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

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

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

When discharged from hospital, patients should have:

DISCHARGE

- Coma or respiratory arrest
- Deteriorating PEF, worsening or persisting hypoxia, or hypercapnea
 Exhaustion, feeble respirations, confusion or drowsiness Transfer to ICU accompanied by a doctor. Prepared to intubate if:

throughout hospital stay

• Chart PEF before and after giving \$2 agonists and at least 4 times daily

- patient deteriorates

- PaO2 normal or raised

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

• Senior clinician may consider use of IV β_2 agonist or progression to IPPV. (Nasing visual signature 1.2-2.0 gover 20 minutes (unless already given)

Discuss patient with senior clinician and ICU team IF PATIENT IS STILL NOT IMPROVING:

- Continue Ipratropium 0.5 mg 4-6 hourly until patient is improving every 15-30 minutes or 10 mg continuously hourly, with monitoring
- Give nebulised β_2 agonist more frequently e.g. salbutamol 5 mg up to continue oxygen and steroids
 - IF PATIENT NOT IMPROVING AFTER 15-30 MINUTES:
- Meubilised \$2 agonist and ipratropium 4-6 hourly Prednisolone 40-50 mg daily or IV hydrocostisone 100 mg 6 hourly n98√xo %09-0⊅ •
 - IF PATIENT IS IMPROVING continue:

SUBSEQUENT MANAGEMENT

- Give nebulised β 2 agonist more frequently e.g. salbutamol 5 mg up to every 15-30 minutes or 10 mg continuously hourly.
- Add IV magnesium sulphate 1.2-2g infusion over 20 minutes (unless • Discuss with senior clinician and ICU Team
 - F LIFE THREATENING FEATURES ARE PRESENT:
 - patient requires IPPV or if another
- Chest radiograph only if pneumothorax or consolidation are suspected or No sedatives of any kind
- Ipratropium bromide 0.5 mg via an oxygen-driven nebuliser
 Prednisolone tablets 40-50 mg or IV hydrocortisone 100mg or both if very

 - (CO₂ retention is not usually aggravated by oxygen therapy in asthma) Santiamol 5mg via an oxygen-driven nebuliser %09-04 n98√xO •

IMMEDIATE TREATMENT:

• Low pH

- treatment with oxygen
- 60 mmHg irrespective of Severe Hypoxia PA)2
 - %76 > 7005 •
 - PEF < 33% of best or predicted
 - ANY ONE OF: Life threatening features -

The presence of any should have all these abnormalities. not be distressed and may not or lite threatening attacks may

Caution patients with severe

immediate management. investigations are needed for arterial blood gases, no other inreatening feature, measure t a patient has any ONE life

• Pulse ≥ 110 beats/min

- Respirations >30 breaths/
- in one breath
- Can't complete sentences predicted if recent best unknown)
- % əsn) 1səq Jo %05-EE Peak expiratory flow (PEF)

Features of acute severe

Requiring IPPV with raised inflation pressures

 Raised PaCO₂ Near fatal asthma:

should alert the doctor.

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

gases, no other investigations are needed for immediate management. If a patient has any ONE life threatening feature, measure arterial blood

- (*H dgid no) Hq wol A
- Severe hypoxia: PaO₂ < 8 kPa (60mmHg) irrespective of treatment with
 - Normal (4.6-6 kPa, 35-45 mmHg) PaCO₂
 - %76 > 20ds •
 - Exhaustion, confusion, or coma
 - Bradycardia, dysrythmia, or hypotension
 - Silent chest, cyanosis, or feeble respiratory effort
 - - PEF < 33% of best or predicted

Life threatening features - ANY ONE OF:

- Pulse ≥ 110 beats/min
- Respirations ≥ 30 breaths/min
- Can't complete sentences in one breath

(имоихип 15аа

• Peak expiratory flow (PEF) 33-50% of best (use % predicted if recent

-eatures of acute severe asthma:

Table 6: Features of Acute Asthma in Adults

Adult Asthma

Pocket Asthma Guidelines



MANAGING ASTHMA IN THE CARIBBEAN



General Considerations

inflation pressures

ODe9 besie8 •

Near fatal asthma:

Requiring IPPV with raised

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 spraybut 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

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

- † 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

$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$SpO_2 > 95\% \qquad SpO_2 > 92\% \qquad SpO_2 < 92\% \qquad SpO_2 < 90\%$ $PEF \ge 80\% \qquad PEF 60-80\% \qquad PEF < 60\% \qquad PEF < 33\%$ $Able to talk \\ sentences \qquad Able to talk phrases \\ Enterces \qquad Able to talk phrases \\ HR \le 100 \qquad HR \le 120 \qquad HR > 120 \qquad Bradycardia \\ RR Increased \qquad Use of accessory \\ muscles \qquad Wheeze end \\ expiratory \qquad Wheeze expiratory \\ Wheeze end \\ expiratory \qquad Wheeze expiratory \\ Wheeze end \\ expiratory \qquad O_2 to maintain \\ SpO_2 > 95\% \qquad SpO_2 > 95\% \\ Via spacer \\ (Max 3 \\ doses \\ in one hour \\ at 20 minute \\ intervals) \qquad O_3 mils/kg \\ Consider \\ oral \\ orticosteroid \\ (OCS) \\ 1-2 mg/kg \\ at least one \\ dose \\ Reassess \\ after each \\ treatment \qquad OCS 2 mg/kg \\ (Max 40mg) $
Able to talk sentences Able to talk sentences HR ≤ 100 RR Increased No use of accessory muscles Wheeze end expiratory Wheeze expiratory Moses of accessory muscles Wheeze expiratory Meeze expiratory Meeze expiratory Meeze expiratory Meeze expiratory Moses of accessory muscles Wheeze expiratory Moses of accessory muscles Wheeze expiratory Meeze expiratory Meeze inspiratory and expiratory and expiratory Meeze inspiratory Meulised May agonist 0.03mls/kg (2.5mg-5mg) (Max 3 doses at pratopim bromide ipratropium bromide ipratropium bromide ipratropium bromide	PEF ≥ 80% Able to talk sentences HR ≤ 100 HR ≤ 120 RR Increased RR Increased No use of accessory muscles Wheeze end expiratory Wheeze end expiratory β₂ agonist 2-4 puffs via spacer (Mαx 3 doses in one hour at 20 minute intervals) 1-2 mg/kg at least one dose arrange transfer Reassess after each If no response arrange transfer Able to talk phrases Too breathless to talk PeF < 60% Poffort Agitation Confusion Silent Chest Cyanosis Veacesinspiratory and expiratory an
Able to talk sentences Able to talk sentences HR ≤ 100 RR Increased RR Increased RR Increased No use of accessory muscles Wheeze end expiratory Wheeze end expiratory Wheeze end expiratory Begin and a common and expiratory Wheeze end expiratory Able to talk phrases Too breathless to talk HR > 120 RR Increased RR > 30 Agitation Confusion Silent Chest Cyanosis Wheeze expiratory Wheeze inspiratory and expiratory and expiratory Wheeze end expiratory Begin and a common and expiratory Wheeze expiratory Nebulized β, agonist 0.03mls/kg (2.5mg-5mg)	Able to talk sentences HR ≤ 100 RR Increased RR Increased No use of accessory muscles Wheeze end expiratory Wheeze end expiratory B₂ agonist 2-4 puffs via spacer (Mαx 3 doses in one hour at 20 minute intervals) 1-2 mg/kg at least one dose freatment If responding continue β₂ agonist If no response arrange transfer to hospital Able to talk phrases to talk RR > 100 HR > 120 HR > 120 Bradycardia Agitation Agitation Agitation Agitation Oconfusion Silent Chest Cyanosis Confusion Silent Chest Cyanosis Oconsider
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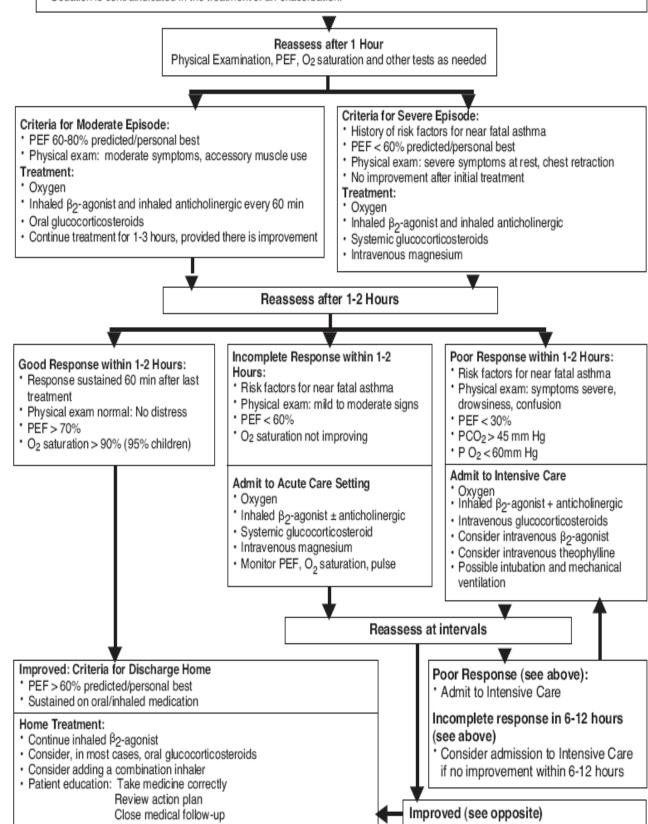
Management of Acute Asthma in Children in Hospital

