

# Improving your approach to nasal obstruction

The causes are diverse—from rhinitis and rhinosinusitis to drugs and structural/mechanical abnormalities. Here's how to provide patients with relief.

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## PRACTICE RECOMMENDATIONS

› Consider intranasal corticosteroids for patients with nasal polyps, as they are effective at reducing the size of the polyps and associated symptoms of obstruction, rhinorrhea, and rhinitis. **A**

› Prescribe intranasal corticosteroids for patients with adenoid hypertrophy. **A**

› Refer patients with chronic refractory rhinosinusitis for functional endoscopic sinus surgery. **B**

### Strength of recommendation (SOR)

- A** Good-quality patient-oriented evidence
- B** Inconsistent or limited-quality patient-oriented evidence
- C** Consensus, usual practice, opinion, disease-oriented evidence, case series

**N**asal obstruction is one of the most common reasons that patients visit their primary care providers.<sup>1,2</sup> Often described by patients as nasal congestion or the inability to adequately breathe out of one or both nostrils during the day and/or night, nasal obstruction commonly interferes with a patient's ability to eat, sleep, and function, thereby significantly impacting quality of life. Overlapping presentations can make discerning the exact cause of nasal obstruction difficult.

To improve diagnosis and treatment, we review here the evidence-based recommendations for the most common causes of nasal obstruction: rhinitis, rhinosinusitis (RS), drug-induced nasal obstruction, and mechanical/structural abnormalities (TABLE 1<sup>3-14</sup>).

## Rhinitis/rhinosinusitis: It all begins with inflammation

Sneezing, rhinorrhea, nasal congestion, and nasal itching are complaints that signal rhinitis, which affects 30 to 60 million people in the United States annually.<sup>3</sup> Rhinitis can be allergic, non-allergic, infectious, hormonal, or occupational in nature. All forms of rhinitis share inflammation as the cause of the nasal obstruction. The most common form is allergic rhinitis (AR), which includes seasonal AR and perennial AR. Seasonal AR is typically caused by outdoor allergens and waxes and wanes with pollen seasons. Perennial AR is caused mostly by indoor allergens, such as dust mites, molds, cockroaches, and pet dander; it persists all or most of the year.<sup>6</sup> Causes of non-allergic rhinitis (NAR) include environmental irritants such as cigarette smoke, perfume, and car exhaust; medications; and hormonal changes,<sup>6</sup> but most causes of NAR are unknown.<sup>3,6</sup>

While AR can begin at any age, most people develop symptoms in childhood or as young adults, whereas NAR tends to begin later in life. Nasal itching can help to distinguish AR

TABLE 1

Common causes of nasal obstruction—and how to treat them\*

Condition	Characteristics	Causes	Treatments	Comments
Allergic rhinitis <sup>3,4,6</sup>	Sneezing, nasal itching, rhinorrhea, nasal congestion	Extrinsic allergens	Allergen avoidance, intranasal corticosteroids, nasal irrigation, intranasal or oral second-generation antihistamines, leukotriene receptor antagonists	Often starts in childhood or young adulthood
Non-allergic rhinitis <sup>3,4,6</sup>	Nasal congestion, post-nasal drip, rhinorrhea	Unknown causes, environmental irritants, medications, hormonal changes	Avoid known triggers; nasal irrigation, AR treatments	Often starts later in life
Drug-induced rhinitis <sup>3,5,6</sup>	Nasal congestion, rhinorrhea	Use of alpha-adrenergic nasal spray for >5-7 days, NSAIDs, ACE inhibitors, beta-blockers, oral contraceptives, antidepressants, intranasal cocaine, and methamphetamines <sup>†</sup>	Discontinue offending agent	
Nasal polyps <sup>7-9,14</sup>	Nasal congestion, rhinorrhea	Idiopathic, CF, ARS, NARS, AERD	Treat overlying ARS/NARS; intranasal corticosteroids	If no relief of symptoms, consider referral for polypectomy
Adenoid hypertrophy <sup>10-13</sup>	Nasal congestion, snoring, mouth breathing, recurrent otitis media	Adenoid tissue obstructs airway	Intranasal corticosteroids, leukotriene receptor antagonists	If no relief of symptoms, consider referral for adenoidectomy

ACE, angiotensin-converting enzyme; AERD, aspirin-exacerbated respiratory disease; AR, allergic rhinitis; ARS, allergic rhinosinusitis; CF, cystic fibrosis; NARS, non-allergic rhinosinusitis; NSAIDs, nonsteroidal anti-inflammatory drugs.

\*Nasal obstruction presenting with atypical symptoms and/or not responding to primary treatments should be considered for early referral to Otolaryngology.

