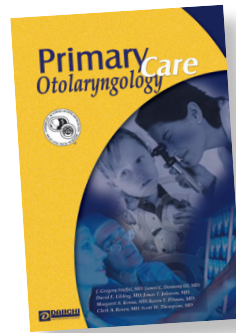


**The American Academy of Otolaryngology—
Head and Neck Surgery Foundation
(AAO-HNSF) Presents...**



Chapter 18: Allergy

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Page 1

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Chapter 18: Allergy

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Dr. Gregory Staffel first authored this short introduction to otolaryngology for medical students at the University of Texas School for the Health Sciences in San Antonio in 1996. Written in conversational style peppered with hints for learning (such as “read and hour a day”), and short enough to digest in one or two evenings, the book was a “hit” with medical students.

Dr. Staffel graciously donated his book to the American Academy of Otolaryngology—Head and Neck Surgery Foundation to be used as a basis for this primer. It has been revised, edited and is now in the second printing. This edition has undergone an extensive review, revision and updating. We believe that you, the reader, will find this book enjoyable and informative. We anticipate that it will whet your appetite for further learning in the discipline that we love and have found most intriguing. It should start your journey into otolaryngology, the field of Head and Neck Surgery.

Enjoy!

Mark K. Wax, MD

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Chapter 18: Allergy

Over twenty million Americans suffer from **inhalant allergies**. Symptoms are **nasal congestion, clear rhinorrhea, itchy watery eyes** and sometimes ear or palatal itching, post-nasal drip and throat irritation. **Fatigue** is common, caused by sleep disturbance from nasal obstruction, perhaps with other immune contributors. Symptoms may occur only in certain seasons or locations. If one parent has inhalant allergies, **a child has about 30% chance of developing allergies**. If both parents have allergies, this increases to about 60%. The percentage of the population with allergy problems has been increasing in developed countries. The **Hygiene Hypothesis** to explain this proposes that the infectious diseases more common in less developed countries help tilt an individual's immune system more toward the Th1 system, minimizing the chance of developing the Th2-mediated atopic reaction, and the resulting allergic symptoms.

Allergic symptoms are initiated by inhalation of **dander, pollen, mold spores** or other antigens. Typically **trees** pollinate and cause symptoms in the spring, **grasses** pollinate in the summer, and **weeds** such as ragweed in the fall. Allergens such as **house dust mite, cockroach**, animal danders and molds can cause symptoms year-round.

Allergies represent an **abnormal immune response to an environmental protein** tolerated by the majority of people.



Chapter 18: Allergy

At least 20% of the US population has the genetic capacity to produce **excess IgE**, the immunoglobulin that mediates allergic symptoms. Having inhalant allergy symptoms requires an initial contact with that specific allergen, which results in development of the allergen-specific IgE. In this **Gell & Coombs Type I** hypersensitivity, the allergen-IgE populates the outside of **mast cells** in tissues. On recontact, the allergen binds to this allergen-specific IgE on the mast cell, triggering release from the mast cell of pre-formed allergic mediators (**histamine**, proteoglycans, proteases, causing immediate symptoms, and initiating the production of further allergic mediators (**leukotrienes** and prostaglandins) responsible for the late phase allergic response (3-12 hours later).

There are three mainstays of treating inhalant allergies:

- Pharmacotherapy
- Avoidance of the provoking allergen
- Immunotherapy

Pharmacotherapy helpful for allergic symptoms includes antihistamines (oral or nasal topical), nasal steroid sprays, decongestants, topical nasal cromolyn, or oral antileukotrienes. Allergy pharmacotherapy is often started empirically, before allergy testing. If symptoms respond well, the medication can be continued as needed, and allergy testing may not be necessary.



Chapter 18: Allergy

Allergen avoidance requires determining what allergens are specific triggers for an individual, either by skin testing or **in-vitro testing** for elevated levels of IgE. In-vitro testing is preferred for patients who:

- Are pregnant
- Have poorly-controlled asthma
- Have dermatographism
- Take a beta blocker medication
- Take a tricyclic antidepressant (TCI)
- Take a monoamine oxidase inhibitor MAOI
- Have a history of severe anaphylaxis

Antihistamine medications (oral or nasal) must be discontinued 3-5 days before testing to avoid false negative results. Antileukotrienes, nasal steroid sprays and oral and topical decongestants may be continued without interfering with allergy skin testing.

Specifics of **allergen avoidance** depend on the allergen. House dust mite sensitivity requires bedroom dust minimization, including mattress and pillow covers, special carpet cleansers, HEPA filters, etc. Cat sensitivity responds to avoiding cats, mold sensitivity requires avoiding damp and musty areas.



Chapter 18: Allergy

If pharmacotherapy is unsuccessful in controlling the allergic symptoms, allergy testing and consideration of **immunotherapy** is indicated. Immunotherapy is the only treatment option capable of altering the immune system's response to allergens. Begun with a very tiny dose that is gradually increased to a known-to-be-effective target dose, immunotherapy decreases antigen-specific IgE, increases antigen-specific IgG, induces antigen-specific T-cell 'tolerance' to the antigen, and tilts the immune system further toward the Th1 response. Immunotherapy can be administered by subcutaneous injection or by sublingual drops.

Both allergy skin testing and immunotherapy have the potential to cause severe or fatal **anaphylaxis**. Both should be undertaken with caution in a setting where emergency supplies, equipment and trained personnel are immediately available. Since poorly controlled or worsening asthma is the main risk factor for developing such anaphylaxis, questions about current asthma status (or actual peak flow measurement) is appropriate on each test or treatment day.

Inhalant allergies, although in themselves rarely life-threatening, have a major negative impact on quality of life. Symptom improvement or resolution with the above approach is usually possible.



Chapter 18: Allergy

Questions, Section 18

1. In inhalant allergies, the T-helper cell system is abnormally weighted toward the _____.
2. If both parents have inhalant allergies, a child has a _____% chance of developing allergies.
3. People with allergies produce excess Ig_____.
4. Trees typically pollinate and cause allergy symptoms in the season of _____.
5. Most inhalant allergies are a Gell & Coombes Type _____ hypersensitivity reaction.
6. IgE populates the outer surface of _____ cells.
7. Mast cells contain preformed allergic mediators, including _____.
8. Medications that are a contraindication to allergy skin testing include _____.
9. The main medication that must be discontinued 3-5 days before skin testing is _____.
10. The most serious adverse reaction to allergy skin testing or immunotherapy is _____.



Chapter 18: Allergy

Answers

1. Th2 side
2. 60%
3. E
4. Spring
5. 1
6. Mast
7. Histamine, or proteoglycans, or proteases
8. Beta blockers, or tricyclic antidepressants, or monoamine oxidase inhibitors
9. Antihistamines
10. Anaphylaxis



Chapter 18: Allergy

More educational opportunities from the AAO-HNSF

The American Academy of Otolaryngology—Head and Neck Surgery Foundation offers many programs designed to keep you up-to-date without leaving your practice. Most activities offer Category 1 AMA/PRA credits. The Academy/Foundation also serves as a primary resource for otolaryngology—head and neck surgery activities and events, and serves as an online clearinghouse for patient education and specialty information.

Visit the Academy’s website, www.entnet.org to learn more about these programs.

