GOAL OF ASTHMA THERAPY: WELL-CONTROLLED ASTHMA

Reduce impairment from poorly controlled symptoms

Reduce risk of exacerbations
REDUCING IMPAIRMENT

- Prevent symptoms
- Reduce need for quick-relief medication
- Maintain “normal” (or near-normal) pulmonary function
- Maintain normal activity level (including exercise and school attendance)
- Meet parents’ and families’ expectations of and satisfaction with asthma care
FOUR COMPONENTS OF ASTHMA MANAGEMENT

1. Measures of assessment and monitoring
2. Education for a partnership in asthma care
3. Control of environmental factors and comorbid conditions that affect asthma
4. Pharmacologic therapy
# Asthma Control Test (ACT)

**Ages 4-11 years**

1. How is your asthma today?
   - Very bad
   - Bad
   - Good
   - Very good

2. How much of a problem is your asthma when you run, exercise or play sports?
   - It’s a big problem, I can’t do what I want to.
   - It’s a problem but I don’t like it.
   - It’s a little problem but it’s okay.
   - It’s not a problem.

3. Do you cough because of your asthma?
   - Yes, all of the time.
   - Yes, most of the time.
   - Yes, some of the time.
   - No, none of the time.

4. Do you wake up during the night because of your asthma?
   - Yes, all of the time.
   - Yes, most of the time.
   - Yes, some of the time.
   - No, none of the time.

5. During the last 4 weeks, how many days did your child have any daytime asthma symptoms?
   - Not at all
   - 1-3 days
   - 4-10 days
   - 11-18 days
   - 19-24 days
   - Everyday

6. During the last 4 weeks, how many days did your child wheeze during the day because of asthma?
   - Not at all
   - 1-3 days
   - 4-10 days
   - 11-18 days
   - 19-24 days
   - Everyday

7. During the last 4 weeks, how many days did your child wake up during the night because of asthma?
   - Not at all
   - 1-3 days
   - 4-10 days
   - 11-18 days
   - 19-24 days
   - Everyday

**Ages 12 years and up**

1. In the past 4 weeks, how much of the time did your asthma keep you from getting as much done at work, school or at home?
   - All of the time
   - Most of the time
   - Some of the time
   - A little of the time
   - None of the time

2. During the past 4 weeks, how often have you had shortness of breath?
   - More than once a day
   - Once a day
   - 2 to 6 times a week
   - Once or twice a week
   - Not at all

3. During the past 4 weeks, how often did your asthma symptoms (wheezing, coughing, shortness of breath, chest tightness or pain) wake you up at night or earlier than usual in the morning?
   - 4 or more nights a week
   - 3 or more nights a week
   - 2 to 3 times a week
   - Once a week or less
   - Not at all

4. During the past 4 weeks, how often have you used your rescue inhaler or nebulizer (medication such as albuterol)?
   - 3 or more times per day
   - 1 or 2 times per day
   - 2 or 3 times per week
   - Once a week or less
   - Not at all

5. How would you rate your asthma control during the past 4 weeks?
   - Not controlled at all
   - Poorly controlled
   - Somewhat controlled
   - Well controlled
   - Completely controlled

---

[Support from the American Lung Association](https://www.lung.org)
ASTHMA CONTROL TEST (ACT)

ACT ages 4-11 years

- Child-directed questions assess:
  - Current asthma status
  - Impact on activity
  - Presence of cough
  - Nighttime awakenings

- Caregiver-directed questions assess:
  - Presence of daytime symptoms
  - Presence of wheeze
  - Nighttime awakenings

ACT ages ≥12 years

- Child-directed questions assess:
  - Symptom interference with daily activity
  - Shortness of breath
  - Nighttime awakenings
  - Use of rescue medication
  - Overall opinion of asthma control

Target score is ≥20 or 3-point improvement from initial assessment
BENEFITS OF ACT

- Valuable tool for initiating asthma discussion
  - Helps patients and caregivers consider the different aspects of good asthma control

