KANSAS CITY ALLERGY & ASTHMA ASSOCIATES, P.A.

# MANAGING ALLERGIC DISEASE

Revised June, 2010

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**ALLERGIC DISEASE**

Statistics show that greater than 20% of the population has the potential for allergic responses to environmental allergens. In these individuals, the immune system is stimulated to respond to foreign substances when they gain access to the body through the skin, eyes, nose, lungs and intestinal tract. The immune system is the body's defense against infections. In an allergic individual, specific components of the immune system known as IgE antibodies, are produced in response to environmental allergens. Examples of common environmental allergens include pet dander, dust mites, molds and pollens. In the non-allergic individual, these allergens are harmless as they do not elicit the same IgE response or allergy symptoms.

IgE can be very important for people living in underdeveloped regions of the world. In many of these areas, parasitic infections are still fairly common and IgE is responsible for helping defend the body against parasitic infections. People who live in these regions and produce large amounts of IgE in response to parasites tend to be healthier and have fewer infections. Once the body no longer needs IgE to fight off parasitic infections, it may then be directed towards otherwise harmless substances such as dust mites, pollen, and molds. For this reason, good IgE producers often develop bad allergies.

In order for allergies to develop, a certain amount of exposure to potential allergens must have occurred previously and most likely at a time that the immune system was vulnerable or primed for response. The immune system produces IgE to specific allergens and this initiates the allergic response. Once IgE has been formed, these molecules attach themselves to mast cells, which are found nearly everywhere in the body. Mast cells are present in large amounts in the skin, eyes, nose, lungs and intestines. One of the many chemicals contained in the mast cell is histamine. When the allergen attaches to the IgE antibodies that are on the mast cell surface, it leads to the immediate release of chemicals contained in the mast cell, producing allergic symptoms such as itchy eyes and nose, sneezing, coughing, wheezing, or hives on the skin. Some of the chemicals contained in the mast cell are responsible for causing delayed allergic responses and inflammation that can persist for days after a single exposure.

**RECOGNIZING ALLERGIC DISEASE**

Allergies are most common in people who have a positive family history of allergies, eczema, or asthma. Symptoms typically start during the first two decades of life, but may occur at any stage in life. They may present in a seasonal pattern such as spring and fall, or continue year round. Symptoms can include, itching, sneezing, runny nose, postnasal drainage, nasal congestion, cough, wheezing, and headache.

Certain individuals may also suffer with gastrointestinal symptoms such as abdominal pain, nausea, vomiting or diarrhea after indigestion of food allergens. Food allergy is less common. About 2% of adults 6-8% of children have food allergies. Food allergy reactions are usually immediate or within a couple of hours of eating the offending food.

**EVALUATION OF ALLERGIC DISEASE**

When symptoms are interfering with normal daily activities, and the ability to control symptoms becomes more difficult, it is appropriate to seek the help of a physician who is Board Certified in Allergy and Immunology. Such certification requires that the physician has completed either residency in pediatrics or internal medicine, spent an additional 2 years training in an accredited program of allergy, asthma and the immune system. The physician has passed competency testing specifically related to allergy and immunology. www.aaaai.org/physref/

A very important part of the evaluation of allergic disease is obtaining a history. This involves gathering information about your environment, family history, symptoms and previous treatment. Skin testing is typically performed to give valuable information about what may be the source of the patient's symptoms. Skin testing with allergenic extracts is a cost effective and rapid method for obtaining that information. Skin testing involves the placement of specific allergenic extracts in the form of liquid droplets on the back. The droplet is then pricked with a sterile needle and the reaction recorded. A positive reaction is recorded if a wheal forms in response to that substance. A wheal is a raised reddened area of the skin and is generally itchy. If a negative response is noted, a more sensitive test may be performed known as intradermal testing. This procedure utilizes a needle to inject a small amount of the allergen directly under the skin. These two tests are done in combination to ensure that all potential allergic responses are determined. The diagnosis of allergies, however, is based on the combination of history and test results, not just on the tests themselves.

