Morphology of the nasal cavity and paranasal sinuses

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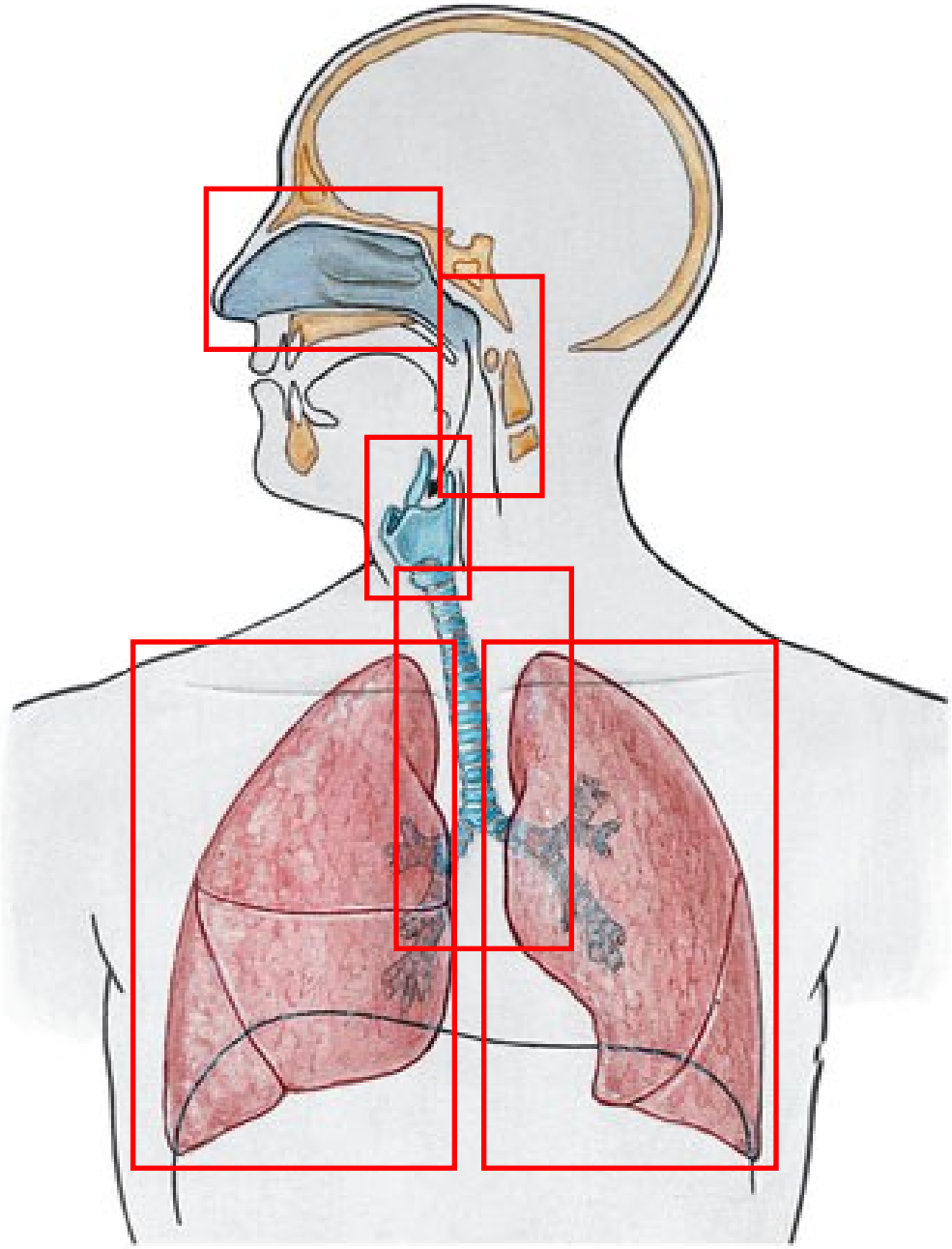
Respiratory system

- gas exchange
  (external respiration: between pulmonary circulation and air)
- respiratory tracts
- vocalization



Respiratory tract:

-upper:

nasal cavity

paranasal sinuses

pharynx (*naso-, oro-, laryngopharynx*)

-lower:

