Allergic Rhinitis

By: Raymond Lengel, FNP, MSN, RN

Purpose: Provide an overview of allergic rhinitis including its causes, signs and symptoms and treatment strategies.

Objectives

• List three causes of allergic rhinitis
• List five signs and symptoms of allergic rhinitis
• Discuss diagnostic testing options for allergic rhinitis
• Discuss five non-pharmacological interventions in the treatment of allergic rhinitis
• Discuss the pharmacological treatment options in the management of allergic rhinitis

Allergies affect the lives of 40 - 50 million Americans (1) and 24 percent of Europeans (2). Individuals affected with allergies can have a significant reduction in quality of life as allergies are associated with sinus infections, otitis media, sleep apnea, hearing impairment, aggravation of underlying asthma, reduced cognitive functioning, learning impairment and nasal polyps. Children with allergies are affected by impaired learning, reduced social interaction and mental health problems (3). Not only does the disease reduce quality of life, but some of the treatments of allergic rhinitis can affect quality of life.

Allergic rhinitis is highly correlated with asthma and atopic dermatitis. Eighty percent of those who have asthma and 80 percent who have atopic dermatitis also suffer from allergic rhinitis (3).

Allergies are a very common problem (4).

• 25% of individuals suffer from allergies at some point in their life
• More than 50% have the condition for greater than 11 years
• Slightly less than 50% of those with allergies report symptoms for more than 2 seasons per year
• In adults, men and women are equally affected
• More women report persistent allergies than men
• In children, more boys are affected than girls
• The average age of onset is 8-11 years old

**Pathophysiology**

The mucus membranes of the eyes, nose, ears and pharynx become inflamed in allergic rhinitis. In susceptible individuals, allergens lead to the production of an immunoglobulin E (IgE). The IgE attaches to the surface of the mast cell which cause the release of many different mediators. Common mediators involved in allergic rhinitis include prostaglandins, histamine, bradykinin and leukotrienes.

Prostaglandins are released by many different body tissues and they increase the action of histamine. Prostaglandins are released at the site of inflammation and are also involved in pain and are linked to body temperature.

Histamine is contained in some white blood cells and mast cells and are released during inflammation. Histamine is involved in vasodilation, smooth muscle spasm and vascular permeability.

Leukotrienes are released by white blood cells and are responsible for vasodilation, chemotaxis and contraction of bronchial muscle.

Bradykinin is also involved in the allergic response. It is involved in vasodilation, vascular permeability and pain transmission.

Some of the pharmacological therapies used in the management of allergic rhinitis are targeted at these mediators.
Risk Factors

Many factors increase the risk of allergies. Common risk factors include:

- Maternal smoking
- Living in areas of high pollution
- Higher socioeconomic status
- Exposure to indoor allergens as a child
- Early introduction of food or formula as an infant
- Non-Caucasian race
- Genetics
- A family history of allergies, asthma and eczema
- Personal history of asthma and/or eczema

Signs and Symptoms

Allergies can present in various ways. Each individual may have different symptoms.

Common symptoms of allergies include:

- Clear runny nose
- Sneezing
- Nasal congestion
- Itchy eyes, nose and throat
- Frequent clearing of the throat
- Watery, red, swollen eyes
- Fatigue
- Headache

The classical presentation of allergic rhinitis is clear rhinorrhea, sneezing, watery, red eyes and itching in the eyes, nose and throat. Some individuals will complain of mainly nasal
congestion. Those who suffer from persistent one-sided nasal congestion should be evaluated for the possibility of a deviated septum, nasal polyp or foreign body.

Patients will also complain of being tired. About 50% of those with allergic rhinitis do not feel rested in the morning (2). It is unclear how much of this is related to the disease and how much is related to the medications used to treat the disease.

Those who suffer from persistent disease report more problems with feeling tired than those with intermittent disease. In addition, those with persistent disease are more likely to complain of feeling irritable, worn out or frustrated (2, 4).

Upon physical exam a number a factors may be noted. When looking in the nose the mucosa may be pale and boggy with enlarged nasal turbinates and thin secretions. Thick discharge does not rule out allergies. Blood may be noticed in the nose from a combination of a dry nose and frequent rubbing of the nose or nose picking. The nose may have a crease due to frequent rubbing of the nose. This suggests that the patient has been rubbing his nose because of itching. The throat may show enlarged tonsils and a cobblestone appearance to the back of the throat. Nasal polyps could be seen. These will look like firm gray masses and may be attached by a stalk.

The eyes can appear red with watery discharge. The conjunctiva may have a cobblestone appearance. There might be a lower eyelid crease called Dennie-Morgan lines. Allergic shiners or periobital edema could be noted around the eyes. Allergic shiners are related to congestion in the nasal passages that affects blood flow.

Fluid behind the ears might be noticed, which may be suggested by seeing fluid or bubbles behind the tympanic membrane, reduced tympanic membrane mobility or a bulging tympanic membrane.

A physical exam should also listen to the lungs and evaluate the skin to assess for any evidence of asthma or eczema, which often accompany allergic rhinitis.
Key questions

Getting a good history will help in the management of allergic rhinitis. Below are a list of questions that can significantly help the clinician understand the allergies and how best to treat them

- When did the symptoms start?
- How long have they been present?
- When are symptoms present (is there a seasonal pattern or do certain environments trigger symptoms)?
- How often do the symptoms occur?
- Are symptoms present all day or do they get better at some points during the day?
- Has there been any change in the environment that may be contributing to the symptoms (construction in the home/just started cutting the grass)?
- Which symptoms are most bothersome? This may help determine which treatment is most appropriate.

