Emerging Challenges in Primary Care: 2018

The Role of Type 2 Inflammation in Severe Asthma: Integrating Biologic Therapy to Optimize Outcomes
Faculty

- **Diego J. Maselli, MD FCCP**  
  Assistant Professor of Medicine  
  Division of Pulmonary Diseases & Critical Care  
  University of Texas Health Science Center at San Antonio  
  Director, Respiratory Care, University Health System  
  Director, Severe Asthma Program, University Health System  
  San Antonio, TX

- **Sandra G. Adams, MD, MS**  
  Professor, Division of Pulmonary Diseases and Critical Care Medicine  
  UT Health San Antonio  
  Staff Physician, The South Texas Veterans Health Care System  
  Founder, President  
  WipeDiseases Foundation  
  San Antonio, TX
Disclosures

- **Diego Maselli, MD, FCCP** serves as a consultant for Sunovion, Bayer, and AstraZeneca.

- **Sandra Adams, MD, MS, FCCP** serves as an Investigator/Grants/Research/Continuing Education member for the National Institute of Health; Veterans Affairs, University of Texas System, Chest Foundation, AstraZeneca Pharmaceuticals LP, Boehringer Ingelheim Pharmaceuticals, Inc., Daiichi Sankyo, GlaxoSmithKline, Novartis Pharmaceuticals, and Sunovion Pharmaceuticals, Inc. Dr. Adams also serves as the President for WipeDiseases Foundation.
Learning Objectives

1. Describe newer concepts in the pathophysiology of asthma and type 2 inflammation and the implications of biologic therapies in the era of precision medicine

2. Determine the utility of simple biomarkers to identify patients who are candidates for targeted biologic therapies and appropriate referral

3. Discuss the impact of comorbid conditions on asthma control and the evidence-based approach to their treatment

4. Discuss the paradigms of multidisciplinary care in asthma, with an emphasis on patient and provider education, to improve adherence to inhalers and emerging biologic therapies in asthma
PRE-TEST QUESTIONS
How confident are you in your ability to differentiate phenotypes of asthma?

1. Not at all confident
2. Slightly confident
3. Moderately confident
4. Pretty much confident
5. Very confident
Pre-test ARS Question 2

How often do you consider treating comorbidities to improve asthma control?

1. Never
2. Rarely
3. Sometimes
4. Frequently
5. Always
Pre-test ARS Question 3

Approximately how many patients with Asthma do you see on a weekly basis, in any clinical setting?

1. None
2. 1-5
3. 6-10
4. 11-15
5. 16-20
6. 21-25
7. >25
Importance of Asthma

- Asthma affects 26 million Americans (7-12%).
- Costs $56 billion in healthcare costs + lost productivity at work/school
- Prevalence continues to increase
What is Severe Asthma?

Definition

- Asthma that requires treatment with high-dose ICS + a second controller (and/or systemic steroids)
- Frequent exacerbations

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  - Asthma that requires treatment with high-dose ICS + a second controller (and/or systemic steroids)
  - Frequent *exacerbations*

- **Other descriptions**
  - Difficult-to-treat asthma
  - Refractory asthma
  - Near-fatal asthma

What is Severe Asthma?

- **Definition**
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  - Frequent *exacerbations*

- **Other descriptions**
  - Difficult-to-treat asthma
  - Refractory asthma
  - Near-fatal asthma

- **5%-10%** of asthmatics meet definition of severe asthma

Approach to Severe Asthma

- Accurate diagnosis
- Therapy
- Trigger control
- Education
- Comorbid conditions

Asthma Care
**Stepwise Approach to Asthma Therapy**

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
<th>Step 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low dose ICS</td>
<td>Low dose ICS</td>
<td>Med/high ICS/LABA</td>
<td>Consider add-on treatments:</td>
<td></td>
</tr>
<tr>
<td>LTRA</td>
<td>LTRA</td>
<td>Med/high ICS/LABA</td>
<td>Tiotropium</td>
<td></td>
</tr>
<tr>
<td>Low dose</td>
<td>Low dose</td>
<td>Tiotropium</td>
<td>Oral steroids</td>
<td></td>
</tr>
<tr>
<td>theophylline</td>
<td>theophylline</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ICS:** inhaled corticosteroids  
**LABA:** long-acting β agonist  
**Leukotriene receptor antagonist**  
**Tiotropium:** long-acting muscarinic antagonist
Asthma is a **heterogeneous** disease
Therapy for Severe Asthma

Asthma is a *heterogeneous* disease

Is everyone the same?