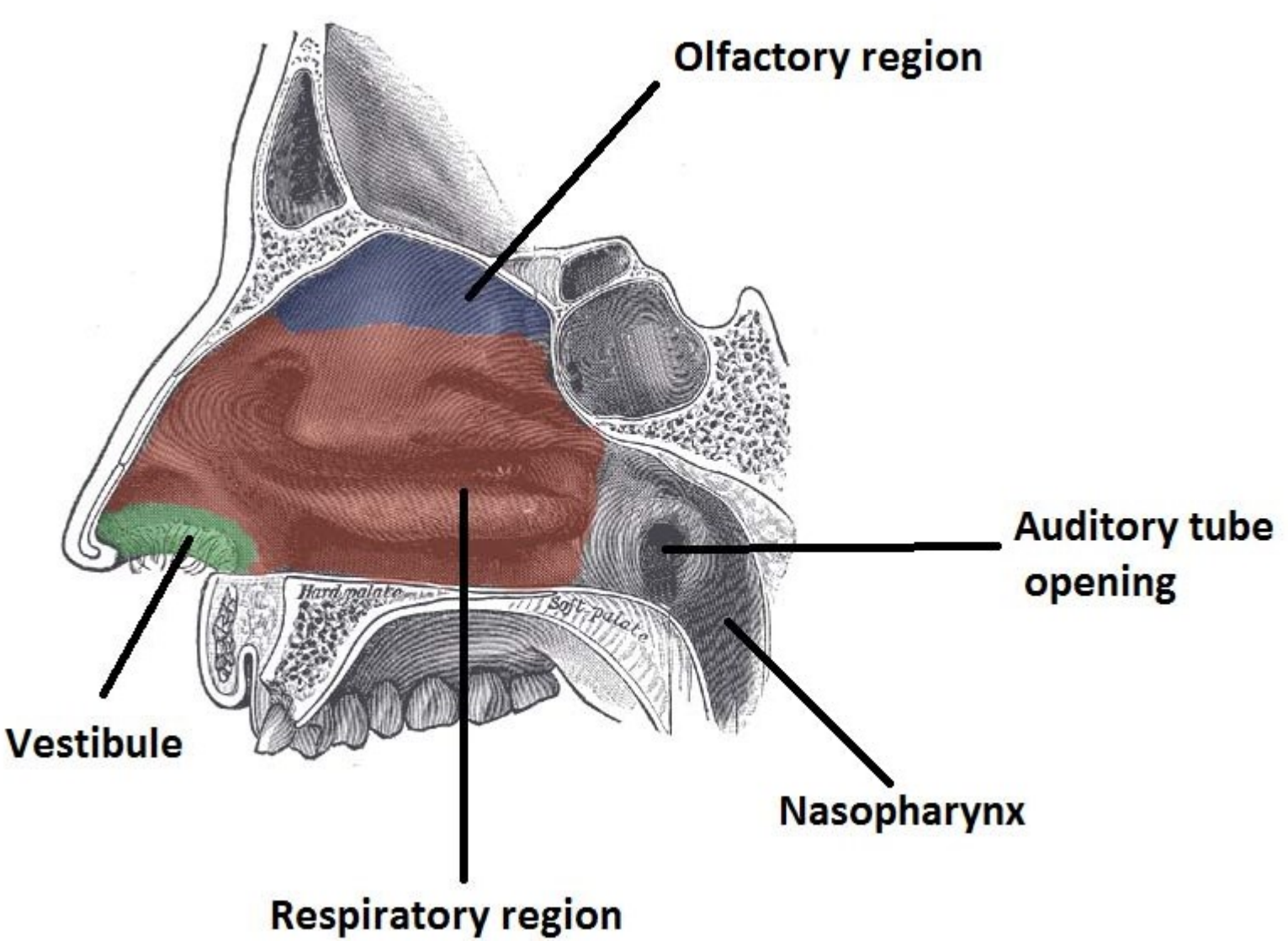
larynx

trachea

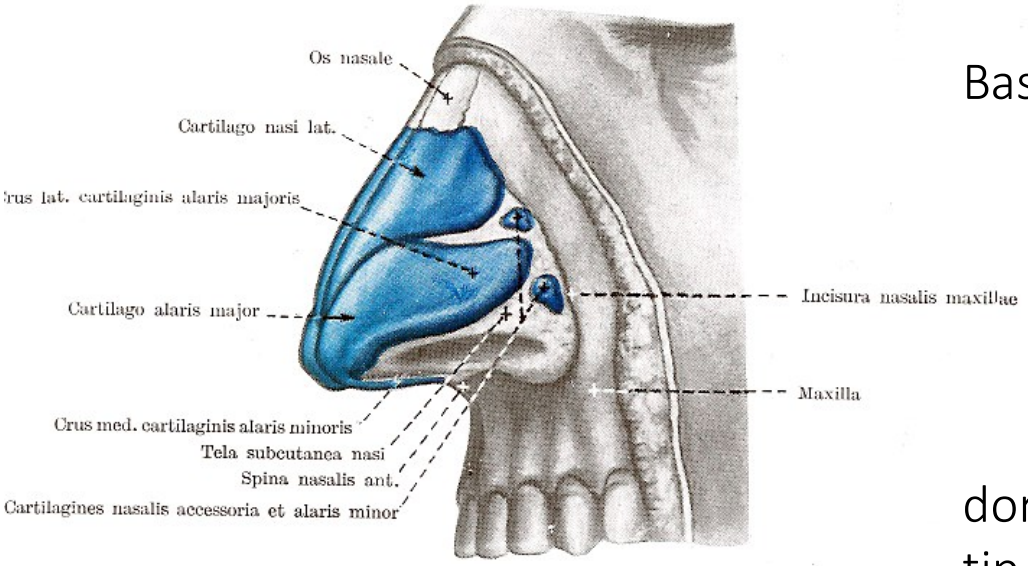
main bronchi

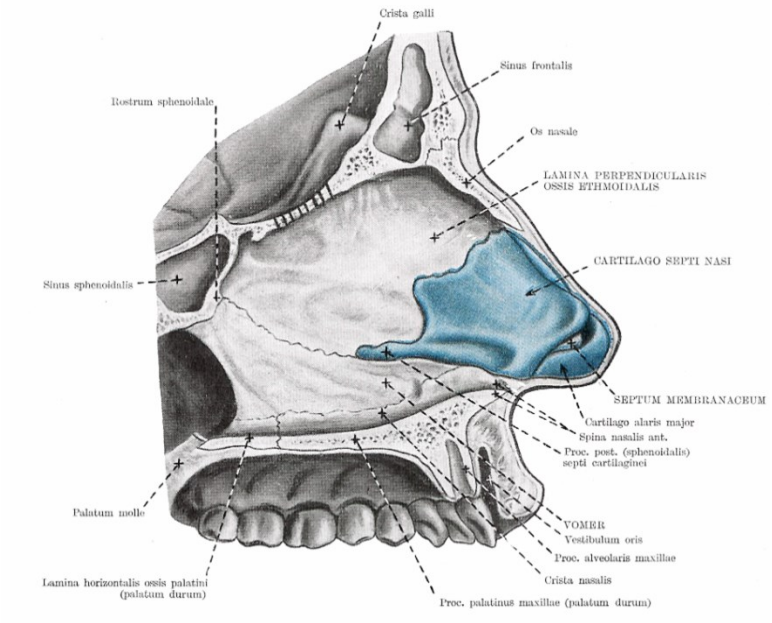
bronchial system

Nasal cavity



External nose





Basis:

- cartilage
  - *lateral cartilage*
  - *alar cartilage*
  - *septal cartilage*
- bone (*nasal bone*)
- dense irregular connective tissue

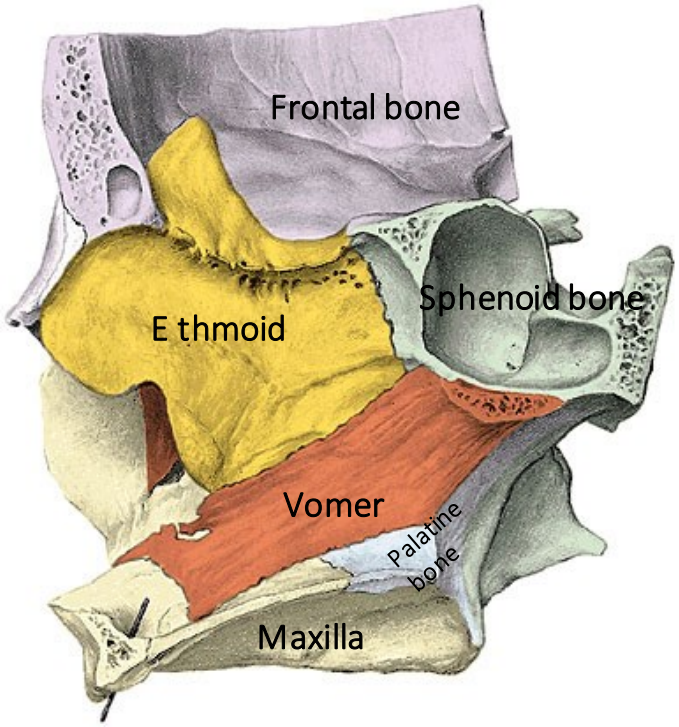
dorsum
tip/apex
nares/nostrils
ala nasi
septum
- cartilaginous part
- bony part

Skin (mimetic/facial muscles: by forced respiration the ala nasi is moving!)

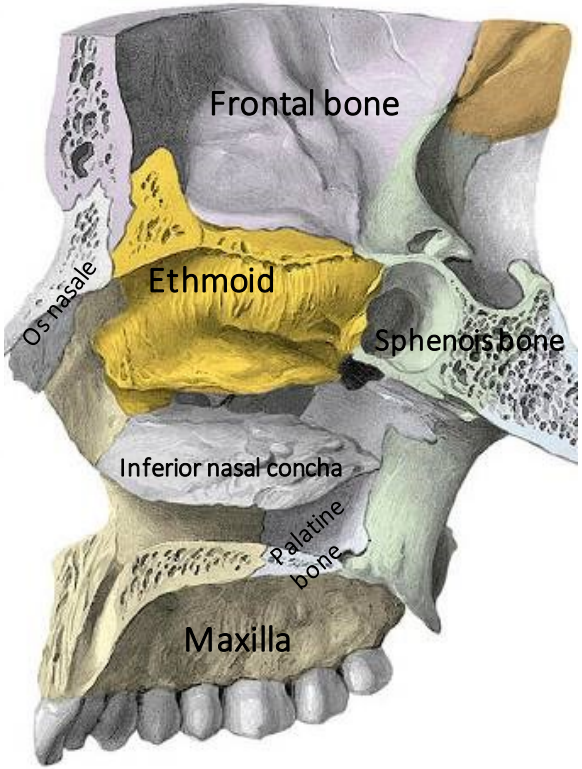
Nasal cavity

Warming and moistening of inspired air, mucociliary transport, mucosal barrier (defence mechanism), resonance, smell, reflexes

