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AAAAAI Liaison to AAPA
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Disclaimer slide

Honoraria – TAPA

Consultant - Boehringer Ingelheim, Meda, Mylan, TEVA

Speakers Bureau - Meda, Mylan, TEVA, ThermoFisher Scientific
Objectives

- Underscore the significant burden and impact on the quality of life due to allergic diseases
- Understand the importance of inflammation in the upper and lower airway
- Discuss several presentations of allergic disease
- Discuss several options for therapy of allergic diseases
Relative Prevalence of Allergic Disorders

Years of Age

% Prevalence

Atopic Dermatitis

Allergic Rhinitis

Asthma

Food Allergy
The Allergy March: A Progression of Seemingly Unrelated Diseases

- Atopic Dermatitis
- GI Distress
- Recurrent Otitis Media
- Allergic Rhinitis
- Allergic Asthma

Genetic Predisposition

Time (~years)
Atopy’s Long-Term Consequences

• Nearly 80% of children with AD go on to develop allergic rhinitis or asthma\(^1\)

• Children with early and long-lasting food sensitization:
  – 3x more likely to develop allergic rhinitis (AR) than those transiently sensitized\(^2\)
  – 5x more likely to develop asthma than those transiently sensitized\(^2\)

• Young wheezers with confirmed atopy are more likely to develop asthma\(^3\)

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Infantile atopic dermatitis
Atopic dermatitis in pre-schoolers
Atopic Dermatitis: Acute

- Erythema
- Crusting
- Papules
- Excoriations
Atopic Dermatitis: Subacute

- Erythema and scaling
- Excoriations
- Fissuring and increased skin markings
Atopic Dermatitis: Chronic

- Lichenification
- Excoriations

http://www.dermnet.com/index.html
Common Triggers

- **Foods**
  - Egg, milk, wheat, soy, peanut and fish
- **Aeroallergens**
  - Dust mite, weeds, animal dander and molds
- **Microbial agents**
  - *Staphylococcus Aureus*,
- **Stress**
- **Temperature extremes, irritants**
Management

- Patient Education
- Skin hydration
- Occlusives/moisturizers
- Topical steroids
- Topical calcineurin inhibitors
- Oral antihistamines
- Emotional aspect
- Multidiscipline approach
- Avoidance of allergens and irritants
Allergic Rhinitis (AR) Affects Many American Adults and Children

- Up to 40 million Americans affected
- 6th most prevalent chronic illness
- Prevalence estimates:
  - 1 in 5 adults (10%-30%)
  - 1 in 4 children (up to 40%)
  - Most common chronic condition in children
- Prevalence has increased substantially in recent decades in developed countries

AR Accounted for >16 Million Visits to PAs in 2006

- Dyslipidemia: 15 million visits
- Pain Management: 16.7 million visits
- Asthma: 11 million visits
- Diabetes: 15 million visits
- Hypertension or High BP: 18 million visits
- Respiratory Infection: 20 million visits
- Arthritis: 17 million visits
- Depression/Anxiety: 14 million visits
- Headache (including migraine): 10 million visits
- Allergic Rinitis/Hay Fever: 17 million visits

AR Is a Major Contributor to Total Costs of Health–Related Absenteeism and Presenteeism

*P*<0.05 for AR/hay fever vs. other conditions.

AR Imposes a Significant Burden on Quality of Life

AR Is Associated With:

- Fatigue and daytime sleepiness
- Daily activity impairment
- Reduced work productivity
- Impaired cognitive functioning
- Reduced learning abilities
- Impaired sleep
- Impaired quality of life

Patients With AR Can Suffer From Many Comorbid Conditions

- Upper Respiratory Infection
- Otitis Media
- Hearing Speech Development
- Sleep Apnea Syndrome
- Nasal Polyps
- Allergic Conjunctivitis
- Asthma
- Sinusitis

ALLERGIC RHINITIS

Most Patients with Asthma Have AR

- Approximately 80% of asthmatics have AR
- Most patients with allergic and non-allergic asthma have AR
- Many patients with AR have asthma
- AR is associated with and also constitutes a risk factor for asthma
- Many patients with AR have increased non-specific bronchial hyperreactivity

AR Can Increase Risk for Asthma ∼3-Fold

P<0.002

% of Subjects Who Developed Asthma

3.6

10.5

No AR at Baseline (n=528) AR at Baseline (n=162)

