



UNC
SCHOOL OF MEDICINE

Surgical Anatomy of the Paranasal Sinuses

Brent A. Senior, MD, FACS, FARS

*Sheila and Nathaniel Harris Professor of
Otolaryngology/Head and Neck Surgery
and Neurosurgery*

University of North Carolina at Chapel Hill



SOUTHERN STATES
RHINOLOGY FOUNDATION

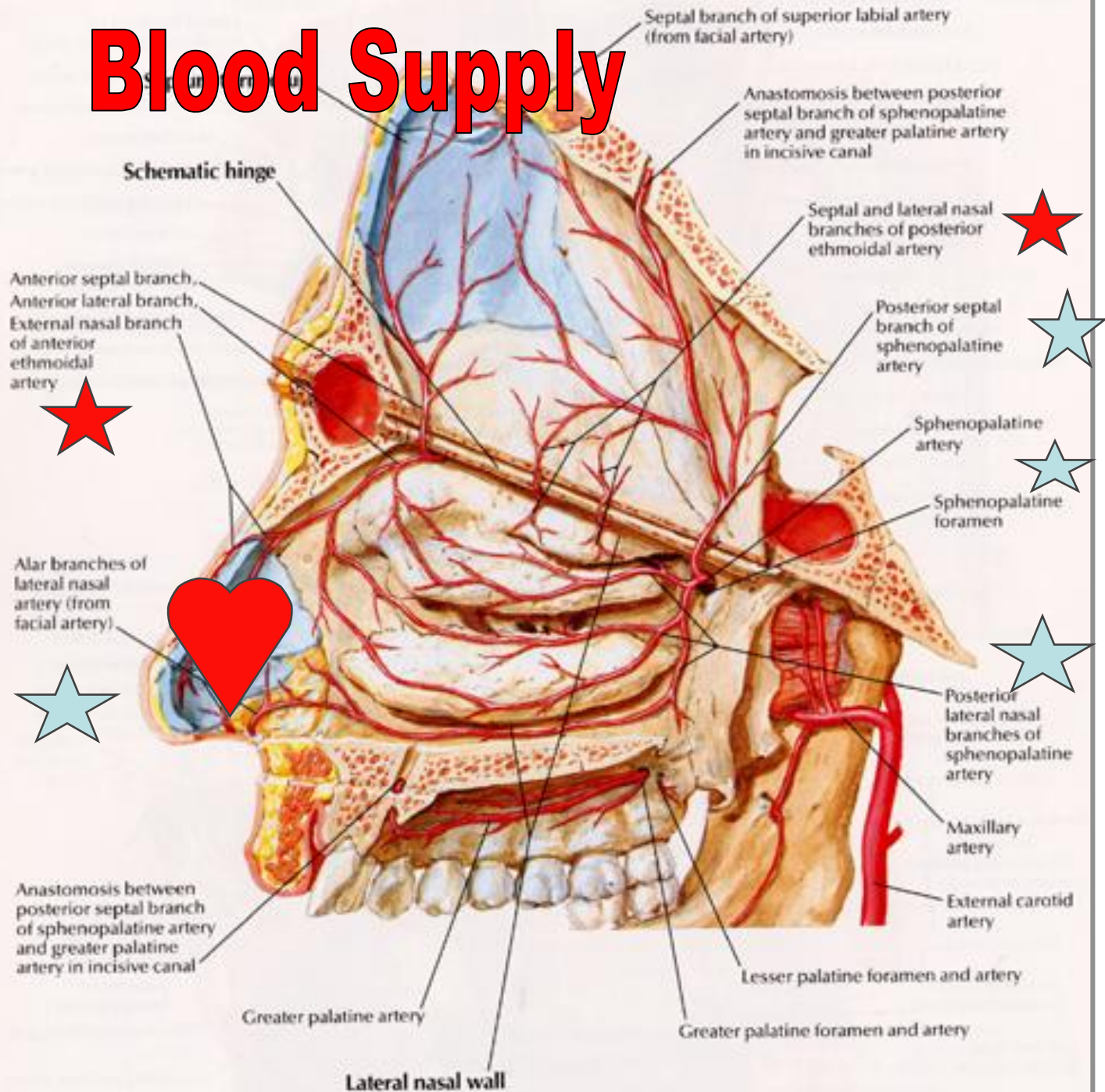
Disclosures

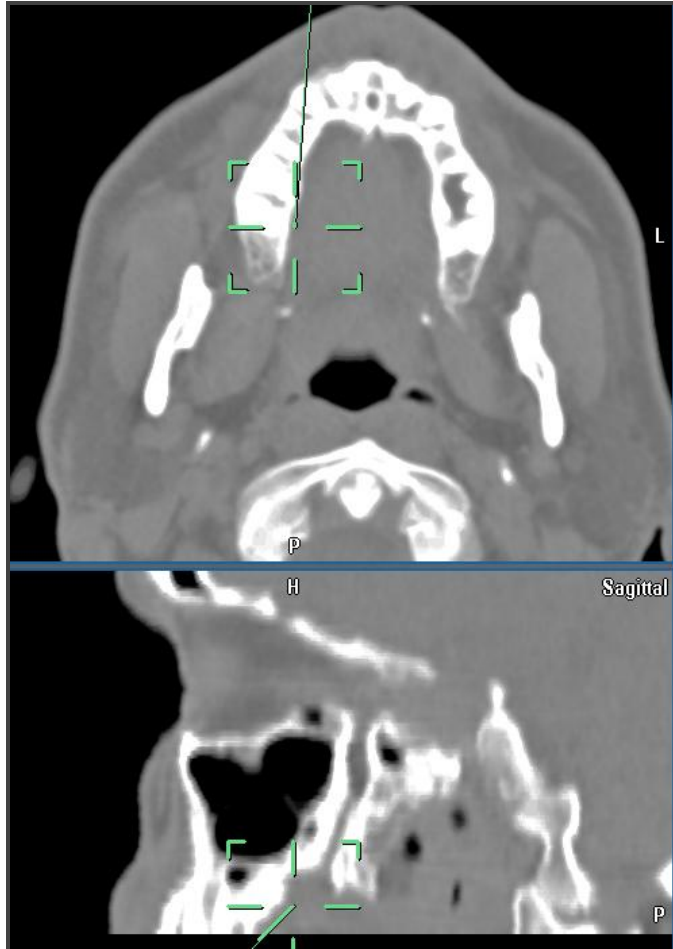
- **Consultant**
 - » Sinuwave
 - » Laurimed
 - » Entrigue
 - » Nasoform
 - » Olympus Gyrus
- **Speaker**
 - » Stryker
