

Allergic Rhinitis Review and Updates in Pharmacologic Management

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Goal. The goal of this lesson is to provide an overview of allergic rhinitis, including symptoms, types and classification, diagnosis, review of guidelines and evidence-based treatment, and discussion of recent changes in pharmacologic therapies.

Objectives. At the completion of this activity, the participant will be able to:

1. demonstrate an understanding of the pathophysiology resulting in allergic rhinitis symptoms and differentiate allergic rhinitis from nonallergic rhinitis;
2. classify allergic rhinitis based on patient symptoms, severity of symptoms, and frequency of symptoms;
3. identify appropriate pharmacologic management of allergic rhinitis based on patient symptoms, updates in evidence-based guidelines, and transition of several intranasal corticosteroids to the over-the-counter market;
4. describe adverse effects, safety concerns, and key counseling points associated with pharmacologic treatment options used in allergic rhinitis management; and
5. demonstrate an understanding of nonpharmacological interventions used to help manage allergic rhinitis and the role of the pharmacist.

Background

Allergic rhinitis is one of the most common disorders in the world, affecting more than 400 million people. In the United States, approximately 20 percent of adults and 40 percent of children are affected. Prevalence peaks during the second through fourth decades of life and generally diminishes as one ages. Annual direct costs of allergies are estimated to be \$3.4 billion. Worldwide, the incidence of respiratory allergic diseases has been increasing for four decades.

Respiratory diseases are now the most common chronic disease among all adolescents and young adults. Frequently, physicians are not involved in the diagnosis of allergic rhinitis. Rather, patients self diagnose.

Diagnosis of allergic rhinitis is usually based on clinical symptoms, with a positive response to oral antihistamines or intranasal corticosteroids. The diagnosis is rarely allergen-specific. Although allergic rhinitis is a complex disease, many patients consider the disease trivial because over-the-counter (OTC) medications are amply available. Most patients self-diagnose and self-manage, making the pharmacist the first-line health care provider for patients suffering from allergic rhinitis.

Allergic rhinitis is an Immunoglobulin E (IgE)-mediated response to allergens. Allergens can result from inhalation (dander or pollen), ingestion (food or penicillin),

injection (venom from bee or wasp), or skin contact (latex or plant). After exposure, the allergen will be identified by the lymph tissue. The lymphocytes then produce IgE. Upon re-exposure, IgE-bound mast cells interact with the allergen to release inflammatory mediators. Individuals cannot develop allergic rhinitis without re-exposure. A person will not be “allergic” to an allergen upon his or her first exposure. Sensitization to the allergen can occur after repeated exposures, as the immune system is primed by the adaptive immune response. The immediate reaction to allergen exposure includes release of inflammatory mediators (histamine, leukotrienes, prostaglandins, and kinins). Next, eosinophils migrate to the nasal mucosa and release additional inflammatory mediators. Late-phase reactions occur in approximately half of allergic rhinitis patients within four to eight hours of exposure, and involve several cytokines that cause the chronic mucosal inflammation and mucus hypersecretion, leading to persistent nasal congestion.

The itching sensation associated with allergies is caused by sensory nerve stimulation, and sneezing is caused by a reflex of the efferent vagal pathways. Histamine is responsible for rhinorrhea, itching, sneezing, and nasal obstruction. Nasal obstruction is also caused by kinins, prostaglandin D₂, and leukotrienes. The overall effect of these inflammatory mediators

Table 1
Symptom differentiation for allergic vs. nonallergic rhinitis

	Allergic	Nonallergic
Presentation	Bilateral symptoms, worse upon awakening and at night	Unilateral symptoms likely, constant all day
Sneezing	Frequent, paroxysmal	Little or absent
Rhinorrhea	Watery and anterior	May be watery or thick and/or mucopurulent, posterior
Pruritis of eyes, nose, and/or palate	Frequent	Absent
Conjunctivitis	Frequent	Absent
Anosmia	Rare	May be present
Epistaxis	Rare	Occurs frequently
Key nasal or facial features	“Allergic shiners” (periorbital darkening secondary to venous congestion); “Dennie’s lines” (wrinkles beneath the lower eyelids); “Allergic salute” (rub the tip of the nose upward with the palm of the hand); “Allergic crease” (horizontal crease across the nose secondary to the “allergic salute”)	Nasal polyps, nasal septal deviation, enlarged tonsils and/or adenoids

Adapted from Krinsky DL, Ferreri SP, Hemstreet BA, et al. Handbook of Non-prescription Drugs: An Interactive Approach to Self-Care. 18th Ed. Washington, DC: American Pharmacists Association; 2015.

results in production of increased nasal secretions, increased vascular permeability, and vasodilation.

