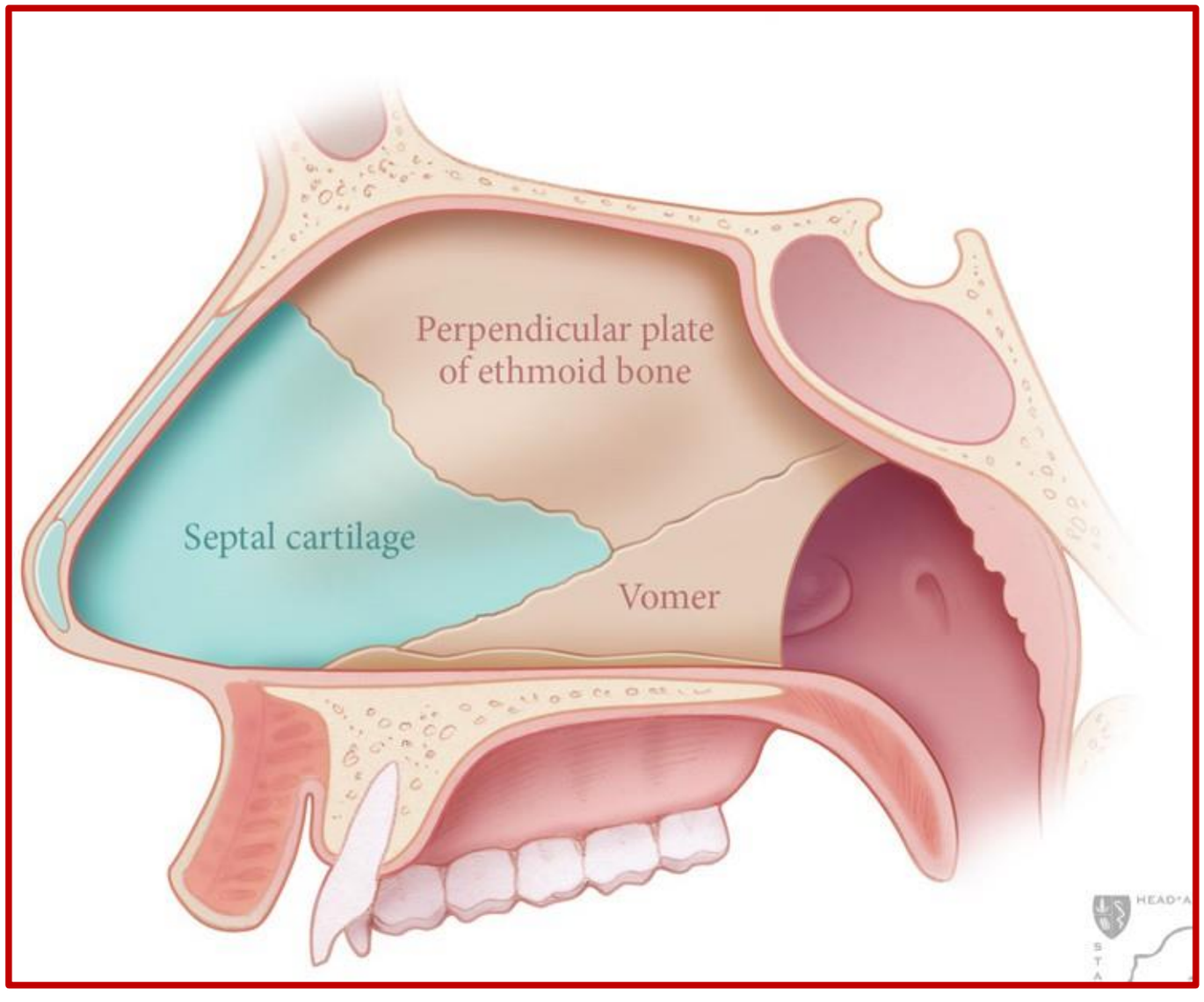
c) Posterior sloping part

- **Anterior surface of the body of the sphenoid bone**
- Ala of the **vomer**



3. Medial wall
(Nasal septum)

- **Anteriorly:** Septal nasal **cartilage**
- **Posterosuperiorly: Perpendicular plate of ethmoid**
- **Posteroinferiorly: Vomer**



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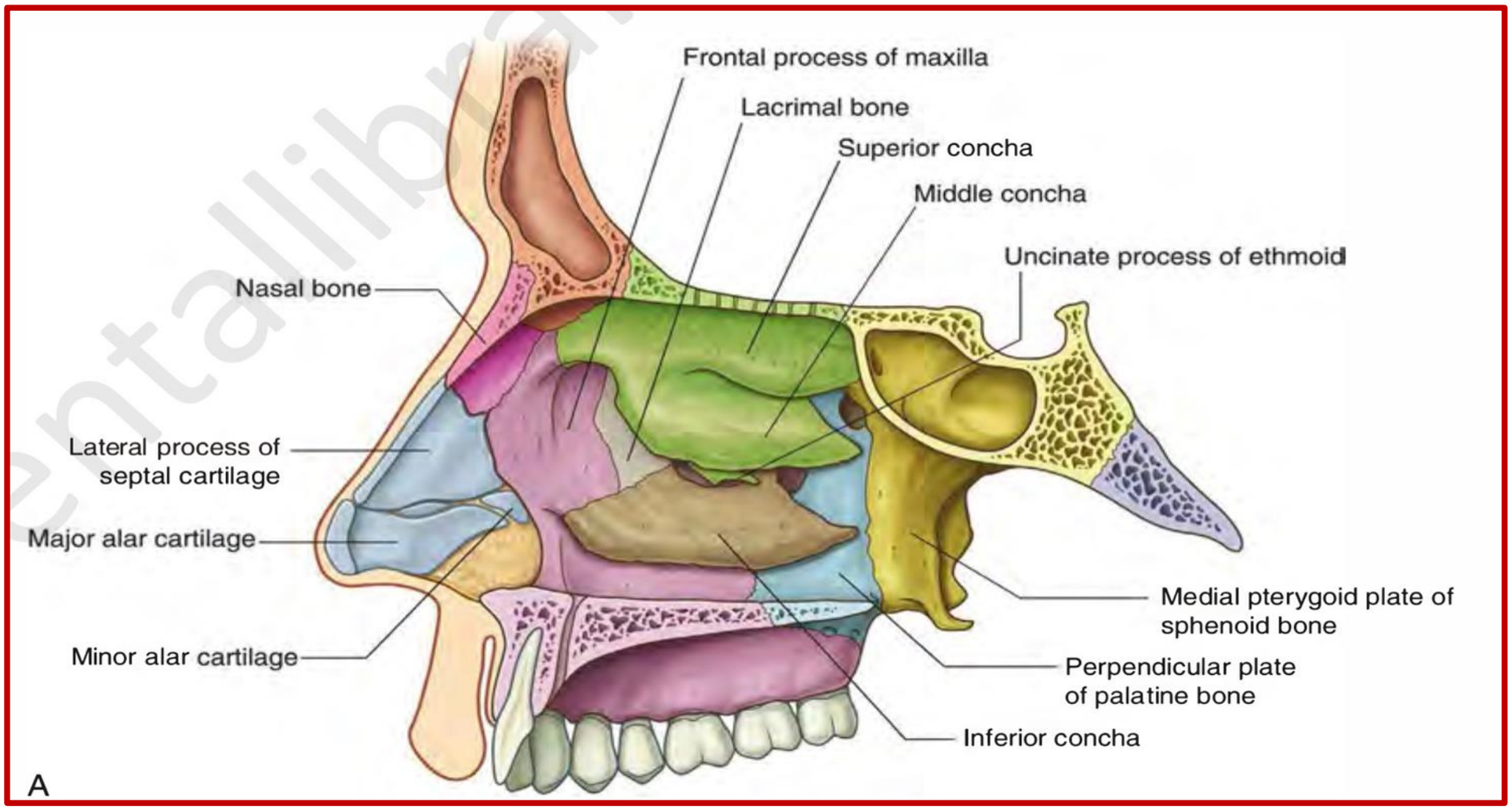
4. Lateral wall

- Complex and formed by bone, cartilage, and soft tissues.
- **Bony support :**
  - Perpendicular plate of the **palatine bone**
  - Medial pterygoid of **sphenoid bone**
  - **maxillae**
  - **Inferior concha**
  - ★ **Ethmoid** bone
  - ★ **Lacrimal** bone
  - **Nasal** bone

Even though they were not included in the theoretical slides, they appeared in theoretical/practical previous exam papers.



4. Lateral wall

- **(3) Conchae**
  - **Bony** projections from the lateral wall: **superior, middle, inferior.**
  - **Superior & middle conchae** originates from the **ethmoidal bone**
  - **Inferior conchae** originates from the **maxilla.**

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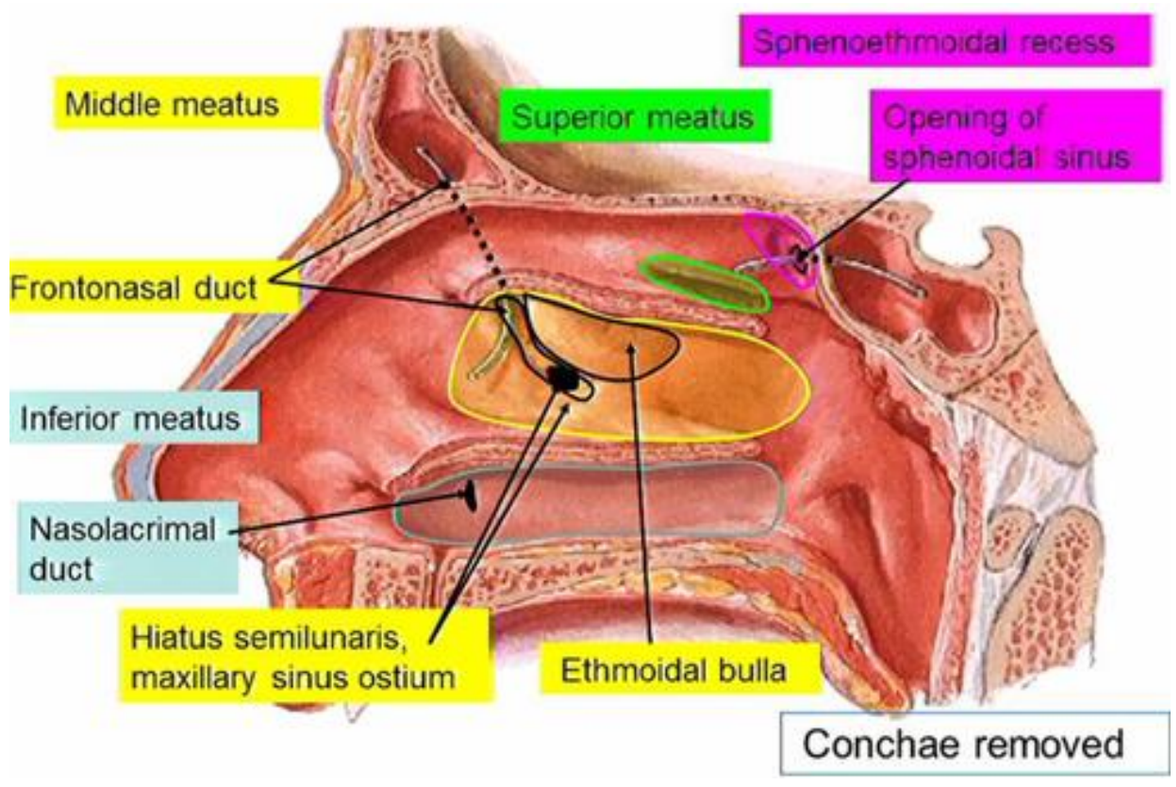
- **(3) Meatuses (groove under each concha)**

1. **Superior meatus**
   - Drains **posterior** ethmoidal air cells
2. **Middle meatus**
   - **Frontal** sinus → via frontonasal duct → infundibulum
   - **Middle** ethmoidal air cells → via **ethmoidal bulla**
   - **Maxillary** sinus & **Anterior** ethmoidal air cells → via **hiatus semilunaris**
3. **Inferior meatus**
   - Receives the **nasolacrimal** duct

