

The Interrelationship Between Allergic Rhinitis & Chronic Sinusitis

Lily Love, MD
Otolaryngology and Facial Plastic and Reconstructive Surgery





Speaker Disclosures & Today's Agenda

Disclosures: No relevant financial relationships to disclose.

Roadmap for Today:

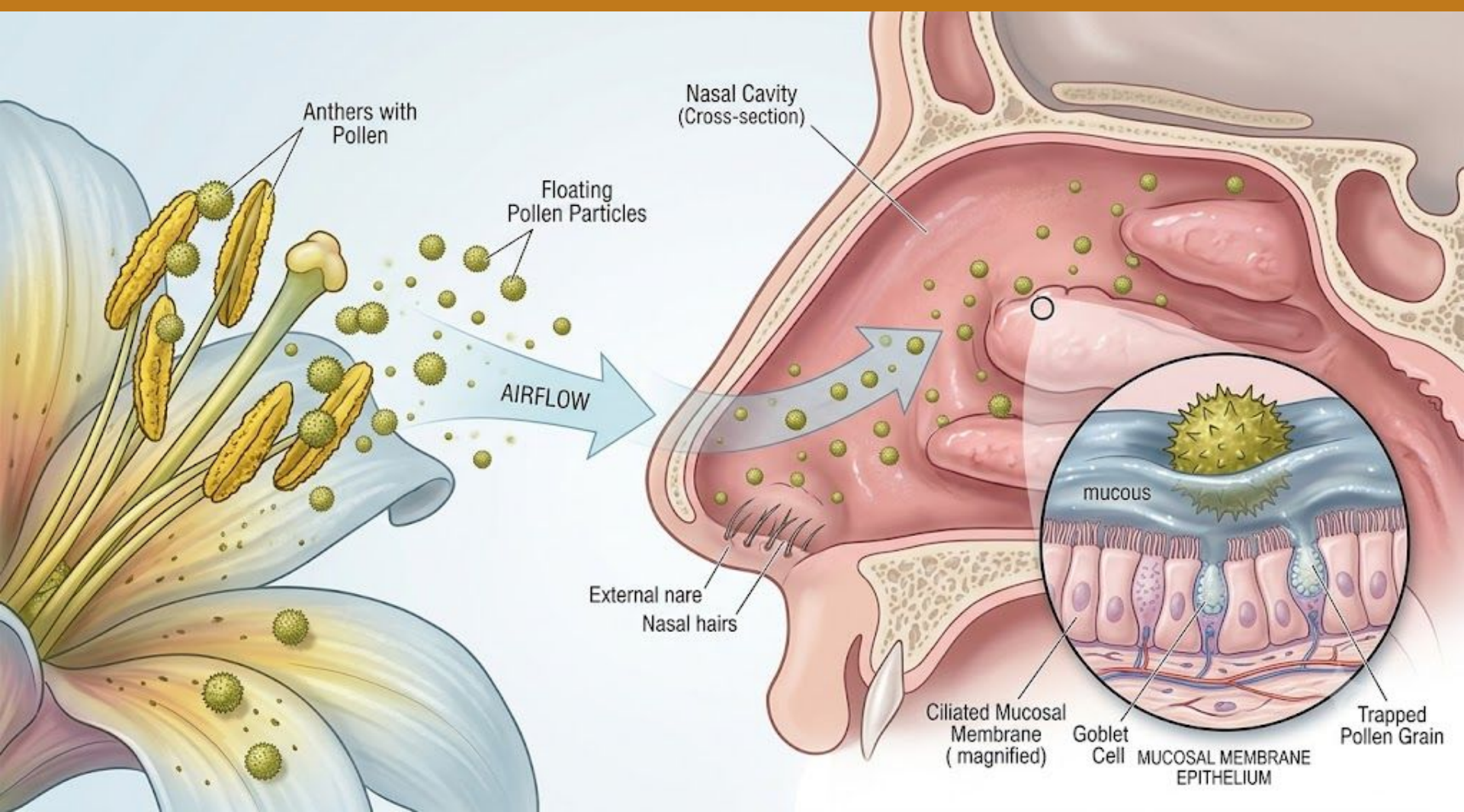
- Anatomy & Pathophysiology: The 'United Airway' concept
- Overlap & Distinction: AR vs. CRS (CRSsNP vs. CRSwNP)
- Max Medical Therapy & Biologics in the clinic
- CT Imaging 101: When, why, and how to order
- Red Flags & Clear Referral Criteria to ENT



The United Airway Concept

One Shared Problem

- Upper and lower airways share pseudostratified ciliated columnar epithelium.
- Allergic inflammation extends throughout the entire mucosal tract.
- Key Takeaway: Isolated sinus disease is rare in severely allergic patients; treat the whole system.
- Citation: Bousquet J, et al. ARIA Guidelines / J Allergy Clin Immunol. 2001.





Meet the Neighbors: AR vs. CRS

Definitions

- **Allergic Rhinitis** : an immunoglobulin E (IgE)-mediated inflammatory condition of the nasal mucous membranes triggered by airborne allergens. It causes sneezing, nasal congestion, itching, and a clear runny nose, commonly known as hay fever or nasal allergies,
 - **Acute Rhinosinusitis**: the sudden, symptomatic inflammation of the mucosal lining of the nasal cavity and paranasal sinuses lasting **less than 4 weeks**.
 - **Subacute Rhinosinusitis**: 4-12 weeks
 - **Chronic Rhinosinusitis** : a long-term inflammatory condition affecting the mucous membranes of the nasal passages and paranasal sinuses lasting for 12 consecutive weeks or longer
-
- The Overlap Zone: Both present with rhinorrhea, pressure, and nasal congestion.
-
- Citation: Fokkens WJ, et al. EPOS 2020: European Position Paper on Rhinosinusitis. Rhinology. 2020.



