



# Evaluating Management Paradigms for the Respiratory Patient

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# Program Objectives

- Highlight the essential role of clinicians in the diagnosis and management of allergies and asthma
- Recognize the challenges that clinicians face when managing patients with allergy-like symptoms
- Convey the quality of life benefits associated with targeted exposure reduction to allergens
- Convey the clinical and economic benefits of targeted exposure reduction
- Explain accuracy, test interpretation, and ordering for the Thermo Scientific™ ImmunoCAP™ specific IgE blood test

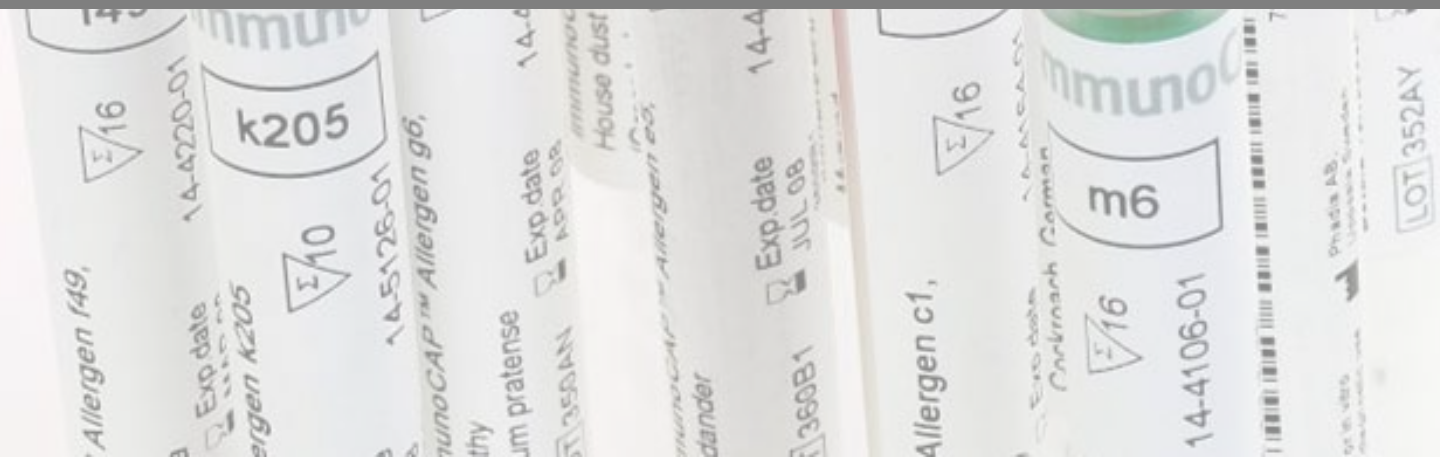
A Mission We Are Proud Of:

A young girl with curly hair is blowing bubbles. She is holding a white and orange bubble wand in her right hand, and several colorful bubbles are floating in the air around her. The background is a bright, sunny outdoor setting with green grass and trees.

**We enable our customers  
to make the world healthier, cleaner and safer.**



# ImmunoCAP



# Advantages of ImmunoCAP as an Allergy Diagnostic Tool<sup>1,2</sup>

- FDA-cleared quantitative measure of specific IgE
- Most widely used specific IgE blood test, documented in > 4,000 peer-reviewed publications
- Interchangeable with skin prick testing



1. Johansson SGO. *Expert Rev Mol Diagn.* 2004;4:273-279. 2. Hamilton RG. *Pediatric Allergy: Principles & Practice.* St Louis, MO: Mosby-Year Book, Inc; 2003:233-242.

# Simplicity of Ordering Specific IgE Testing

- ✓ No interference from any medications
- ✓ One blood draw any time of day
- ✓ For adults and children/infants with allergy-like symptoms<sup>1</sup>
- ✓ Lab-designed profiles

1. Data on file



## Region 8: IL, MO, IA

Alternaria alternata, m6  
Aspergillus fumigatus, m3  
Bermuda grass (Cynodon dactylon), g2  
Cat dander, e1  
Cladosporium herbarum, m2  
Cockroach, i6  
Common ragweed (short; Ambrosia)  
Cottonwood (Populus deltoids), t14  
D. farinae, d2  
D. pteronyssinus, D1  
Dog dander, e5  
Elm (Ulmus americana), t8  
Maple (box elder, Acer negindo), t1

Maple Leaf sycamore, London Plane, t11  
Mountain Cedar (Juniperus Sabinoides), t6  
Mouse Urine, e72  
Oak (Quercus alba), t7  
Pecan/Hickory (carya soecue, pecan), t22  
Penicillium Notatum, m1  
Rough marsh elder (Iva), w16  
Rough pigweed (Amaranthus retroflexus), w14  
Russian Thistle (Saltwort, salsola kali), w1  
Timothy grass (Phleum pratense), g6  
Walnut (Juglans californica), t10  
White Ash (Fraxinus Americana), t15  
White Mulberry, t70



# Food Allergy Profile

- Three national profiles

Regional Respiratory Profile

**Food Allergy Profile**

Early Childhood Profile

The following allergens are typically included in a food allergy profile:

Clam, f207  
Cod sh, f3  
Corn (Maize), f8  
Egg white, f1



Milk, f2  
Peanut, f13  
Scallop, f338  
Sesame, f10



Shrimp, f24  
Soybean, f14  
Walnut, f256  
Wheat, f4



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- Three national profiles

## Regional Respiratory Profile

## Food Allergy Profile

## Early Childhood Profile

The allergens included in the early childhood profile have been pre-selected by your laboratory provider based on perennial and food allergen data and disease prevalence. Each profile has been optimized for predictive value and efficiency of the testing process and typically includes:

Cat dander, e1  
Cockroach, i6  
Cod fish, f3  
Cow's milk, f2  
Dog dander, e5

Egg white, f1  
House Dust Mite (D. farinae), d2  
House Dust Mite (D. pteronyssinus), d1  
Mold (A. alternata), m6  
Mold (C. herbarum), m2

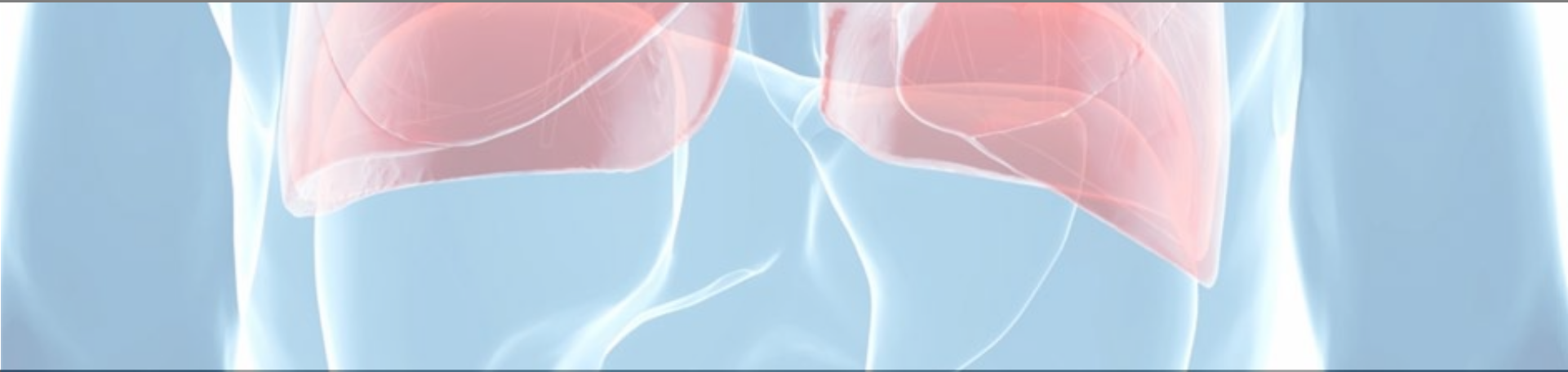
Peanut, f13  
Shrimp, f24  
Soybean, f14  
Walnut, f256  
Wheat, f4  
Total IgE



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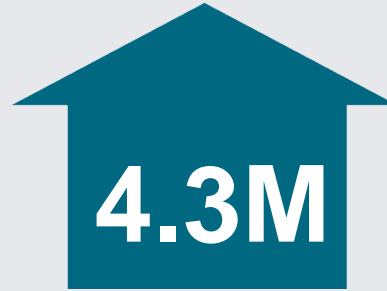
# Asthma