**TREATMENT OF ALLERGIES—AVOIDANCE, MEDICATIONS, AND IMMUNOTHERAPY**
**AVOIDANCE MEASURES**
Once the specific allergens have been identified, the most important part of the treatment plan is avoidance. This will minimize the individual's exposure, and therefore reduce symptoms. This can also decrease the need for medications. There are specific control measures to consider for each allergen. For example, pets should be kept out of the bedroom, but attempting to keep pets out of the home is preferred. Even with the best of efforts, it is not possible to avoid all allergens completely. Treatment also includes medications and immunotherapy. For specific avoidance measures, please refer to the sections on dust mites, molds, pollens and animal dander.

**MEDICATIONS**
Medications can be helpful in controlling allergy symptoms in addition to avoidance measures. The medications commonly utilized include oral and intranasal antihistamines, nasal steroids, leukotriene blockers, mucolytics, mast cell stabilizers, and decongestants.

Antihistamines are useful in targeting the symptoms caused by the release of histamine. Histamine causes blood vessels to be leaky, which allows fluid to leave the blood vessels and enter the tissues. This creates watery discharge from the eyes and nose, itching, and irritation. An antihistamine is prescribed to help prevent and relieve the common allergy symptoms of itching, hives, sneezing, and runny nose.

Antihistamines work best if they are taken on a regular basis during the time when the person's allergic response is at its greatest.

Several antihistamines are available over the counter without a prescription. This includes diphenhydramine (Benadryl), clemastine (Tavist) and chlorpheneramine (Chlor-Trimeton). These first generation antihistamines have a higher incidence of side effects, such as drowsiness, dry mouth, dizziness, and occasional weight gain; although they can occur with the newer, second-generation antihistamine as well. Loratadine (Claritin) and cetirizine (Zyrtec) are second-generation antihistamines now available without a prescription. Sometimes antihistamines cause irritability, hyperactivity, and difficulty sleeping in the very young and in the elderly. Caution should be taken when operating machinery or driving while on an antihistamine if drowsiness is experienced.
Commonly prescribed oral antihistamines include fexofenadine (Allegra), desloradatine (Clarinex) and and levocetirizine (Xyzal).

**MEDICATIONS** *(Continued)*
There are many over-the-counter antihistamines as well, which include cetirizine (Zyrtec), loratadine (Claritin), diphenhydramine (Benadryl) and chlorpheniramine (several brands). There are also antihistamine nasal sprays, which can help wih runny nose, sneezing and nasal congestion. These include Azelastine (Astelin and Astepro) and Olopatadine (Patanase).

Eye drops that inhibit histamine release from mast cells include over-the-counter ketotifen (Zaditor & Zyrtec), epinastine (Elestat – soon to be over-the-counter, if not already, olopatadine (Patanol and Pataday), azeleastine (Optivar), and Bepotastine (Bepreve). Restasis is another eye drop that is frequently used by allergy patients. This medication is not indicated in the treatment of allergic conjunctivitis, but rather, dry eyes. However, this medication does appear to provide some relief of ocular allergy symptoms. Additional eye drop formulations include levocabastine (Livostin), which is a non-steroidal stabilizer.

Intranasal steroids are used to decrease nasal swelling and inflammation and prevent nasal symptoms. These block multiple steps in the allergic cascade but they do not work quickly. They work best if taken regularly during the time when the individual is more likely to have symptoms, such as spring and fall. They are safe to take year round to help with perennial allergic symptoms or nasal polyps. Polyps are made of nasal tissue and are often the result of excessive nasal tissue swelling.