- **(1) Recess**

1. **Sphenoethmoidal recess**
   - Drains the **sphenoidal sinus**



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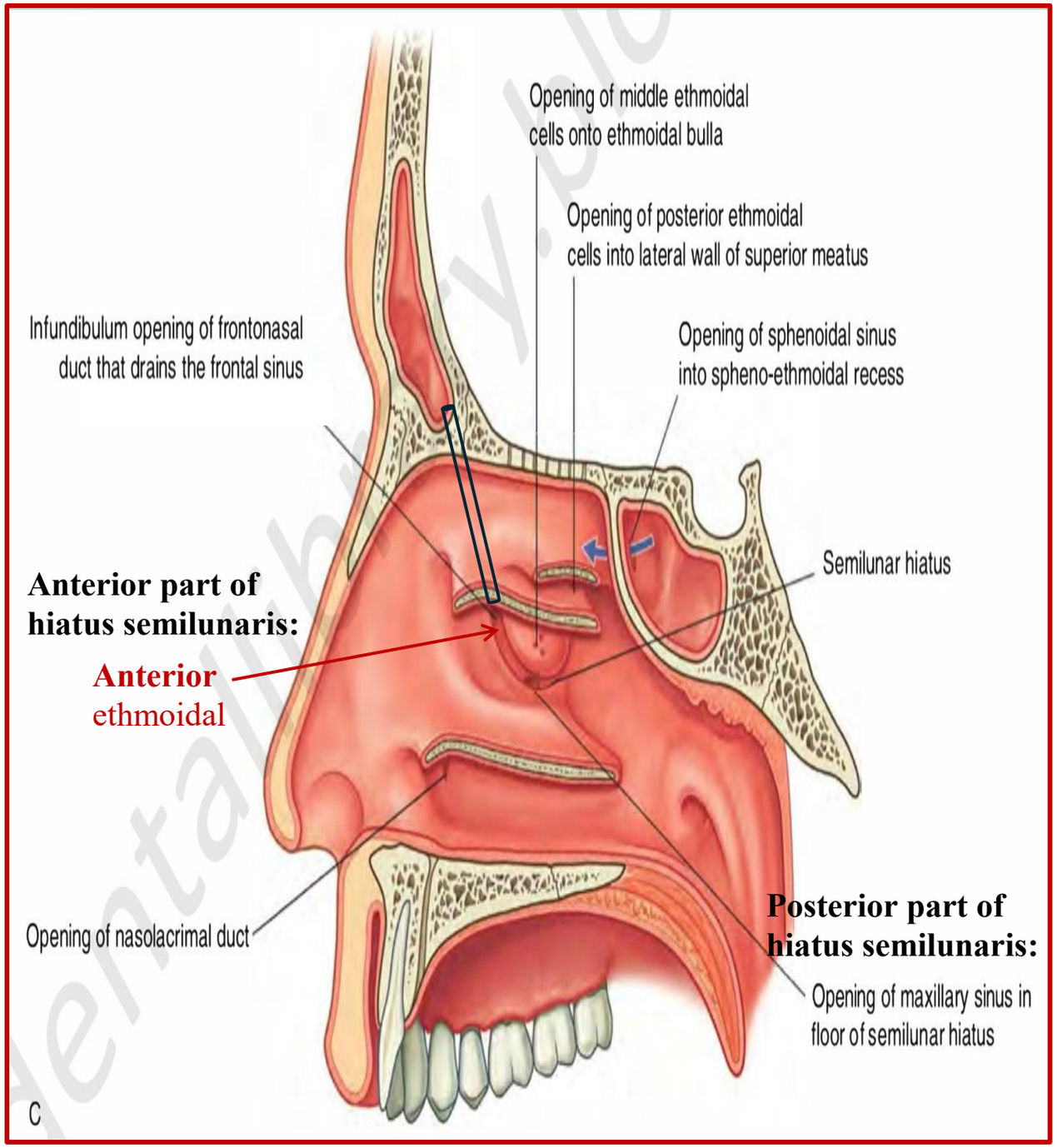
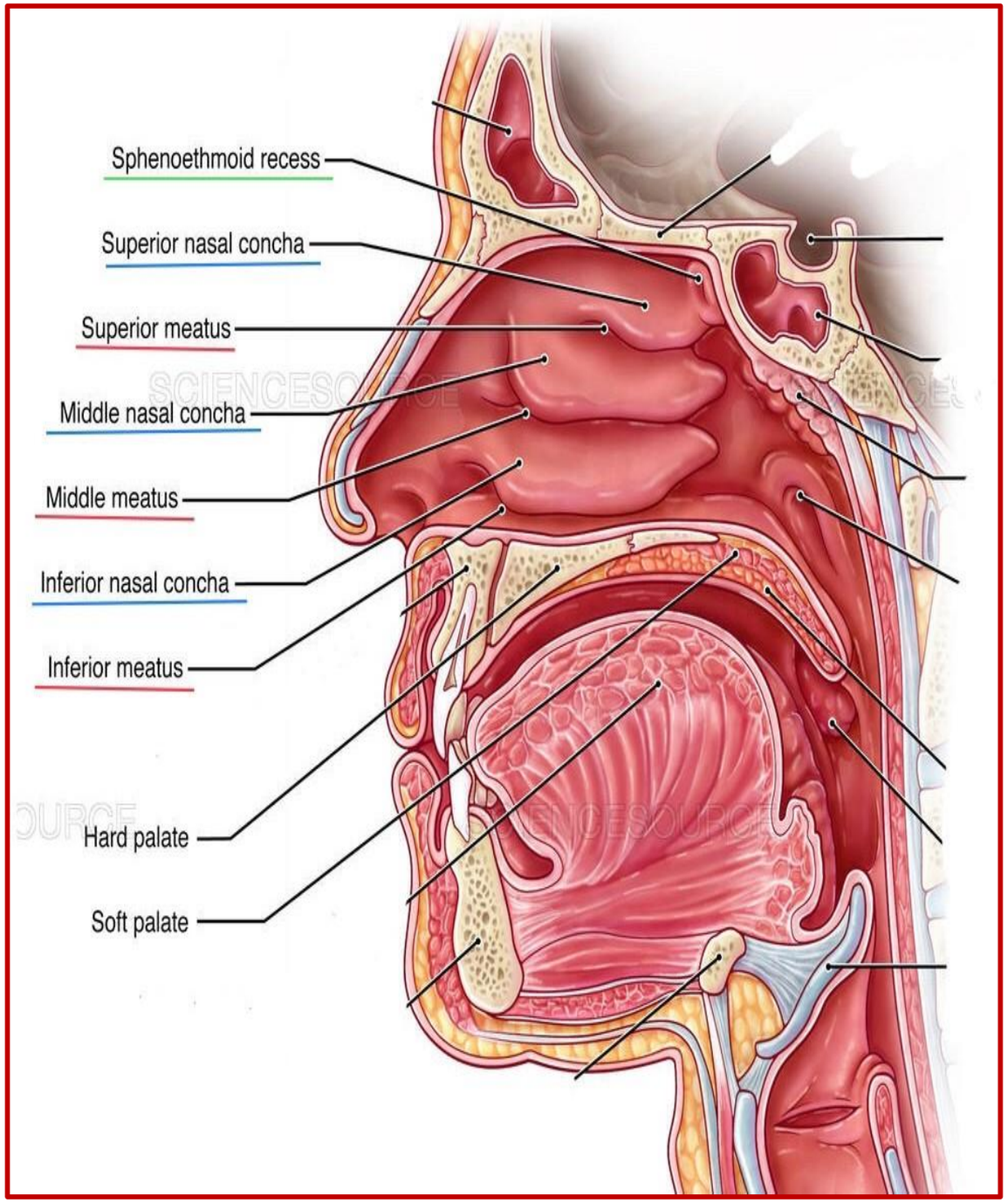




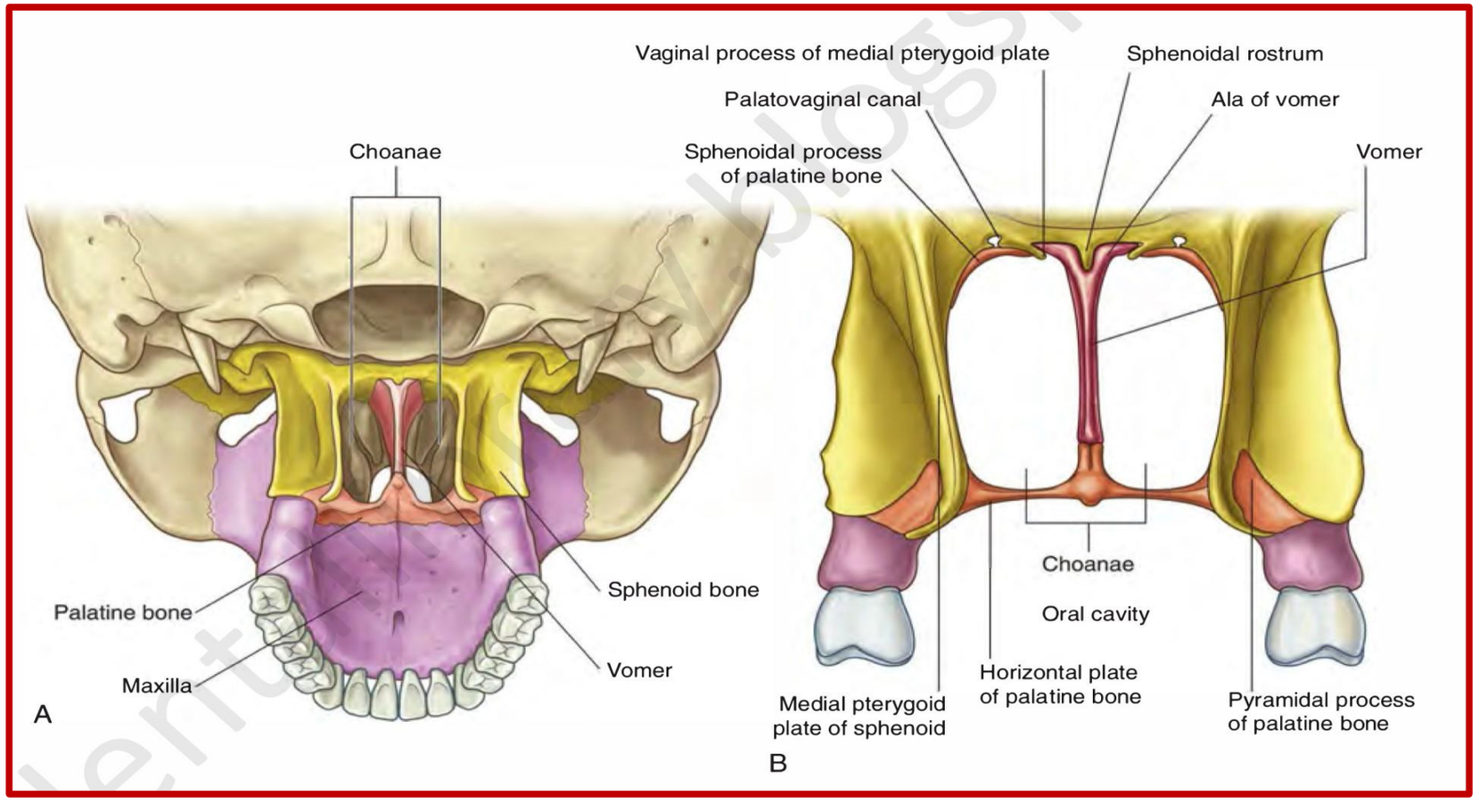
!! Important !! : According to the doctor, textbooks are incorrect in describing the **infundibulum** as the opening for the **frontonasal duct and anterior ethmoidal cells**; instead, the **anterior ethmoidal cells open posterior to the infundibulum on the anterior part of the semilunar hiatus**.

2- Choana.

* The doctor mentioned that this is a **commonly asked lab question** during theoretical lectures.

- **Boundaries of the Choana**

Boundary	**Structure**
Medial	Vomer
Lateral	**Medial** pterygoid plate of the sphenoid bone
Superior	Ala of Vomer
Inferior/ base	Palatine bone



- **Foramina of the hard palate**

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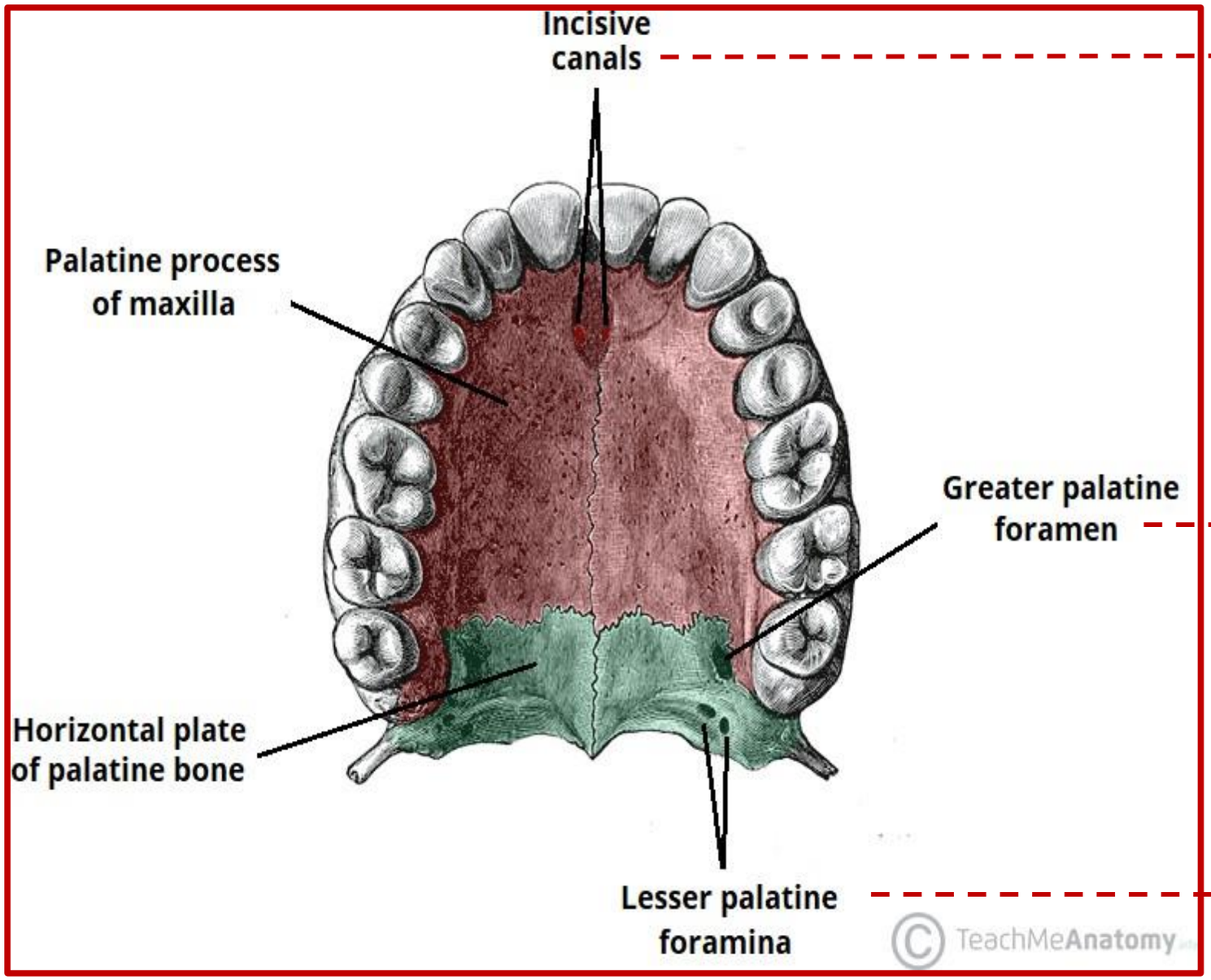
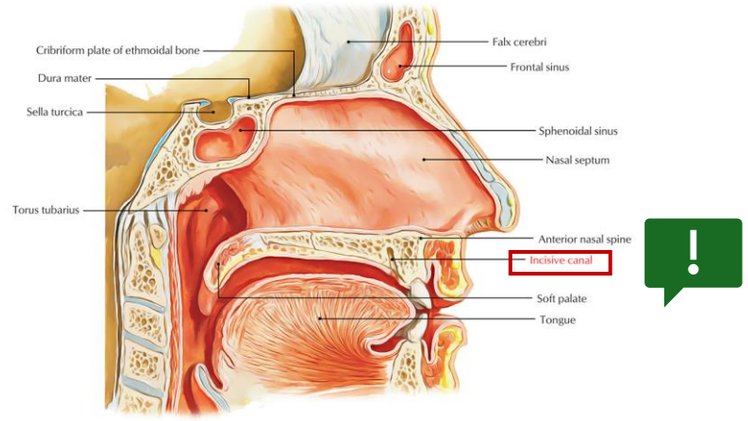
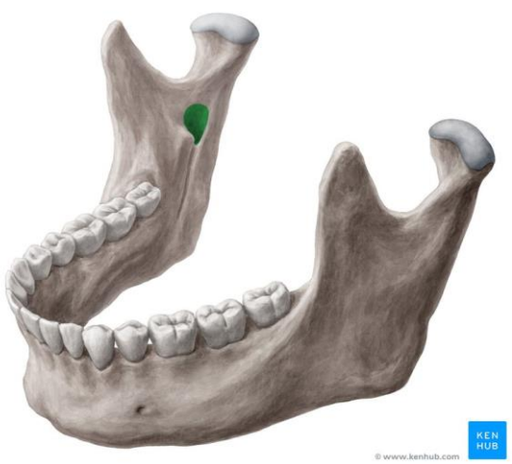