Medical History and Physical Examination Are Essential for Diagnosis of AR

- Detailed and accurate history *critical* to proper diagnosis and successful treatment
  - Time course: onset, pattern
  - Symptoms
  - Effect of previous treatments (Rx and OTC)
  - Sequelae and comorbidities
  - Family history-atopic history
- Physical exam: more than the nose

Physical Examination Should Include an Expanded HEENT Exam

• Skin: eczema, excoriation, shiners, Dennie-Morgan lines
• Eyes: injection, discharge, chemosis
• Ears: air fluid level, retraction
• Nose: transverse crease, turbinates, mucosa, discharge, nasal polyp
• Oropharynx: mouth breathing, palatal arch, post nasal drainage, cobblestoning
• Chest: wheezing

Signs of Allergic Rhinitis

- Facial Grimacing
- Allergic Salute
- Mouth Breathing
- Allergic Shiner

Diagnostic Tests for AR

- General ENT examination
- Allergy tests
  - Skin testing
  - Allergen-specific IgE antibody (RAST, ImmunoCap®)
- Endoscopy referral
  - Rigid
  - Flexible

RAST = radioallergosorbent testing
RAST and ImmunoCap® are trademarks of PhaDia AB.

Allergy Skin Testing

US POLLEN SEASONS

Current Treatment Options for AR

For SAR and PAR in adults and children

- Allergen avoidance
- Environmental control
- Oral H\textsubscript{1}-antihistamine
- Intranasal H\textsubscript{1}-antihistamine
- Intranasal corticosteroid
- Intranasal cromolyn sodium
- Subcutaneous specific immunotherapy

SAR=seasonal allergic rhinitis; PAR=perennial allergic rhinitis.

Environmental Control Measures: House Dust Mites

- Vigorous methods necessary
  - Ordinary vacuuming/dusting have little effect
  - Wash bedding weekly in water ≥130°F

- Simple furnishings without carpeting
  - Especially bedroom, family room, etc
  - Plastic, leather, wood are best

Measures for Reducing Animal Allergens

• The ideal solution: remove pets from house
• If not possible:
  – Keep pet out of bedroom
  – Use HEPA air filtering system
  – Remove carpet and other reservoirs for allergens from bedroom
  – Encasing on mattress, box springs, and pillow
  – Wash pet weekly

Pharmacologic Options in the Management of AR

- Antihistamines
  - Oral
  - Nasal
- Decongestants
  - Oral
  - Topical
- Anticholinergics
  - Oral
  - Intranasal
- Antihistamine/Decongestant Combinations
- Corticosteroids
  - Intranasal
  - Systemic
- Cromolyn sodium
- Leukotriene antagonists
- Immunotherapy

The Allergy Report. Volume II; 2000..
Role of Medications in AR: Antihistamines

<table>
<thead>
<tr>
<th>Sedating</th>
<th>Non-sedating/Low-sedating</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Chlorpheniramine, diphenhydramine</td>
<td>• Azelastine, cetirizine, desloratadine, fexofenadine, loratadine, levocetirizine, olapatidine</td>
</tr>
<tr>
<td>• Competitive antagonists of H₁-mediated effects</td>
<td>• Equally efficacious compared with sedating antihistamines</td>
</tr>
<tr>
<td>• Relieve rhinorrhea, pruritus, sneezing, and ocular symptoms</td>
<td>• Lack prominent CNS and anticholinergic effects</td>
</tr>
<tr>
<td>• Use limited by sedation, performance impairment, and anticholinergic effects</td>
<td>• Nonsedating: desloratadine, fexofenadine, loratadine</td>
</tr>
<tr>
<td></td>
<td>• Mildly sedating: cetirizine, azelastine (intranasal)</td>
</tr>
</tbody>
</table>

