

Suspected Asthma Algorithm

Alberta Childhood Asthma Pathway for Primary Care

Asthma Diagnosis – Box 1

Diagnosis:

- Based on **symptom pattern**, careful and **thorough history** of symptoms (wheeze, cough, night-waking and activity limitations), and **assessment of family history** of asthma and allergies.
- Presence of atopy and early sensitisation support a diagnosis, as does a family history of atopy which also predicts likelihood that asthma will persist.

Clinical Diagnostic Signs, Symptoms & Tests:

- A history of multiple episodes in a season (>3) of shortness of breath and wheeze or 2 weeks of cough
- Persistent cough or cough during sleep that is not related to URTI/sinusitis
- Presence of wheeze on expiration or forced expiration during examination
- Findings of prolonged expiratory phase on examination of the chest
- In children aged 6 and over diagnosis should be substantiated by a response to Beta2 agonist inhalation demonstrated on spirometry

Persistent / Seasonal Pattern – Box 2

- Symptoms are persistent (unless adequately treated) but may have exacerbations and milder periods of low symptom activity
- **Often** accompanied by a personal/family history of atopy
- Responds in 15 minutes to trial of beta2 agonist by inhaler
- Diagnosis is supported by therapeutic trial of adequate doses of ICS. Response is generally seen within 2-4 weeks, but may take up to 8 weeks.
 - Failure to respond to ICS indicates likely **NOT** asthma (must assure good adherence, dose and technique)

Intermittent Pattern – Box 3

- Predominantly in children <6 but some older children
- Child has intermittent symptoms generally triggered by viral infections
- Predominantly wheeze (+/-) shortness of breath (+/-) cough with episode
- Symptom-free (and normal testing and exam) between episodes
- **May** have a positive personal/family history of atopy
- Shows a clear response to inhaled beta2 agonists within 15 minutes on three occasions during episodes
- **Asthma Predictive Index (API)** is a tool that can be used to predict whether a child with intermittent wheezing before the age of 3 will develop a persistent asthma pattern during school age years:
 - A positive API is highly suggestive that they will; a negative API is highly suggestive they will not
- A **positive** API is defined as:

Three or more episodes of wheeze in first 3 years of life

AND EITHER

One (or more) major risk factor:

- A parental history of asthma
- Personal eczema
- Skin test positive to aero-allergens

