Prescribing Guidelines for Asthma
Prescribing for Asthma

This tool was created by Partners For Kids to assist in following recommendations from the guidelines to treat asthma after proper diagnosis. For more information, refer to the asthma clinical tool (www.NationwideChildrens.org/for-medical-professionals/tools-for-your-practice/clinical-tools > Pulmonary Medicine > Asthma), the Global Initiative for Asthma Report, or the National Asthma Guidelines.

Initial Visit/Starting Therapy

1. Start by classifying asthma severity to select initial treatment
   a. Select medication and delivery devices appropriate for each individual patient
   b. Intermittent asthma: short acting beta agonists (SABA) are first-line treatment
   c. Persistent asthma: inhaled corticosteroids (ICS) for long-term control, combined with as needed short acting beta-agonists (SABA), are first-line treatment

2. Complete patient education by reviewing medication administration technique and describing how to manage asthma

3. Develop a written Asthma Action Plan (AAP) and provide to patient/family at each visit
   a. Defines steps to be taken to control asthma, when experiencing symptoms, and in times of danger
   b. Goal is to prevent asthma attacks and reduce emergency visits by increasing adherence, knowledge, and comfortability with medication therapy
   c. Example AAP: asthma.com > Toolbox > Asthma Action Plan

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### Classification of Asthma Severity: Clinical Features before Treatment

(Modeled after NHLBI Guidelines)

<table>
<thead>
<tr>
<th></th>
<th>Intermittent</th>
<th>Mild Persistent</th>
<th>Moderate Persistent</th>
<th>Severe Persistent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Daytime symptoms</strong></td>
<td>≤ 2 days/week</td>
<td>&gt; 2 days/week</td>
<td>Daily</td>
<td>Throughout the day</td>
</tr>
<tr>
<td><strong>Nighttime symptoms</strong></td>
<td>≤ 2 times/month</td>
<td>3 – 4 times/month</td>
<td>&gt; 1 time/week</td>
<td>Nightly</td>
</tr>
<tr>
<td><strong>Rescue inhaler use</strong></td>
<td>≤ 2 days/week</td>
<td>&gt; 2 days/week</td>
<td>Daily</td>
<td>Several times a day</td>
</tr>
<tr>
<td><strong>Exercise limitation</strong></td>
<td>None</td>
<td>Minor</td>
<td>Some</td>
<td>Extremely</td>
</tr>
<tr>
<td><strong>FEV1</strong></td>
<td>&gt;80%</td>
<td>&gt;80%</td>
<td>60 – 80%</td>
<td>&lt;60%</td>
</tr>
<tr>
<td><strong>FEV1/FVC</strong></td>
<td>&gt;85%</td>
<td>&gt;80%</td>
<td>75 – 80%</td>
<td>&lt;75%</td>
</tr>
<tr>
<td><strong>“Risk”</strong></td>
<td>0 – 1 oral steroids/year</td>
<td>≥ 2 oral steroids per year</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Follow-up Visits/Continuing Therapy**

1. Administer and determine asthma control using an Asthma Control Test (ACT) at every visit  
   a. Example ACT: asthma.com > Additional Resources > Asthma Control Test or Childhood Asthma Control Test

2. Review asthma control; if inadequate control, optimize therapy as needed  
   a. Step-up in therapy after checking adherence, inhaler technique, environmental control, and comorbid conditions  
   b. Start with low-dose inhaled corticosteroid (ICS) for patients on no controller therapy  
   c. If already on controller therapy, but not achieving goals, choose from the following options: increase to medium-dose ICS, add montelukast, and/or add a long-acting beta agonist (LABA) [typically used if > 6 years of age]  
   d. Consider referral to pulmonary or allergy specialist if the patient has already been stepped-up twice and is still uncontrolled for evaluation of:  
      i. Diagnosis accuracy and/or presence of comorbidities (allergies, vocal cord dysfunction, etc.)  
      ii. Consideration for more aggressive therapies such as an ICS/LABA in patients < 5 years of age or biologic therapies (e.g., anti-IGE or anti-IL5 agents)

3. Update and provide current AAP to patient/family at each visit

4. Schedule follow-up appointments in appropriate time frame depending on asthma control and adherence to therapy  
   a. Intermittent: every 6 months  
   b. Persistent: every 3 months  
   c. Poorly controlled: every 4 – 6 weeks

<table>
<thead>
<tr>
<th>What is uncontrolled asthma? Follow the “Rule of 2’s”.</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 2 daytime/exercise symptoms per week OR</td>
</tr>
<tr>
<td>≥ 2 episodes of albuterol use per week OR</td>
</tr>
<tr>
<td>≥ 2 nighttime awakenings per month OR</td>
</tr>
<tr>
<td>≥ 2 steroid courses or hospital admissions per year</td>
</tr>
</tbody>
</table>
Controller Medications

Inhaled Corticosteroids (ICS)

- Breathe out before inhaling
- Hold breath for 10 seconds or as long as possible after inhaling medication
- Rinse mouth after use

<table>
<thead>
<tr>
<th>Drug</th>
<th>Inhaler Type</th>
<th>Strengths</th>
<th>Usual Dosing</th>
<th>Counter</th>
<th>Clinical Pearls</th>
</tr>
</thead>
</table>
| Metered-dose Inhalers (MDI)  
Aerosolized inhalation that is pushed to activate; Spacer compatible | | | | | |
| Asmanex® (Mometasone furoate)  
HFA | MDI | 100 mcg  
200 mcg | BID | Yes | Shake before use  
Needs primed |
| Flovent® (Fluticasone propionate)  
HFA | MDI | 44 mcg  
110 mcg  
220 mcg | BID | Yes | Shake before use  
Needs primed |
| Dry Powder Inhalers (DPI)  
Breath-actuated; Spacer incompatible and not required* | | | | | |
| Arnuity® Ellipta®  
(Fluticasone furoate) | DPI | 50 mcg  
100 mcg  
200 mcg | QDay | Yes | Do not open cap until ready to use |
| Asmanex® Twisthaler®  
(Mometasone furoate) | DPI | 110 mcg  
220 mcg | QDay | Yes | Hold horizontally |
| Flovent® Diskus®  
(Fluticasone propionate) | DPI | 50 mcg  
100 mcg  
250 mcg | BID | Yes | Keep level and flat while holding horizontally |
| Pulmicort® Flexhaler®  
(Budesonide) | DPI | 90 mcg  
180 mcg | BID | Yes | Hold horizontally |
| QVAR® RediHaler®  
(Beclomethasone) | DPI | 40 mcg  
80 mcg | BID | Yes | Do not open cap until ready to use |
| Nebulizer solution  
Passive inhalation via nebulizer; Requires functioning nebulizer | | | | | |
| Pulmicort® Respules  
(Budesonide) | Nebulizer vials | 0.25mg/2mL;  
0.5mg/2mL;  
1mg/2mL | 0.25mg  
BID or  
0.5mg  
QDay | N/A | Can be irritating to the eyes; Nebulizer requires power supply and longer administration time |

Key: Bolded medications are available generically, * = advanced technique required, avoid if patient requires spacer with mask.
ICS + Long-Acting Beta Agonist (LABA)

- Breathe out before inhaling
- Hold breath for 10 seconds or as long as possible after inhaling medication
- Rinse mouth after use

<table>
<thead>
<tr>
<th>Drug</th>
<th>Inhaler Type</th>
<th>Strengths</th>
<th>Usual Dosing</th>
<th>Counter</th>
<th>Clinical Pearls</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Metered-dose Inhalers (MDI)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aerosolized inhalation that is pushed to activate; Spacer compatible</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Advair&lt;sup&gt;®&lt;/sup&gt; (Fluticasone / salmeterol) HFA</td>
<td>MDI</td>
<td>45-21 mcg</td>
<td>BID</td>
<td>Yes</td>
<td>Shake before use Needs primed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>115-21 mcg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>230-21 mcg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dulera&lt;sup&gt;®&lt;/sup&gt; (Mometasone / formoterol) HFA</td>
<td>MDI</td>
<td>100-5 mcg</td>
<td>BID</td>
<td>Yes</td>
<td>Shake before use Needs primed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200-5 mcg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symbicort&lt;sup&gt;®&lt;/sup&gt; (Budesonide / formoterol) HFA</td>
<td>MDI</td>
<td>80-4.5 mcg</td>
<td>BID</td>
<td>Yes</td>
<td>Shake before use Needs primed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>160-4.5 mcg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dry Powder Inhalers (DPI)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breath-actuated; Spacer incompatible and not required*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advair&lt;sup&gt;®&lt;/sup&gt; Diskus&lt;sup&gt;®&lt;/sup&gt; (Fluticasone / salmeterol)</td>
<td>DPI</td>
<td>100-50 mcg</td>
<td>BID</td>
<td>Yes</td>
<td>Keep level and flat while holding horizontally</td>
</tr>
<tr>
<td></td>
<td></td>
<td>250-50 mcg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>500-50 mcg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wixela&lt;sup&gt;®&lt;/sup&gt; Inhub&lt;sup&gt;®&lt;/sup&gt; (Fluticasone / salmeterol)</td>
<td>DPI</td>
<td>100-50 mcg</td>
<td>BID</td>
<td>Yes</td>
<td>Hold vertically</td>
</tr>
<tr>
<td></td>
<td></td>
<td>250-50 mcg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>500-50 mcg</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>AirDuo&lt;sup&gt;®&lt;/sup&gt; Respiclick&lt;sup&gt;®&lt;/sup&gt; (Fluticasone / salmeterol)</td>
<td>DPI</td>
<td>55-14 mcg</td>
<td>BID</td>
<td>Yes</td>
<td>Do not open cap until ready to use</td>
</tr>
<tr>
<td></td>
<td></td>
<td>113-14 mcg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>232-14 mcg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Leukotriene Inhibitors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Drug</strong></td>
<td><strong>Strength</strong></td>
<td><strong>Usual Dosing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singulair&lt;sup&gt;®&lt;/sup&gt; (Montelukast)</td>
<td>4mg</td>
<td>QDay</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>chewable tablet and granule packet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5mg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>chewable tablet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10mg</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>tablet</td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

