Asthma: Emergency Management in Children

Purpose
This procedure provides clinical practice guidelines to guide clinicians involved in the emergency management of children with acute asthma.

Scope
This guideline relates to all staff involved in the care and management of children with acute asthma.

Related documents

- **Procedures, Guidelines, Protocols**
  - Asthma Carepath LCCH
  - Asthma Education Checklist
  - CHQ-GDL-00730 Preschool wheeze
  - Wheeze action plan
  - Asthma educational video

Guideline

Introduction
Asthma is a chronic inflammatory disorder of the airways involving reversible airway obstruction. It is a significant health problem in Australia, with prevalence rates (1 in 6 children) that are high by international standards. Asthma is one of the most common conditions with which children present to emergency services, accounting for approximately 3.5% of emergency presentations in Australia and New Zealand.

Children with asthma have sensitive airways which react to triggers (such as viral illnesses) causing swelling of the airway, thickened mucous and narrowing of the muscles surrounding the airway. Airway inflammation and bronchospasm lead to reduced airflow and air trapping.
Children with acute asthma usually present with cough, wheeze and/or difficulty breathing. In an acute asthma episode a wheeze may not always be heard. However, a prolonged respiratory phase of expiration may be present. Acute bronchospasm may lead to respiratory failure and life-threatening acute asthma if not identified and treated promptly.3,4

The diagnosis of asthma is confirmed by demonstrating reversible airway obstruction. Other causes of recurrent respiratory symptoms should be also considered.

Assessment

Children with asthma may present with a range of symptoms and varying levels of severity. When performing the clinical assessment of an asthmatic child the following should be assessed:

- respiratory rate and phases of respiration
- work of breathing and use of accessory muscles (nasal flaring, tracheal tug, intercostal or substernal recession)
- oxygen saturation (in room air or with supplemental oxygen)
- heart rate
- skin colour (pallor or cyanosis)
- blood pressure and pulse volume
- level of consciousness (irritability or drowsiness).

Assessment of a combination of clinical features allows classification of the severity of the acute asthma episode as mild, moderate, severe or life threatening. Unfortunately this process is very subjective.5,6 In light of the lack of objective and standardised criteria for assessing asthma severity, a variety of scoring systems have been developed for evaluating the severity of acute asthma in children. Children’s Health Queensland (CHQ) consensus opinion is that the initial assessment of a child presenting with acute asthma should be guided by the modified version of the National Asthma Council Australia severity assessment criteria and the Australasian Triage Scale (ATS) displayed in Table 1.1,7

<table>
<thead>
<tr>
<th>Clinical Feature</th>
<th>MILD</th>
<th>MODERATE</th>
<th>SEVERE</th>
<th>LIFE-THREATENING</th>
</tr>
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<tbody>
<tr>
<td>Conscious state</td>
<td>Normal</td>
<td>Normal</td>
<td>Agitated</td>
<td>Exhaustion</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Restlessness</td>
<td>Confused</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Distressed</td>
<td>Altered level of consciousness</td>
</tr>
<tr>
<td>Accessory muscle use</td>
<td>None</td>
<td>Minimal</td>
<td>Moderate muscle use</td>
<td>Excessive muscle use</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nasal flaring</td>
<td>Nasal flaring</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tracheal tug</td>
<td>Tracheal tug</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hyperinflated chest</td>
<td>Hyperinflated chest</td>
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<tr>
<td>Respiratory rate</td>
<td>Normal to a mild increase in respiratory rate</td>
<td>Tachypnoea</td>
<td>Tachypnoea</td>
<td>Decreasing respiratory rate</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Dyspnoea</td>
<td>May only gasp occasionally</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Prolonged expiration</td>
<td></td>
</tr>
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ALERT Beware the silent chest

If the wheeze disappears in an asthmatic child, this is usually a sign of clinical improvement. However, in life-threatening asthma, it may herald an impending respiratory arrest, due to lack of ventilation.

