Journal of Society Medicine
Research & Review Articles on Diseases
Journal of Society Medicine. 2025; 4 (9)

A Review of Non-surgical Strategies for Managing Chronic Rhinosinusitis

Gunawan Wijaya Setiawan [1*]

[1] *Faculty of Medicine, Universitas Sumatera Utara, Indonesia*

***Corresponding Author**: Gunawan Wijaya Setiawan, Email: sharewithgunawan@gmail.com

ARTICLE INFO

Article history:
Received
04 May 2025

Revised
09 July 2025

Accepted
30 September 2025

Manuscript ID:
JSOCMED-040525-49-1

Checked for Plagiarism: Yes

Language Editor:
Rebecca

Editor-Chief: Prof. Aznan Lelo, PhD

Keywords

ABSTRACT

Chronic rhinosinusitis (CRS) remains a significant public health challenge, characterized by persistent inflammation of the sinonasal mucosa lasting at least 12 weeks, leading to symptoms such as nasal congestion, facial pain, rhinorrhea, and olfactory dysfunction. Affecting an estimated 5-12% of the global population, CRS imposes considerable economic and quality-of-life burdens. While surgical options like functional endoscopic sinus surgery (FESS) are effective for refractory cases, non-surgical management is the initial and often primary approach, emphasizing symptom control, inflammation reduction, and prevention of disease progression. This comprehensive review synthesizes evidence from recent guidelines, clinical trials, and observational studies on non-surgical strategies, including nasal saline irrigation, intranasal and systemic corticosteroids, antibiotics, biologics, and adjunctive therapies. Key advancements include precision medicine via endotyping and the integration of biologics for type 2 inflammation-dominant phenotypes, particularly in CRS with nasal polyps (CRSwNP). Drawing from updated 2024-2025 literature, we highlight personalized treatment algorithms to optimize outcomes, minimize adverse effects, and reduce the need for surgery.

Chronic rhinosinusitis, non-surgical management, nasal saline irrigation, intranasal corticosteroids, type 2 inflammation.

How to cite: Setiawan GW. A Review of Non-surgical Strategies for Managing Chronic Rhinosinusitis. *Journal of Society Medicine*. 2025; 4 (9): 272-275. **DOI: https://doi.org/10.71197/jsocmed.v4i9.234**

INTRODUCTION

Chronic rhinosinusitis (CRS) is a multifaceted inflammatory disorder of the nose and paranasal sinuses that persists for ≥12 weeks and manifests as at least two cardinal symptoms: nasal blockage/obstruction/congestion, nasal discharge (anterior/posterior nasal drip), facial pain/pressure, or reduction/loss of smell, accompanied by objective evidence on nasal endoscopy or computed tomography (CT) imaging. CRS is phenotypically classified as CRS without nasal polyps (CRSsNP) and CRS with nasal polyps (CRSwNP), with endotyping revealing underlying mechanisms such as type 2 (T2) inflammation in many CRSwNP cases, driven by cytokines like interleukin (IL)-4, IL-5, and IL-13. The prevalence varies geographically, affecting 1-5% in the United States and higher rates in Europe, with annual direct healthcare costs exceeding $11 billion in the US alone. Comorbidities, including asthma, allergic rhinitis, and aspirin-exacerbated respiratory disease (AERD), exacerbate morbidity, underscoring the need for holistic management [1-2].

Nonsurgical management prioritises conservative therapies to address pathophysiology, enhance mucociliary clearance, and improve patient-reported outcomes, preserving surgery for failure of maximal medical therapy (MMT). Recent guidelines such as the European Position Paper on Rhinosinusitis and Nasal Polyps (EPOS) 2020 and the International Consensus Statement on Allergy and Rhinology (ICAR) 2021 advocate for evidence-based, stepwise approaches. Advances in 2024-2025 include biologics such as tezepelumab for severe CRSwNP and refined endotyping for precision medicine. This review expands these strategies by incorporating data from randomised controlled trials (RCTs), meta-analyses, and real-world studies to provide a detailed framework for clinicians [3-4].

Pathophysiology and Diagnostic Considerations

The pathophysiology of CRS involves a complex interplay between microbial dysbiosis, impaired epithelial barrier function, mucociliary dysfunction, and aberrant immune responses. In CRSsNP, type 1 or mixed inflammation predominates, often with bacterial biofilms, whereas CRSwNP features T2 inflammation with eosinophilia, elevated IgE, and polyp formation. Environmental triggers such as allergens, pollutants, and pathogens exacerbate these processes. Diagnosis requires clinical symptoms plus objective confirmation, such as nasal endoscopy for mucosal oedema, polyps, or purulence, or CT for opacification (Lund-Mackay score ≥4). Biomarkers such as blood eosinophils (>300 cells/μL), tissue eosinophilia, and cytokines aid endotyping and guide therapy selection. Differential diagnoses include allergic rhinitis, migraines, and neoplasms, necessitating a red-flag evaluation (e.g. unilateral symptoms). Tools such as the Sino-Nasal Outcome Test (SNOT-22) and visual analogue scale (VAS) quantify symptom burden [5].

