

HIGHLIGHTS OF MAJOR CHANGES IN EPR—3: FULL REPORT 2007

The following are highlights of major changes. Many recommendations were updated or expanded based on new evidence. See EPR—3: Full Report 2007 for key differences at the beginning of each section and for a full discussion.

New focus on monitoring asthma control as the goal for asthma therapy and distinguishing between classifying asthma severity and monitoring asthma control.

- Severity: the intrinsic intensity of the disease process. Assess asthma severity to initiate therapy.
- Control: the degree to which the manifestations of asthma are minimized by therapeutic interventions and the goals of therapy are met. Assess and monitor asthma control to adjust therapy.

New focus on impairment and risk as the two key domains of severity and control, and multiple measures for assessment. The domains represent different manifestations of asthma, they may not correlate with each other, and they may respond differentially to treatment.

- Impairment: frequency and intensity of symptoms and functional limitations the patient is experiencing currently or has recently experienced.
- Risk: the likelihood of either asthma exacerbations, progressive decline in lung function (or, for children, lung growth), or risk of adverse effects from medication.

Modifications in the stepwise approach to managing asthma long term.

- Treatment recommendations are presented for three age groups (0–4 years of age, 5–11 years of age, and youths ≥ 12 years of age and adults). The course of the disease may change over time; the relevance of different measures of impairment or risk and the potential short- and long-term impact of medications may be age related; and varied levels of scientific evidence are available for these three age groups.
- The stepwise approach expands to six steps to simplify the actions within each step. Previous guidelines had several progressive actions within different steps; these are now separated into different steps.
- Medications have been repositioned within the six steps of care.
 - Inhaled corticosteroids (ICSs) continue as preferred long-term control therapy for all ages.
 - Combination of long-acting beta₂-agonist (LABA) and ICS is presented as an equally preferred option, with increasing the dose of ICS in step 3 care, in patients 5 years of age or older. This approach balances the established beneficial effects of combination therapy in older children and adults with the increased risk for severe exacerbations, although uncommon, associated with daily use of LABA.
 - Omalizumab is recommended for consideration for youths ≥ 12 years of age who have allergies or for adults who require step 5 or 6 care (severe asthma). Clinicians who administer omalizumab should be prepared and equipped to identify and treat anaphylaxis that may occur.

New emphasis on multifaceted approaches to patient education and to the control of environmental factors or comorbid conditions that affect asthma.

- Patient education for a partnership is encouraged in expanded settings.
 - Patient education should occur at all points of care: clinic settings (offering separate self-management programs as well as integrating education into every patient visit), Emergency Departments (EDs) and hospitals, pharmacies, schools and other community settings, and patients' homes.
 - Provider education should encourage clinician and health care systems support of the partnership (e.g., through interactive continuing medical education, communication skills training, clinical pathways, and information system supports for clinical decisionmaking).
- Environmental control includes several strategies:
 - Multifaceted approaches to reduce exposures are necessary; single interventions are generally ineffective.
 - Consideration of subcutaneous immunotherapy for patients who have allergies at steps 2–4 of care (mild or moderate persistent asthma) when there is a clear relationship between symptoms and exposure to an allergen to which the patient is sensitive. Clinicians should be prepared to treat anaphylaxis that may occur.
 - Potential benefits to asthma control by treating comorbid conditions that affect asthma.

Modifications to treatment strategies for managing asthma exacerbations. These changes:

- Simplify the classification of severity of exacerbations. For the urgent or emergency care setting: <40 percent predicted forced expiratory volume in 1 second (FEV₁) or peak expiratory flow (PEF) indicates severe exacerbation and potential benefit from use of adjunctive therapies; ≥70 percent predicted FEV₁ or PEF is a goal for discharge from the emergency care setting.
- Encourage development of prehospital protocols for emergency medical services to allow administration of albuterol, oxygen, and, with medical oversight, anticholinergics and oral systemic corticosteroids.
- Modify recommendations on medications:
 - Add levalbuterol.
 - Add magnesium sulfate or heliox for severe exacerbations unresponsive to initial treatments.
 - Emphasize use of oral corticosteroids. Doubling the dose of ICS for home management is not effective.
 - Emphasize that anticholinergics are used in emergency care, not hospital care.
 - Add consideration of initiating ICS at discharge.

