

Pocket Asthma Guidelines



MANAGING ASTHMA IN THE CARIBBEAN



2012

MONITORING

- Repeat measurement of PEF 15-30 minutes after starting treatment
- Oximetry: maintain SpO₂ > 92%
- Repeat blood gas measurements within 2 hours of starting treatment if: initial PaO₂ < 8 kPa (60 mmHg) unless subsequent SpO₂ > 92%
- PaO₂ normal or raised
- patient deteriorates

- Chart PEF before and after giving β₂ agonists and at least 4 times daily throughout hospital stay
- Transfer to ICU accompanied by a doctor. Prepared to intubate if:
 - Deteriorating PEF, worsening or persisting hypoxia, or hypercapnea
 - Exhaustion, feeble respirations, confusion or drowsiness
 - Coma or respiratory arrest

DISCHARGE

When discharged from hospital, patients should have:

- Been on discharge medication for 24 hours and have had an inhaler technique checked and recorded
- PEF > 75% of best predicted and PEF diurnal variability < 25% unless discharge is agreed with respiratory physician
- Treatment with oral and inhaled steroids in addition to bronchodilators
- Own PEF meter and written asthma action plan
- GP follow up arranged within 2 working days
- Follow up appointment in respiratory clinic within 4 weeks

Patients with severe asthma (indicated by need for admission) and adverse behavioral or psychosocial features are at risk of further severe or fatal attacks

- Determine reason(s) for exacerbation and admission
- Send details of admission, discharge and potential best PEF to GP

Near fatal asthma:

- Raised PaCO₂
- Requiring IPPV with raised inflation pressures

Table 6: Features of Acute Asthma in Adults

IMMEDIATE TREATMENT:	Features of acute severe asthma:
<ul style="list-style-type: none"> Oxygen 40-60% CO₂ retention is not usually aggravated by oxygen therapy in asthma) Sabutamol 5mg via an oxygen-driven nebuliser Ipratropium bromide 0.5 mg via an oxygen-driven nebuliser Prednisolone tablets 40-50 mg or IV hydrocortisone 100mg or both if very ill No sedatives of any kind Chest radiograph only if pneumothorax or consolidation are suspected or patient requires IPPV or if another 	<ul style="list-style-type: none"> Peak expiratory flow (PEF) 33-50% of best (use % predicted if recent best unknown) Can't complete sentences in one breath Respirations ≥ 30 breaths/min Pulse ≥ 110 beats/min
<p>IF LIFE THREATENING FEATURES ARE PRESENT:</p> <ul style="list-style-type: none"> Discuss with senior clinician and ICU Team Add IV magnesium sulphate 1.2-2g infusion over 20 minutes (unless already given) Give nebulised β₂ agonist more frequently e.g. salbutamol 5 mg up to every 15-30 minutes or 10 mg continuously hourly 	<p>asthma:</p> <ul style="list-style-type: none"> Peak expiratory flow (PEF) 33-50% of best (use % predicted if recent best unknown) Can't complete sentences in one breath Respirations ≥ 30 breaths/min Pulse ≥ 110 beats/min
<h3 style="text-align: center;">SUBSEQUENT MANAGEMENT</h3> <p>IF PATIENT IS IMPROVING continue:</p> <ul style="list-style-type: none"> 40-60% oxygen Prednisolone 40-50 mg daily or IV hydrocortisone 100 mg 6 hourly Nebulised β₂ agonist and ipratropium 4-6 hourly <p>IF PATIENT NOT IMPROVING AFTER 15-30 MINUTES:</p> <ul style="list-style-type: none"> Continue oxygen and steroids Give nebulised β₂ agonist more frequently e.g. salbutamol 5 mg up to every 15-30 minutes or 10 mg continuously hourly, with monitoring Continue ipratropium 0.5 mg 4-6 hourly until patient is improving 	<p>Features of acute severe asthma:</p> <ul style="list-style-type: none"> Peak expiratory flow (PEF) 33-50% of best (use % predicted if recent best unknown) Can't complete sentences in one breath Respirations ≥ 30 breaths/min Pulse ≥ 110 beats/min
<p>IF PATIENT IS STILL NOT IMPROVING:</p> <ul style="list-style-type: none"> Discuss patient with senior clinician and ICU team IV magnesium sulphate 1.2-2.0g over 20 minutes (unless already given) Senior clinician may consider use of IV β₂ agonist or progression to IPPV. 	<p>Life threatening features - ANY ONE OF:</p> <ul style="list-style-type: none"> PEF < 33% of best or predicted SaO₂ < 92% Severe Hypoxia (PaO₂ < 60 mmHg irrespective of treatment with oxygen) Low pH SpO₂ < 92%