 - » Genentech
- **Stockholder**
 - » Entrigue
 - » Remedease
 - » Nasoform

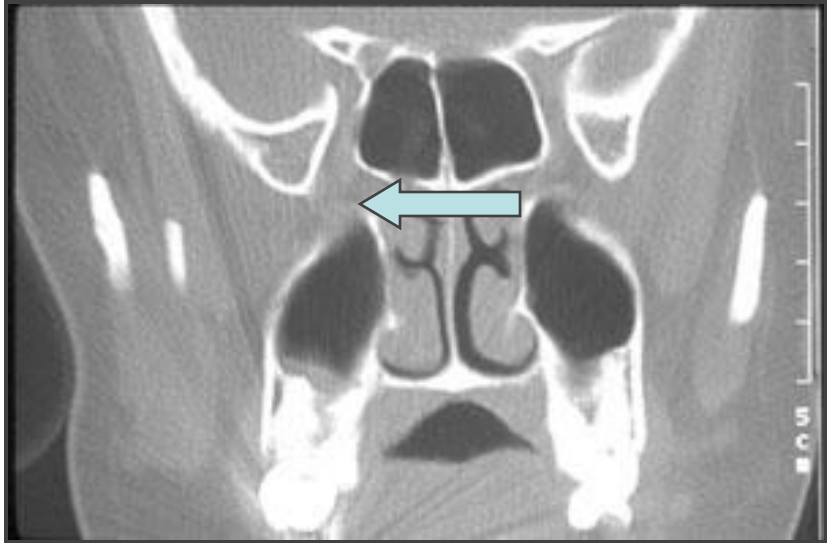
Objectives

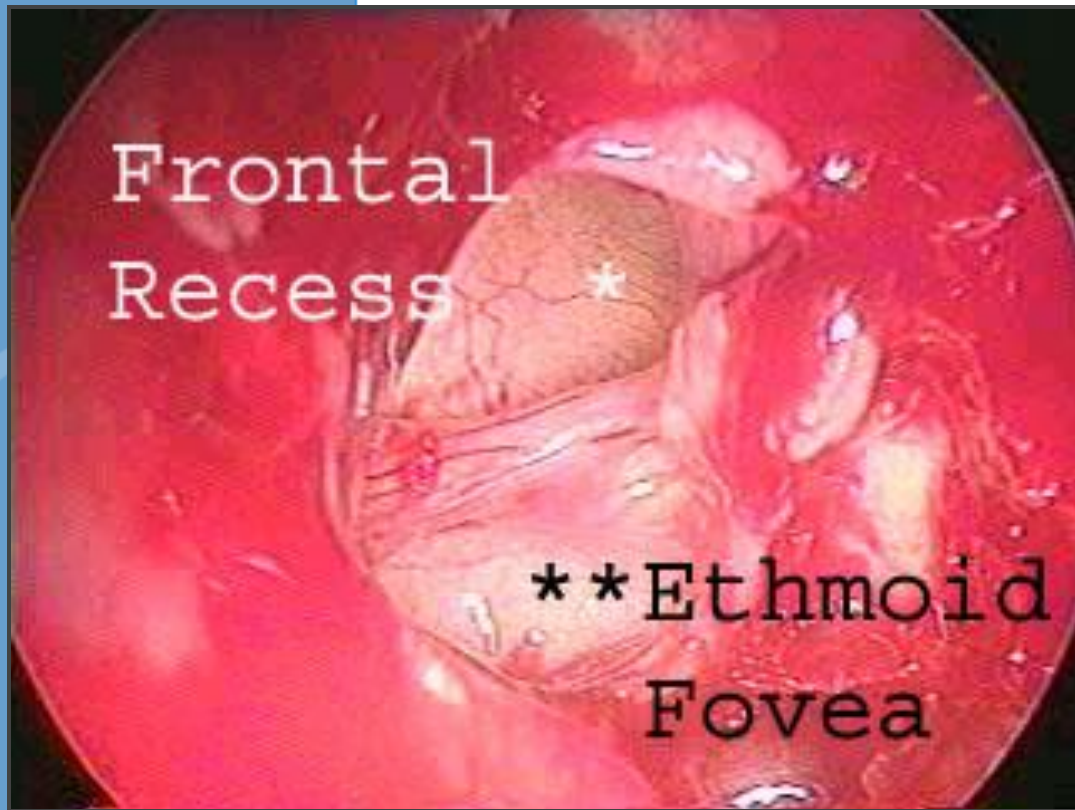
- To gain basic and advanced understanding of the surgical anatomy of the nose and sinuses
 - » To gain understanding of the basic **embryology** of the paranasal sinuses and its influence on the surgical anatomy
 - » To gain understanding of the **special named sinuses**
 - » To gain understanding of the **spaces** of the sinuses