There is a high prevalence of asthma and atopic dermatitis (eczema) in patients with allergic rhinitis. There is a possible association of disease severity between asthma and allergic rhinitis.

Risk factors for allergic rhinitis include genetic predisposition, higher socioeconomic class, eczema, and a positive reaction to allergy skin tests. In the United States, ragweed and grass pollen are the most common allergens, with ragweed affecting up to 75 percent of Americans who suffer from allergic rhinitis. Commonly, allergic rhinitis is caused by different allergens in the different seasons. In spring,

tree pollens are most common; in late spring and summer, grass; and in late summer to fall, ragweed. Grass pollens, such as fescue, Kentucky bluegrass, orchard, redtop, and timothy, often cross-react; whereas, tree pollens such as ash, beech, birch, cedar, hickory, maple, oak, poplar, and sycamore are often distinctive allergens. Pollutants and mold are other common outdoor allergies. Common indoor allergies include dust mites, cockroaches, mold species, cigarette smoke, and animal dander.

Identifying Allergic Rhinitis Symptoms and Classifying Severity

In a community pharmacy setting, a differential diagnosis of allergic

rhinitis based on patient history, symptoms, and a physical exam is crucial. Typically, tests are not conducted to confirm allergic rhinitis; however, sensitization to an allergen can be confirmed through IgE levels or a positive epicutaneous skin test. Diagnosis can be considered confirmed when 1) there is a history of symptoms to this sensitized allergen, and 2) when there is a wheal and flare reaction to an allergen extract. A wheal is a blanched skin eruption that is surrounded by an area of redness due to histamine release. It is easier to diagnose allergic rhinitis when symptoms occur seasonally and when there is a clear trigger, versus chronic symptoms or multiple triggers. According to guidelines, allergy testing is not currently recommended, unless a patient does not respond to empiric therapy, diagnosis is uncertain, or there is a need to identify the specific cause.

Patient history includes environmental factors and exposures, previous medication used to manage allergic rhinitis and the results, family history, medication list, and medical conditions. Symptoms and physical exam findings are listed in Table 1 for differentiation of allergic and nonallergic rhinitis. Causes of nonallergic rhinitis can include infection (rhinosinusitis); work environment (laboratory animals, wood dust, mites, latex, chemicals); medications (NSAIDs, methyl dopa, ACE-I, intraocular beta blockers, oral contraceptives, cocaine use, withdrawal from intranasal vasoconstrictors); hormones (menstruation, puberty, pregnancy, hypothyroidism, acromegaly); tobacco smoke; foods (hot spicy food and some dyes and preservatives); emotions (stress and sexual arousal); atrophic rhinitis, and idiopathic rhinitis. Because as many as one in every four to five ambulatory patients will seek care for allergic rhinitis, but exhibit symptoms of nonallergic rhinitis, pharmacists should consider nonallergic rhinitis as the cause of symptoms as well. Pharmacists should also monitor for associated comorbidities such as

asthma, atopic dermatitis, breathing issues while sleeping, conjunctivitis, rhinosinusitis, and otitis media. These comorbidities can impact selection of optimal drug therapy, and may exclude a patient from self-care.

Symptoms that should cue pharmacists into other conditions causing nasal symptoms include facial pain, epistaxis (nosebleeds), thick or discolored mucus, symptoms on only one side of the nose, anosmia (loss of smell), or post-nasal drip with thick mucus. These patients should be referred to a primary care provider or urgent care setting for further assessment.