Allergy Triggers

Certain factors trigger allergies. Figuring out what triggers symptoms will improve the ability to manage allergies. Knowing what causes the symptoms helps patients know how to avoid that trigger. Sometimes it is not that easy. When one is allergic to grass pollen in the spring, the only way to completely avoid the allergen is to stay inside. This is not a practical strategy.

Those who are affected by allergens that cannot be avoided may need medications to control their symptoms. Common allergens to consider includes: mold spores, animals, grass, smoke, pollution and outdoor pollens.
A recent survey suggested that plants, flowers, house dust mites, animals and tobacco smoke are the top allergens. Other contributors include: molds, foods, feathers and perfumes.

Utilization of the allergy chart (Table 1) will help patients get a handle on their allergies. Recording the severity of the symptoms at a given time and what the patient was doing at that time can help determine what triggers the allergy symptoms. Filling out the chart for a couple of days and then studying the chart will help the patient get a handle on patterns of symptoms. Have the patients consider the questions listed above (under the key questions section) in regard to the allergy chart. For example, if allergy symptoms are most severe when going outside to the local park, this may indicate that there are allergies to grass or tree pollens.

The second to last column is titled medications. Medications taken are recorded here to help provide some explanation of how effective medications are at managing symptoms. For example, if symptoms are much improved for 4 hours after taking Benadryl, this indicates that Benadryl works well, but only for four hours.
<table>
<thead>
<tr>
<th>Time</th>
<th>Sneezing</th>
<th>Runny nose</th>
<th>Nasal congestion</th>
<th>Sore throat</th>
<th>Red, itchy, watery eyes</th>
<th>Fatigue</th>
<th>Headache</th>
<th>Medications</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Rate the severity of the symptoms

0 - none; 1 - mild; 2 - moderate; 3 severe; 4 - unbearable
Classification of allergies

One method of classification of allergies is to break them down into perennial and seasonal.

- Perennial allergies are symptoms that occur throughout the year. They are usually brought on by a specific allergen or allergens in the home such as pets, mold, dust mites, cockroaches or rodents.

- Seasonal allergies take place during a specific time to a specific allergen. Tree pollen allergies are more common in the early spring and grass pollens are more common in the late spring and throughout summer. Weed pollens cause most problems in the late summer and into the fall. Ragweed allergy commonly occurs in the fall. Dry, sunny and windy days are often associated with the highest pollen counts and with the worst symptoms. Outdoor molds are another source of allergic symptoms and can be agitated by gardening or digging.

- Some medications can induce allergic like symptoms including: aspirin, ibuprofen, estrogen and birth control pills.

Another way of classifying allergies is by intermittent versus persistent and mild versus moderate/severe.

- Intermittent allergies are symptoms less than four days a week or symptoms lasting less than 4 weeks.

- Persistent symptoms occur more than four days per week and symptoms last longer than 4 weeks.

- Mild symptoms do not interfere with sleep, daily activities, work or school and do not cause any troublesome symptoms.
• Moderate/severe symptoms are associated with at least one of the following: abnormal sleep, troublesome symptoms, problems at work or school or impairment in daily activities.

Symptoms can occur due a specific allergen in a specific environment. Some intermittent allergies may occur when:

• Entering a house with a pet
• When carpet is removed from the workplace
• Shortly after sex. Dust mites from the bed become airborne and may enter the respiratory tract

**Differential diagnosis**

• Viral illness. The common cold is often confused with allergies. While they have many similar symptoms, viral illnesses usually present with an abrupt onset of upper respiratory symptoms. Viral illnesses are often associated with a low-grade fever.
• Foreign body. The younger child with one-sided symptoms is more at risk for having an object in the nose.
• Sinus infection. Prolonged symptoms of nasal congestion may be a sinus infection. Rarely are sinus infections associated with sneezing and watery eyes.
• Non-allergic rhinitis. This occurs when there is exposure to irritants or weather changes. There is less itching and more postnasal drip.
• Rhinitis medicamentosa occurs with prolonged use of topical nasal decongestants.
• Hormonal rhinitis is often seen in pregnancy or hypothyroidism.
• Nasal polyps
• Enlarged adenoid glands
• Tumors
• Nasal septum deviation

Testing

Usually allergies are diagnosed on history and physical exam, but in some cases testing can be employed. Two tests are commonly used for diagnosing allergy symptoms. These tests are used to detect allergen-specific IgE. The most common test is allergy skin testing. This involves the health care provider pricking the skin and introducing a small amount of allergen. Many allergenic extracts are available to the clinician. If the skin reacts to the allergen, than there is an allergy; if there is no reaction, there is no allergy. The test is quick, inexpensive and sensitive.

In this test the antigen binds to IgE of the mast cell on the skin. In a sensitized individual, a wheel and flare reaction, which is associated with itching, is noticed in 15-20 minutes. A bigger reaction is associated with a more severe allergy. Intradermal testing – which is much more sensitive than percutaneous testing – can be done by introducing the allergen into the dermis with a percutaneous needle.

The radioallergosorbent test (RAST) examines the blood to determine serum allergen-specific IgE levels. It is less helpful than skin tests, as it is not as sensitive, more expensive and limited in what it can test for. It tests for dust mites, pollens, molds and pet dander but less helpful for food, drugs or venom. Skin testing is preferred to RAST because skin testing is more sensitive, less expensive and tests for more allergens.

An advantage of the RAST test is that its results will not be affected by skin rashes or if the patient has taken antihistamines.

Other testing is sometimes employed in those with allergies. These may include:

• Blood tests for total serum IgE and total blood eosinophils can be used as part of the evaluation of allergies. These tests are not specific or sensitive and therefore not used as standalone tests in allergic rhinitis.
• Sinus films and CT scans can be used in the evaluation of the sinus cavities. These tests are commonly used to diagnose sinus infections. CT is a more sensitive test for sinus infection and can also help pick up septal deviation, nasal polyps and swelling of the turbinates.

• Magnetic resonance imaging can also be used in the evaluation of sinus infection but is not as sensitive as CT scanning. It is more helpful in finding cancer of the upper airway.

Treatment

There are three primary treatment categories for allergies.

1. Environmental control
2. Medications
3. Immunotherapy

Knowing the cause of the allergies allows more effective treatment of the allergies. This is an argument in favor of allergy testing. Those who have had their allergies tested know what aggravates them and can avoid those allergens. Lifestyle interventions, which include allergy avoidance and environmental control are a mainstay in allergic rhinitis management.

The next section will provide some tips for managing allergic rhinitis utilizing environmental control and allergy avoidance. Tips will be provided for those who suffer from indoor and outdoor allergies.

Outdoor allergies

• Remain indoors with doors and windows closed and the air conditioning on to cool the home if needed. While this is not practical all of the time, if you are sensitive to pollen, it is especially important on days with high pollen counts to remain indoors as much as possible.
• Monitoring pollen counts should be done by all patients with allergies to pollen. This can be done through multiple websites including: [http://www.pollen.com](http://www.pollen.com).

• When driving, roll up the windows and use the air conditioner.

• High efficiency particulate air (HEPA) filters should be used on air conditioning units and heating vents. Air filters and air ducts should be cleaned regularly.

• Air-drying laundry outdoors can increase the amount of allergens on the clothes, so use indoor methods to dry clothes.

• After being outside, bathing may help reduce the amount of pollen on the body.

**Indoor allergies**

• Keep the bedroom as free of allergens as possible as this is the room that can most easily lead to problems.

• Wash the bedding every week in hot water.

• Vacuum the mattress.

• Place impermeable covers on the bed – such as plastic.

• Most furniture should be made of dust proof material such as wood, metal or plastic.

• Remove stuffed animals from the bedroom.

• No pets in the bedroom.

• Remove carpet from the bedroom and other rooms, if possible.

• If you use a rug, use one that is made of synthetic fiber.

• If allergy measures are maximized in the bedroom but not in other rooms, keep the door to the bedroom closed.

• No indoor plants (especially in the bedroom).

• Dehumidify the home.
• Control mildew and mold in the bathroom by reducing humidity and spraying the shower with a mold/mildew reducing product such as Lysol mildew.
• Use high-efficiency particulate air filters.
• When vacuuming or dusting wear a mask or get someone without allergies to do these tasks.
• Wash pets frequently.
• Brush pets outside.

While these measures are routinely recommended for the management of allergic rhinitis, there is evidence that they are not terribly effective. In a recent survey every patient who reported that they removed the carpet from their house had no impact on their perception of rhinitis. Thirty percent of those who placed bedding covers on their beds to thwart allergies did not find them effective (2).

Health care professionals are encouraged to recommend these preventative measures, but have some healthy skepticism about the beneficial effect they may have.

**Medications**

Sometimes lifestyle modifications and elimination of triggers are not enough to manage the disease and medications need to be used. It is important to have a solid handle on the patient’s symptoms as some medications work better for specific symptoms. Those with eye symptoms should be treated with allergy eye drops. Oral antihistamines can treat sporadic symptoms. Nasal congestion is best managed with decongestants and nasal corticosteroids.

Medications typically do not work when they are not taken. Individuals with persistent disease need to be treated continually or symptoms will return.

Oral antihistamines are the most common initial treatment for allergies, mainly because of their availability and ease of use. Antihistamines treat runny nose, red watery eyes,
sneezing and itching. They do not treat nasal congestion effectively but many products come combined with decongestants.

Older antihistamines - chlorpheniramine (Chlor-Trimeton), diphenhydramine (Benadryl) and hydroxyzine (Atarax) - are associated with more side effects, particularly sedation, and are less commonly used when compared to newer medications. These agents work well at managing allergies and are less expensive than the second generation agents. Another problem with older antihistamines (which are also called first-generation antihistamines) is that they require more frequent dosing. For maximal effectiveness they need to be taken every 4-8 hours.

Second-generation medications (see table 2) have improved dosing schedules and are less commonly associated with sedation. There are five, second-generation antihistamines available. Side effects are not as common in the second-generation antihistamine class when compared to the first-generation antihistamines. Only cetirizine causes sedation at a higher rate than placebo (4).

