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## Allergic Rhinitis

**R**espiratory allergy now affects more than 20% of the U.S. population. Allergic rhinitis, or allergic rhinosinusitis (involving both nasal and sinus mucosa) results from inflammation of mucous membranes due to an allergic reaction to inhaled allergens.

Diagnosis of allergy may be obvious when symptoms recur seasonally. However, reactions to perennial allergens often require a careful history, physical exam and special allergy tests to make a correct diagnosis and optimize treatment.

Allergic rhinitis is often accompanied by significant co-morbidities that includes allergic conjunctivitis, sinusitis, eustachian tube dysfunction, ear infections, and/or asthma symptoms. Atopic dermatitis is also frequently associated with allergic rhinitis in children and adults.

### Onset and mechanism

Symptoms commonly begin in childhood, affecting both sexes. Re-

spiratory allergy often runs in families, indicating a genetic role. However, we are now observing many adults suffering from allergy symptoms for the first time. Respiratory allergy results from allergic inflammation of the mucosal membranes, triggered by airborne allergen's contact with a specific IgE allergy antibody which concentrates on the surface of mast cells that line the respiratory mucosa. Both genetics and allergen exposure determine who will develop allergy symptoms. Following allergen exposure, IgE-bound allergens trigger mast-cells to release chemical mediators including histamine, tryptase, chymase, kinins and others. Other mediators—such as leukotrienes and prostaglandins—are synthesized as a result of the allergic reaction, and they play a key role in inflammation. The resulting allergic inflammatory response produces increased vascular permeabil-

ity, mucous production, inflammatory cell accumulation and tissue edema. This results in itching, sneezing and rhinorrhea, redness, and nasal congestion. At times, allergy sufferers may experience similar inflammation of the mucosal membranes of the eyes, sinus mucosa, throat, eustachian tubes, and lungs.

### Symptoms of allergy

Itchy nose, congestion and sneezing are common symptoms of allergic rhinitis. Watery, itchy eyes often accompany nasal symptoms, indicating allergic conjunctivitis. Wearing contact lenses may trap airborne allergens and worsen this condition. Although symptoms are







**Grass pollen cross-react. So if you're allergic to grass, you're probably allergic to all.**

triggered by specific allergens initially, once the mucosa is sensitized, many irritants including smoke, air pollution, scents, and cleaning products can also trigger or prolong symptoms.

## Symptoms

- Ear, nose, throat, and sinus congestion
- Hoarseness, coughing
- Runny nose, congestion
- Decreased sense of smell
- Sneezing
- Sore throat, post nasal drip
- Serous otitis media and hearing loss
- Snoring and/or worsening of sleep apnea
- Watery, itch eye, red eyes
- Coughing, shortness of breath, wheezing
- Halitosis
- Headache or sinus pressure
- General malaise
- Fatigue or irritability
- Poor mental concentration, impaired learning

## Signs of allergy

**"Allergic shiners"** or dark circles around the eyes due to vascular congestion related to allergic rhinitis

**Nasal crease** is horizontal across lower half of the nose

and caused by repeated rubbing (the "allergic salute")

**Nasal turbinates** are swollen, pale, boggy or bluish

**Nasal secretions** are clear and filled with eosinophils

**Nasal septum perforation** may

indicate other pathology, including cocaine abuse, misapplication of topical medications, or granulomatous disease (Wegener's)

**Nasal obstruction** may be

due to polyps, tumors, septal deviation, turbinate edema or foreign bodies

**Discolored mucous** may indicate infection including sinusitis

**Lungs:** check for signs of asthma, a known co-morbidity

**Skin:** evidence of atopic dermatitis often associated

with respiratory allergy

**Examine neck**

**for thyroid disease** which could be associated with nasal congestion

## Testing

General laboratory tests, including a total IgE, are not very helpful in identifying the presence of specific allergy antibodies. In contrast, the RAST or Immunocap (TM) test is a blood test that detects specific allergy. This test is less sensitive than the intradermal skin test and is used when allergy skin testing is not possible.

Nasal secretions can be stained in the lab, which suggests allergy when a large number of eosinophils are present. *Percutaneous skin testing* entails placing a fresh sample of a specific allergen extract on the skin and using a needle to prick through the allergen, thus exposing the skin's mast cells to the test allergen. If the patient is allergic, a hive (wheal & flare) will appear at the test site within a few minutes. The larger the hive, the greater the individual's sensitivity. When the test is negative and allergy is still suspected, the patient should undergo the more sensitive, intradermal allergy skin test. In this case, a very small amount of dilute antigen is injected into the epidermis. This technique is far more sensitive than the per-

cutaneous test. Positive and negative controls assure the test's validity.

