GINA 2014

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Global INitiative for Asthma

INTRODUCTION

- Definition and diagnosis of asthma
- Assessment of asthma
- Treating asthma to control symptoms and minimize risk
- Asthma flare-ups (exacerbations)
- Diagnosis and management of asthma in children
  5 years and younger
- Primary prevention of asthma

GINA Strategy - major revision 2014

- New chapters
  - Management of asthma in children 5 years and younger, previously published separately in 2009
  - Diagnosis of asthma-COPD overlap (ACOS): a joint project of GINA and GOLD

Burden of asthma

- Asthma is one of the most common chronic diseases worldwide with an estimated 300 million affected individuals
- Prevalence is increasing in many countries, especially in children
- Asthma is a major cause of school and work absence
- Health care expenditure on asthma is very high

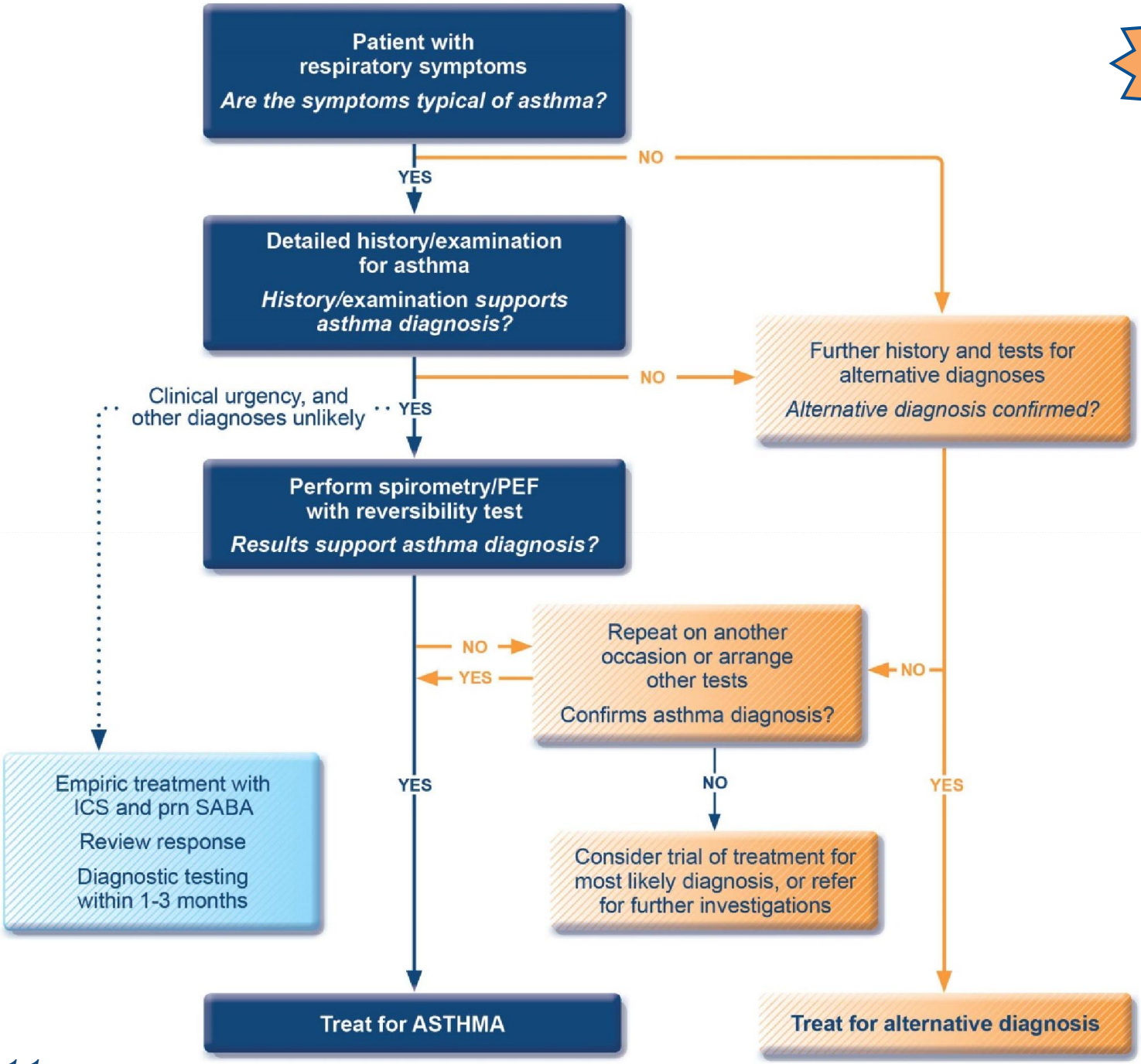
Definition of asthma

Asthma is a heterogeneous disease, usually characterized by chronic airway inflammation.