# Asthma: Clinical and Economic Burden<sup>1</sup>



18.9 million adults  
7.1 million children



Increase in the asthma  
population from 2001-09

**2.1M<sup>2</sup>**

Annual ER visits

**\$3,300**

Annual cost per person (medical expenses)<sup>4</sup>

**479K<sup>2</sup>**

Annual  
hospitalizations

**14.2M<sup>3</sup>**

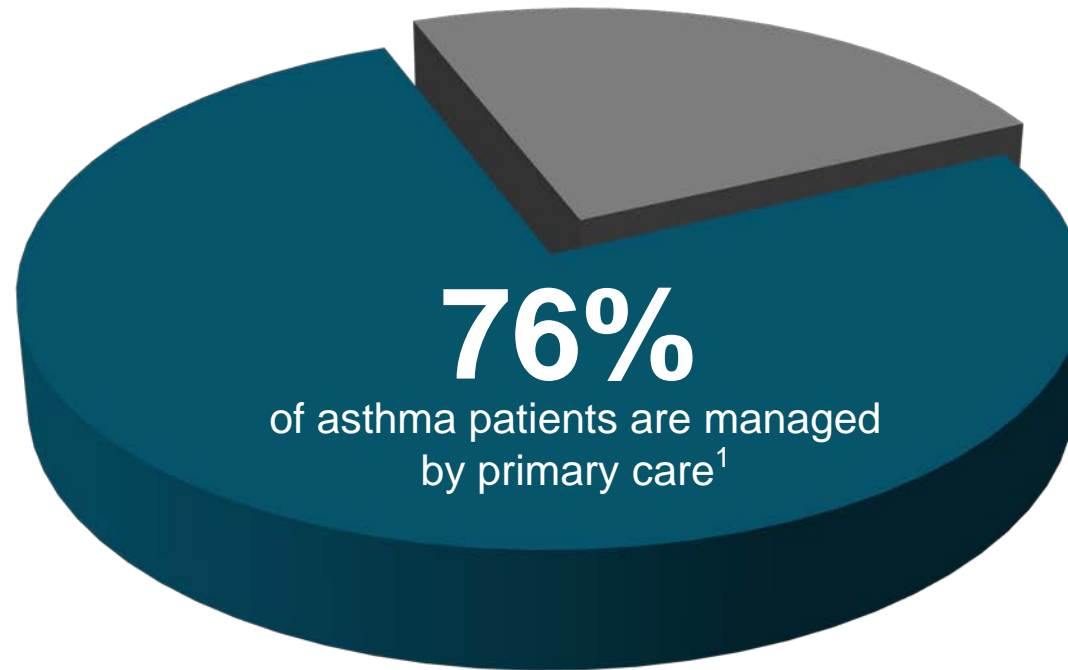
Lost work days

**\$50B<sup>3</sup>**

Annual direct costs  
of care

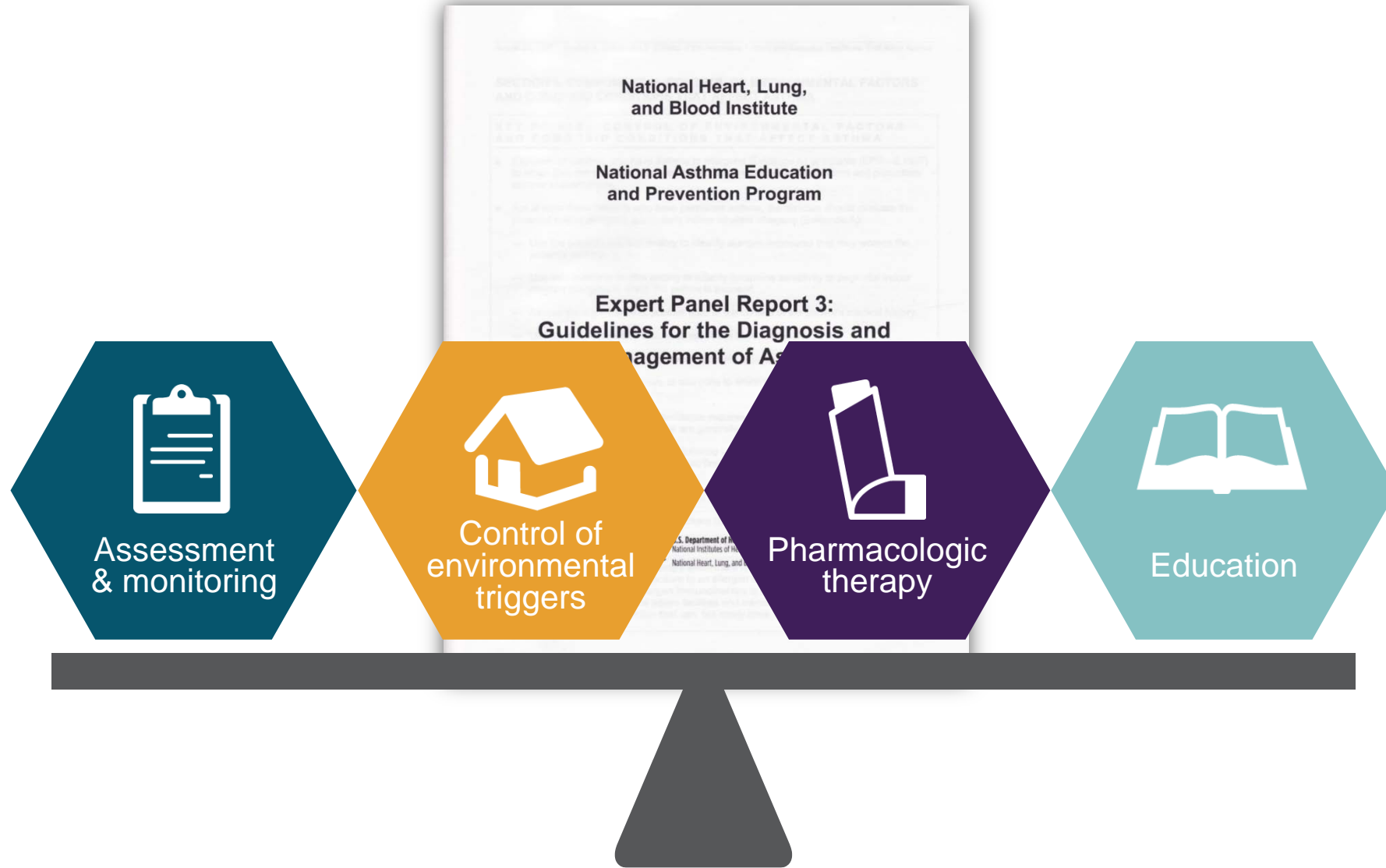
1. Asthma in the US. <http://www.cdc.gov/nchs/fastats/asthma.htm> Accessed Feb 12, 2013.
2. [cdc.gov/asthma/asthmadata.htm](http://cdc.gov/asthma/asthmadata.htm). National Surveillance of Asthma: United States, 2001–2010, Series 3, Number 35 Novem 2012 Accessed March 7, 2013.
3. Amer. Lung Assoc. Asthma in Adults. [www.lung.org/lung-disease/asthma/resources/facts-and-figures/asthma-in-adults.html](http://www.lung.org/lung-disease/asthma/resources/facts-and-figures/asthma-in-adults.html). Accessed March 7, 2013.
4. <http://www.cdc.gov/vitalsigns/asthma>. Accessed March 7, 2013.

