Management of Asthma in Children and Adults

CARE MANAGEMENT OVERVIEW

Asthma is a chronic inflammatory disease of the airways. In those susceptible to asthma, this inflammation causes the airways to spasm and swell periodically so that the airways narrow. The individual then must wheeze or gasp for air. Obstruction to air flow either resolves spontaneously or responds to a wide range of treatments, but continuing inflammation makes the airways hyper-responsive to stimuli such as cold air, exercise, dust mites, pollutants in the air, and even stress and anxiety.

According to the American Lung Association, as of 2007, about 34.1 million Americans, including 9 million children, had been diagnosed with asthma during their lifetime. This number appears to be both increasing, especially among children under age 6, while at the same time the disease is becoming more severe. In the United States, 18.7 million non-institutionalized adults (8%) and 7 million children (9.4%) have been diagnosed with asthma. Rates of asthma are highest among females (10%); race/ethnicity prevalence is highest among Blacks (12%) followed by Whites (8%) and Hispanics (7%). Asthma is estimated to cause between 3,500 and 5,000 deaths annually in the United States. In 2007, it was responsible for 217,000 emergency room visits and 10.4 million office visits. The estimated annual cost of this disease to the United States economy is $19.7 billion.

Asthma Triggers and Core Symptoms

A pattern of respiratory symptoms can occur when a person is exposed to asthma triggers. In addition to the stimuli noted above, common triggers include: animals, certain foods, cigarette smoke, feathers, mold and pollen. Core symptoms of asthma consist of a pattern of respiratory symptoms that occur with exposure to triggers (e.g., allergen, exercise, viral infection) and resolve with trigger avoidance or the administration of asthma medication. Some patients will report all three of the classic symptoms below, while others may report only one or two of the following:

- Wheeze (high-pitched whistling sound, usually upon exhalation)
- Cough (often worse at night)
- Shortness of breath or difficulty breathing

Asthma is closely linked to allergies; about 75% of people with asthma also have allergies. The changes that take place in the lungs of people with asthma makes the airways (the "breathing tubes," or bronchi and the smaller bronchioles) hyper-reactive to many different types of stimuli that do not affect healthy lungs. In an asthma attack, the muscle tissue in the walls of bronchi go into spasm, and the cells lining the airways swell and secrete mucus into the airways. Both these actions cause the bronchi to become narrowed (bronchoconstriction). As a result, an asthmatic person has to make a much greater effort to breathe in and to expel it. Airway changes that occur in asthma include:

- **Muscles**: Relaxed smooth muscles
- **Airway**: Wall inflamed and thickened
- **Alveoli**: Air trapped in alveoli
- **Muscles**: Tightened smooth muscles
Three Basic Categories of Asthma

The following section describes the three basic categories of asthma.

- **Child-onset** affects approximately 9 million American children. Approximately 20% of cases begin in the first year of life. When asthma begins in childhood, it often does so in a child who is likely, for genetic reasons, to become sensitized to common allergens in the environment (atopic person). When these children are exposed to dust mites, animal proteins (i.e., animal hair, dander), fungi, or other potential allergens, they produce a type of antibody that is intended to engulf and destroy the foreign materials. This has the effect of making the airway cells sensitive to particular materials. Further exposure can lead rapidly to an asthmatic response.

- **Adult-onset.** Allergies also may play a role when adults become asthmatic. Adults who develop asthma may be exposed to allergens in the workplace, such as certain forms of plastic, solvents, and wood dust. Other adults may be sensitive to aspirin, non-steroidal anti-inflammatory drugs (NSAIDs such as ibuprofen), or other drugs. More women than men are diagnosed with adult-onset asthma. Compared to childhood-onset asthma, adult-onset asthma tends to be more continuous, while childhood asthma often is marked by asthmatic episodes followed by asthma-free periods.