It is defined by the history of respiratory symptoms such as wheeze, shortness of breath, chest tightness and cough that vary over time and in intensity, together with variable expiratory airflow limitation.

Diagnosis of asthma

- The diagnosis of asthma should be based on:
  - A history of characteristic symptom patterns
  - Evidence of variable airflow limitation, from bronchodilator reversibility testing or other tests
- Document evidence for the diagnosis in the patient's notes, preferably before starting controller treatment
  - It is often more difficult to confirm the diagnosis after treatment has been started
- Asthma is usually characterized by airway inflammation and airway hyperresponsiveness, but these are not necessary or sufficient to make the diagnosis of asthma.

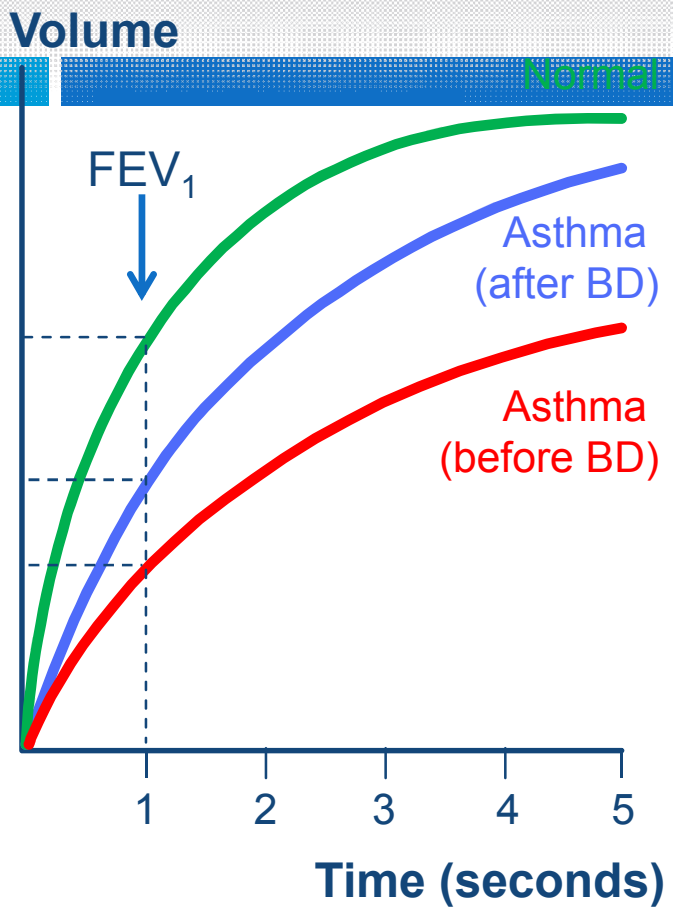


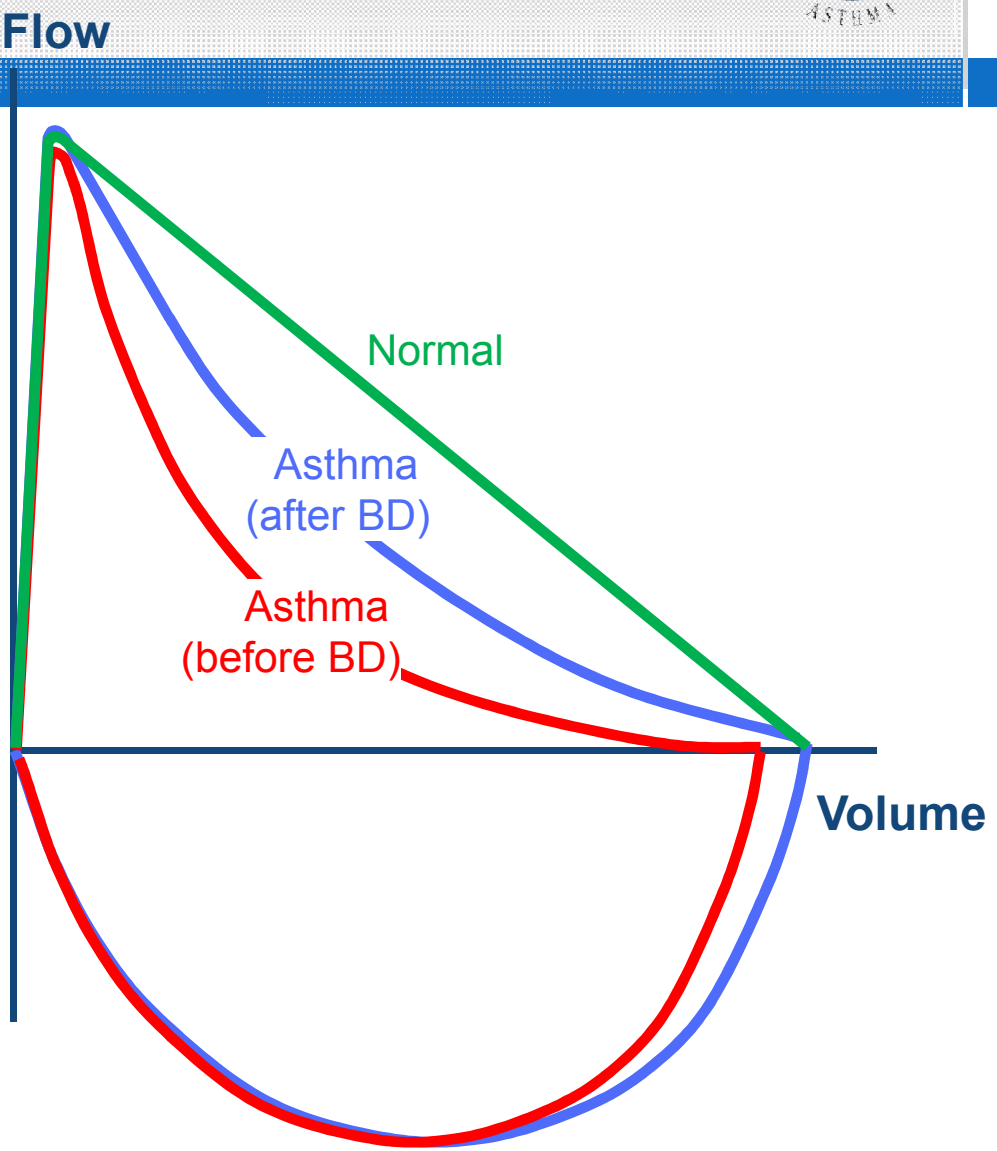
GINA 2014, Box 1-1

Diagnosis of asthma – variable airflow limitation

- Confirm presence of airflow limitation
  - Document that FEV_1/FVC is reduced (at least once, when FEV_1 is low)
  - FEV_1/ FVC ratio is normally >0.75 – 0.80 in healthy adults, and >0.90 in children
- Confirm variation in lung function is greater than in healthy individuals
  - The greater the variation, or the more times variation is seen, the greater probability that the diagnosis is asthma
  - Excessive bronchodilator reversibility (adults: increase in FEV_1 >12% and >200mL; children: increase >12% predicted)
  - Excessive diurnal variability from 1-2 weeks' twice-daily PEF monitoring (daily amplitude x 100/daily mean, averaged)
  - Significant increase in FEV_1 or PEF after 4 weeks of controller treatment
  - If initial testing is negative:
    - Repeat when patient is symptomatic, or after withholding bronchodilators
    - Refer for additional tests (especially children ≤5 years, or the elderly)

Typical spirometric tracings





Note: Each FEV_1 represents the highest of three reproducible measurements