Nerve: **Nasopalatine N.**
Artery: Branch of the **greater palatine A.**



Nerve: **Greater palatine N.**
Artery: **Greater palatine A.**

Nerve: **Lesser palatine N.**
Artery: **Lesser palatine A.**



Although it was not required in the lab slides, it has appeared in previous exam papers and is therefore worth noting. This is the **mandibular foramen**, it transmits the **inferior alveolar nerve** (a branch of the **mandibular** nerve, V3) along with the **inferior alveolar artery** (a major branch of the **first** part of the **maxillary** artery).

3- Nasal Cavity Blood Supply.

Sphenopalatine Artery

- **Posterior lateral nasal arteries**
  - Supply the **lateral wall of the nasal cavity**
  - Also referred to as **short sphenopalatine arteries**
- **Posterior septal branches**
  - Supply the **nasal septum**
  - The **largest** branch passes inferiorly on the septum
  - Known as the **long sphenopalatine artery**

Palatine Artery

- **Greater Palatine Artery**
  - Passes to the oral cavity through the palatine canal to supply the **hard palate.**
  - Then continues to the nose through the incisive foramen to supply **posterior and anterior inferior quadrant of the lateral wall of the nose.**

Infraorbital artery

- A branch of the **maxillary artery**.
- Gives:
  - **lateral nasal branches** supplying the **external nose**
  - Palpebral branches to the lower eyelid
  - Superior labial branches to the upper lip

Ethmoidal arteries

- The ethmoidal arteries are branches of the **ophthalmic artery**, which arises from the **internal carotid artery**.

Anterior ethmoidal artery

- Originates in the **anterior cranial fossa**
- Passes through the **anterior ethmoidal foramen** into the nasal cavity

Supplies:

- **Anterior superior part of the nasal septum**
- **Anterior superior part of the lateral wall**
- Terminates as the **external nasal artery**, supplying the **external nose.**

Posterior ethmoidal artery

- Passes through the **posterior ethmoidal foramen**

Supplies:

- **Posterior superior parts of the septum**
- **Posterior superior parts of the lateral wall**

Superior labial artery

- Branch of the **facial artery**
- Supplies:
  - **Upper lip**
  - **Anterior part of the nasal septum**

Epistaxis (nosebleed)

- Commonly occurs at **Kiesselbach's area,** Located at the junction between: Upper 2/3 & Lower 1/3 of the nasal septum.

Main arteries forming Kiesselbach's area

- **Long sphenopalatine artery**
- **Superior labial artery**

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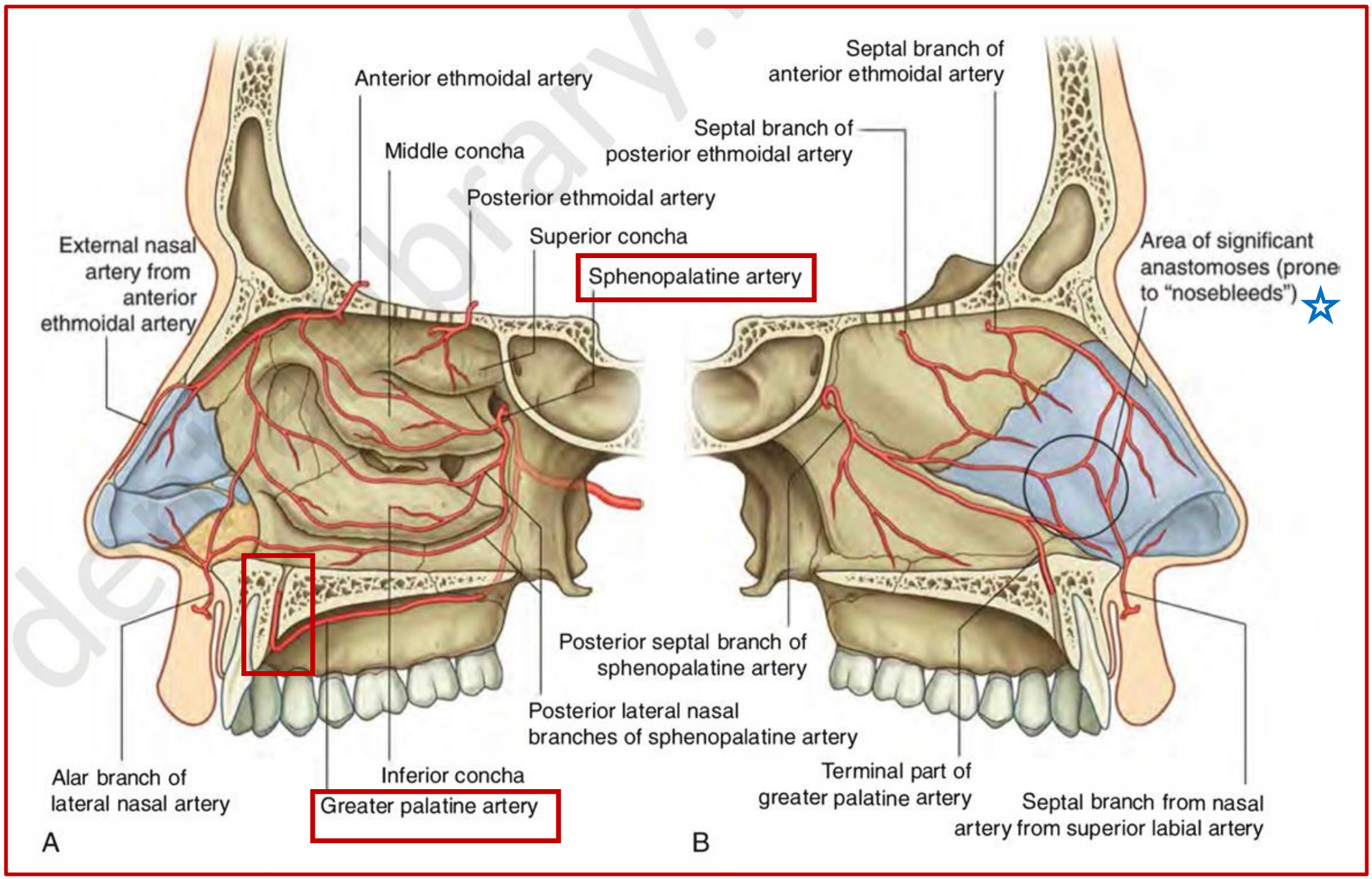
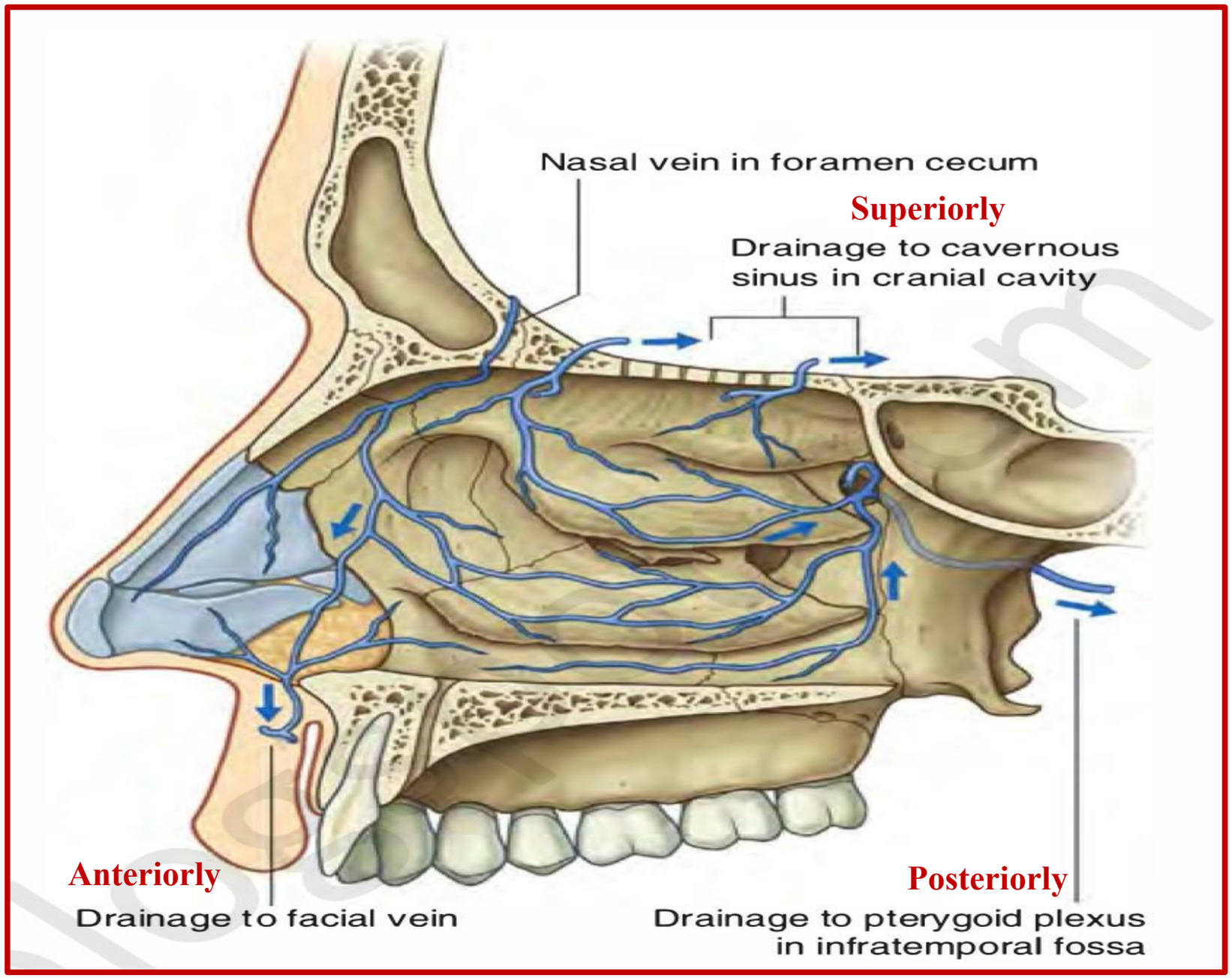


4- Nasal Cavity Venous Drainage.

Venous supply

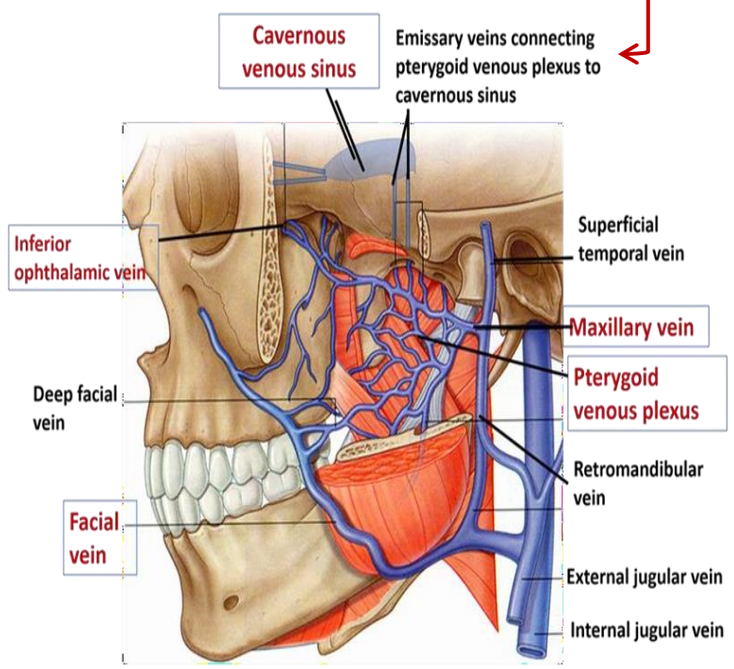
1. **Anterior** Drainage → **Facial Vein** → IJV
2. **Posterior** Drainage → **Pterygoid Venous Plexus** → Maxillary vein
3. **Superior** Drainage → **Cavernous Sinus (Intracranial)**



Near lateral pterygoid muscle

Note that: The **pterygoid venous plexus** communicates with the **cavernous** sinus through **emissary veins** passing via:

- Foramen **ovale**
- Foramen **spinosum**



5- Nasal Cavity Innervation.

