Summary of the Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma

National Institutes of Health (NIH)
National Heart, Lung, and Blood Institute
National Asthma Education and Prevention Program (NAEPP)

This information is abstracted from the 2007 NAEPP Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma. To access the complete report, go to www.nhlbi.nih.gov/guidelines/asthma/asthdln.pdf.
Goals of Asthma Control

- **Reduce impairment**
  - Prevent chronic and troublesome symptoms
  - Require infrequent use of inhaled short-acting beta₂-agonists (SABA) for quick relief of symptoms (≤2 days per week)
  - Maintain (near) “normal” pulmonary function
  - Maintain normal activity levels (including exercise and other physical activity and attendance at work or school)
  - Meet patients’ and families’ expectations of and satisfaction with asthma care

- **Reduce risk**
  - Prevent recurrent exacerbations and minimize the need for emergency department (ED) visits/hospitalizations
  - Prevent progressive loss of lung function; for children, prevent reduced lung growth
  - Provide optimal pharmacotherapy with minimal or no adverse effects

Guidelines include separate but related concepts of severity, control, and responsiveness to treatment

- **Severity**
  - The intrinsic intensity of the disease process
  - Measured most easily and directly in a patient not receiving long-term control therapy
  - Assessed to guide clinical decisions on appropriate medications and interventions

- **Control**
  - The degree to which the manifestations of asthma (symptoms, functional impairments, and risks of untoward events) are minimized and the goals of therapy are met
  - Guide decisions to maintain or adjust therapy

- **Responsiveness**
  - The ease with which asthma control is achieved by therapy

**Assess asthma severity to initiate therapy**
- During a patient’s initial presentation, if the patient is not currently taking long-term control medication, assess asthma severity to guide clinical decisions for initiating the appropriate medication and other therapeutic interventions

**Assess asthma control to monitor and adjust therapy**
- Once therapy is initiated, the emphasis for clinical management is changed to the assessment of asthma control. Use the level of asthma control to guide decisions either to maintain or to adjust therapy
### Assessing Severity: Patients ≥12 Years of Age

#### Classifying Asthma Severity and Initiating Treatment in Patients ≥12 Years of Age

**Components of Severity**

<table>
<thead>
<tr>
<th>Intermittent</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms</td>
<td>≤2 days/week</td>
<td>&gt;2 days/week but not daily</td>
<td>Daily</td>
</tr>
<tr>
<td>Nighttime awakenings</td>
<td>≤2x/month</td>
<td>3-4x/month</td>
<td>&gt;1x/week but not nightly</td>
</tr>
<tr>
<td>Short-acting beta-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>
<td>Daily</td>
</tr>
<tr>
<td>Interference with normal activity</td>
<td>None</td>
<td>Minor limitation</td>
<td>Some limitation</td>
</tr>
<tr>
<td>Lung function</td>
<td>None</td>
<td>Normal FEV₁/FVC</td>
<td>FEV₁ &gt;80% predicted</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exacerbations requiring oral systemic corticosteroids</th>
<th>0-1 per year</th>
<th>≥2 per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>RISK</td>
<td>Consider severity and interval since last exacerbation.</td>
<td>Frequency and severity may fluctuate over time for patients in any severity category.</td>
</tr>
</tbody>
</table>

#### Recommended Step for Initiating Therapy

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4 or 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>In 2-6 weeks, evaluate level of asthma control that is achieved, and adjust therapy accordingly.</td>
<td>and consider short course of oral systemic corticosteroids</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Normal FEV₁/FVC: 8-19 yr: 85% | 20-39 yr: 80% | 40-59 yr: 75% | 60-80 yr: 70% |

### Assessing Control: Patients ≥12 Years of Age

#### Assessing Asthma Control and Adjusting Therapy in Patients ≥12 Years of Age

**Components of Control**

<table>
<thead>
<tr>
<th>Well Controlled</th>
<th>Not Well Controlled</th>
<th>Very Poorly Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤2 days/week</td>
<td>&gt;2 days/week</td>
<td>Throughout the day</td>
</tr>
<tr>
<td>≤2x/month</td>
<td>1-3x/week</td>
<td>≥4x/week</td>
</tr>
<tr>
<td>None</td>
<td>Some limitation</td>
<td>Extremely limited</td>
</tr>
<tr>
<td>≤2 days/week</td>
<td>&gt;2 days/week</td>
<td>Several times per day</td>
</tr>
<tr>
<td>&gt;80% predicted/personal best</td>
<td>60%-80% predicted/personal best</td>
<td>&lt;60% predicted/personal best</td>
</tr>
<tr>
<td>0 ≤0.75† ≥20</td>
<td>1-2 ≥1.5 16-19</td>
<td>3-4 N/A ≤15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exacerbations requiring oral systemic corticosteroids</th>
<th>0-1 per year</th>
<th>≥2 per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>RISK</td>
<td>Consider severity and interval since last exacerbation.</td>
<td></td>
</tr>
</tbody>
</table>

**Recommended Action for Treatment**

- Maintain current step.
- Regular follow-ups every 1-6 months to maintain control.
- Consider step down if well controlled for at least 3 months.
- Step up 1 step and reevaluate in 2-6 weeks.
- For side effects, consider alternative treatment options.
- Consider short course of oral systemic corticosteroids, step up 1-2 steps, and reevaluate in 2 weeks.
- For side effects, consider alternative treatment options.