The Vicious Cycle: How AR Breeds CRS

The Domino Effect in the Ostiomeatal Complex

1. Allergen Exposure → Mucosal edema and swelling.
2. Ostiomeatal Complex (OMC) Blockage → Occlusion of primary drainage pathways.
3. Stagnant Mucus + Hypoxia → Ciliary dysfunction & microbial overgrowth.
4. Outcome: Acute allergic flare evolving into chronic inflammatory sinus disease.

Allergic Rhinitis

Acute Sinusitis

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Frontal sinus
(clear contents)

Ethmoid sinus
(clear contents)

Middle meatus
(clear contents)

Maxillary sinus
(clear contents)

Nasal obstruction

Clear watery
discharge

Frontal sinus
(Inflamed and
purulent)

Ethmoid sinus
(Inflamed and
purulent)

Middle meatus
(Ostial
Inflammation)

Maxillary sinus
(Inflamed and
purulent)

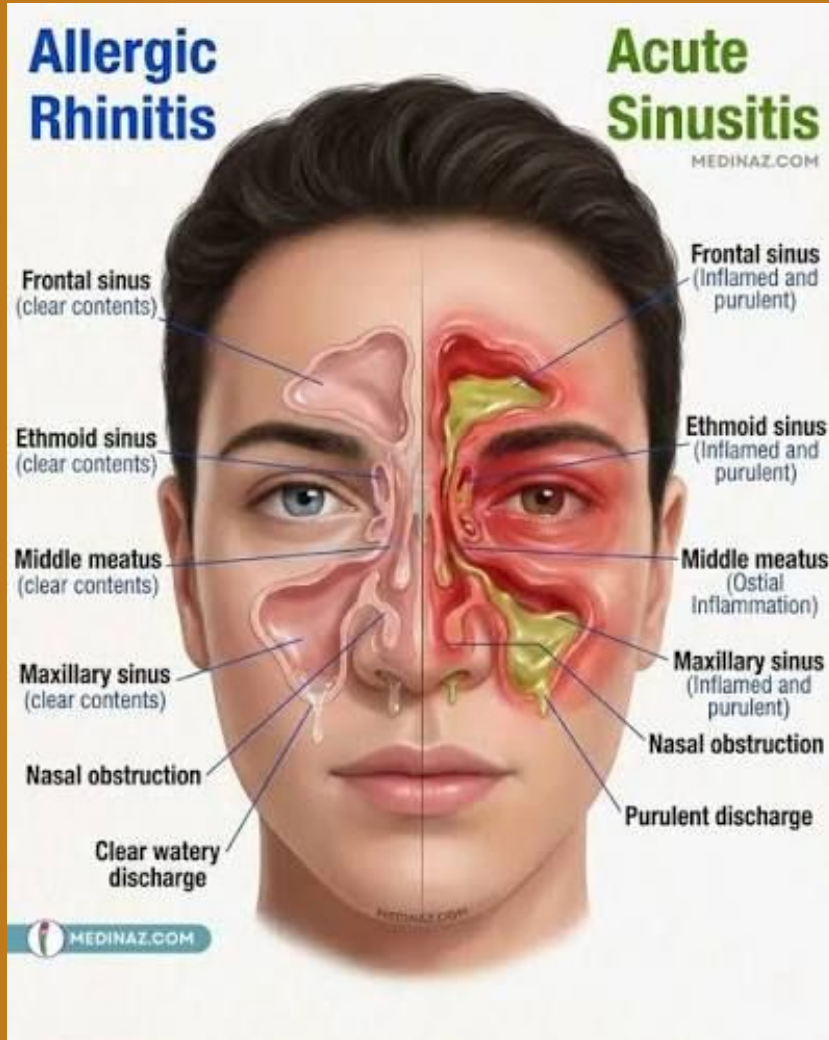
Nasal obstruction

Purulent discharge

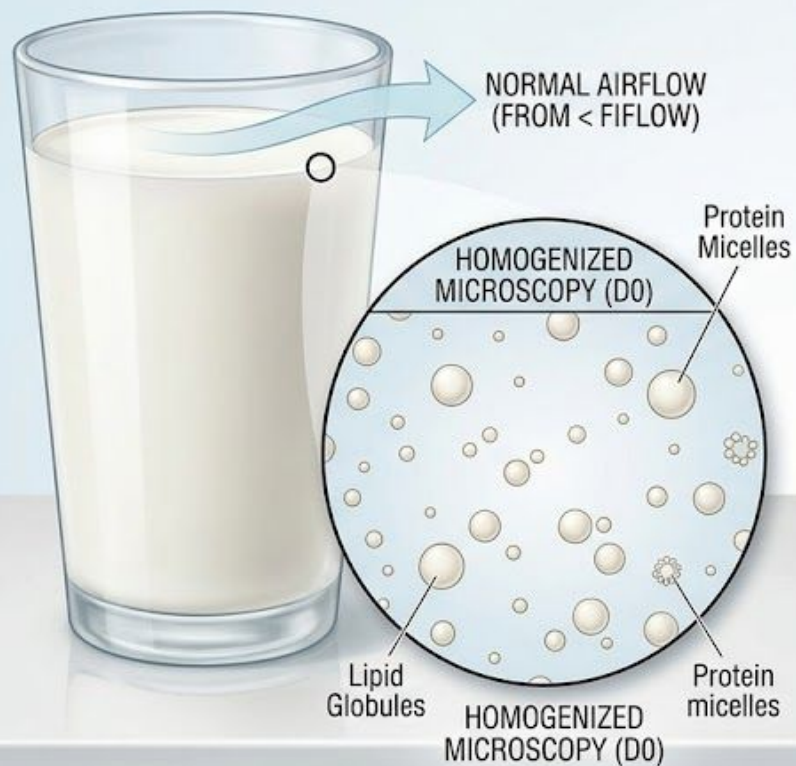


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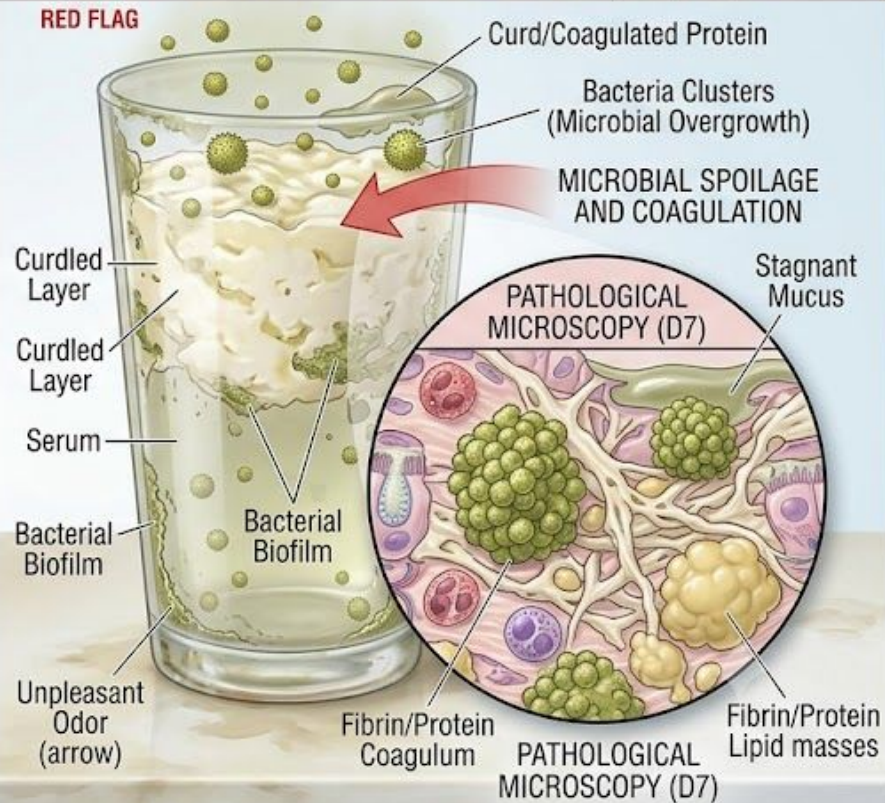
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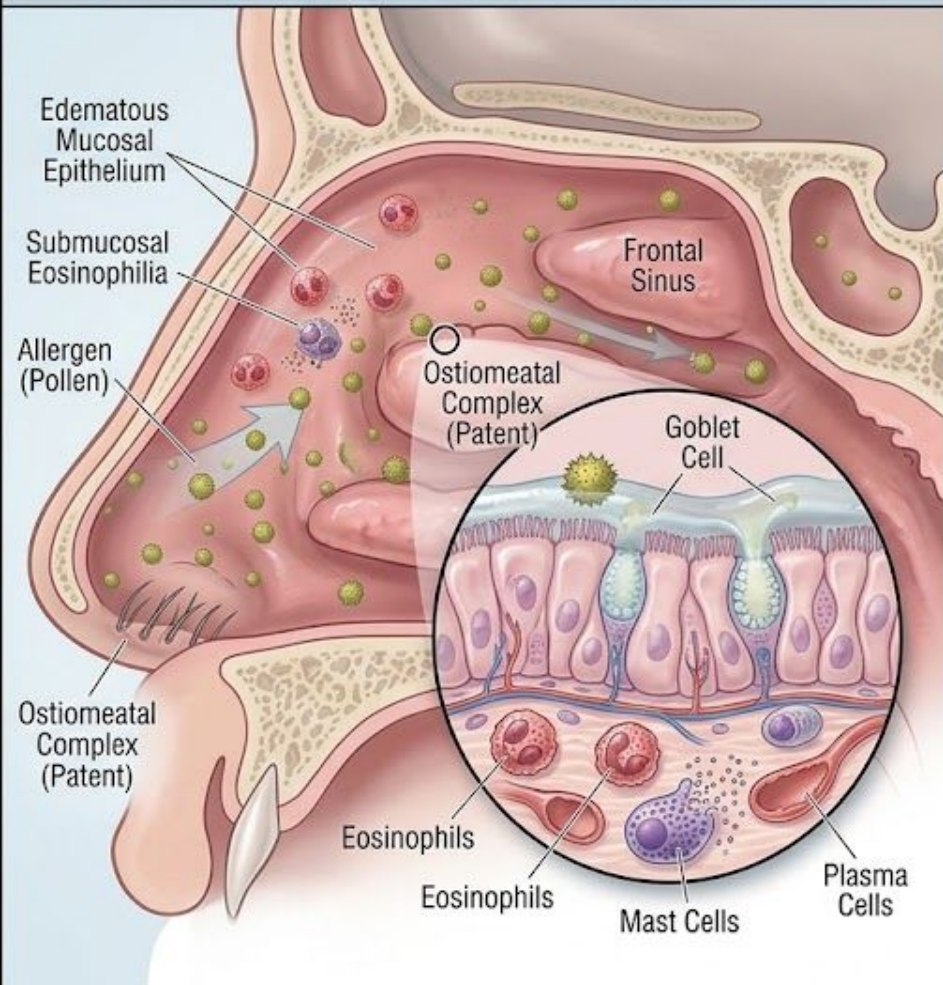
Panel A: Freshly Poured (Day 0)