Assessment of asthma

GINA assessment of asthma control

A. Symptom control

In the past 4 weeks, has the patient had:

- Daytime asthma symptoms more than twice a week? Yes❑ No❑
- Any night waking due to asthma? Yes❑ No❑
- Reliever needed for symptoms* more than twice a week? Yes❑ No❑
- Any activity limitation due to asthma? Yes❑ No❑

Level of asthma symptom control

Well-controlled	Partly controlled	Uncontrolled
None of these	1-2 of these	3-4 of these

*Excludes reliever taken before exercise, because many people take this routinely

This classification is the same as the GINA 2010-12 assessment of 'current control', except that lung function now appears only in the assessment of risk factors

GINA assessment of asthma control

A. Symptom control

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Level of asthma symptom control

Well-controlled	Partly controlled	Uncontrolled
None of these	1-2 of these	3-4 of these

B. Risk factors for poor asthma outcomes

- Assess risk factors at diagnosis and periodically
- Measure FEV_1 at start of treatment, after 3–6 months of controller treatment to record the patient's personal best, then periodically for ongoing risk assessment

ASSESS PATIENT'S RISKS FOR:

- Exacerbations
- Fixed airflow limitation
- Medication side-effects

Assessment of risk factors for poor asthma outcomes

Risk factors for exacerbations include:

- Ever intubated for asthma
- Uncontrolled asthma symptoms
- Having ≥1 exacerbation in last 12 months
- Low FEV_1 (measure lung function at start of treatment, at 3-6 months to assess personal best, and periodically thereafter)
- Incorrect inhaler technique and/or poor adherence
- Smoking
- Obesity, pregnancy, blood eosinophilia

Risk factors for fixed airflow limitation include:

- No ICS treatment, smoking, occupational exposure, mucus hypersecretion, blood eosinophilia

Risk factors for medication side-effects include:

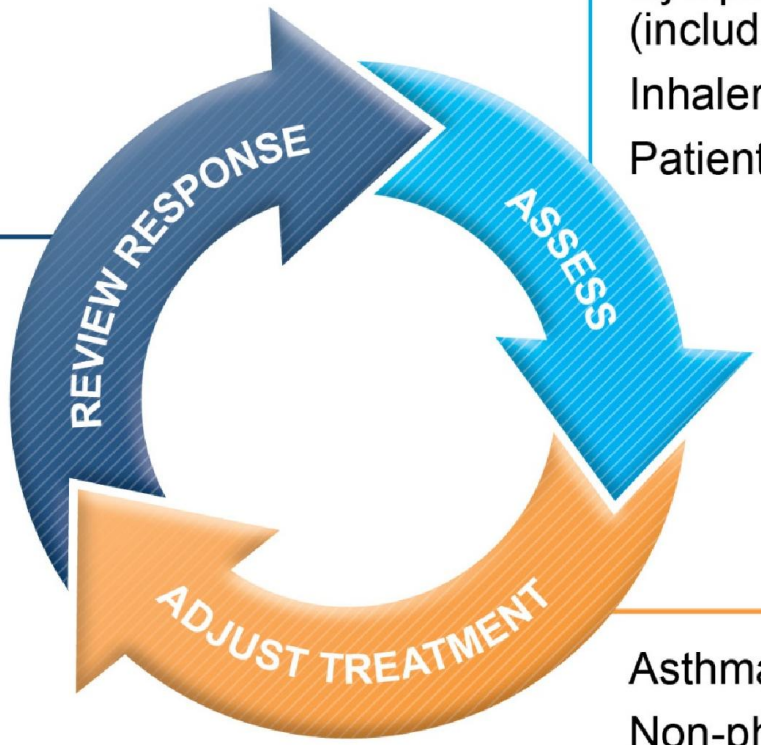
- Frequent oral steroids, high dose/potent ICS, P450 inhibitors

Treating asthma to control symptoms and minimize risk

Goals of asthma management

- The long-term goals of asthma management are
  1. **Symptom control**: to achieve good control of symptoms and maintain normal activity levels
  2. **Risk reduction**: to minimize future risk of exacerbations, fixed airflow limitation and medication side-effects
- Achieving these goals requires a partnership between patient and their health care providers
  - Ask the patient about their own goals regarding their asthma
  - Good communication strategies are essential
  - Consider the health care system, medication availability, cultural and personal preferences and health literacy

The control-based asthma management cycle



Diagnosis

Symptom control & risk factors (including lung function)

Inhaler technique & adherence

Patient preference

Symptoms

Exacerbations

Side-effects

Patient satisfaction

Lung function

Asthma medications

Non-pharmacological strategies

Treat modifiable risk factors

NEW!

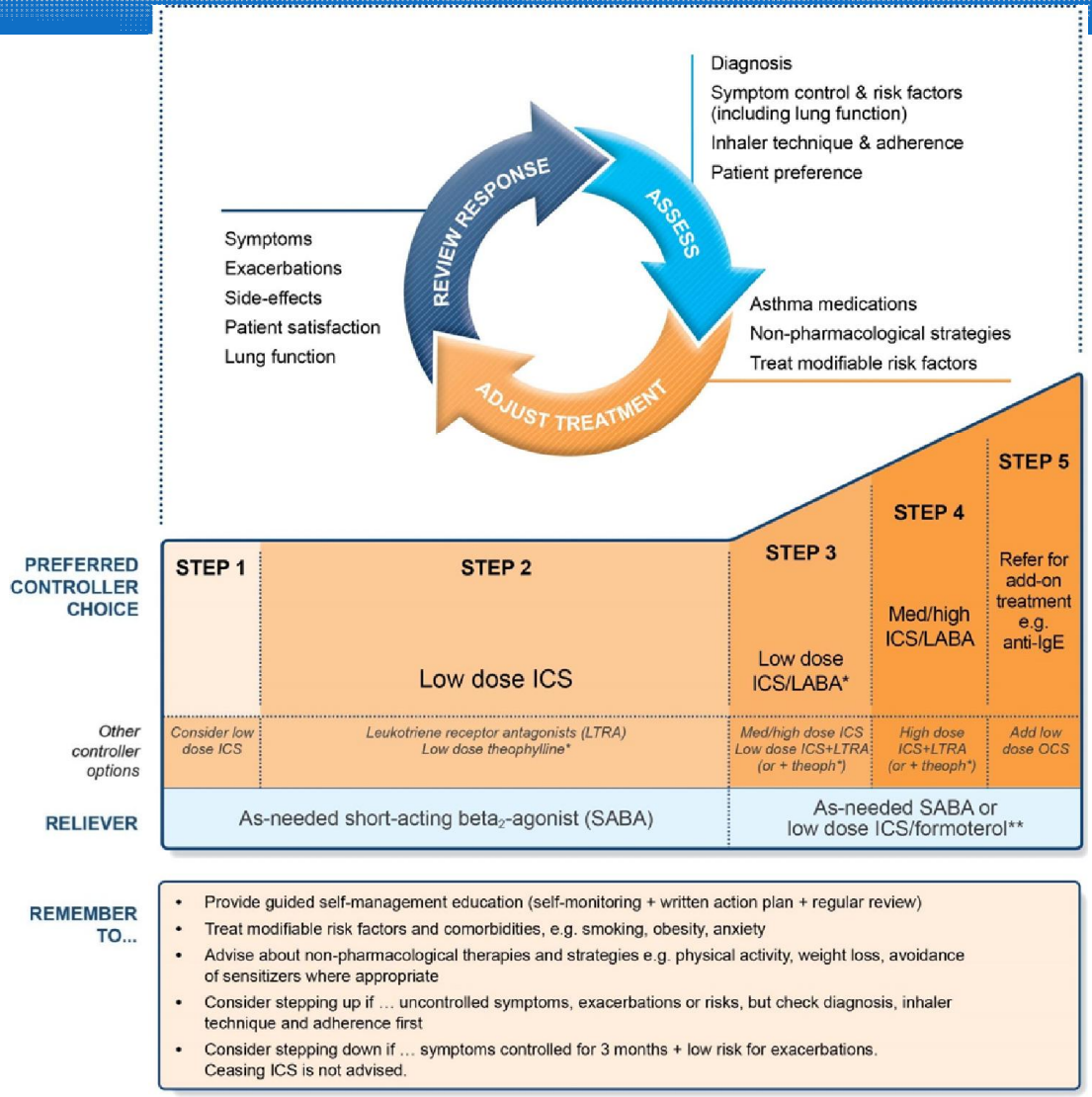
Initial controller treatment for adults, adolescents and children 6–11 years

