Assessment and Treatment of Early Wheeze for Children 0-4 years old

Assess Early Wheeze

1. History of Current Illness: frequency of episodes of wheeze, response to short-acting beta-agonist (albuterol), triggers for wheeze (viral illness, exercise, exposures), severity of episodes (hospitalizations, emergency department visits, oral corticosteroids), allergies and eczema
2. Family History: asthma in parents
3. Environment: tobacco smoke exposure and indoor exposures (e.g., pets, cockroaches, rodents)
4. Physical Exam: evaluate for signs of more severe disease (e.g., failure to thrive, clubbing, persistent hypoxemia

Responds to albuterol?

<table>
<thead>
<tr>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refer to page 2</td>
<td></td>
</tr>
</tbody>
</table>

Categories of Wheeze

1. Episodic Wheeze: frequent episodes of wheeze with respiratory tract illnesses only
   a. Transient Wheeze (more likely to stop wheezing by age 6): at least 4 episodes of wheeze lasting >24 hours (at least 1 provider diagnosed) or 2 episodes of wheeze requiring oral corticosteroids (OCS) in a child who does not meet the criteria below
   b. Emerging Asthma (at risk to continue wheezing or progress): minimum of 3 episodes of wheeze lasting >24 hours (at least 1 provider diagnosed) and/or at least 1 episode of wheeze requiring OCS in a child who meets criteria listed below
2. Multiple Trigger Wheeze/Persistent Asthma: wheeze with respiratory tract illnesses and between illnesses due to other triggers and/or not meeting monitoring goals for a minimum of 2-4 weeks

Risk Factors for Continued Wheezing or Progression to Persistent Asthma
(Required: 1 major criterion or 2 minor per the modified asthma predictive index):
- **Major**: presence of atopic dermatitis OR positive allergy testing to at least 1 aeroallergen OR parental history of asthma
- **Minor**: food allergy, wheeze between illnesses, eosinophilia >4%

Episodic Wheeze Treatment
(Transient Wheeze or Emerging Asthma)

High-dose inhaled corticosteroids (ICS) (see medication chart) OR montelukast 4 mg by mouth starting at the onset of a resp. illness and continue for 7 days and short-acting beta agonist as needed.

Multiple Trigger Wheeze/Persistent Asthma Treatment

Daily, low-dose inhaled corticosteroids (ICS) or alternatives per the NHLBI EPR-3 guideline for children 0-4 years of age per page 2 and short-acting beta-agonist (SABA) as needed.

Episodic Wheeze Monitoring

- Re-evaluate every 1-6 months for daytime symptoms, exercise limitation, short-acting beta-agonist use and wheezing episodes.
- Consider assessing at every visit using the TRACK test.
- If the child has not met goals, assess compliance and device technique, consider alternate diagnosis and/or specialist referral and treat as persistent asthma per page 2.
- If the child has met the goals, re-evaluate in 1-6 months and consider a trial off of intermittent controller medications.

Multiple Trigger Wheeze/Persistent Asthma Monitoring

- Re-evaluate any child started on a daily medication in 2-6 weeks.
- Consider assessing at every visit using the TRACK test.
- If the child has not met the goals, assess compliance and device technique, consider alternate diagnosis and/or specialist referral and then step up per page 2.
- If the child has met goals for a minimum of 3 months, re-evaluate in 1-6 months and consider discontinuation of daily therapy and treat as episodic wheeze, taking into consideration allergies and cold and viral season.

Modified Asthma Predictive Index (mAPI)

- If the child is lower risk for long term asthma then only use an intermittent ICS at the start of respiratory symptoms.
- If the child is higher risk for long term asthma then use a daily ICS at the start of respiratory symptoms.

Monitoring Goals

- Short-acting beta-agonist use less than twice a week AND
- Nighttime symptoms less than twice a month AND
- No exercise limitation AND
- Fewer than 2 episodes of wheeze in 12 months requiring a course of oral corticosteroids

Consider Oral Corticosteroids

- Consider a short course of oral corticosteroids for severe exacerbations requiring urgent care, ED visit or hospitalization.


Wheeze Not Responsive to Albuterol (continued from page 1)

If not responding to albuterol, work up for alternate diagnosis, such as:
- airway malacia or compression, aspiration, cystic fibrosis, foreign body.

### Alternate Diagnosis Established

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treat diagnosis.</td>
<td>Consider referral to specialist.</td>
</tr>
</tbody>
</table>

#### Multiple Trigger Wheeze/Persistent Asthma: Daily Medication

Consult with asthma specialist if step 3 care or higher is required. Consider consultation at step 2

**Step 1**
- **Preferred:** Short-acting beta-agonist (SABA)
  - As needed for symptoms every 4-6 hours.
- **Alternative:** montelukast

**Step 2**
- **Preferred:** Medium-dose ICS
- **Alternative:** montelukast

**Step 3**
- **Preferred:** Medium-dose ICS + either long-acting beta-agonist (LABA) or montelukast

**Step 4**
- **Preferred:** High-dose ICS + either LABA or montelukast

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

**Step 6**
- **Preferred:** High-dose ICS + either LABA or montelukast + Oral systemic corticosteroids

### Patient Education and Environmental Control at Each Step

**All long-acting beta-agonists (LABAs) and combination agents containing LABAs have a black-box warning.**

**Assess control.**

**Step up** if needed (first, check adherence, inhaler technique and environmental control).

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

---

Adapted from the NAEPP EPR-3 (http://www.nhlbi.nih.gov/guidelines/asthma), and updated with current literature (most notably: Bacharier LB, Guilbert TW. Diagnosis and management of early asthma in preschool-aged children. J Allergy Clin Immunol. 2012;130: 287-296.). Development credit to Health Team Works, Colorado. This guideline is designed to assist the clinician in the management of asthma. This guideline is not intended to replace the clinician’s judgment or establish a protocol for all patients with a particular condition. Revised 4/1/2013.