Can we better *tailor* therapy?
Asthma Phenotypes

- Early-onset allergic
- Severe asthma
  - Late-onset eosinophilic
  - Late-onset neutrophilic

Asthma Phenotypes

- Starts during childhood
- Positive allergy testing
- +/- eosinophils

Early-onset allergic

Late-onset eosinophilic

Late-onset neutrophilic

Severe asthma

**Early-onset allergic**
- Starts during childhood
- Positive allergy testing
- +/- eosinophils

**Severe asthma**
- Strong eosinophilic component
- Less atopic
- +/- obesity

**Late-onset eosinophilic**

**Late-onset neutrophilic**
Severe asthma

Early-onset allergic

- Starts during childhood
- Positive allergy testing
- +/- eosinophils

Severe asthma

- Fixed obstruction
- Reduced lung function
- Obesity

Late-onset eosinophilic

- Strong eosinophilic component
- Less atopic
- +/- obesity

Late-onset neutrophilic

ARS Question 4

Which of the following is an example of type-2 asthma?

1. Eosinophilic asthma
2. Paucigranulocytic asthma
3. Obesity-associated asthma
4. Smoking-associated (neutrophilic) asthma
Type-2 Asthma

- With a better understanding of different inflammatory patterns in asthma, a new nomenclature has developed

- Activated cells include eosinophils, mast cells, basophils, TH2 cells, type 2 innate lymphoid cells (ILC2s), IgE-producing B cells

Wenzel SE. Nat Med. 201218.5:716-725.
Type-2 Asthma

- With a better understanding of different inflammatory patterns in asthma, a new nomenclature has developed
- Activated cells include eosinophils, mast cells, basophils, TH2 cells, type 2 innate lymphoid cells (ILC2s), IgE-producing B cells

**Type-2 asthma**
- Allergic asthma
- Eosinophilic asthma (less allergic)
- Exercise induced asthma

**Non-Type 2 (Low-Type 2) asthma**
- Obesity associated asthma
- Smoking associated asthma (neutrophilic)
- Paucigranulocytic asthma (smooth-muscle mediated)

Wenzel SE. Nat Med. 201218.5:716-725.
Type-2 Asthma Comorbidities

- Type 2 inflammation can also cause comorbidities

**Type-2 Asthma Inflammation**

**Activated Cells**
- Type 2 Helper lymphocytes
- Eosinophils
- Mast cells basophils
- Type 2 innate lymphoid cells (ILC2s)
- IgE-producing B cells

**Cytokines**
- Immunoglobulin E (IgE)
- Interleukins (IL)
  - IL-4
  - IL-5
  - IL-13
Effects of Type-2 Inflammation

Dendritic cells, IL-25, IL-33, TSLP

Pollutants, viral infections, allergens

Effects of Type-2 Inflammation

Dendritic cells, IL-25, IL-33, TSLP

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Effects of Type-2 Inflammation

Dendritic cells, IL-25, IL-33, TSLP

Pollutants, viral infections, allergens

ARS Question 5

A 38-year-old obese man (BMI 30.3 kg/m²) with 10-year history of asthma and 5-year history of GERD presents for a checkup. He reports 2 acute asthma exacerbations in the last year and notes that his asthma is often worse after supper. Current medications include high-dose inhaled steroids, long-acting beta agonist (LABA), and an H2 receptor blocker.

After reviewing the brief scenario above, please rate each of the statements as consistent with or not consistent with your clinical practice:

Order test for serum IgE and eosinophil levels:

1. Yes, it is consistent
2. No, it is not consistent
Asthma Phenotypes in Clinical Practice

- Asthma phenotypes may help clinicians identify “treatable traits”
- More relevant in severe disease
Asthma Phenotypes in Clinical Practice

- Asthma phenotypes may help clinicians identify “treatable traits”
- More relevant in severe disease
- **Simple testing** may identify characteristics that help clinicians select therapy:
Asthma Phenotypes in Clinical Practice

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  - Serum eosinophils
  - Serum IgE
Asthma Phenotypes in Clinical Practice

- Asthma phenotypes may help clinicians identify “treatable traits”

- More relevant in severe disease

- **Simple testing** may identify characteristics that help clinicians select therapy:
  - Serum eosinophils
  - Serum IgE
  - Fractional exhaled nitric oxide (FENO)
ARS Question 6

Which of the following suggests potential benefits to use of an Anti-IL-5 agent (i.e. mepolizumab, reslizumab, benralizumab) for the patient with severe asthma?