- Start controller treatment early
  - For best outcomes, initiate controller treatment as early as possible after making the diagnosis of asthma
- Indications for regular low-dose ICS - any of:
  - Asthma symptoms more than twice a month
  - Waking due to asthma more than once a month
  - Any asthma symptoms plus any risk factors for exacerbations

Initial controller treatment for adults, adolescents and children 6–11 years

- Consider starting at a higher step if:
  - Troublesome asthma symptoms on most days
  - Waking from asthma once or more a week, especially if any risk factors for exacerbations
- If initial asthma presentation is with an exacerbation:
  - Give a short course of oral steroids and start regular controller treatment (e.g. high dose ICS or medium dose ICS/LABA, then step down)

Stepwise approach to control asthma symptoms and reduce risk



REMEMBER TO...

- Provide guided self-management education (self-monitoring + written action plan + regular review)
- Treat modifiable risk factors and comorbidities, e.g. smoking, obesity, anxiety
- Advise about non-pharmacological therapies and strategies e.g. physical activity, weight loss, avoidance of sensitizers where appropriate
- Consider stepping up if … uncontrolled symptoms, exacerbations or risks, but check diagnosis, inhaler technique and adherence first
- Consider stepping down if … symptoms controlled for 3 months + low risk for exacerbations. Ceasing ICS is not advised.

NEW!

Low, medium and high dose inhaled corticosteroids Adults and adolescents (≥12 years)

Inhaled corticosteroid	Total daily dose (mcg)		
	Low	Medium	High
Beclometasone dipropionate (CFC)	200–500	>500–1000	>1000
Beclometasone dipropionate (HFA)	100–200	>200–400	>400
Budesonide (DPI)	200–400	>400–800	>800
Ciclesonide (HFA)	80–160	>160–320	>320
Fluticasone propionate (DPI or HFA)	100–250	>250–500	>500
Mometasone furoate	110–220	>220–440	>440
Triamcinolone acetonide	400–1000	>1000–2000	>2000