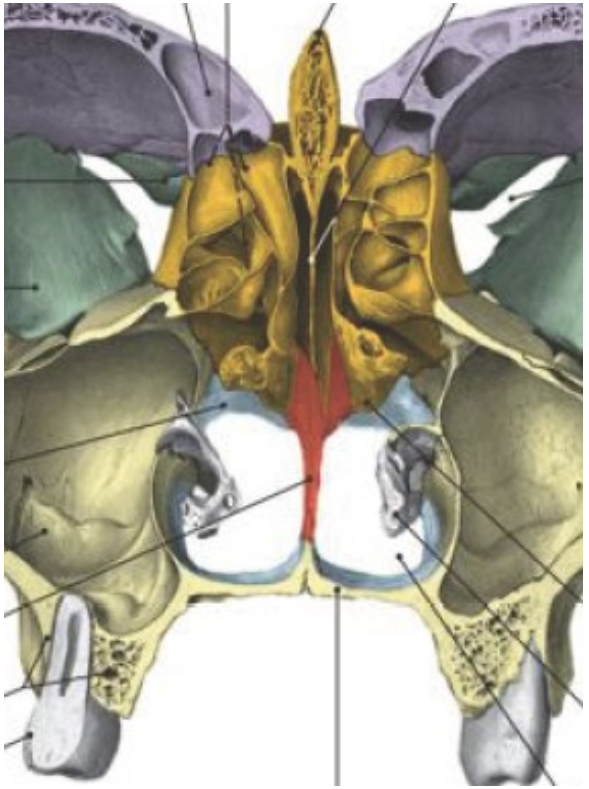
Medial wall



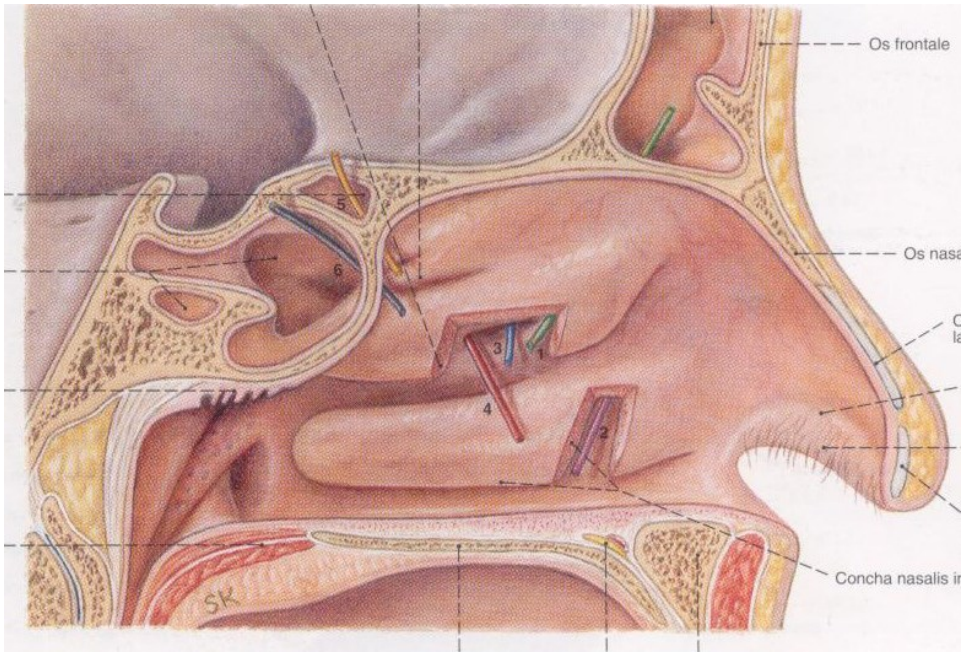
Lateral wall

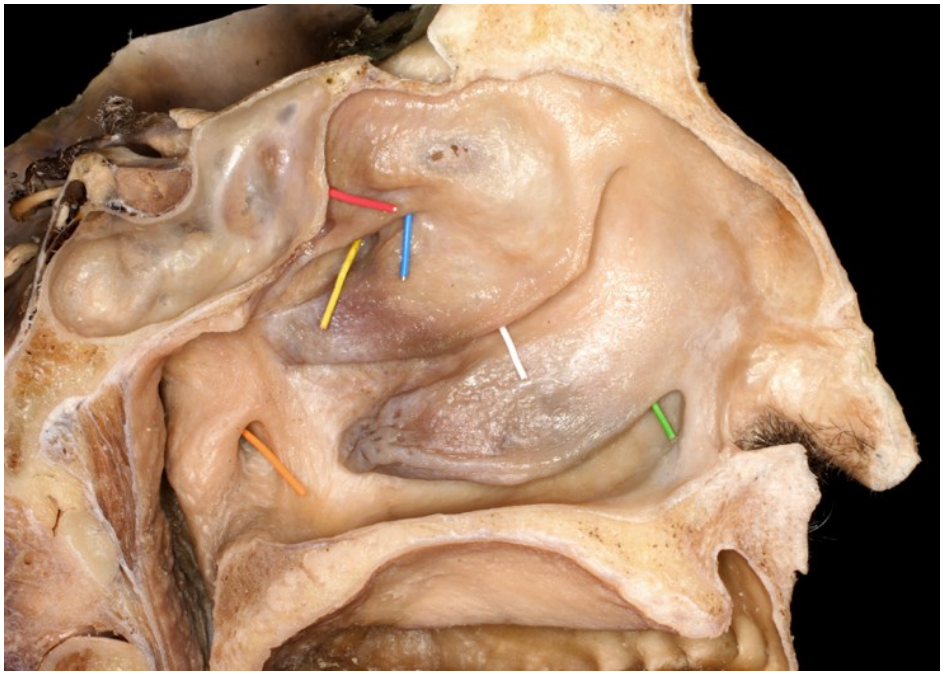


Frontal view



Nasal meatuses





Common nasal meatus

- piriform aperture
- cribriform plate
- incisive canal
- sphenopalatine foramen
- aperture of the sphenoidal sinus
  sphenoethmoidal recess
- choanae

Superior nasal meatus

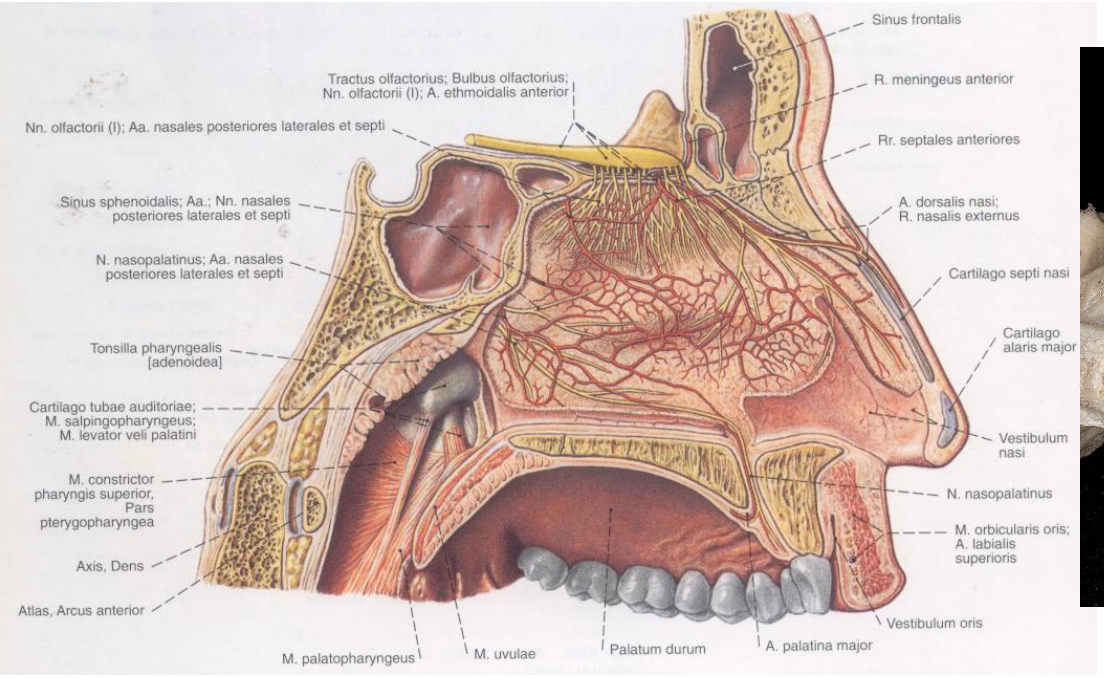
- posterior air cells of the ethmoid

Medial nasal meatus

- semilunar hiatus:
  ethmoidal infundibulum, aperture for the maxillary sinus, anterior and medial air cells of the ethmoid

Inferior nasal meatus

- nasolacrimal duct



Vessels and nerves:

anterior ethmoidal artery (ophthalmic artery)

anterior ethmoidal nerve (branch of the nasociliar nerve V/1.)

posterior ethmoidal artery (ophthalmic artery)

sphenopalatine artery (maxillary artery)

posterior nasal branches of V/2.

septal branch of superior labial artery (facial artery)