- Most patients with asthma are managed by primary care

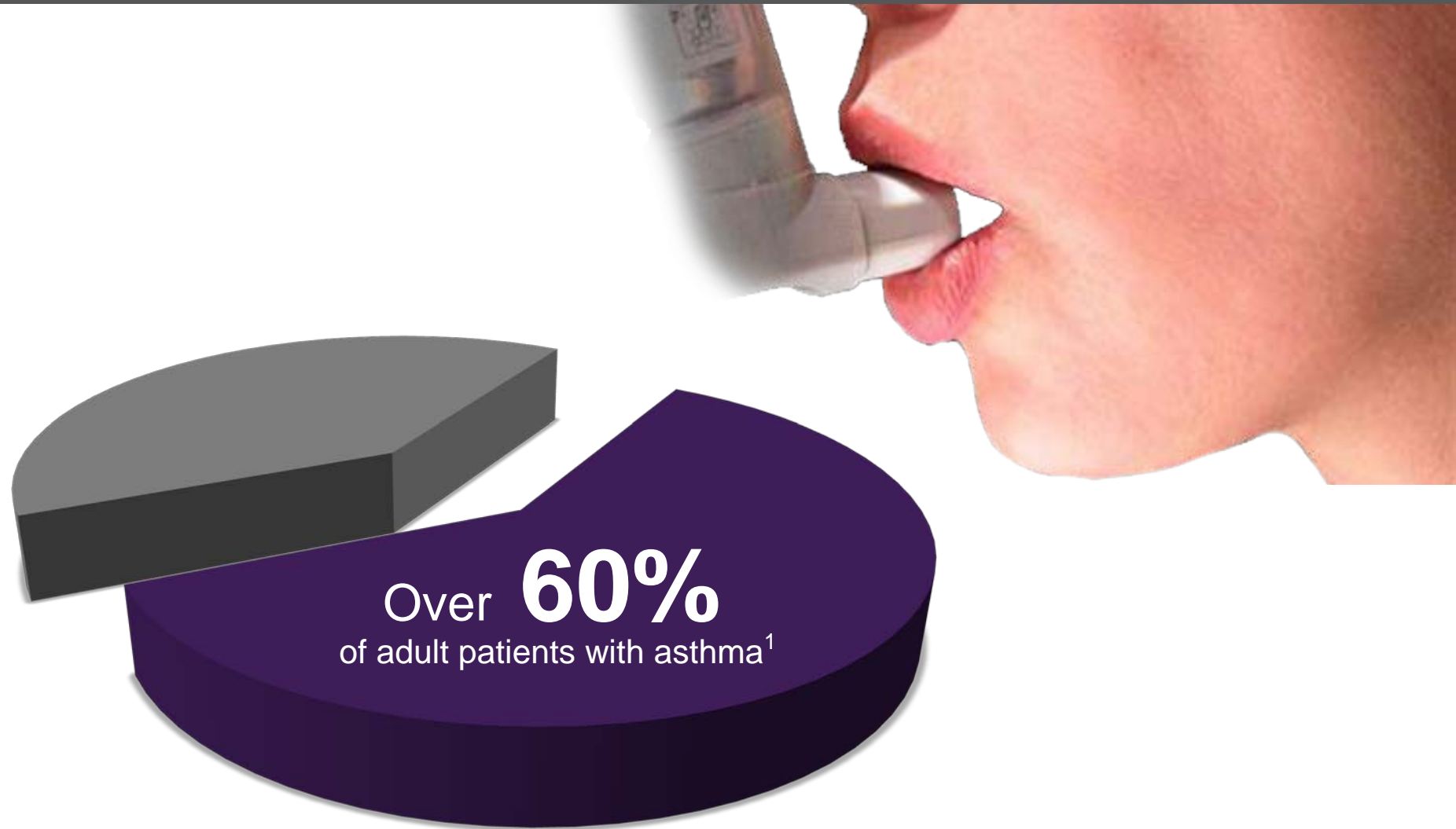


1. Kwong KYC, Eghrari-Sabet JS, Mendoza GR, et al. The benefits of specific Immunoglobulin e testing in the primary care setting. Am Manag Care. 2011;17:S447-S459.