- **Exercise induced.** People who may not have allergies can still develop a form of asthma that is brought on by aerobic exercise. These episodes can last for several minutes and leave the individual gasping for breath. Some estimates suggest that 12-15% of Americans are susceptible to exercise-induced asthma. Breathing in cold air, aerobic exercise lasting more than 10 minutes, or shorter periods of very heavy aerobic exercise tend to bring on an exercise-induced asthma attack in susceptible individuals. Polluted air and certain chemicals (e.g., chlorine in pools, herbicides on a playing field) appear to increase an asthma episode in sensitive individuals.

General principles for treatment of asthma include:

- Patient education, including a written asthma action plan;
- Ensure compliance/adherence to medications;
- Control asthma triggers; and
- Monitor control.

**Behavioral Health and Asthma**

According to research, depression is found in 45% of asthma patients. Severe depression results in elevated total healthcare costs; increased healthcare costs range from $411 to $721 per member, per month. Also, comorbid anxiety associated with asthma also increases healthcare costs. Anxiety and asthma symptoms overlap but can be separated.

<table>
<thead>
<tr>
<th>Anxiety symptoms:</th>
<th>Asthma symptoms:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shortness of breath</td>
<td>Shortness of breath</td>
</tr>
<tr>
<td>Worry</td>
<td>Worry</td>
</tr>
<tr>
<td>Dread</td>
<td>Dread</td>
</tr>
<tr>
<td>Somatic symptoms</td>
<td>Coughing</td>
</tr>
<tr>
<td>Avoidance of activities</td>
<td>Wheezing</td>
</tr>
<tr>
<td>Normal spirometry</td>
<td>Abnormal spirometry</td>
</tr>
<tr>
<td>Continuous</td>
<td>Intermittent</td>
</tr>
</tbody>
</table>

The PHQ-4 is a brief screen for depression and anxiety. Action is recommended at a PHQ-4 score of 3 or higher on each section. Scoring the PHQ-4 is based on a few key items:

- Items 1 and 2 are screening questions for anxiety.
- Items 3 and 4 are screening questions for depression.
The following is a table for scoring the PHQ-4 screen:

<table>
<thead>
<tr>
<th>Questions 1 and 2 (Anxiety Screen)</th>
<th>Total Score</th>
<th>Rating</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>None – minimal</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>1 or 2</td>
<td>Mild</td>
<td>Watchful waiting; repeat at follow-up</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Moderate</td>
<td>Treatment plan, consider counseling and/or pharmacotherapy</td>
</tr>
<tr>
<td></td>
<td>4 or 5</td>
<td>Moderately-Severe</td>
<td>Active treatment with pharmacotherapy and/or psychotherapy</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Severe</td>
<td>Immediate initiation of pharmacotherapy, expedited referral to BH specialist</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Questions 3 and 4 (Depression Screen)</th>
<th>Total Score</th>
<th>Rating</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>None – minimal</td>
<td>None</td>
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<td></td>
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</tr>
</tbody>
</table>

The PHQ-2 and GAD-2 consist of the first two items of the PHQ-9 and GAD-7 respectively, and constitute the two core DSM-IV items for major depressive disorder and generalized anxiety disorder, respectively. Each ranges from a score of 0 to 6. The operating characteristics of these ultra-brief measures are quite good; the recommended cutpoints for each when used as screeners is a score of 3 or greater. When used together, they are referred to as the PHQ-4 a 4-item screening measure which ranges from a score of 0 to 12, and serves as a good measure of —caseness‖ (i.e., the higher the score, the more likely there is an underlying depressive or anxiety disorder). In particular, the PHQ-2 and GAD-2 subscores of the PHQ-4 provide separate depressive and anxiety scores, and can be used as screeners for depression and anxiety. The PHQ is available at http://phqscreener.com.


### Integrated Care Management

Management of asthma involves:

- Identifying and removing asthma triggers from the member’s environment. (This may involve other family members, especially those who are smokers).
- Ensuring adherence to maintenance medications.
- Vaccinating against influenza and pneumonia.
- Having an asthma action plan.
- Screening for anxiety and depression, and based on findings, initiate treatment or continued surveillance.