There are several prescription steroid nasal sprays available, including beclamethasone (Beconase AQ), fluticasone (Flonase), triamcinalone (Nasacort AQ), flunisolide, mometasone (Nasonex), budesonide (Rhinocort Aqua), ciclesonide (Omnaris) and fluticasone furoate (Veramyst). Side effects of the nasal sprays are typically minor, but may include nosebleed, headache, and nasal irritation. Septal perforation is possible, but usually related to the technique of spraying the medication. These have been shown to be the most effective medications in the treatment of allergies. Multiple studies have documented the safety of topical steroid sprays with minimal systemic absorption. **Be sure to check with your provider for the proper technique, when using nasal sprays or nasal irrigations!**

Leukotriene blockers such as montelukast (Singulair) are helpful for blocking the symptoms caused by the release of leukotrienes in allergic disease. Singular has been available for the treatment of asthma for several years, and is now FDA approved for the treatment of allergies. Leukotrienes are released from the mast cell when the inflammatory response takes place. They contribute to the symptoms of stuffy nose and congestion. This medication can be used in addition to antihistamines, nasal sprays, or can be used alone.

Mucolytics are mucus thinning agents like guaifenesin (Mucinex). Guiafenesin may enhance the clearing of mucus produced in the nasal passage and the lungs, though data on these products is weak.

Mast cell stabilizers work to prevent the release of various chemicals from the mast cell. If released, these chemicals produce the itchy, sneezy, runny, stuffy and wheezy symptoms. They work best if taken regularly as prescribed by the doctor. Several eyedrops are mast cell stabilizers, such as cromolyn sodium (Opticrom), ketotifen (Zaditor or Zyrtec), and nedocromil (Alocril). Nasalcrom is available over the counter as a nasal spray and has fewer side effects and is less effective than the steroid nasal sprays.

**MEDICATIONS** *(Continued)*
Ipratropioum nasal spray (Atrovent nasal) is an anticholinergic spray that blocks acetylcholine receptors, inhibiting nasal secretions. This medication is frequently used in patients with non-allergic rhinitis to treat a drippy nose and post nasal drainage.

Decongestants are used to treat nasal congestion and eustachian tube dysfunction that may be part of the allergic individual's condition. Eustachian tube dysfunction occurs when the tube connecting the middle ear to the nasopharynx has difficulty equalizing middle ear pressure. This is usually related to congestion and swelling of surrounding tissues. Decongestants work to decrease swelling and congestion. Pseudoephredrine and phenylephrine are common oral decongestants. They are often combined with antihistamines and mucolytics in both prescription and non-prescription medications. Side effects of oral decongestants include high blood pressure, heart palpitations, insomnia, tremor and rapid heart rate. Patients with high blood pressure should use decongestants only after speaking with their doctor.

Decongestants are also available over the counter as topical nasal sprays. Topical decongestants should never be used for longer than4-5 days because of the potential for rebound congestion that is associated with longer use. Topical decongestants do help reduce swelling and congestion associated with viral and allergic symptoms and can be useful if used properly.

One of the frequently asked questions about decongestants is whether or not Afrin can be used in patients with high blood pressure. If the patient's blood pressure is currently under control, this medication can be used with caution. Given that it is a local decongestant and is supposed to be taken for only three days, effects on blood pressure are often minimal.

**IMMUNOTHERAPY**
Treatment with allergy shots (vaccine), or immunotherapy, is generally considered for several reasons. If symptoms are not controlled with medications, immunotherapy is the next step towards achieving control of a patient's allergies. Some patients prefer to minimize the long-term use and cost of medications, and this can often be achieved by immunotherapy. Other indications include intolerance to allergy medications, the possible prevention of allergic asthma and the possible prevention of development of new environmental allergies. Allergy vaccines are used in addition to avoidance measures and medications in order to reduce the degree of sensitivity to specific allergens. Allergy injections contain extracts of specific allergens to which the patient is allergic. The injections begin with a dilute concentration of the allergen. The dose is gradually increased over time until a maintenance dose is achieved. The immune system responds by shifting the lymphocyte response (from TH2 to TH1 dominant) and by increasing its production of IgG blocking antibodies. Additional immunologic changes occur that serve to decrease the body's tendency to react to allergens.

Allergy injections should be received on a regular basis as directed by the physician. They are given over a three to five year period to maximize their effectiveness. Injections are given once or twice a week during the build up phase. When symptoms are adequately controlled and the maintenance dose has been achieved, the injection schedule can be progressively advanced out to every four weeks. As symptom control improves, medications can generally be reduced. Stopping allergy injections prematurely is associated with return of symptoms.