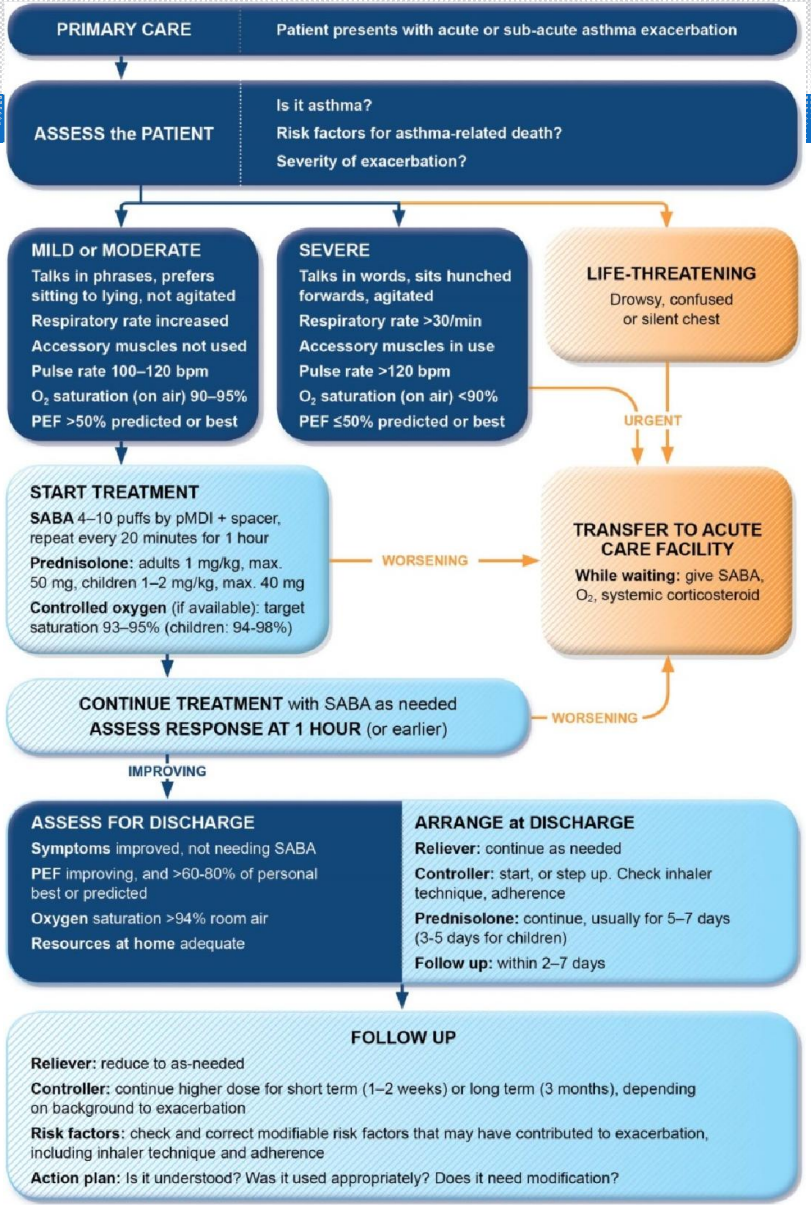
Low, medium and high dose inhaled corticosteroids Children 6–11 years

Inhaled corticosteroid	Total daily dose (mcg)		
	Low	Medium	High
Beclometasone dipropionate (CFC)	100–200	>200–400	>400
Beclometasone dipropionate (HFA)	50–100	>100–200	>200
Budesonide (DPI)	100–200	>200–400	>400
Budesonide (nebules)	250–500	>500–1000	>1000
Ciclesonide (HFA)	80	>80–160	>160
Fluticasone propionate (DPI)	100–200	>200–400	>400
Fluticasone propionate (HFA)	100–200	>200–500	>500
Mometasone furoate	110	≥220–<440	≥440
Triamcinolone acetonide	400–800	>800–1200	>1200

Reviewing response and adjusting treatment

- How often should asthma be reviewed?
  - 1-3 months after treatment started, then every 3-12 months
  - During pregnancy, every 4-6 weeks
  - After an exacerbation, within 1 week