1. Serum IgE 30-700 IU/mL
2. Serum eosinophils > 400 cells/mcL
3. Serum total WBC 12-15 K cells/mcL
4. Serum lymphocytes >1,500 cells/mcL
Anti-IL-5 Therapy
(Anti-Eosinophil Therapy)

- Mepolizumab, reslizumab, benralizumab
- Developed to treat the “eosinophilic” asthma phenotype
- IL-5 effect on eosinophils
  - Differentiation & maturation in bone marrow
  - Mobilization, activation, survival
- Efficacy in asthma:
  - Exacerbations
  - Emergency department visits
  - Lung function

Omalizumab (Anti-IgE)

- Omalizumab: monoclonal Ab that binds to IgE and prevents its interaction with mast cells

- Given subcutaneously every 2 - 4 weeks

- Interrupts inflammatory cascade involved in pathogenesis of allergic asthma
  - Moderate to severe asthmatics
  - Responsive for perennial allergens
  - IgE levels 30-700 IU/mL

- First to use a biomarker in clinical practice as a “treatable trait”
Omalizumab (Anti-IgE)

- Multiple studies have shown efficacy in:
  - Quality of life
  - Exacerbations
  - Emergency department visits
  - Hospitalizations
  - Steroid requirements

## Current FDA-approved Therapies

<table>
<thead>
<tr>
<th>Monoclonal antibody</th>
<th>Target</th>
<th>Dosing</th>
<th>Dosing calculation</th>
<th>Treatable traits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omalizumab</td>
<td>IgE</td>
<td>SQ q 2-4 weeks</td>
<td>IgE levels Weight</td>
<td>High IgE levels (30-700) + perennial allergens</td>
</tr>
<tr>
<td>Mepolizumab</td>
<td>IL-5</td>
<td>SQ q 4 weeks</td>
<td>100mg</td>
<td>High Eosinophil levels (&gt; 150 cells/mcL)</td>
</tr>
<tr>
<td>Reslizumab</td>
<td>IL-5</td>
<td>IV q 4 weeks</td>
<td>Weight</td>
<td>High Eosinophil levels (&gt; 400 cells/mcL)</td>
</tr>
<tr>
<td>Benralizumab</td>
<td>IL-5</td>
<td>SQ q 4 wks x3, then q 8 wks</td>
<td>30mg</td>
<td>High Eosinophil levels (&gt; 150 cells/mcL)</td>
</tr>
</tbody>
</table>
ARS Question 7

38 y/o obese man (BMI 30.3 kg/m²)
10 yr hx Asthma and 5 yr hx GERD
2 acute asthma exacerbations in the last year
Asthma is often worse after supper.
Meds: high-dose inhaled steroids, long-acting beta agonist (LABA), and an H2 receptor blocker.

After reviewing the brief scenario above, please rate each of the statements as consistent with or not consistent with your clinical practice:

Refer to an asthma specialist for further testing and treatment:
1. Yes, it is consistent
2. No, it is not consistent
Referring to Specialists

When to refer patients for advanced asthma therapies?

- Asthma that is not controlled with ICS/LABA and a second controller
- Frequent exacerbations (more than 2 in 1 year)
- Hospitalizations (1 or more) or history of ICU admissions
- Daily symptoms despite maximal therapy

What testing is helpful before a referral?

- Complete pulmonary function testing (spirometry and lung volumes)
- IgE serum levels
- CBC with differential to evaluate for eosinophils
- Chest X-ray

When Should I Order a Chest CT?

DLCO = Diffusion capacity in Liters of Carbon Monoxide

When Should I Order a Chest CT?

Recommended in patients that have “atypical” symptoms:

DLCO = Diffusion capacity in Liters of Carbon Monoxide

When Should I Order a Chest CT?

Recommended in patients that have “atypical” symptoms:

- Excessive mucus production

DLCO = Diffusion capacity in Liters of Carbon Monoxide

When Should I Order a Chest CT?

Recommended in patients that have “atypical” symptoms:

- Excessive mucus production
- Rapid decline in lung function

DLCO = Diffusion capacity in Liters of Carbon Monoxide

When Should I Order a Chest CT?