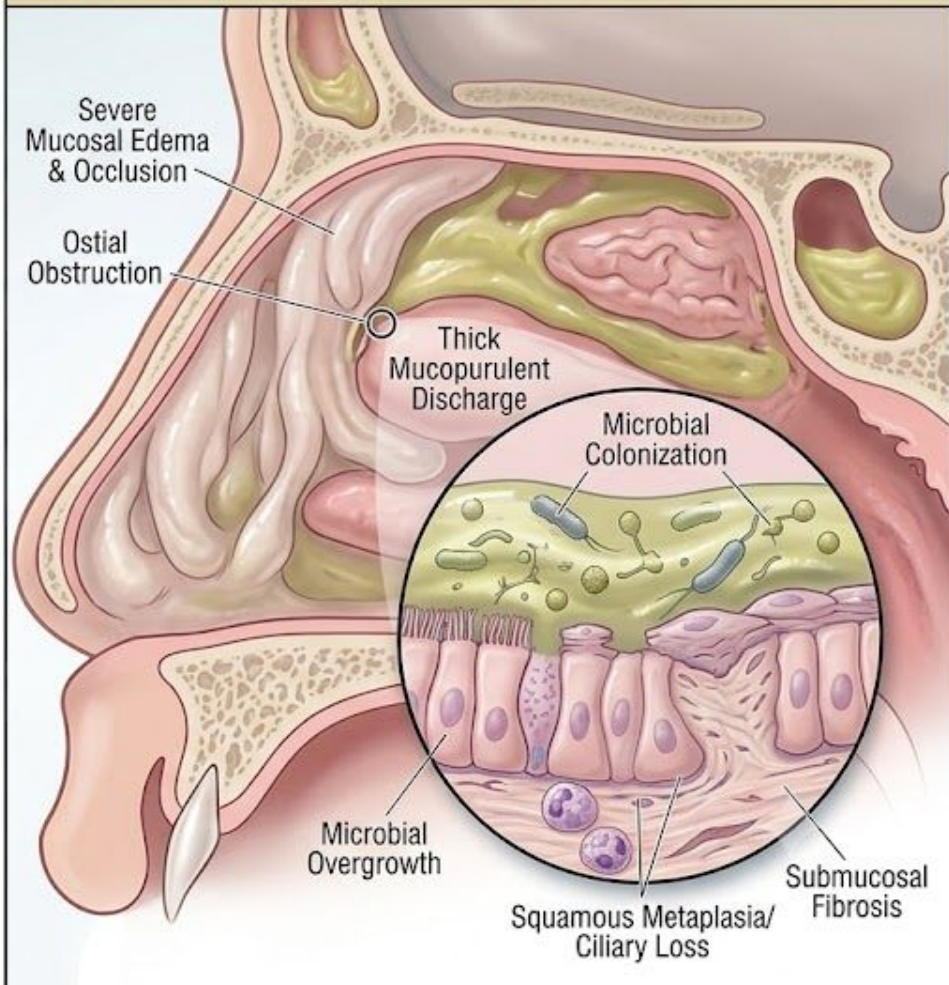
Panel B: One Week Later (Day 7)



Allergic Rhinitis (Type 2 Inflammation): Mucosal Edema

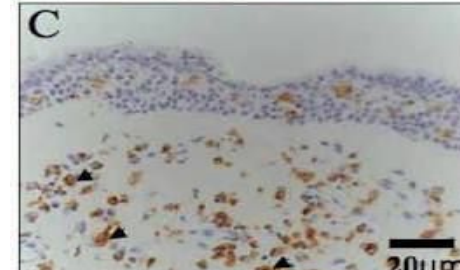
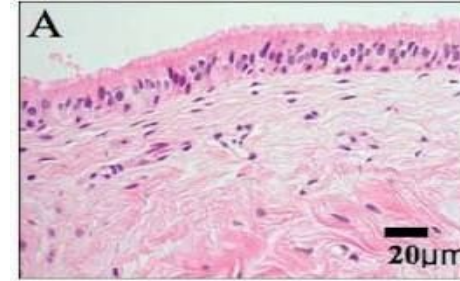


Chronic Sinusitis: Obstruction, Hypoxia, and Infection



Phenotyping CRS: CRSsNP vs. CRSwNP

- CRSsNP (Without Polyps): Often Type 1/mixed inflammation, structural issues, fibrosis.
- CRSwNP (With Polyps): Strongly driven by Type 2 inflammation (eosinophils, IL-4/5/13)—the classic 'Allergy Clinic' phenotype.
- AERD (Samter's Triad): Asthma + Nasal Polyps + NSAID Sensitivity.
- Citation: Akdis CA, et al. Type 2 immunity in rhinosinusitis. Nat Rev Immunol. 2020.







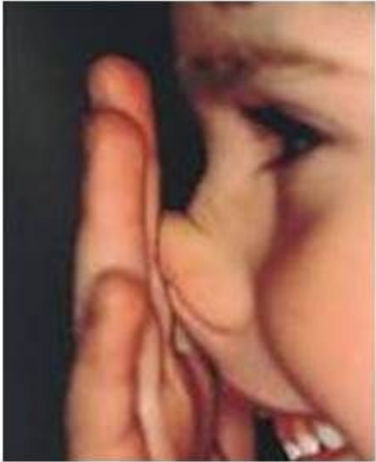
Symptom Decoder: What Is the Patient Saying?

Translating Subjective Complaints

- **'My nose won't stop itching'** → Classic AR (IgE / Histamine pathway).
- **'My forehead feels like it is in a vice'** → Suggests CRS (Ostial obstruction).
- **'I haven't smelled coffee in 6 months'** → High index of suspicion for CRSwNP or olfactory cleft edema.
- **'It is only on the right side and smells terrible'** → RED FLAG (Odontogenic, unilateral polyp, or neoplasm).