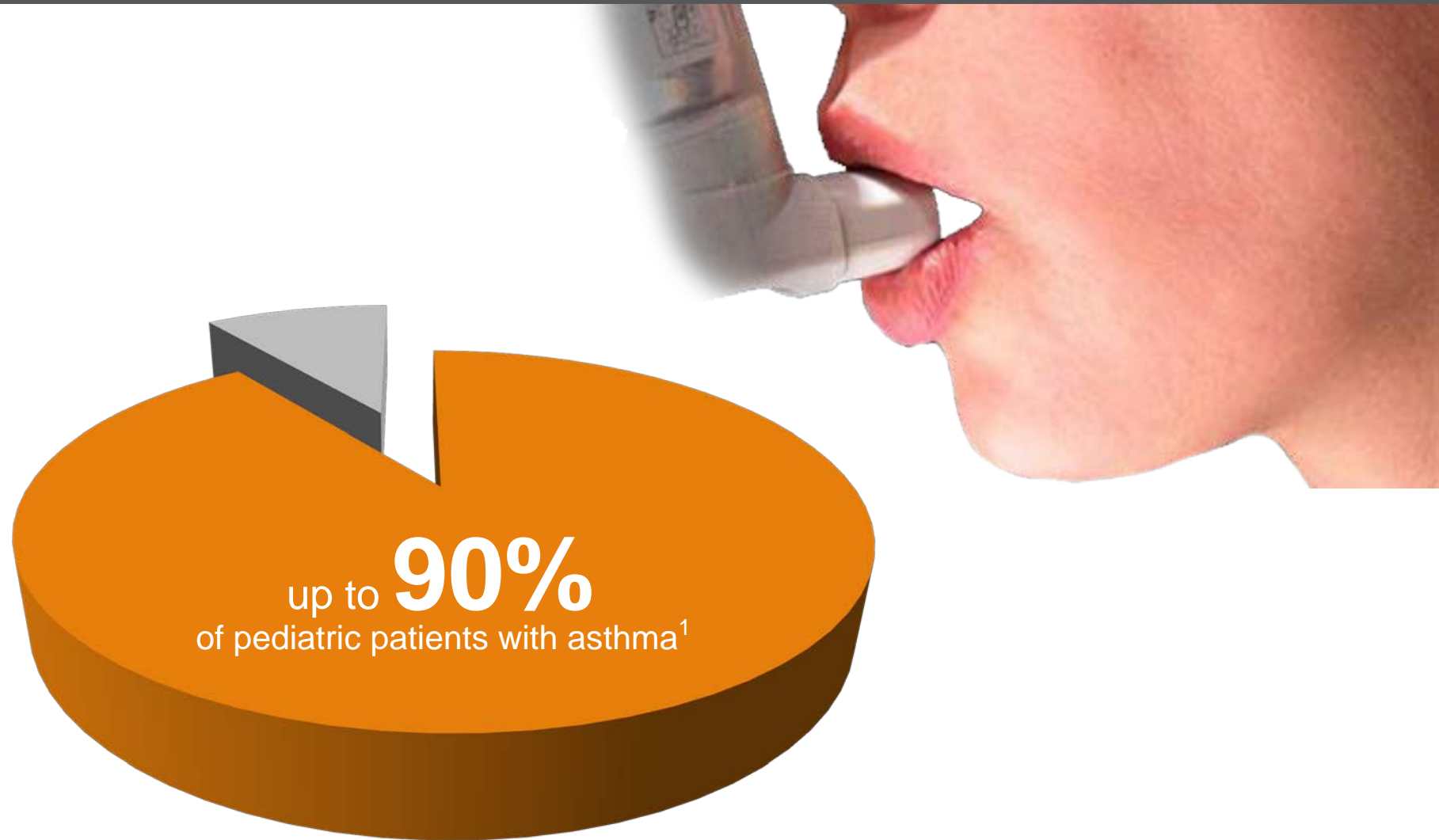
# Core Components of Asthma Care<sup>1</sup>



1. National Heart Lung and Blood Institute. National Asthma Education and Prevention Program. Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma. Full Report 2007. <http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.pdf>. Accessed May 3, 2013.