Blood Supply







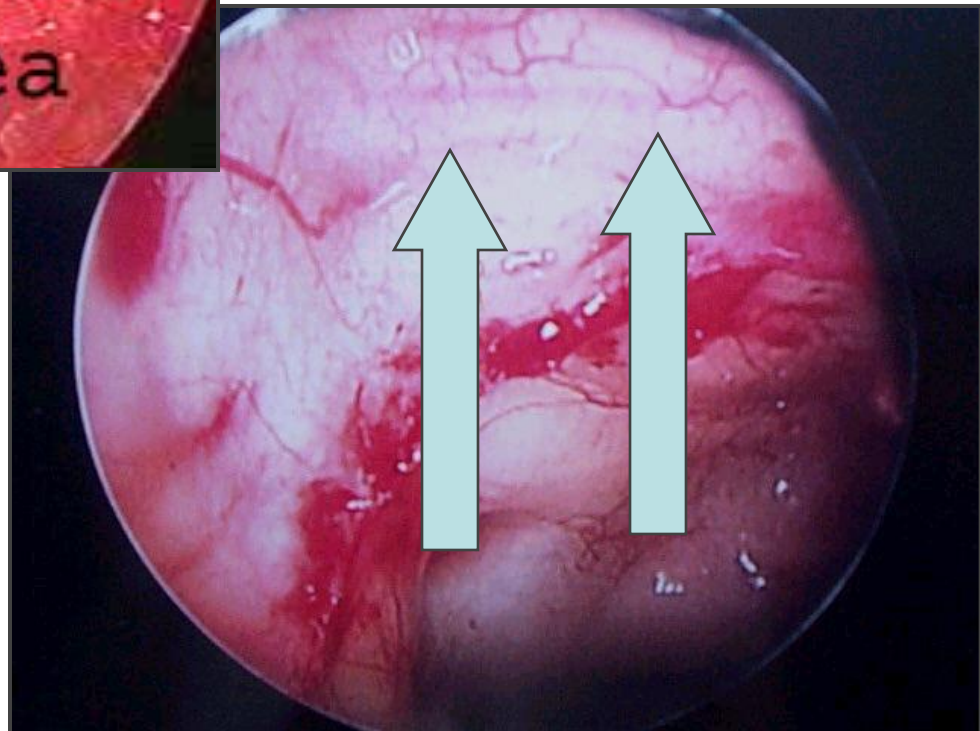


Frontal
Recess *

*** Ethmoid
Fovea

- Anterior Ethmoid A
 - » *Anterior medial to post lateral*

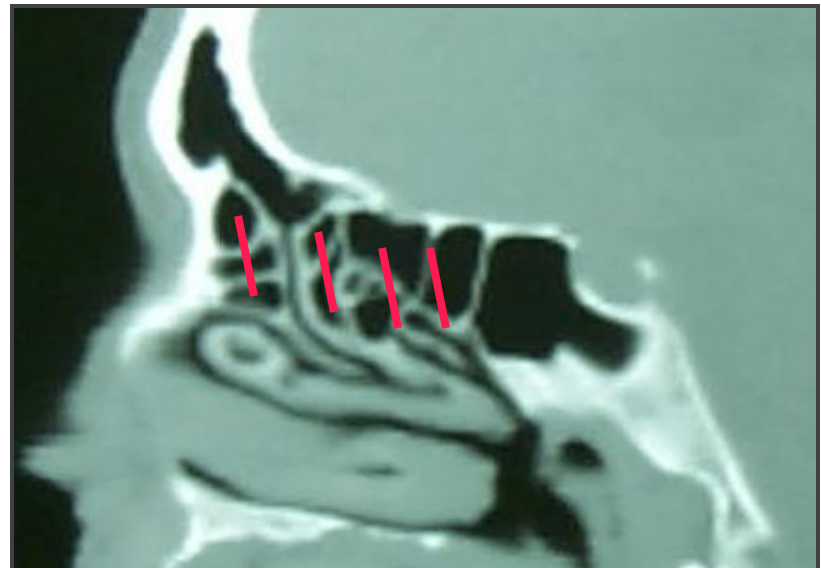
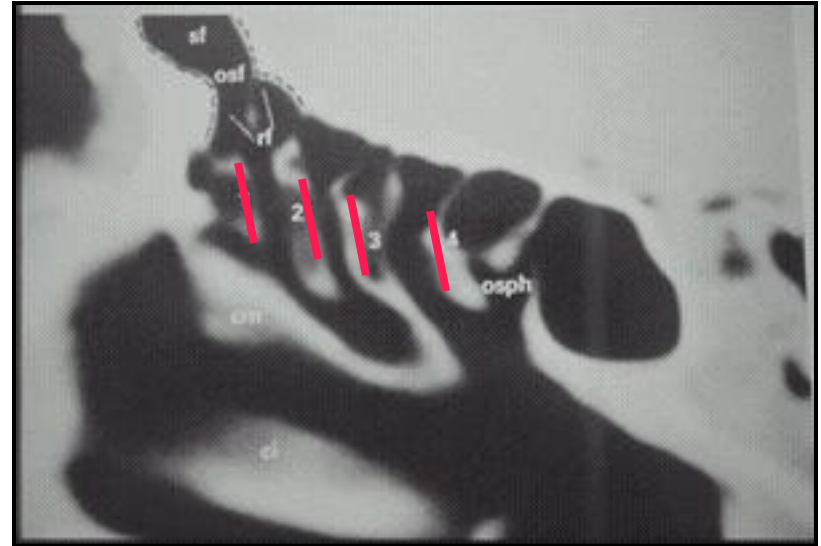
- Posterior Ethmoid A
 - » Encased in Bone



Embryology of the Lateral Nasal Wall and Sinuses

• *Basal Lamellae* of the Lateral Nasal Wall

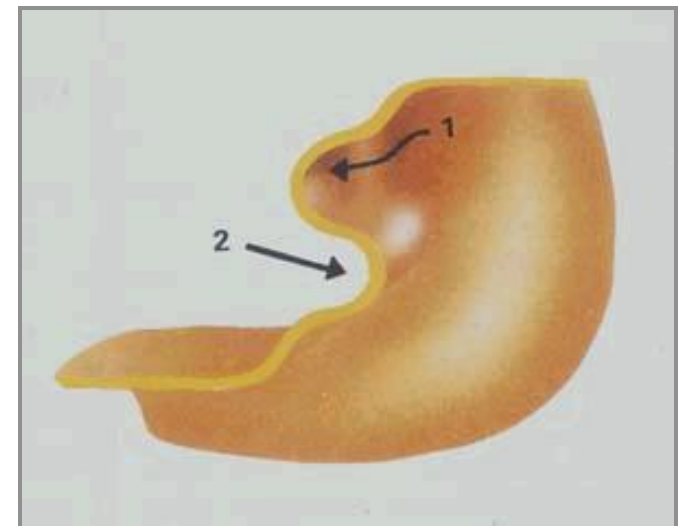
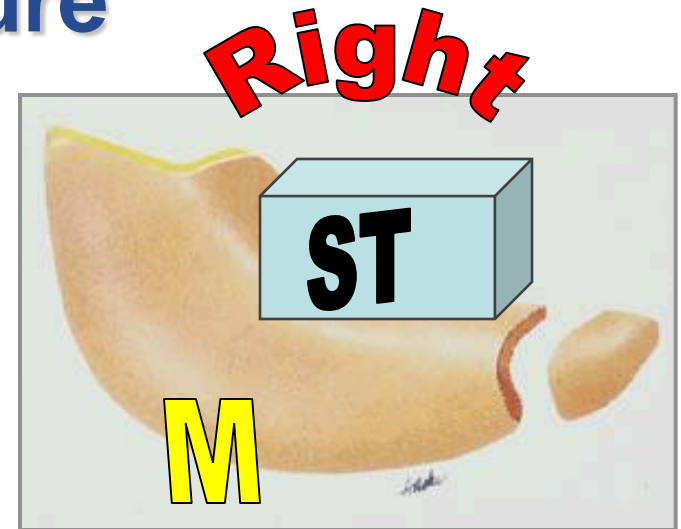
- » First- unciniate
- » Second- ethmoid bulla
- » Third- middle turbinate
- » Fourth- superior turbinate
- » Fifth- supreme turbinate



Anatomic Terminology and Nomenclature

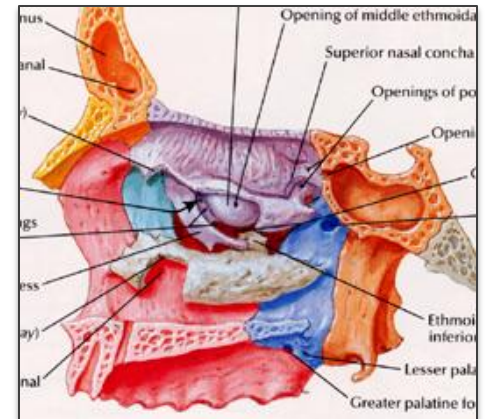
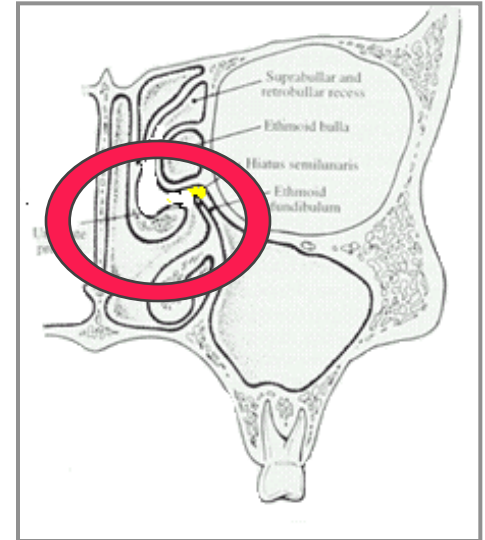
Middle Turbinate