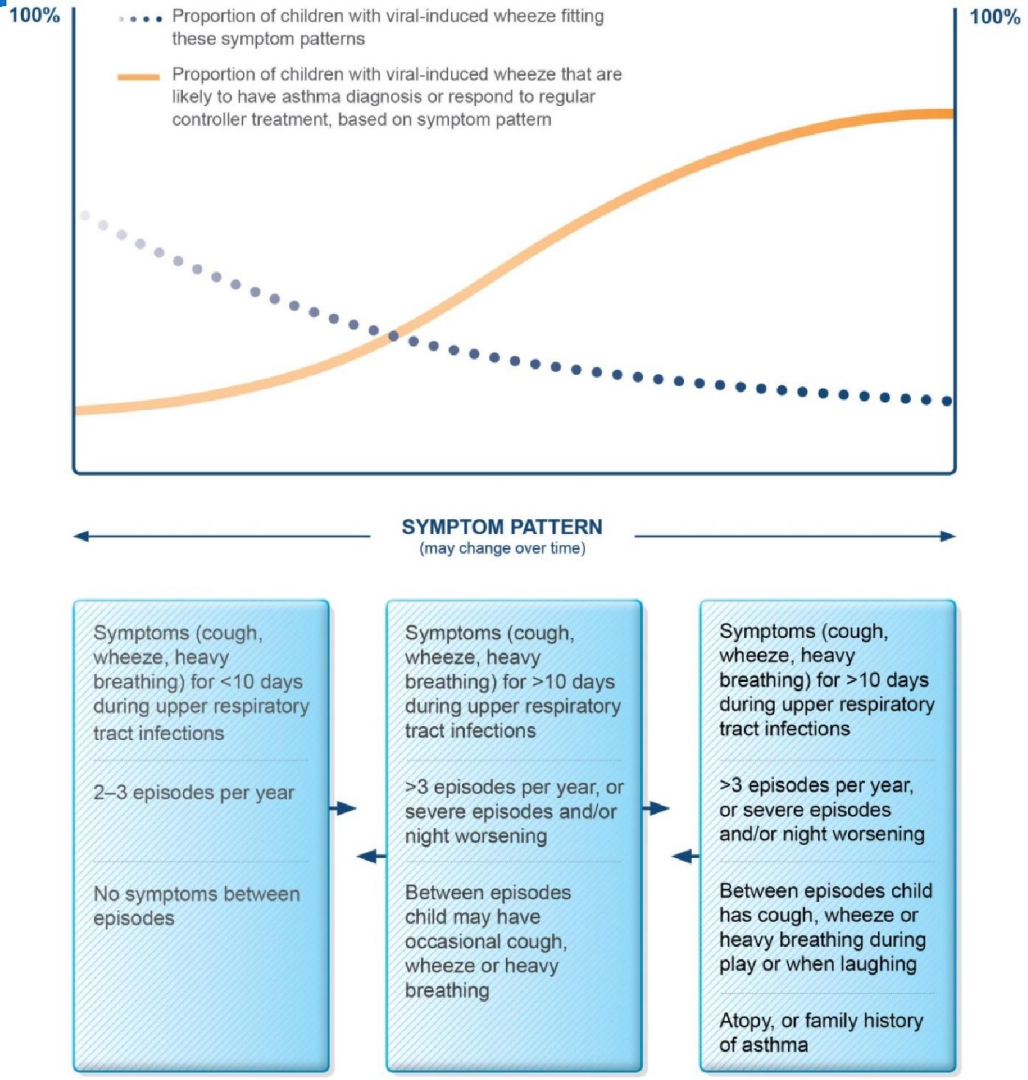
Managing exacerbations in primary care



NEW!

Diagnosis and management of asthma in children 5 years and younger

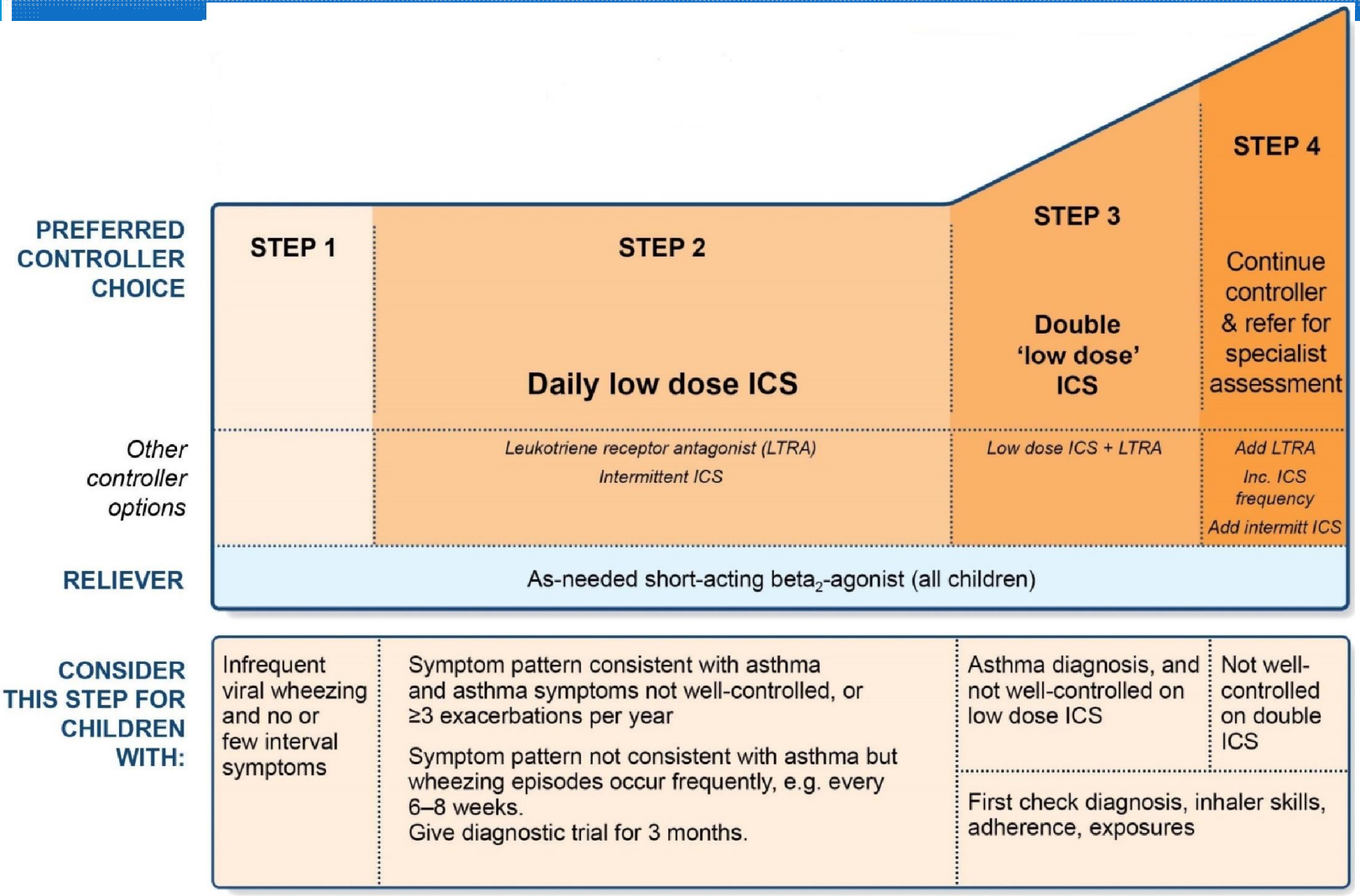
Probability of asthma diagnosis or response to asthma treatment in children ≤5 years