Features of acute severe asthma:

- Peak expiratory flow (PEF) 33-50% of best (use % predicted if recent best unknown)
- Can't complete sentences in one breath
- Respirations ≥ 30 breaths/min
- Pulse ≥ 110 beats/min

Life threatening features - ANY ONE OF:

- PEF < 33% of best or predicted
- Silent chest, cyanosis, or feeble respiratory effort
- Bradycardia, dysrhythmia, or hypotension
- Exhaustion, confusion, or coma
- SpO₂ < 92%
- Normal (4.6-6 kPa, 35-45 mmHg) PaCO₂
- Severe hypoxia: PaO₂ < 8 kPa (60mmHg) irrespective of treatment with oxygen
- A low pH (or high H⁺)

Caution patients with severe or life threatening attacks may not be distressed and may not have all these abnormalities. The presence of any of these abnormalities should alert the doctor.

Near fatal asthma:

- Raised PaCO₂
- Requiring IPPV with raised inflation pressures

Table 6: Features of Acute Asthma in Adults

General Considerations

Table 1. Common Asthma Triggers and Avoidance Strategies

Common asthma triggers	Avoidance strategies
Domestic dust mite allergens	Wash bed linens and blankets once a week in hot water and dry in a hot dryer or sun. Encase pillows and mattresses in air tight covers. Remove carpets, especially in sleeping rooms. Use vinyl, leather, or plain wooden furniture instead of fabric covered furniture
Tobacco smoke	Stay away from tobacco smoke. Patients and parents should not smoke.
Allergens from animals with fur	Remove animals from the home, or at least from the sleeping area
Cockroach allergen	Clean the home thoroughly and often; make every effort to reduce the availability of food. Use pesticide spray-but make sure the patient is not at home when spraying occurs
Outdoor pollens and mold	Close windows and doors and remain indoors when pollen and mold counts are highest.
Physical activity	Do not avoid physical activity. Symptoms can be prevented by taking short- or long- acting inhaled beta-2-agonist or sodium chromoglycate before strenuous exercise
Medication: avoid or use with caution	Aspirin, non steroidal anti-inflammatory drugs, beta-blockers (oral or intra-ocular (close supervision is essential))
Viral upper respiratory tract infections, influenza.	For the child with recurrent, severe asthma exacerbations related to viral URIs, consider limiting exposure to viral infections. Influenza vaccines for children with persistent asthma (who are not allergic to eggs).
Occupational asthma	Consider this in all adults with new onset asthma e.g. isocyanates, allergens from grain and others.
Emotions	Avoid emotional and psychological stress
Foods	Food allergies (e.g. peanut), food additives

CLASSIFICATION OF ASTHMA BY LEVEL OF CONTROL

Traditionally, the degree of symptoms, airflow limitation, and lung function variability have allowed asthma to be classified by **severity** (e.g., as Intermittent, Mild Persistent, Moderate Persistent, or Severe Persistent).

However, it is important to recognize that asthma severity involves both the severity of the underlying disease and its responsiveness to treatment. In addition, severity is not an unvarying feature of an individual patient's asthma, but may change over months or years.

Therefore, for ongoing management of asthma, **classification of asthma by level of control** is more relevant and useful (**Figure 2**).

Levels of Asthma Control			
Characteristic	Controlled (All of the following)	Partly Controlled (Any measure present in any week)	Uncontrolled
Daytime symptoms	None (twice or less/week)	More than twice/week	Three or more features of partly controlled asthma present in any week
Limitations of activities	None	Any	
Nocturnal symptoms/awakening	None	Any	
Need for reliever/rescue treatment	None (twice or less/week)	More than twice/week	One in any week [†]
Lung function (PEF or FEV ₁) [‡]	Normal	< 80% predicted or personal best (if known)	
Exacerbations	None	One or more/year*	

* Any exacerbation should prompt review of maintenance treatment to ensure that it is adequate.
[†] By definition, an exacerbation in any week makes that an uncontrolled asthma week.
[‡] Lung function testing is not reliable for children 5 years and younger.