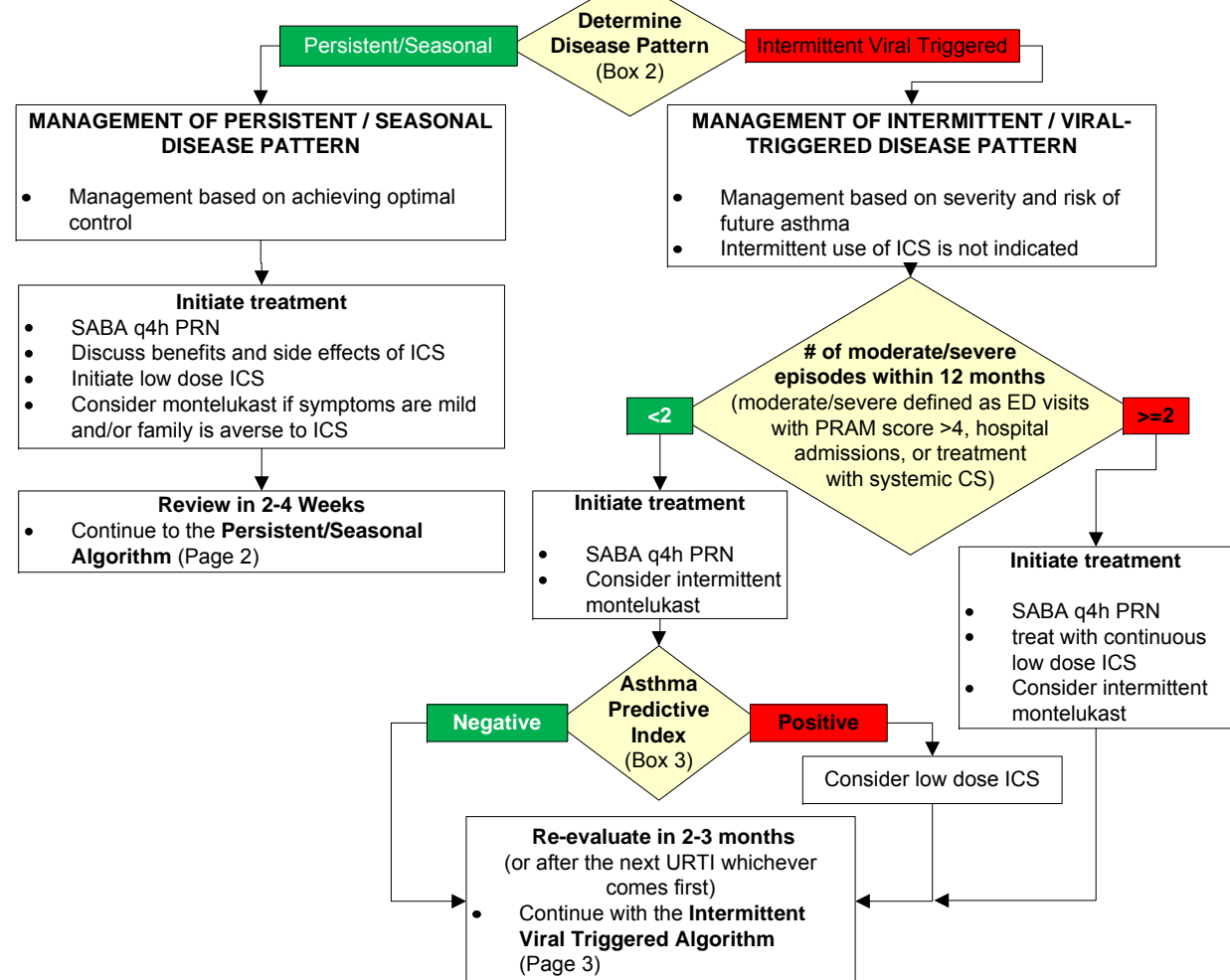
OR

Two (or more) minor risk factors:

- Eosinophilia
- Wheezing without colds
- Skin test positive to foods
- Allergic rhinitis

Confirm Diagnosis (Box 1)

- Identify patient and family concerns and goals of therapy
- Discuss environmental control and how to avoid and control triggers
- Conduct an allergy assessment
- Conduct spirometry for confirmation and objective airways assessment if >= 6 years
- Provide asthma education, preferably with CRE or CAE for everyone
 - AAAP for everyone
 - Teach inhalation technique (IT)
- Determine if child has (persistent/seasonal) or (intermittent viral triggers) disease pattern
- Conduct a Sino-nasal assessment



Follow Up - Persistent / Seasonal Algorithm

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MANAGEMENT OF PERSISTENT / SEASONAL DISEASE PATTERN

- Management based on achieving optimal control

Optimal Control Questionnaire – Box 1

'Yes' to one or more of the questions below indicates asthma is not under optimal control. 'Yes' to 2 or more questions is a strong indication for change in management.

