ACAAI
Instant Reference Guide for Health Professionals

Guidelines for the Diagnosis and Management of Asthma

Summary of Expert Panel Report 3

National Heart, Lung and Blood Institute (NHLBI)

National Asthma Education and Prevention Program (NAEPP)

Based on current scientific evidence, NAEPP has, for the first time in 10 years, updated its guidelines for the diagnosis and management of asthma. The guidelines recommend a new treatment approach that focuses on achieving and maintaining control as the primary goal of asthma therapy so that patients with asthma can be active all day and sleep well at night.

This Instant Reference Guide highlights key elements of the guidelines. For more information, including charts on assessing severity and control and taking a stepwise treatment approach with six steps of care, visit **www.acaai.org**.

Diagnosis and Long-Term Management of Asthma

Accurate diagnosis is critical.
To establish an asthma diagnosis:

- Use medical history and physical examination to determine that symptoms of recurrent episodes of airflow obstruction are present. Key symptom indicators include wheezing, history of cough, particularly at night, recurrent wheeze, difficulty in breathing and chest tightness. Symptoms are worse when exposed to triggers and occur or worsen at night.
- Use spirometry in all patients ≥5 years of age to determine that airway obstruction is at least partially reversible. Reversibility is determined by an increase in FEV_1 of >200 mL and ≥12 percent from baseline measure after inhalation of short-acting $beta_2$-agonist (SABA).
- Rule out alternative causes of airway impairment (e.g., COPD and vocal cord dysfunction in adults and aspiration and cystic fibrosis in children).

The goal of asthma therapy and long-term disease management is control:

- **Reduce impairment.** Prevent chronic symptoms. Achieve infrequent use of SABA. Maintain (near) normal lung function and normal activity levels. Meet patients' expectations for care.
- **Reduce risk.** Prevent exacerbations, minimize need for emergency care or hospitalization. Prevent loss of lung function or, for children, prevent reduced lung growth. Have no or minimal adverse effects of therapy.

Four Components of Asthma Care

I. Assessment and Monitoring: Asthma Severity and Control

- Assess asthma severity, considering both impairment and risk, to begin therapy. Severity classifications include: Intermittent, Mild Persistent, Moderate Persistent and Severe Persistent.
- Assess control, considering both impairment and risk, to monitor and adjust therapy with the level of control guiding decisions to either maintain or adjust therapy (step up or step down – See Stepwise Approach on page 6).
- Monitor and reassess every 2 to 6 weeks for patients who are starting therapy or stepping up to regain asthma control and every 1-6 months once control is achieved. Review asthma control, medication technique, written asthma action plan and patient adherence and concerns at every visit.

II. Education for a Partnership in Care

- Take into account education, literacy level and cultural practices of patients.
- Develop a written asthma action plan in partnership with patients.
- Integrate education into all points of care where health professionals interact with patients.
- Teach and reinforce:
  - Self-monitoring (via either peak flow or symptoms) to assess level of control or signs of worsening disease.
  - Using a written asthma action plan and reviewing proper use of long-term control and quick-relief medications.
  - Taking medications correctly (inhaler technique and device use).
  - Avoiding environmental factors that worsen asthma.

III. Control Environmental Factors and Comorbid Conditions

- Recommend measures to control exposures to allergens and pollutants or irritants that worsen asthma.
- In patients who have persistent asthma, use skin or in vitro testing to assess sensitivity to perennial indoor allergens.
- Consider allergen immunotherapy by specially trained personnel when there is clear evidence of a relationship between symptoms and exposure to a known allergen.
- Treat comorbid conditions such as allergic bronchopulmonary aspergillosis, gastroesophageal reflux, obesity, sleep apnea, rhinitis and sinusitis, stress or depression to help improve asthma control.
- Consider inactivated influenza vaccine for all patients over 6 months of age.

IV. Medications

- Select medication and delivery devices to meet patient's needs and circumstances.
- Use stepwise approach to identify appropriate treatment options.
  - Inhaled corticosteroids (ICSs) are part of the preferred treatment across all age groups.
  - Long-acting beta$_2$-agonists (LABAs) combined with an ICS is the preferred treatment when stepping up therapy in patients ≥12 years of age and, when appropriate, may be used in younger age groups.

Stepwise Approach

A stepwise approach to managing asthma is recommended to gain and maintain control with the dose, number of medications and frequency of administration increased when necessary (stepped up) and decreased when possible (stepped down).

Decision-making using the stepwise approach should consider both impairment and risk domains:

- Consider impairment, or asthma's effects on quality of life and functional capacity, on an ongoing basis (i.e., at present).
- Consider risks for adverse events in the future, such as exacerbations, progressive loss of lung function and reduction in lung growth in children.

These two domains may respond differentially to treatment.

General principles for all age groups

- Incorporate all four components of care at each step.
- Initiate therapy based on asthma severity.
- Monitor response and adjust treatment based on asthma control; step up if necessary and step down if possible when asthma is controlled for 3 months.

Ages 0-4

- Initiate daily long-term control therapy for:
  - Children who have had ≥4 episodes of wheezing the past year that lasted >1 day and affected sleep and who have a positive asthma risk profile.
- Consider daily long-term control therapy for:
  - Children who consistently require short-acting $beta_2$-agonist (SABA) treatment >2 days per week for >4 weeks.

  - Children who have 2 exacerbations requiring oral systemic corticosteroids within 6 months.
- Monitor response and adjust treatment as necessary.

Ages 5-11

- Involve child in developing a written asthma action plan. Address child's concerns, preferences and school schedule.
- Promote physical activity.
- Treat exercise-induced bronchospasm (EIB). Step up daily therapy if the child has poor endurance or symptoms during normal play activities.
- Monitor for disease progression and loss of lung growth.
- Consider allergen immunotherapy for patients with allergic asthma requiring steps 2 through 4 care (chronic persistent asthma).

Ages 12 and older

- Involve patient in developing written asthma action plan. Address patient's concerns, preferences and schedule in selecting treatment.
- Promote physical activity. Treat EIB. Step up daily therapy if the patient has poor endurance or symptoms during normal physical activities.
- Assess possible benefit of treatment in older patients. Establish reversibility with a short course of oral systemic corticosteroids.
- Adjust medications to address coexisting medical conditions common among older patients.
- Consider allergen immunotherapy for patients with allergic asthma requiring steps 2 through 4 care (chronic persistent asthma).

Medication Types

Long-Term Control Medications

Used daily to achieve and maintain control of persistent asthma.

- Corticosteroids. Inhaled corticosteroids (ICSs) are the most consistently effective long-term control medication at all steps of care for persistent asthma. Short courses of oral systemic corticosteroids are often used to gain prompt control of asthma. Oral corticosteroids are used long term to treat patients who require step 6 care (severe persistent asthma).
- Cromolyn sodium and nedocromil are used as alternative, but not preferred, medication for patients requiring step 2 care (mild persistent asthma).
- The immunomodulator omalizumab (anti-IgE) is used as adjunctive therapy for patients ≥12 years of age who have sensitivity to relevant allergens and who require step 5 or step 6 care (severe persistent asthma). Referral to a specialist is recommended for the use of omalizumab and clinicians should be prepared and equipped to identify and treat anaphylaxis that may occur.
- Leukotriene modifiers, including montelukast, zafirlukast and zileuton, are alternative, but not preferred, therapy for patients who require step 2 care (mild persistent asthma). They can be used as adjunctive therapy with ICSs, but for patients ≥12 years of age, they are not preferred adjunctive therapy compared to long-acting $beta_2$-agonists (LABAs).
- LABAs (salmeterol and formoterol), inhaled bronchodilators with a duration of at least 12 hours, are not to be used as monotherapy for long-term asthma control. They are used in combination with ICSs in step 3 care (moderate or severe

persistent asthma) or higher in children ≥5 years of age and in adults, and in step 4 (severe persistent asthma) or higher in children 0-4 years of age. They are the preferred therapy to combine with ICSs in patients ≥12 years of age.

- The methylxanthine theophylline is a mild to moderate bronchodilator used as alternative, but not preferred therapy, for step 2 care (mild persistent asthma) or as adjunctive therapy with ICS in patients ≥5 years of age.

Quick-Relief Medications

Used to treat acute symptoms and exacerbations.

- Anticholinergics may provide additive benefit to short-acting beta$_2$-agonist (SABA) in the emergency care setting. They may be used as an alternative to patients who do not tolerate SABA.
- SABAs are the treatment of choice for relief of acute symptoms and prevention of EIB. Use of SABA > 2 times a week generally indicates inadequate asthma control.
- Systemic corticosteroids are used for moderate and severe exacerbations in addition to SABA to speed recovery and prevent exacerbations.

Managing Exacerbations

Asthma exacerbations are acute or subacute episodes in which symptoms, including shortness of breath, cough, wheezing and/or chest tightness, become progressively worse. Exacerbations are characterized by decreases in expiratory airflow that should be measured by lung function — spirometry and peak expiratory flow (PEF) — which are more reliable measures than the severity of the symptoms. There is a decreased risk of exacerbations in patients whose asthma is well controlled with inhaled corticosteriods (ICSs).

Classifying Severity

The severity of an exacerbation should not be underestimated. Severe exacerbations can be life-threatening and can occur in patients at any level of asthma severity (Intermittent, Mild Persistent, Moderate Persistent or Severe Persistent).

Patients at risk for asthma-related death should have intensive education, monitoring and care and be advised to seek immediate medical attention when an exacerbation occurs.

Risk factors for asthma-related death include:

- Previous severe exacerbation (e.g., intubation or ICU admission for asthma)
- Two or more hospitalizations or >3 ED visits in the past year
- Use of >2 canisters of short-acting beta$_2$-agonist (SABA) per month
- Difficulty perceiving airway obstruction or the severity of worsening asthma
- Low socioeconomic status or inner-city residence
- Illicit drug use
- Major psychosocial problems or psychiatric disease
- Comorbidities, such as cardiovascular disease or other chronic lung disease

Home Management

Incorporate all four components of asthma care, including assessment and monitoring, patient education, environmental control and medications, to effectively manage asthma exacerbations.

Early treatment of exacerbations at home is the best strategy for patient management. Instruct patients how to:

- Use a written asthma action plan that notes when and how to treat signs of an exacerbation. A peak flow-based plan may be useful for patients who have difficulty perceiving airflow obstruction or have a history of severe exacerbations.
- Recognize early signs and symptoms of an exacerbation, including worsening PEF.
- Adjust medications (increase SABA and, in some cases, add a short course of oral systemic corticosteroids).
- Remove or avoid contact with allergens or environmental irritants that may contribute to the exacerbation.
- Monitor response to treatment and seek immediate medical care if there is serious deterioration in symptoms or PEF or no response to treatment.

There are no studies to indicate the effectiveness of home management techniques such as: drinking large volumes of liquids; breathing warm moist air; or using over-the-counter medications such as antihistamines or cold medicines. These techniques should not be recommended since they may delay patients from seeking appropriate medical care.

Refer to an asthma specialist, such as an allergist, if:

- there are difficulties achieving or maintaining control
- step 4 care or higher is required. Consider referral in ages 0-4 if step 3 care or higher is required
- immunotherapy or omalizumab is considered
- the patient required 2 bursts of oral systemic corticosteroids in the past year
- the patient required a hospitalization in the past year
- signs and symptoms are atypical or if there are problems with a differential diagnosis
- additional testing is indicated

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