Allergic rhinitis is classified by the duration and the severity of symptoms. *Intermittent allergic rhinitis* is classified as symptoms occurring ≤ 4 days per week OR ≤ 4 weeks. This may also be referred to as *seasonal allergic rhinitis*. With *persistent allergic rhinitis*, symptoms occur ≥ 4 days per week AND ≥ 4 weeks. *Mild allergic rhinitis* is described as symptoms that do not impair sleep or daily activities (i.e., work, school, sports, and leisure) and are not troublesome. *Moderate-severe allergic rhinitis* is classified as having one or more of the following: impairment of sleep, impairment of daily activities, or other troublesome symptoms.

Treatment Approach for Allergic Rhinitis Symptom Control

Three guidelines exist for allergic rhinitis, with the most recent being *Clinical Practice Guideline: Allergic Rhinitis*, which was released by the American Academy of Otolaryngology – Head and Neck Surgery Foundation in 2015. This lesson will focus on these guidelines since they are the most recent. Pharmacists should note that these guidelines do not pertain to pediatric patients less than two-years-old as allergic rhinitis presents differently in this patient population, but they should be used in all other pediatric and adult patients.

The Management of Allergic Rhinitis and its Impact on Asthma,

Table 2
Pharmacologic treatments for allergies

OTC Allergy Medications

Second-Generation Antihistamines
Zyrtec® (cetirizine)
Claritin® (loratadine)
Allegra® (fexofenadine)
Xyzal® (levocetirizine)
NasalCrom® (Intranasal cromolyn)
Topical and Systemic Decongestants
Intranasal Corticosteroids (INCS)
Nasacort® Allergy 24HR
(triamcinolone acetonide)
Rhinocort® (budesonide)
Flonase® (fluticasone propionate)
Flonase® Sensimist (fluticasone furoate)

Prescription Allergy Medications

Second-Generation Antihistamines
Clarinex® (desloratadine)
Intranasal Antihistamines
Patanase® (olopatadine)
Astepro®, Astelin® (azelastine)
Leukotriene Receptor Antagonists
Intranasal Corticosteroids (INCS)
Nasonex® (mometasone furoate monohydrate)
Omnaris®, Zetonna® (ciclesonide)
Qnasl® (beclomethasone dipropionate)
Beconase AQ® (beclomethasone dipropionate monohydrate)

Adapted from Lexi-Drugs. Lexicomp. Wolters Kluwer Health, Inc. Hudson, OH. Available at: <http://online.lexi.com>. Accessed February 27, 2017.

known as the ARIA guidelines, were released in 2008. *The diagnosis and management of rhinitis: an updated practice parameter* was released in 2008 by the Joint Task Force on Practice Parameters for Allergy and Immunology. These guidelines represent a joint effort between the American Academy of Allergy, Asthma & Immunology (AAAAI), the American College of Allergy, Asthma, and Immunology (ACAAI), and the Joint Council of Allergy, Asthma, and Immunology.

There are several pharmacologic treatment options available for allergic rhinitis, most of which are available as OTC medications. Table 2 provides a listing of prescription and OTC medications used to treat allergic rhinitis. None of the pharmacological options available affect progression of allergic rhinitis; rather, they simply manage the associated symptoms. Intranasal corticosteroids (INCS) have become the standard of care with their recent transition to OTC availability, and with the release of the 2015 guidelines. The efficacy, safety, and cost effectiveness of INCS make them the preferred first-line agent. INCS provide significantly greater relief of nasal blockage, nasal discharge, sneezing, nasal itching, and post-nasal drip compared to oral antihistamines. INCS have

not been found to provide superior relief of ocular symptoms; an oral or ocular antihistamine may be preferred for ocular symptoms. Previously, in the ARIA guidelines, intranasal corticosteroids were only preferred in moderate-severe, persistent allergic rhinitis with step-down therapy recommended once symptoms were controlled.

For conjunctivitis symptoms, an oral antihistamine or intraocular antihistamine/mast-cell stabilizer (Zaditor®, Alaway® [ketotifen]) is preferred. Leukotriene-receptor antagonists (LTRA) are not recommended as first-line therapy in allergic rhinitis. Clinical trials have shown LTRA to be less effective than other first-line therapies. Their use should be reserved for patients with diagnosis of both allergic rhinitis and asthma; however, they are not recommended for first-line treatment in asthma either. Immunotherapy is only recommended in patients who do not have an adequate response to standard therapy.