†ACQ values are indeterminate regarding well-controlled asthma.

‡ACT = Asthma Control Test. Asthma Control Test is a trademark of QualityMetric Incorporated.
### Intermittent Asthma

Consult with asthma specialist if Step 4 care or higher is required. Consider consultation at Step 3.

### Persistent Asthma: Daily Medication

#### Step 1
**Preferred:**
SABA PRN

**Alternative:**
- Cromolyn, LTRA, nedocromil, or theophylline

#### Step 2
**Preferred:**
- Low-dose ICS
- Alternative:
  - Medium-dose ICS
  - Cromolyn, LTRA, nedocromil, or theophylline

#### Step 3
**Preferred:**
- Medium-dose ICS + LABA
- Alternative:
  - Low-dose ICS + either LTRA, theophylline, or zileuton

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

#### Step 5
**Preferred:**
- Medium-dose ICS + either LTRA, theophylline, or zileuton

#### Step 6
**Preferred:**
- High-dose ICS + LABA
- AND
- Consider omalizumab for patients who have allergies
- OR
- Consider oral corticosteroid

#### Assess control

Step up if needed (first, check adherence, environmental control, and comorbid conditions)

Step down if possible (and asthma is well controlled at least 3 months)

### 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.
### Assessing Severity: Children 5-11 Years of Age

#### Classifying Asthma Severity and Initiating Treatment in Children 5-11 Years of Age

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

<table>
<thead>
<tr>
<th>Components of Severity</th>
<th>Intermittent</th>
<th>Persistent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Symptoms</strong></td>
<td>≤2 days/week</td>
<td>&gt;2 days/week but not daily</td>
</tr>
<tr>
<td><strong>Nighttime awakenings</strong></td>
<td>≤2x/month</td>
<td>3-4x/month</td>
</tr>
<tr>
<td><strong>Short-acting beta2-agonist use for symptom control (not prevention of EIB)</strong></td>
<td>≤2 days/week</td>
<td>&gt;2 days/week but not daily</td>
</tr>
<tr>
<td><strong>Interference with normal activity</strong></td>
<td>None</td>
<td>Minor limitation</td>
</tr>
</tbody>
</table>

#### Lung function

- Normal FEV1, between exacerbations
- FEV1 >80% predicted
- FEV1/FVC >85%

- FEV1 = >80% predicted
- FEV1/FVC >80%
- FEV1/FVC = 75%-80%

- FEV1 <60% predicted
- FEV1/FVC <75%

#### Exacerbations requiring oral systemic corticosteroids

- Relative annual risk of exacerbations may be related to FEV1.

- Consider severity and interval since last exacerbation.

- Frequency and severity may fluctuate over time for patients in any severity category.

**Recommended Step for Initiating Therapy**

- **Step 1**: Maintain current step. Regular follow-up every 1-6 months. Consider step down if well controlled for at least 3 months.

- **Step 2**: Step up 1-2 steps, and reevaluate in 2-6 weeks. For side effects, consider alternative treatment options.

- **Step 3**: medium-dose ICS option, or Step 4 and consider short course of oral systemic corticosteroids, or Step 5.

- **Step 4**: Consider short course of oral systemic corticosteroids, or Step 5.

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

### Assessing Control: Children 5-11 Years of Age

#### Assessing Asthma Control and Adjusting Therapy in Children 5-11 Years of Age

<table>
<thead>
<tr>
<th>Components of Control</th>
<th>Classification of Asthma Control (5-11 Years of Age)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Symptoms</strong></td>
<td>Well Controlled</td>
</tr>
<tr>
<td>≤2 days/week but not more than once on each day</td>
<td>&gt;2 days/week or multiple times on ≤2 days/week</td>
</tr>
<tr>
<td>≤1x/month</td>
<td>≥2x/month</td>
</tr>
</tbody>
</table>

#### Impairment

- Nighttime awakenings
- Interference with normal activity
- Short-acting beta2-agonist use for symptom control (not prevention of EIB)
- Lung function

- **Normal FEV1, between exacerbations**
- FEV1 >80% predicted
- FEV1/FVC >85%

- FEV1 = >80% predicted
- FEV1/FVC >80%
- FEV1/FVC = 75%-80%

- FEV1 <60% predicted
- FEV1/FVC <75%

**Risk**

- Exacerbations requiring oral systemic corticosteroids
- Reduction in lung growth
- Treatment-related adverse effects

**Recommended Action for Treatment**

- Maintain current step. Regular follow-up every 1-6 months. Consider step down if well controlled for at least 3 months.