Kisselbach's area

pterygoideal and pharyngeal venous plexus

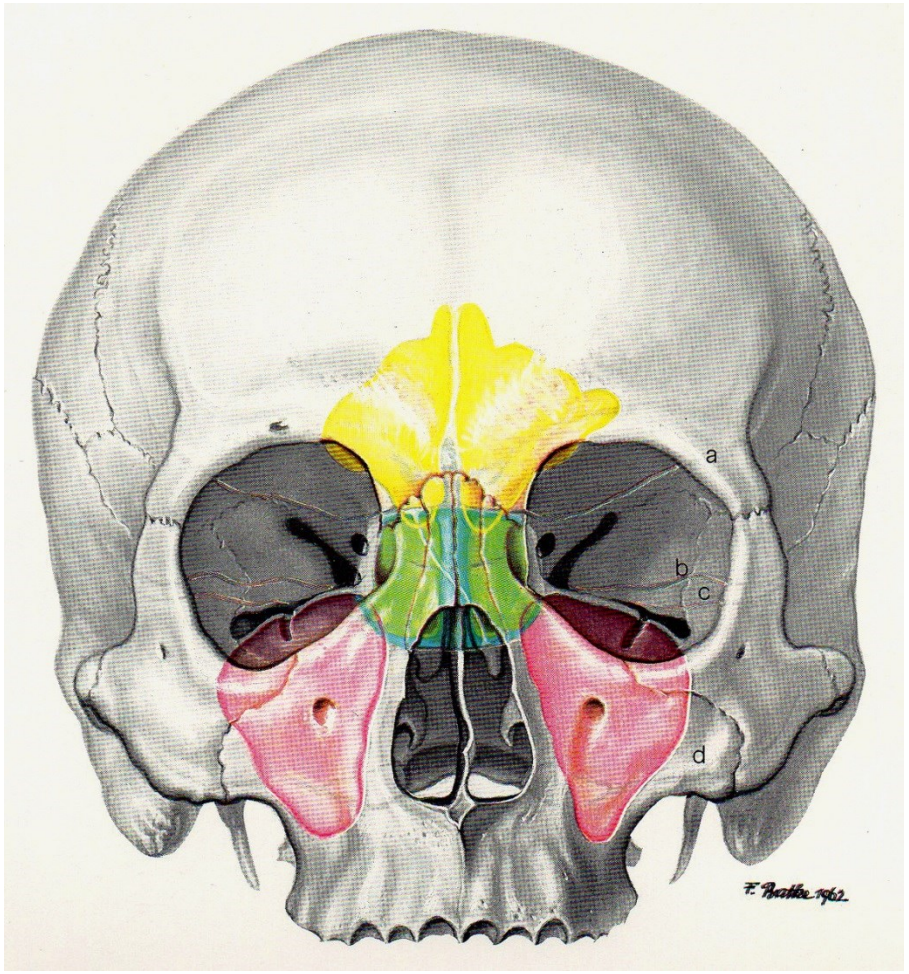
cavernous sinus

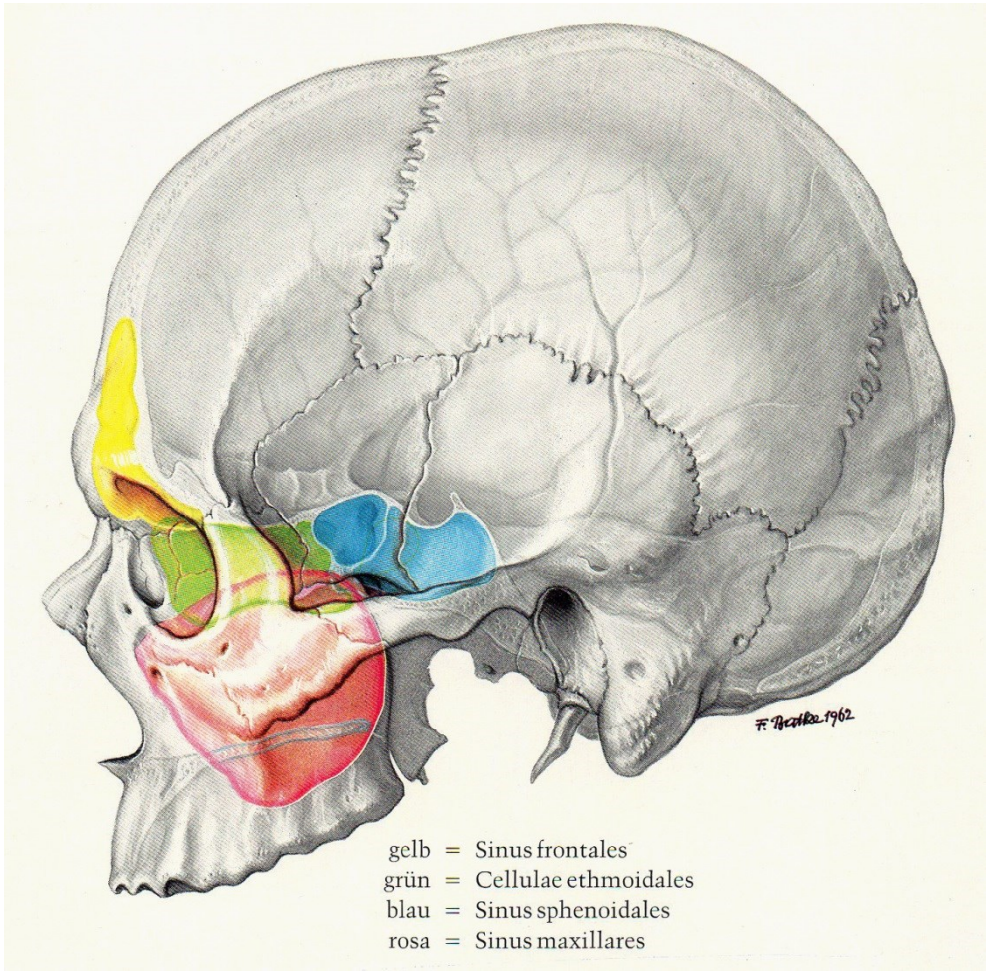
Lymphnodes:

submandibular, retropharyngeal and upper deep lymphnodes of the neck

Paranasal sinuses

Warming of the inspired air, „buffer”, „makes the head lighter”