When developing a pharmacotherapy plan for allergic rhinitis, therapy should be directed at the symptoms. Sedating antihistamines should be avoided in favor of the more tolerable second-generation antihistamines. Although treatment goals are patient

specific, the following should be considered: 1) unimpaired sleep, 2) no troublesome symptoms, 3) normal daily activities without limitations (i.e., participation in sports, leisure activities, work attendance), and 4) minimal side effects.

Intranasal Corticosteroids (INCS). In recent years, INCS have become available OTC, signaling a major shift in the management of allergic rhinitis since it is primarily a self-care condition. In 2006, the Joint Task Force for the American Academy of Allergy, Asthma and Immunology and the American College of Allergy, Asthma and Immunology released a white paper regarding the potential switch to OTC status with safety concerns without prescriber oversight. However, pharmacists should feel confident recommending these products to their patients as no significant topical or systemic side effects have been demonstrated in clinical trials. INCS have markedly reduced systemic bioavailability compared to oral and inhaled corticosteroids. With each dose of INCS, approximately 30 percent of the dose is deposited in the nose where it binds with glucocorticoid receptors; the other 70 percent is swallowed and subject to first-pass metabolism in the liver before it becomes systemically available.

Side effects of INCS are usually mild, often transient, primarily limited to nasal tissue, and include sneezing; nasal irritation, stinging, or burning; nose bleed; and after taste. A strong correlation has been found between the nostril that bleeds and the hand used to administer INCS. For example, if the patient administers INCS with their right hand, there is higher risk of bleeding in the right nostril than in the left. Administration technique can increase the incidence of both bleeding and nasal septum perforation; thus, patients should be counseled on appropriate administration technique to minimize side effects.

While nasal septum perforation is rare, it is thought to be due

to the vasoconstrictive properties of INCS. Reports of perforation are limited, but when reported, perforation generally occurs during the first 12 months of use. Occasional nasal septum perforation has been reported; however, it is believed that this is due to trauma from improper use of the INCS or other factors such as cocaine or decongestant abuse. There are also risks for atrophy of the nasal mucosa and changes in nasal epithelial cells, but studies from 12 months to five years do not show adverse outcomes as a result of these changes.

Systemic side effects such as hypothalamic-pituitary-adrenal (HPA) axis suppression, growth stunting, and other prominent oral corticosteroid side effects are not consistently shown in the literature and are not thought to be clinically significant. INCS should be of minimal concern in patients with diabetes compared to oral corticosteroids. Oral corticosteroids can cause cortisol-induced insulin resistance with long-term use and impair glucose tolerance. After three months of use, triamcinolone acetonide was found to have no impact on A1c or fasting blood glucose. Proper administration technique will minimize the risk of systemic side effects. Growth stunting in children using INCS was reported for beclomethasone dipropionate in many population studies. It is generally thought that this may be as little as 1 cm in height, which is not clinically significant. However, additional studies are needed.

Although INCS have been proven safe, they should be avoided in patients with existing nasal conditions, such as nasal polyps or any olfactory disorders. As previously mentioned, INCS are the most effective treatment option for allergic rhinitis, and current guidelines recommend these for first-line therapy. INCS provide therapeutic effect by interrupting the “allergic cascade,” have potent anti-inflammatory effects, and prevent the release of histamine. Some studies have shown INCS provide better overall symptom relief; how-

ever, other studies have shown oral antihistamines are more effective for ocular symptoms. INCS also improve quality of life and sleep for patients.

Ciclesonide, fluticasone furoate, fluticasone propionate and mometasone furoate may be preferred INCS as they have lower systemic bioavailability. These INCS are second-generation and have favorable pharmacokinetics that decrease their systemic bioavailability further. These may be ideal agents to recommend to patients, primarily those available OTC. While INCS are the most effective treatment for allergic rhinitis, they have a delayed onset of action of 12 to 24 hours, a peak effect that takes several days to occur, and require daily or continuous use for optimal therapeutic benefit. Typically, it takes two weeks of use to start to see benefit and improvement in allergic rhinitis symptoms.

