Asthma

Source Guideline
http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.pdf

Goal of Asthma Care
The overarching goal of asthma care is to achieve asthma control, enabling a patient to live without functional limitations, impairment in quality of life, or risk of adverse events.

Guiding Principles
1. Prevent chronic and troublesome symptoms.
2. Reduce impairment (prevent chronic symptoms, achieve infrequent use of short-acting beta-agonist (SABA, “rescue inhalers”), maintain (near) normal lung function and normal activity levels).
3. Maintain near normal pulmonary function and activity levels.
4. 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).
5. Prevent progressive loss of lung function; for children, prevent reduced lung growth.
6. Step-down therapy: minimum medication necessary to maintain control.

Four Components of Care
1. Assessment and Monitoring
   a. Assess asthma severity to initiate therapy.
   b. Assess asthma control to monitor and adjust therapy.
   c. Schedule follow-up care.
2. Education
   a. Provide self-management education.
   b. Develop a written asthma action plan in partnership with the patient.
   c. Integrate education into all points of care where health professionals interact with patients.
3. Control Environmental Factors and Comorbid Conditions
   a. Recommend measures to control exposures to allergens and pollutants or irritants that make asthma worse.
   b. Treat comorbid conditions.
4. Medications
   a. Select medication and delivery devices to meet patient’s need and circumstances.

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<th>Reference Page</th>
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<td>Figure 3 – 10c</td>
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</tr>
</tbody>
</table>
**Core Guideline Elements**

**FIGURE 4-1a. STEPWISE APPROACH FOR MANAGING ASTHMA IN CHILDREN 0–4 YEARS OF AGE**

### Intermittent Asthma
- Preferred: SABA PRN
- Alternative: Cromolyn or Montelukast

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

### Step 1
- Preferred: Low-dose ICS
- Alternative: Cromolyn or Montelukast

### Step 2
- Preferred: Medium-dose ICS
- Alternative: LABA or Montelukast

### Step 3
- Preferred: High-dose ICS + either LABA or Montelukast

### Step 4
- Preferred: Oral systemic corticosteroids

### Step 5
- Preferred: High-dose ICS + either LABA or Montelukast

### Step 6
- Preferred: Step up if needed
- (first, check adherence, inhaler technique, and environmental control)

### Assess control
- Step down if possible (and asthma is well controlled at least 3 months)

### 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.

### Key
- Alphabetical order is used when more than one treatment option is listed within either preferred or alternative therapy. ICS, inhaled corticosteroid; LABA, inhaled long-acting beta₂-agonist; SABA, inhaled short-acting beta₂-agonist

### Notes:
- The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.
- If alternative treatment is used and response is inadequate, discontinue it and use the preferred treatment before stepping up.
- If clear benefit is not observed within 4–6 weeks and patient/family medication technique and adherence are satisfactory, consider adjusting therapy or alternative diagnosis.
- Studies on children 0–4 years of age are limited. Step 2 preferred therapy is based on Evidence A. All other recommendations are based on expert opinion and extrapolation from studies in older children.
Figure 4-2a. Classifying Asthma Severity and Initiating Treatment in Children 0-4 Years of Age

Assessing severity and initiating therapy in children who are not currently taking long-term control medication

<table>
<thead>
<tr>
<th>Components of Severity</th>
<th>Classification of Asthma Severity (0-4 years of age)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intermittent</td>
</tr>
<tr>
<td></td>
<td>&lt;2 days/week</td>
</tr>
<tr>
<td></td>
<td>&gt;2 days/week but not daily</td>
</tr>
<tr>
<td></td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td>Throughout the day</td>
</tr>
<tr>
<td>Impairment</td>
<td></td>
</tr>
<tr>
<td>Symptoms</td>
<td></td>
</tr>
<tr>
<td>Nighttime awakenings</td>
<td>0</td>
</tr>
<tr>
<td>Short-acting beta-agonist use for symptom control (not prevention of EIB)</td>
<td>&lt;2 days/week but not daily</td>
</tr>
<tr>
<td>Interference with normal activity</td>
<td>None</td>
</tr>
<tr>
<td>Risk</td>
<td></td>
</tr>
<tr>
<td>Exacerbations requiring oral systemic corticosteroids</td>
<td>0-1/year</td>
</tr>
</tbody>
</table>

**Step 1**: Step 1

Exacerbations of any severity may occur in patients in any severity category.