Table 1: Initial assessment of acute asthma in children
Pulse rate

<table>
<thead>
<tr>
<th>Normal</th>
<th>Tachycardia</th>
<th>Tachycardia</th>
<th>Decreasing heart rate</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Pulse may be hard to feel</td>
<td></td>
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</table>

Pulsus paradoxus

<table>
<thead>
<tr>
<th>Not present</th>
<th>May be palpable</th>
<th>Palpable</th>
<th>Palpable</th>
</tr>
</thead>
</table>

Talks in

<table>
<thead>
<tr>
<th>Sentences</th>
<th>Phrases</th>
<th>1 – 2 word gasps</th>
<th>Unable to talk</th>
</tr>
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Central cyanosis

<table>
<thead>
<tr>
<th>None</th>
<th>None</th>
<th>Likely to be present</th>
<th>Present</th>
</tr>
</thead>
</table>

Wheeze intensity

<table>
<thead>
<tr>
<th>Variable</th>
<th>Moderate to loud</th>
<th>Often quiet</th>
<th>Often quiet (silent chest)</th>
</tr>
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SaO2 on presentation

<table>
<thead>
<tr>
<th>&gt; 94%</th>
<th>90 – 94%</th>
<th>&lt; 90%</th>
<th>&lt; 90%</th>
</tr>
</thead>
</table>

Adapted from: National Asthma Council Australia\(^1\) and Department of Health and Ageing, Australian Government\(^7\)

Investigations (such as chest x-ray, blood gas analysis and serum electrolytes) are not routinely required in a child with acute asthma, as they rarely provide any useful additional information.\(^3\) However, they may be considered in specific situations such as life-threatening asthma or the child with severe asthma not responding to treatment.\(^3\) **Frequent repeated clinical assessment is the best indicator to guide management.**

**Management**

The initial management of acute asthma in children continues to be based upon the use of inhaled beta\(_2\)-agonists (salbutamol) and steroids while maintaining adequate oxygenation.\(^3, 42\) Other useful adjuncts may include IV salbutamol, anticholinergics (ipratropium bromide), magnesium sulphate and IV aminophylline.\(^3, 42\)

**Metered dose inhalers with spacers versus nebulisers**

Salbutamol may be effectively administered by nebuliser or by metered dose inhaler (MDI) with a spacer device. To optimise drug delivery, new spacers should be primed with 10 puffs of salbutamol before use (to negate electrostatic charge).

The dose of salbutamol (inhaled) is 6 puffs for patients under 6 years of age or less than 20kg in weight. For children over 6 years of age, or more than 20 kgs, 12 puffs should be given, 100mcg salbutamol per puff. The MDI should be shaken before each puff. It should then be administered 1 puff at a time into the spacer with a face mask attached. The medication is cleared from the spacer by the child taking 5 breaths following each puff of medication.

Studies in paediatric populations have confirmed that metered dose inhalers with spacers are as effective as nebulisers in the treatment of acute asthma and may be a more cost effective and quicker means of delivery.\(^11-15\) This route should be encouraged as first line management in all instances except children requiring continuous delivery of salbutamol or oxygen therapy.

While the effectiveness of nebulisation is widely recognised, the method has several disadvantages. Studies have indicated that delivery of salbutamol by nebuliser results in greater facial and oropharyngeal deposition of medication delivering at best 10% of the prescribed drug to the lungs, with consequent systemic absorption and side effects such as tachycardia and tremor. Nebulisation of salbutamol requires a child to sit still for at least 10 minutes.\(^9, 10\)
Steroids—which route and which one?

Corticosteroids are used to treat the airway oedema and increased mucous production associated with the inflammation in acute asthma.16 Corticosteroid therapy is recommended for children assessed as having a moderate-to-severe acute asthma exacerbation, or if there is incomplete response to beta-agonists.17 It is suggested that the use of systemic corticosteroids in pre-school children, particularly those with intermittent viral induced wheezing, should be limited to those with at least moderate but generally severe acute wheeze requiring hospital admission.17 An initial dose of 2 mg/kg of prednisolone (maximum 50 mg) orally is recommended, followed by daily doses of 1mg/kg if required.17 A 3 day course is usually sufficient, but a more prolonged course may be indicated in severe episodes. Oral dexamethasone may be used as an alternative.18-20,42

In a Cochrane review, children administered corticosteroids within one hour of presentation to an emergency service with acute asthma were significantly less likely to be admitted.21 Oral corticosteroid treatment is particularly effective in children and has minimal side effects.21 Maximum benefit occurs within 4 to 6 hours after the administration of corticosteroids.