# Spray Volumes of Commercial Products

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Brand Name</th>
<th>Spray Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azelastine</td>
<td>Astelin® Astelin new formulation</td>
<td>137 μL</td>
</tr>
<tr>
<td>Olopatadine</td>
<td>Patanase®</td>
<td>100 μL</td>
</tr>
<tr>
<td>Ciclesonide</td>
<td>Omnaris®</td>
<td>70 μL</td>
</tr>
<tr>
<td>Fluticasone propionate</td>
<td>Flonase®</td>
<td>100 μL</td>
</tr>
<tr>
<td>Fluticasone furoate</td>
<td>Veramyst®</td>
<td>50 μL</td>
</tr>
<tr>
<td>Triamcinolone acetonide</td>
<td>Nasacort® AQ</td>
<td>100 μL</td>
</tr>
<tr>
<td>Flunisolide</td>
<td>Nasarel™</td>
<td>100 μL</td>
</tr>
<tr>
<td>Mometasone furoate</td>
<td>Nasonex®</td>
<td>100 μL</td>
</tr>
<tr>
<td>Budesonide</td>
<td>Rhinocort® Aqua™</td>
<td>50 μL</td>
</tr>
</tbody>
</table>
Pharmacologic Options in AR: Intranasal Corticosteroids

- Topical agents
  - Beclomethasone dipropionate
  - Budesonide
  - Flunisolide
  - Fluticasone furoate, fluticasone propionate
  - Mometasone furoate
  - Triamcinolone acetonide
- Produce anti-inflammatory effect by reducing number of eosinophils, basophils, T cells and mast cells
- Reduce release of preformed and newly generated mediators
- Can inhibit IgE production

What Do We Know About Intranasal Corticosteroids?

- Most effective pharmacotherapy for AR
- Control all four major symptoms
  - Sneezing
  - Rhinorrhea
  - Itching
  - Nasal blockage
- Similar in terms of efficacy, safety, and effect on QOL vs. placebo
- Important differences can influence patient preference, compliance, and outcomes
  - Onset and duration of action
  - Magnitude of effect

QOL = Quality of life

What Is Allergen Immunotherapy?

- Desensitization process
  - Includes administration of increasing doses of a specific allergen, over time, to a sensitive individual
  - Increases tolerance for the particular allergen
  - Decreases symptoms when patient comes in contact with particular allergen
  - Effective when optimally administered

- May be useful in patients unresponsive or intolerant to conventional therapy

- Not generally recommended for children <5 yrs

- Should be performed by a specialist


Emerging Therapies in Allergic Rhinitis

- Sublingual immunotherapy
  - Extracts of mite, grass, tree, ragweed allergens
  - More research needed on mechanism of action and long-term benefits
- New antihistamines
  - Epinastine
  - Acravastine
  - Temelastin
- New nasal antihistamines: olopatadine
- New corticosteroids: ciclesonide (pro-drug)
- Monoclonal anti-IgE therapy: omalizumab

Asthma Facts

30 Million Persons

2 Million ED Visits

500,000 Hospitalizations

Over 4,900 Deaths (14/day)

Disproportionately Affects Children and African Americans

Costs of Asthma $16 Billion

American Lung Association Fact Sheet: Asthma in Adults, June 2004. Available at: http://www.lungusa.org/site/
National Institute of Allergy and Infectious Disease. Focus on Asthma. Available at: http://www.niaid.nih.gov/newsroom
Classification of Asthma

Asthma
30 million in US

Intermittent
7.3%

Persistent
92.7%

Mild
15.4%

Moderate/Severe
77.3%

Asthma 30 million in US

Intermittent 7.3%

Persistent 92.7%

Mild 15.4%

Moderate/Severe 77.3%
Asthma Pathophysiology

BRONCHUS

Normal

Asthma

Cartilage
Mucous gland
Airway
Muscle Layer

Reduced airway opening
Mucus
Muscle Layer Contracts
Initial Assessment and Diagnosis

• Determine that:
  – Patient has history or presence of episodic symptoms of airflow obstruction
  – *Airflow obstruction is at least partially reversible*
  – Alternative diagnoses are excluded

• Methods for establishing diagnosis:
  – Detailed medical history
  – Physical exam
  – *Spirometry to demonstrate reversibility*
Is airflow obstruction at least partially reversible by spirometry?

- **Airflow obstruction:**
  - $\text{FEV}_1 < 80\%$ predicted
  - $\text{FEV}_1/\text{FVC} < 65\%$ or below the lower limit of normal

- **Reversibility:**
  - $\text{FEV}_1$ increases $\geq 12\%$ and $\geq 200$ mL after short-acting inhaled beta$_2$-agonist
Does patient have history or presence of episodic symptoms of airflow obstruction?