- Step up 1 step and reevaluate in 2-6 weeks. For side effects, consider alternative treatment options.

- Consider short course of oral systemic corticosteroids, or Step 1-2 steps, and reevaluate in 2 weeks. For side effects, consider alternative treatment options.
### Assessing Treatment Options: Children 5-11 Years of Age

#### Stepwise Approach for Managing Asthma in Children 5-11 Years of Age

<table>
<thead>
<tr>
<th>Intermittent Asthma</th>
<th>Persistent Asthma: Daily Medication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consult with asthma specialist if Step 4 care or higher is required. Consider consultation at Step 3.</td>
<td></td>
</tr>
</tbody>
</table>

#### Step 1
- **Preferred:** SABA PRN

#### Step 2
- **Preferred:** Low-dose ICS
- **Alternative:** Cromolyn, LTRA, nedocromil, or theophylline

#### Step 3
- **Preferred:** EITHER Med-dose ICS + LABA
- **Alternative:** High-dose ICS + either LTRA or theophylline

#### Step 4
- **Preferred:** Medium-dose ICS + LABA
- **Alternative:** High-dose ICS + either LTRA or theophylline

#### Step 5
- **Preferred:** High-dose ICS + LABA + oral systemic corticosteroid
- **Alternative:** Medium-dose ICS + either LTRA or theophylline

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

#### 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.
- 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.

#### Assessing Control
- Step up if needed (first, check adherence, inhaler technique, environmental control, and comorbid conditions)
- Step down if possible (and asthma is well controlled at least 3 months)

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Patients 0-4 Years of Age

Assessing Severity: Children 0-4 Years of Age

Classifying Asthma Severity and Initiating Treatment in Children 0-4 Years of Age

Assessing severity and initiating treatment in children who are not currently taking long-term control medications

<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>Mild</td>
</tr>
<tr>
<td>Symptoms</td>
<td>≤2 days/week</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>≤2 days/week</td>
</tr>
<tr>
<td>Interference with normal activity</td>
<td>None</td>
</tr>
<tr>
<td>Exacerbations requiring oral systemic corticosteroids</td>
<td>0-1 per year</td>
</tr>
</tbody>
</table>

Recommended Step for Initiating Therapy

In 2-6 weeks, depending on severity, evaluate level of asthma control that is achieved. If no clear benefit is observed in 4-6 weeks, consider adjusting therapy or alternative diagnoses.

Assessing Control: Children 0-4 Years of Age

Assessing Asthma Control and Adjusting Therapy in Children 0-4 Years of Age

<table>
<thead>
<tr>
<th>Components of Control</th>
<th>Classification of Asthma Control (0-4 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>≤1x/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>Exacerbations requiring oral systemic corticosteroids</td>
<td>0-1 per year</td>
</tr>
<tr>
<td>Treatment-related adverse effects</td>
<td></td>
</tr>
</tbody>
</table>

Recommended Action for Treatment

- Maintain current treatment.
- Regular follow-up every 1-6 months.
- Consider step down if well controlled for at least 3 months.
- Step up 1 step and Reevaluate in 2-6 weeks.
  - If no clear benefit in 4-6 weeks, consider alternative diagnoses or adjusting therapy.
  - For side effects, consider alternative treatment options.
- Consider short course of oral systemic corticosteroids, Step up 1-2 steps, and Reevaluate in 2 weeks.
- If no clear benefit in 4-6 weeks, consider alternative diagnoses or adjusting therapy.
- For side effects, consider alternative treatment options.
## Assessing Treatment Options: Children 0-4 Years of Age

**Stepwise Approach for Managing Asthma in Children 0-4 Years of Age**

<table>
<thead>
<tr>
<th>Intermittent Asthma</th>
<th>Persistent Asthma: Daily Medication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consult with asthma specialist if Step 3 care or higher is required. Consider consultation at Step 2.</td>
<td></td>
</tr>
</tbody>
</table>

### Step 1
- **Preferred:** SABA PRN

### Step 2
- **Preferred:** Low-dose ICS
- **Alternative:** Cromolyn or montelukast

### Step 3
- **Preferred:** Medium-dose ICS + either LABA or montelukast

### Step 4
- **Preferred:** High-dose ICS + either LABA or montelukast
- **Step 5 Preferred:** Oral systemic corticosteroid

### Step 6
- **Preferred:** High-dose ICS + either LABA or montelukast

### 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.

### Patient education and environmental control at each step

### Reference: