

## Reliever on Demand

All individuals with asthma should have a reliever for as needed use.

- SABAs are appropriate relievers for all age groups and severity.
- SABAs are the preferred class of reliever for mild asthma.
- In individuals 12 years of age and over, BUD/FORM combination may be considered:
  - as a reliever in individuals with moderate asthma and poor control despite fixed-dose maintenance ICS/LABA combination;
  - as a reliever and a controller in a single inhaler for exacerbation-prone individuals with uncontrolled asthma despite high maintenance doses of ICS or ICS/LABA combination therapy.

## 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.

## ICSs are the first-line controller therapy for all ages

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

PRODUCT – (Trade Name)	Pediatric Daily ICS Dose (mcg) (Age 6–11 years)			Adult Daily ICS Dose (mcg) (12 years and over)		
	LOW	MEDIUM	HIGH	LOW	MEDIUM	HIGH
Beclomethasone dipropionate HFA (QVAR) <sup>†</sup>	≤200	201–400	>400	≤250	251–500	>500
Budesonide* (Pulmicort® Turbuhaler®)	≤400	401–800	>800	≤400	401–800	>800
Ciclesonide* (Alvesco®)	≤200	201–400	>400	≤200	201–400	>400
Fluticasone (Flovent® MDI and spacer; Flovent® Diskus®)	≤200	201–400	>400	≤250	251–500	>500
Mometasone (Amanexx® Twisthaler®)				200	≥400–800	>800

NOTE: Dosing categories are approximate, based upon a combination of approximate dose equivalency as well as safety and efficacy data rather than available product formulations. \* Licensed for once daily dosing in Canada. Highlighting indicates doses which are not approved in Canada.

## Adjunct Controller Therapy

Adjunct controller therapy is indicated if asthma cannot be controlled on ICS (or alternatively, 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 only be used as add-on therapy to an ICS (ideally in

## 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.

Maintenance therapy	Recommended controller step-up therapy for the Action Plan "Yellow zone"	
	1st choice	2nd choice
<b>Preschoolers (under 6 years) and children (6–11 years)</b>		
No maintenance	None	Consider starting regular controller therapy
ICS	None	Prednisone/prednisolone 1 mg/kg x 3–5 days <sup>†</sup>
ICS/LABA <sup>§</sup>	None	Prednisone/prednisolone 1 mg/kg x 3–5 days <sup>†</sup>
<b>Adults (12 years and over)</b>		
No maintenance	None	Consider starting regular controller therapy
ICS	Trial of ≥4-fold ↑ in ICS for 7–14 days**	Prednisone 30–50 mg for at least 5 days**
ICS/LABA BUD/FORM	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)	Prednisone 30–50 mg for at least 5 days
FP/SALM or MOW/FORM	Trial of ≥4-fold ↑ in ICS (higher ICS strength of ICS/LABA combination or extra ICS) for 7–14 days**	Prednisone 30–50 mg for at least 5 days**

<sup>†</sup> In children with a recent history of severe exacerbation and suboptimal response to SABA during index exacerbation, <sup>§</sup> 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

FEV<sub>1</sub>: Forced expiratory volume in 1 second; FVC: Forced vital capacity; PEF: Peak expiratory flow; PC<sub>20</sub>: Proactive concentration of methacholine producing a 20% fall in FEV<sub>1</sub>; <sup>†</sup> 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; MOW: Mometasone; ICS: Inhaled Corticosteroid; LABA: Long-acting beta<sub>2</sub>-agonist; LTRA: Leukotriene receptor antagonist; SABA: Short-acting beta<sub>2</sub>-agonist.

## Bibliography

Loughhead MD, Lemiere C, Ducharme F, et al. Canadian Thoracic Society 2012 guideline update: Diagnosis and management of asthma in preschoolers, children and adults. *Can Respir J* 2012; Vol 19(2), 127–64.





# Recommendations for the Diagnosis and Management of Asthma Preschoolers, Children and Adults 2012 Update

## 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

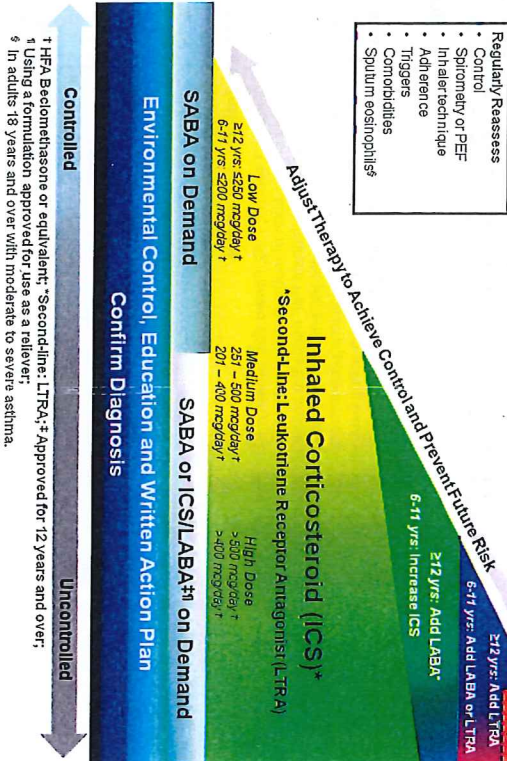
## Objective measures of pulmonary function supportive of an Asthma diagnosis:

- Reversible airflow obstruction (after a bronchodilator) or
- Variable airflow limitation over time or after controller therapy
- Airway hyperresponsiveness



Active control and prevent future risk

## 2012 Asthma Management Continuum Children (6 years and over) and Adult



## Pulmonary Function Criteria

Pulmonary Function Measurement	Children (6 years of age and over)	Adults
<b>PREFERRED: Spirometry showing reversible airway obstruction</b>		
Reduced FEV <sub>1</sub> /FVC	Less than lower limit of normal* (<0.8-0.9)**	Less than lower limit of normal* (<0.75-0.8)**
<b>AND</b>		
Increase in FEV <sub>1</sub> after a bronchodilator or after course of controller therapy	≥12%	≥12% (and a minimum ≥200 mL)

## ALTERNATIVE: Peak Expiratory Flow (PEF) variability

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

## ALTERNATIVE: Positive Challenge Test

a) Methacholine Challenge	PC <sub>20</sub> <4 mg/mL (4-16 mg/mL is borderline; >16 mg/mL is negative)	<b>OR</b>
b) Exercise Challenge	≥10-15% decrease in FEV <sub>1</sub> post-exercise	

\* Based on age, sex, height and ethnicity.  
\*\* Approximate lower limits of normal ratios for children and adults.

## 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.

Characteristic	Frequency or Value
Daytime symptoms	<4 days/week
Night-time symptoms	<1 night/week
Physical activity	Normal
Exacerbations	Mild, infrequent
Absence from work or school due to asthma	None
Need for a fast-acting beta <sub>2</sub> -agonist	<4 doses/week
FEV <sub>1</sub> or PEF	≥90% personal best
PEF diurnal variation	<10-15%
Sputum eosinophils*	<2-3%

\* 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.