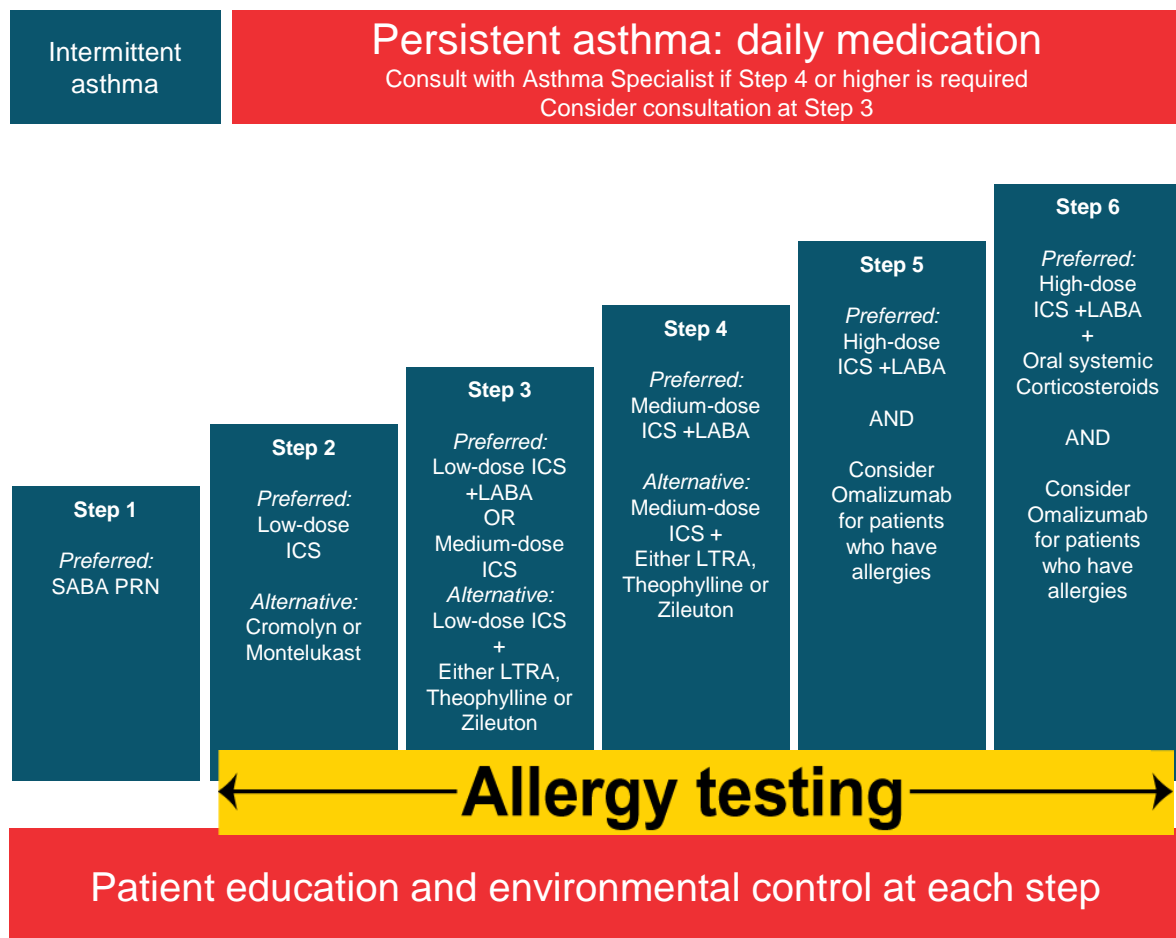


1. Characteristics of allergic sensitization among asthmatic adults older than 55 years: results from the National Health and Nutrition Examination Survey, 2005-2006  
Original Research Article Annals of Allergy, Asthma & Immunology, Volume 110, Issue 4, April 2013, Pages 247-252  
Image retrieved from: <https://www.hopepaige.com/how-to-properly-use-your-asthma-inhaler.aspx>



1. Høst A, et al. *Allergy*. 2000;55:600-608.  
Image retrieved from: <https://www.hopepaige.com/how-to-properly-use-your-asthma-inhaler.aspx>

## Stepwise Approach for Managing Asthma



## Environmental Controls

- Indicated across all levels of severity

## Allergy Testing

- Indicated for at least patients with persistent asthma
- Skin or *in vitro* tests may be used
- Category A evidence

1. NIH. *Guidelines for the Diagnosis and Management of Asthma*, 2007. NIH publication 08-4051.



# Is History Sufficient to Identify Allergic Triggers? 1



## High False Positive Rates w/ Structured History Alone

- **32%** cat
- **48%** grass pollen
- **75%** dust mite
- **54%** tree pollen
- **27%** dog



1. Smith HE, et al. *Journal of Allergy and Clinical Immunology*. 2009;123:646-50.

Case Study:  
3 year old male  
“Cough and wheeze”

## Presentation

- Cough & wheeze, worse at night
- No problems at Dad's home

## Past Medical History

- Several ED/office visits for acute respiratory distress x 1 yr
- Parents confirm mild eczema as an infant
- Immunizations up to date

## Social History

- Only child
- Large group daycare
- No pets at home
- No smokers at home

## Meds

- Budesonide .5 mg bid via nebulizer
- Montelukast 5 mg qd
- Albuterol 3-4x/week for nighttime wheezing

### Physical Exam

- RR=20, ht 50%, wt 60%
- WDWN male toddler; Active, NAD
- HEENT: Scant clear nasal discharge
- Lungs: Scattered wheezes bilaterally
- Skin: Clear

*Now what?*

Allergen	kU <sub>A</sub> /L (nl <0.10)
Cockroach	20.1
House dust mite ( <i>D. pteronyssinus</i> )	1.34
House dust mite ( <i>D. farinae</i> )	0.58
Meadow/June grass (Kentucky blue)	0.45
Oak	0.43
Common ragweed	0.41
Maple, Boxelder	0.39
Rough marshelder	0.37
Orchard grass (Cocksfoot)	0.35
Common silver birch	<0.10
Cat dander	<0.10
Dog dander	<0.10
Elm	<0.10
Mold ( <i>A. alternata</i> )	<0.10
Mold ( <i>A. fumigatus</i> )	<0.10
Mold ( <i>C. herbarum</i> )	<0.10
Total IgE	380 kU/L

# Counseling the Patient Regarding Targeted Exposure Reduction

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## Discover the connection

Reduce Exposure to Your Allergic Triggers

Patient Name: 3 y/o female  
Your Allergy Triggers:

- Cockroach
- Dust Mite
- Grass Pollen

Case history → Test results → Diagnosis

Specific IgE blood testing helps to identify your allergic triggers so you and your doctor can develop a plan to reduce your exposure to those allergens to which you are sensitized.

### The things that you are allergic to **really** add up

If you are allergic to pollen, that might not be the only reason you are sneezing, and if you have asthma that might not be the only reason you are wheezing. It may be because you are sensitive to more than one allergen. Allergens often add up and can cause you to sneeze, wheeze or get a runny nose.

To stay symptom free, you need to stay under your threshold. Every person has a different level at which they show symptoms. Until the level is reached, they are not affected. When that level is crossed however, the combination of allergens turns into symptoms.<sup>1,2</sup>

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- Make a plan with the patient
- Rank positive results in order from high to low IgE measurements
- Consider reducing exposure to allergens with the highest IgE levels first
- Focus on indoor triggers, since they may be easier to control

# Counseling the Patient Regarding Targeted Exposure Reduction

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## Reduce Exposure to Your Allergic Triggers<sup>3</sup>

### House dust mites

Dust mites are microscopic creatures that live in house dust and feed on dead skin flakes.

- Encase mattresses, pillows, and box springs in allergen-proof coverings
- Wash bedding weekly in 130° F hot water
- Keep house clean by vacuuming and reducing clutter
- Wear an appropriate mask while cleaning and avoid area 20 minutes after cleaning
- Change furnace and air conditioner filters
- Use a dehumidifier to reduce the humidity in your home

### Cockroaches

Cockroach saliva, fecal material, and shed skins are the main sensitizers for humans.

- Wash dishes, vacuum, keep food and garbage in closed containers, and take out garbage regularly
- Do not store paper bags, newspapers, or cardboard boxes in your home
- Place bait traps, or call a professional exterminator to eliminate cockroaches
- Seal plumbing openings, cracks, and crevices

### Molds (Indoor)

Molds are both indoors and outdoors. They give off spores that can cause allergic reactions throughout the year.