Initial Assessment (see Figure 4.4-1)

History, physical examination (auscultation, use of accessory muscles, heart rate, respiratory rate, PEF or FEV1, oxygen saturation, arterial blood gas if patient in extremis)

Initial Treatment

- Oxygen to achieve O₂ saturation ≥ 90% (95% in children)
- Inhaled rapid-acting β₂-agonist continuously for one hour.
- Systemic glucocorticosteroids if no immediate response, or if patient recently took oral glucocorticosteroid, or if episode is severe.
- Sedation is contraindicated in the treatment of an exacerbation.

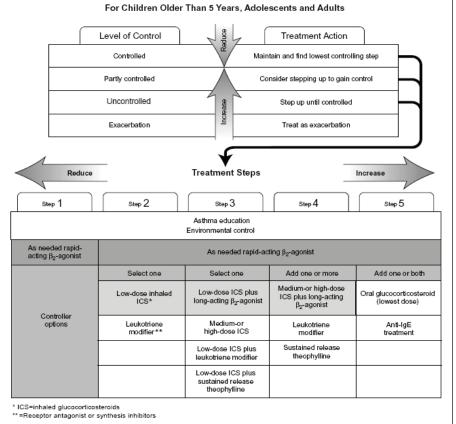


Discharge Criteria from Hospital (Children)

- 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

Management of Asthma to Prevent Exacerbations and Improve Quality of Life

Management Approach Based on Control



Alternative reliever treatments include inhaled anticholinergics, short-acting oral β_2 -agonists, some long-acting β_2 -agonists, and short-acting theophylline. Regular dosing with short and long-acting β_2 -agonist is not advised unless accompanied by regular use of an inhaled glucocorticosteroid.

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.

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 (<i>Richards</i> 1993, Innes 1998)			
Life threatening asthma	Any one of the following in a pati asthma - PEF <33% best or predicted - SpO ₂ <92% - PaO ₂ <8kPa - normal PaCO ₂ (4.6-6.0kPa) - silent chest	- bradycardia - dysrhythmia - hypotension - exhaustion - confusion		

- cyanosis

Acute severe asthma

Any one of:

- PEF 33-50% best or predicted - respiratory rate >25/min - heart rate > 110/min

- feeble respiratory effort

- inability to complete sentences in one breath

Moderate asthma exacerbation

- Increasing symptoms

- PFF> 50-75% best or predicted no features of acute severe asthma

Brittle asthma

Type I: wide PEF variability (>40% diurnal variation for 50% of the time over a period >150 days)

- coma

despite intense therapy

- Type 2: sudden severe attacks on a background of apparently well controlled asthma

[‡] 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.