- » Oriented in three planes:
- » Divides the anterior and posterior ethmoid sinuses
 - The basal lamella
 - Occasionally flat, but frequently indented by posterior pneumatization of the bulla
- » **Defines the “spaces” of the sinuses**



Anatomic Terminology and Nomenclature: Spaces

- Hiatus semilunaris (Grunwald)
 - » a two-dimensional space analogous to a doorway
 - » Inferior= Doorway b/n bulla and the uncinata
 - » Superior= doorway b/n bulla and the MT
 - Strictly: b/n the basal lamella and the bulla



Anatomic Terminology and Nomenclature: Spaces

- The Recesses

- » Suprabullar Recess

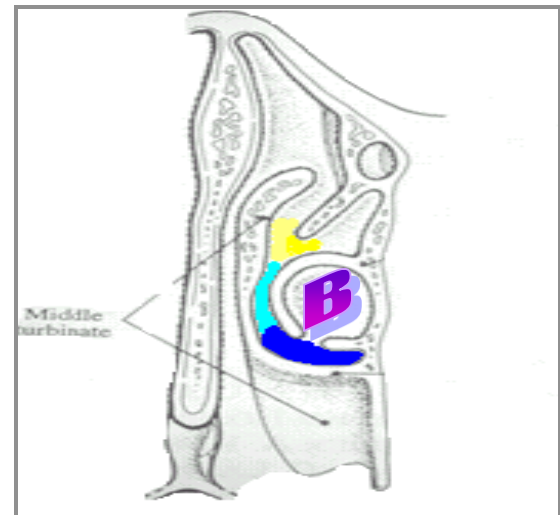
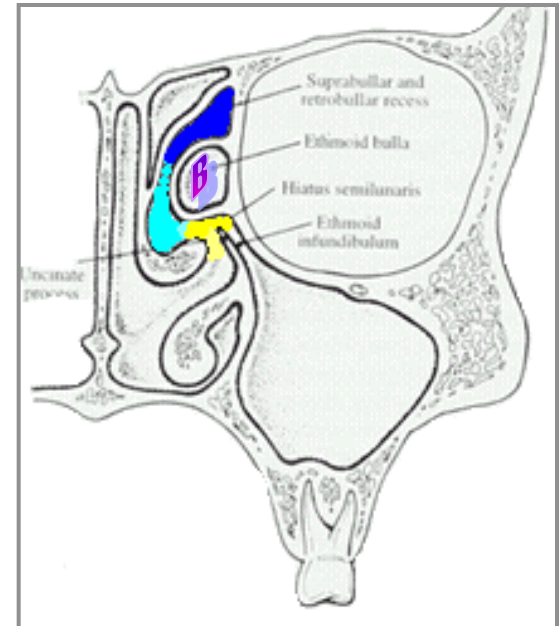
- Discrete or potential space between the bulla and the skull base

- » Retrobullar Recess

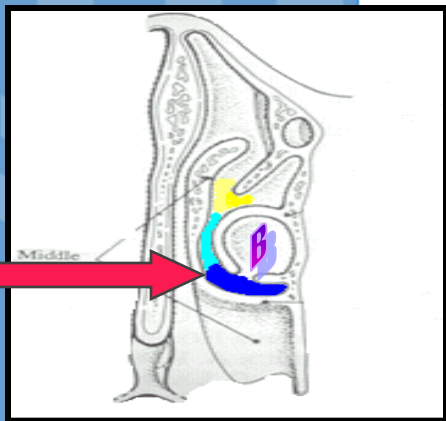
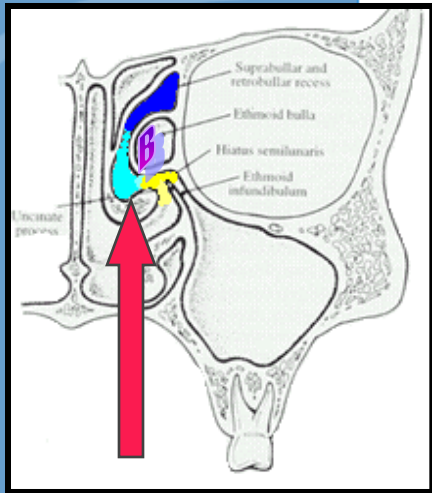
- Discrete or potential space between the bulla and the basal lamella of the middle turbinate