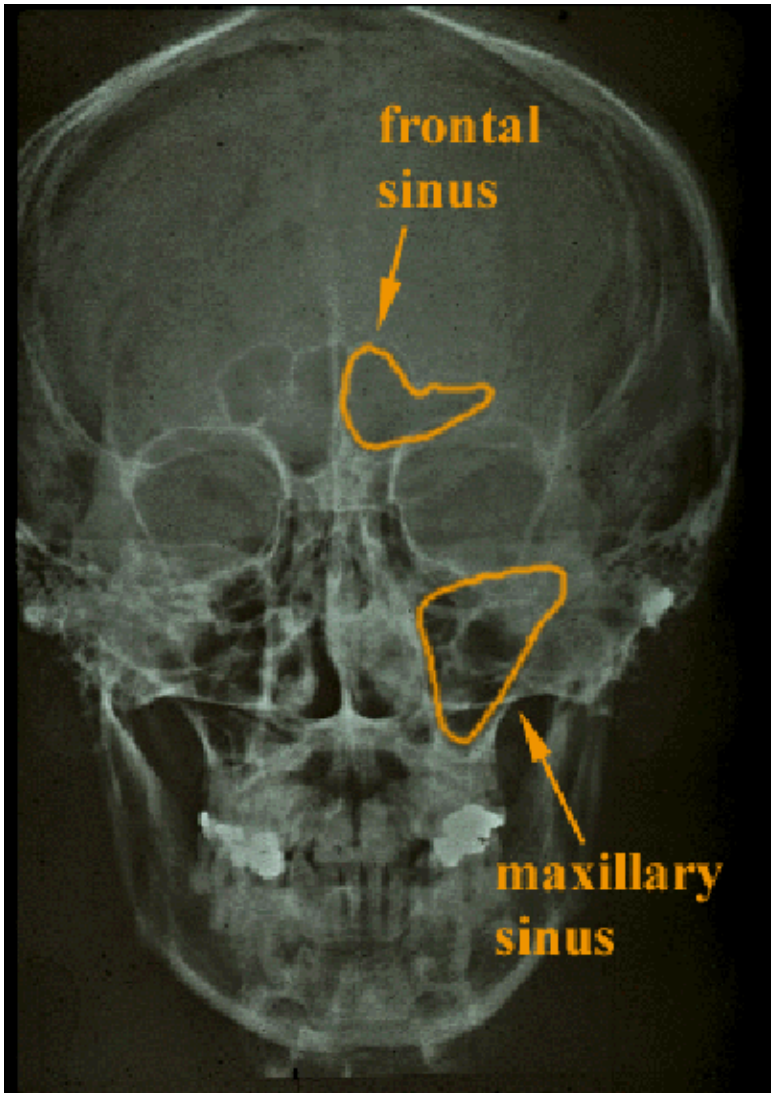




Frontal sinus

Opens via the ethmoidal infundibulum (frontonasal duct) at the semilunar hiatus (anteriorly)

Innervation: supraorbital n.

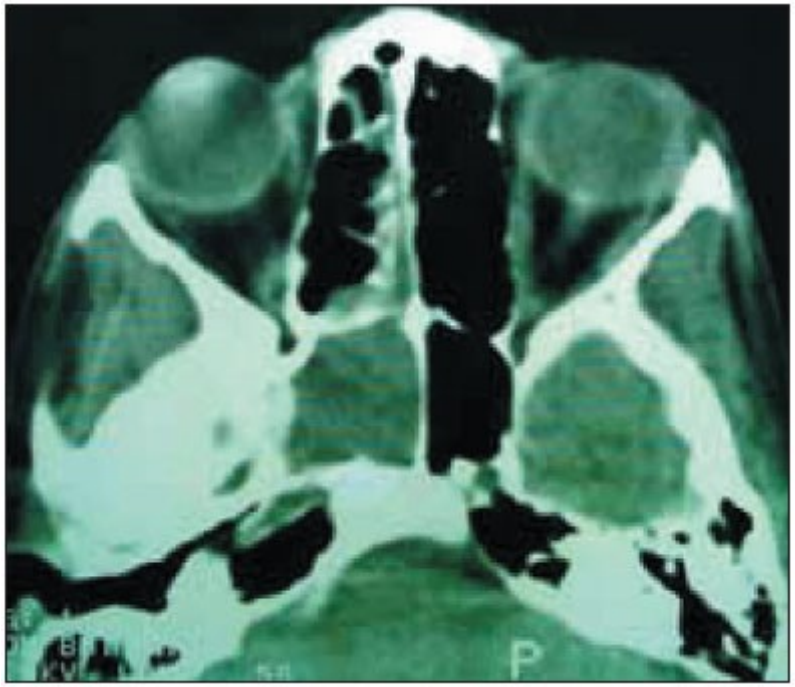


Sphenoidal sinus

Paired cavities in the body of sphenoid

Openings - apertura sinus sphenoidalis – separately within the sphenoethmoidal recess

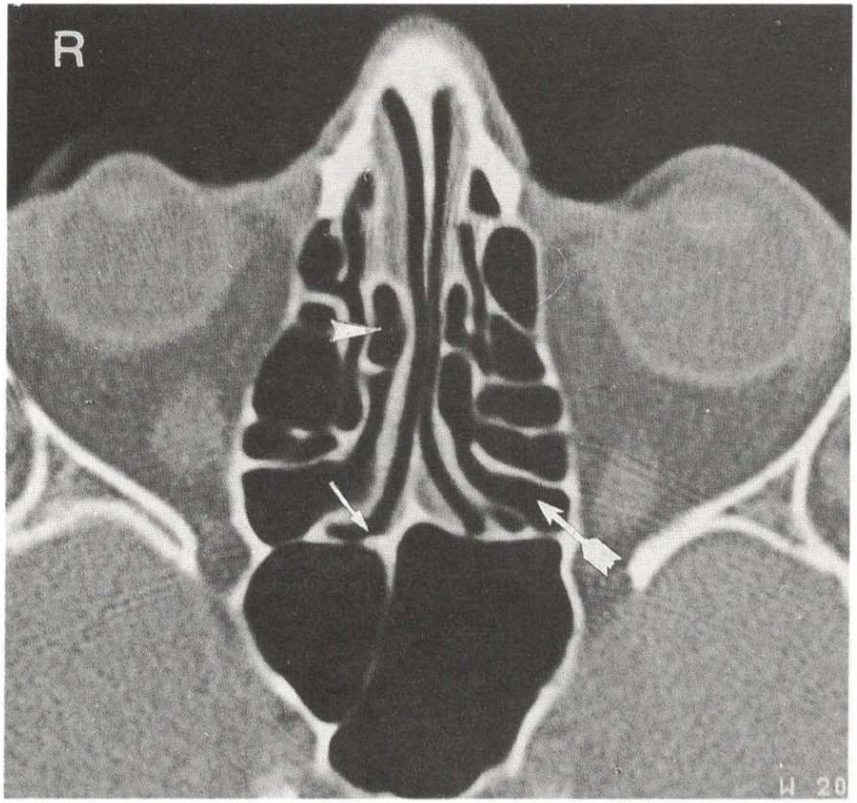
Innervation: maxillary n.



Ethmoidal sinus (labirynth)

Numerous openings
- anterior and medial air cells – at the semilunar hiatus
- posterior air cells - superior nasal meatus

Innervation: branches of the maxillary n.