Recommended in patients that have “atypical” symptoms:

- Excessive mucus production
- Rapid decline in lung function
- Reduced DLCO

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When Should I Order a Chest CT?

Recommended in patients that have “atypical” symptoms:

- Excessive mucus production
- Rapid decline in lung function
- Reduced DLCO
- Chest X-ray with infiltrates, masses or effusions

DLCO = Diffusion capacity in Liters of Carbon Monoxide

When Should I Order a Chest CT?

Recommended in patients that have “atypical” symptoms:

- Excessive mucus production
- Rapid decline in lung function
- Reduced DLCO
- Chest X-ray with infiltrates, masses or effusions
- Recurrent fevers or systemic symptoms

DLCO = Diffusion capacity in Liters of Carbon Monoxide

Questions to Consider
COMORBIDITIES IN ASTHMA
OSA = sleep apnea

OSA

Obesity

GERD

Allergic Rhinitis

Vocal cord dysfunction

Anxiety

Depression

Smoking

COPD

Medications
β blockers
Aspirin
ACE inhibitors
NSAIDS

ASTHMA
GORD
Obesity
OSA
Allergic Rhinitis
Anxiety
Depression
Smoking
Medications
β blockers
Aspirin
ACE inhibitors
NSAIDS
COPD
Vocal cord dysfunction

OSA = sleep apnea
ARS Question 8

38 y/o obese man (BMI 30.3 kg/m²)

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2 acute asthma exacerbations in the last year.

Asthma is often worse after supper.

Meds: high-dose inhaled steroids, long-acting beta agonist (LABA), and an H2 receptor blocker.

After reviewing the brief scenario above, please rate each of the statements as consistent with or not consistent with your clinical practice:

Discontinue H2 blocker and start proton pump inhibitor:

1. Yes, it is consistent
2. No, it is not consistent
GERD and Asthma

- 55% of difficult-to-control asthmatics may have GERD
- 35% of asthmatic patients with documented GERD by pH monitoring did not have typical symptoms
- Clinical suspicion:
  - Worsening of asthma symptoms after a meal
  - Heartburn or regurgitation before of onset of asthma symptoms
• Vagal response

• Abdominal pressure

• Negative thoracic pressure

• Asthma medications

• Micro aspiration

• Hyperinflation

• Lower esophageal sphincter

• GERD

• Asthma medications

• Micro aspiration
GERD and Asthma: Clinical Studies

- 24 weeks of lansoprazole BID in moderate to severe asthmatics and positive GERD symptoms (N=173)

- Daily asthma symptoms, albuterol use, and PFTs did not improve

## GERD and Asthma: Clinical Studies

<table>
<thead>
<tr>
<th>Therapy</th>
<th>Subjects</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 weeks esomeprazole</td>
<td>N=624 mod-severe asthma +/- GERD +/- nocturnal symptoms</td>
<td>Improved PEF only in +GERD/+nocturnal symptoms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No diff. Exacerbations</td>
</tr>
<tr>
<td>24 weeks esomeprazole</td>
<td>N=393 inadequately controlled asthma Minimal or no GERD ~80% using ICS+LABA</td>
<td>No differences in asthma control, PFTs, symptoms, nocturnal awakenings or QoL</td>
</tr>
<tr>
<td>Baseline data for</td>
<td>53% had reflux by pH (N=304) 38% had proximal reflux (N=242)</td>
<td>No differences in SABA use, nocturnal awakenings, ICS dose, LABA use, PFTs, or methacholine response +/- prox. or distal reflux</td>
</tr>
<tr>
<td>Study of Acid Reflux and Asthma</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GERD and Asthma

Take Home Points:

1. Asthmatics with GERD symptoms should be treated with a PPI, especially if they have nocturnal asthma symptoms.
2. Severe asthmatics with GERD symptoms appear to have greater benefits with PPI treatment.
3. PPIs have no benefit in patients with poorly controlled asthma with minimal or no GERD symptoms.
4. Ambulatory pH monitoring is not usually warranted unless there are atypical symptoms.
Allergic Rhinitis (AR) and Asthma

- AR increases the risk of asthma 3-fold
- Present in 75%-80% of patients with severe asthma
- May add substantial costs to asthma patients