Table: Oral Antihistamines

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Side effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-generation antihistamines</td>
<td></td>
<td>Sedation, constipation,</td>
</tr>
<tr>
<td>Diphenhydramine (Benadryl)</td>
<td>For those 12-years-old and older take 25-50 mg every 4-6 hours; 6-11-years-old take 12.5 to 25 mg every 4-6 hours; not recommended for those under 6-years-old</td>
<td>blurred vision, dizziness, difficulty urinating, can cause excitability in kids</td>
</tr>
<tr>
<td>Antihistamines</td>
<td>Dosage and Usage</td>
<td>Side Effects</td>
</tr>
<tr>
<td>----------------</td>
<td>-----------------</td>
<td>--------------</td>
</tr>
<tr>
<td><strong>Chlorpheniramine (ChlorTrimeton)</strong>&lt;br&gt;For those 12-years-old and older take one tablet (4 mg) every 4-6 hours as needed; 6-11-years-old take one-half tablet every 4-6 hours as needed, not recommended under 6-years-old</td>
<td>Sedation, constipation, blurred vision, dizziness, difficulty urinating, can cause excitability in kids</td>
<td></td>
</tr>
<tr>
<td><strong>Hydroxyzine (Atarax)</strong>&lt;br&gt;For those 12-years-old and older take 25 mg four times a day; for those between 6-11 years-old take 50-100 mg divided 3 to 4 times a day</td>
<td>Sedation, constipation, blurred vision, dizziness, difficulty urinating, can cause excitability in kids</td>
<td></td>
</tr>
<tr>
<td><strong>Second-generation antihistamines</strong></td>
<td>Sedation and it is therefore dosed at night. It also can cause diarrhea, dry mouth, nervousness and insomnia</td>
<td></td>
</tr>
<tr>
<td><strong>Cetirizine (Zyrtec)</strong>&lt;br&gt;5-10 mg orally every day for those over 6-years-old; for those 6-months and older it is indicated for perennial allergic rhinitis - and the dose is reduced to as low as 2.5 mg for those between the ages of 6-months and 5-years-old.</td>
<td>Sedation, fatigue, dry mouth, sore throat. Kids may have fever, cough and bloody nose</td>
<td></td>
</tr>
<tr>
<td><strong>Levocetirizine (Xyzal)</strong>&lt;br&gt;Dosed between 2.5-5 mg orally every day – typically at night. It is indicated for individuals six-years-old and older.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fexofenadine (Allegra)</strong></td>
<td>Dosed 60 mg orally twice a day or 180 mg orally once a day for the adult. It is indicated for those 6-years-old and older, and those 6-11-years-old are dosed 30 mg orally twice a day. It comes as an oral suspension for children under 6 and it can be given</td>
<td>Headache, GI upset sinusitis, cough, fever, pain, drowsiness, and upper respiratory infection.</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Loratadine (Alavert, Claritin)</strong></td>
<td>Dosed as 10 mg in the adult once a day. Loratadine is for those over 2-years-old with seasonal allergies</td>
<td>Headache, sleepiness, fatigue, dry mouth, Kids may show: cold symptoms, wheezing, nervousness and abdominal pain</td>
</tr>
<tr>
<td><strong>Desloratadine (Clarinex)</strong></td>
<td>Dosed 5 mg once a day and remains available by prescription only. Desloratadine is indicted for those over six-months if afflicted with perennial allergies or chronic idiopathic urticaria and over the age of 2-years-old with seasonal allergies.</td>
<td>Sore throat, dry mouth, sleepiness, muscle aches, nausea, dizziness, kids may show fever, diarrhea, cough and cold symptoms</td>
</tr>
</tbody>
</table>

**Other oral medications**

Leukotriene receptor blockers inhibit the action of leukotrienes. This class of drug is commonly used on those with asthma. The medication in this class that has been approved for seasonal and perennial allergic rhinitis is montelukast (Singulair). It can be used in children over two-years-old for seasonal allergies and over 6 months in those with perennial
allergies. It has similar efficacy in treating allergy symptoms as does loratadine (4). It is often added on to those who have difficult to control allergies. Nasal corticosteroids sprays are more effective in managing allergy symptoms than leukotriene receptor blockers.

Monetelukast is dosed 10 mg a day in those 16 years-old and older once a day, kids 6-15 years-old take 5 mg once a day and those 2-6 years-old take 4 mg once a day.

**Nasal sprays**

Multiple types of nasal sprays are helpful in the management of allergies.

- Nasal saline
- Nasal corticosteroids
- Nasal antihistamines
- Nasal cromolyn

**Nasal Saline**

Nasal saline is a frequently overlooked option for allergies. It removes factors that cause allergies and improves mucus clearance. Everyone who has allergies should use nasal saline. It helps the body perform its natural function in clearing the nasal passages.

Two primary types of nasal saline are normal saline and hypertonic saline. Hypertonic saline has a higher concentration of salt in it. It is hyped to be more effective at drying the nose than normal saline. It also is more likely to cause a burning and stinging sensation when used.

Plain tap water irrigations should not be encouraged as it is hypotonic and may actually increase congestion.

**Nasal corticosteroids**

Nasal corticosteroids are recommended as first-line treatment of moderate to severe persistent allergies. Immediate relief will not be noticed with them. Some benefit is usually
appreciated by the fourth day of use and it typically takes a couple of weeks before full effects are noticed. They work by reducing the amount of inflammation in the nose. They are often combined with oral antihistamines in the management of allergic rhinitis.

Nasal steroids are very effective in the treatment of nasal symptoms with few side effects. A meta-analysis evaluated the effectiveness mometasone furoate (Nasonex) and demonstrated a significant effect in nasal congestion, runny nose, nasal itching and sneezing. In this study adverse events with mometasone furoate were equal to placebo (5).

Ideally they should be started about two weeks before exposure to allergens. This may be hard to predict, but those individuals who have a predictable onset of allergies in the spring should start these medications two weeks before.

These medications manage itching, runny nose, nasal congestion and sneezing. Nasal corticosteroids are also approved for non-allergic rhinitis. In order to provide relieve they must be used regularly. They are generally not considered to be effective for symptoms in the eyes, but a few recent studies have suggested that some agents may provide some relief of ocular symptoms (17, 19).

Side effects include:

- Nasal irritation
- Sneezing
- Nose bleeds
- Headache
- Fungal infections (rare)
- Perforated nasal septum (rare).

One side effect that warrants special attention is growth stunting in children. There is some evidence that there is some growth stunting with the use of nasal corticosteroids.
Therefore, all children who take long-term nasal steroids should have their height measured every six months (6). Some nasal corticosteroids – mometasone and fluticasone - have not shown a reduction in height (7, 8). Studies done with higher doses of corticosteroids in asthma demonstrated that growth stunting may be seen in children up to 1-2 cm but this does not affect adult height (9).

Most people are not afflicted with side effects, but nasal perforation is one that is quite concerning to patients, even though it is very rare. The incidence of this can be decreased if the patient is taught to spray the intranasal corticosteroid toward the outside of the nose and away from the septum. The patient should be taught to insert the nose spray and aim toward the inner corner of the eye on the same side that the medication is being inserted.

Bloody nose can also occur, but applying lubricant in the first inch of the nose may help prevent this complication.

Continuous treatment with nasal corticosteroids is needed to see continued benefit of treatment. Oral antihistamines show some benefit when used intermittently, but some evidence reports that continuous treatment provides better symptom relief. There is significant data suggesting the continuous treatment can be used safely for both antihistamines and nasal corticosteroids (10).

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
<th>Side effects/notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluticasone propionate</td>
<td>Adults: 1-2 sprays in each nostril once a day or one spray twice a day. Children 4-11-years-old: Start with one spray in each nostril once a day, may increase to 2 sprays in each nostril every day</td>
<td>Headache, bloody nose, burning nose, sore throat, nausea, cough, may decrease growth in children</td>
</tr>
<tr>
<td><strong>Fluticasone furoate (Veramyst)</strong></td>
<td>Over 12 years old: 2 sprays in each nostril once a day; may reduce to one in each nostril once a day; 2-11 years-old: 1 spray in each nostril once a day; may increase to 2 sprays</td>
<td>Headache, bloody nose, sore throat, runny nose, cough, back pain</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Mometasone (Nasonex)</strong></td>
<td>Adults: 2 sprays in each nostril once a day. Children 2-11-years-old: one spray once a day</td>
<td>Headache, bloody nose, cough, sore throat, sinus infection, may decrease growth in children</td>
</tr>
<tr>
<td><strong>Budesonide (Rhinocort Aqua)</strong></td>
<td>Adults: 1-4 sprays in each nostril each day. Those 6-11-years-old: 1-2 sprays each nostril once a day</td>
<td>Headache, bloody nose, burning nose, sore throat, nausea, cough, may decrease growth in children</td>
</tr>
</tbody>
</table>

**Nasal Antihistamines**

Spraying antihistamines up the nose is another method to deliver medicine to the allergic patient. Three topical antihistamines are available azelastine (Astelin, Astepro) and olopatadine (Patanase). These products provide antihistamines directly in the nose and help treat sneezing, itching and rhinorrhea. It is as effective for nasal symptoms as oral antihistamines. Different than the oral antihistamines, the topical antihistamines are effective at treating nasal congestion.

Azelastine is dosed two puffs in each nostril twice a day. A newer product called Astepro provides the same benefit but it lacks some of the side effects of the older version of
azelastine. Astepro has less of a bitter taste and less somnolence than Astelin. Olopatadine (Patanase) is dosed two sprays in each nostril twice a day.

Intranasal and oral antihistamines are approved for allergic rhinitis and both improve symptoms and improve quality of life. Intranasal antihistamines are more effective in the management of nasal congestion and have a quicker onset of action. Oral agents should be used in those who have symptoms outside the nose (red, watery eyes and itching outside the nose) (11). Astepro and Patanase are not recommended for children and Astelin is approved for those over the age of four. Those between the ages of 5-11 years-old, Astelin is dosed one spray in each nostril twice a day.

Individuals who do not respond to second-generation oral antihistamines should be considered for treatment with intranasal antihistamines. Some suggest that intranasal antihistamines are more effective than second-generation antihistamines (12).

Intranasal antihistamines are also effective in the treatment of nasal congestion. Although more research is needed before it becomes a standard of care, the use of combined intranasal antihistamines and intranasal steroids may provide the most effective treatment in severe disease (13).

**Nasal Anticholinergic**

Anticholinergic medication - ipratropium bromide (Atrovent nasal spray) – can also help dry a runny nose. This medication comes in two strengths 0.03 and 0.06%. Only the 0.03% is indicated for allergic and non-allergic perennial rhinitis while the 0.06% is indicated for runny nose associated with the common cold. This medicine can be used in those over five and is dosed two sprays, 2 to three times a day.
**Nasal Cromolyn**

Cromolyn sodium (Nasalcrom) is an over the counter medication used in the management of allergic rhinitis. It requires frequent dosing and is given one puff per nostril every 4-6 hours. It is not as useful for immediate relief and it may take a week before benefit is realized. It is not as potent as nasal corticosteroids (14).

**Eye Symptoms**

The red eye is the red appearance of the open eye secondary to dilatation of blood vessels in the eye. There are many causes of the red eye, but the most common causes are an infection of the conjunctiva or an eye allergy.

Allergy is common cause of conjunctivitis and red eye. It presents with clear watery discharge, a red eye and itching. It may be associated with a runny nose and sneezing.

When allergies affect the eyes, there are two ways to manage them. Take an oral antihistamine (all of which have systemic effects). Use eye drops to deliver the medication directly in the eye.

Some people are able to use saline eye drops to effectively manage their eye symptoms. Saline eye drops are just salt water that can help flush away allergens, but do not have any medication in them.

Many people with severe eye symptoms need medicated eye drops. Many products are a combination of antihistamines and mast cell stabilizers and effectively treat red, watery and itchy eyes (Table 4). For eyes that are inflamed and painful the use of ketorolac or a steroid eye drop may be helpful.

Over the counter medications are available for the treatment of allergic eye symptoms. Naphazoline pheniramine (Naphcon A/Opcon A) is a popular over the counter medication that is helpful in the reduction of eye symptoms. Some evidence suggests that the use naphazoline has more side effects when compared to ketotifen or olopatadine (15).
Ketotifen (Zaditor) is an over the counter antihistamine eye drop. It is dosed one drop twice a day in children over three years old.

**Prescription Medications**

Olopatadine is a topical eye drop that is used for the treatment of ocular itching due to allergic conjunctivitis. It is sold under the brand name Patanol (0.1%) and Pataday (0.2%) and is approved for those above three years old.

This agent should not be instilled with contact lenses in place, but the contact lens may be reinserted after 10 minutes if the eye is without redness. Patanol is dosed one drop in each eye two times a day at least 6 hours apart. Pataday is dosed one drop in each eye once a day. It can help treat eyelid swelling, ocular redness, ocular itching, tearing and chemosis.

Azelastine (Optivar) is an antihistamine eye drop and is dosed two times a day. This agent should not be instilled with contact lenses in place, but the contact lens may be reinserted after 10 minutes if the eye is without redness.

Agents to treat ocular allergies demonstrate similar effectiveness with some small differences. One study showed that olopatadine, ketotifen and epinastine (Elestat) provided more relieve of itching and redness than the steroid eye drop fluorometholone acetate. Comparing the allergy eye drops similar results were noted in regard to eyelid swelling, tearing and chemosis (16).

While agents placed directly in the eye may be most effective, other agents are available to treat allergies of the eye. Oral antihistamines provide some relief of eye symptoms. Recent evidence has linked two nasal corticosteroids to the improvement in eye symptoms.

Nasal corticosteroids are helpful in the management of nasal symptoms of allergic rhinitis, but there is some evidence that some nasal steroids are also effective for ocular symptoms of allergies. Fluticasone furoate (Veramyst) improved both nose and ocular symptoms associated with seasonal allergic rhinitis in patients who are sensitized to ragweed, grass and
mountain cedar pollen (17). Future studies will look at the efficiency of other agent in the management of occur symptoms associated with allergic rhinitis, but for the time being only fluticasone furoate has shown consistent benefit in managing ocular symptoms in seasonal (18).

Since the release of this study another study suggested that fluticasone furoate was not the only agent that may help eye symptoms in allergic rhinitis. The use of mometasone furoate (Nasonex) significantly reduced the eye symptoms of itching, burning and tearing over placebo. There was improvement in eye redness, but results did not reach statistical significance (19).

Table: Allergy Eye Drops

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage</th>
<th>Use</th>
<th>Side Effects</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olopatadine (Patanol)</td>
<td>One drop in each eye twice a day (Patanol)</td>
<td>Reduces eye itching and watery eyes</td>
<td>Headache, blurred vision, stinging eyes, swollen eyes, sore throat, runny nose</td>
<td>Prescription antihistamine and mast cell stabilizer</td>
</tr>
<tr>
<td>Olopatadine (Pataday)</td>
<td>and one drop once a day in both eyes (Pataday) for those over the age of 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Azelastine (Optivar)</td>
<td>One drop in each eye twice a day for those over the age of 3</td>
<td>Reduces eye itching may help with pain</td>
<td>Burning eyes, headache, blurred vision, bitter taste</td>
<td>Prescription antihistamine and mast cell stabilizer</td>
</tr>
<tr>
<td>Medicine</td>
<td>Usage Details</td>
<td>Effect</td>
<td>Side Effects</td>
<td>Type of Medicine</td>
</tr>
<tr>
<td>---------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>Epinastine HCl (Elestat)</td>
<td>One drop in each eye twice a day in those over the age of 3</td>
<td>Prevents ocular itching due to allergic conjunctivitis</td>
<td>Burning eyes, headache, cold symptoms, red eyes</td>
<td>Prescription antihistamine and mast cell stabilizer</td>
</tr>
<tr>
<td>Loteprednol etabonate (Alrex)</td>
<td>One drop in each eye four times a day</td>
<td>Seasonal allergic conjunctivitis</td>
<td>Blurred vision, itching, dry eye, burning, photophobia, sore throat, earache; Prolonged use can have serious side effects</td>
<td>Prescription steroid that should be used very cautiously</td>
</tr>
</tbody>
</table>

**Stuffy nose**

Allergies are often accompanied by nasal stuffiness. Some of the medications already discussed can provide relief from nasal congestion – topical antihistamines and nasal corticosteroids. Effective and rapid relief from nasal congestion can be attained with decongestants.
Decongestants are dangerous in some people. Decongestants have the potential to increase the blood pressure, heart rate and make one feel jittery. Those with high blood pressure, heart disease, heart rhythm problem, diabetes, thyroid problems, an enlarged prostate or glaucoma should use decongestants only at the direction of their doctor.