- Identify and clean moldy areas with fungicide or bleach
- Use a dehumidifier to reduce the humidity in your home
- Fix water leaks
- Clean surface filters on refrigerator, and dehumidifier (and clean drip pans with bleach)
- Thoroughly dry clothes before storing

### Pollens

Pollens are the tiny airborne particles given off by trees, weeds, and grasses.

- Shower after working outside —wash hair, eyes, and eyelashes
- Remove work clothes outdoors after working outside and carry them in a bag to the washing machine
- Take allergy medicines 30 minutes before going outdoors
- Stay indoors when pollen counts are high for pollens you are allergic to. Check reports for pollen count forecasts online at [www.pollen.com](http://www.pollen.com)
- Have someone else do your yard work, or wear a microfiber facemask
- At home and when driving, keep windows closed, and, when possible, use an air conditioner
- Use high-efficiency particulate air (HEPA) filters for furnace and vacuum cleaners

### Rodents

Integrated pest management (IPM) approaches offer effective means of controlling rodents in the home.

- Seal holes and cracks between rooms outside
- Seal passages through floors, walls, ceiling, and gaps between the bottom of cabinetry or built-in furniture to the floor
- Keep bushes and trees at least 6 feet from homes
- Ensure trash is stored in secure containers
- Store food in pest-proof containers

### Animals

Allergy to animal dander (such as a cat or dog) may also be a sensitivity to the animal's skin flakes and saliva.

- Confine the animal to a room with carpeted floor and wipeable furniture
- Restrict your furniture to the bedroom and keep the animal off furniture
- Use high-efficiency particulate air (HEPA) filters and vacuum cleaners
- Wash your pet regularly in warm water and soap
- If you own a pet, try to keep allergens or find it a new home

### Indoor Allergens

### Molds (Outdoor)

- Avoid mowing grass, leaf raking, mulch, composting, or leaf piles
- Avoid using fans that blow in outside air, window air conditioners, use an air conditioner, or use a recirculating fan to keep windows and doors closed

### Outdoor Allergens

**If specific IgE sensitization is not detected, your doctor may consider the following non-allergic triggers:**

- Cigarette smoke
- Paint / cleaning agents
- Temperature change
- Infection
- Alcohol
- Air pollution
- Perfume
- Aerosol sprays

**References:** 1. Haiken, S, et al. Effect of mattress and pillow encasings on children with asthma and house dust mite allergy. *J Allergy Clin Immunol.* 111:1:169-176. 2003.  
2. Morgan, WJ, et al. Results of a home-based environmental intervention among urban children with asthma. *N Engl J Med.* 1068-1080. 2004. 3. Environmental management of pediatric asthma. Guidelines for health care providers. National Guideline Clearinghouse. 2006.

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## Clinical Diagnosis

- Moderate Persistent Allergic Asthma
- Allergic Rhinitis

## Treatment – Parents agree and have the ability to:

- Targeted exposure reduction: Cockroach, dust mites, pollens
- Continue present meds

### Follow-Up:

- Now on budesonide 0.25 mg qd
- Exacerbations only with upper respiratory infections



## A Multifaceted Home-based Environmental Intervention

- 937 inner-city children
- Intervention activities tailored to child's sensitization profile
- Targeted allergen exposure reduction improves asthma control

1. Morgan WJ, et al. *N Engl J Med*. 2004;351(11):1068-1080.

# Inner-City Asthma Study<sup>1</sup>



- 2 years with Targeted Exposure Reduction
- Bedroom-only interventions
- 34 fewer days of wheezing; effect similar to ICS therapy



1. Morgan WJ, et al. *N Engl J Med.* 2004;351(11):1068-1080.

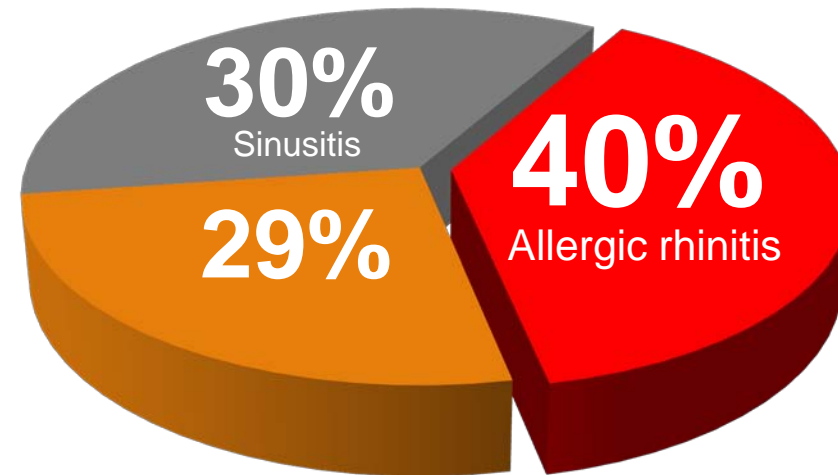


# Rhinitis



# Distribution of URD in US<sup>1-4</sup>

- 40% of total population (122M of 307M) have URD<sup>1-4</sup>



1. NIAID. Sinus infection (sinusitis) web page. <http://www3.niaid.nih.gov/topics/sinusitis/>. Accessed September 1, 2009.
2. ACAAI News Release. November 12, 2006.
3. Asthma and Allergy Foundation of America. PNAR-Perennial Non-Allergic Rhinitis. <http://www.aafa.org/print.cfm?id=9&sub=19&cont=266> Accessed September 1, 2009.
4. US Census Bureau. US & World Population Clock. <http://www.census.gov/main/www/popclock.html>.