IV steroids may be indicated if oral therapy is poorly tolerated or in life-threatening asthma. Options include IV Hydrocortisone 4mg/kg every 6 hours (maximum 200mg) or methylprednisolone at an initial dose of 2 mg/kg (maximum 60 mg) and subsequent doses 1mg/kg every 6 hours on day 1, then every 12 hours on day 2, and then daily.17 42 While there is some evidence for the benefit of inhaled corticosteroids and leukotriene receptor antagonists in acute asthma, oral or intravenous corticosteroids remain the treatment of choice at present. 48

Ipratropium bromide (Atrovent)

Anticholinergics may be useful in combination with beta2-agonists in the early management of children presenting with moderate to severe acute asthma.1,8 The mechanism of action of anticholinergic bronchodilators remains unclear. However, it is thought that cholinergic pathways play an important role in the pathogenesis of asthma exacerbations.22 A number of studies show that combined ipratropium bromide and salbutamol therapy is superior to salbutamol therapy alone.23-26 There is good evidence to suggest that its use with salbutamol in the first 2 hours (ideally given with the first 3 doses) of treatment is safe, causing a significant improvement in the peak expiratory flow rate, and decreasing hospitalisation rates.27 The benefits of ipratropium bromide are more apparent in the more severe presentations or those that have not had a response to inhaled salbutamol alone.8

The recommended inhaled dose of ipratropium bromide is 20micrgrams per puff, <6years four puffs every 20minutes for 1st hour, >6 years 8 puffs for acute presentation.59 If given in nebulised form, for a severe attack, it can be given with salbutamol, every 20 minutes, up to three doses. The dose is 250microgram/1mL diluted in Normal Saline to total of 4 mL every 20minutes for first hour for severe attacks59.

Intravenous Salbutamol

Intravenous salbutamol should be considered for children who present with severe or life-threatening acute asthma and who do not respond appropriately to initial continuous doses of inhaled beta2-agonists. Near or complete airway obstruction may be present in life-threatening asthma and can prevent effective aerosolised bronchodilator therapy.28 Studies over the past decade trialling the use of IV salbutamol in the early management of life threatening asthma have all found benefits in its use.28-30 A single bolus of IV salbutamol administered over 10-20 minutes has been shown to shorten the duration of severe attacks, improve recovery time and reduce the overall requirements for inhaled salbutamol.28-30

There has been some recent conjecture regarding an appropriate dose of intravenous salbutamol for use in children with severe, acute asthma. Additionally, there are significant concerns that current intravenous salbutamol dosing recommendations for children may be excessive and may unnecessarily raise the potential for adverse reactions such as lactic acidosis and tachycardia, and through increasing respiratory workload, exacerbate respiratory fatigue.50
With regard to the IV salbutamol dose practice varies widely: some centres start at the lower end of the range and titrate according to response; others use a higher rate initially and reduce thereafter (e.g. 5 micrograms/kg/minute for the first hour, then 1–2 micrograms/kg/minute until symptoms improve).52, 55, 56
This CHQ guideline recommends the latter approach. Regardless of the chosen dose regime the child should be closely observed and monitored for signs of salbutamol toxicity (extreme tachycardia, lactic acidosis, hypertension, hypokalaemia). If there are significant concerns regarding toxicity, the infusion should be slowed down or ceased. The clinical response to this initial dose should be evaluated and the requirement for progression to a continuous intravenous salbutamol infusion considered at a rate of 1 to 5 microgram/kg/min. All children requiring treatment with IV salbutamol should be discussed with Paediatric Intensive Care Unit (PICU) or Retrieval Services Queensland (RSQ).

**Magnesium sulphate**

Intravenous magnesium sulphate is a safe and effective treatment for children with severe acute asthma not responding to conventional therapy. Magnesium sulphate should be considered in severe asthma not responsive to bronchodilators used in the first hour. 47 A meta-analysis on the use of IV magnesium sulphate for treating acute asthma in children in the emergency service showed additional benefits in moderate to severe asthma, both in terms of pulmonary function tests and rates of hospitalisation.32

The action of magnesium sulphate remains unclear. However, it is thought that magnesium ions decrease the uptake of calcium by bronchial smooth muscle cells, which leads to bronchodilation.31,32 Magnesium may also have a role in inhibiting mast cell degranulation, which reduces inflammatory mediators.31,32 The standard dose of magnesium sulphate is 0.2 mmol/kg (equivalent to 50 mg/kg) with a maximum dose of 8 mmol. The calculated dose should be infused over 20 minutes.17 The dose should be charted in mmol and administered using safety software syringe drivers with a standard concentration of 25 mmol of magnesium sulphate in 50mL of 0.9% sodium chloride. Children requiring repeat doses should be discussed with PICU or RSQ.