**IMMUNOTHERAPY** *(Continued)*

Since the injection extract consists of the specific allergens to which you are allergic, it is important to become aware of any signs of allergic reactions to the allergy shots. Mild local reactions from the injection include redness, itching and swelling around the injection site. Rarely, an individual will experience the onset of generalized symptoms such as itching of the eyes, nose or throat, runny nose, hives, coughing, wheezing, chest tightness or dizziness. Generally, this reaction usually begins within the first 20-30 minutes following the injection, but occasionally the reaction may be delayed.

THE NATIONAL GUIDELINES ON IMMUNOTHERAPY RECOMMEND THAT WE REQUIRE ALL PATIENTS TO WAIT IN THE PHYSICIAN'S OFFICE WHERE THE SHOT WAS ADMINISTERED FOR 20-30 MINUTES FOLLOWING THE INJECTION TO MONITOR FOR POTENTIAL REACTIONS ALL REACTIONS MUST BE REPORTED TO THE INJECTION CLINIC STAFF BEFORE THE NEXT INJECTION IS GIVEN. Depending on the type and severity of reaction, the dose of your injection may be adjusted. Asthmatics are at greater risk of systemic reactions, so make sure your asthma is controlled prior to receiving your injection.

Allergy medications do not interfere with allergy injections and should not be withheld on your allergy injection day. Antihistamines taken before your injection help to minimize local reactions like redness, swelling and itching. A group of medications known as beta-blockers (such as Ziac, Toprol, or Inderal) should not be taken while receiving allergy injections. IF YOU ARE HAVING SIGNIFICANT SYMPTOMS OF ALLERGY, ASTHMA, OR INFECTION WITH FEVER OF 100 DEGREES OR ABOVE, VOMITING OR DIARRHEA, ALLERGY INJECTIONS ARE WITHHELD UNTIL YOU ARE WELL. The injection may be given if you have been on an antibiotic for at least 24 hours, if you are not running a fever, or have no persistent coughing or wheezing. Maintenance allergy immunotherapy has been shown to be safe during pregnancy, though generally shots are not started during pregnancy. If you know you are pregnant, please inform the injection clinic PRIOR to receiving your shot, as the dose may need to be adjusted.

**DUST MITE ENVIRONMENTAL CONTROL MEASURES**

House dust mites are microscopic creatures that can cause allergic reactions. They live off dead human skin in our pillows, bedding, mattresses, carpets, and upholstered furniture. The waste product produced by these mites is the main substance in house dust to which people become allergic. The tiny particles are heavier than air, and settle on the carpet and the furniture. Dust mites thrive in temperatures ranging from 72-80 degrees, and at a humidity level above 50%.

While it is impossible to completely rid our houses of house dust mites, certain steps can be taken to reduce our exposure. The bedroom is a haven for house dust mites, as we spend at least one third of our day there, even if we only sleep in the bedroom. Children tend to spend even more time there. With that in mind it is important to emphasize control measures in the bedroom.

- ✓ The mattress pad, pillowcases and sheets should be washed weekly in the hot water wash cycle (130 degrees). The pillows, blanket, bedspread and curtains should be washed every 2 to 3 weeks in hot water. Dry them thoroughly. Hot water is required to kill the dust mites.
- ✓ Avoid excessive quilts, comforters, dust ruffles, or canopies on beds.
- ✓ Encase bed mattress and box springs in a zippered, allergen-proof cover, and place the mattress pad over the allergen-proof cover.
- ✓ Encase pillows in allergen-proof covers. Consider replacing pillows annually.
- ✓ Washable curtains or shades are preferred on the windows, as mini-blinds only act as dust collectors. Vertical blinds or shades may be used and damp dusted twice weekly.
- ✓ It is best not to have carpeting in the bedroom. If it is present, it should be very low nap.
- ✓ Thoroughly vacuum 1-2 times each week. Although vacuuming decreases dust levels in carpets, many small dust particles escape through the vacuum bag. These particles contain dust mite allergens, and then become airborne and easily breathed into the nose and lungs. Using a vacuum cleaner with a HEPA filter can trap the particles and reduce the amount of particles in the air while vacuuming.
- ✓ Central vacuums can be vented outside of the home.
- ✓ Wear a dust filter mask while vacuuming and vacuum when others are out of the room, especially children.
- ✓ Damp dusting should occur at least 30 minutes after vacuuming, to allow particles to settle on the furniture, woodwork and objects in the bedroom. This will ensure that the majority of particles are no longer suspended in the air and will be removed by damp dusting.
- ✓ Tile or linoleum flooring is best because it can be damp dusted twice weekly.
- ✓ Keep the humidity level in the home below 50%, but above 30%.

**MOLD ENVIRONMENTAL CONTROL MEASURES**

Molds can be found indoors as well as outdoors throughout the year in our relatively moderate climate. Molds are made up of clusters of filaments. They live on decomposing plant or animal matter. Many molds reproduce by releasing spores into the air, and cause allergic symptoms if someone is sensitized to mold. Mold counts are highest in the summer months, but also tend to be present at high levels immediately preceding a rain. They tend to rise after the rain as well. Molds are easily carried by the wind, and may be present in a variety of environments. In some areas, mold counts are high at the same time as pollen levels, which can make spring and fall especially difficult for people who are sensitized to both. Molds are also present indoors in locations like the basement, which may be damp and/or poorly ventilated, as well as kitchens and bathrooms where moisture accumulates in heating/cooling systems. Moist soil can be a source of mold in houseplants.

- ✓ The bathroom is a haven for molds due to the potential for moisture to accumulate. Wash tiles and grout frequently, check corners, behind toilets, and under sinks.
- ✓ Carpet should be removed from the bathroom if present, as it can easily trap moisture.
- ✓ Indoor plants may breed mold in their potting soil. Do not keep them in the bedroom.
- ✓ Dried flowers often contain mold, so minimize these in the home.
- ✓ Since humidifiers, dehumidifiers and air conditioners are constantly exposed to dampness, check them frequently for a musty smell and a spray with a mold inhibitor such as Lysol if needed.
- ✓ Vent the clothes dryer outside, and try to dry clothing completely immediately after washing.
- ✓ Exhaust fans in the kitchen and bathroom can help remove water vapors and humidity.
- ✓ Paint with a mold retardant can be used in basements or areas that are more likely to be damp. Leaks should be repaired.
- ✓ Damp footwear can rapidly breed mold if not allowed to “air out” and dry.
- ✓ Dehumidifiers may be necessary, especially during the summer, or in damp areas such as the basement. Dehumidifiers should be emptied of water daily and cleaned with a dilute bleach solution or commercial mold retardant weekly.
- ✓ Allow the home to breathe by avoiding heavy vegetation around and over the house as it encourages dampness and mold growth.
- ✓ Books, stuffed toys and foam rubber pillows or mattresses are mold collectors. They should be limited and kept out of the bedroom.
- ✓ Real Christmas trees and indoor storage of wood are best avoided as they are heavily populated with molds.
- ✓ Attics, damp closets, crawl spaces may require a low watt light bulb to help prevent mold growth.
- ✓ Keep humidity low, between 30% and 50%. A humidity gauge, called a hygrometer can be helpful to measure humidity levels throughout a house. If central or room humidifiers are used during the winter, care should be taken to avoid making the environment too humid. Change the water frequently and use a dilute bleach solution or commercial mold retardant weekly. Vaporizers should be avoided because of heavy mold contamination.
- ✓ Air conditioning prevents mold growth by keeping the environment cooler. The filter needs to be washed or changed frequently. The drip tray serves as an excellent environment for mold growth if it is not kept clean. The central air conditioning should be cleaned and primed yearly.
- ✓ In regards to outdoor molds, avoid the outdoors at dusk or later. Mold counts rise after dusk. Mold spores are airborne during high winds, so avoid exposure on those days.
- ✓ Avoid cutting the grass, raking leaves, working with soil, compost piles, sandboxes, hay, fertilizers, barns, grain harvesting, and heavy growth of vegetation within 150 to 200 feet of the house. If exposure cannot be avoided, it is helpful to wear a mask.