Allergic Salute



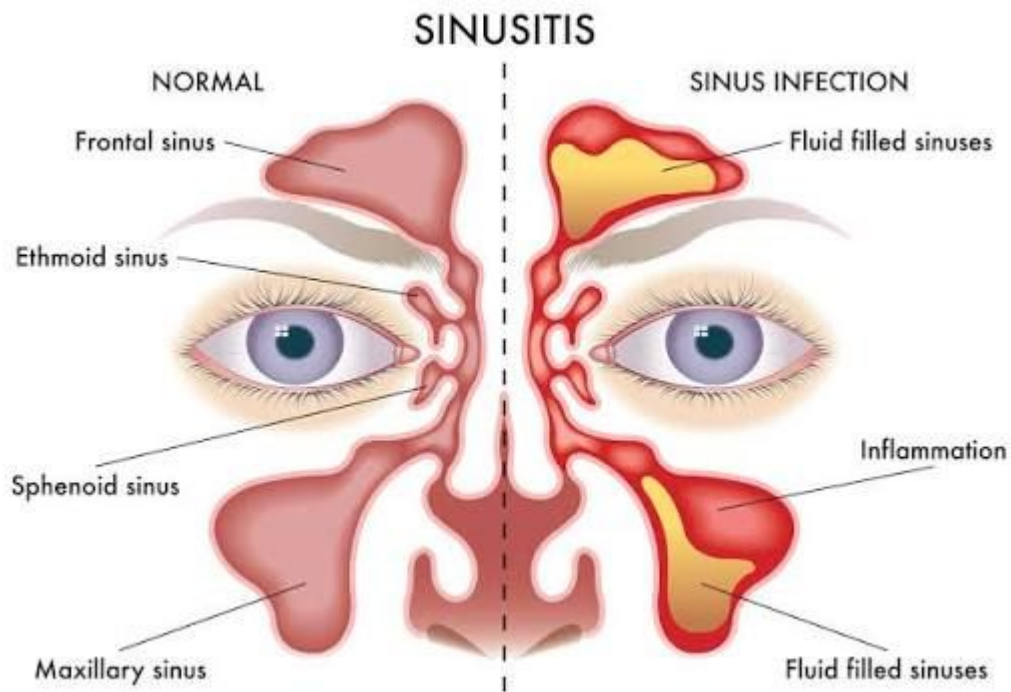


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Pressure





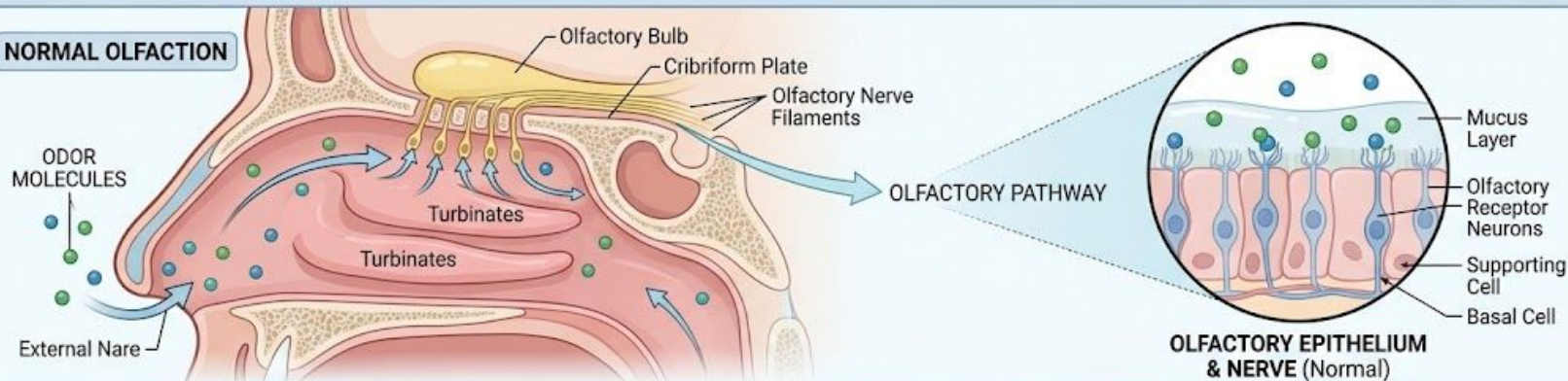
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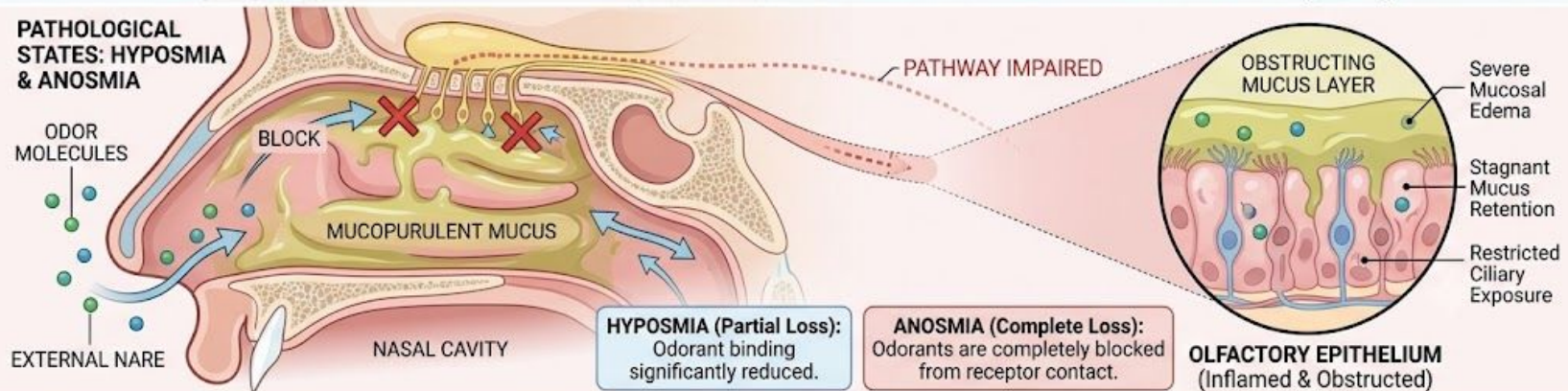
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THE OLFACTORY SYSTEM: Mechanism of Inflammation-Induced Sense of Smell Loss

NORMAL OLFACTION



PATHOLOGICAL STATES: HYPOSMIA & ANOSMIA



"The United Airway Concept: One Continuous Mucosa, One Shared Problem" (an underlying principle from slide 3 of image_0.png)