**Step 2**: Step 2

Consider severity and interval since last exacerbation. Frequency and severity may fluctuate over time.

**Step 3**: Step 3 and consider short course of oral systemic corticosteroids

---

**Key**: EIB, exercise-induced bronchospasm

**Notes**

- The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.
- Level of severity is determined by both impairment and risk. Assess impairment domain by patient’s/caregiver’s recall of previous 2-4 weeks. Symptom assessment for longer periods should reflect a global assessment such as inquiring whether the patient’s asthma is better or worse since the last visit. Assign severity to the most severe category in which any feature occurs.
- At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma severity. For treatment purposes, patients who had ≥2 exacerbations requiring oral systemic corticosteroids in the past 6 months, or ≥4 wheezing episodes in the past year, and who have risk factors for persistent asthma may be considered the same as patients who have persistent asthma, even in the absence of impairment levels consistent with persistent asthma.
### FIGURE 3-5a. ASSESSING ASTHMA CONTROL IN CHILDREN 0–4 YEARS OF AGE

<table>
<thead>
<tr>
<th>Components of Control</th>
<th>Classification of Asthma Control (Children 0–4 years of age)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Well Controlled</td>
</tr>
<tr>
<td>Impairment</td>
<td></td>
</tr>
<tr>
<td>Symptoms</td>
<td>≤2 days/week</td>
</tr>
<tr>
<td>Nighttime awakenings</td>
<td>≤1x/month</td>
</tr>
<tr>
<td>Interference with</td>
<td>None</td>
</tr>
<tr>
<td>normal activity</td>
<td></td>
</tr>
<tr>
<td>Short-acting beta-2-</td>
<td>≤2 days/week</td>
</tr>
<tr>
<td>agonist use for</td>
<td></td>
</tr>
<tr>
<td>symptom control</td>
<td></td>
</tr>
<tr>
<td>(not prevention of EIB)</td>
<td></td>
</tr>
<tr>
<td>Risk</td>
<td></td>
</tr>
<tr>
<td>Exacerbations</td>
<td>0–1/year</td>
</tr>
<tr>
<td>requiring oral systemic</td>
<td></td>
</tr>
<tr>
<td>corticosteroids</td>
<td></td>
</tr>
<tr>
<td>Treatment-related</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>
</tr>
<tr>
<td>adverse effects</td>
<td></td>
</tr>
</tbody>
</table>

Key: EIB, exercise-induced bronchoconstriction; ICU, intensive care unit

**Notes:**

- The level of control is based on the most severe impairment or risk category. Assess impairment domain by caregiver’s recall of previous 2–4 weeks. Symptom assessment for longer periods should reflect a global assessment, such as inquiring whether the patient’s asthma is better or worse since the last visit.

- At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma control. In general, more frequent and intense exacerbations (e.g., requiring urgent, unscheduled care, hospitalization, or ICU admission) indicate poorer disease control. For treatment purposes, patients who had ≥2 exacerbations requiring oral systemic corticosteroids in the past year may be considered the same as patients who have not-well-controlled asthma, even in the absence of impairment levels consistent with persistent asthma.
**Figure 4-1b. Stepwise Approach for Managing Asthma in Children 5–11 Years of Age**

**Step 1**
- **Preferred:** Low-dose ICS
- **Alternative:** Cromolyn, LABA, Nedocromil, or Theophylline

**Step 2**
- **Preferred:** Medium-dose ICS + LABA
- **Alternative:** Medium-dose ICS + either LTRA or Theophylline

**Step 3**
- **Preferred:** Low-dose ICS + either LABA, LTRA, or Theophylline
- **Alternative:** Low-dose ICS + either LTRA or Theophylline

**Step 4**
- **Preferred:** High-dose ICS + LABA
- **Alternative:** High-dose ICS + either LTRA or Theophylline

**Step 5**
- **Preferred:** High-dose ICS + oral systemic corticosteroid
- **Alternative:** High-dose ICS + either LTRA or Theophylline + oral systemic corticosteroid

**Step 6**
- **Preferred:** High-dose ICS + LABA + oral systemic corticosteroid
- **Alternative:** High-dose ICS + either LTRA or Theophylline + oral systemic corticosteroid

Each step: Patient education, environmental control, and management of comorbidities.