Asthma in Children

Table 2: Management of Asthma in Children

	Mild	Moderate	Severe	Life threatening
Symptoms/Signs	SpO ₂ > 95%	SpO ₂ > 92%	SpO ₂ < 92%	SpO ₂ < 90%
	PEF ≥ 80%	PEF 60-80%	PEF < 60%	PEF < 33%
	Able to talk sentences	Able to talk phrases	Too breathless to talk	Poor respiratory effort
	HR ≤ 100	HR ≤ 120	HR > 120	Bradycardia
Treatment	RR Increased	RR Increased	RR > 30	Agitation
	No use of accessory muscles	Use of accessory muscles	Use of accessory muscles	Confusion
	Wheeze end expiratory	Wheeze expiratory	Wheeze inspiratory and expiratory	Silent Chest
	Wheeze expiratory	Wheeze inspiratory and expiratory	Wheeze inspiratory and expiratory	Cyanosis
Treatment	β ₂ agonist 2-4 puffs via spacer (Max 3 doses in one hour at 20 minute intervals)	O ₂ to maintain SpO ₂ > 95%	O ₂ to maintain SpO ₂ > 95%	O ₂ to maintain SpO ₂ > 95%
	Consider oral corticosteroid (OCS) 1-2 mg/kg at least one dose	β ₂ agonist 4-10 puffs via spacer or nebulized β ₂ agonist 0.03mls/kg (2.5mg-5mg) (Max 3 doses at 20 minute intervals)	Nebulized β ₂ agonist 0.03mls/kg (2.5mg-5mg)	Nebulized β ₂ agonist 0.03mls/kg (2.5mg-5mg)
	Reassess after each treatment	Consider ipratropium bromide 125-250µg (Max 3 doses in one hour at 20 minute intervals)	Nebulized ipratropium bromide 125-250µg	Nebulized ipratropium bromide 125-250µg
	If responding continue β ₂ agonist 1-4 hourly	OCS 2 mg/kg (Max 40mg)	OCS 2 mg/kg (Max 40mg)	IV hydrocortisone 4-6mg/kg or OCS 2 mg/kg
Treatment	If no response arrange transfer to hospital	Reassess after each treatment	Assess response after treatment	Immediate transfer to hospital
		Reassess after each treatment	Assess response after treatment	Immediate transfer to hospital
		OCS 2 mg/kg (Max 40mg)	Assess response after treatment	Immediate transfer to hospital
		Reassess after each treatment	Assess response after treatment	Immediate transfer to hospital