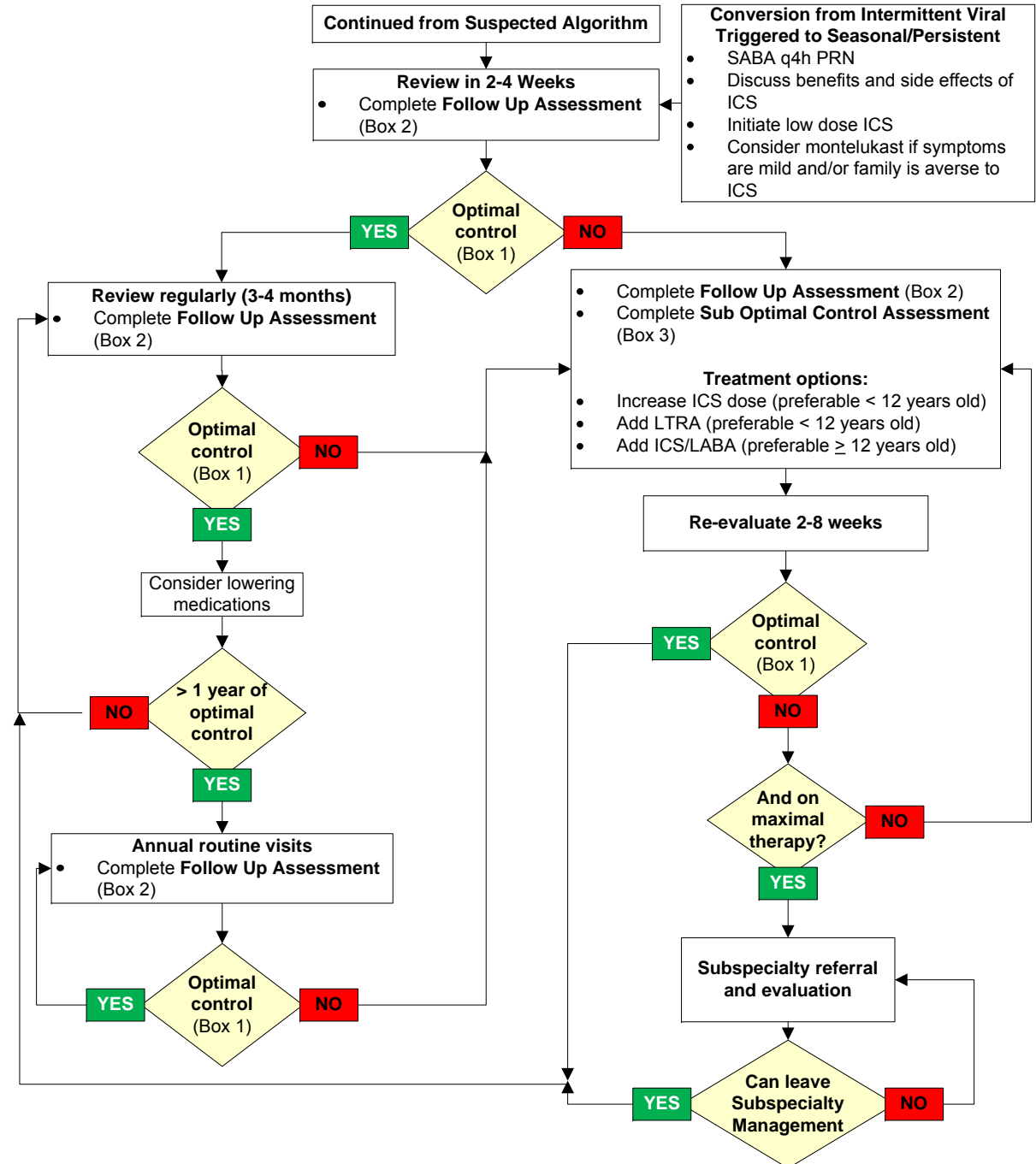
- Do you cough, wheeze or have a tight chest because of your asthma?
- Do coughing, wheezing, or chest tightness wake you at night?
- Do you stop exercising because of your asthma?
- Do you ever miss work or school because of your asthma?
- Do you use your reliever/rescue medication more than 2-3 times a week?

Follow Up Assessment – Box 2

- Identify/review patient and family concerns & goals of therapy
- Discuss/review environmental control and how to avoid and/or control triggers
- Conduct/review an allergy assessment
- Assess/review adherence to therapy
- Teach/review inhalation technique
- Provide/review written Asthma Action Plan

Sub Optimal Control Assessment – Box 3

- Consider allergy referral for skin testing
- Conduct sino-nasal assessment
- Assess/review adherence to therapy
- Conduct/order spirometry for confirmation and objective airways assessment for children ages 6-18 years
- Provide/refer for asthma education, preferably with a Respiratory Educator
- Teach/review inhalation technique
- Discuss benefits & side effects of inhaled corticosteroids.