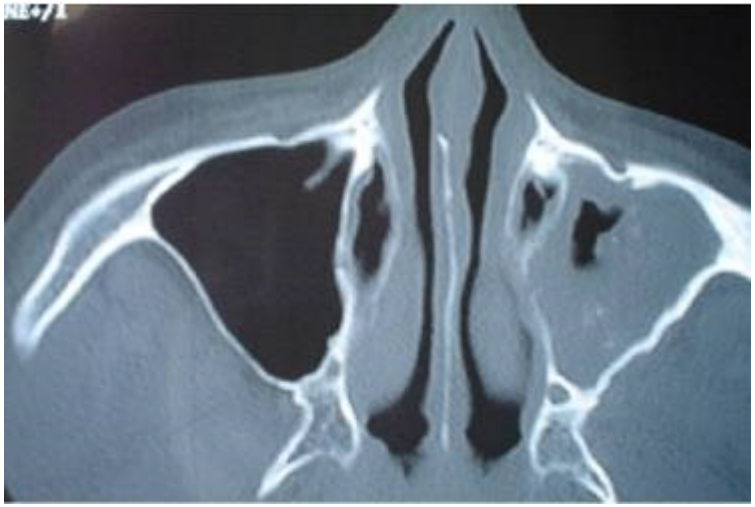


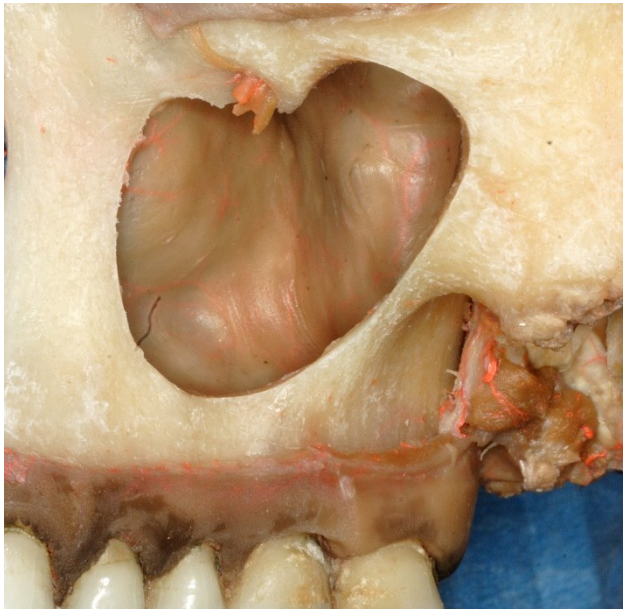
Maxillary sinus (sinus of Highmore)

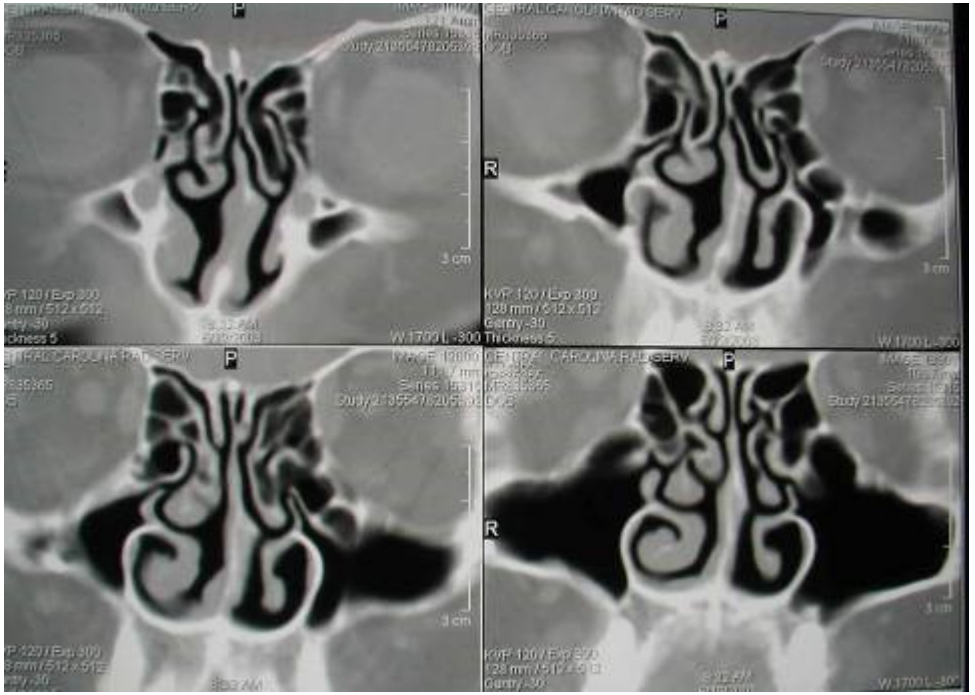
The largest sinus.

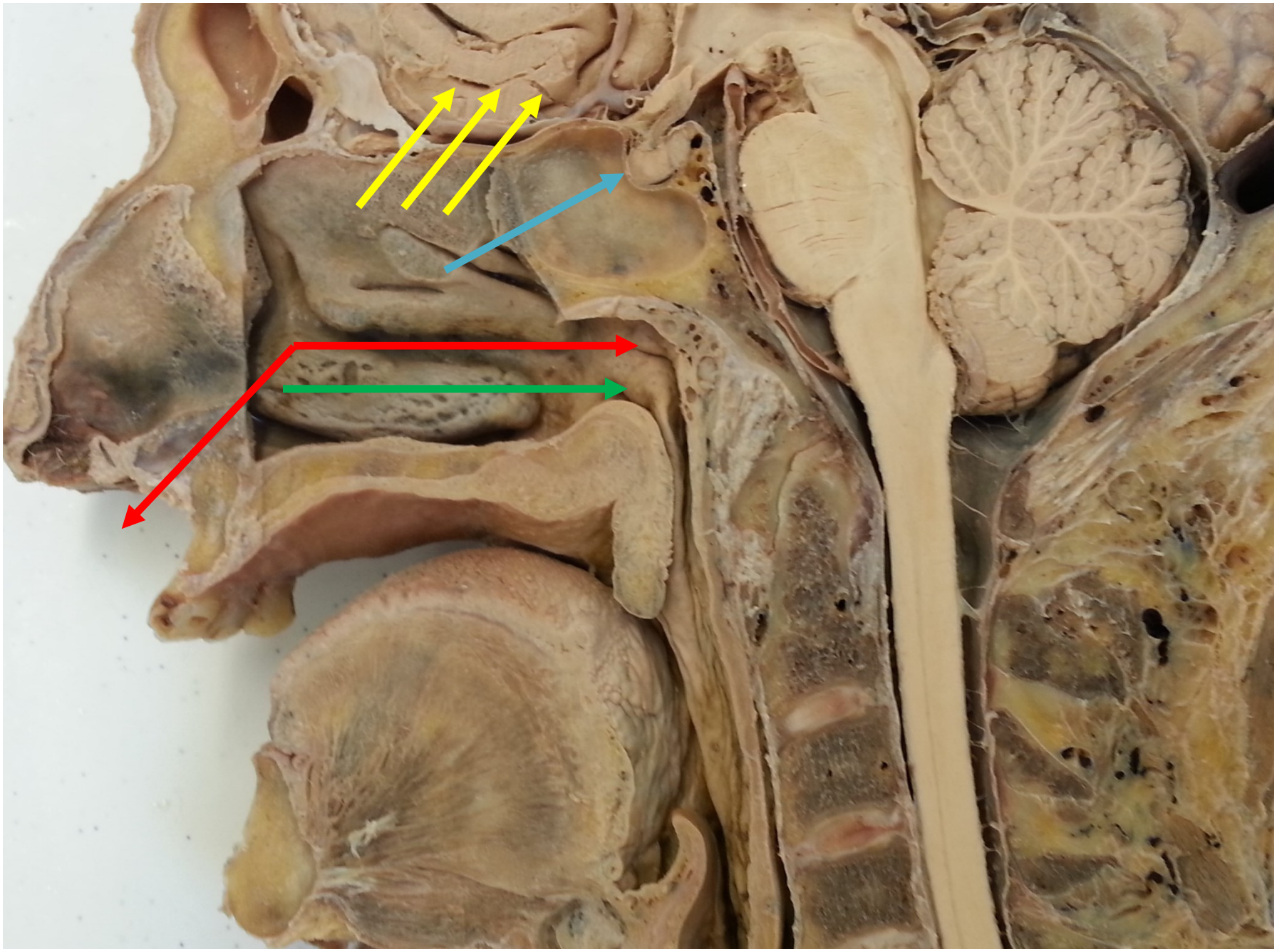
Opens via the semilunar hiatus.

Important topographical relation:
Roots of the upper teeth and orbit









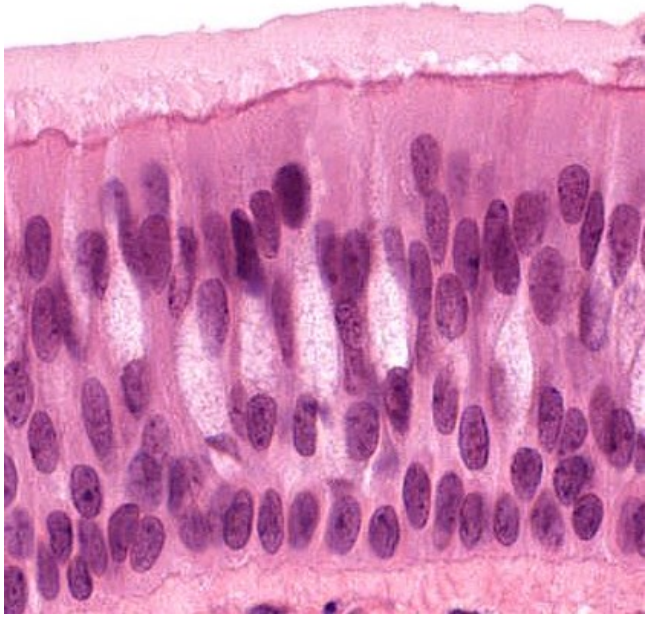
nosebleed *(epistaxis)* cribriform plate fracture ear infection sella turcica + pituitary gland

Histological features of the nasal cavity

vestibule: stratified non ceratinized squamous epithelium

respiratory region: ciliated pseudostratified columnar epithelium

olfactory region: sensory epithelium



40 µm

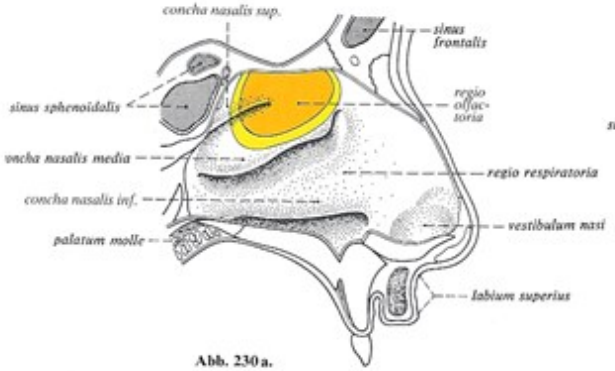


Abb. 230 a.

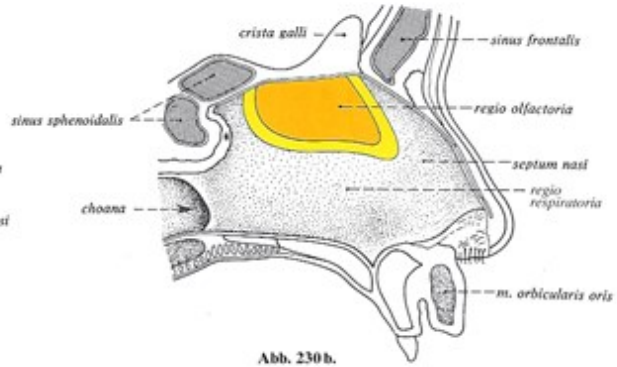


Abb. 230 b.

Thank you for your attention!

Források

Dr. Baksa Gábor: Kehlkopfskelett, Gelenke, Bänder, Kehlkopfmuskulatur
Dr. Herbert-Minkó Krisztina: Légzőrendszer
Dr. Réthelyi Miklós: Sinus paranasales
Dr. Székely Andrea: Anatomy of the nasal cavity. Paranasal sinuses.
Dr. Székely Andrea: Larynx

Szenágothai, Réthelyi: Funkcionális anatómia (Semmelweis Kiadó, 1994)

Khale, Leonhardt, Platzer: Taschenatlas der Anatomie – Innere Organe (Thieme, 1991)
Pernkopf: Atlas der topografischen und angewandten Anatomie des Menschen (Urban und Schwarzenbert, 1963)
Sobotta: Az ember anatómiájának atlasza (Urban és Fischer, 2000)
www.histologyguide.com
https://teachmeanatomy.info/head/organs/the-nose/nasal-cavity/

Fotók: Dr. Baksa Gábor, Dr. Grimm András