**POLLEN ENVIRONMENTAL CONTROL MEASURE**

One in five people in the United States suffer from pollen related hay fever. Pollen are tiny, seed-like grains released by trees, grasses, and weeds in order for these plants to reproduce. These grains are carried by the wind or insects and can travel for hundreds of miles. A square mile of ragweed, one of the top pollen producers, yields up to 16 tons of pollen, and can be blown 250 miles away. Wind borne pollen can easily get into your eyes, nose, or lungs causing havoc to your system. Insect borne pollen generally is too large to cause an allergic response. For this reason trees that flower, like dogwoods, do not cause allergies.

Tree pollen is prevalent in early spring; grass pollen is present from late spring through mid-summer in the Midwest, and longer in the Southern states; ragweed, as well as other weeds, pollinates in late summer and may last until the first hard frost in the Midwest. The following measures may help in reducing symptoms when pollen counts are particularly high.

- ✓ Check the local pollen forecast daily at **www.kcallergy.com**. When the counts are high, avoid outdoor activities. Counts are reflecting what was in the air 1-2 days before the actual date the count was measured.
- ✓ Keep the home closed during pollen seasons.
- ✓ Use central air conditioning whenever possible. Leave the fan running so air continuously circulates through the filters.
- ✓ Re-circulate the air conditioning in the car as well.
- ✓ Do NOT use an attic fan during pollen season. It draws outside, pollen filled air into the home.
- ✓ Wear glasses to avoid getting pollen in the eyes.
- ✓ Save outdoor activities for after a rain when pollen has been washed out of the air, but be aware that some molds only release their spores into the air on rainy days or when humidity is high.
- ✓ After being outdoors, shower and wash hair, change clothes, and place dirty clothes in the hamper outside of the bedroom.
- ✓ Wear a mask when doing yard work, but try to avoid this on a regular basis during your particular allergy season.
- ✓ Avoid using antihistamines that cause drowsiness if operating machinery or driving a car.
- ✓ Pets can bring pollen into the home on their bodies, so before and after, bathe them regularly.
- ✓ Receive allergy injections on a regular basis during the season.
- ✓ Short hair animals may bring less pollen into the home.

**ANIMAL DANDER CONTROL MEASURES**

Animal derived allergens, such as dander, urine and saliva, are often the primary offender for inhalant allergy. The most common animal allergies are to cats and dogs, but any warm-blooded pet including small rodents, birds, rabbits, cows and horses can cause problems. Most animal allergens circulate through a house as small microscopic particles, invisible to the human eye.

Regular resting sites of animals like carpets, couches, and beds generally have a significant allergen build-up. Clothing may also have considerable build up of allergen. When one of these areas is disturbed, the allergens become airborne and stay in the air for a very long period of time. Many times, people do not recognize that their allergy symptoms could be related to animals in their environment, because their symptoms are present all year long. This occurs because the animal allergen is continually present in the environment, so once the allergy has been triggered, symptoms are continual. Since there is no obvious onset and decline of symptoms as occurs with seasonal allergies, the source of symptoms is easily overlooked. Cat allergen can be very problematic. There are detectable levels of cat allergen even in homes where there has never been a cat due to people picking up the allergen on their clothing and bringing it home.

- ✓ Avoidance is always the best control measure! Keeping the animal out of the home is ideal.
- ✓ At the very least, keep the animal out of the bedroom to minimize the concentration of allergen located there.
- ✓ Thoroughly clean the areas where the animal rests. Wear a dust mask while doing this.
- ✓ Washing and grooming the animal regularly outside of the house can also help reduce the allergen load in the home.
- ✓ Wash the animal's bedding weekly in hot water.
- ✓ Follow the general principles for dust control.
- ✓ Use multi-pleat extended surface filters in your heating system to eliminate airborne dander. HEPA filters placed in the bedroom may reduce nighttime exposure if the animal is kept out of the room at all times.
- ✓ Short hair animals may bring less pollen into the home.
- ✓ When visiting a home with pets, remember to take your medications prior to your visit. Try to change clothing as soon as possible after your departure.