Oral Antihistamines. First-generation “sedating” antihistamines should not be used in the management of allergic rhinitis. Patients should be managed on a second-generation “nonsedating” antihistamine as they have a more favorable side effect profile and are just as effective at managing symptoms. Oral antihistamines work by blocking the effects of histamine at the histamine-1 (H1) receptor. Histamine is directly responsible for many symptoms of allergic rhinitis including mucus secretion, vascular permeability, and sensory nerve stimulation. Oral antihistamines provide relief of many nasal symptoms associated with allergic rhinitis; however, their relief is not as effective as INCS. Oral antihistamines generally have no effect on nasal congestion, and a decongestant may also be required. A combination of a second-generation antihistamine with an oral decongestant has been shown to provide significantly greater symptom control in patients with ragweed allergy. This may be a suitable treatment option for seasonal allergic rhinitis with occasional decongestant use, but the cardio-

vascular risks of decongestants do not warrant daily use. INCS have also been shown to provide nasal blockage and discharge relief, and may be a suitable alternative for long-term congestion management. Oral antihistamines are generally less effective than INCS, but still provide symptom relief. Compared to INCS, oral antihistamines provide greater relief of ocular symptoms and potentially greater relief of nasal itching, but not other nasal symptoms such as congestion.

When looking at second-generation antihistamines, they are generally considered equivalent in terms of efficacy. Recommendation for a specific second-generation antihistamine can be based on patient and pharmacist preference with consideration of what the patient has previously tried. Some studies have shown that loratadine has a slower onset of action (three hours) compared to fexofenadine and cetirizine (one hour). It is not well known if this is clinically significant, especially for daily antihistamine use. While second-generation antihistamines have reduced sedation compared to first-generation, there is a slight risk of sedation associated with their use. Sedation is most likely with cetirizine compared to other second-generation antihistamines.

Few head-to-head studies have failed to show INCS to be superior to oral antihistamines. Compared to INCS, oral antihistamines have a much quicker onset of action. Depending on the antihistamine, symptoms should start to improve within one to three hours. Oral antihistamines are preferred in patients who cannot or will not administer INCS, need immediate relief, or have occasional symptoms that do not require daily treatment (i.e., occasional pet dander exposure).

Intranasal Antihistamines.

Intranasal antihistamines typically have limited use in practice, likely due to the inconvenience of nasal administration of a medication that is orally available without any decrease in side effects. Intranasal

antihistamines do have a rapid onset of action with an increase in effectiveness for nasal congestion over oral antihistamines. There is likely limited or no additional benefit for all other symptoms with intranasal antihistamines. Intranasal antihistamines are recommended after failure of INCS or oral antihistamines.

Intranasal Cromolyn. Intranasal cromolyn is available OTC. This medication is a mast-cell stabilizer that is thought to work by preventing histamine degranulation; thus, this medication should be used as a prophylactic treatment in allergic rhinitis. Intranasal cromolyn is less effective than INCS and oral antihistamines, with frequent application of up to three to six times per day. Further, it takes three to seven days to see an effect from the medication, with full benefit not occurring until after two to four weeks of use. Thus, intranasal cromolyn is used for allergic rhinitis in patients who are pregnant, since there are minimal safety concerns compared to other therapies. It provides symptom relief for rhinorrhea, sneezing, and itching. Side effects are minimal and are primarily limited to nasal tissue, including sneezing, nasal stinging and burning, and an unpleasant taste in the mouth.

Decongestants. Both topical and systemic decongestants can be used to treat nasal congestion associated with allergic rhinitis due to their agonist activity on adrenergic receptors in the nasal mucosa. Topical decongestants should be avoided if a patient is using an INCS or intranasal antihistamine to avoid minimized drug absorption, drug binding issues, and excessive irritation of nasal mucosa. Evidence has shown that decongestants work well with oral antihistamines by shrinking swollen mucosa and improving breathing, which is helpful since oral antihistamines do not provide benefit in nasal congestion. Use of topical decongestants should be limited to three to five days to minimize risk of dependency on the decongestant

or rebound congestion.