Figure 1. SUMMARY OF RECOMMENDED KEY CLINICAL ACTIVITIES FOR THE DIAGNOSIS AND MANAGEMENT OF ASTHMA

Clinical Issue	Key Clinical Activities	Action Steps
DIAGNOSIS		
	Establish asthma diagnosis.	Use medical history and physical examination to determine that symptoms of recurrent episodes of airflow obstruction are present. Use spirometry in all patients ≥ 5 years of age to determine that airway obstruction is at least partially reversible. Consider alternative causes of airway obstruction.
MANAGING ASTHMA LONG TERM		
<p>Goal of asthma therapy is asthma control:</p> <ul style="list-style-type: none"> ■ Reduce impairment (prevent chronic symptoms, require infrequent use of short-acting beta₂-agonist (SABA), maintain (near) normal lung function and normal activity levels). ■ Reduce risk (prevent exacerbations, minimize need for emergency care or hospitalization, prevent loss of lung function, or for children, prevent reduced lung growth, have minimal or no adverse effects of therapy). 		
Four Components of Care		
Assessment and Monitoring	<p>Assess asthma severity to initiate therapy.</p> <p>Assess asthma control to monitor and adjust therapy.</p> <p>Schedule followup care.</p>	<p>Use severity classification chart, assessing both domains of impairment and risk, to determine initial treatment.</p> <p>Use asthma control chart, assessing both domains of impairment and risk, to determine if therapy should be maintained or adjusted (step up if necessary, step down if possible).</p> <p>Use multiple measures of impairment and risk: different measures assess different manifestations of asthma; they may not correlate with each other; and they may respond differently to therapy. Obtain lung function measures by spirometry at least every 1–2 years, more frequently for not-well-controlled asthma.</p> <p>Asthma is highly variable over time, and periodic monitoring is essential. In general, consider scheduling patients at 2- to 6-week intervals while gaining control; at 1–6 month intervals, depending on step of care required or duration of control, to monitor if sufficient control is maintained; at 3-month intervals if a step down in therapy is anticipated.</p> <p>Assess asthma control, medication technique, written asthma action plan, patient adherence and concerns at every visit.</p>
Education	Provide self-management education.	<p>Teach and reinforce:</p> <ul style="list-style-type: none"> ■ Self-monitoring to assess level of asthma control and signs of worsening asthma (either symptom or peak flow monitoring shows similar benefits for most patients). Peak flow monitoring may be particularly helpful for patients who have difficulty perceiving symptoms, a history of severe exacerbations, or moderate or severe asthma. ■ Using written asthma action plan (review differences between long-term control and quick-relief medication). ■ Taking medication correctly (inhaler technique and use of devices). ■ Avoiding environmental factors that worsen asthma. <p>Tailor education to literacy level of patient. Appreciate the potential role of a patient’s cultural beliefs and practices in asthma management.</p>

Figure 1. SUMMARY OF RECOMMENDED KEY CLINICAL ACTIVITIES FOR THE DIAGNOSIS AND MANAGEMENT OF ASTHMA (continued)

Clinical Issue	Key Clinical Activities	Action Steps
Four Components of Care (continued)		
Education (continued)	<p>Develop a written asthma action plan in partnership with patient.</p> <p>Integrate education into all points of care where health professionals interact with patients.</p>	<p>Agree on treatment goals and address patient concerns.</p> <p>Provide instructions for (1) daily management (long-term control medication, if appropriate, and environmental control measures) and (2) managing worsening asthma (how to adjust medication, and know when to seek medical care).</p> <p>Involve all members of the health care team in providing/reinforcing education, including physicians, nurses, pharmacists, respiratory therapists, and asthma educators.</p> <p>Encourage education at all points of care: clinics (offering separate self-management education programs as well as incorporating education into every patient visit), Emergency Departments and hospitals, pharmacies, schools and other community settings, and patients' homes.</p> <p>Use a variety of educational strategies and methods.</p>
Control Environmental Factors and Comorbid conditions	<p>Recommend measures to control exposures to allergens and pollutants or irritants that make and asthma worse.</p> <p>Treat comorbid conditions.</p>	<p>Determine exposures, history of symptoms in presence of exposures, and sensitivities (In patients who have persistent asthma, use skin or in vitro testing to assess sensitivity to perennial indoor allergens.).</p> <p>Advise patients on ways to reduce exposure to those allergens and pollutants, or irritants to which the patient is sensitive. Multifaceted approaches are beneficial; single steps alone are generally ineffective. Advise all patients and pregnant women to avoid exposure to tobacco smoke.</p> <p>Consider allergen immunotherapy, by specifically trained personnel, for patients who have persistent asthma and when there is clear evidence of a relationship between symptoms and exposure to an allergen to which the patient is sensitive.</p> <p>Consider especially: allergic bronchopulmonary aspergillosis; gastroesophageal reflux, obesity, obstructive sleep apnea, rhinitis and sinusitis, and stress or depression. Recognition and treatment of these conditions may improve asthma control.</p> <p>Consider inactivated influenza vaccine for all patients over 6 months of age.</p>
Medications	<p>Select medication and delivery devices to meet patient's needs and circumstances.</p>	<p>Use stepwise approach (See below.) to identify appropriate treatment options.</p> <p>Inhaled corticosteroids (ICSs) are the most effective long-term control therapy. When choosing among treatment options, consider domain of relevance to the patient (impairment, risk, or both), patient's history of response to the medication, and patient's willingness and ability to use the medication.</p>

Figure 1. SUMMARY OF RECOMMENDED KEY CLINICAL ACTIVITIES FOR THE DIAGNOSIS AND MANAGEMENT OF ASTHMA (continued)