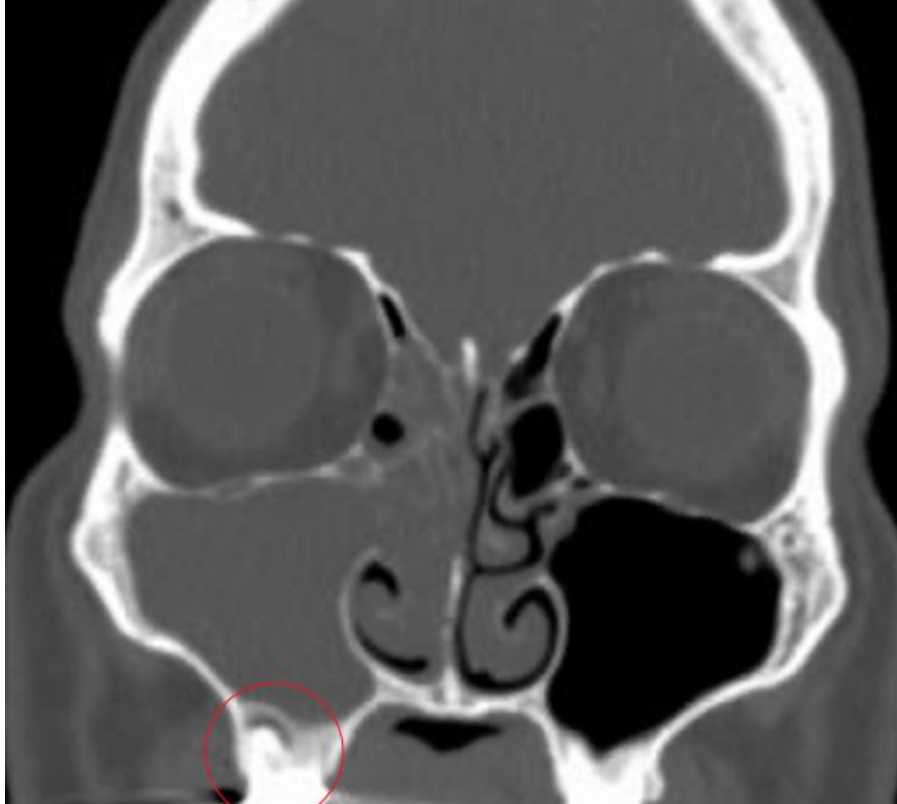


Symptom Decoder: What Is the Patient Saying?

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Odontogenic sinusitis and Fistula





Medical Treatment

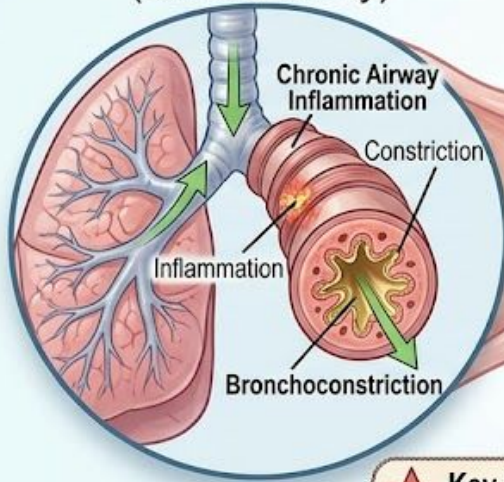
Maxing Out Conservative Care

- Intranasal Corticosteroids (INCS): First-line therapy for both AR and CRS.
 - Saline Irrigations: Mechanically flushes allergens and thins viscous inflammatory mucin.
 - Antihistamines & LTRAs: Excellent for AR; limited efficacy in isolated CRSsNP.
 - Biologics
-
- Clinical Pearl: Verify compliance and spray technique (aim outward, away from septum) before declaring treatment failure.

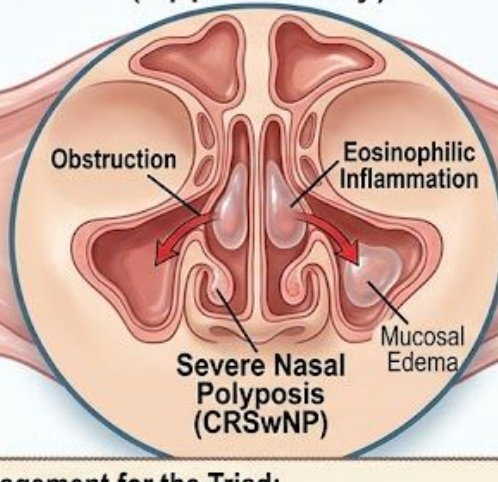
***Look out for AERD/ Samters Triad**

AERD: Aspirin-Exacerbated Respiratory Disease (Samter's Triad)

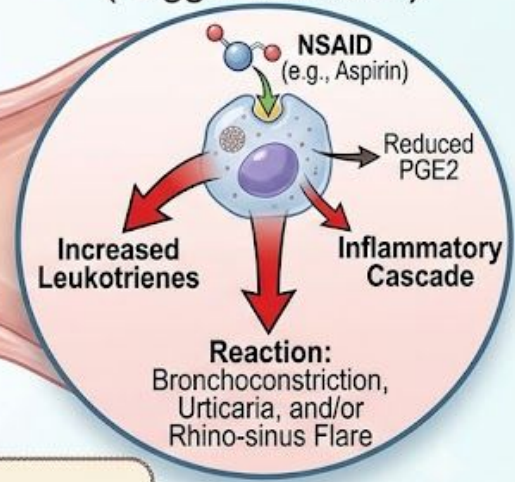
1. ASTHMA (Lower Airway)



2. NASAL POLYPS (Upper Airway)



3. NSAID SENSITIVITY (Trigger Reaction)



Key Management for the Triad:

- Maximize CRSwNP and Asthma therapies (e.g., INCS, Saline, Biologics)
- Rigorous NSAID Avoidance unless desensitized
- Consider Biologics targeting Type 2 inflammation