Immunotherapy. Immunotherapy is not a traditional pharmacotherapy option as for many years it was only available in a physician's office; however, sublingual dosage forms have recently come on the market. Immunotherapy targets the underlying disease of allergic rhinitis by affecting basic immunologic mechanisms to induce immunological tolerance. This is the only disease-modifying therapy that provides clinically effective and sustained systemic relief after treatment while also preventing progression of the condition. Within the environment, patients are typically exposed to low doses of allergen at any time. With immunotherapy, the patient is given a high dose of allergen to build tolerance. There are two primary functions that cause immune tolerance, one being immune duration, where there is moderation of the immunological response to allergen. An induction of T cell regulation also occurs: Th1 cells produce interferon gamma, which stimulates B cells to produce IgG instead of IgE. This prevents an allergen from triggering an immune response. Further, suppression of local Th2 cells occurs, which redirects antibody production in favor of IgG and IgA. Presentation of the allergen to Th2 cells occurs, which ultimately blocks the allergen-induced action of mast cells.

Patients receive immunotherapy subcutaneous injections every one to two weeks in a physician's office while the dose is being increased, and then monthly as maintenance therapy. Immunotherapy must be administered in a physician office because life-threatening anaphylaxis, although rare, can occur. Allergens are administered at increasing concentrations to decrease the allergen-specific response when a patient is exposed. Sublingual immunotherapy tablets are administered at a fixed dose for 12 to 16 weeks before the allergy season starts. These are not administered in a physician's office because the risk of anaphy-

laxis does not carry over from the injections. There are no head-to-head studies comparing sublingual and subcutaneous immunotherapy; however, indirect studies suggest subcutaneous therapy is more effective, but sublingual therapy is safer.

Special Populations. Cromolyn sodium is the drug of choice for allergic rhinitis in pregnancy due to its safety profile and topical administration; however, pharmacists must be mindful it takes up to four weeks to see optimal benefit. If an immediate-acting medication is needed, chlorpheniramine, a first-generation antihistamine is the most well-studied and safest antihistamine for use in pregnancy. Decongestants should be avoided in pregnancy due to risks of birth defects during the first trimester.

Older adults should not use first-generation antihistamines for allergic rhinitis due to sedation and potential for fall risk. Loratadine has the least risk of sedation among second-generation antihistamines. There is minimal concern for use of INCS in the geriatric population.

Nonpharmacologic Strategies

Allergen avoidance is commonly recommended in managing allergic rhinitis. Despite common sense rationale of allergic rhinitis symptom improvement, clinical trials have not shown significant benefit of allergen avoidance. Limited benefit has been shown in persistent allergic rhinitis in both children and adults. Avoidance of allergens should never be recommended alone, but in conjunction with pharmacotherapy. Recommendations to reduce dust mite allergens include decreasing household humidity below 40 percent, removing mold with bleach, removing carpets from the patient's bedroom, encasing bedding in mite-impermeable materials, removing stuffed toys from the patient's bedroom, and washing bedding weekly in hot water. One strategy to avoid outdoor

mold includes avoiding activities that involve decayed plant material.

Patients can avoid indoor mold by lowering household humidity, venting areas of high humidity, repairing damp areas of the house (i.e., basements), and removing houseplants. Pet-related allergens may be reduced by removing the pet from the house or washing the pet weekly. Cockroaches can be reduced by keeping the kitchen clean, storing food in tightly closed containers, removing garbage regularly, and treating infestations with pesticides. Indoor allergens can be improved by use of a high-efficiency particulate air (HEPA) filter within the ventilation system and vacuum cleaner, removing wall-to-wall carpeting, and reducing exposure to cigarette smoke. Outdoor allergens such as pollutants and pollens can be assessed by the air quality index and pollen counts, respectively, and outdoor activities can be planned when these are low. When counts are high, keep windows and doors closed, shower and change clothes following outdoor activity, and use air conditioning.

Nasal wetting agents (saline, propylene, or polyethylene glycol sprays or gels) are an inexpensive treatment option that may have some efficacy. Nasal irrigation with warm water (isotonic or hypertonic) via syringe or Neti Pots has become a popular option to treat nasal congestion. Irrigation flushes out mucus and irritants while also osmotically reducing inflammation. It may also reduce markers of inflammation for up to several hours after use. Studies looking at efficacy of nasal irrigation show conflicting results. Nasal irrigation should only be used with distilled, sterile, or boiled tap water to reduce the risk of infection. Chronic use may not be recommended. Adverse effects include nasal irritation, burning, and stinging; these are more common when using hypertonic solutions. Patients have developed serious fungal infections when tap water was used for irriga-

tion. Counsel patients to read the instructions for whichever product they purchase, as the different products may be handled differently. Patients should also be told to use nasal irrigation before using a nasal steroid.

The Pharmacist's Role in Allergy Symptom Management

Pharmacists play an important role in allergy management due to the availability of OTC medications to treat this condition. Despite the potential for complexity in diagnosis due to overlap of symptoms with other allergic conditions (i.e., the atopic triad), most patients do not seek diagnosis from a physician and will self-diagnose and self-manage the condition. Pharmacists are often the primary source of health care advice for treatment of allergic rhinitis; thus, it is critical that pharmacists assess the patient's symptoms to confirm the diagnosis and recommend appropriate treatment. Further, pharmacists must ensure they stay up-to-date on guidelines, OTC product transitions, and new therapeutic options.

Despite being viewed as a benign condition, the respiratory symptoms associated with allergic rhinitis can have a significant impact on a patient's quality of life, i.e., physical functioning, energy level, sleep impairment, social functioning, and reduction in school or work performance. This highlights the importance of pharmacist intervention, especially in the community pharmacy setting to offer optimal patient management. Most patients self-medicate with oral antihistamines, although intranasal corticosteroids are now suggested as first-line therapy. When pharmacists see patients seeking OTC allergic rhinitis medications, they should attempt to assess the patient's symptoms and recommend appropriate therapy.

Larger dosage volumes of INCS have been found to be associated with decreased adherence. If the

volume is too large, it can result in irritation of nasal tissue and runoff down the back of the throat. Pharmacists should work with patients to use the lowest effective dose (i.e., one spray in each nostril vs. two sprays) to attempt to maximize patient adherence.

Adherence may vary based on the patient's lifestyle. Overall adherence has significant room for improvement, which is important since INCS need to be administered daily for optimal benefit. Patients with higher education levels have been found to have higher adherence. Patients with two or more dependent children have been found to have lower adherence, which may be related to challenges fitting medication administration into their schedule. Unsurprisingly, patients who did not perceive benefit from the medication were less likely to be adherent. This is where pharmacists can intervene about appropriate expectations for onset of benefit. This challenge can likely be fixed, whereas a busy patient schedule would push preference to oral antihistamines due to ease of administration despite greater benefit with INCS.

Counseling is critical for optimal management of allergic rhinitis and minimization of side effects of recommended therapies. Most INCS side effects, especially those that are more significant, result from improper administration technique. Patients should be counseled to shake the bottle well and prime the inhaler when it has not been previously used, when it has been awhile since the last use, or when the nozzle has been recently cleaned. To prime the product, the inhaler should be aimed away from the patient's face and sprayed until a fine mist appears. The patient should then blow his or her nose before administration of the product.

The tip of the applicator, not the full nozzle, should be inserted laterally into the nose, pointed away from the septum with the

other nostril closed. This allows for decreased deposition of the medication on the septum and decreased trauma. While releasing a spray, patients should be counseled to gently sniff and that they will feel a light mist in their nose. They should be counseled to repeat the spray in the other nostril. Depending on symptom severity, a second dose may be required in each nostril.

When counseling on oral antihistamines, pharmacists should be mindful of why the patient is using the antihistamine. If the patient is using the oral antihistamine for intermittent allergic rhinitis, it should be taken two to five hours before allergen exposure. If the patient is taking the medication for seasonal or persistent allergic rhinitis, they should take the medication at the same time each day. Second-generation antihistamines should have minimal risk of sedation, so the medication can be administered whatever time of day is most convenient, ideally one to three hours before the most bothersome symptoms occur.