- Wheeze, shortness of breath, chest tightness, or cough
- Asthma symptoms vary throughout the day
- Absence of symptoms at the time of the examination does not exclude the diagnosis of asthma
Role of Allergy in Asthma

- Allergy is common in children
  - 80%–90% of school-aged children with asthma
  - “Treat the sneeze-prevent the wheeze” - E. Bronsky MD

- Presence of allergy is associated with more severe and persistent asthma

- Allergen exposure is associated with
  - Increased risk of developing asthma
  - Increased asthma morbidity
  - “Allergic March”

Allergen avoidance can reduce airway hyperreactivity and asthma morbidity
**Goal of Asthma Therapy: Achieve Control**

### Reduce Impairment
- Prevent chronic and troublesome symptoms
- Require infrequent use of inhaled SABA (≤2 days/week)
- Maintain (near) “normal” pulmonary function
- Maintain normal activity levels
- Meet patients’ expectations of, and satisfaction with, asthma care

### Reduce Risk
- Prevent recurrent exacerbations
- Minimize need for emergency department visits or hospitalizations
- Prevent progressive loss of lung function
- Provide optimal pharmacotherapy, with minimal or no adverse effects

Stepwise Approach for Managing Asthma in Children Aged 0 to 4 Years

**Step 1**
*Preferred:*
- Medium-dose ICS (A)
- Low-dose ICS (A)
*Alternative:*
- Cromolyn (B)
- Montelukast (A)

**Step 2**
*Preferred:*
- SABA PRN
*Alternative:*
- Intermittent Asthma

**Step 3**
*Preferred:*
- Medium-dose ICS + either LABA (D) or Montelukast (D)

**Step 4**
*Preferred:*
- Medium-dose ICS + either LABA (D) or Montelukast (D)

**Step 5**
*Preferred:*
- High-dose ICS + either LABA or Montelukast (D)
- Oral Systemic Corticosteroids (D)

**Step 6**
*Preferred:*
- High-dose ICS + either LABA or Montelukast (D)

**Persistent Asthma: Daily Medication**
Consult with asthma specialist if Step 3 care or higher is required.
Consider consultation at Step 2.

**Intermittent Asthma**
Consult with asthma specialist if Step 3 care or higher is required.
Consider consultation at Step 2.

**Patient Education and Environmental Control at Each Step**
- Quick-Relief Medication for All Patients
  - SABA as needed for symptoms. Intensity of treatment depends on severity of symptoms
  - With viral respiratory infection: SABA q 4-6 hours up to 24 hours (longer with physician consult). Consider short course of oral systemic corticosteroids if exacerbation is severe or patient has history of previous severe exacerbations
  - Caution: Frequent use of SABA may indicate the need to step up treatment. See text for recommendations on initiating daily long-term-control therapy

Stepwise Approach for Managing Asthma in Children Aged 5 to 11 Years

Intermittent Asthma

Step 2
Preferred: Low-dose ICS (A)
Alternative: Cromolyn (B), LTRA (B), Nedocromil (B), or Theophylline (B)

Step 3
Preferred: EITHER Medium-dose ICS + LABA (B)
Alternative: High-dose ICS + either LTRA (B), or Theophylline (B)
OR Medium-dose ICS (B)

Step 4
Preferred: High-dose ICS + LABA (B)
Alternative: Medium-dose ICS + either LTRA (B) or Theophylline (B)

Step 5
Preferred: High-dose ICS + LABA (B)
Alternative: High-dose ICS + either LTRA (B) or Theophylline (B)

Step 6
Preferred: High-dose ICS + LABA + Oral Systemic Corticosteroid (D)
Alternative: High-dose ICS + either LTRA or Theophylline and Oral Systemic Corticosteroid (D)

Persistent Asthma: Daily Medication

Consult with asthma specialist if Step 4 care or higher is required. Consider consultation at Step 3.