Rhinoscopy helps identify structural problems such as deviated septum, nasal polyps, ulcer, tumor, adenoidal hypertrophy, granulomatous disease, foreign bodies, infection or sinus disease.

Complications of allergic rhinitis include acute and chronic sinusitis, nasal and sinus polyps, otitis media, eustachian tube dysfunction, flares of asthma (one-airway concept), fatigue, drowsiness, general malaise, decrease performance at work and school, and decreased quality of life. In addition, swelling of the mucosa of the upper airway may worsen or provoke symptoms of snoring and/or sleep apnea.

## Differential diagnosis

- Perennial allergic rhinitis (year-round allergen exposure)
- Rhinitis medicamentosa (topical decongestant sprays)
- Chronic sinusitis
- Medications (anti hypertensives, cocaine)
- Hormonal rhinitis (pregnancy, hypothyroidism, oral contraceptives)
- Physical obstruction (septal deformity, tumor, adenoid hypertrophy)
- Foreign body
- Cerebral spinal fluid leak
- Immunodeficiency
- Ciliary disorder
- Cystic fibrosis
- Hyperthyroidism
- Vasomotor rhinitis
- NARES (non-allergic rhinitis with eosinophilia)
- Gustatory rhinitis (vagally mediated) following meals
- Granulomatous disease (Sarcoidosis, Wegener's granulomatosis)



ergic to one, chances are

## Treatment

### Allergen avoidance

You can prevent or lessen allergic reactions by evaluating the allergen content at home and work, reducing your exposure.

Consider your exposure to pets, lab animals, organic dust, farming, horses, enzymes organic products, chemicals and mold.

### Home allergen control

- Dust mite control
- Use of air cleaners
- Humidity control
- Pet control

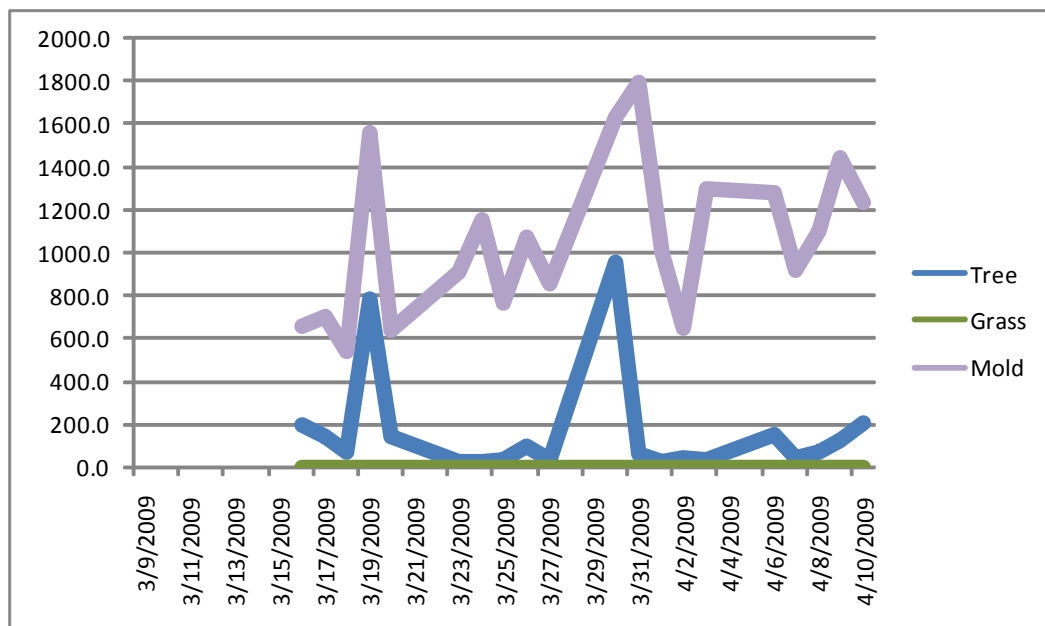
## The allergens

**Tree pollen** begins in the early spring (see graph above). Common tree pollen in the Delaware Valley include oak, juniper, edar elm, sycamore, pine, walnut and mulberry. There may be more than one tree season each year (spring and fall for elm or pine pollen). Each tree pollen allergen is unique. Most people allergic to a few specific tree pollen are not bothered by others.

**Grass pollen** occurs mostly between April and June in the Delaware Valley. Common grass pollen include Timothy, Kentucky Blue, and Rye grass. Bermuda grass is not prominent in our area. Grass pollen share many common allergens and most people allergic to a specific grass will have problems with most grass pollen.

**Weed pollen** common to our area include ragweed, sheep sorrel, yellow dock, sage, urtica, lamb's quarters, and English plantain. Weeds pollinate from midsummer through the fall. Ragweed is a very common and potent pollen east of the rocky mountains that causes severe symptoms in many patients between mid-August and the first frost.

**House dust mites** are parasites living off of human dander that thrive under humid conditions—both abundantly provided by patients in their beds each night. There are two species of dermatophagoides (dust mite) found in bedding, carpets,



The Asthma Center Pollen Count Statistics as of April 10, 2009

Cherry Hill, NJ

upholstered furniture and stuffed toys.

**Mold spores** are ubiquitous and found both indoors and outdoors throughout most of the year.

**Outdoor molds** found in abundance locally include Alternaria, Cladosporium, and Basidiomycetes. Their airborne concentration is highest at the end of the summer and early fall, when dead and dying vegetation is abundant. Outdoor mold decreases dramatically when the ground is frozen or covered with snow.

**Indoor molds** including Aspergillus, Penicillium Mucor, Fusarium, and are found wherever there is dampness or poor ventilation (bath, basement, attic, closets, etc.) or following a leak or flooding.

**Cockroach allergen** is a common potent allergen in cities—especially in multi-unit apartments. It is mostly associated with perennial allergic rhinitis and allergic asthma.

**Animal dander allergens** result from the dead skin flakes, salivary and urinary proteins arising from both dogs and cats. Such allergens accumulate in the indoor environment and can be very potent allergens, causing chronic symptoms. However, animal dander may also “prime” or intensify the patient’s reaction to other allergens.

**Occupational allergens** are of-

ten associated with allergic rhinitis and asthma symptoms. Allergens in the workplace include: animal dander (dander affects mostly lab workers, veterinarians, farm workers and zoo employees) agricultural (pollen, grain, mold), wood dust, latex gloves and powder, acid anhydrides, glues, and psyllium (nursing homes).

### Immunotherapy

Immunotherapy consists of a series of injections containing allergy-causing proteins (pollen, dust mite, animal dander, mold, etc.) intended to promote tolerance to the allergen. Initially, the dose is small and weak and does not provoke an allergic reaction. Over time, the dose is gradually increased and results in a growing tolerance to the allergen injected. Immunotherapy can greatly diminish one’s hypersensitivity, thus allowing a decreasing need for medication to control symptoms.

Immunotherapy is highly recommended if allergen exposure results in frequent symptoms that don’t respond to avoidance and medications. Decreased allergy symptoms may persist long after immunotherapy has been discontinued, indicating the long-term benefit of this treatment. Immunotherapy can change the natural course of allergy and confer lifelong immunity. Recent studies have shown immunotherapy may have a role in preventing asthma in children. The usual duration of treatment is from four to six years.



When administering immunotherapy, consider the following:

- Choice of allergen
- Extract potency
- Dosage and schedule of injections
- Duration of therapy
- Patient's reaction history
- Treatment failure
- Modified antigens
- Subcutaneous injections
- Sublingual therapy (SLIT)\*

\* SLIT is not currently approved for treatment by the FDA and is an off-label technique. Although convenient, it may prove to be a substandard therapy as compared to the currently approved and highly effective injection therapy which is currently the only approved treatment in the U.S. for allergen immunotherapy.

## Pharmacological therapy

### Antihistamines

■ Oral non-sedating  
Claritin, Clarinex, loratadine, and Allegra. Zyrtec and Xyzal may have no, or mild sedating effects. Antihistamines are helpful for sneezing but have many mild side effects. New topical medication may also have some antihistaminic effect and they include Astepro, and Patanase.

### ■ Sympathomimetics

Usually combined with an oral antihistamine such as Claritin D12 or D24, Zyrtec D12 or D24, Allegra D12 or D24. The sympathomimetics act as decongestants. Topical nasal decongestants should be avoided.