Key: **Bolded medications** are available generically, * = advanced technique required, avoid if patient requires spacer with mask.
## Rescue Medications

### Short-Acting Beta-2 Agonists (SABA)
- Breathe out before inhaling
- Hold breath for 10 seconds or as long as possible after inhaling medication

<table>
<thead>
<tr>
<th>Drug</th>
<th>Inhaler Type</th>
<th>Strengths</th>
<th>Usual Dosing</th>
<th>Counter</th>
<th>Clinical Pearls</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Metered-dose Inhalers (MDI)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ventolin®, ProAir®, Proventil® (Albuterol) HFA</td>
<td>MDI</td>
<td>90 mcg</td>
<td>PRN</td>
<td>Yes</td>
<td>Shake before use Needs primed Ventolin® and ProAir® have authorized generics available</td>
</tr>
<tr>
<td>Xopenex® (Levalbuterol) HFA</td>
<td>MDI</td>
<td>45 mcg</td>
<td>PRN</td>
<td>No</td>
<td>Shake before use Needs primed; Requires PA</td>
</tr>
<tr>
<td><strong>Nebulizer Solution</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AccuNeb® (Albuterol)</td>
<td>Nebulizer vials</td>
<td>2.5 mg/3 mL (0.083%)</td>
<td>PRN</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.5 mg/0.5 mL (0.5%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.63 mg/3 mL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.25 mg/3 mL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xopenex® (Levalbuterol)</td>
<td>Nebulizer vials</td>
<td>0.31 mg/3 mL</td>
<td>PRN</td>
<td>N/A</td>
<td>Requires PA</td>
</tr>
</tbody>
</table>
Systemic Corticosteroids

- Use for asthma exacerbations

<table>
<thead>
<tr>
<th>Drug</th>
<th>Strength</th>
<th>Usual Dosing</th>
<th>Clinical Pearl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prednisolone (OraPred®)</td>
<td>Solution: 6.7mg/5ml, 10mg/5ml, 15mg/5ml, 20mg/5ml, 25mg/5ml; OD: 10mg, 15mg, 30mg; Tablet: 5mg</td>
<td>QDay or BID</td>
<td>Take with food&lt;br&gt; Easier and better administration for pediatric patients vs. prednisone since solution does not contain alcohol</td>
</tr>
<tr>
<td>Prednisone (Deltasone®)</td>
<td>Solution: 5mg/5ml, 5mg/ml; Tablets: 1mg, 2.5mg, 5mg, 10mg, 20mg, 50mg; EC Tablets: 1mg, 2mg, 5mg</td>
<td>QDay or BID</td>
<td>Take with food&lt;br&gt; Solution contains alcohol; avoid in younger patients</td>
</tr>
</tbody>
</table>

Key: **Bolded medications** are available generically, * = advanced technique required, avoid if patient requires spacer with mask.
## Comparative Total Daily Dosages for Inhaled Corticosteroids