Each Step: Patient education, environmental control, and management of comorbidities

Steps 2-4: Consider subcutaneous allergen immunotherapy for patients who have allergic asthma

Quick-Relief Medication for All Patients

- SABA as needed for symptoms. Intensity of treatment depends on severity of symptoms: up to 3 treatments at 20-minute intervals as needed. Short course of oral systemic corticosteroids may be needed
- Caution: Increasing of use of SABA or use >2 days a week for symptom relief (not prevention of EIB) indicates inadequate control and the need to step up treatment

Stepwise Approach for Managing Asthma in Patients Aged ≥12 Years

**Step 1**

*Preferred:*
Low-dose ICS (A)  

*Alternative:*
Cromolyn (A), LTRA (A), Nedocromil (A), or Theophylline (B)

**Step 2**

*Preferred:*
Low-dose ICS + LABA (A)  
OR  
Medium-dose ICS + LABA (B)

*Alternative:*
Low-dose ICS + either LTRA (A), Nedocromil (A), or Theophylline (B), or Zileuton (D)

**Step 3**

*Preferred:*
Medium-dose ICS + LABA (B)  
OR  
Medium-dose ICS + LTRA (A)

*Alternative:*
Low-dose ICS + either LTRA (A), Nedocromil (A), Theophylline (B), or Zileuton (D)

**Step 4**

*Preferred:*
High-dose ICS + LABA (B)
AND  
Consider Omalizumab for Patients Who Have Allergies (B)

**Step 5**

*Preferred:*
High-dose ICS + LABA + Oral Corticosteroid
AND  
Consider Omalizumab for Patients Who Have Allergies (B)

**Step 6**

*Preferred:*
High-dose ICS + LABA + Oral Corticosteroid
AND  
Consider Omalizumab for Patients Who Have Allergies (B)

**Quick-Relief Medication for All Patients**

- SABA as needed for symptoms. Intensity of treatment depends on severity of symptoms: up to 3 treatments at 20-minute intervals as needed. Short course of systemic oral corticosteroids may be needed.
- Use of SABA >2 days a week for symptom relief (not prevention of EIB) generally indicates inadequate control and the need to step up treatment.

**Intermittent Asthma**

Consult with asthma specialist if Step 4 care or higher is required. Consider consultation at Step 3.

**Persistent Asthma: Daily Medication**

Consult with asthma specialist if Step 4 care or higher is required. Consider consultation at Step 3.

**Assess Control**

Step Up If Needed (first, check adherence, environmental control, and comorbid conditions)

Step Down If Possible (and asthma is well controlled at least 3 months)

ICS = inhaled corticosteroids; LABA = long-acting β₂-agonist; LTRA = leukotriene receptor antagonist.

Classifying Asthma Severity and Initiating Treatment in Youths ≥12 Years of Age and Adults

<table>
<thead>
<tr>
<th>Components of Severity</th>
<th>Intermittent</th>
<th>Persistent</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mild</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>Impairment</strong></td>
<td></td>
<td>0-2/year</td>
<td>&gt;2/year</td>
</tr>
<tr>
<td>Normal FEV&lt;sub&gt;1&lt;/sub&gt;/FVC:</td>
<td></td>
<td>Frequency and severity may fluctuate over time for patients in any severity category</td>
<td>Relative annual risk of exacerbations may be related to FEV&lt;sub&gt;1&lt;/sub&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0-2/year</td>
<td>&gt;2/year</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Frequency and severity may fluctuate over time for patients in any severity category</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Frequency and severity may fluctuate over time for patients in any severity category</td>
<td>Relative annual risk of exacerbations may be related to FEV&lt;sub&gt;1&lt;/sub&gt;</td>
</tr>
<tr>
<td>Risk</td>
<td></td>
<td>In 2 to 6 weeks, evaluate level of asthma control that is achieved and adjust therapy accordingly</td>
<td></td>
</tr>
</tbody>
</table>

Exacerbations (requiring oral corticosteroids)

EIB = exercise-induced bronchoconstrictions; FEV<sub>1</sub> = forced expiratory volume in one second; FVC = forced vital capacity.

Assessing Asthma Control and Adjusting Therapy in Youths ≥12 Years of Age and Adults