Steps 2–4: Consider subcutaneous allergen immunotherapy for patients who have allergic asthma (see notes).

Quick-Relief Medication for All Patients:
- SABA as needed for symptoms; frequency 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 use of SABA or use ≥2 days a week for symptom relief (not prevention of EIB) generally indicates inadequate control and the need to step up treatment.

Key: Alphabetical order is used when more than one treatment option is listed within either preferred or alternative therapy. ICS, inhaled corticosteroid; LABA, inhaled long-acting beta₂-agonist; LTRA, leukotriene receptor antagonist; SABA, inhaled short-acting beta₂-agonist

Notes:
- The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.
- If alternative treatment is used and response is inadequate, discontinue it and use the preferred treatment before stepping up.
- Theophylline is a less desirable alternative due to the need to monitor serum concentration levels.
- Step 1 and step 2 medications are based on Evidence A. Step 3 ICS + adjunctive therapy and ICS are based on Evidence B for efficacy of each treatment and extrapolation from comparator trials in older children and adults—comparator trials are not available for this age group; steps 4–6 are based on expert opinion and extrapolation from studies in older children and adults.
- Immunotherapy for steps 2–4 is based on Evidence B for house-dust mites, animal danders, and pollens; evidence is weak or lacking for molds and cockroaches. Evidence is strongest for immunotherapy with single allergens. The role of allergy in asthma is greater in children than in adults. Clinicians who administer immunotherapy should be prepared and equipped to identify and treat anaphylaxis that may occur.
### FIGURE 4-2b. CLASSIFYING ASTHMA SEVERITY AND INITIATING TREATMENT IN CHILDREN 5–11 YEARS OF AGE

Assessing severity and initiating therapy in children who are not currently taking long-term control medication

<table>
<thead>
<tr>
<th>Components of Severity</th>
<th>Classification of Asthma Severity (5–11 years of age)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intermittent</td>
</tr>
<tr>
<td>Impairment</td>
<td>Persistent</td>
</tr>
<tr>
<td>Symptoms</td>
<td>≤2 days/week</td>
</tr>
<tr>
<td>Nighttime awakenings</td>
<td>≤2x/month</td>
</tr>
<tr>
<td>Short-acting beta-agonist use for symptom control (not prevention of EIB)</td>
<td>≤2 days/week but not daily</td>
</tr>
<tr>
<td>Interference with normal activity</td>
<td>None</td>
</tr>
<tr>
<td>Lung function</td>
<td>Normal FEV₁ between exacerbations</td>
</tr>
<tr>
<td></td>
<td>FEV₁ &gt;80% predicted</td>
</tr>
</tbody>
</table>

**Risk**

<table>
<thead>
<tr>
<th>Exacerbations requiring oral systemic corticosteroids</th>
<th>0–1/year (see note)</th>
<th>≥2/year (see note)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency and severity may fluctuate over time for patients in any severity category.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative annual risk of exacerbations may be related to FEV₁.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Recommended Step for Initiating Therapy**

(See figure 4-1b for treatment steps.)

- **Step 1**: In 2-6 weeks, evaluate level of asthma control that is achieved, and adjust therapy accordingly.
- **Step 2**: Step 3, medium-dose ICS option and consider short course of oral systemic corticosteroids.
- **Step 3, medium-dose ICS option**: or step 4

**Key**:
- EIB, exercise-induced bronchospasm;
- FEV₁, forced expiratory volume in 1 second;
- FVC, forced vital capacity;
- ICS, inhaled corticosteroids