Allergic Rhinitis and Asthma

Activation of systemic inflammatory pathways

Post nasal drip into the airways

Nasobronchial reflex

↓ filtration
↓ humidification
↓ warming

Allergic Rhinitis

Asthma
# Impact of Treating AR in Asthma

<table>
<thead>
<tr>
<th>STUDY</th>
<th>N</th>
<th>DESIGN</th>
<th>OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adam, 2002</td>
<td>1610</td>
<td>Retrospec.</td>
<td>Nasal steroids and antihistamines associated with <strong>reduced</strong> ED visits</td>
</tr>
<tr>
<td>Crystal-Peters, 2002</td>
<td>4944</td>
<td>Retrospec.</td>
<td>Asthma ED visits/hospitalizations occurred less often in treated group (6.6% v. 1.3%, p = 0.001)</td>
</tr>
<tr>
<td>Corren, 2004</td>
<td>361 cases 1444 controls</td>
<td>Nested case-control</td>
<td>Treatment with nasal steroids or antihistamines <strong>reduced</strong> risk of hospitalization for asthma</td>
</tr>
<tr>
<td>Dixon, 2015</td>
<td>237 adults 151 children</td>
<td>Prospective double blind PBO-controlled</td>
<td>24 weeks of nasal steroids <strong>did not</strong> improve asthma control</td>
</tr>
</tbody>
</table>

Obesity and Asthma

- Asthma is more prevalent in obese patients.
- Odds ratio 1.5-3.5 for having asthma when obese, across demographics

Obesity

Increased Inflammatory state

Altered lung mechanics

Chronic deconditioning

\(\downarrow\) Response to inhaled steroids

Asthma
Obesity

Increased Inflammatory state

Altered lung mechanics

Chronic deconditioning

Response to inhaled steroids

Asthma

OBESITY RELATED COMORBIDITIES

GERD, OSA, depression
Obesity and Asthma

- Up to 32% of patients misdiagnosed with asthma when they have coexisting obesity
- In extreme obesity (BMI > 40) it virtually impossible to diagnose asthma

Obesity and Asthma

- Up to 32% of patients misdiagnosed with asthma when they have coexisting obesity
  - In extreme obesity (BMI > 40) it virtually impossible to diagnose asthma

- SIMILAR SYMPTOMS:
  - Shortness of breath
  - Exercise-induced dyspnea
  - Chest tightness

- Treatment:

Obesity and Asthma

- Up to 32% of patients misdiagnosed with asthma when they have coexisting obesity
  - In extreme obesity (BMI > 40) it virtually impossible to diagnose asthma

- SIMILAR SYMPTOMS:
  - Shortness of breath
  - Exercise-induced dyspnea
  - Chest tightness

- Treatment:
  - Some evidence of less response to inhaled steroids.
  - Adding “non-steroidal” treatments should be considered
  - Encourage weight loss on every visit and referral for weight reduction programs when available (including surgery)

ARS Question 9

38 y/o obese man (BMI 30.3 kg/m²)

10 yr hx Asthma and 5 yr hx GERD

2 acute asthma exacerbations in the last year.

Asthma is often worse after supper.

Meds: high-dose inhaled steroids, long-acting beta agonist (LABA), and an H2 receptor blocker.

After reviewing the brief scenario above, please rate each of the statements as consistent with or not consistent with your clinical practice:

Refer to patient educator to review inhaler technique and lifestyle interventions:

1. Yes, it is consistent
2. No, it is not consistent
Multidisciplinary Approach to Asthma
Multidisciplinary Approach to Asthma

- Patient
- Primary Care Provider
- Emergency Department
- Asthma educators/case managers
Multidisciplinary Approach to Asthma

Asthma educators/case managers

Patient

Primary Care Provider

Emergency Department

Respiratory Therapist
Multidisciplinary Approach to Asthma

- Pulmonologist
- Primary Care Provider
- Allergist
- Respiratory Therapist
- Emergency Department
- Asthma educators/case managers

Patient
Multidisciplinary Approach to Asthma

- Pulmonologist
- Primary Care Provider
- Allergist
- Respiratory Therapist
- Emergency Department
- Other specialists: GI, ENT, Psychiatry
- Asthma educators/case managers

Patient
Challenges of Education in Asthma

- Heterogeneity of asthma

Challenges of Education in Asthma

- Heterogeneity of asthma
- Cost/Time
Challenges of Education in Asthma

- Heterogeneity of asthma
- Cost/Time
- Evolving asthma treatments
Challenges of Education in Asthma