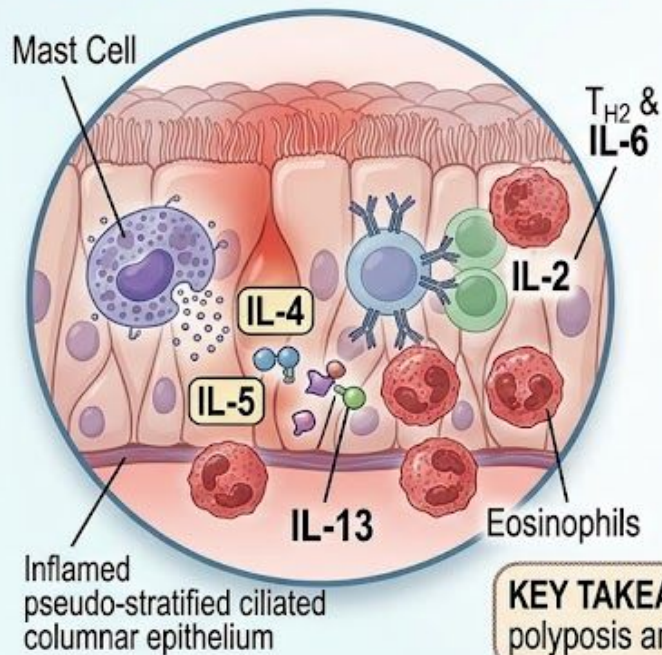
Biologics in the Allergy-CRS Spectrum

Game Changers for Type 2 Disease

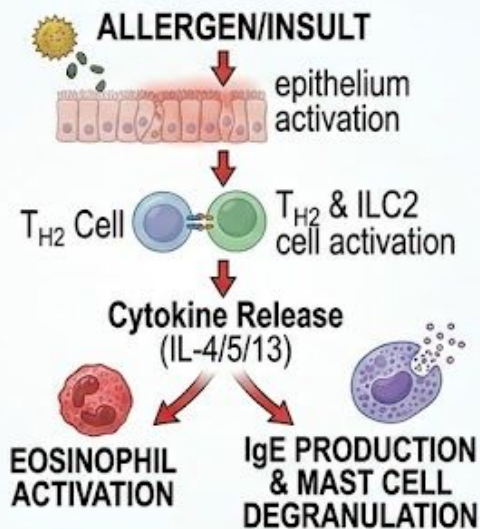
- Targeted Monoclonals: Anti-IL-4R α (Dupilumab), Anti-IL-5 (Mepolizumab/Reslizumab), Anti-IgE (Omalizumab).
- Indication: Severe CRSwNP refractory to INCS and oral steroids.
- Role of Allergy Team: Identifying candidates with comorbid asthma, severe AR, and polyposis.
- Citation: Stevens WW, et al. Biologics for CRSwNP. J Allergy Clin Immunol Pract. 2021.

UNDERSTANDING TYPE 2 INFLAMMATION IN CRSwNP & ALLERGY

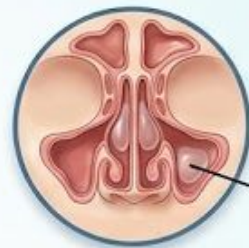
KEY DRIVERS & MECHANISMS



THE TYPE 2 INFLAMMATORY



CLINICAL MANIFESTATIONS



UPPER AIRWAY

- Severe Nasal Polyposis
- Mucosal Edema
- Olfactory Dysfunction

LOWER AIRWAY

- Comorbid Asthma
- Bronchoconstriction
- Mucus Hypersecretion



KEY TAKEAWAY: Type 2 inflammation is a shared pathway driving both severe polyposis and comorbid asthma; targeted therapy must address the common driver.



When Does Routine Medical Care Fail?

Recognizing Refractory Disease

- Persistent symptoms despite ≥ 6 weeks of continuous topical steroids + nasal saline rinses.
- Frequent 'acute' sinus exacerbations (≥ 4 episodes per year requiring systemic therapy).
- Complete anosmia impact on safety/quality of life.
- Severe polyposis preventing topical spray delivery into sinus ostia.



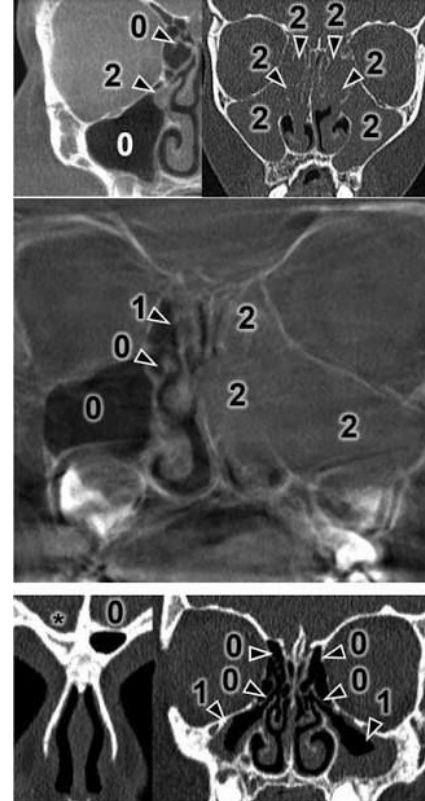
Imaging

Selecting the Proper Modality

- Plain Radiographs (X-Rays): High rate of false positives/negatives; non-diagnostic.
- Gold Standard: Non-contrast High-Resolution CT of Paranasal Sinuses (1–2mm thin cuts).
- **Insurance Approval: *medical records must show chronic sinus problems lasting 12 weeks or more, or frequent infections (4 or more per year), and that standard treatments like nasal sprays, saline rinses, and antibiotics have failed***
- Citation: Desrosiers M, et al. Canadian guidelines for CRS. Allergy Asthma Clin Immunol. 2011.