**Notes**

- The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.
- Level of severity is determined by both impairment and risk. Assess impairment domain by patient’s/caregiver’s recall of the previous 2–4 weeks and spirometry. Assign severity to the most severe category in which any feature occurs.
- At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma severity. In general, more frequent and intense exacerbations (e.g., requiring urgent, unscheduled care, hospitalization, or ICU admission) indicate greater underlying disease severity. For treatment purposes, patients who had ≥2 exacerbations requiring oral systemic corticosteroids in the past year may be considered the same as patients who have persistent asthma, even in the absence of impairment levels consistent with persistent asthma.
### FIGURE 3–5b. ASSESSING ASTHMA CONTROL IN CHILDREN 5–11 YEARS OF AGE

<table>
<thead>
<tr>
<th>Components of Control</th>
<th>Classification of Asthma Control (Children 5–11 years of age)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Well Controlled</td>
</tr>
<tr>
<td><strong>Impairment</strong></td>
<td>≤2 days/week but not more than once on each day</td>
</tr>
<tr>
<td>Symptoms</td>
<td>≤1x/month</td>
</tr>
<tr>
<td>Nighttime awakenings</td>
<td>None</td>
</tr>
<tr>
<td>Interference with normal activity</td>
<td>≤2 days/week</td>
</tr>
<tr>
<td>Short-acting beta&lt;sub&gt;2&lt;/sub&gt;-agonist use for symptom control (not prevention of EIB)</td>
<td>&gt;80% predicted/personal best</td>
</tr>
<tr>
<td>Lung function</td>
<td>&gt;80%</td>
</tr>
<tr>
<td>FEV&lt;sub&gt;1&lt;/sub&gt; or peak flow</td>
<td>100%</td>
</tr>
<tr>
<td>FEV&lt;sub&gt;1&lt;/sub&gt;/FVC</td>
<td></td>
</tr>
<tr>
<td><strong>Risk</strong></td>
<td>Exacerbations requiring oral systemic corticosteroids</td>
</tr>
<tr>
<td>Reduction in lung growth</td>
<td>Evaluation requires long-term followup.</td>
</tr>
<tr>
<td>Treatment-related adverse effects</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>
</tr>
</tbody>
</table>

Key: EIB, exercise-induced bronchoconstriction; FEV<sub>1</sub>, forced expiratory volume in 1 second; FVC, forced vital capacity; ICU, intensive care unit.

**Notes:**

- The level of control is based on the most severe impairment or risk category. Assess impairment domain by patient’s/caregiver’s recall of previous 2–4 weeks and by spirometry/peak flow measures. Symptom assessment for longer periods should reflect a global assessment, such as inquiring whether the patient’s asthma is better or worse since the last visit.

- At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma control. In general, more frequent and intense exacerbations (e.g., requiring urgent, unscheduled care, hospitalization, or ICU admission) indicate poorer disease control. For treatment purposes, patients who had ≥2 exacerbations requiring oral systemic corticosteroids in the past year may be considered the same as patients who have not-well-controlled asthma, even in the absence of impairment levels consistent with not-well-controlled asthma.
FIGURE 4–5. STEPWISE APPROACH FOR MANAGING ASTHMA IN YOUTHS ≥12 YEARS OF AGE AND ADULTS

Intercurrent Asthma

Persistent Asthma: Daily Medication
Consult with asthma specialist if step 4 care or higher is required. Consider consultation at step 3.

Step 1
Preferred:
Low-dose ICS
Alternative:
Cromolyn, LTRA, Nedocromil, or Theophylline

Step 2
Preferred:
Low-dose ICS + LABA
Alternative:
Medium-dose ICS + LABA

Step 3
Preferred:
Low-dose ICS + LABA
Alternative:
Medium-dose ICS + either LTRA, Theophylline, or Zileuton

Step 4
Preferred:
High-dose ICS + LABA
AND
Consider Omnizumab for patients who have allergies

Step 5
Preferred:
High-dose ICS + LABA + oral corticosteroids
AND
Consider Omnizumab for patients who have allergies

Step 6

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.
- 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.