### DIAGNOSIS AND MANAGEMENT OF ASTHMA

A critical aspect of the diagnosis and management of asthma is the precise and periodic measurement of lung function — both before and after bronco-dilator therapy to determine both the severity and the effectiveness of therapeutic interventions. When establishing the diagnosis of asthma, evaluate:

- **Medical history** including smoking, drug and alcohol use; physical examination; and supportive diagnostic lung function testing.
- **Establish that episodic symptoms of airflow obstruction are present**, and objectively demonstrate that...
obstruction is at least partially reversible with Spirometry.

- **Exclude the presence of any alternative diagnoses**, particularly COPD or vocal chord obstruction in adults; and aspiration, cardiac failure, inhaled foreign body, structural abnormality or cystic fibrosis in children.

- **Medication requirements.** Short-acting bronchodilators used more than twice per week should prompt daily inhaled corticosteroid administration for persistent asthma, even if mild severity.

Measures of assessment and monitoring should include:

- **Spirometry**, to be conducted at least once a year before and after inhaled bronchodilator therapy. Significant reversibility is indicated by an increase of ≥ 12% and 200 ml in FEV1

- **Peak Flow.** Symptomatic patients with normal spirometry should:
  - Have a daily assessment of peak flow monitoring upon rising and before bedtime; and
  - Maintain an accurate log of daily measurements to help detect subtle changes in lung function that may otherwise go unnoticed by the patient or the provider.

**Contributing Factors**

Assess at the initial evaluation & additional visits based on seasonal variations:

- Smoking and secondhand smoke. If the member smokes, address the value and available resources to aid in smoking cessation.

- Identify possible environmental inhalant allergens, indoor irritants, pet dander, air pollution

- Viral Respiratory Infection component to induction of Reactive Airways Disease

- Identify all the modifiable risk factors: sedentary lifestyle, obesity, stress, smoking, drug use

- Identify other factors: acute/chronic rhino-sinusitis, gastro-esophageal reflux, drugs (ASA/NSAIDS, sulfites, beta-adrenergic blockers in sensitive patients)

**Member Education**

All patients with Asthma should have a written Asthma Action Plan which incorporates all aspects of their Asthma care. This care plan should be re-evaluated at least annually and more often if necessary to help control the patient’s changing condition. A team approach, which includes the patient, the PCP, a certified asthma educator, and a pulmonary specialist when appropriate, is the ideal delivery model for the effective and efficient treatment of Asthma. Toward this end, the patient must understand his/her Asthma Action Plan – which includes:

- Short and long term goals
- Written environmental control recommendations
- Lifestyle changes including sick day interventions
- Self-monitoring of peak flows with use of a recording system (monthly calendar charting seasonal variations in asthma symptoms)
- Basic facts about asthma (provide written material for patient reference)
- List of environmental controls (stress the importance of implementation)
- Appropriate role of Asthma medications:
  - Explain use of controller vs. reliever medications
  - Provide Asthma Action Plan for medication use
  - Provide use instructions for MDI (observe use and critique technique) and the use of Spacer devises
  - Refer to WellCare Asthma Disease Management Program

**Monitoring, Reporting and Follow Up**

- Establish therapeutic goals: normal Activity without restriction, rare symptoms.
- Provide instructions for monitoring and reporting. Practice use of peak flow meter as a monitoring tool and instruct patient to record missed school/work days, altered activity, symptom changes.
- Routine office exams seasonally or every 1 to 6 months if stable, with increased frequency in acute cases or if
patient’s routine “stable” status changes
- Assess attainment of patient goals and concerns
- Adjust treatment plans as often as necessary for optimal control; add inhaled corticosteroids for all persistent (rescue meds > twice per week) asthma, no matter how mild the severity
- Update the Asthma Action Plan and self-management plan annually and as indicated for changes in status
- Re-assess patient’s peak flow and inhaler technique
- Smoking cessation program referral for smokers