Non-surgical Management Strategies

Nasal Saline Irrigation

Nasal saline irrigation is a cornerstone therapy for all CRS phenotypes, mechanically removing mucus, allergens, and inflammatory mediators, while improving mucociliary transport. High-volume (>200 mL) isotonic saline via a netipot or squeeze bottle is superior to low-volume sprays, with RCTs demonstrating reductions in SNOT-22 scores by 20-30% and improved endoscopic findings. Hypertonic solutions (2-3%) may offer marginal benefits in mucus clearance, but can cause irritation; isotonic solutions are preferred for long-term use. Daily irrigation, often twice daily, enhances adherence and prevents exacerbations, particularly when combined with intranasal corticosteroids (INCS). Evidence from meta-analyses (e.g. ICAR 2021) supports its safety, with rare complications such as eustachian tube dysfunction mitigated by proper techniques. In paediatric CRS, irrigation aids in the management of adenoid hypertrophy, potentially averting surgery. Adjuncts, such as surfactants (e.g. 1% baby shampoo) or xylitol in irrigants, disrupt biofilms, with pilot studies showing symptom relief in recalcitrant cases, although larger trials are needed [1-6].

Intranasal Corticosteroids

INCS is the first-line pharmacotherapy that targets local inflammation with minimal systemic effects. Agents such as mometasone furoate (200-400 μg/day) and fluticasone propionate reduce mucosal oedema, polyp size, and symptoms in both CRSsNP and CRSwNP. Delivery devices such as exhalation delivery systems improve penetration of the ostiomeatal complex, enhancing efficacy in post-surgical or polypoid disease. Meta-analyses of RCTs report improvements in SNOT-22 by 15-25 points and endoscopic scores, with number needed to treat (NNT) of 3-5 for symptom relief. Side effects are limited to epistaxis (5-10%) and nasal irritation, resolving with technique adjustment. Guidelines recommend daily use for ≥3 months before assessing the response, with a combination of INCS-antihistamine sprays for comorbid allergic rhinitis. In CRSwNP, higher-dose INCS showed superior polyp reduction compared to standard sprays, supported by 2024 updates [3,6].

Systemic Corticosteroids

Oral corticosteroids provide rapid anti-inflammatory effects for acute exacerbations, severe CRSwNP, and shrinking polyps to facilitate topical therapy. Short courses (e.g., prednisone 20-40 mg tapered over 5-10 days) temporarily improve VAS scores and olfaction, but benefits wane after 2-3 weeks. In clinical-cytological grading (CCG)-based approaches, low-dose regimens (12.5-25 mg/day for 3-6 days/month) reduce surgery rates by up to 90% in moderate-severe cases over 5 years. However, long-term use risks osteoporosis, diabetes, and adrenal suppression, limiting to 2-3 courses/year. Evidence from RCTs indicates an NNT of 4 for short-term relief but no sustained advantage over placebo beyond 12 weeks [6,7].

Antibiotics

Antibiotics have a restricted role and are reserved for acute bacterial exacerbations with purulent discharge, fever, or worsening pain. Broad-spectrum options, such as amoxicillin-clavulanate (875 mg BID for 10-14

days), target common pathogens (Streptococcus pneumoniae, Haemophilus influenzae), guided by culture in resistant cases. Long-term low-dose macrolides (e.g. azithromycin 250 mg thrice weekly) offer anti-inflammatory effects, improving endoscopy scores in non-eosinophilic CRS, but their routine use is discouraged due to antimicrobial resistance. Topical antibiotics (e.g. mupirocin irrigation) show promise in biofilm-associated diseases, with RCTs reporting reduced bacterial load and symptoms. Guidelines emphasise avoidance in uncomplicated CRS, as inflammation, not infection, is predominant [1-4].