Key: Alphabetical order is used when more than one treatment option is listed within either preferred or alternative therapy. EIB, exercise-induced bronchospasm; ICS, inhaled corticosteroid; LABA, long-acting inhaled beta2-agonist; LTRA, leukotriene receptor antagonist; SABA, inhaled short-acting beta2-agonist

Notes:
- The stepwise approach is meant to assist, not replace, the clinical decision-making required to meet individual patient needs.
- If alternative treatment is used and response is inadequate, discontinue it and use the preferred treatment before stepping up.
- Zileuton is a less desirable alternative due to limited studies as adjunctive therapy and the need to monitor liver function. Theophylline requires monitoring of serum concentration levels.
- In step 6, before oral systemic corticosteroids are introduced, a trial of high-dose ICS + LABA + either LTRA, theophylline, or zileuton may be considered, although this approach has not been studied in clinical trials.
- Step 1, 2, and 3 preferred therapies are based on Evidence A; step 3 alternative therapy is based on Evidence A for LTRA, Evidence B for theophylline, and Evidence D for zileuton. Step 4 preferred therapy is based on Evidence B, and alternative therapy is based on Evidence B for LTRA and theophylline and Evidence D for zileuton. Step 5 preferred therapy is based on Evidence B. Step 6 preferred therapy is based on (EPR—2 1997) and Evidence B for omalizumab.
- Immunotherapy for steps 2–4 is based on Evidence B for house-dust mites, animal danders, and pollens; evidence is weak or lacking for molds and cockroaches. Evidence is strongest for immunotherapy with single allergens. The role of allergy in asthma is greater in children than in adults.
- Clinicians who administer immunotherapy or omalizumab should be prepared and equipped to identify and treat anaphylaxis that may occur.
## FIGURE 4-6. CLASSIFYING ASTHMA SEVERITY AND INITIATING TREATMENT IN YOUTHS ≥12 YEARS OF AGE AND ADULTS

Assessing severity and initiating treatment for patients who are not currently taking long-term control medications.

<table>
<thead>
<tr>
<th>Components of Severity</th>
<th>Classification of Asthma Severity ≥12 years of age</th>
<th>Persistent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intermittent</td>
<td>Mild</td>
</tr>
<tr>
<td><strong>Impairment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal FEV₁/FVC: 8–19 yr</td>
<td>85%</td>
<td></td>
</tr>
<tr>
<td>20–39 yr</td>
<td>80%</td>
<td></td>
</tr>
<tr>
<td>40–59 yr</td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td>60–80 yr</td>
<td>70%</td>
<td></td>
</tr>
<tr>
<td>Symptoms</td>
<td>≤2 days/week</td>
<td>&gt;2 days/week but not daily</td>
</tr>
<tr>
<td>Nighttime awakenings</td>
<td>≤2x/month</td>
<td>3–4x/month</td>
</tr>
<tr>
<td>Short-acting beta₂-agonist use for symptom control (not prevention of EIB)</td>
<td>≤2 days/week</td>
<td>&gt;2 days/week but not daily and not more than 1x on any day</td>
</tr>
<tr>
<td>Interference with normal activity</td>
<td>None</td>
<td>Minor limitation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lung function</th>
<th>Normal FEV₁ between exacerbations</th>
<th>FEV₁ &lt;80% predicted</th>
<th>FEV₁ &gt;80% predicated</th>
<th>FEV₁/FVC normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk</td>
<td>Exacerbations requiring oral systemic corticosteroids</td>
<td>0–1/year (see note)</td>
<td>≥2/year (see note)</td>
<td>Consider severity and interval since last exacerbation. Frequency and severity may fluctuate over time for patients in any severity category. Relative annual risk of exacerbations may be related to FEV₁.</td>
</tr>
</tbody>
</table>

### Recommended Step for Initiating Treatment

(See figure 4-5 for treatment steps.)

- **Step 1:** In 2–6 weeks, evaluate level of asthma control that is achieved and adjust therapy accordingly.

**Notes:**

- The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.

- Level of severity is determined by assessment of both impairment and risk. Assess impairment domain by patient/caregiver's recall of previous 2–4 weeks and spirometry. Assign severity to the most severe category in which any feature occurs.