- » SB Recess and RB Recess = Sinus Lateralis

- The hiatus semilunaris superior is the opening to the sinus lateralis



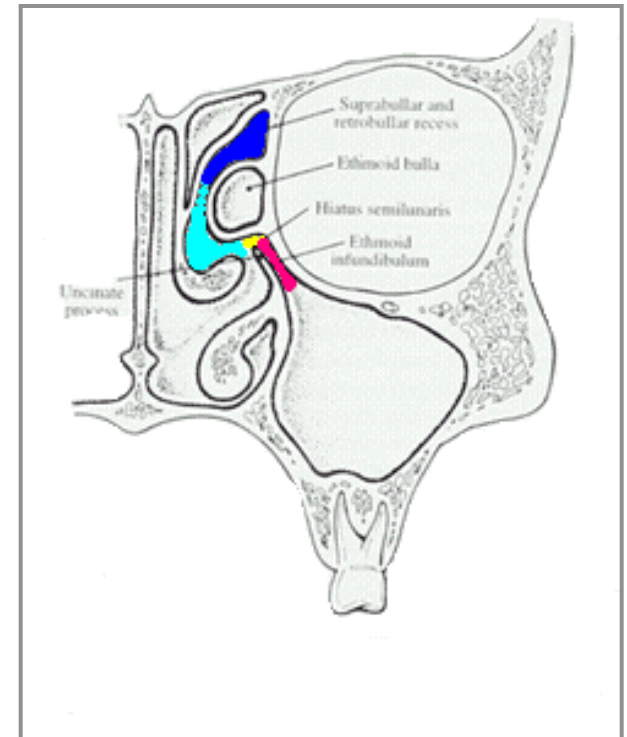
Intact Bulla Anterior Ethmoidectomy (Left)

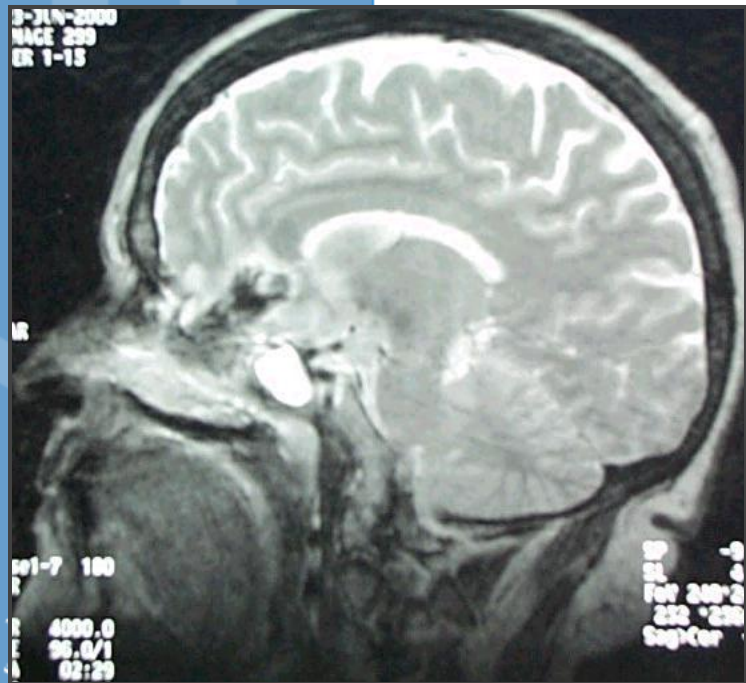
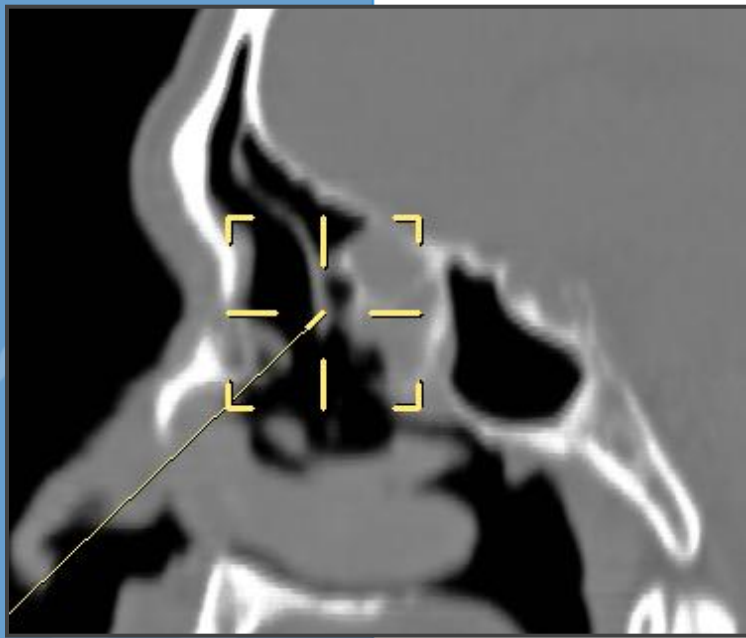


Anatomic Terminology and Nomenclature: Spaces

• Infundibulum (3)

- » frontal
- » maxillary
- » ethmoid
 - the three dimensional space that the doorway of the hiatus semilunaris inferior opens into
 - bounded by uncinata process and the lamina papyracea





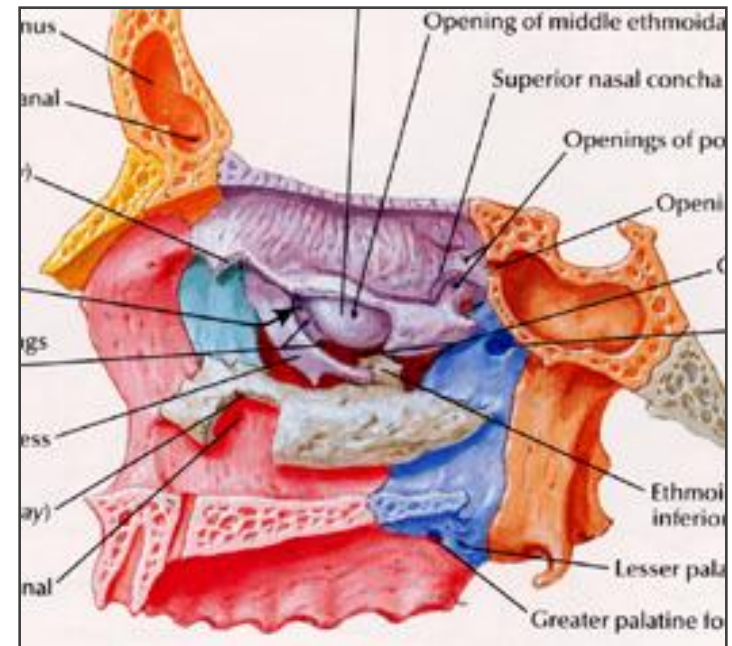
- **Ethmoid Roof**
 - » Frontal bone (fovea) and the cribriform
 - » varying depth to the olfactory fossa
 - flatter more posterior
 - occasionally asymmetrical
 - » Slope from ant to post

Anterior Ethmoid and Related Structures

- **Nasal Fontanelles**

- » divided (arbitrarily) by the projection of the uncinata over its surface

- posterior (superior)= accessory ostia of the maxillary sinuses
- anterior (inferior) = maxillary ostium



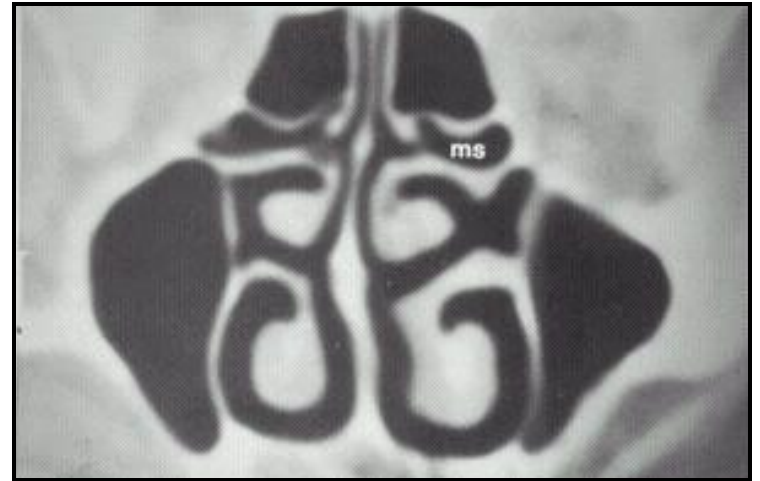
Anterior Ethmoid and Related Structures



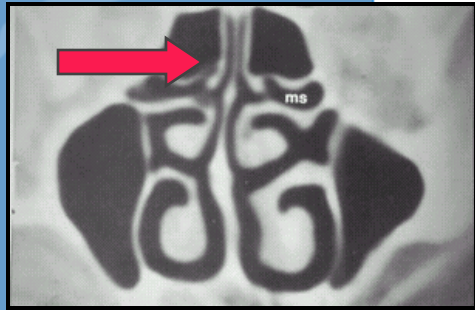
Brian Matthews, WFU

Posterior Ethmoid and Related Structures

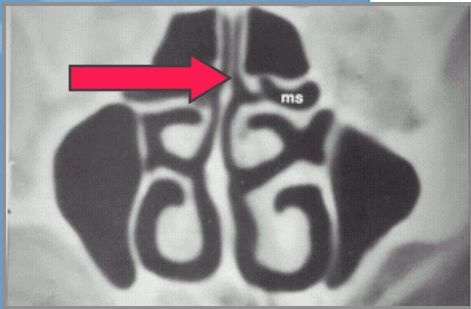
- Sphenoethmoid recess
 - » Medial border: septum
 - » Lateral border: superior turbinate
 - » Superior border: ethmoid roof
 - » Contains the opening of the sphenoid sinus



Sphenoid Approach: Inside Out (Right)