<table>
<thead>
<tr>
<th>Components of Control</th>
<th>Well Controlled</th>
<th>Not Well Controlled</th>
<th>Very Poorly Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impairment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symptoms</td>
<td>≤2 days/week</td>
<td>&gt;2 days/week</td>
<td>Throughout the day</td>
</tr>
<tr>
<td>Nighttime awakenings</td>
<td>≤2x/month</td>
<td>1-3x/week</td>
<td>≥4x/week</td>
</tr>
<tr>
<td>Interference with normal activity</td>
<td>None</td>
<td>Some limitation</td>
<td>Extremely limited</td>
</tr>
<tr>
<td>SABA use for symptom control (not prevention of EIB)</td>
<td>≤2 days/week</td>
<td>&gt;2 days/week</td>
<td>Several times per day</td>
</tr>
<tr>
<td>FEV1 or peak flow</td>
<td>&gt;80% predicted/personal best</td>
<td>60%-80% predicted/personal best</td>
<td>&lt;60% predicted/personal best</td>
</tr>
<tr>
<td>Validated questionnaires</td>
<td>0 ≤0.75  ≥20</td>
<td>1-2 ≥1.5 16-19</td>
<td>3-4 N/A ≤15</td>
</tr>
<tr>
<td>ATAQ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACQ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exacerbations requiring oral systemic corticosteroids</td>
<td>0-1/year</td>
<td>≥2/year</td>
<td>Consider severity and interval since last exacerbation</td>
</tr>
<tr>
<td><strong>Risk</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Progressive loss of lung function</td>
<td>Evaluation requires long-term follow-up</td>
<td>Medication side effects can vary in intensity from none to very troublesome and worrisome. The level of intensity does not correlate to specific levels of control but should be considered in the overall assessment of risk</td>
<td></td>
</tr>
<tr>
<td>Treatment-related adverse effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Recommended Action for Treatment</strong></td>
<td>• Maintain current step</td>
<td>• Step up 1 step and</td>
<td>• Consider short course of oral systemic corticosteroids</td>
</tr>
<tr>
<td>• Regular follow-ups every 1-6 months to maintain control</td>
<td>• Reevaluate in 2 to 6 weeks</td>
<td>• Step up 1-2 steps, and</td>
<td></td>
</tr>
<tr>
<td>• Consider step down if well controlled for at least 3 months</td>
<td>• For side effects, consider alternative treatment options</td>
<td>• Reevaluate in 2 weeks</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For side effects, consider alternative treatment options</td>
<td></td>
</tr>
</tbody>
</table>

Asthma Control Test (ACT)

1. In the past 4 weeks, how much of the time did your asthma keep you from getting as much done at work, school or at home?

2. During the past 4 weeks, how often have you had shortness of breath?

3. During the past 4 weeks, how often did your asthma symptoms (wheezing, coughing, shortness of breath, chest tightness or pain) wake you up at night, or earlier than usual in the morning?

4. During the past 4 weeks, how often have you used your rescue inhaler or nebulizer medication (such as albuterol)?

5. How would you rate your asthma control during the past 4 weeks?

Asthma Control Test™ is a trademark of QualityMetric Incorporated.
1. How is your asthma today?

- 0: Very bad
- 1: Bad
- 2: Good
- 3: Very Good

2. How much of a problem is your asthma when you run, exercise or play sports?

- 0: It's a big problem, I can't do what I want to do.
- 1: It's a problem and I don't like it.
- 2: It's a little problem but it's okay.
- 3: It's not a problem.

3. Do you cough because of your asthma?

- 0: Yes, all of the time.
- 1: Yes, most of the time.
- 2: Yes, some of the time.
- 3: No, none of the time.

4. Do you wake up during the night because of your asthma?

- 0: Yes, all of the time.
- 1: Yes, most of the time.
- 2: Yes, some of the time.
- 3: No, none of the time.
5. During the **last 4 weeks**, on average, how many **days per month** did your child have any daytime asthma symptoms?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>5</td>
</tr>
<tr>
<td>1-3 days/mo</td>
<td>4</td>
</tr>
<tr>
<td>4-10 days/mo</td>
<td>3</td>
</tr>
<tr>
<td>11-18 days/mo</td>
<td>2</td>
</tr>
<tr>
<td>19-24 days/mo</td>
<td>1</td>
</tr>
<tr>
<td>Everyday</td>
<td>0</td>
</tr>
</tbody>
</table>

6. During the **last 4 weeks**, on average, how many **days per month** did your child wheeze during the day because of asthma?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>5</td>
</tr>
<tr>
<td>1-3 days/mo</td>
<td>4</td>
</tr>
<tr>
<td>4-10 days/mo</td>
<td>3</td>
</tr>
<tr>
<td>11-18 days/mo</td>
<td>2</td>
</tr>
<tr>
<td>19-24 days/mo</td>
<td>1</td>
</tr>
<tr>
<td>Everyday</td>
<td>0</td>
</tr>
</tbody>
</table>