- At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma severity. In general, more frequent and intense exacerbations (e.g., requiring urgent, unscheduled care, hospitalization, or ICU admission) indicate greater underlying disease severity. For treatment purposes, patients who had ≥2 exacerbations requiring oral systemic corticosteroids in the past year may be considered the same as patients who have persistent asthma, even in the absence of impairment levels consistent with persistent asthma.
### FIGURE 3–5c. ASSESSING ASTHMA CONTROL IN YOUTHS ≥12 YEARS OF AGE AND ADULTS

<table>
<thead>
<tr>
<th>Components of Control</th>
<th>Classification of Asthma Control (Youths ≥12 years of age and adults)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Well-Controlled</td>
</tr>
<tr>
<td><strong>Impairment</strong></td>
<td></td>
</tr>
<tr>
<td>Symptoms</td>
<td>≤2 days/week</td>
</tr>
<tr>
<td>Nighttime awakening</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></td>
</tr>
<tr>
<td>ATAQ</td>
<td>0</td>
</tr>
<tr>
<td>ACQ</td>
<td>≤0.75*</td>
</tr>
<tr>
<td>ACT</td>
<td>≥20</td>
</tr>
<tr>
<td><strong>Risk</strong></td>
<td></td>
</tr>
<tr>
<td>Exacerbations</td>
<td>0–1/year</td>
</tr>
<tr>
<td>Progressive loss of lung function</td>
<td></td>
</tr>
<tr>
<td>Treatment-related adverse effects</td>
<td>Medication side effects can vary in intensity from none to very troublesome and moribund. The level of intensity does not correlate to specific levels of control but should be considered in the overall assessment of risk.</td>
</tr>
</tbody>
</table>

*ACQ values of 0.76–1.4 are indeterminate regarding well-controlled asthma.

Key: EIB, exercise-induced bronchospasm; FEV₁, forced expiratory volume in 1 second. See figure 3–9 for full name and source of ATAQ, ACQ, ACT.

**Notes:**
- The level of control is based on the most severe impairment or risk category. Assess impairment domain by patient's recall of previous 2–4 weeks and by spirometry/or peak flow measures. Symptom assessment for longer periods should reflect a global assessment, such as inquiring whether the patient's asthma is better or worse since the last visit.
- At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma control. In general, more frequent and intense exacerbations (e.g., requiring urgent, unscheduled care, hospitalization, or ICU admission) indicate poorer disease control. For treatment purposes, patients who had ≥2 exacerbations requiring oral systemic corticosteroids in the past year may be considered the same as patients who have not-well-controlled asthma, even in the absence of impairment levels consistent with not-well-controlled asthma.
FIGURE 3-6. SAMPLE QUESTIONS FOR ASSESSING AND MONITORING ASTHMA CONTROL

Monitoring Asthma Control

Ask the patient:

- Has your asthma awakened you at night or early morning?
- Have you needed more quick-relief bronchodilator medication (inhaled short-acting beta₂-agonist) than usual?
- Have you needed any urgent medical care for your asthma, such as unscheduled visits to your doctor, an urgent care clinic, or the emergency department?
- Are you participating in your usual and desired activities?
- If you are measuring your peak flow, has it been below your personal best?

Actions to consider:

- Assess whether the medications are being taken as prescribed.
- Assess whether the medications are being inhaled with correct technique.
- Assess lung function with spirometry and compare to previous measurement.
- Adjust medications, as needed; either step up if control is inadequate or step down if control is maximized, to achieve the best control with the lowest dose of medication.

FIGURE 3-10a. SAMPLE ASTHMA ACTION PLAN

My Asthma Action Plan

Patient Name:  
Medical Record #:  

Physician’s Name:  
Physician’s Phone #:  
Completed by: 
Date:  

Long-Term-Control Medicines | How Much To Take | How Often | Other Instructions |
--- | --- | --- | --- |
 |  |  |  |  |
Quick-Relief Medicines | How Much To Take | How Often | Other Instructions |
--- | --- | --- | --- |
 |  |  |  |  |

Special Instructions when I feel  

GOOD

PREVENT asthma symptoms everyday:

☐ Take my long-term-control medicines (above) every day.
☐ Before exercise, take ________ puffs of ________.
☐ Avoid things that make my asthma worse like:

NOT GOOD

☐ Take my long-term-control medicines (above) every day.
☐ Before exercise, take ________ puffs of ________.
☐ Avoid things that make my asthma worse like:

AWFUL

MEDICAL ALERT! Get help!

