**Fast Facts**

- **6.5%** of children <18 have asthma
- **49%** of children with asthma have missed one or more school days due to asthma

**When to Refer**

- **Refer to pulmonary:**
  - Any red flags
  - Complication such as bronchiectasis
  - Multiple morbidities
  - Unsure about or difficulty confirming asthma diagnosis
- **Refer to allergy and immunology:**
  - Suspected aeroallergen allergy/intolerance
  - Suspected aeroallergen or food allergy/intolerance
- **Refer to cardiology:**
  - Symptoms suggestive of cardiac cause

**Assessment**

Asthma is a heterogeneous disease, usually characterized by chronic inflammation. It is defined by a history of respiratory symptoms such as wheeze, shortness of breath, chest tightness and cough. Symptoms vary over time and intensity, together with variable expiratory airflow limitations.

**ASSESSMENT**

Provide a history and physical exam (HPE). Assess patient history of characteristic symptom pattern.

Features typical of asthma include the following. If present, these increase asthma probability.
- Respiratory symptoms of wheeze, shortness of breath, cough and/or chest tightness
- Symptoms triggered by viral infection, exercise, allergen exposure, changes in weather, laughter, or irritants such as car exhaust fumes, smoke or strong smells

Symptoms are often worse at night or in early morning and vary in intensity/over time.

The following features decrease the probability that respiratory symptoms are due to asthma:
- Chest pain
- Chronic production of sputum
- Exercise-induced dyspnea with noisy inspiration
- Shortness of breath associated with dizziness, light-headedness or paresthesia

Perform or refer patient for bronchodilator reversibility spirometry test or other lung function test to assess evidence of variable expiratory airflow limitations. Test before treating whenever possible, as it is more difficult to confirm diagnosis afterward.

**HPE (History and Physical Exam) Red Flags**

The following factors increase the risk of asthma-related death.
- Not currently using inhaled corticosteroids
- Currently using or having recently stopped using oral corticosteroids (a marker of event severity)
- Food allergy in a patient with asthma
- History of near-fatal asthma requiring intubation and mechanical ventilation
- History of psychiatric disease or psychosocial problems
- Hospitalization or emergency care visit for asthma in the past year
- Overuse of short-acting beta-agonists (SABAs), especially use of more than one canister of albuterol (or equivalent) monthly
- Poor adherence with inhaled corticosteroids (ICS)-containing medications and/or poor adherence with (lack of) a written asthma action plan
- Comorbidities including pneumonia, diabetes and arrhythmias. These are independently associated with an increased risk of death after hospitalization for an asthma exacerbation.

**Management**

Refer to the following pages for management guidance.

If you would like additional copies of this tool, or would like more information, please contact the Physician Outreach and Engagement team at Cincinnati Children’s.

If you have questions or need more information, contact the Division of Pulmonary Medicine at 513-636-6771.
Persistent Asthma
Children 5 years and younger* starting treatment

*adapted from GINA Update 2022; available at www.ginasthma.org

<table>
<thead>
<tr>
<th>Assess</th>
<th>Infrequent viral wheezing or few interval symptoms</th>
<th>Symptom pattern not consistent with asthma but wheezing episodes require SABA frequently, e.g., ≥3 per year. Give diagnostic trial for 3 months. Consider specialist referral.</th>
<th>Asthma diagnosis, and asthma not well-controlled on low dose ICS Before stepping up, check for alternative diagnosis, check inhaler skills, review exposures and adherence.</th>
<th>Asthma not well-controlled on double ICS</th>
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<tbody>
<tr>
<td>• Confirmation of diagnosis • Comorbidities</td>
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<td>• Symptom control and modifiable risk factors</td>
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<td>Symptom pattern consistent with asthma, and asthma symptoms not well-controlled or ≥3 exacerbation per year.</td>
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<tr>
<td>• Inhaler technique and adherence • Child and parent preferences and goals</td>
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**Consider This Step For Children With:**

- **Infrequent viral wheezing or few interval symptoms**
  - **STEP 1** None
  - **STEP 2** Daily low dose inhaled corticosteroids (ICS) (see www.Ginasthma.org for table of ICS dosing ranges based on age)

- **Symptom pattern not consistent with asthma but wheezing episodes require SABA frequently, e.g., ≥3 per year.**
  - **STEP 1** Consider intermittent short course ICS at onset of viral illness*
  - **STEP 2** Daily leukotriene receptor antagonist (LTRA), OR intermittent short course ICS at onset of viral illness

- **Asthma diagnosis, and asthma not well-controlled on low dose ICS**
  - **STEP 3** Double “low dose” ICS

- **Asthma not well-controlled on double ICS**
  - **STEP 4** Continue controller AND Refer for expert advice

- **Symptom pattern consistent with asthma, and asthma symptoms not well-controlled or ≥3 exacerbation per year.**
  - **STEP 3** Low dose ICS+LTRA Consider specialist referral