MANAGEMENT OF INTERMITTENT / VIRAL-TRIGGERED DISEASE PATTERN

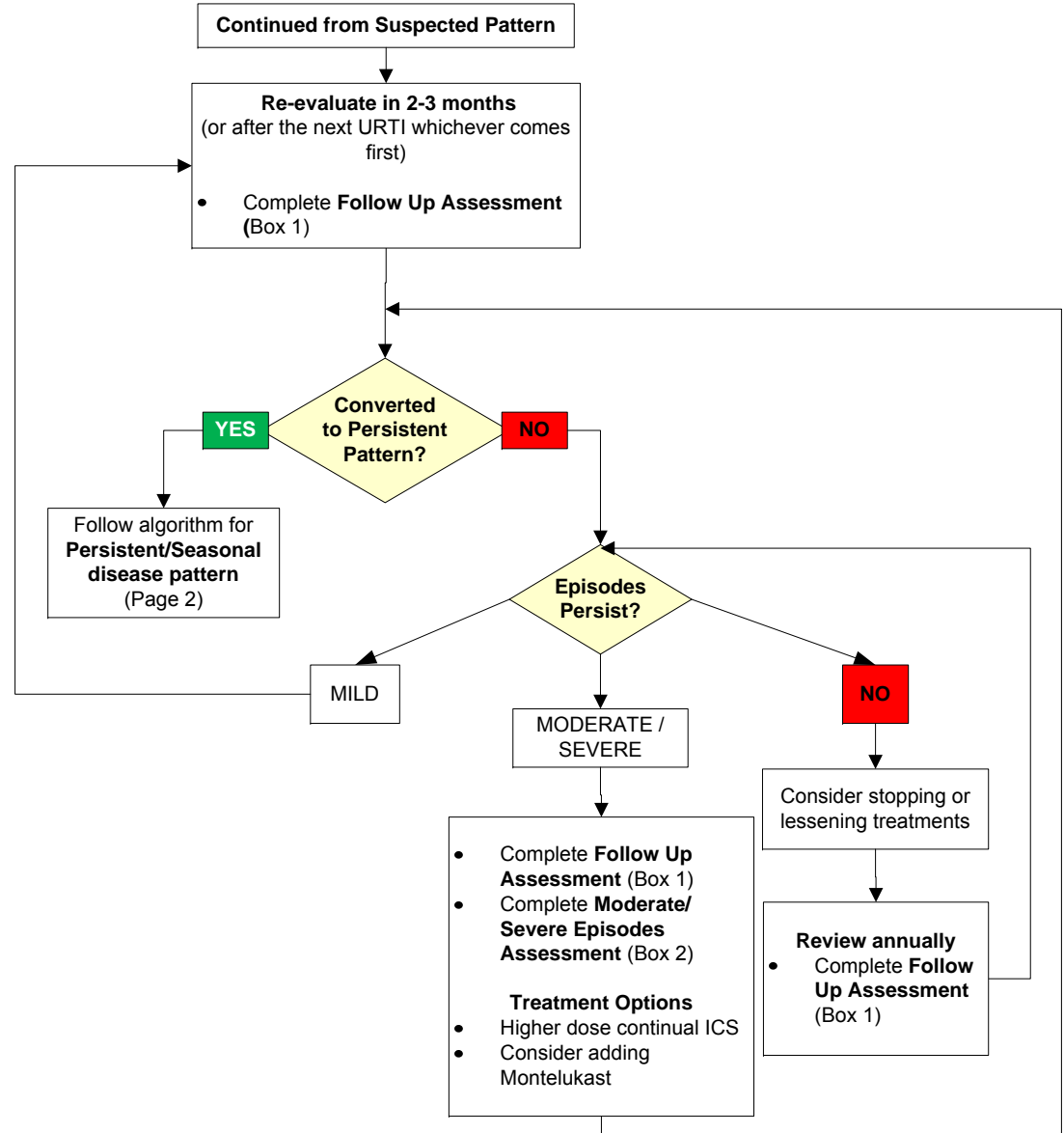
- Management based on severity and risk of future asthma
- Intermittent use of ICS is not indicated

Follow Up Assessment - Box 1

- Identify/review patient and family concerns & goals of therapy
- Discuss/review environmental control and how to avoid and/or control triggers
- Conduct/review an allergy assessment
- Assess/review adherence to therapy
- Teach/review inhalation technique
- Provide/review written Asthma Action Plan

Moderate/Severe Episodes Assessment - Box 2

- Consider allergy referral for skin testing
- Conduct sino-nasal assessment
- Assess/review adherence to therapy
- Conduct/order spirometry for confirmation and objective airways assessment for children ages 6-18 years
- Provide/refer for asthma education, preferably with a Respiratory Educator
- Teach/review inhalation technique
- Discuss benefits & side effects of inhaled corticosteroids.