Call 9-1-1 if you have trouble walking or talking due to shortness of breath or lips or fingernails are gray or blue.

---

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**Figure 3-10b. Sample Asthma Action Plan**

**Child Asthma Action Plan**

0–5 years of age

**Healthcare Provider's Name:** __________________________ Date: ___________

**Healthcare Provider's Phone #:** __________________________

<table>
<thead>
<tr>
<th>Long-Term-Control Medicines (Take every day, as needed)</th>
<th>How Much To Take</th>
<th>How Often</th>
<th>Other Instructions (such as spacer/inhaler, nebulizer)</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Quick-Relief Medicines</th>
<th>How Much To Take</th>
<th>How Often</th>
<th>Other Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Green Zone**

- Child is well and has no asthma symptoms, even during active play.
- PREVENT asthma symptoms every day:
  - Give the above long-term-control medicines every day.
  - Avoid things that make the child’s asthma worse:
    - Avoid tobacco smoke; ask people to smoke outside.

**Yellow Zone**

- Child is not well and has asthma symptoms that may include:
  - Coughing
  - Wheezing
  - Runny nose or other cold symptoms
  - Breathing harder or faster
  - Awakenings due to coughing or difficulty breathing
  - Playing less than usual
  - Other symptoms that could indicate that your child is having trouble breathing may include difficulty (coughing, grunting sounds, poor sucking), changes in sleep patterns, crying and tire decreased appetite.

**Red Zone**

- Child feels awful! Warning signs may include:
  - Child’s sneeze, cough, or difficulty breathing continues or worsens even after giving yellow zone medicines.
  - Child’s breathing is so hard that it is having trouble walking or sleeping.
  - Child is drowsy or less alert than normal.

**Medical Alert! Get help!**

- Call 9-1-1 if:
  - The child's skin is sucked in around neck and ribs, or
  - Lips and/or fingernails are grey or blue, or
  - Child doesn't respond to you.
**FIGURE 3-10c. SAMPLE ASTHMA ACTION PLAN**

**Asthma Action Plan**

**For:**

**Doctor:**

**Doctor's Phone Number:**

**Hospital/Emergency Department Phone Number:**

---

**Doing Well**

- No cough, wheeze, chest tightness, or shortness of breath during the day or night.
- Can do usual activities.
- And, if a peak flow meter is used:

  - Peak flow: more than 
  - 20 percent or more of my best peak flow.

  My best peak flow is:

**Asthma Is Getting Worse**

- Cough, wheeze, chest tightness, or shortness of breath.
- Waking at night due to asthma, or:

  - Can do some, but not all, usual activities.

  - Peak flow: 
  - 60 to 70 percent of my best peak flow.

---

**Medical Alert!**

- Very short of breath, or:
  - Quick-relief medicines have not helped, or:
  - Cannot do usual activities, or:
  - Symptoms are same or get worse after 24 hours in Yellow Zone.

  - Peak flow: less than 
  - 50 percent of my best peak flow.

---

**DANGER SIGNS**

- Trouble talking and walking due to shortness of breath
- Lips or fingernails are blue

**Take this medicine:**

- (short-acting beta agonist) 
- 4 or 6 puffs or 
- Nebulizer

---

**Take these long-term-control medicines each day (include an anti-inflammatory).**

**Medicine**

**How much to take**

**When to take it**

**Before exercise, if prescribed, take:**

- 2 or 4 puffs

---

**Add: quick-relief medicine—and keep taking your GREEN ZONE medicine.**

- 2 or 4 puffs, every 20 minutes for up to 1 hour
- Nebulizer, once

If applicable, remove yourself from the thing that made your asthma worse.

If your symptoms and peak flow, if used, return to GREEN ZONE after 1 hour of above treatment:

- Continue monitoring to be sure you stay in the green zone.

- If your symptoms (and peak flow, if used) do not return to GREEN ZONE after 1 hour of above treatment:

  - Take: (short-acting beta agonist)
  - Add: (oral corticosteroid)
  - Call the doctor __________ hours after taking the oral corticosteroid.

---

Then call your doctor NOW. Go to the hospital or call an ambulance if:

- You are still in the red zone after 15 minutes AND
- You have not reached your doctor.