- Heterogeneity of asthma
- Cost/Time
- Evolving asthma treatments
- Multiple factors that influence asthma

Key Areas of Education in Asthma
Key Areas of Education in Asthma

- Self-recognition of symptoms
- Self-management action plans

Asthma PATIENT Education
Key Areas of Education in Asthma

- Self-recognition of symptoms
- Inhaler technique
- Self-management action plans
- Trigger avoidance at home/work
Asthma Action Plan

- Self management techniques reduced:
  - ED visits and hospitalizations
  - Unscheduled consultations

- Clinical practice use:
  - 9%-46% of asthmatics

- Limitations:
  - Time
  - Education - practitioners not aware of AAP

AAP = Asthma Action Plan

Challenges with Inhalers

- No single inhaler will satisfy all patients’ needs
- Proliferation of multiple inhalers results in confusion

Baverstock et al. Thorax, 2010;65:A117-A118
Challenges with Inhalers

- No single inhaler will satisfy all patients’ needs
- Proliferation of multiple inhalers results in confusion
- 39%-67% of providers are not knowledgeable in the use of devices
- It is critical to know advantages and disadvantages of inhalers to select the best therapy

Baverstock et al. Thorax, 2010;65:A117-A118
Asthma Education in Clinical Practice

- Must be part of routine asthma care
- Focus on severe disease and lower socio-economic status (but all patients should be educated)
- Involve as many people as possible (nurses, family members and other providers)
Asthma Education in Clinical Practice

- Must be part of routine asthma care
- Focus on severe disease and lower socio-economic status (but all patients should be educated)
- Involve as many people as possible (nurses, family members and other providers)
- Use web-based services to educate patients

Wipediseases.org  Chestnet.org  Lung.org
CONCLUSIONS

1. Asthma is *heterogeneous* and various subtypes of asthma exist

2. **Type 2 inflammation** involves various cell lines and cytokines (IL-4, IL-5, IL-13) and may be activated by allergic and non-allergic triggers

3. **Target therapies**, such as monoclonal antibodies, improve asthma outcomes and can be considered in severe asthma not controlled with standard therapies
4. All patients with severe asthma should be evaluated for the presence of asthma comorbidities

5. Treatment with a proton-pump inhibitor is effective in asthma in patients with both symptomatic reflux and night-time respiratory symptoms

6. Treatment of allergic rhinitis and obesity is encouraged in all asthmatics

7. A multidisciplinary approach is often required in severe asthma, and asthma education should be a component of all asthma care
POST-TEST QUESTIONS
After completing this activity, how confident are you now in your ability to differentiate phenotypes of asthma?

1. Not at all confident
2. Slightly confident
3. Moderately confident
4. Pretty much confident
5. Very confident
Post-test Question 2

After completing this activity, how often do you now intend to consider treating comorbidities to improve asthma control?

1. Never
2. Rarely
3. Sometimes
4. Frequently
5. Always
Post-test Question 3

Which of the following is an example of type-2 asthma?

1. Eosinophilic asthma
2. Paucigranulocytic asthma
3. Obesity-associated asthma
4. Smoking-associated (neutrophilic) asthma
Post-test Question 4

Which of the following suggests potential benefits to use of an Anti-IL-5 agent (i.e. mepolizumab, reslizumab, benralizumab) for the patient with severe asthma?

1. Serum IgE 30-700 IU/mL
2. Serum eosinophils > 400 cells/mcL
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2 acute asthma exacerbations in the last year.

Asthma is often worse after supper.

Meds: high-dose inhaled steroids, long-acting beta agonist (LABA), and an H2 receptor blocker.

After reviewing the brief scenario above, please rate each of the statements as consistent with or not consistent with your clinical practice now:

**Order test for serum IgE and eosinophil levels:**

1. Yes, it is consistent
2. No, it is not consistent
Post-test Question 6

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After reviewing the brief scenario above, please rate each of the statements as consistent with or not consistent with your clinical practice now:

**Discontinue H₂ blocker and start proton pump inhibitor:**
1. Yes, it is consistent
2. No, it is not consistent
Post-test Question 8

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10 yr hx Asthma and 5 yr hx GERD

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After reviewing the brief scenario above, please rate each of the statements as consistent with or not consistent with your clinical practice now:

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Questions?