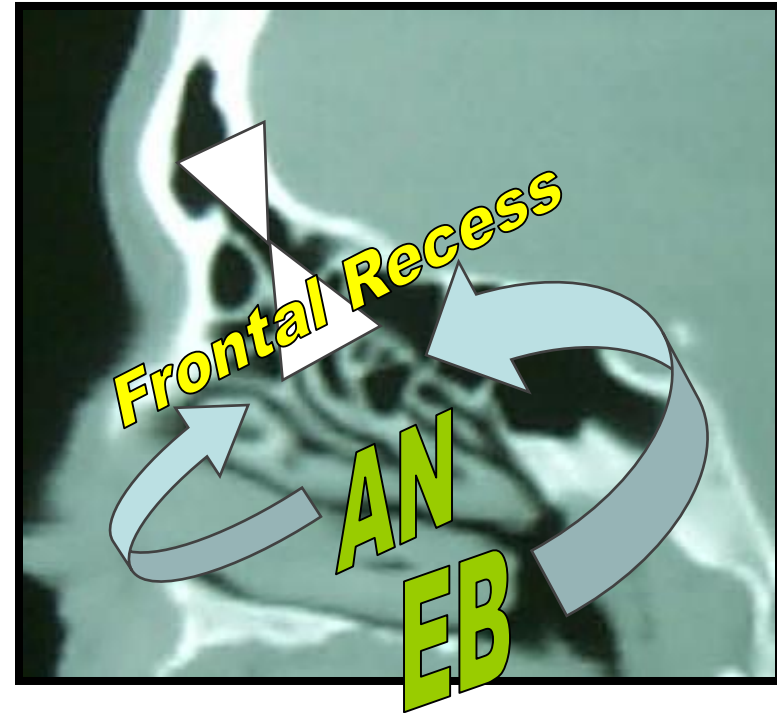


Sphenoid Approach: Outside In (Left)



Frontal Sinus Outflow Tract

- Infundibulum (above)
- Frontal ostium (neck)
- Frontal recess (below)
 - » Ethmoid Bulla cells located posteriorly
 - Suprabullar cells
 - » Suprabullar recess
 - Frontal bullar cells
 - Supraorbital cells
 - » Agger Nasi located anteriorly
 - Agger nasi cell
 - Frontal cells
 - » Bent and Kuhn, 1994
 - » Intersinus Septal Cells located medially



How to Perform Endoscopic Frontal Sinusotomy: Think Outside the Box!

The Box
Left Side

Medial

Posterior

Frontal Infundibulum

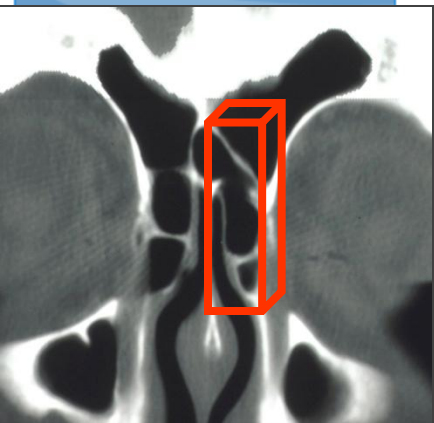
MT and intersinus septal cell

Agger nasi, Frontal cells, and uncinata

Bullar cells, SOE

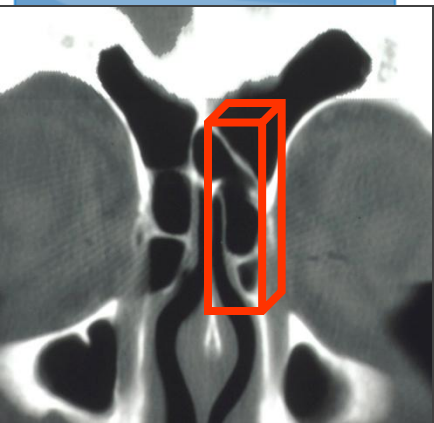
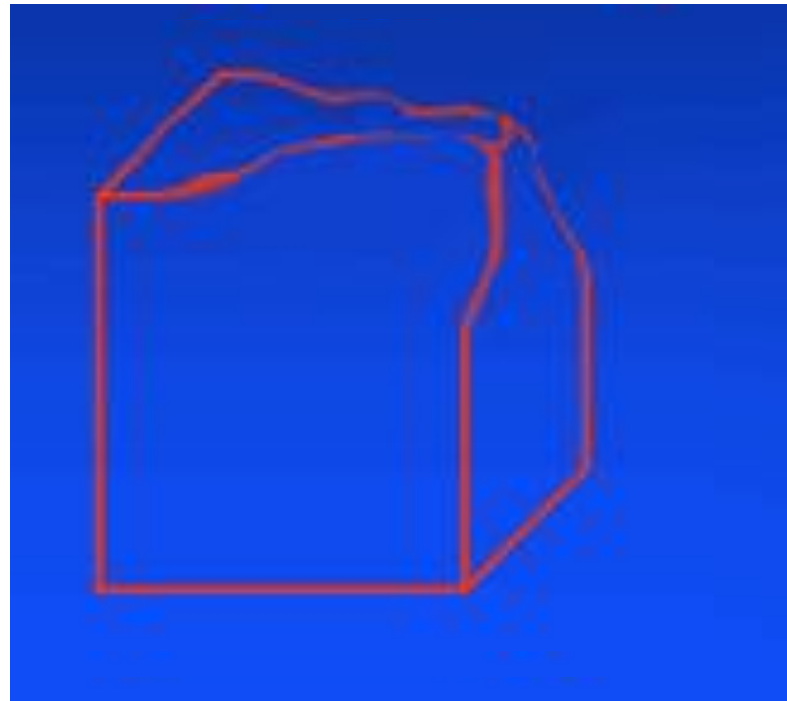
Lateral

Anterior



How to Perform Endoscopic Frontal Sinusotomy

**The Box
Left Side**





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