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Mostly:

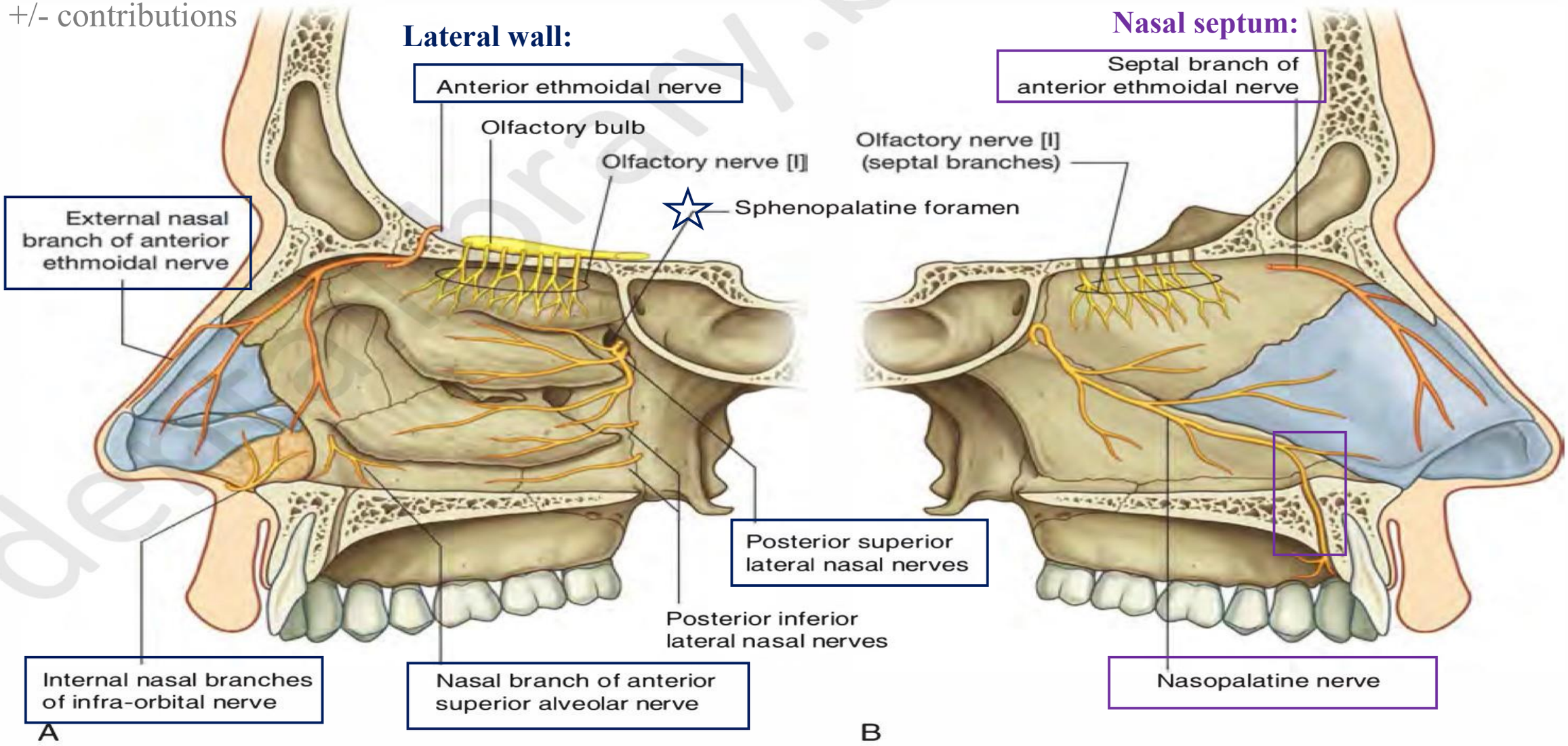
Nasal septum:

- **Anterior:** Septal branch of anterior ethmoidal nerve (V1)
- **Posterior:** Nasopalatine nerve (V2)

Lateral wall:

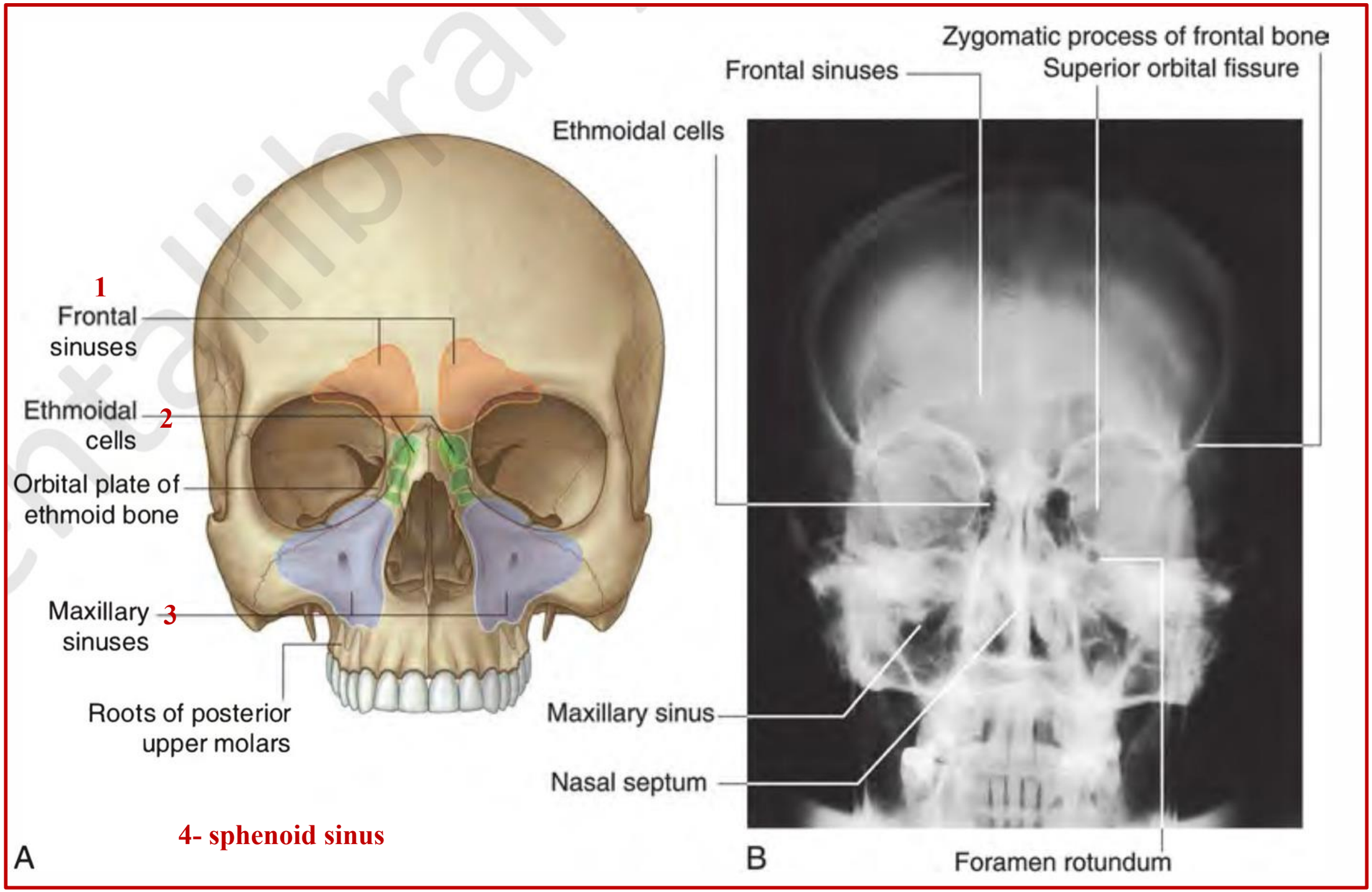
- **Anterior:** Anterior ethmoidal nerve (V1)
- **Posterior:** Short sphenopalatine nerve (Posterior superior lateral nasal nerve) (V2)

+/- contributions



6- Paranasal Sinuses.

- Students should know the location of the paranasal sinuses, their sites of drainage, and their nerve supply.