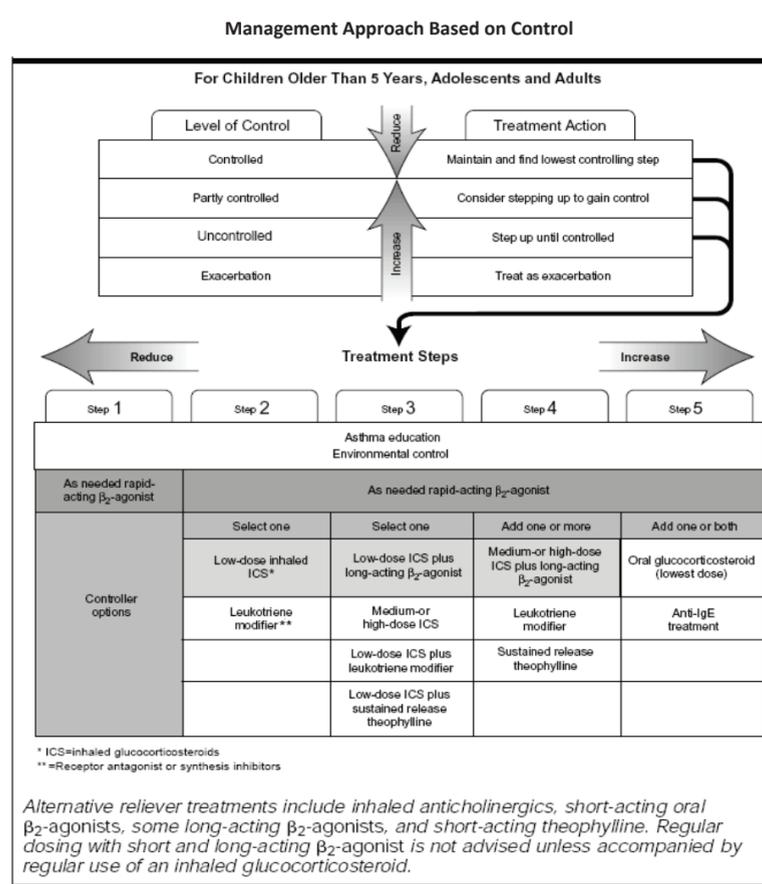
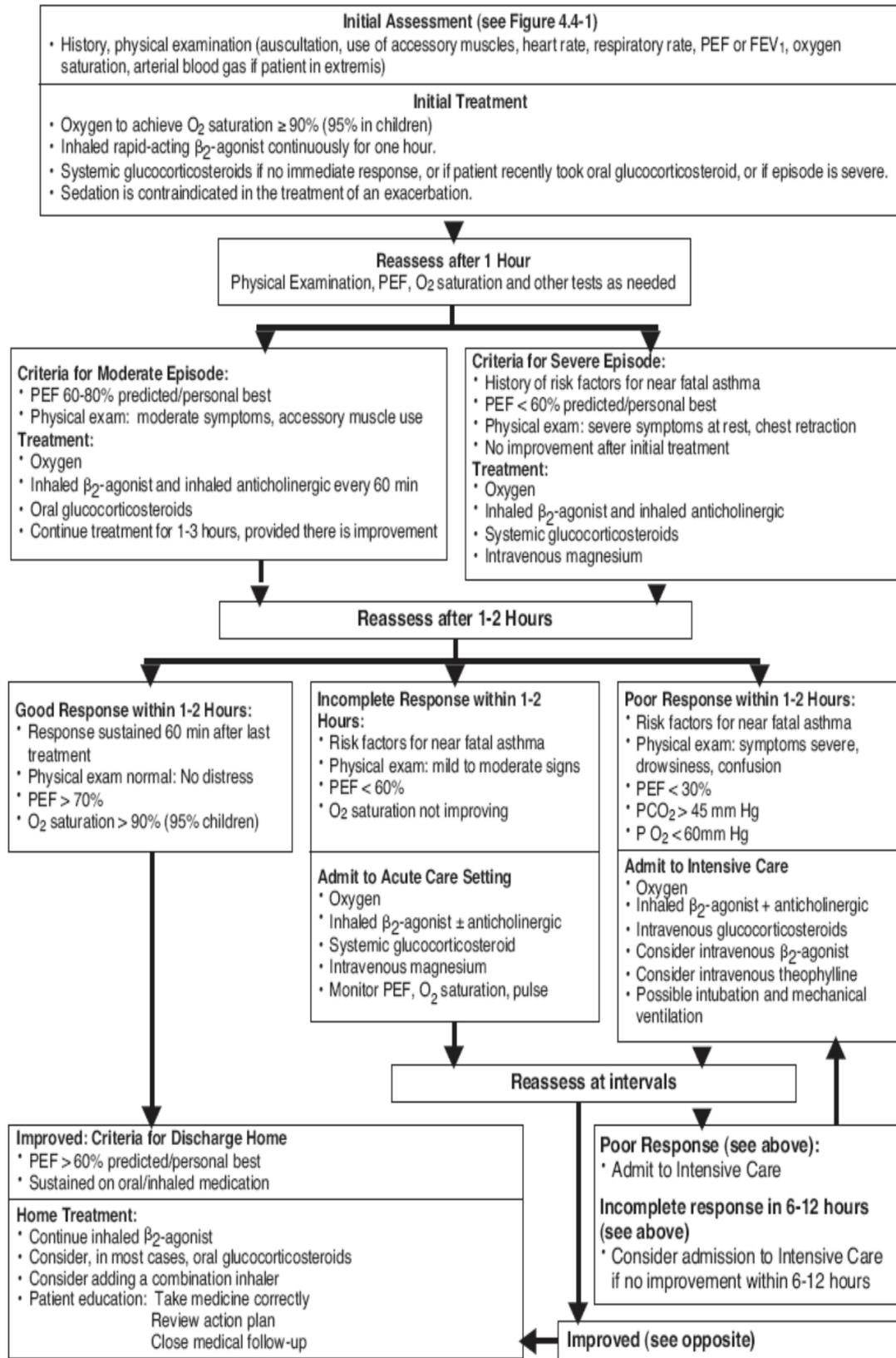