7. During the **last 4 weeks**, on average, how many **days per month** did your child wake up during the night because of asthma?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>5</td>
</tr>
<tr>
<td>1-3 days/mo</td>
<td>4</td>
</tr>
<tr>
<td>4-10 days/mo</td>
<td>3</td>
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<tr>
<td>11-18 days/mo</td>
<td>2</td>
</tr>
<tr>
<td>19-24 days/mo</td>
<td>1</td>
</tr>
<tr>
<td>Everyday</td>
<td>0</td>
</tr>
</tbody>
</table>
Scoring the ACT/C-ACT

- 19 or less: Your asthma may not be under control.
  - Make an appointment to discuss your Asthma Control Test score.
- 20 or more: Your asthma seems to be well controlled.

www.asthmacontrol.com
Overview of Asthma Medications

Long-Term Control
- Corticosteroids (inhaled)
- Long-acting beta\textsubscript{2}-agonists
- Leukotriene modifiers
- Cromolyn/nedocromil
- Methylxanthines
- Anti-IgE therapy

Quick Relief
- Short-acting inhaled beta\textsubscript{2}-agonists
- Anticholinergics
- Systemic corticosteroids
Medications to Treat Asthma: Short-acting Inhaled Bronchodilators

- Proventil, Ventolin (albuterol)
- Xopenex (levalbuterol) – now in MDI
- Maxair Autohaler (pirbuterol)
- Alupent (metaproterenol)
- For relief of acute symptoms or as preventive treatment prior to exercise
  - Drugs of choice for acute bronchospasm
- Potential adverse effects: tremors, tachycardia, headache
### Available ICS Agents

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Brand Name</th>
<th>Propellant or Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beclomethasone dipropionate (BDP)</td>
<td>QVAR®</td>
<td>MDI-HFA</td>
</tr>
<tr>
<td>Budesonide inhalation powder</td>
<td>Pulmicort Turbuhaler®</td>
<td>DPI</td>
</tr>
<tr>
<td>Budesonide inhalation suspension</td>
<td>Pulmicort Respules®</td>
<td>Nebulized suspension</td>
</tr>
<tr>
<td>Flunisolide inhalation</td>
<td>AeroBid®</td>
<td>MDI-HFA</td>
</tr>
<tr>
<td>Fluticasone propionate</td>
<td>Flovent®</td>
<td>MDI-HFA, DPI</td>
</tr>
<tr>
<td>Triamcinolone acetonide</td>
<td>Azmacort®</td>
<td>MDI-CFC</td>
</tr>
<tr>
<td>Mometasone furoate (MF)</td>
<td>Asmanex Twisthaler®</td>
<td>DPI</td>
</tr>
</tbody>
</table>

**Recently approved ICS**

| Ciclesonide (CIC)      | Alvesco ®                  | MDI-HFA                  |

MDI = metered dose inhaler; HFA = hydrofluoroalkane; DPI = dry powder inhaler; CFC = chlorofluorocarbon.

Medications to Treat Asthma: Steroid Phobia-Unfounded

- Inhaled steroids in doses most often prescribed are very safe
- Inhaled meds delivered directly to lungs where they are needed
- Little systemic absorption if proper technique used
Medications to Treat Asthma: Long Acting Beta Agonists

- Serevent (salmeterol diskus)
- Foradil (fomoterol DPI)
- Potential adverse effects: tachycardia, tremors, hypokalemia
- Should not be used in place of anti-inflammatory therapy
Why Use Combination (ICS + LABA) Therapy?

Low-dose ICS + LABA vs. comparator results in:

• ↑ Lung function
• ↓ Symptoms
• ↓ Exacerbations
• ↓ Albuterol use
• Reduced need to increase ICS dose

Replicated numerous times by other investigators.

Nelson et al *J Allergy Clin Immunology*. 2000;106:1088-1095
ICS + LABA Combinations

- Greater efficacy in combination products versus ICS alone:
  - Improved daytime and nighttime symptoms
  - Improved lung function
  - Decreased SABA need
  - Reduced frequency of exacerbations
  - Improved asthma control
  - Reduced ICS dose
- Increased convenience
- May improve adherence
- U.S. combinations:
  1. Budesonide + formoterol (HFA) Approved 2007
  2. Fluticasone + salmeterol (DPI & HFA)

GINA Guidelines 2006
Asthma control means different things to different people.
The nose is that portion of the respiratory tract accessible by the finger.

-Sheldon L. Spector, MD