Clinical Issue	Key Clinical Activities	Action Steps
Stepwise Approach (continued)		
Ages 5–11 Years	<p>Involve child in developing a written asthma action plan.</p> <p>Promote physical activity.</p> <p>Monitor for disease progression and loss of lung growth.</p>	<p>Address child’s concerns, preferences, and school schedule in selecting treatments.</p> <p>Encourage students to take a copy of written asthma action plan to school/ afterschool activities.</p> <p>Treat exercise-induced bronchospasm (EIB) (See below.) Step up daily therapy if the child has poor endurance or symptoms during normal play activities.</p> <p>Treatment will not alter underlying progression of the disease, but a step up in therapy may be required to maintain asthma control.</p>
Ages 12 and Older	<p>Involve youths in developing written asthma action plan.</p> <p>Promote physical activity.</p> <p>Assess possible benefit of treatment in older patients.</p> <p>Adjust medications to address coexisting medical conditions common among older patients.</p>	<p>Address youth’s concerns, preferences, and school schedule in selecting treatment.</p> <p>Encourage students to take a copy of written asthma action plan to school/afterschool activities.</p> <p>Treat EIB. Step up daily therapy if the child has poor endurance or symptoms during normal daily activities.</p> <p>Establish reversibility with a short course of oral systemic corticosteroids.</p> <p>Consider, for example: calcium and vitamin D supplements for patients who take ICS and have risk factors for osteoporosis; increased sensitivity to side effects of bronchodilators with increasing age; increased drug interactions with theophylline; medications for arthritis (NSAIDs), hypertension, or glaucoma (beta blockers) may exacerbate asthma.</p>
Exercise-Induced Bronchospasm (EIB)	Prevent EIB	<p>Treatment strategies to prevent EIB include:</p> <ul style="list-style-type: none"> ■ Long-term control therapy. ■ Pretreatment before exercise with SABA, leukotriene receptor antagonists (LTRAs), cromolyn or nedocromil; frequent or chronic use of long acting beta₂-agonist (LABA) for pretreatment is discouraged, as it may disguise poorly controlled persistent asthma. ■ Warmup period or a mask or scarf over the mouth for cold-induced EIB.
Pregnancy	Maintain asthma control through pregnancy.	<p>Monitor asthma control during all prenatal visits; asthma worsens in one-third of women during pregnancy and improves in one-third; medications should be adjusted accordingly.</p> <p>It is safer to be treated with asthma medications than to have poorly controlled asthma. Maintaining lung function is important to ensure oxygen supply to the fetus.</p> <p>Albuterol is the preferred SABA. ICS is the preferred long-term control medication (Budesonide is preferred because more data are available on this medication during pregnancy.).</p>
Surgery	Reduce risks for complications during and after surgery.	<p>Assess asthma control prior to surgery. If lung function is not well controlled, provide medications to improve lung function. A short course of oral systemic corticosteroids may be necessary.</p> <p>For patients receiving oral systemic corticosteroids during 6 months prior to surgery, and for selected patients on high dose ICS, give 100 mg hydrocortisone every 8 hours intravenously during the surgical period, and reduce the dose rapidly within 24 hours after surgery.</p>

Figure 1. SUMMARY OF RECOMMENDED KEY CLINICAL ACTIVITIES FOR THE DIAGNOSIS AND MANAGEMENT OF ASTHMA (continued)

Clinical Issue	Key Clinical Activities	Action Steps
Managing Exacerbations		
Home Management	<p>Incorporate four components of care.</p> <p>Develop a written asthma action plan.</p>	<p>Include assessment and monitoring, patient education, environmental control, and medications.</p> <p>Instruct patients how to:</p> <ul style="list-style-type: none"> ■ Recognize early signs, symptoms, peak expiratory flow (PEF) measures that indicate worsening asthma. ■ Adjust medications (increase SABA and, in some cases, add oral systemic corticosteroids) and remove or withdraw from environmental factors contributing to the exacerbation. ■ Monitor response and seek medical care if there is serious deterioration or lack of response to treatment.
Management in the Urgent or Emergency Care Setting	<p>Assess severity.</p> <p>Treat to relieve hypoxemia and airflow obstruction; reduce airway inflammation.</p> <p>Monitor response.</p> <p>Discharge with medication and patient education</p>	<p>Treatment strategies include:</p> <ul style="list-style-type: none"> ■ Assessing initial severity by lung function measures (for ages ≥ 5 years) and symptom and functional assessment ■ Supplemental oxygen ■ Repetitive or continuous SABA ■ Oral systemic corticosteroids ■ Monitoring response with serial assessment of lung function measures, pulse oximetry, and symptoms ■ Considering adjunctive treatments magnesium sulfate or heliox in severe exacerbations (e.g., forced expiratory volume in 1 second (FEV₁) or PEF <40 percent predicted) unresponsive to initial treatment ■ Providing at discharge: <ul style="list-style-type: none"> — Medications: SABA, oral systemic corticosteroids; consider initiating ICS — Referral to followup care — An emergency department asthma discharge plan — Review of inhaler technique and, whenever possible, environmental control measures