**PHARMACOTHERAPY AND ASTHMA**

Asthma medication plays a key role in managing symptoms. Commonly prescribed medications include:
- Short-acting inhaled beta agonists for relief of acute symptoms (e.g., albuterol)
- Inhaled glucocorticoids for “controller therapy”
- Oral glucocorticoids for starting controller therapy or for exacerbations
- Anti-leukotriene agents (e.g., Singulair)
- Anti-IgE Therapy

Providers can help members maintain optimal outcomes by helping them:
- Control chronic and nocturnal symptoms
- Maintain normal activity levels, including exercise
- Maintain near normal pulmonary function
- Prevent acute episodes of asthma exacerbation
- Avoid adverse effects of asthma medications
- In addition to allergen avoidance, enhance pharmacotherapy for environmental allergy based seasonal asthma, e.g. daily antihistamines and nasal steroid sprays to avoid asthma induction, daily inhaled corticosteroids during season even if not needed outside of season, etc.
- Annual Influenza immunization; Pneumococcal vaccination as appropriate

Pharmacotherapy should be based on the member’s individual needs such as:

- **Rescue Medication**
  - Short Acting Beta2 Adrenergic Agonist Bronchodilator
  - Primary medication only for infrequent symptoms or pre-exposure prophylaxis

- **First Line Controller Medication**
  - Inhaled Corticosteroids
  - To be added for ALL persistent disease, no matter how mild

- **Second Line Controller Medication**
  - Long Acting Beta2 Adrenergic Agonist Bronchodilators
  - To be added for asthmatics inadequately controlled on steroids

- **Third Line Medications**
  - Other anti-inflammatory inhalers
  - Only added for asthmatics inadequately controlled on 1st & 2nd step therapy

- **Fourth Line Medications**
  - Methylxanthines
  - Available, but rarely required

**Leukotriene modifiers:** Include Leukotriene Receptor Antagonist (LTRA) and a 5-lipoxygenase inhibitor. TwoLTRAs are available—montelukast (for patients >1 year of age) and zafirlukast (for patients ≥7 years of age). The 5-lipoxygenase pathway inhibitor zileuton is available for patients ≥12 years of age; liver function monitoring is essential.LTRAs are alternative, but not preferred, therapy for the treatment of mild persistent asthma. LTRAs can also be used as adjunctive therapy with ICSs, but for youths ≥12 years of age and adults they are not the preferred adjunctive therapy compared to the addition of LABAs. Zileuton can be used as alternative but not preferred adjunctive therapy in adults.
## Components of Severity and Therapy Initiation in Children (0-11 years)

<table>
<thead>
<tr>
<th>Components of Severity</th>
<th>Impairment</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nighttime awakenings</td>
<td>Normal FEV₁</td>
<td>0-1 year (see notes)</td>
</tr>
<tr>
<td>Short-acting beta-agonist use for symptom control</td>
<td>FEV₁ (predicted) or peak flow (personal best)</td>
<td></td>
</tr>
<tr>
<td>Interference with normal activity</td>
<td>Exacerbations requiring oral systemic corticosteroids (consider severity and exacerbation pattern)</td>
<td></td>
</tr>
<tr>
<td>Lung Function</td>
<td>Duration of exacerbations, worsening of expiratory flow, increased risk of hospitalization</td>
<td></td>
</tr>
</tbody>
</table>

### Classification

<table>
<thead>
<tr>
<th>Asthma Severity</th>
<th>Ages 0-4</th>
<th>Ages 5-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe</td>
<td>&gt;2 daily/week</td>
<td>&gt;2 daily/week but not daily</td>
</tr>
<tr>
<td>Persistent</td>
<td>Throughout the day</td>
<td>&gt;1/week but not nightly</td>
</tr>
<tr>
<td>Moderate</td>
<td>Daily</td>
<td>3-4/week</td>
</tr>
<tr>
<td>Intermittent</td>
<td>&lt;2/day/week</td>
<td>&lt;2/day/week but not daily</td>
</tr>
</tbody>
</table>

### Therapy Initiation

1. **Step 1:** Consider initiating controller therapy for persistent asthma.
2. **Step 2:** Consider adding a controller medication for intermittent asthma.
3. **Step 3:** Consider adding a controller medication for intermittent asthma.

### Additional Notes

- **Intermittent asthma:** Children 6-11 years old: If no clear benefit is observed in 4-6 weeks, step treatment and consider alternative diagnoses or adjust therapy accordingly.
- **Severe asthma:** Children 6-11 years old: Assess treatment needs.
- **Moderate asthma:** Use short-course oral corticosteroids for exacerbations.

---

**Clinical Practice Guideline**

### Assessing Asthma Control and Adjusting Therapy in Children (0-11 years)\(^2\)

<table>
<thead>
<tr>
<th>Components of Control</th>
<th>Impairment</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms</td>
<td>Nighttime awakening</td>
<td>(&gt;80%)</td>
</tr>
<tr>
<td></td>
<td>Inference with normal activity</td>
<td>Non-treatment, (75-80%)</td>
</tr>
<tr>
<td></td>
<td>Short-acting beta-agonist use for symptoms</td>
<td>Non-treatment, (&gt;80%)</td>
</tr>
<tr>
<td></td>
<td>Long function</td>
<td>(&gt;80%)</td>
</tr>
<tr>
<td></td>
<td>Exertions requiring oral systemic corticosteroids</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reduction in lung growth</td>
<td></td>
</tr>
</tbody>
</table>

**Well Controlled**
- Ages 0-4: \(<2\) days/week, but not more than once on each day
- Ages 5-11: \(<1\) day/week

**Not Well Controlled**
- Ages 0-4: \(>2\) days/week or multiple times on \(<2\) day/week
- Ages 5-11: \(>1\) month

**Very Poorly Controlled**
- Ages 0-4: Throughout the day
- Ages 5-11: Several times per day

**Assessing Asthma Control and Adjusting Therapy in Children**

<table>
<thead>
<tr>
<th>Ages</th>
<th>Component</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>5-11</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Recommended Action for Treatment**

(See "Stepwise Approach for Managing Asthma" for treatment steps.)

The stepwise approach is meant to assist, not replace, clinical decision-making required to meet individual patient needs.
Assessing Asthma Control and Adjusting Therapy in Youths ≥ 12 years of Age and Adults

<table>
<thead>
<tr>
<th>Components of Control</th>
<th>Classification of Asthma Control (≥12 years of age)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Well Controlled</td>
</tr>
<tr>
<td>Symptoms</td>
<td>≤2 days/week</td>
</tr>
<tr>
<td>Nighttime awakenings</td>
<td>≤2x/month</td>
</tr>
<tr>
<td>Interference with normal activity</td>
<td>None</td>
</tr>
<tr>
<td>Short-acting beta-agonist use for symptom control (not prevention of EIB)</td>
<td>≤2 days/week</td>
</tr>
<tr>
<td>FEV₁ or peak flow</td>
<td>&gt;80% predicted/personal best</td>
</tr>
<tr>
<td>Validated questionnaires</td>
<td>ATAQ ≤0.75*</td>
</tr>
<tr>
<td></td>
<td>ACT ≥20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exacerbations requiring oral systemic corticosteroids</td>
</tr>
<tr>
<td>Progressive loss of lung function</td>
</tr>
<tr>
<td>Treatment-related adverse effects</td>
</tr>
</tbody>
</table>

**Recommended Action for Treatment**

(See "Stepwise Approach for Managing Asthma" for treatment steps.)

- **Well Controlled**: Maintain current step.
- **Not Well Controlled**: Step up 1 step. Rerevaluate in 2–6 weeks. For side effects, consider alternative treatment options.
- **Very Poorly Controlled**: Consider short course of oral systemic corticosteroids. Step up 1–2 steps. Rerevaluate in 2 weeks. For side effects, consider alternative treatment options.
### Classifying Asthma Severity and Initiating Treatment in Youths ≥ 12 Years of Age and Adults

<table>
<thead>
<tr>
<th>Classification of Asthma Severity</th>
<th>Persistent</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;2 days/week but not daily</td>
<td>Daily</td>
<td>Often 7x/week but not nightly</td>
<td>Throughout the day</td>
</tr>
<tr>
<td>&gt;2 days/week but not daily</td>
<td>Daily</td>
<td>&gt;1x/week but not nightly</td>
<td>Several times per day</td>
</tr>
<tr>
<td>3x/month</td>
<td>Minor limitation</td>
<td>Extremely limited</td>
<td>Extremely limited</td>
</tr>
<tr>
<td>≤2 days/week</td>
<td>None</td>
<td>Some limitation</td>
<td>Extremely limited</td>
</tr>
<tr>
<td>≤2x/month</td>
<td>None</td>
<td>Some limitation</td>
<td>Extremely limited</td>
</tr>
</tbody>
</table>

#### Components of Severity

- **Impairment**
  - Normal FEV1/FVC:
    - 8–13 yr: 85–80%
    - 20–39 yr: 80–75%
    - 40–59 yr: 75–70%
    - 60–80 yr: 70–65%
- **Symptoms**
  - Nighttime awakenings
  - Short-acting beta-agonist use for prevention of EIB
- **Interference with normal activity**
  - None
  - Minor limitation
- **Lung function**
  - Normal FEV1
  - >90%
  - >80%
  - <80%
  - <60%
  - FEV1/FVC reduced >5%

#### Risk

- 0–1 year (see note)
- ≥2/year (see note)
- Consider severity and interval since last exacerbation, frequency and severity may fluctuate over time for patients in any severity category.

#### Step-by-Step Approach for Managing Asthma

1. **Step 1**
   - In 2–6 weeks, evaluate level of asthma control that is achieved and adjust therapy accordingly.
2. **Step 2**
   - Consider short course of oral systemic corticosteroids.
3. **Step 3**
   - Relative annual risk of exacerbations may be related to FEV1.
4. **Step 4** or **5**
   - Consider short course of systemic corticosteroids and adjust therapy accordingly.

#### Recommended Step for Initiating Treatment

(See “Stepwise Approach for Managing Asthma for treatment steps.”)
**Figure 1. Summary of Recommended Key Clinical Activities for the Diagnosis and Management of Asthma**

<table>
<thead>
<tr>
<th>Clinical Issue</th>
<th>Key Clinical Activities</th>
<th>Action Steps</th>
</tr>
</thead>
</table>
| **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**     | Goal of asthma therapy is asthma control:                                               | ● 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). |
| **LONG TERM**           |                                                                                        |                                                                                                                                                                                                             |
| **FOUR COMPONENTS OF CARE** | Assess asthma severity to initiate therapy.                                             | ● Use severity classification chart, assessing both domains of impairment and risk, to determine initial treatment.  
                            |                                                                                        | ● 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).  
                            |                                                                                        | ● 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.  
                            |                                                                                        | Asthma is highly variable over time; periodic monitoring is essential. 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.  
                            |                                                                                        | ● Assess asthma control, medication technique, written asthma action plan, patient adherence and concerns at every visit.  
                            |                                                                                        |                                                                                                                                                                                                             |
| Assessment and Monitoring | Assess asthma control to monitor and adjust therapy.                                     |                                                                                                                                                                                                             |
|                          | Schedule follow-up care.                                                                |                                                                                                                                                                                                             |
| Education                | Provide self-management education.                                                      | Teach and reinforce:  
                            |                                                                                        | ● 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 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.  
                            |                                                                                        | ● Agree on treatment goals and address patient concerns.  
                            |                                                                                        | ● 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).  
                            |                                                                                        | ● Involve all members of the health care team in providing / reinforcing education, including physicians, nurses, pharmacists, respiratory therapists, and asthma educators.  
                            |                                                                                        | ● 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.  
                            |                                                                                        | ● Use a variety of educational strategies and methods.                                                                                                                                                        |
|                          | Integrate education into all points of care where health professionals interact with patients. |                                                                                                                                                                                                             |
| Control Environmental Factors and | Recommend measures to control exposures to allergens and pollutants.                  | ● 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.).  
                            |                                                                                        |                                                                                                                                                                                                             |
Comorbid conditions or irritants that make and asthma worse.

Treat comorbid conditions.

- 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.
- 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.
- Consider especially: allergic bronchopulmonary aspergillosis; gastroesophageal reflux, obesity, obstructive sleep apnea, rhinitis and sinusitis, and stress or depression. Recognition and treatment of conditions may improve asthma control.
- Consider inactivated influenza vaccine for all patients over 6 months of age.

Medications Select medication and delivery devices to meet patient’s needs and circumstances.

- Use stepwise approach (See below.) to identify appropriate treatment options.
- 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.

<table>
<thead>
<tr>
<th>Clinical Issue</th>
<th>Key Clinical Activities</th>
<th>Action Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEPWISE APPROACH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Principles for All Age Groups</td>
<td>Incorporate four components of care.</td>
<td>Include medications, patient education, environmental control measures, and management of comorbidities at each step. Monitor asthma control regularly (See above, assessment and monitoring.)</td>
</tr>
<tr>
<td>Initiate therapy based on asthma severity.</td>
<td></td>
<td>For patients not taking long-term control therapy, select treatment step based on severity (See figures on stepwise approach for different age groups.). Patients who have persistent asthma require daily long-term control medication.</td>
</tr>
<tr>
<td>Adjust therapy based on asthma control.</td>
<td></td>
<td>Once therapy is initiated, monitor the level of asthma control and adjust therapy accordingly: step up if necessary and step down if possible to identify the minimum amount of medication required to maintain asthma control. Refer to an asthma specialist for consultation or co-management if there are difficulties achieving or maintaining control; step 4 care or higher is required (step 3 care or higher for children 0–4 years of age); immunotherapy or omalizumab is considered; or additional testing is indicated; or if the patient required 2 bursts of oral systemic corticosteroids in the past year or a hospitalization.</td>
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</tbody>
</table>


HEDIS AND STAR MEASURES

CMS has not published any measures for this topic.

WellCare adheres to the measures issued by the National Committee for Quality Assurance (NCQA) for the management of children and adults with asthma. Members should be assessed for the following:
- Appropriate medication use
- Influenza and pneumococcal vaccinations
- Tobacco use and assistance with tobacco cessation (for those Members using tobacco)

RELATED CLINICAL PRACTICE GUIDELINES

In addition to the information contained in this document, please reference the following CPGs:
- COPD : HS 1007
- Smoking Cessation : HS 1035
REFERENCES


LEGAL DISCLAIMER

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MEDICAL POLICY COMMITTEE HISTORY AND REVISIONS

<table>
<thead>
<tr>
<th>Date</th>
<th>History and Revisions by the Medical Policy Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/5/2015</td>
<td>Approved. Included items from Care Management training.</td>
</tr>
<tr>
<td>6/17/2014</td>
<td>Approved by MPC. Inclusion of NCQA Disease Management Performance Measure.</td>
</tr>
<tr>
<td>12/1/2011</td>
<td>New template design approved by MPC.</td>
</tr>
<tr>
<td>9/2010</td>
<td>Approved by MPC.</td>
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</table>