How to Read a Sinus CT Report

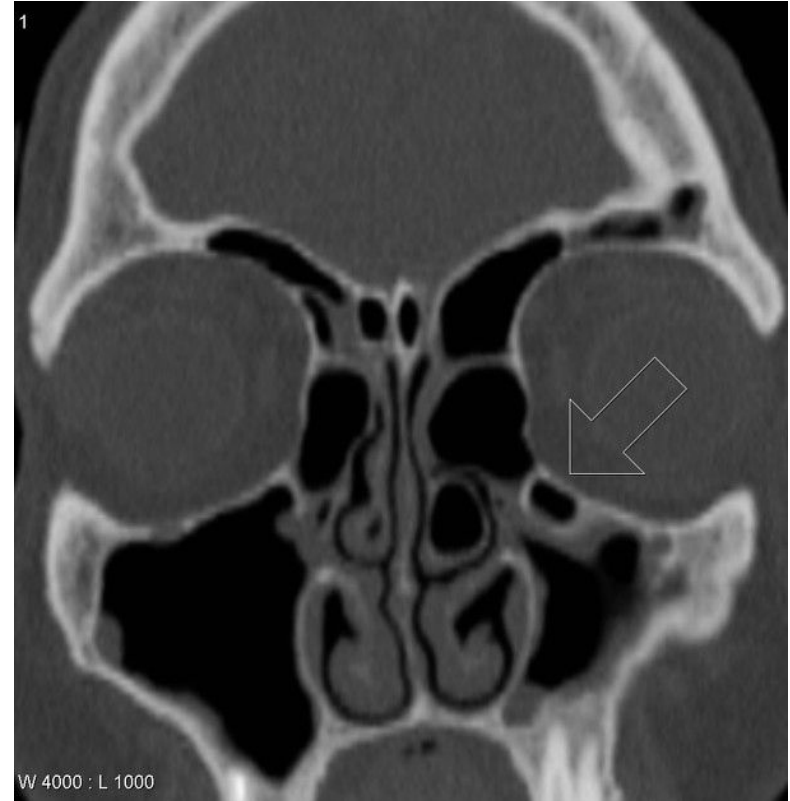
- Lund-Mackay Score: Standardized scoring system (0 = clear, 1 = partial, 2 = complete opacification per sinus; Max = 24).
- Ostiomeatal Complex (OMC) Patency: Is the drainage pathway open or occluded?
- Mucosal Thickening vs. Air-Fluid Levels: Thickening = chronic inflammation; Fluid = acute retention.
- Expansion/Erosion: Demineralization indicates chronic expansion (polyps, allergic fungal sinus disease).





Other Anatomic Causes of Obstruction

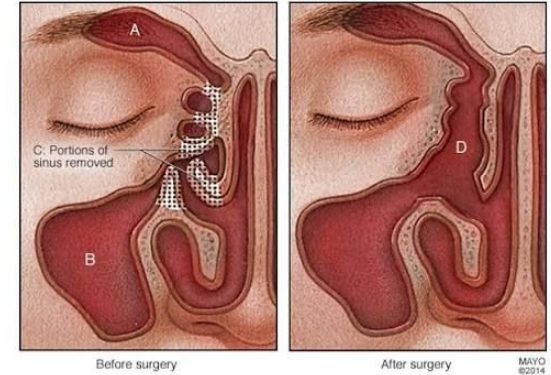
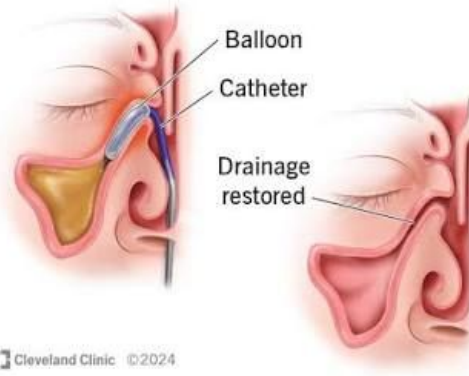
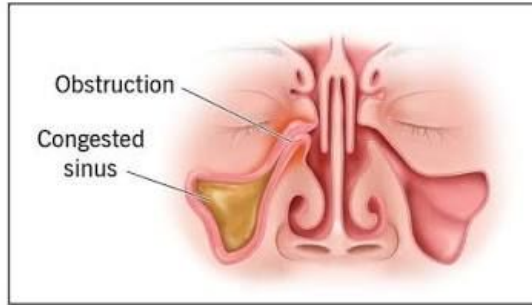
- Deviated Nasal Septum: Creates physical airflow resistance and narrow ostial clearance.
- Concha Bullosa: Pneumatized middle turbinate obstructing the middle meatus.
- Infraorbital Ethmoid (Haller) Cells: Narrow the maxillary sinus ostium.
- Takeaway: Allergies supply the mucosal swelling, but anatomical variants contribute to where blockage occurs.



How Surgery Helps

- Primary Goal: Re-establish ventilation and natural ostial drainage while preserving healthy mucosa.
- Surgery creates wide cavities for topical delivery.
- Post-op Access: Enables nasal rinses and topical steroid irrigations (e.g., Budesonide rinses) to reach the target mucosa.
- Citation: Patel ZM, et al. ICAR: Rhinosinusitis 2021. Int Forum Allergy Rhinol. 2021.

Balloon sinuplasty



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Clinical Triage Algorithm for Clinic Staff

Step 1: Screen upper airway complaints for CRS cardinal symptoms (≥ 12 weeks duration).

Step 2: Optimize medical therapy (INCS + Saline irrigations $\pm$ Biologics/AIT) for 6–8 weeks.

Step 3: If non-responsive, order non-contrast High-Res Sinus CT at baseline.

Step 4: If CT confirms OMC obstruction, opacification, or structural blockage $\rightarrow$ Refer for IOP.



Co-Managing the Patient: Post-Op Care

- Surgery restores drainage; allergy management prevents inflammatory recurrence.
- Post-Surgical Care: High-volume saline irrigations and topical steroid solutions.
- Allergen Immunotherapy (AIT): Helps reduce polyp recurrence and delays revision surgery in allergic CRS.
- Citation: DeYoung K, et al. Immunotherapy & revision rates in CRSwNP. Int Forum Allergy Rhinol. 2018.



Summary & Key Takeaways

1. AR and CRS frequently coexist.
2. Optimize topical medical therapy before obtaining non-acute imaging.
3. High-Res Sinus CT at clinical baseline.
4. Recognize Red Flags (orbital, neuro, unilateral).
5. Surgery opens the doors; ongoing allergy management keeps them open.

Questions & Discussion

Thank You!

Questions?

- Contact:
 - Phone: 505-331-2567
 - Email: lilypllove@gmail.com