Figure 6. Estimated Equipotent Doses of Inhaled Glucocorticosteroids

Drug	Adults Daily dose (μg)†			Children Daily dose (μg)†		
	Low	Medium	High‡	Low	Medium	High‡
Beclomethasone dipropionate	200-500	>500-1000	>1000-2000	100-200	>200-400	>400
Budesonide*	200-400	>400-800	>800-1600	100-200	>200-400	>400
Budesonide-Neb Inhalation suspension (children only)	—	—	—	250-500	>500-1000	>1000
Ciclesonide*	80-160	>160-320	>320-1280	80-160	>160-320	>320
Flunisolide	500-1000	>1000-2000	>2000	500-750	>750-1250	>1250
Fluticasone	100-250	>250-500	>500-1000	100-200	>200-500	>500
Mometasone furoate*	200-400	>400-800	>800-1200	100-200	>200-400	>400
Triamcinolone acetonide	400-1000	>1000-2000	>2000	400-800	>800-1200	>1200

† Comparisons based on efficacy data.

‡ Patients considered for high daily doses except for short periods should be referred to a specialist for assessment to consider alternative combinations of controllers. Maximum recommended doses are arbitrary but with prolonged use are associated with increased risk of systemic side effects.

* Approved for once-daily dosing in mild patients.

Additional Notes:

- The most important determinant of appropriate dosing is the clinician's judgment of the patient's response to therapy. The clinician must monitor the patient's response in terms of clinical control and adjust the dose accordingly. Once control of asthma is achieved, the dose of medication should be carefully titrated to the **minimum** dose required to maintain control, thus reducing the potential for adverse effects.
- Designation of low, medium, and high doses is provided from manufacturers' recommendations where possible. Clear demonstration of dose-response relationships is seldom provided or available. The principle is therefore to establish the minimum controlling dose in each patient, as higher doses may not be more effective and are likely to be associated with greater potential for adverse effects.
- As CFC preparations are taken from the market, medication inserts for HFA preparations should be carefully reviewed by the clinician for the equivalent correct dosage.

Adult Asthma

Features of Near Fatal Adult Asthma

A COMBINATION OF SEVERE ASTHMA RECOGNISED BY ONE OR MORE OF:

- previous near fatal asthma, e.g. previous ventilation or respiratory acidosis
- previous admission for asthma especially if in the last year
- requiring three or more classes of asthma medication
- heavy use of B2 agonist
- repeated attendances at A&E for asthma care especially if in the last year
- brittle asthma

AND ADVERSE BEHAVIOURAL OR PSYCHOSOCIAL FEATURES RECOGNISED BY ONE OR MORE OF:

- non-compliance with treatment or monitoring
- failure to attend appointments
- self-discharge from hospital
- psychosis, depression, other psychiatric illness or deliberate self-harm
- current or recent major tranquilliser use
- denial
- alcohol or drug abuse
- obesity
- learning difficulties
- employment problems
- income problems
- social isolation
- childhood domestic, marital or legal stress

Levels of severity of acute asthma exacerbations in adults

Near fatal asthma	Raised PaCO ₂ and/or requiring mechanical ventilation with raised inflation pressures (Richards 1993, Innes 1998)
Life threatening asthma	Any one of the following in a patient with severe asthma <ul style="list-style-type: none"> PEF <33% best or predicted SpO₂ <92% PaO₂ <8kPa normal PaCO₂ (4.6-6.0kPa) silent chest cyanosis feeble respiratory effort bradycardia dysrhythmia hypotension exhaustion confusion coma
Acute severe asthma	Any one of: <ul style="list-style-type: none"> PEF 33-50% best or predicted respiratory rate >25/min heart rate > 110/min inability to complete sentences in one breath
Moderate asthma exacerbation	<ul style="list-style-type: none"> Increasing symptoms PEF > 50-75% best or predicted no features of acute severe asthma
Brittle asthma	<ul style="list-style-type: none"> Type 1: wide PEF variability (>40% diurnal variation for 50% of the time over a period >150 days) despite intense therapy Type 2: sudden severe attacks on a background of apparently well controlled asthma

Discharge Criteria from Hospital (Children)

- PEF > 80%
- SaO₂ > 95%
- Minimal/Absent signs and symptoms
- Sufficient medications (bronchodilator and anti-inflammatory) can be obtained
- Outpatient care can be obtained
- Action/Management plan written
- Education re spacer and inhaler devices provided
- Follow up arranged