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This lesson is a knowledge-based CPE activity and is targeted to pharmacists in all practice settings. Disclosure: The OPF trustees and other individuals responsible for planning OPF continuing pharmacy education activities have no relevant financial relationships to disclose.

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- Allergic rhinitis is a response to allergens mediated by:
 - IgG.
 - IgA.
 - IgE.
 - IgD.
- Individuals can have an allergic reaction to an allergen the first time they are exposed to the substance.
 - True
 - False
- Patients with nonallergic rhinitis may experience all of the following signs and symptoms EXCEPT:
 - frequent epistaxis.
 - allergic shiners.
 - unilateral symptoms.
 - enlarged tonsils.
- Risk factors for allergic rhinitis include all of the following EXCEPT:
 - low socioeconomic status.
 - genetic predisposition.
 - eczema.
 - positive reaction to allergy skin tests.
- Pharmacists should monitor for which of the following comorbid conditions in patients with allergic rhinitis?
 - COPD
 - Acne
 - Asthma
 - Sinus infection
- Patients should be referred to urgent care or a primary care provider for all of the following symptoms EXCEPT:
 - facial pain.
 - nosebleeds.
 - bilateral congestion.
 - loss of smell.
- Intermittent allergic rhinitis or seasonal allergic rhinitis is classified as symptoms occurring:
 - ≤4 days per week OR ≤4 weeks.
 - ≤4 days per week AND ≤4 weeks.
 - ≥4 days per week OR ≥4 weeks.
 - ≥4 days per week AND ≥4 weeks.

Completely fill in the lettered box corresponding to your answer.

- | | | |
|--------------------|---------------------|---------------------|
| 1. [a] [b] [c] [d] | 6. [a] [b] [c] [d] | 11. [a] [b] [c] [d] |
| 2. [a] [b] | 7. [a] [b] [c] [d] | 12. [a] [b] [c] [d] |
| 3. [a] [b] [c] [d] | 8. [a] [b] [c] [d] | 13. [a] [b] [c] [d] |
| 4. [a] [b] [c] [d] | 9. [a] [b] [c] [d] | 14. [a] [b] |
| 5. [a] [b] [c] [d] | 10. [a] [b] [c] [d] | 15. [a] [b] [c] [d] |

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If no, list any unmet _____
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 yes no If no, why? _____
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 yes no
- How long did it take you to read this lesson and complete the quiz? _____
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2674 Federated Blvd, Columbus, OH 43235-4990**

- According to the *Clinical Practice Guideline: Allergic Rhinitis* released in 2015, which of the following is the preferred first-line agent to treat allergic rhinitis?
 - Oral antihistamines
 - Topical decongestants
 - Intraocular antihistamines
 - Intranasal corticosteroids
- Leukotriene-receptor antagonists should be reserved for patients diagnosed with allergic rhinitis and:
 - asthma.
 - conjunctivitis.
 - atopic dermatitis.
 - COPD.
- The onset of action of INCS is:
 - 2-5 hours.
 - 12-24 hours.
 - 2-3 days.
 - 2-4 weeks.
- Compared to oral antihistamines, INCS provide greater relief for all of the following EXCEPT:
 - nasal congestion.
 - eye itching.
 - rhinorrhea.
 - sneezing.
- All of the following are true for use of intranasal cromolyn in allergic rhinitis EXCEPT it is:
 - a mast-cell stabilizer.
 - used prophylactically.
 - the drug of choice in pregnancy.
 - more effective than INCS.
- Allergen avoidance includes all of the following measures EXCEPT:
 - removing carpet.
 - removing stuffed toys.
 - avoiding cigarette smoke.
 - washing bedding in cold water.
- Tap water should be boiled prior to use in nasal irrigation systems.
 - True
 - False
- Patients should be counseled to shake and prime the INCS inhalers in all of the following situations EXCEPT:
 - when the nozzle has been recently cleaned.
 - when the bottle has not been previously used.
 - before administration in the second nostril.
 - if it has been awhile since the last use.

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