Many allergy medications combine decongestants and antihistamines. When allergy medication has a “D” on the back, for example, Claritin D, this has a decongestant in it.

When symptoms are a combination of sneezing, runny nose and watery eyes with nasal congestion, than the use of an allergy product with a decongestant will be more helpful than an antihistamine alone in managing symptoms.

Decongestants come in a variety of forms (Table 5). They can be taken orally, topically (as a nasal spray) and as a vapor.

Intranasal corticosteroids are more effective in the treatment of nasal congestion than oral antihistamines (20). None-the-less some of the newer second-generation oral antihistamines provide some relieve versus placebo in nasal congestion associated with allergic rhinitis. A recent meta-analysis showed that when the agents desloratadine (Clarinex), fexofenadine (Allegra) and levocetirizine (Xyzal) were used for the treatment of allergies, nasal congestion was improved more than placebo. Improvement was noted by day 2 and throughout the treatment (21). While the second-generation antihistamines have some noted effect in the management of nasal congestion, this was compared over placebo. It did not compare these agents to other medications.

Some evidence suggests that leukotriene inhibitors are effective in the management of nasal congestion (20), but no leukotriene inhibitors are FDA approved for nasal congestion.

<table>
<thead>
<tr>
<th>Table : Decongestants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication</td>
</tr>
<tr>
<td>Oral</td>
</tr>
<tr>
<td>decongestants</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td><strong>Sudafed (Standard formula)</strong></td>
</tr>
<tr>
<td>Under 6 – not recommended</td>
</tr>
<tr>
<td><strong>Pseudoephedrine liquid</strong></td>
</tr>
<tr>
<td>Age Group</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>4-5-years-old</td>
</tr>
<tr>
<td><strong>Phenylephrine HCl</strong></td>
</tr>
<tr>
<td>Under 4 years-old</td>
</tr>
<tr>
<td><strong>Sudafed PE</strong></td>
</tr>
<tr>
<td>Under 12-years-old</td>
</tr>
<tr>
<td><strong>Pseudoephedrine PE liquid</strong></td>
</tr>
<tr>
<td>4-5-years-old</td>
</tr>
<tr>
<td>Topical nasal sprays</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Dristan</td>
</tr>
<tr>
<td>Neo-synephrine</td>
</tr>
<tr>
<td>Vapor nasal sprays</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>Levmetamfetamine</td>
</tr>
<tr>
<td>Vicks inhaler</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
When patients come down with the hallmark symptoms of allergies – sneezing, watery
eyes, runny nose and nasal congestion – what should they do?

1. The first thing to do is take an inventory of your symptoms. This is best accomplished
   by maintaining an allergy log (see table 1). With the use of this allergy log the patient
can determine when allergies are worst, which symptoms are most bothersome, what
is aggravating them and how effective treatments are at controlling the symptoms.

2. Patients should be encouraged to eliminate any factors that may be making the
   allergies worse.

3. If this does not work, a trail of some over the counter medication is appropriate. This
   may include cetirizine (Zyrtec) or loratadine (Claritin). If patients are plagued by
   congestion, the addition of decongestants may be helpful. Do not recommend the
   addition of decongestants if they are affected by high blood pressure, heart disease,
thyroid disease, heart rhythm problem, diabetes, prostate enlargement or glaucoma.

4. If symptom control is unsuccessful with over the counter medications, encourage the
   patient to set up an appointment with their health care provider.

5. If after two or three appointments with the primary care doctor symptoms are not
   controlled than seeing an allergy specialist should be considered.

What the doctor will do?

If environmental control and over the counter medications have not provided adequate
relief than the health care provider may prescribe some of the other medications discussed
above. Nasal corticosteroids are often tried when there is any combination of rhinorrhea,
nasal congestion, sneezing or nasal itching that is not controlled with over the counter
medications. Substituting nasal antihistamines may also be considered in the management of
allergic rhinitis. Leukotriene inhibitors can also be tried in those who are unresponsive to
nasal corticosteroids and antihistamines.
When the primary doctor is unable to adequately manage symptoms with the above interventions than allergy testing (if not already done) or immunotherapy may be indicated. The primary doctor will provide a complete evaluation and may decide on an earlier referral if other symptoms suggestive of a problem are evident. Certain conditions that would warrant evaluation by a specialist include:

- Nasal polyps which would be suggested by chronic congestion, runny nose, post-nasal drip and reduced smelling and/or taste
- One sided nasal congestion
- Persistent bloody discharge
- Complications of allergies such as recurrent sinus or ear infections

**Immunotherapy**

Eighty to 90 percent of the cases of allergic rhinitis can be managed with immunotherapy. Immunotherapy is considered when symptoms are not adequately managed with environmental control, over the counter medications and prescription medications. It can also be used by those who cannot tolerate or do not want to take long-term medications. It is also often used for those with severe disease or those who have frequent secondary complications such as recurrent otitis media or sinus infections.

The patient being treated should have clinical evidence of immunoglobulin E mediated disease. Those with non-allergic triggers will not benefit.

Immunotherapy is effective, but the onset of effect is slow. It may take up to one year before significant effect is noticed. Therapy is often continued three to five years.