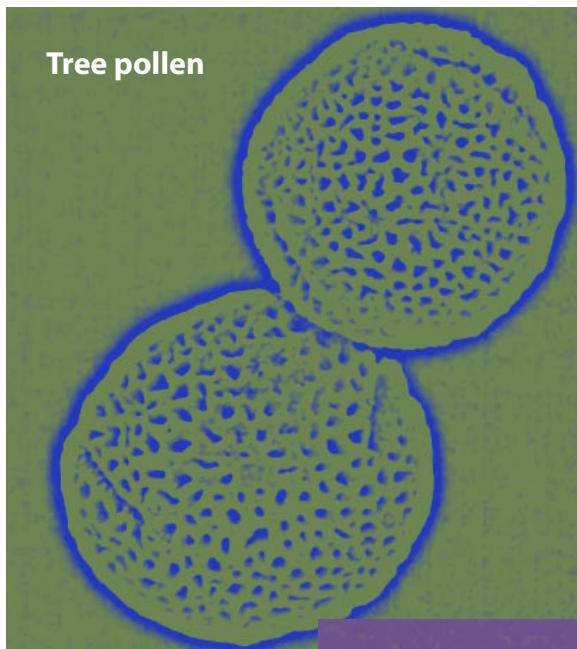
### ■ Topical corticosteroids:

These medications suppress or block inflammation by preventing the invading inflammatory cells into the mucosa. Examples include: Nasonex, Flonase, Veramyst, Rhinocort, Omnisar, Nasacort, Beconase, and others.

### ■ Topical mast cell inhibitors:

Nasal crom and to a lesser extent Patanase, Atepro and primarily suppress the mast cells from releasing their mediators.

Tree pollen



### ■ Leukotriene inhibitors

Singulair, Accolate and Zflo are all effective in blocking the inflammatory effect of the leukotriene mediators that are pro-inflammatory and are synthesized during the allergic reaction. Only Singulair is FDA-approved for allergic rhinitis.

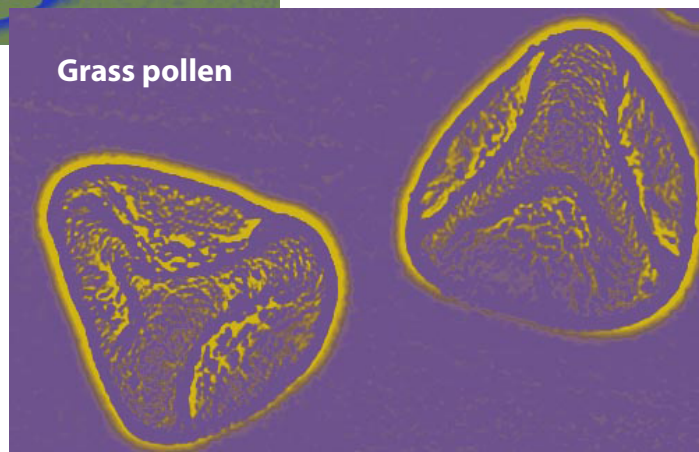
■ Systemic corticosteroids are reserved for short-term use in individuals with severe nasal obstruction, when topical sprays cannot penetrate the nasal passageway.

■ Topical Anticholinergics-atrovent or ipratropium bromide can help with control of profuse rhinorrhea. They are particularly effective for gustatory rhinorrhea and

■ Nasal/sinus saline wash once or twice a day removes pollen from the nose, and clears excess mucous and bacteria.

While allergen avoidance is the best treatment, it's not always possible in nature. Immunotherapy offers the possibility of reducing sensitivity, so that patients can tolerate even significant allergen exposure. Although medication often offers quick relief, immunotherapy provides a long-term solution to a chronic problem that often recurs over many decades. SLIT, or sublingual immunotherapy is not FDA-approved

Grass pollen



and not recommended at this time.

## Alternative medicines

While little scientific evidence supports their efficacy, alternative or homeopathic medicines help support some patients' pharmacological and/or immunotherapeutic treatments.

For example, hydrotherapy (alternating hot and cold compresses on the sinus area every two minutes) may loosen the nasal secretions. Alternatively, patients may try yogic breathing techniques in an attempt to loosen mucous buildup through the vibrational practice of chanting.

Additionally, pressure-based practices such as acupuncture, massage and reflexology are sometimes sought to relieve pain, pressure and headache.

To learn more about these treatments, visit [theasthmacenter.org](http://theasthmacenter.org) and get your free download of *Understanding Sinusitis*.