## Similar Symptoms – different causes

Allergic Rhinitis	Non-Allergic Rhinitis	Infectious Rhinitis
Nasal Congestion	Nasal Congestion	Nasal Congestion
Nasal Discharge	Nasal Discharge	Nasal Discharge
Sneezing	Sneezing	Sneezing
Nasal Pruritis		Headache



- Reduce costs associated with absenteeism
- Improved productivity
- Appropriate use of medication
- Reduced medication costs
- Fewer unscheduled doctor visits

1. Welsh N, et al. *J Am Pharm Assoc.* 2006;46:627.

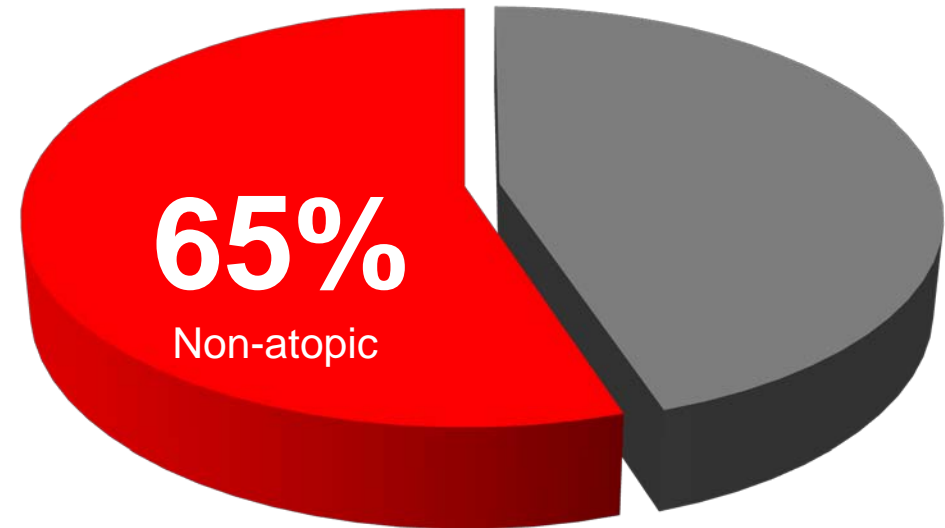
2. Szeinbach SL, Williams B, Muntendam P, et al. Identification of allergic disease among users of antihistamines. *J Manag Care Pharm.* 2004; 10 (3): 234-238.

3. Szeinbach SL, Seoane-Vazquez EC, Beyer A, Williams PB. The impact of allergic rhinitis on work productivity. *Prim Care Respir J* 2007;16(2):98-105.



# Allergic or Non-Allergic Rhinitis?

- Allergic and non-allergic rhinitis have similar symptoms but different causes
- In 2/3 (65%) of patients, symptoms were non-allergic in origin
- Testing identifies sensitization



1. Szeinbach SL, Williams B, Muntendam P, et al. Identification of allergic disease among users of antihistamines. *J Manag Care Pharm.* 2004;10(3):234-238.

Case Study:  
66 year old female  
“Frequent sinus headaches”

## Presentation

- Chronic rhinosinusitis
- Frequent “sinus” headaches
- Persistent postnasal drainage

## Social History

- Retired, widowed
- Lives in apartment with beloved cat



## Past Medical History

- States “allergic” to multiple foods/meds, esp. antibiotics
- Presumes URD symptoms due to cat allergy
- Previous choking sensation from thick, mucoid PND
- Records indicate ENT eval  $\ominus$  for posterior pharyngeal mass or polyps

## Meds

- Loratadine 10 mg
- Rx nasal steroids prn
- Freq OTC decongestant nasal sprays
- Freq courses of antibiotics

## Physical Exam

- VSS, NAD
- HEENT: Clear mucus
- Lungs: Clear to Auscultation
- Skin: Within normal limits

*Now what?*

Allergen	kU <sub>A</sub> /L (nl <0.10)
Maple, Boxelder	<0.10
Orchard grass (Cocksfoot)	<0.10
House dust mite ( <i>D. pteronyssinus</i> )	<0.10
Common ragweed	<0.10
Cat dander	<0.10
Elm	<0.10
Lamb's-quarter (Goosefoot)	<0.10
Oak	<0.10
Common silver birch	<0.10
Mold ( <i>A. alternata</i> )	<0.10
Dog dander	<0.10
White ash	<0.10
Cockroach	<0.10
Total IgE	43

## Clinical Diagnosis

- NON-allergic rhinosinusitis
- Rhinitis Medicamentosa?

## Treatment

- D/C antihistamine
- D/C nasal decongestant
- “Re-educate” on use of nasal steroid
  - Increase to QD (daily), appropriate technique
- Consider re-evaluating in 2-4 weeks upon change in tx

# Diagnostic Testing is Already Routine

## *Type 2 diabetes*

Hx & PE ➡ lab tests ➡ diet and exercise ➡ pharmacotherapy

## *Dyslipidemia*

Hx & PE ➡ lipid profile ➡ diet and exercise ➡ pharmacotherapy

## *Asthma*

Hx & PE ➡ IgE profile ➡ Targeted exposure reduction ➡ pharmacotherapy



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