There is a risk of severe allergic reaction and it should only be done in the office of a health care provider who has the ability to handle a severe allergic reaction. Immunotherapy is associated with a small risk of anaphylaxis and the patient should remain in the office for 20
to 30 minutes to assure there is no severe allergic reaction. The risk of a serious event is more common in those who have asthma or those who have an allergy to latex, seafood or peanuts (22). Anyone with asthma who is receiving immunotherapy should be without asthma symptoms. Those with symptoms are at increased risk for having anaphylaxis.

Immunotherapy provides long lasting treatment for allergies and is the only therapy that can cure allergic rhinitis. Some individuals have a reoccurrence of symptoms 2-3 years after stopping immunotherapy.

Immunotherapy involves giving an extract of the allergen in incrementally increased doses to induce changes in the immune system. It is usually given in injection form. Recently a sublingual route of administering immunotherapy has become available. This may be a safer route, but those who are receiving therapy should be educated about risks and what to do in the face of negative effects, as this therapy is usually done at home. Those who are sensitive to a single allergen typically have a better response to therapy than those with multiple allergies. Sublingual therapy involves placing a small amount of the allergen under the tongue everyday.

**Nurse's Role**

The nurse’s role in the management of allergies involves teaching and recommending. Nurses are often on the front line of talking to patients when they complain of allergy symptoms. In such situations, nurses should take an inventory of symptoms and make recommendations of environmental control steps that may help in the management of their allergic rhinitis. The nurse should also take a quick history to determine which symptoms are most bothersome and provide recommendations for treatments for allergic symptoms. Some medications a nurse may recommend include:

- Over the counter antihistamines
- Nasal saline
• Nasal cromolyn

Nurses should also help patients communicate effectively with their doctor. Below is a list of questions each patient should ask their doctor.

1. Which medications do you recommend to manage my symptoms?
2. Which environmental changes do you recommend?
3. Are there any potential interactions between the medications that you are recommending and the current medications that I am on or any other health problems I may have?
4. When should I expect an improvement in my condition?
5. What complications should I look out for and how will they show up?

Case Study 1

JR is a 24 year-old white male who presents to his primary care doctor for his “annual spring sinus infection”. He complains of nasal congestion, facial pressure, rhinorrhea and sneezing for the last week. Important negative findings in his history include a lack of fever, purulent nasal discharge, sore throat, cough and generalized malaise. He reports that every year his doctor puts him on amoxicillin and it clears up in about seven to ten days. Upon further questioning he reports that the top of his mouth itches and he frequently clears his throat.

The nurse practitioner decides to treat him with a combination of nasal corticosteroids and the over-the-counter oral antihistamine cetirizine. The patient is upset that the nurse practitioner will not give him an antibiotic, because in previous years he has always had very good luck with antibiotics with these symptoms.

He is told that this is not a sinus infection, but an annual flair of allergies secondary to spring pollens. The nurse practitioner spends time explaining the difference between allergies and sinus infections. He is told to return to get a prescription for a nasal...
corticosteroid in late winter to start at least two weeks before the spring allergy season. The nurse practitioner explains that by proactively treating allergies aggressively these symptoms should not return next year.

He is told to watch pollen counts and avoid spending time outdoors when pollen counts are high. He is told to keep the doors and windows closed in the house as well as drive with the windows rolled up in his car.

He is taught how to properly use the nasal corticosteroid and is told that it does not work immediately and it will take a few days to notice benefit and two weeks before maximal benefit is noticed. It is emphasized that the nose spray should be used every day.

He is also told that the use of oral antihistamines will help him gain control of his symptoms more rapidly than the nasal corticosteroid.

JR calls the office after one week to report that he feels as good as he ever did after his “spring sinus infection”. He wanted to thank the nurse practitioner for insisting that he treat the allergies instead of prescribing an antibiotic.

**Conclusion**

Allergic rhinitis is a prevalent problem and is associated with much morbidity. Both patient and health care provider have key roles in the management of allergic rhinitis. Patients need adequate assess their symptoms and treat them with environmental manipulation and over the counter medications. When the patient is unsuccessful in the management of his condition the health care provider must provide further intervention to help the patient gain control of his or her disease.
References


16. Borazan M, Karalezil A, Akova YA, Akman A, Kiyici H & Erbek SS. Efficacy of olopatadine HCl 0.1%, ketotifen fumarate 0.025%, epinastine HCl 0.05%, emedastine 0.05% and fluorometholone acetate 0.1% ophthalmic solutions for seasonal allergic conjunctivitis: a placebo-controlled environmental trial. *Acta Ophthalmology* 2009; 87(5): 549-554.


19. Prenner BM, Lanier BQ, Bernstein DI, Shekar T & Teper A. Mometasone furoate nasal spray reduces the ocular symptoms of seasonal allergic rhinitis. *Journal of Allergy and Clinical Immunology* 2010; 125(6): 1247-1253.


The information presented in this course is intended solely for the use of healthcare professionals taking this course, for credit, from NurseCe4Less.com. The information is designed to assist healthcare professionals, including nurses, in addressing issues associated with healthcare.

The information provided in this course is general in nature, and is not designed to address any specific situation. This publication in no way absolves facilities of their responsibility for the appropriate orientation of healthcare professionals. Hospitals or other organizations using this publication as a part of their own orientation processes should review the contents of this publication to ensure accuracy and compliance before using this publication.

Hospitals and facilities that use this publication agree to defend and indemnify, and shall hold NurseCe4Less.com, including its parent(s), subsidiaries, affiliates, officers/directors, and employees from liability resulting from the use of this publication.

The contents of this publication may not be reproduced without written permission from NurseCe4Less.com.