Biologics

Biologics revolutionise the management of refractory CRSwNP with T2 inflammation by targeting key cytokines. Dupilumab (anti-IL-4Rα, 300 mg biweekly) reduced polyp scores by 57%, nasal congestion by 50%, and SNOT-22 scores by 30 points in phase III trials (LIBERTY NP SINUS-24/52), outperforming placebo when added to INCS. Omalizumab (anti-IgE, dosed by weight/IgE) improves the quality of life and obstruction, especially in patients with AERD or asthma comorbidities. Mepolizumab (anti-IL-5, 100 mg monthly) decreases eosinophils and polyp size, with 2023-2025 real-world data showing 45-47% SNOT-22 improvement. Emerging agents, including benralizumab (anti-IL-5R) and tezepelumab (anti-TSLP), reduce polyp size and symptoms in a 2025 NEJM RCT. Comparative studies suggest that biologics rival FESS in symptom control but require ongoing therapy; side effects include injection reactions (10-20%) and conjunctivitis (dupilumab). Eligibility often requires eosinophils ≥300 cells/μL and failure to undergo MMT/surgery [8-10].

Adjunctive Therapies

Montelukast (10 mg/day) benefits AERD or allergic CRS by reducing leukotrienes and symptoms. Aspirin desensitisation in AERD lowers polyp recurrence and corticosteroid dependence. Antihistamines and immunotherapy address allergies, whereas decongestants are only short-term. Probiotics and vitamin D supplementation show emerging promise in modulating microbiota and immunity, but the evidence is preliminary [11-12].

Tabel 1. Summary of Therapies for Chronic Rhinosinusitis (CRS)

Therapy	Indication	Evidence Level	Key Outcomes
Nasal Irrigation	All Chronic Rhinosinusitis	Level 1 (Meta-analyses)	SNOT-22 score ↓ 20–30%
Intranasal Corticosteroids	First-line treatment	Level 1	Polyp size ↓, Symptoms ↓
Biologics	Refractory CRSwNP	Level 2 (RCT)	Surgery reduction 50–70%

CONCLUSION

Nonsurgical management of CRS emphasises irrigation, INCS, and targeted biologics, with personalised strategies that improve outcomes and reduce surgical needs. Ongoing innovations promise further advancements.

DECLARATIONS

None

CONSENT FOR PUBLICATION

The Authors agree to be published in the Journal of Society Medicine.

FUNDING

None

COMPETING INTERESTS

The authors declare no conflicts of interest in this case report.

AUTHORS' CONTRIBUTIONS

The authors have made substantial contributions to the review. The author was responsible for patient management, data collection, and the initial drafting of the manuscript. The authors reviewed and approved the final version of the manuscript, ensuring its accuracy and integrity and being accountable for all aspects of the work.

ACKNOWLEDGMENTS

None

REFERENCE

1. Klover CR, Gorantla VR. Chronic Rhinosinusitis Management: A Narrative Review Comparing Interventional Treatment With Osteopathic Manipulation. Cureus. 2024;16(9):e70276.
2. Darougar S, Hematyar M, Savoji PB. A mini-update on chronic rhinosinusitis. Explor Asthma Allergy. 2024;2(3):473-484.
3. Peters A, Zhao X, Near AM, Han J, Spahn JD, Wu SS. Real-world Outcomes Following Biologic Initiation in US Patients with Chronic Rhinosinusitis with Nasal Polyps. Adv Ther. 2025;42(10):4205-4224.
4. Bachert C. Chronic rhinosinusitis with nasal polyposis: Management and prognosis. UpToDate. Waltham, MA: UpToDate Inc; 2025.
5. Chin CJ, Scott JR, Lee JM. Diagnosis and management of chronic rhinosinusitis. CMAJ. 2024;197(6):E148.
6. Ah-See KL, MacKenzie K, Ah-See KW. Management of chronic rhinosinusitis. BMJ. 2012;345:e7054.
7. Lipworth BJ, Han JK, Desrosiers M, Hopkins C, Lee SE, Mullol J, et al. Tezepelumab in Adults with Severe Chronic Rhinosinusitis with Nasal Polyps. N Engl J Med. 2025;392(12):1178-1188.
8. Chin CJ, Scott JR, Lee JM. Diagnosis and management of chronic rhinosinusitis. CMAJ. 2024;197(6):E148.
9. Webb H, Morcom S. Updates in the management of chronic rhinosinusitis. Aust J Gen Pract. 2024;53(12):828-835.
10. Brzost J, Czerwaty K, Dżaman K, Ludwig N, Piszczatowska K, Szczepański MJ. Perspectives in Therapy of Chronic Rhinosinusitis. Diagnostics (Basel). 2022;12(10):2301.
11. Bachert C. Chronic rhinosinusitis without nasal polyposis: Management and prognosis. UpToDate. Waltham, MA: UpToDate Inc; 2025.
12. Gelardi M, Iannuzzi L, De Giosa M, Taliente S, De Candia N, Quaranta N, et al. Non-surgical management of chronic rhinosinusitis with nasal polyps based on clinical-cytological grading: a precision medicine-based approach. Acta Otorhinolaryngol Ital. 2017;37(1):38-45.