Exacerbation Algorithm

Alberta Childhood Asthma Pathway for Primary Care

MANAGEMENT OF PRESENT OR IMPENDING EXACERBATIONS

Management considerations:

- Severity of the previous episodes
- Age
- Previous responses
- Side effect potential of systemic corticosteroids

Options for prevention of an exacerbation

- On exposure to trigger (eg. URTI) – Montelukast; continue for the duration of the URTI
- At the onset of the school season (September 1st):
 - Remind families to restart their ICS if it has been stopped for the summer (usually not to be recommended to stop them)
 - Montelukast for the first 6 weeks

Management at home - Box 1

- Beta adrenergic medications**
 - Salbutamol (Ventolin) 2-5 puffs q4h prn
 - Terbutaline (Bricanyl) 1-2 puffs q4h prn
 - ** If needing more frequently or for over 24 hours, consult physician immediately
- Consider Quadrupling dose of ICS (this includes Combination products, specifically Symbicort or Zenhale) if they remain within the recommended maximum LABA dose

Criteria for home management - Box 2

- Using Salbutamol less frequently than q4h
- Using Salbutamol q4h less than 24h
- Significantly improved within 2-3 days

Immediate Office Management - Box 3

- Systemic corticosteroids
 - Prednisone 2mg/kg for 2-5 days
 - Dexamethasone 0.3 mg/kg for 2-3 days
- Salbutamol (Ventolin) 5 puffs or Terbutaline (Bricanyl) 2 puffs

Criteria for going home - Box 4

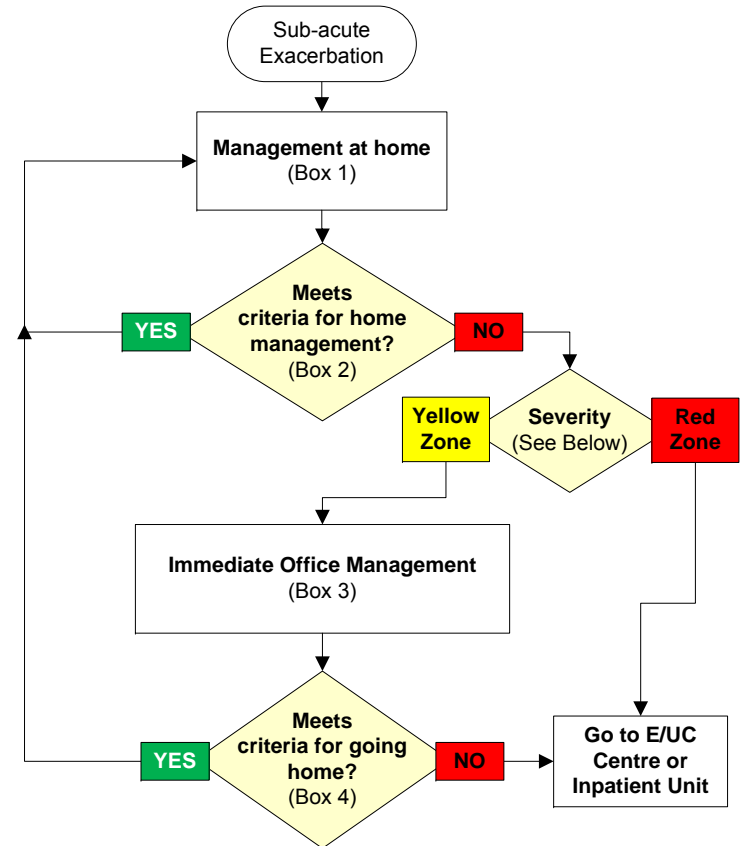
The following can be considered as a guide when deciding to send a child back home from your office