<sup>†</sup>The most common agents are listed here; other drug classes may also cause rhinitis.

from NAR. NAR symptoms tend to be perennial and include postnasal drainage. If symptoms persist longer than 12 weeks despite treatment, the condition becomes known as chronic rhinosinusitis (CRS).

**Treatment of rhinitis:**

**Tiered and often continuous**

Treatment of AR and NAR is similar and multitiered beginning with the avoidance of irritants and/or allergens whenever possible, moving on to pharmacotherapy, and, at least for AR, ending with allergen immunotherapy. Treatment is often an ongoing process and typically requires continuous therapy as opposed to treatment on an as-needed basis.<sup>3</sup> It is unnecessary to perform allergy testing before making a presumed diagnosis of NAR and starting treatment.<sup>6</sup>

■ **Intranasal corticosteroids.** Currently,

intranasal glucocorticosteroids (INGCs) are the most effective monotherapy for AR and NAR and have few adverse effects when used at prescribed doses.<sup>3,4</sup> For mild to intermittent symptoms, begin with the maximum dosage of an INGC for the patient's age and proceed with incremental reductions to identify the lowest effective dose.<sup>3</sup> If INGCs alone are ineffective, studies have shown that the addition of an intranasal second-generation antihistamine can be of some benefit.<sup>3,4</sup> In fact, an INGC and an intranasal antihistamine—along with saline nasal irrigation—is recommended for both AR and NAR resistant to single therapy.<sup>3,6,15</sup> If intranasal antihistamines are not an option, oral therapy can be initiated.

■ **Start with second-generation antihistamines and consider LRAs.** For oral therapy, start with second-generation antihistamines

(loratadine, cetirizine, fexofenadine). First-generation antihistamines (diphenhydramine, hydroxyzine, chlorpheniramine), although widely available at relatively low cost, can cause several significant adverse effects including sedation, impaired cognitive function, and agitation in children.<sup>3,4</sup> Because second-generation antihistamines have fewer adverse effects, they are recommended as first-line therapy when oral antihistamine therapy is desired, such as for nasal congestion, sneezing, and itchy, watery eyes.

Of note: A 2014 meta-analysis found that a leukotriene receptor antagonist (LRA) (montelukast) had efficacy similar to oral antihistamines for symptom relief in AR, and that LRAs may be better suited to nighttime symptoms (difficulty falling asleep, nighttime awakenings, congestion on awakening), while antihistamines may provide better relief of daytime symptoms (pruritus, rhinorrhea, sneezing).<sup>16</sup> Although further head-to-head, double-blind randomized controlled trials (RCTs) are needed to confirm the results and investigate possible gender differences in symptom response, consider an LRA for first-line therapy in patients with AR who have predominantly nighttime symptoms.

### What about pregnant women and the elderly?

It is important to consider teratogenicity when selecting medications for pregnant patients, especially during the first trimester.<sup>3</sup> Nasal cromolyn has the most reassuring safety profile in pregnancy. Cetirizine, chlorpheniramine, loratadine, diphenhydramine, and tripelemamine may be used in pregnancy. The US Food and Drug Administration considers them to have a low risk of fetal harm, based on human data, whereas it views many other antihistamines as probably safe, based on limited or no human data. Most INGCs are not expected to cause fetal harm, but limited human data are available. Avoid prescribing oral decongestants to women who are in the first trimester of pregnancy due to the risk of gastroschisis in newborns.<sup>17</sup>

Elderly patients represent another population for which adverse effects must be carefully considered. Allergies in individuals

>65 years of age are uncommon. Rhinitis in this age group is often secondary to cholinergic hyperactivity, alpha-adrenergic hyperactivity, or rhinosinusitis. Given elderly patients' increased susceptibility to the potential adverse central nervous system (CNS) and anticholinergic effects of antihistamines, non-sedating medications are recommended. Oral decongestants also should be used with caution in this population, not only because of CNS effects, but also because of heart and bladder effects<sup>3</sup> (TABLE 2<sup>18</sup>).

### For drug-induced rhinitis, stop the offending drug and consider an INGC

Several types of medications, both oral and inhaled, are known to cause rhinitis. The use of alpha-adrenergic decongestant sprays for more than 5 to 7 days can induce rebound congestion on withdrawal, known as rhinitis medicamentosa.<sup>3</sup> Repeated use of intranasal cocaine and methamphetamines can also result in rebound congestion. Oral medications that can result in rhinitis or congestion include angiotensin-converting enzyme (ACE) inhibitors, beta-blockers, nonsteroidal anti-inflammatory drugs (NSAIDs), oral contraceptives, and even antidepressants.<sup>3</sup>

The treatment for drug-induced rhinitis is termination of the offending agent. INGCs can be used to help decrease inflammation and control symptoms once the offending agent is discontinued.

### Mechanical/structural causes of obstruction are wide-ranging

Mechanical/structural causes of nasal obstruction range from foreign bodies to anatomical variations including nasal polyps, a deviated septum, adenoidal hypertrophy, foreign bodies, and tumors. Because more than one etiology may be at work, it is best to first treat any non-mechanical causes of obstruction, such as ARS or NARS.

### Nasal polyposis often requires both a medical and surgical approach

Nasal polyps are benign growths arising from the mucosa of the nasal sinuses and nasal cavities and affecting up to 4% of the population.<sup>7</sup> Their etiology is unclear, but we do



**When prescribing intranasal corticosteroids for allergic and nonallergic rhinitis, begin with the maximum dosage and then incrementally reduce the amount to identify the lowest effective dose.**

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Leukotriene receptor antagonists may be better suited to nighttime symptoms of nasal obstruction, while oral antihistamines may be better suited to daytime symptoms.

**TABLE 2**  
**Commonly used medications for nasal obstruction**

Category	Medication	Adult dose <sup>18</sup>
<b>Intranasal antihistamine</b>		
	azelastine	1-2 sprays BID
	olopatadine	2 sprays BID
<b>Oral antihistamine</b>		
First generation	diphenhydramine	25-50 mg q4-6 hours
	hydroxyzine	25-50 mg q6 hours
	chlorpheniramine	4 mg q4-6 hours
Second generation	loratadine	10 mg once daily
	cetirizine	10 mg once daily
	fexofenadine	180 mg once daily
<b>Intranasal glucocorticoids</b>		
	flunisolide	2 sprays once daily
	triamcinolone	2 sprays once daily
	budesonide	1 spray once daily
	beclomethasone	1-2 sprays twice daily
	fluticasone	2 sprays once daily
	mometasone	2 sprays once daily
<b>Leukotriene receptor antagonists</b>		
	montelukast	10 mg once daily

know that nasal polyps result from underlying inflammation.<sup>7</sup> Uncommon in children outside of those affected by cystic fibrosis,<sup>7</sup> nasal polyposis can be associated with disease processes such as AR and sinusitis. Polyps are also associated with clinical syndromes such as aspirin-exacerbated respiratory disease (AERD) syndrome, which involves upper and lower respiratory tract symptoms in patients with asthma who have taken aspirin or other NSAIDs.<sup>9</sup>

Symptoms vary with the location and size of the polyps, but generally include nasal congestion, alteration in smell, and rhinorrhea. The goals of treatment are to restore or improve nasal breathing and olfaction and prevent recurrence.<sup>8</sup> This often requires both a medical and surgical approach.

Topical corticosteroids are effective at reducing both the size of polyps and associated symptoms (rhinorrhea, rhinitis).<sup>8</sup> And research has shown that steroids reduce the need for both primary and repeat surgical polypectomies.<sup>4</sup> Other treatments to consider prior to surgery (if no symptom reduction oc-

curs with INGCs) include systemic (oral) corticosteroids, intra-polyp steroid injections, macrolide antibiotics, and nasal washes.<sup>7,14</sup>

When symptoms of polyposis are refractory to medical management, functional endoscopic sinus surgery (FESS) is the surgical procedure of choice.<sup>3</sup> In addition to refractory symptoms, indications for FESS include the need to correct anatomic deformities believed to be contributing to the persistence of disease and the need to debulk advanced nasal polyposis.<sup>3</sup> The principal goal is to restore patency to the ostiomeatal unit.<sup>3</sup>

Several studies have reported a high success rate for FESS in improving the symptoms of CRS.<sup>3,19-23</sup> In a 1992 study, for example, 98% of patients reported improvement following surgery,<sup>19</sup> and in a follow-up report approximately 6 years later, 98% of patients continued to report subjective improvement.<sup>22</sup>

**For septal etiologies, consider septoplasty**

Deviation of the nasal septum is a common

structural etiology for nasal obstruction arising primarily from congenital, genetic, or traumatic causes.<sup>24</sup> Turbulent airflow from the septal deviation often causes turbinate hypertrophy, which creates (or exacerbates) the obstructive symptoms from the septal deviation.<sup>25</sup>

Septoplasty is the most common ear, nose, and throat operation in adults.<sup>26</sup> Reduction of nasal symptoms has been reported in up to 89% of patients who receive this surgery, according to one single-center, non-randomized trial.<sup>27</sup> Currently, at least one multicenter, randomized trial is underway that aims to develop evidence-based guidelines for septoplasty.<sup>26</sup>

■ **Septal perforation** is another etiology that can present with nasal obstruction symptoms. Causes include traumatic perforation, inflammatory or collagen vascular diseases, infections, overuse of vasoconstrictive medications, and malignancy.<sup>28,29</sup> A careful inspection of the nasal septum is necessary to identify a perforation; this may require nasal endoscopy.

Anterior, rather than posterior, perforations are more likely to cause symptoms of nasal obstruction. Posterior perforations rarely require treatment unless malignancy is suspected, in which case referral for biopsy is recommended. Anterior perforations are treated initially with avoidance of any causative agent if, for example, the problem is drug- or medication-induced, and then with humidification and emollients.<sup>28,29</sup>

For anterior perforations, septal silicone buttons can be used for recalcitrant symptoms. However, observational studies indicate that for long-term symptom resolution, silicone buttons are effective in only about one-third of patients.<sup>29</sup>

For patients with persistent symptoms despite the above measures, surgical repair with various flap techniques is an option. A meta-analysis of case studies involving various techniques concluded that there is a wide variety of options, and that surgeons must weigh factors such as the characteristics and etiology of the perforation and their own experience and expertise when choosing from among available methods.<sup>30</sup> Additional good quality research is necessary before

clear recommendations regarding technique can be made.

#### **Adenoid hypertrophy:**

##### **Consider corticosteroid nasal drops**

Adenoid hypertrophy is a common cause of chronic nasal obstruction in children. Although adenoidectomy is commonly performed to correct the problem, current evidence regarding the efficacy of the procedure is inconclusive.<sup>10</sup> Evidence demonstrates corticosteroid nasal drops significantly reduce symptoms of nasal obstruction in children and may provide an effective alternative to surgical resection.<sup>18</sup> Studies have also demonstrated that treatment with oral LRAs significantly reduces adenoid size and nasal obstruction symptoms.<sup>12,13</sup>

#### **Foreign bodies:**

##### **Don't forget "a mother's kiss"**

Foreign bodies are the most common cause of nasal obstruction in the pediatric population. There is a paucity of high-quality evidence on removal of these objects; however, a number of retrospective reviews and case series support that most objects can be removed in the office or emergency department without otolaryngologic referral.<sup>31,32</sup>

Techniques for removal include positive pressure, which is best used for smooth or soft objects. Positive pressure techniques include having the patient blow their own nose or having a parent use a mouth-to-mouth-type blowing technique (ie, the "mother's kiss" method).<sup>32</sup> Refer patients to Otolaryngology if the obstruction involves:<sup>31</sup>

- objects not easily visualized by anterior rhinoscopy
- chronic or impacted objects
- button batteries or magnets
- penetrating or hooked objects
- any object that cannot be removed during an initial attempt.

#### **Nasal tumors: More common in older men**

Nasal tumors occur most often in the nasal cavity itself and are more common in men  $\geq 60$  years.<sup>33</sup> There is no notable racial predominance.<sup>33</sup> Other risk factors include human papillomavirus (HPV)



**Although adenoidectomy is commonly performed to correct adenoid hypertrophy in children, current evidence regarding the efficacy of the procedure is inconclusive.**

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infection, tobacco smoke, and occupational exposure to inhaled wood dust, glues, and adhesives.<sup>34-37</sup>

■ **Benign tumors** occurring in the nasal cavity are a diverse group of disorders, including inverted papillomas, squamous papillomas, pyogenic granulomas, and other less common lesions, all of which typically present with nasal obstruction as a symptom. Many of these lesions cause local tissue destruction or have a high incidence of recurrence. These tumors are treated universally with nasoendoscopic resection.<sup>38</sup>

■ **Malignant nasal tumors** are rare but serious causes of nasal obstruction, making up 3% of all head and neck cancers.<sup>39</sup> Most nasal cancers present when they are locally advanced and cause unilateral nasal obstruction, lacrimation, and epistaxis. These symptoms are typically refractory to initial medical management and present as CRS. This diagnosis should be suspected in certain patient groups, such as those who have been exposed to wood dust (eg, construction workers or those who work in wood mills).<sup>36</sup>

Computed tomography is the gold standard imaging method for CRS; however, if nasal cancer is suspected, referral for biopsy and histopathologic examination is necessary for a final diagnosis.<sup>39</sup> Because of the nonspecific nature of their initial presentation, many nasal tumors are at an advanced stage and carry a poor prognosis by the time they are diagnosed.<sup>39</sup> **JFP**

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➤ **Most foreign bodies can be removed in the office or emergency department without referral to Otolaryngology.**

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