Controller Therapy

Regular controller therapy is indicated in individuals who have one or more indicators of poor control.

- Pharmacologic therapy should be determined based upon an individual’s current asthma control, escalated if needed to gain control, only after addressing other reasons for poor control, and reduced to the least amount required to maintain asthma control.
- Prescribed controller therapy should take into account both current control and future risk for severe exacerbations.

ICs are the first-line controller therapy for all ages

In preschoolers, low-dose ICs are first-line therapy.

<table>
<thead>
<tr>
<th>Product – Trade Name</th>
<th>Pediatric Daily ICS Dose (mcg)</th>
<th>Adult Daily ICS Dose (mcg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LOW</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>Budesonide®</td>
<td>≤200</td>
<td>201–400</td>
</tr>
<tr>
<td>Fluticasone® Flunisolide®</td>
<td>≤200</td>
<td>201–400</td>
</tr>
<tr>
<td>Mometasone® Neosporin®</td>
<td>200</td>
<td>201–400</td>
</tr>
</tbody>
</table>

Adjunct Controller Therapy

Adjunct controller therapy is indicated if asthma cannot be controlled on IC (or alternately, on LTRAs).

- The Asthma Management Continuum diagram outlines which adjunct therapy should be considered at what ICs dosing category for children 6 years of age and over and adults.
- LABAs are not indicated in preschoolers.
- LABAs should never be used alone (as monotherapy) for asthma.
- LABAs should be used as add-on therapy to an IC (ideally in the same inhaler device).
- High doses of ICs may be associated with significant side effects in children and adults and should only be prescribed by asthma specialists.

Written Action Plan

Written action plans are a key component of care for all ages. An action plan should outline:

- Daily preventive management to maintain control;
- When and how to adjust reliever and controller therapy for loss of control;
- Clear instructions regarding when to seek urgent medical attention.

Adherence to maintenance (‘green zone’) therapy is a fundamental component of written action plans.

<table>
<thead>
<tr>
<th>Maintenance therapy</th>
<th>Recommended controller step-up therapy for the Action Plan “Yellow zone”</th>
</tr>
</thead>
<tbody>
<tr>
<td>No maintenance</td>
<td>1st choice</td>
</tr>
<tr>
<td>No maintenance</td>
<td>None</td>
</tr>
<tr>
<td>ICS</td>
<td>None</td>
</tr>
<tr>
<td>ICS/LABA*</td>
<td>None</td>
</tr>
<tr>
<td>Adults (12 years and over)</td>
<td>Trial of 4-fold ↑ in ICS for 7–14 days**</td>
</tr>
<tr>
<td>ICS/LABA BUD/FORM</td>
<td>Increase BUD/FORM to max 4 inh bid x 7–14 days OR BUD/FORM as a reliever and a controller (max 8 inh/ day)</td>
</tr>
<tr>
<td>FP/SALM or MOM/FORM</td>
<td>Trial of 4-fold ↑ in ICS (higher ICS strength of ICS/LABA combination or extra ICS) for 7–14 days**</td>
</tr>
</tbody>
</table>

* In children with a recent history of severe exacerbation and suboptimal response to SABA during index exacerbation. ** Does not apply to preschoolers. † In individuals ≥15 years of age with a history of severe acute loss of asthma control in the preceding year.

Definition of abbreviations and terms

FEV₁: Forced expiratory volume in 1 second; FVC: Forced vital capacity; PEF: Peak expiratory flow; PC₂₀: Proactive concentration of methacholine producing a 20% fall in FEV₁. * Diurnal variation: is calculated as the highest PEF minus the lowest divided by the highest PEF multiplied by 100 for morning and night (determined over a 1–2 week period); BUD/FORM: Budesonide/Formoterol; FP/SALM: Fluticasone propionate/salmeterol; MOM: Mometasone; ICS: Inhaled Corticosteroids; LABA: Long-acting beta₂-agonist; LTRA: Leukotriene receptor antagonist; SABA: Short-acting beta₂-agonist.

Bibliography

What is Asthma?
Asthma is an inflammatory disorder of the airways characterized by paroxysmal or persistent symptoms such as dyspnea, chest tightness, wheezing, sputum production and cough, associated with variable airflow limitation and a variable degree of hyperresponsiveness of airways to endogenous or exogenous stimuli.

How to diagnose Asthma
Management of asthma begins with establishing an accurate diagnosis, typically by supplementing history with objective measures of lung function in individuals 6 years of age and over. In preschoolers, for whom it is not possible to routinely assess lung function, a careful history (including family history, risk factors for asthma development, and response to trial of therapy) and physical examination are used to differentiate asthma from other causes of episodic respiratory symptoms.

Symptoms suggestive of Asthma:
• Frequent episodes of breathlessness, chest tightness, wheezing or cough
• Symptoms worse at night and in the early morning
• Symptoms develop with a viral respiratory tract infection, after exercise, or exposure to aero-allergens or irritants
• Symptoms develop in young children after playing or laughing
• Symptoms improve with bronchodilators or corticosteroids

Objective measures of pulmonary function supportive of an asthma diagnosis:
• Reversible airway obstruction (after a bronchodilator) or Variable airflow limitation over time or after controller therapy
• Airway hyperresponsiveness

Approach to Asthma Management
The primary goal is to control the disease and prevent future risk.
• Confirm diagnosis with history and objective lung function measurements
• Self-management education including:
  - Environmental trigger avoidance
  - Inhaler technique
  - Adherence
  - Written action plan
• Reliever therapy for PRN use
• Daily controller therapy
• Regular reassessment of asthma control, including spirometry or PEF

Asthma Control
Asthma control should be assessed at each visit, including at least one measure of lung function (spirometry or PEF), in all patients able to reproducibly perform lung function testing.

Pulmonary Function Criteria

<table>
<thead>
<tr>
<th>Pulmonary Function Measurement</th>
<th>Children (6 years of age and over)</th>
<th>Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREferred: Spirometry showing reversible airway obstruction</td>
<td>Reduced FEV1/FVC AND Increase in FEV1, after a bronchodilator or after course of controller therapy</td>
<td>Less than lower limit of normal* (&lt;0.8–0.9)** AND ≥12%</td>
</tr>
</tbody>
</table>

ALternative: Peak Expiratory Flow (PEF) variability

| Increase after a bronchodilator or after course of controller therapy OR Diurnal variation† | ≥20% | 60 L/min (minimum ≥20%) |
| OR | Not recommended | OR | ≥8% based upon twice daily readings; >20% based upon multiple daily readings |

ALternative: Positive Challenge Test

| Methacholine Challenge | PC20 <4 mg/mL (4–16 mg/mL is borderline; >16 mg/mL is negative) |
| OR | Exercise Challenge | ≥10–15% decrease in FEV1, post-exercise |

* Consider as an additional measure of asthma control in individuals 18 years and over with moderate to severe asthma who are assessed in specialized centres.

Canadian Respiratory Guidelines
Asthma
Treatable. Preventable.