Features suggesting asthma in children ≤5 years

Feature	Characteristics suggesting asthma
Cough	Recurrent or persistent non-productive cough that may be worse at night or accompanied by some wheezing and breathing difficulties. Cough occurring with exercise, laughing, crying or exposure to tobacco smoke in the absence of an apparent respiratory infection
Wheezing	Recurrent wheezing, including during sleep or with triggers such as activity, laughing, crying or exposure to tobacco smoke or air pollution
Difficult or heavy breathing or shortness of breath	Occurring with exercise, laughing, or crying
Reduced activity	Not running, playing or laughing at the same intensity as other children; tires earlier during walks (wants to be carried)
Past or family history	Other allergic disease (atopic dermatitis or allergic rhinitis) Asthma in first-degree relatives
Therapeutic trial with low dose ICS and as-needed SABA	Clinical improvement during 2–3 months of controller treatment and worsening when treatment is stopped

Stepwise approach – pharmacotherapy (children ≤5 years)



‘Low dose’ inhaled corticosteroids (mcg/day) for children ≤5 years

Inhaled corticosteroid	Low daily dose (mcg)
Beclometasone dipropionate (HFA)	100
Budesonide (pMDI + spacer)	200
Budesonide (nebulizer)	500
Fluticasone propionate (HFA)	100
Ciclesonide	160
Mometasone furoate	Not studied below age 4 years
Triamcinolone acetonide	Not studied in this age group

GINA 2014, Box 6-6

Initial assessment of acute asthma exacerbations in children ≤5 years

Symptoms	Mild	Severe*
Altered consciousness	No	Agitated, confused or drowsy
Oximetry on presentation (SaO_2)**	>95%	<92%
Speech†	Sentences	Words
Pulse rate	<100 beats/min	>200 beats/min (0–3 years) >180 beats/min (4–5 years)
Central cyanosis	Absent	Likely to be present
Wheeze intensity	Variable	Chest may be quiet

*Any of these features indicates a severe exacerbation
**Oximetry before treatment with oxygen or bronchodilator
† Take into account the child's normal developmental capability

Initial management of asthma exacerbations in children ≤5 years

Therapy	Dose and administration
Supplemental oxygen	24% delivered by face mask (usually 1L/min) to maintain oxygen saturation 94-98%
Inhaled SABA	2–6 puffs of salbutamol by spacer, or 2.5mg by nebulizer, every 20 min for first hour, then reassess severity. If symptoms persist or recur, give an additional 2-3 puffs per hour. Admit to hospital if >10 puffs required in 3-4 hours.
Systemic corticosteroids	Give initial dose of oral prednisolone (1-2mg/kg up to maximum of 20mg for children <2 years; 30 mg for 2-5 years)
Additional options in the first hour of treatment	
Ipratropium bromide	For moderate/severe exacerbations, give 2 puffs of ipratropium bromide 80mcg (or 250mcg by nebulizer) every 20 minutes for one hour only
Magnesium sulfate	Consider nebulized isotonic $MgSO_4$ (150mg) 3 doses in first hour for children ≥2 years with severe exacerbation

Primary prevention of asthma

Primary prevention of asthma

- The development and persistence of asthma are driven by gene-environment interactions
- For children, a ‘window of opportunity’ exists *in utero* and in early life, but intervention studies are limited
- For intervention strategies including allergen avoidance

Primary prevention of asthma

- Current recommendations are
  - Avoid exposure to tobacco smoke in pregnancy and early life
  - Encourage vaginal delivery
  - Advise breast-feeding for its general health benefits
  - Where possible, avoid use of paracetamol (acetaminophen) and broad-spectrum antibiotics in the first year of life