**ALLERGIES AND SINUS DISEASE**

Allergic individuals tend to have more problems with sinus disease, specifically infections and nasal polyps. When allergies are present, the lining of the nose and sinuses become swollen and inflamed. This blocks drainage of mucus from the area and disrupts the lining so mucus cannot be cleared effectively. The tissue swelling can block the tiny openings (ostea) of the sinuses. This can lead to a buildup of mucus in the sinuses, which is a perfect setting for bacteria to grow, resulting in an infection.

Blockage of the nasal passages from viral upper respiratory tract infections (URIs) can also contribute to the development of sinusitis. Other frequent sources of impaired sinus clearing include enlarged adenoids and nasal polyps. The adenoids are lymphatic tissue, similar to tonsils, which are present in the nasopharynx. The nasopharynx is the portion of the nasal airway above the soft palate. With URIs, the adenoids tend to enlarge as part of the inflammatory response.
Unfortunately, sometimes they stay enlarged, and contribute to blocking the nasal passages. Sometimes, they can be chronically infected, contributing to the recurrent infections, Children, ages one to ten, are more likely to have problems related to enlarged adenoids than children beyond that age. It is not usually a factor in adults.

Nasal polyps are sometimes visible in the nasal passages. They appear swollen, pale and covered with mucus. They are more likely to occur in allergic individuals, but may also occur in non-allergic people and are related to the excessive swelling that occurs to the lining of the sinuses. Unless the polyps are treated with nasal steroids or surgery, they tend to remain swollen and will obstruct the nasal passages, contributing to recurrent sinus infections.

Another potential contributing factor is gastroesophageal reflux (GERD). Reflux may occur with obvious symptoms of heartburn, burping or indigestion, or with more subtle symptoms, such as recurrent sore throat, chronic nasal congestion, cough or a bad taste in the mouth. If gastroesophageal reflux is present, it can allow the passage of digestive juices from the stomach into the nasopharynx, causing irritation and inflammation of the nasal passages, contributing to mucus production, and setting the stage for recurrent sinusitis.

While it can be difficult to differentiate sinusitis from allergies or viral illness, some of the symptoms of chronic sinusitis usually present include:

- ✓ Nasal congestion
- ✓ Post-nasal drip
- ✓ Persistent cough, especially in the early morning or at night
- ✓ Bad breath
- ✓ Recurrent sinus headaches
- ✓ Dark circles or swelling under the eyes
- ✓ Sinus pressure
- ✓ Toothaches or facial pain
- ✓ Prolonged duration of discolored nasal discharge
- ✓ Symptoms persisting beyond 10 days

If sinusitis is suspected, it is important that the ears, nose, and lungs are examined. A CT scan of your sinuses may be ordered to help confirm the diagnosis. This radiological test provides detailed pictures of your sinuses.
Appropriate treatment for people with underlying allergies includes antibiotics for 14-21 days. Decongestants, saline irrigations, and corticosteroid nasal sprays also may be used. A follow up CT scan may be necessary to make sure the infection has completely cleared.

**SALINE IRRIGATION**
It can be beneficial to use salt water to irrigate the nasal passages to promote the clearing of nasal secretions. The salt water can be mixed at home, or you can purchase a kit at many stores. Sometimes you provider may have you add medications or 1/2 tsp of baby shampoo to the irrigation mixture to decrease inflammation or bacterial growth. The recipe is as follows:

1 level teaspoon of table salt or sea salt
1 pint of lukewarm water
A pinch of baking soda

Fill a small bulb syringe of this mixture. Lean over the sink, looking straight down. Place the tip of the syringe inside the nostril, and squeeze the bulb with enough force to get the solution to the back of the nose. Use 2 full syringes in each nostril twice daily. Much of the water may come out of the same nostril, but if done properly, some of the water will drain out of the opposite nostril.

Several saline irrigation kits are available commercially. Some of the commonly recommended brands include NeilMed Nasal Rinse and ENT sol.

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