- Simplification of asthma goals
  - Sleeping through the night
  - Optimal school/work attendance
  - Optimal play and activity level
SPIROMETRY

Benefits of spirometry:

- Provides an objective measure of lung function
- Prevents clinicians from overestimating the degree of asthma control, which can lead to suboptimal treatment, decreased activity, increased medical costs, and decreased quality of life

NAEPP recommendations:

- Spirometry can demonstrate obstruction and assess reversibility in patients ≥5 years of age
- Use spirometry in all patients ≥5 years of age to diagnose asthma and monitor lung function
CASE STUDY:
8-YEAR-OLD BOY WITH ASTHMA

- Coughs 3 days per week
- Albuterol 3-4 times per week
- Mother reports no cough at night or while playing
- $\text{FEV}_1 = 97\%, \text{FEV}_1/\text{FVC} = 85\%$
## Asthma Severity
*(Children Age 5-11 Years)*

<table>
<thead>
<tr>
<th>Symptom</th>
<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, not daily</td>
<td>Daily</td>
<td>Throughout the day</td>
</tr>
<tr>
<td>Nighttime awakenings</td>
<td>≤2x /month</td>
<td>3-4x /month</td>
<td>&gt;1x /week, not nightly</td>
<td>Often 7x /week</td>
</tr>
<tr>
<td>SABA use for symptom control</td>
<td>≤2 days/week</td>
<td>&gt;2 days/week, not daily</td>
<td>Daily</td>
<td>Several times per day</td>
</tr>
<tr>
<td>Interference with normal activity</td>
<td>None</td>
<td>Minor</td>
<td>Some</td>
<td>Extreme</td>
</tr>
<tr>
<td>Lung function</td>
<td>Normal FEV₁ between exacerbations, FEV₁ &gt;80% predicted, FEV₁/FVC &gt;80%</td>
<td>FEV₁ &gt;80% predicted, FEV₁/FVC &gt;80%</td>
<td>FEV₁ 60%-80% predicted, FEV₁/FVC 75%-80%</td>
<td>FEV₁ &lt;60% predicted, FEV₁/FVC &lt;75%</td>
</tr>
<tr>
<td>Exacerbations requiring oral systemic corticosteroids</td>
<td>0-1x /year</td>
<td>≥2 exacerbations/year</td>
<td>Relative annual risk may be related to FEV₁</td>
<td>Frequency and severity may fluctuate</td>
</tr>
</tbody>
</table>

STEP-WISE APPROACH FOR MANAGING ASTHMA (CHILDREN AGE 5-11 YEARS)

Intermittent

Mild Persistent

Moderate Persistent

Severe Persistent

Step 1
Preferred: SABA

Step 2
Preferred: Low-Dose ICS (A)

Alternative: LTRA (B)
Cromolyn (B)
Nedocromil (B)
Theophylline (B)

Step 3
Preferred: Medium-dose ICS (B)

or...

Low-dose ICS Plus
LABA
LTRA
Theophylline (B)

Step 4
Preferred: Medium-dose ICS or LABA (B)

Alternative: Low-dose ICS Plus LTRA or Theophylline (B)

Step 5
Preferred: High-dose ICS plus LABA (B)

Alternative: High-dose ICS plus LTRA or Theophylline (B)

Omalizumab may be considered for patients who have allergies

Step 6
Preferred: High-dose ICS plus LABA plus oral corticosteroids (D)

Alternative: High-dose ICS plus either LTRA or Theophylline and oral corticosteroids (D)

Omalizumab may be considered for patients who have allergies

SABA = short-acting beta2-agonist, LABA = long-acting beta2-agonist, LTRA= leukotriene receptor antagonist, ICS= inhaled corticosteroid.
CONTROL-BASED ASTHMA MANAGEMENT CYCLE

Assess
- Diagnosis
- Symptom control and risk factors
- Inhaler technique and adherence
- Patient preference