- Minimal work of breathing – minimal indrawing, comfortable and at ease, ability to speak sentences
- Administer 5-10 puffs of Salbutamol and observe response after 20-30 minutes
- Family comfort and home resources
- SaO₂ ≥ 93%

Follow up with Family Physician in 1 week or sooner if necessary

Considerations for prevention of future episodes:

- Ensure adequate adherence to therapy
- Environmental avoidance strategies (eg. Day care)
- Number & frequency of episodes
- Increase the baseline controller / preventer medications



	Yellow Zone	Red
1. Daytime Symptoms	More than 3 times/week	Continuous & getting worse
2. Nighttime Symptoms	Some nights	Continuous & getting worse
3. Reliever	More than 3 times/week	Relief for less than 3-4 hours
4. Physical Activity	Limited	Very limited
5. Can go to school or work	Maybe	No

Or as directed by physician

Fast Acting Beta Agonist dosing in children

- Salbutamol (Ventolin, Airomir)
- Terbutaline (Bricanyl)
- Formoterol (Symbicort) as part of SMART therapy in children over 12 years of age
- If using more than 3 times per week, modification of therapy is required

Comparative inhaled corticosteroids (ICS) dosing in children

The following table was adapted from the Canadian Thoracic Society 2012 Clinical Practice Guidelines for Asthma (Can Respir J. Vol 19(2): 127-64) and Kovesi et al. (2010) (CMAJ 182(4): E172-83).

Medication (trade name) and inhaler device	Minimum age licensed for use in Canada [¶]	Daily ICS dose (mcg) [§]		
		Low	Medium	High [†]
Beclomethasone (QVAR) by MDI/Spacer	5 yr	≤ 200	201 - 400	> 400
Budesonide (Pulmicort) by DPI	6 yr [‡]	≤ 400	401 - 800	> 800
Ciclesonide (Alvesco) by MDI/Spacer	6 yr	≤ 200	201 - 400	> 400
Fluticasone (Flovent) by MDI/Spacer or DPI	1 yr [‡]	≤ 200	201 - 400	> 400
Mometasone (Asmanex) by DPI	12 yr [‡]	200	≥ 400 - 800	> 800

¶ Many specialists, with the patient's informed approval often prescribe medication outside of the age range for scientific and/or patient reasons.

§ Children tend to "auto-scale" their inhaled medication dose and the same dose of maintenance medication can be used at all ages for all medications (level IV evidence) (Becker et al., (2005) CMAJ 173(6):S1-56).

† It is recommended to administer high-dose ICS in consultation with an asthma expert.

‡ The youngest children able to use a DPI are generally 4-5 years of age.

Leukotriene Receptor Antagonist (LTRA) dosing in children (CPS 2013)

Medication (trade name) and inhaler device	Recommended Age Range	Recommended Dosage
Singulair 10 mg tablet	15+ yrs	1 tablet QPM
Singulair 5 mg tablet	6 -14 yrs	1 tablet QPM
Singulair 4 mg chewable tablet	2 – 5 yrs	1 tablet QPM
Singulair 4 mg packet	2 – 5 yrs	1 packet QPM

Combination drug medication dosing in children (CPS 2013)

Combination	Medication (trade name) and inhaler device	Recommended Age Range	Recommended Dosage
Fluticasone + Salmeterol	Advair 100 Diskus	4+ yrs	1 inhalation BID
	Advair 250 Diskus	12+ yrs	1 inhalation BID
	Advair 500 Diskus	12+ yrs	1 inhalation BID
	Advair 125 by MDI/Spacer	12+ yrs	2 inhalation BID
	Advair 250 by MDI/Spacer	12+ yrs	2 inhalation BID
Budesonide + Formoterol	Symbicort 100 Turbuhaler	12+ yrs	1 - 2 inhalation BID
	Symbicort 200 Turbuhaler	12+ yrs	1 - 2 inhalation BID
Mometasone + Formoterol	Zenhale 50/5 by MDI/Spacer	12+ yrs	2 inhalation BID
	Zenhale 100/5 by MDI/Spacer	12+ yrs	2 inhalation BID
	Zenhale 200/5 by MDI/Spacer	12+ yrs	2 inhalation BID