<table>
<thead>
<tr>
<th>Inhaled Corticosteroids (ICS)</th>
<th>Low TOTAL Daily Dose</th>
<th>Medium TOTAL Daily Dose</th>
<th>High TOTAL Daily Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug</td>
<td>0-4 yrs</td>
<td>5-11 yrs</td>
<td>≥12 yrs and adult</td>
</tr>
<tr>
<td>Arnuity® Ellipta® (Fluticasone furoate) DPI</td>
<td>NA</td>
<td>50 mcg</td>
<td>100 mcg</td>
</tr>
<tr>
<td>• 50 mcg; 100 mcg; 200 mcg</td>
<td>NA</td>
<td>50 mcg</td>
<td>100 mcg</td>
</tr>
<tr>
<td>Asmanex® (Mometasone furoate) HFA</td>
<td>NA Δ</td>
<td>NA Δ</td>
<td>NA Δ</td>
</tr>
<tr>
<td>• 100 mcg; 200 mcg</td>
<td>NA</td>
<td>110 mcg</td>
<td>220 mcg</td>
</tr>
<tr>
<td>Asmanex® Twisthaler® (Mometasone furoate) DPI</td>
<td>88-176 mcg*</td>
<td>176 mcg</td>
<td>176 mcg</td>
</tr>
<tr>
<td>• 110 mcg; 220 mcg</td>
<td>NA</td>
<td>110 mcg</td>
<td>220 mcg</td>
</tr>
<tr>
<td>Flovent® (Fluticasone propionate) HFA</td>
<td>100-200 mcg</td>
<td>200-300 mcg</td>
<td>NA</td>
</tr>
<tr>
<td>• 44 mcg; 110 mcg; 220 mcg</td>
<td>NA</td>
<td>110 mcg</td>
<td>220 mcg</td>
</tr>
<tr>
<td>Flovent® Diskus® (Fluticasone propionate) DPI</td>
<td>NA</td>
<td>100-200 mcg</td>
<td>200-300 mcg</td>
</tr>
<tr>
<td>• 50 mcg; 100 mcg; 250 mcg</td>
<td>NA</td>
<td>100-200 mcg</td>
<td>200-300 mcg</td>
</tr>
</tbody>
</table>

Key: DPI = dry powder inhaler; HFA = hydrofluoroalkane; MDI = metered-dose inhaler; NA = not available (either not approved, no data available, or safety and efficacy not established for this age group); *= exceeds FDA-approved dose for age group, see package insert and use clinical judgement; Δ= fluticasone HFA preferred for ages 0 – 11 years, but if insurance requires, can use mometasone HFA 100 mcg BID as an alternative.
# Inhaled Corticosteroids (ICS) (continued)

<table>
<thead>
<tr>
<th>Drug</th>
<th>0-4 yrs</th>
<th>5-11 yrs</th>
<th>≥12 yrs and adult</th>
<th>0-4 yrs</th>
<th>5-11 yrs</th>
<th>≥12 yrs and adult</th>
<th>0-4 yrs</th>
<th>5-11 yrs</th>
<th>≥12 yrs and adult</th>
</tr>
</thead>
</table>
| **Pulmicort® (Budesonide) Flexhaler® DPI**  
- 90 mcg; 180 mcg | NA | 360 mcg | 360-540 mcg | NA | 450-720 mcg | >630-1,080 mcg* | NA | >800 mcg* | >1,200 mcg* |
| **Pulmicort® Respules® (Budesonide) Inhalation Suspension for Nebulization**  
- 0.25 mg; 0.5 mg; 1 mg | 0.25-0.5 mg | 0.5 mg | NA | >0.5-1 mg | 1 mg | NA | >1 mg | 2 mg* | NA |
| **QVAR® (Beclomethasone) RediHaler® HFA**  
- 40 mcg; 80 mcg | NA | 80-160 mcg | 80-240 mcg | NA | 200-320 mcg* | 280-480 mcg | NA | >320 mcg* | >480 mcg |

Key: DPI = dry powder inhaler; HFA = hydrofluoroalkane; MDI = metered-dose inhaler; NA = not available (either not approved, no data available, or safety and efficacy not established for this age group); *= exceeds FDA-approved dose for age group, see package insert and use clinical judgement; Δ= fluticasone HFA preferred for ages 0 – 11 years, but if insurance requires, can use mometasone HFA 100 mcg BID as an alternative.
References


Referrals and Consultations

Online: NationwideChildrens.org
Phone: (614) 722-6600 or (877) 722-6220  |  Fax: (614) 722-4000
Physician Direct Connect Line for 24-hour urgent physician consultations: (614) 355-0221 or (877) 355-0221.