**Preferred Controller**

- **STEP 1** None

**Other Controller Options**

- **STEP 1** Consider intermittent short course ICS at onset of viral illness*

**Reliever**

- **As-needed short-acting beta2-agonist**

**STEP 4** Add LTRA, OR increase ICS frequency, or add intermittent ICS

**ICS:** inhaled corticosteroids; **LTRA:** leukotriene receptor antagonist; **SABA:** short-acting beta2-agonist.

*Recommend high-dose ICS for age
**Persistent Asthma**

*Children 6–11 years old with a diagnosis of asthma* starting treatment

*adapted from GINA Update 2022; available at www.ginasthma.org

<table>
<thead>
<tr>
<th>Assess</th>
<th>Preferred Controller</th>
<th>Other Controller Options</th>
<th>Reliever</th>
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<tbody>
<tr>
<td>• Confirmation of diagnosis</td>
<td>Low dose ICS</td>
<td>Limited indications, or</td>
<td>As-needed short-acting</td>
</tr>
<tr>
<td>• Comorbidities</td>
<td>taken whenever SABA</td>
<td>less evidence for efficacy)</td>
<td>beta₂-agonist (or low dose ICS-formoterol reliever for MART as above)</td>
</tr>
<tr>
<td>• Symptom control and modifiable risk factors</td>
<td>SABA taken</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Inhaler technique and adherence</td>
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**Start here if:**

**Symptoms**

- **<2x/mo**
- **≥2x/mo, but less than daily**
- **Symptoms most days OR waking with asthma ≥1x/wk**
- **Symptoms most days OR waking with asthma ≥1x/wk and low lung function**
- **Short course OCS may also be needed for patients presenting with severely uncontrolled asthma**

**Preferred Controller**

To prevent exacerbations and control symptoms

**STEP 1**

- **Low dose ICS** taken whenever SABA taken

**STEP 2**

- **Daily low dose inhaled corticosteroids (ICS)** (see table of ICS dosing ranges based on age)

**STEP 3**

- **Low dose ICS-LABA, OR medium dose ICS, OR very low dose**
  - ICS-formoterol maintenance and reliever (MART)

**STEP 4**

- **Medium dose ICS-LABA, OR low dose**
  - ICS-formoterol maintenance and reliever therapy (MART).
  - Refer for expert advice

**STEP 5**

- **Refer for phenotypic assessment**
  - ± higher dose ICS-LABA or add-on asthma biologic therapy, e.g. anti-IgE, anti-IL-4R

**Other Controller Options**

**STEP 1**

- **Consider daily low dose ICS**

**STEP 2**

- **Daily leukotriene receptor antagonist (LTRA), or low dose ICS taken whenever SABA taken**

**STEP 3**

- **Low dose ICS+LTRA**

**STEP 4**

- **Add tiotropium OR add LTRA**

**STEP 5**

- **Add-on anti-IL5 OR, as last resort, consider add-on asthma biologic therapy, e.g. anti-IL-5 but consider side effects**

**Reliever**

As-needed short-acting beta₂-agonist (or low dose ICS-formoterol reliever for MART as above)


*Very low dose: 1 puff  BUD-FORM 80/4.5 mcg

**Low dose: 1 puff  BUD-FORM 160/4.5 mcg
Persistent Asthma
Adults and adolescents with a diagnosis of asthma* starting treatment

*adapted from GINA Update 2022; available at www.ginasthma.org

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<td>• Confirmation of diagnosis</td>
<td>&lt;4–5 days/wk</td>
<td>≥1x/wk</td>
<td>≥1x/wk and low lung function</td>
<td>STEP 1–2: As needed low dose ICS formoterol</td>
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<td>STEP 3: Low dose* maintenance ICS-formoterol</td>
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<td>STEP 4: Medium dose** maintenance ICS-formoterol</td>
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<td>STEP 5: Add-on LAMA</td>
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<td>Refer for phenotypic assessment</td>
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**Preferred Controller**
To prevent exacerbations and control symptoms

- **STEP 1–2**: As needed low dose ICS formoterol
- **STEP 3**: Low dose* maintenance ICS-formoterol
- **STEP 4**: Medium dose** maintenance ICS-formoterol
- **STEP 5**: Add-on LAMA

**Preferred Reliever**
As-needed low-dose ICS-formoterol

**Alternate Controller**
Before considering a regimen with SABA reliever, check if patient is likely to be adherent with daily controller therapy

- **STEP 1**: Take ICS whenever SABA taken
- **STEP 2**: Low dose maintenance ICS
- **STEP 3**: Low dose maintenance ICS-LABA
- **STEP 4**: Medium/high dose maintenance ICS-LABA
- **STEP 5**: Add-on LAMA

**Alternate Reliever**
As-needed short-acting beta₂-agonist


*Very low dose: 1 puff BUD-FORM 80/4.5 mcg
**Low dose: 1 puff BUD-FORM 160/4.5 mcg

For urgent issues, or to speak with the specialist on call 24/7, call the Physician Priority Link® at 1-888-987-7997.