Review Response
- Symptoms
- Exacerbations
- Side effects
- Patient satisfaction
- Lung function

Adjust Treatment
- Asthma medications
- Nonpharmacologic strategies
- Treat modifiable risk factors
DRUG DELIVERY OPTIONS

- Drug delivery options
  - Nebulizer (infants and very young children)
  - Metered-dose inhalers (children ages 5 and up)
  - Dry powder inhalers (adolescents)

- Factors to consider
  - Patient age/ability
  - Compliance
    - Minimize daily dosing
    - Patient education
  - Family and patient preferences
    - Patient comfort and willingness
    - Family schedule
    - Size/portability/accessibility of medication

PERSONALIZING THERAPY

- Use shared decision making to select drug and delivery system
- Educate patients and caregivers
  - Talking points:
    - Efficacy
    - Safety/tolerability
    - Growth effects
- Utilize nurses, asthma educators to enhance communication, education, and adherence
- Adjust treatment to reduce burden when possible
Asthma action plans should be provided to every patient/caregiver
- Reinforces education over time

Provide action plans for every environment where the child spends time
- Household(s)
- School and/or after-school program
- Sports coach
**Green Zone:**
Child feels well
Plan for daily controller medication

**Yellow Zone:**
Child does not feel well
Plan for medication at first sign of cough, cold, or wheeze
Add SABA or increase ICS

**Red Zone:**
Child feels very bad
Plan for symptom continuation despite SABA or increased-dose ICS
Seek care immediately
# ASTHMA ACTION PLANS

## Child Asthma Action Plan

**9–5 years of age**

<table>
<thead>
<tr>
<th>Health Care Provider’s Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Record #:</td>
<td></td>
</tr>
</tbody>
</table>

### Long-Term Control Medications

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

### Quick-Relief Medicines

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

**Central Message:**

- **PREVENT** asthma symptoms every day:
  - Take the above long-term control medications every day.
  - Avoid things that make your asthma worse.
  - Avoid tobacco smoke.

- Call when needed.

**If child feels awful!** Warning signs may include:

- Asthma symptoms don’t get better after using quick-relief medicine.
- Coughing more than usual.
- Breathing more than usual.
- New wheezing.
- Breathing is difficult.
- Breathing is noisy or less wheezy than usual.

**MEDICAL ALERT! Get help!**

- Take the child to the hospital or call 9-1-1 immediately.
- Call 9-1-1 if:
  - The child’s skin is cool and pale.
  - The child’s skin is cold.
  - The child is very hoarse.
  - The child doesn’t respond to you.

- Call your doctor if:
  - The child has a fever.
  - The child has chest or neck pain.
  - The child has difficulty breathing.
  - The child has difficulty playing.

**Special instructions when I feel good:**

- Wash hands and face after touching the face.

## My Asthma Action Plan

<table>
<thead>
<tr>
<th>Physician’s Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Record #:</td>
<td></td>
</tr>
</tbody>
</table>

### Long-Term Control Medications

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

### Quick-Relief Medicines

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

**Central Message:**

- **PREVENT** asthma symptoms every day:
  - Take the above long-term control medications every day.
  - Avoid things that make your asthma worse.
  - Avoid tobacco smoke.

- Call when needed.

**If child feels awful!** Warning signs may include:

- Asthma symptoms don’t get better after using quick-relief medicine.
- Coughing more than usual.
- Breathing more than usual.
- New wheezing.
- Breathing is difficult.
- Breathing is noisy or less wheezy than usual.

**MEDICAL ALERT! Get help!**

- Take the child to the hospital or call 9-1-1 immediately.
- Call 9-1-1 if:
  - The child’s skin is cool and pale.
  - The child’s skin is cold.
  - The child is very hoarse.
  - The child doesn’t respond to you.

- Call your doctor if:
  - The child has a fever.
  - The child has chest or neck pain.
  - The child has difficulty breathing.
  - The child has difficulty playing.

- Special instructions when I feel good:
  - Wash hands and face after touching the face.

---