4- sphenoid sinus

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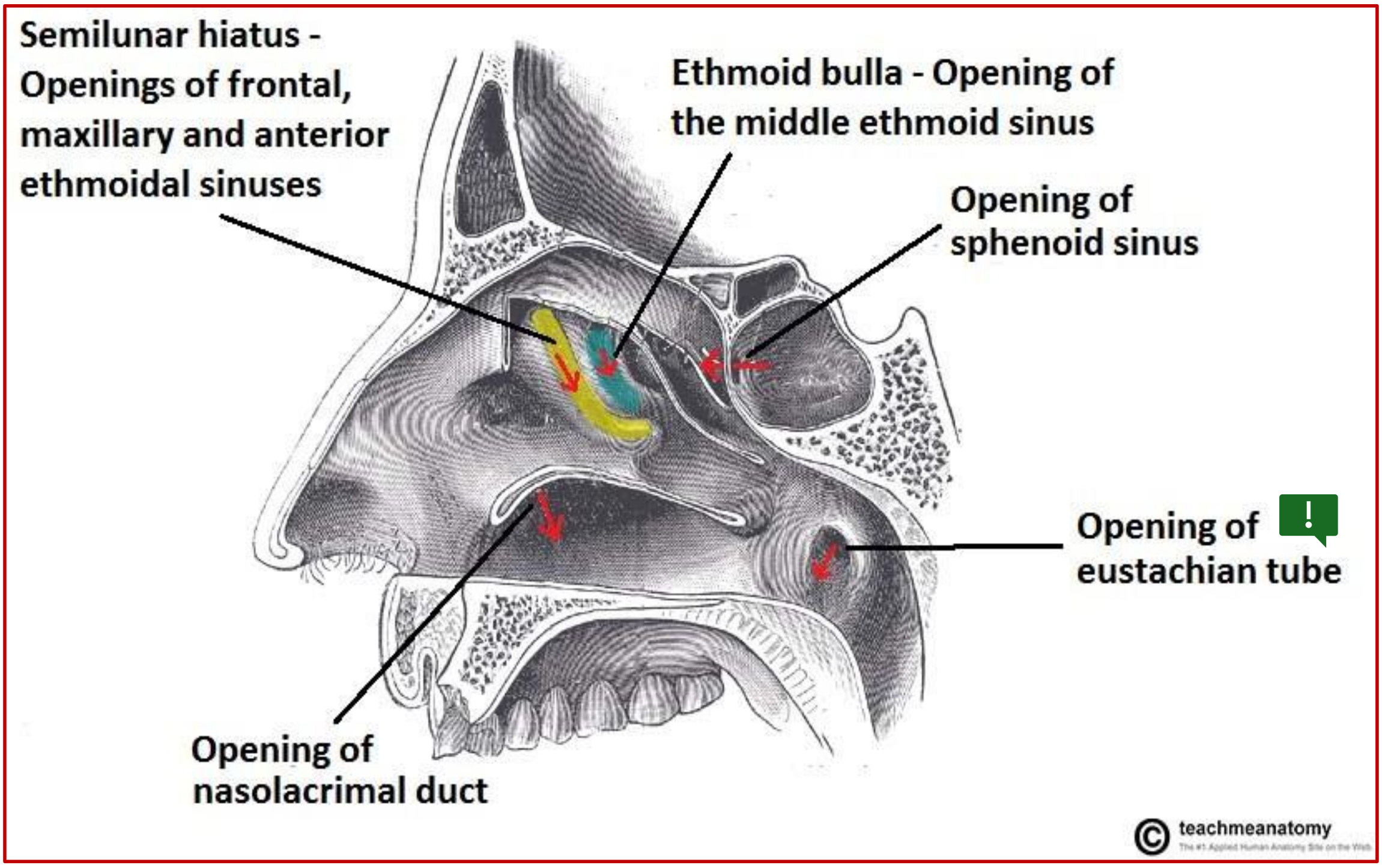
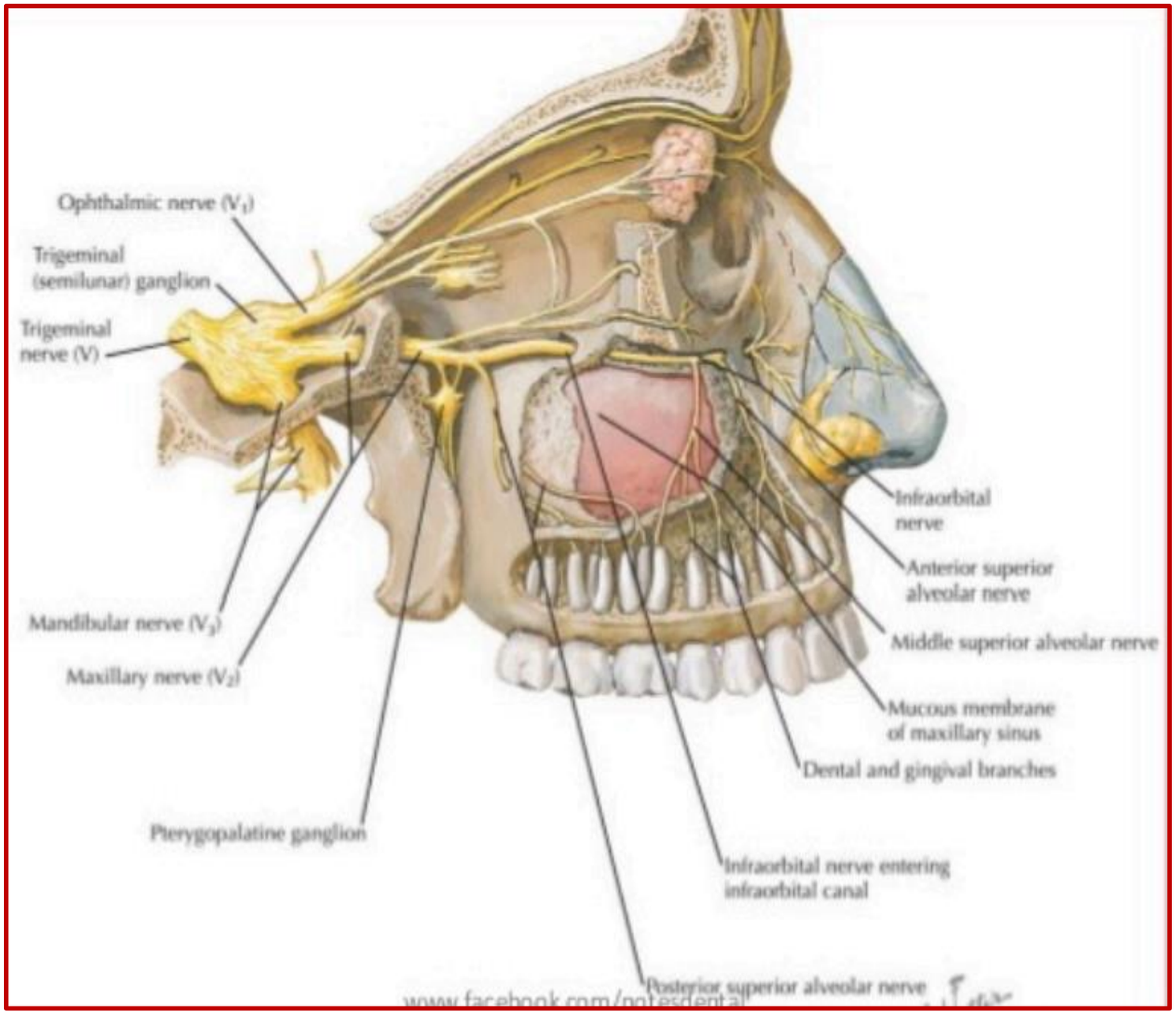
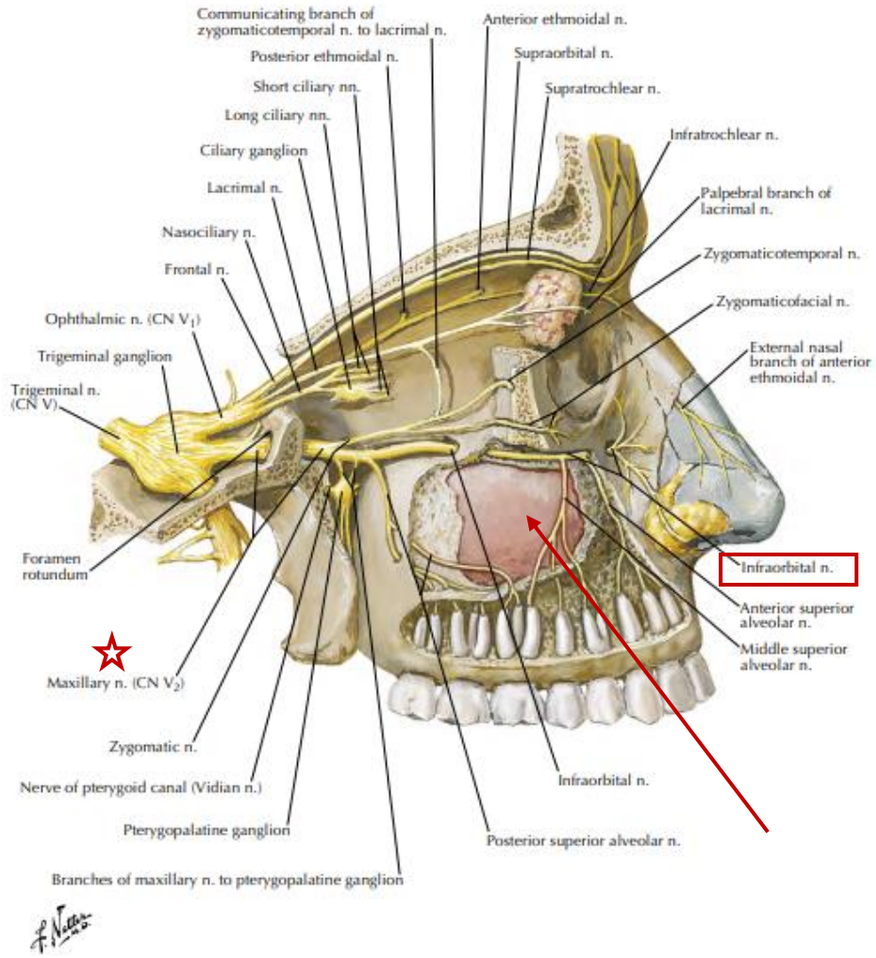
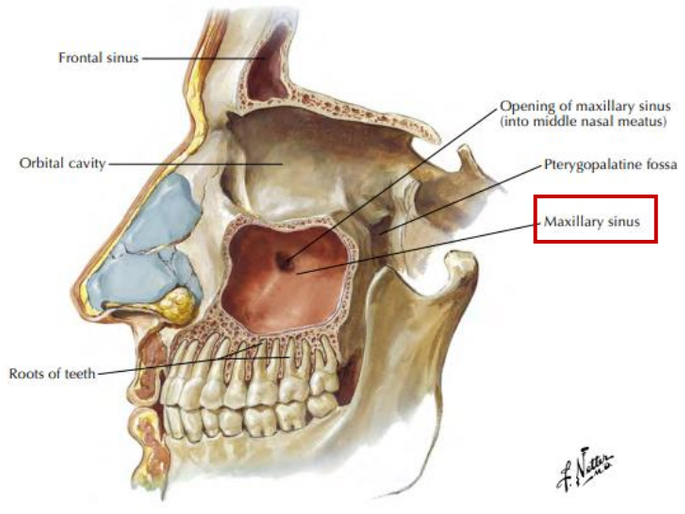
- **Site of drainage:** slide 7



1- Maxillary sinus:

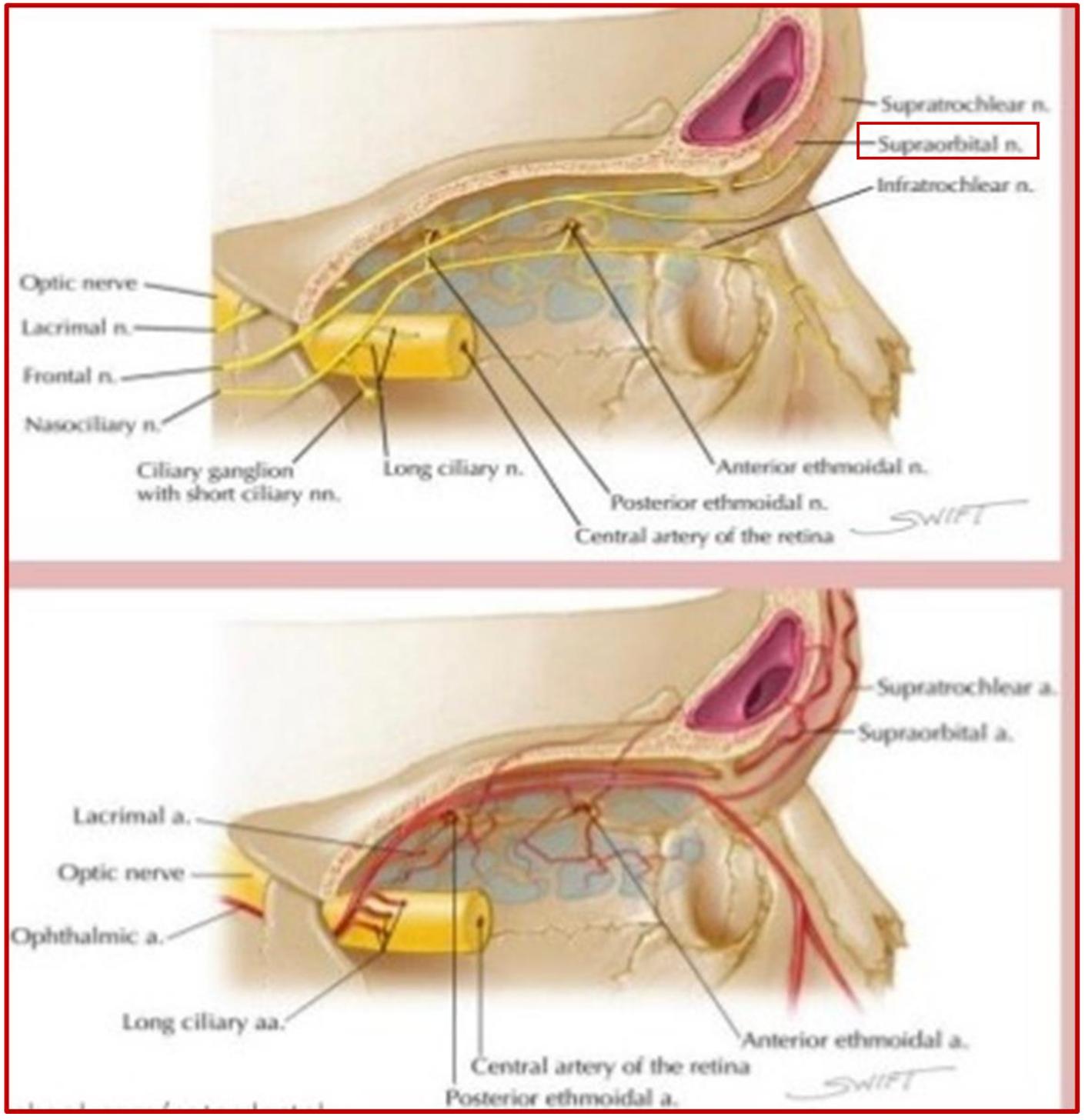


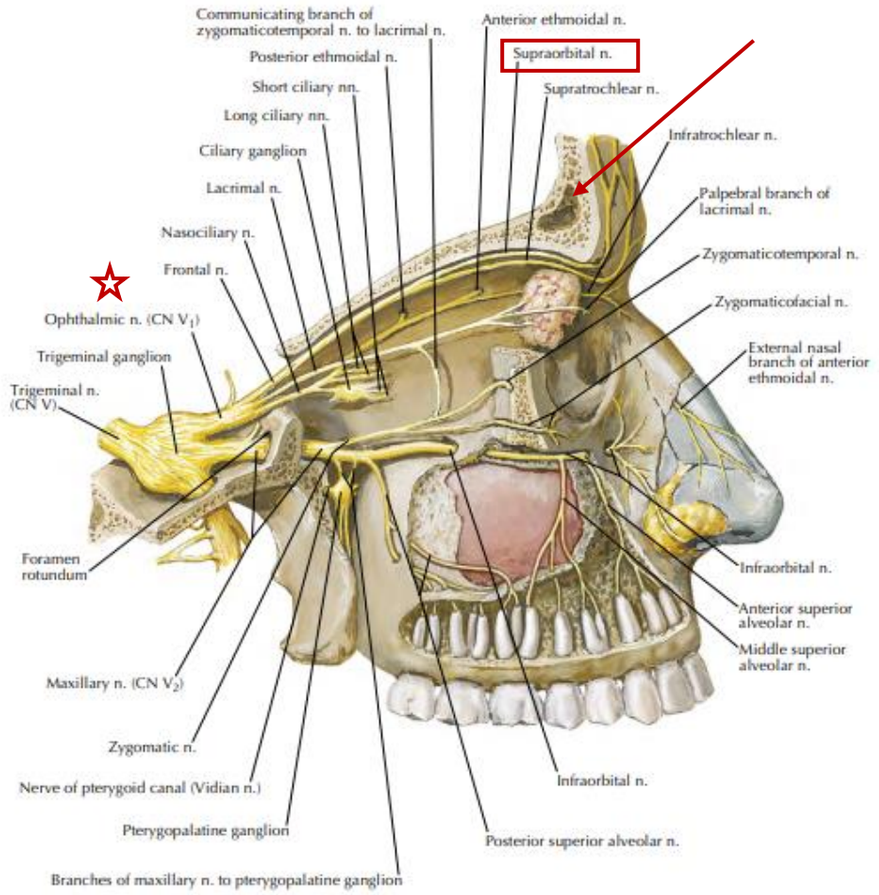


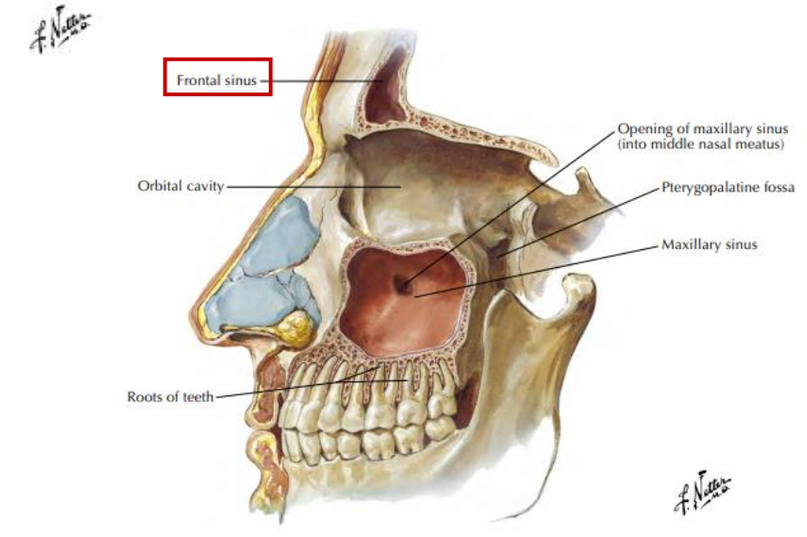


- It is innervated by **branches of the maxillary nerve**, mainly the **infraorbital nerve & posterior superior alveolar nerve.**

2- Frontal sinus:

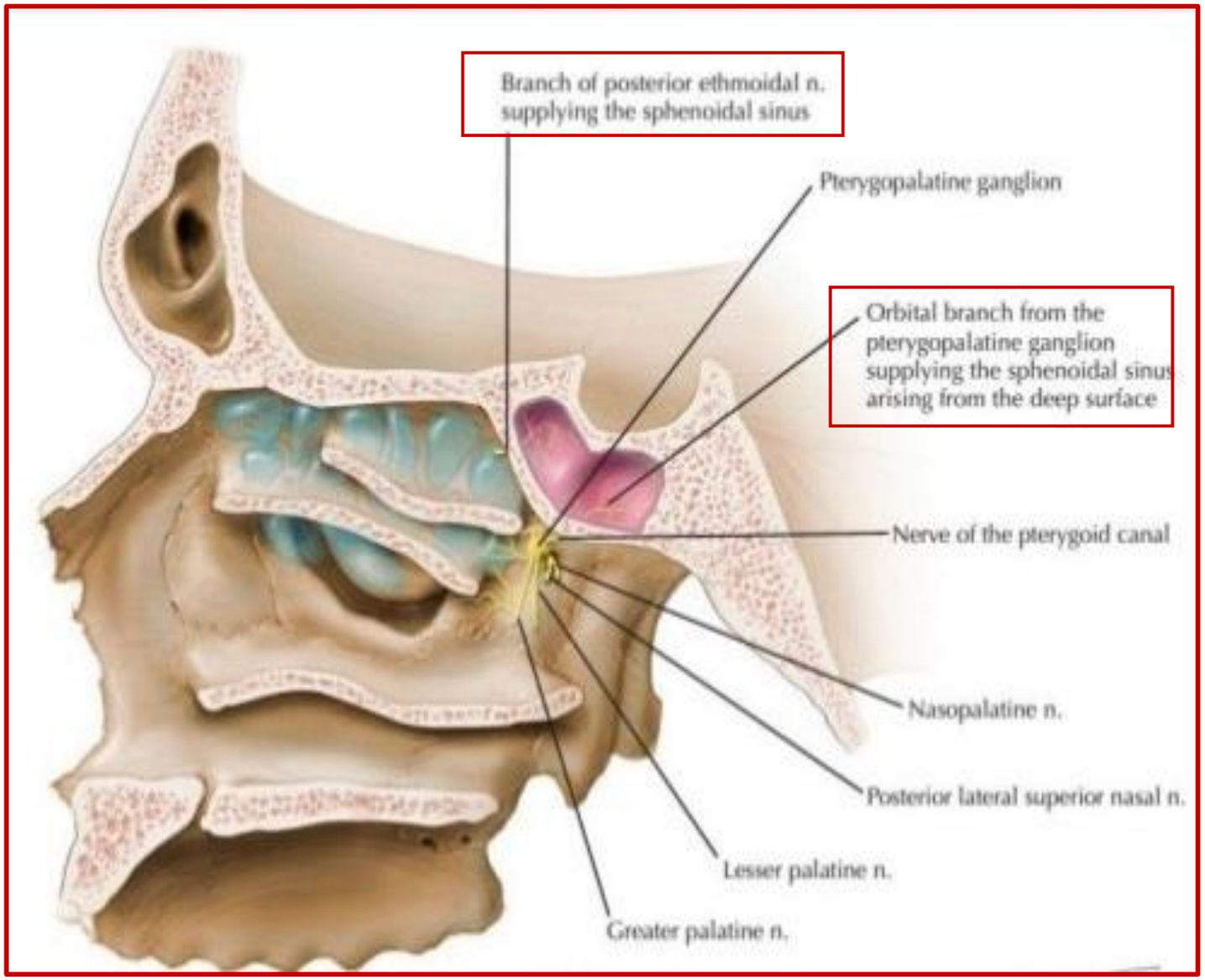




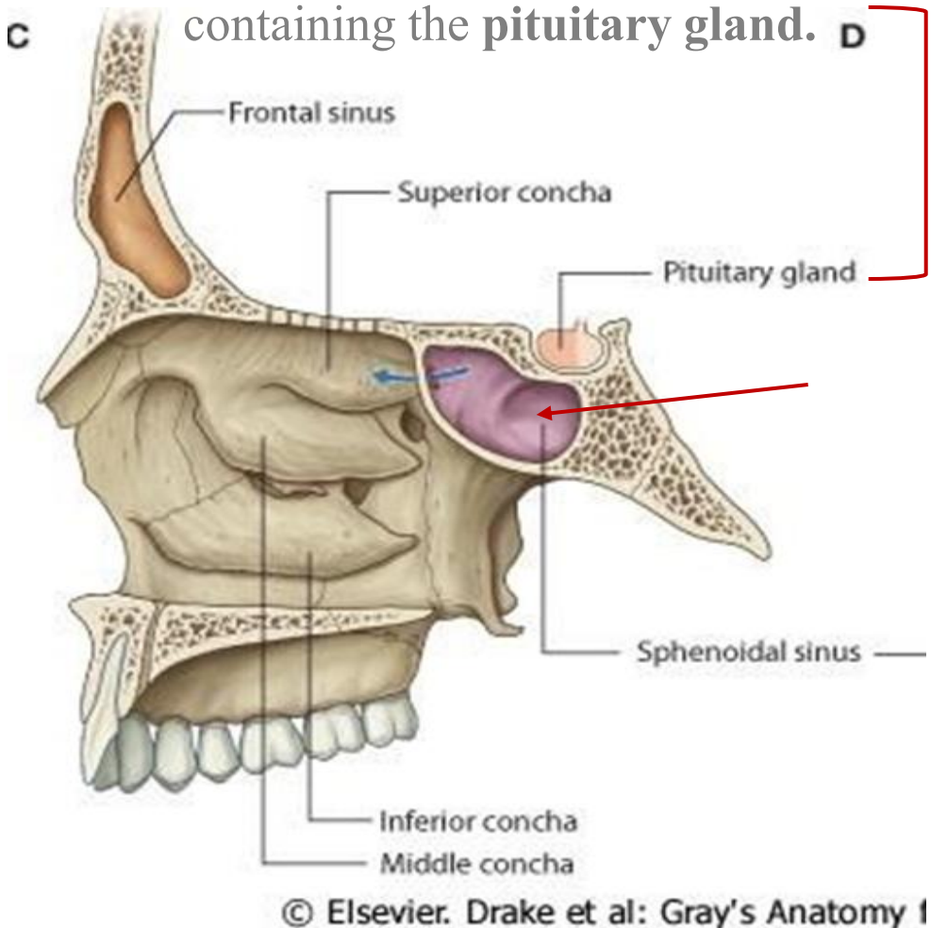


- It is innervated by branches of the **supra-orbital nerve**, which arises from the **ophthalmic** division of the trigeminal nerve (V1).

3- Sphenoid sinus:

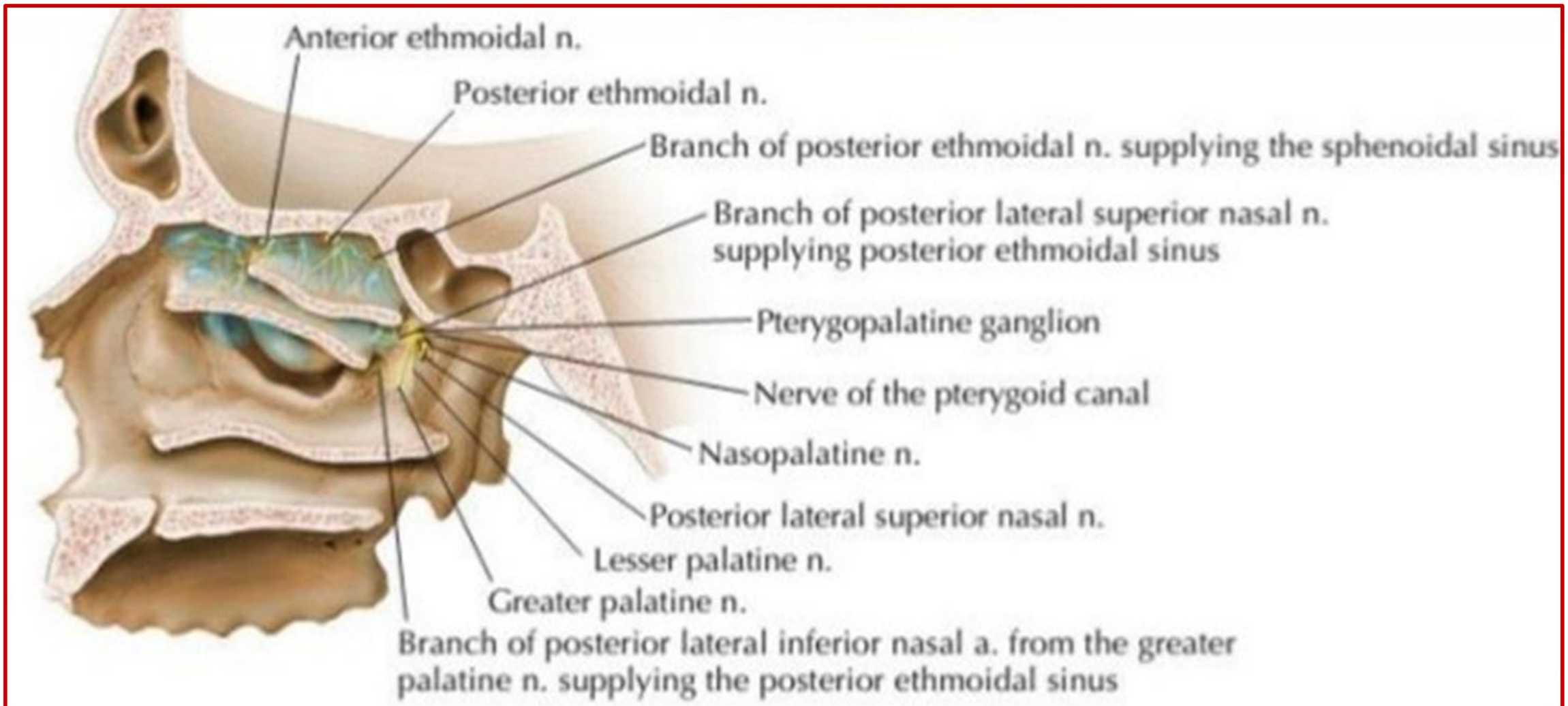


Be aware of this relation: Superiorly, the sinus is related to the Sella turcica containing the **pituitary gland.**



- It is innervated by **Posterior ethmoidal nerve** (branch of **ophthalmic nerve, V1**) **& Maxillary nerve (V2)** via **orbital branches**

4- Ethmoidal sinuses:

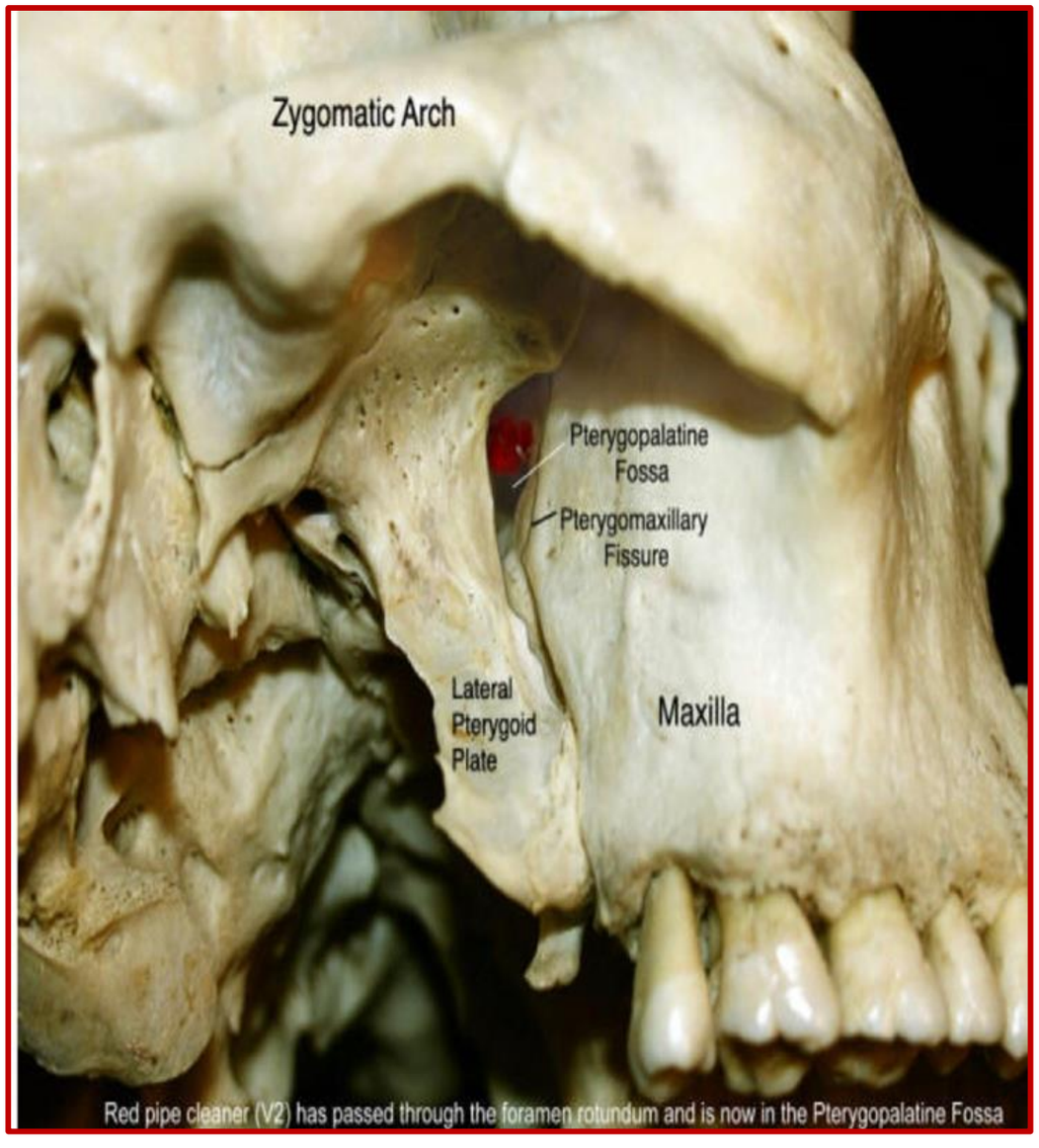


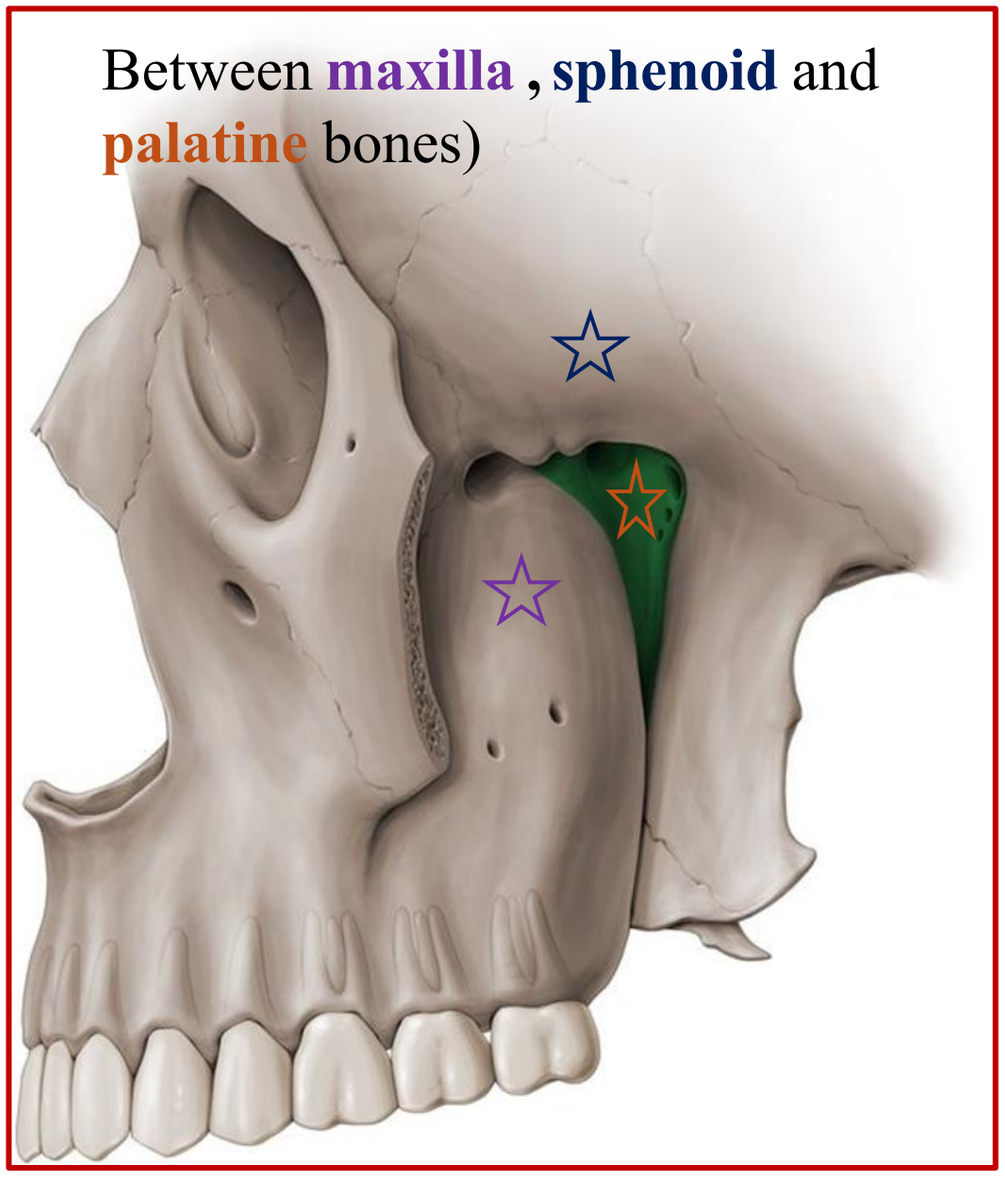
- Innervated by **Anterior ethmoidal nerve & Posterior ethmoidal nerve** (both branches of **ophthalmic nerve, V1)**

7- Pterygopalatine fossa.

- Students should know the site, boundaries, foramina and fissures with their communications, contents, and associated ganglion of the pterygopalatine fossa.

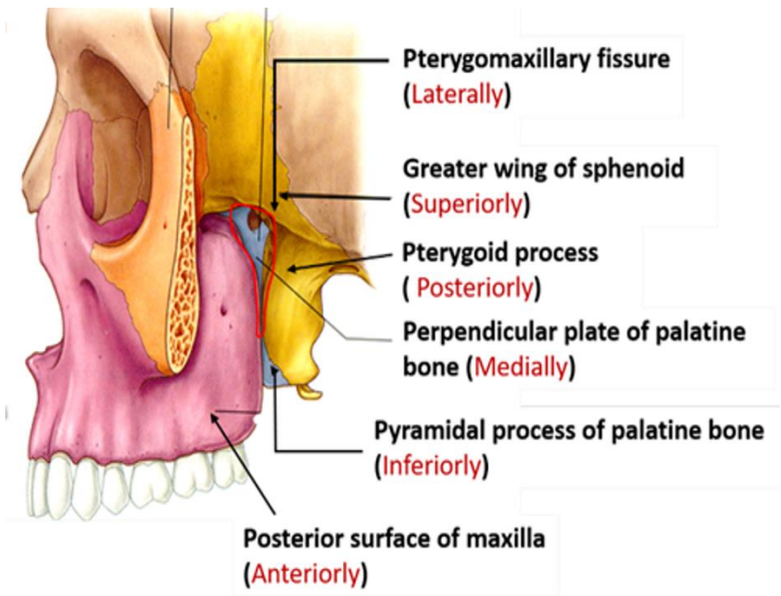
Site of the fossa:

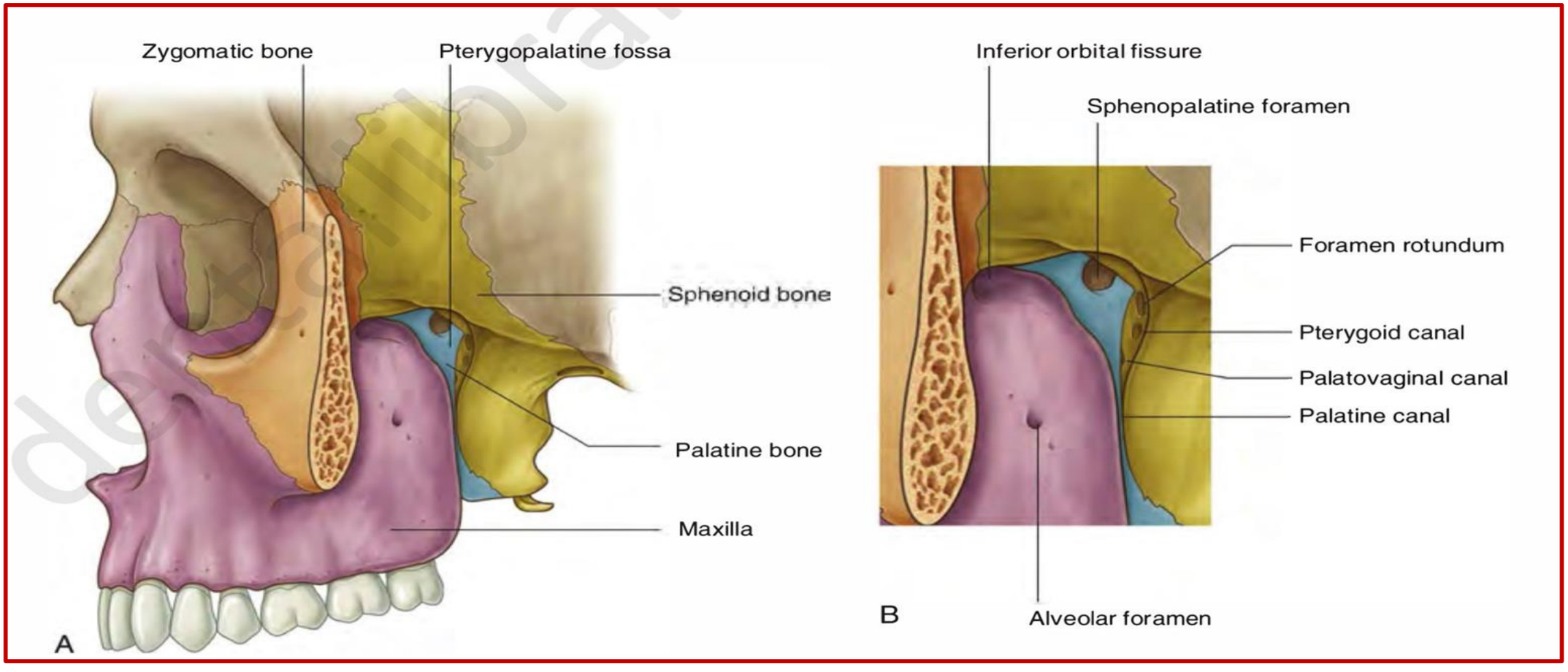




▪ PPF boundaries:

Wall	Formed by
Anterior wall	Posterior surface of the **maxilla**
Medial wall	Lateral surface of the **palatine bone**
Posterior wall	**Lateral pterygoid plate** of the **sphenoid** bone
Roof	**Greater wing of sphenoid** bone
Lateral wall	**Pterygomaxillary fissure** (space)





▪ PPF foramina:

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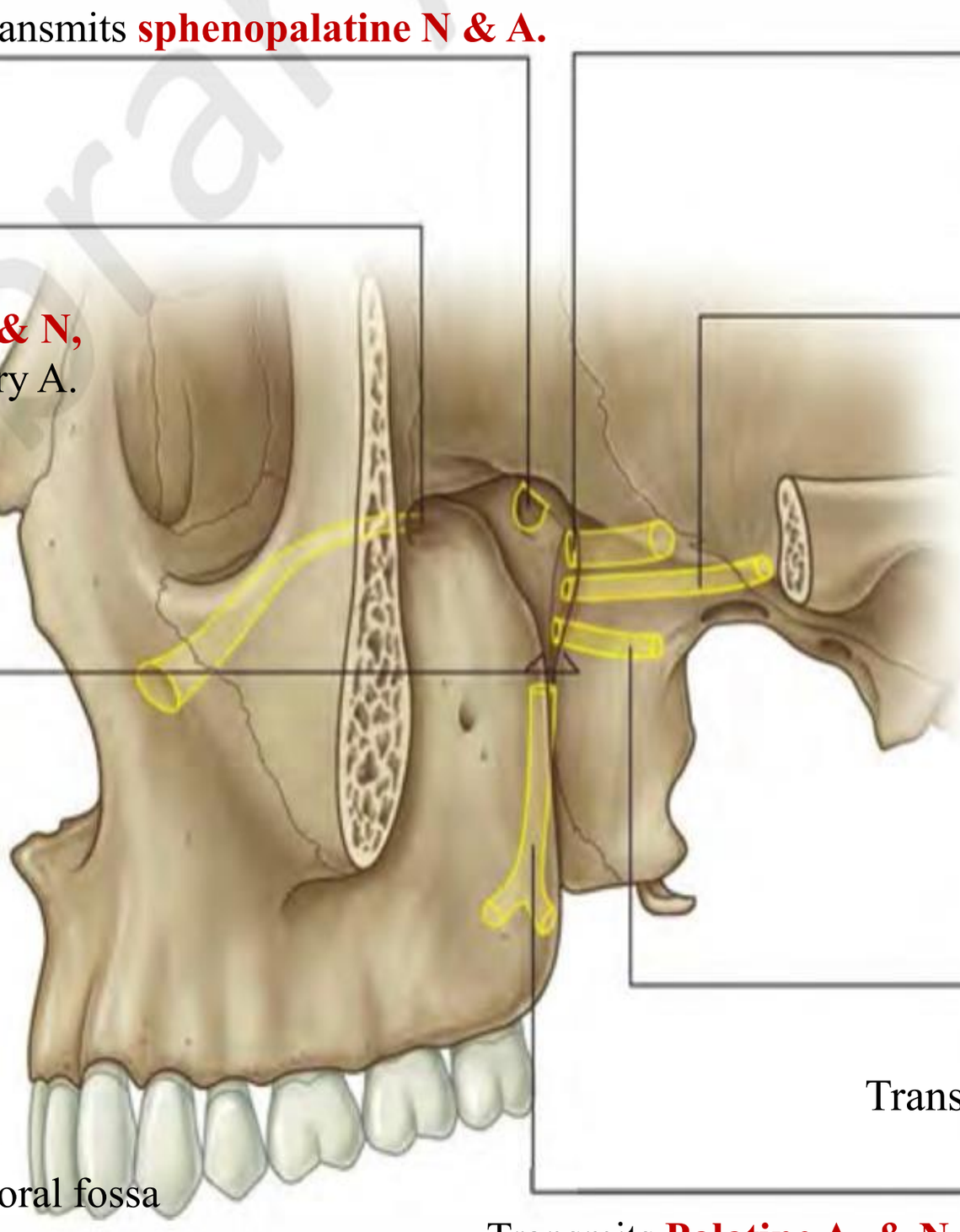


5 Sphenopalatine foramen
nasal cavity
Transmits **sphenopalatine N & A.**

6 Inferior orbital fissure
floor of orbit
Transmits **infra-orbital A & N,**
terminal branch of maxillary A.

Pterygomaxillary fissure
7 infratemporal fossa
Transmits:
Maxillary artery
→ passes **into** the PPF
Maxillary nerve (V2)
→ passes **out of** the PPF

Recall:
N ---------->
PPF → PMF → Infratemporal fossa
<----------A

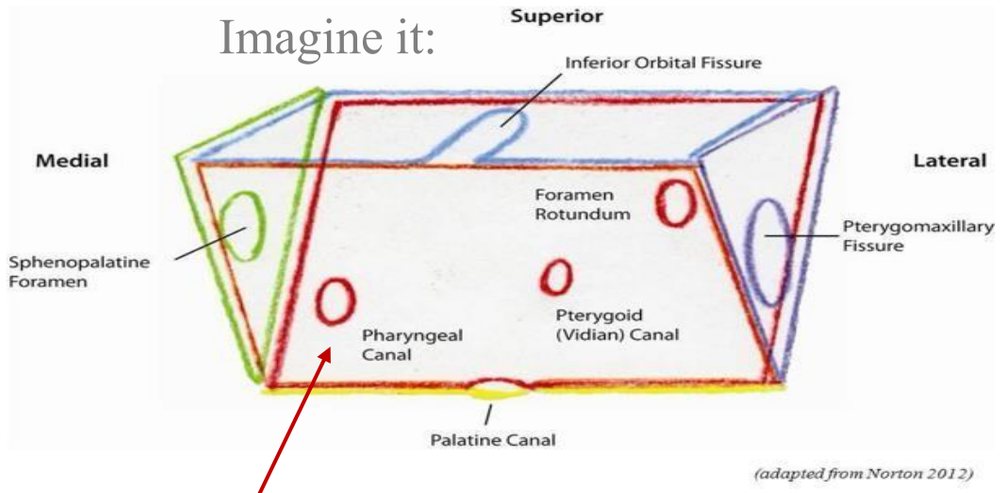
Foramen rotundum
1 cranial cavity
(middle cranial fossa)
Transmits **Maxillary N.**

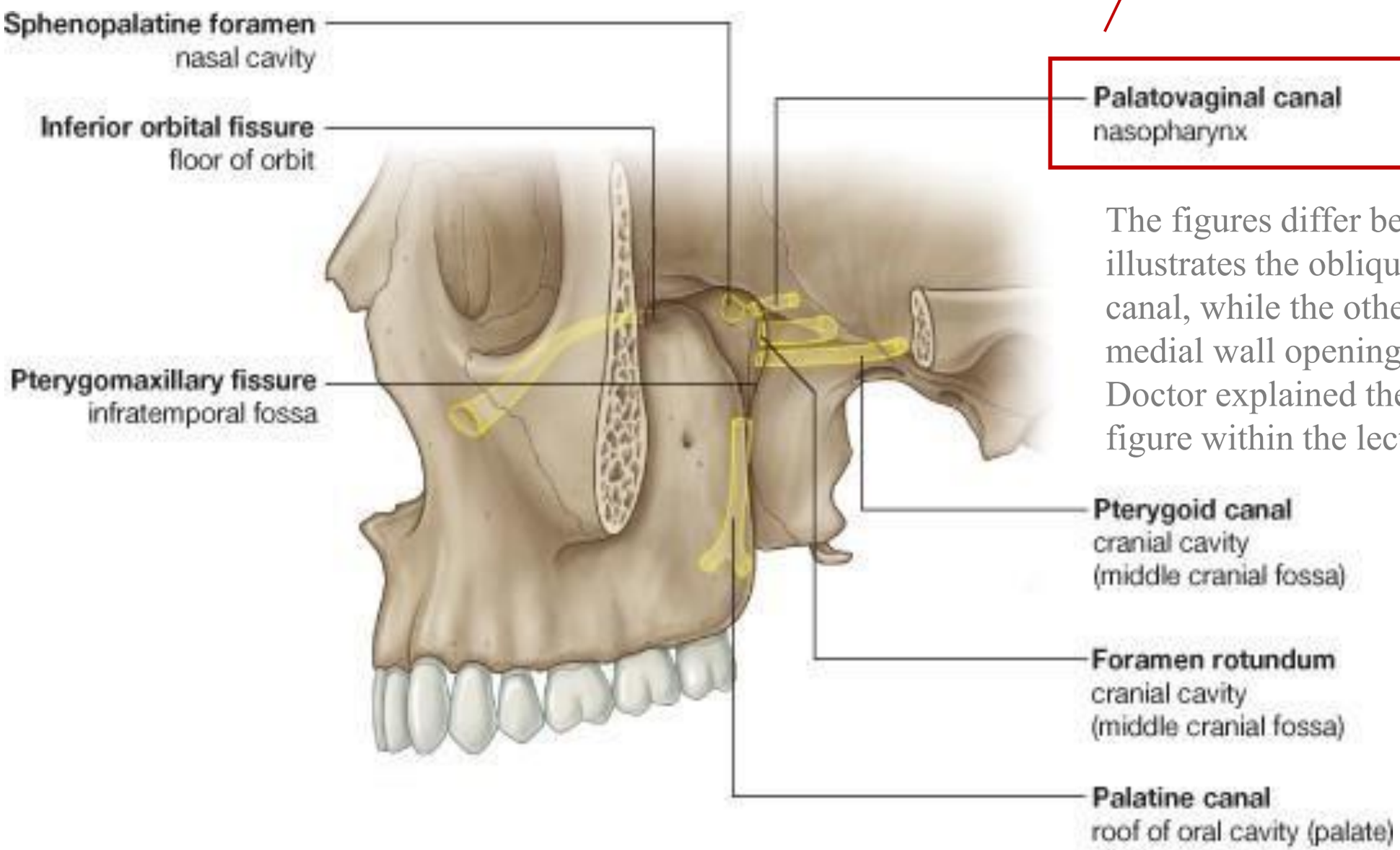
Pterygoid canal
2 cranial cavity
(middle cranial fossa)
Transmits **nerve of pterygoid canal.**

Palatovaginal canal
3 nasopharynx
Transmits **Pharyngeal N. & A.**

Palatine canal
Transmits **Palatine A. & N.** **4** roof of oral cavity (palate)

Imagine it:





The figures differ because one illustrates the oblique course of the canal, while the other shows its medial wall opening; Note that the Doctor explained the canal on this figure within the lecture.

▪ PPF contents:

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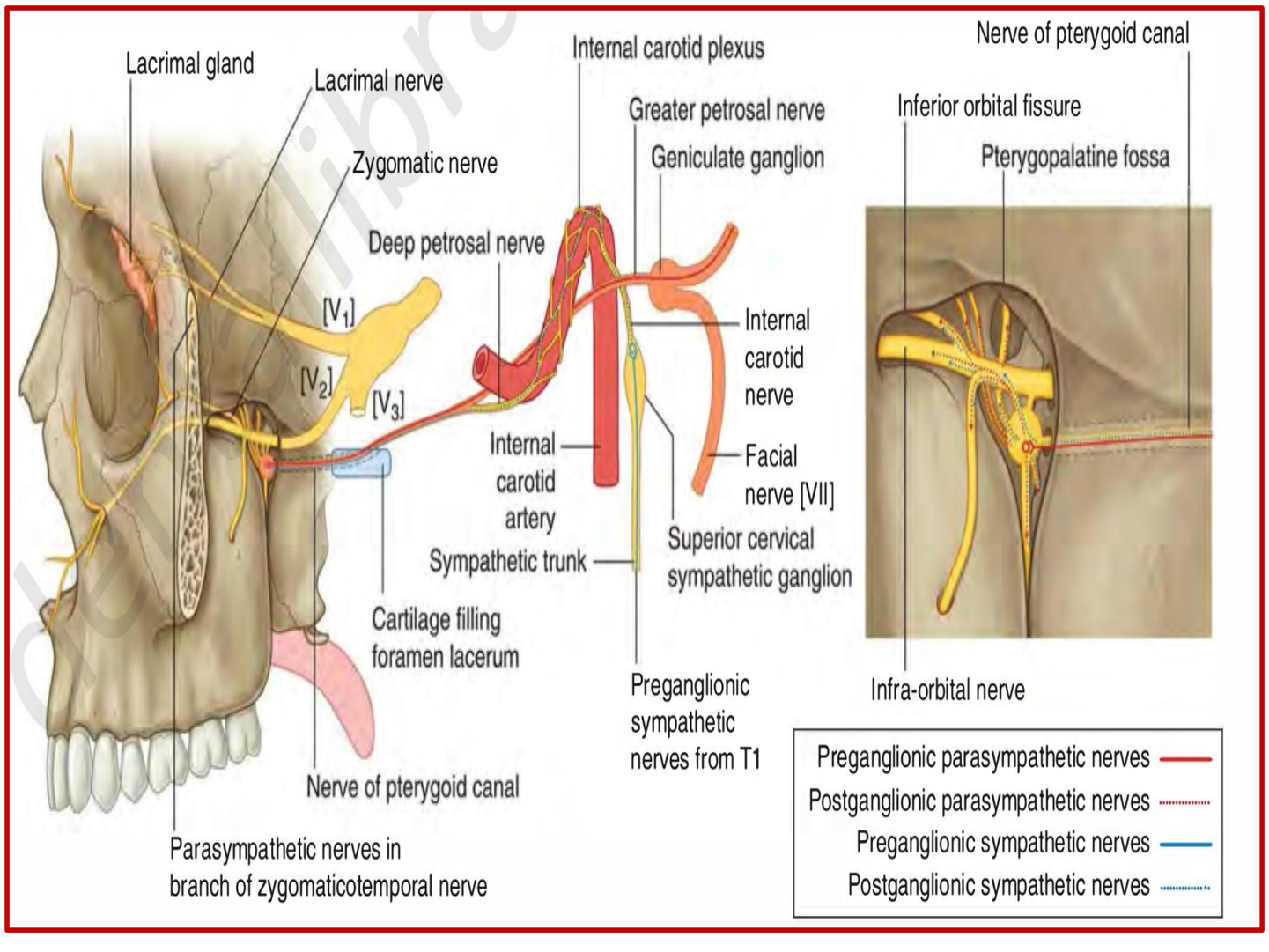
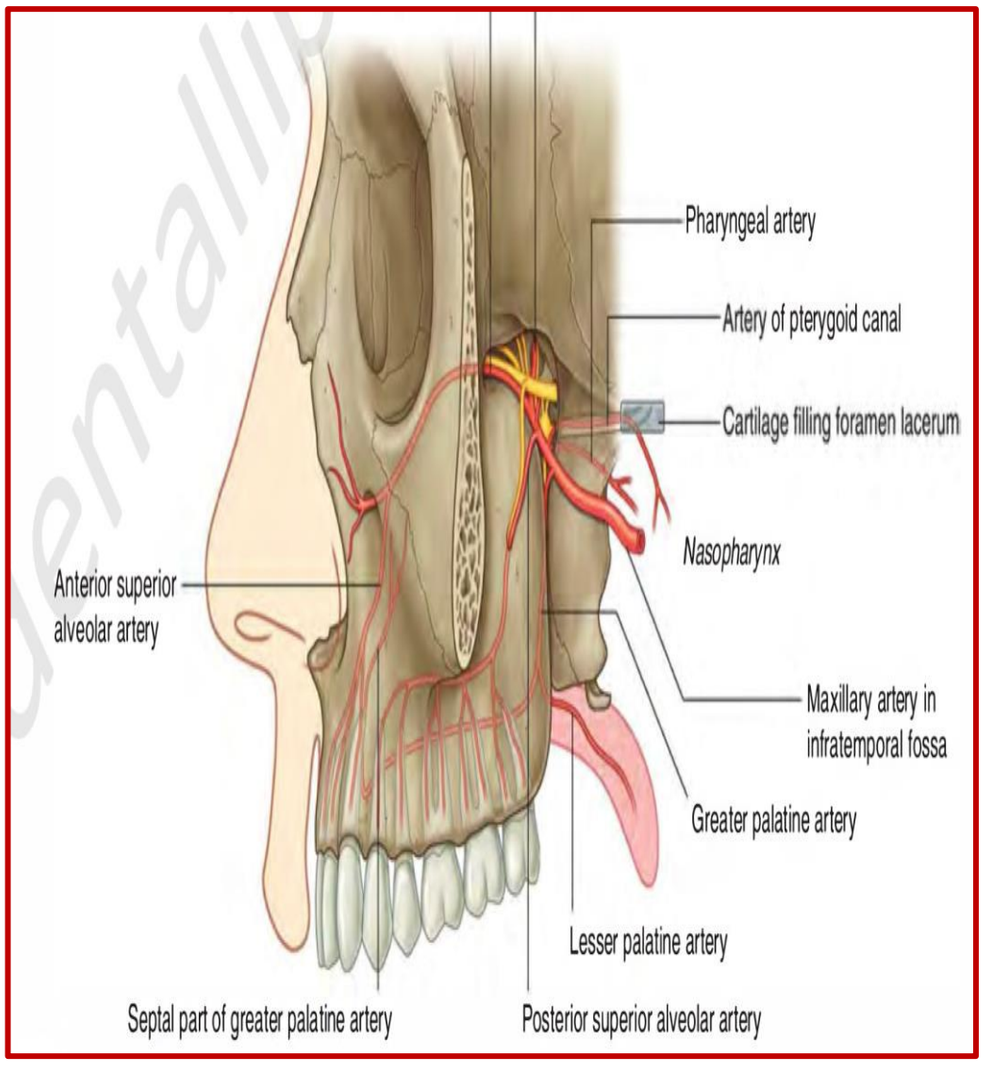
1. The maxillary nerve [V2]
2. Terminal part of the maxillary artery
3. Nerve of the pterygoid canal
4. The pterygopalatine ganglion (parasympathetic)
5. Veins and lymphatics also pass through the pterygopalatine fossa.





▪ Pterygopalatine ganglion:

1. **Preganglionic parasympathetic** fibers (**great petrosal N.**).
2. **Sensory** and **ganglionic** branches of the **maxillary nerve.**
3. **Postganglionic sympathetic** fibers (**deep petrosal N**.).