This guideline advocates prescribing MgSO4 in mmols, rather than grams to ensure safe practice.

e.g. If patient weighs 10 kg: 0.2mmol x 10 = 2 mmols MGSO4, dilute in Normal Saline to 4 mLs e.g 0.5mmol/mL infused over 10 to 20 mins via a syringe driver, using the IV medication safety software

Magnesium therapy is usually well tolerated with only minor side effects reported, such as epigastric or facial warmth, flushing, pain or numbness at the infusion site, dry mouth and malaise.33 However allergic reactions, respiratory depression, hypotension and circulatory collapse can rarely occur. When giving repeated doses, knee reflexes should be monitored between each dose as loss of reflexes can occur in magnesium toxicity. If reflexes are absent discontinue magnesium as use of the drug beyond this point risks respiratory failure.

There has been some recent interest in the role of nebulised magnesium sulphate. Currently, no good evidence exists that inhaled magnesium sulphate can be used as an alternative to inhaled beta2-agonists. 46, 47 Given that a preservative free preparation of magnesium sulphate suitable for nebuliser therapy is currently unavailable in Queensland, use of magnesium sulphate via a nebuliser is not recommended.

**Aminophylline**

Traditionally, IV aminophylline has been used in PICU to manage children with severe asthma unresponsive to maximum doses of bronchodilators and steroids. Aminophylline improves lung function within 6 hours of administration and is associated with fewer respiratory arrests compared to placebo.47, 48

**ALERT:** Magnesium Sulphate

Patients being administered IV magnesium sulphate require full cardiac monitoring. Heart rate, blood pressure and respiratory rate should be recorded at least every 5 minutes during the infusion. If hypotension persists—cease infusion. Magnesium should be prescribed in mmols and administered using safety software syringe drivers to avoid medication errors.

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stay.\textsuperscript{34} It is also associated with numerous side effects including vomiting.\textsuperscript{8} A loading dose of 10mg/kg (maximum dose 500mg) over 60 minutes should be given. Aminophylline should not be given as an intravenous infusion in the patient already taking oral theophylline. Due to limited evidence, consensus opinion is that IV aminophylline should NOT be administered in the emergency service without first referring the child and sourcing advice from RSQ and/or a PICU service.

**Non invasive ventilation (NIV) & high flow nasal cannula (HFNC) oxygen**

For children with acute respiratory insufficiency due to asthma who have not responded to standard medical therapies, NIV and HFNC oxygen are usually well tolerated and early use may prevent the requirement for intubation and mechanical ventilation.\textsuperscript{35,51} If there is inability to maintain SaO$_2$ $\geq$ 93% despite oxygen via a Hudson mask with reservoir, or the child has deteriorating work of breathing with increasing fatigue, tachycardia, and tachypnoea modalities such as HFNC oxygen, CPAP or BiPAP should be considered. Children who are candidates for NIV should have a normal level of consciousness. In children with a deteriorating level of consciousness, who may require intubation and ventilation, HFNC oxygen may be valuable to provide pre-oxygenation whilst preparation for the intubation is underway.\textsuperscript{52} Mechanical ventilation of intubated asthmatics can be very difficult and should only be undertaken following advice from PICU/RSQ.

Commencement of NIV and HFNC is guided by CHQ NIV and HFNC oxygen protocols, and should involve liaison with a Level 6 PICU.\textsuperscript{41,43} The child should be nursed as an appropriate (1:1 or 1:2) nurse to patient ratio, in an acute area such as a resuscitation room with continuous oximetry and ECG monitoring. Vascular access must be secured and the child must remain nil by mouth with consideration given to the placement of a nasogastric tube to prevent gastric insufflation.

See flowchart Appendix 1—Management of acute asthma in children.

**Disposition**

An acute presentation with asthma provides an opportunity for multidisciplinary staff to optimise the patient’s long-term management. Consideration should be given to the potential need for a preventer medication, compliance with treatment, and the need for an updated asthma action plan and education.\textsuperscript{36} Prior to discharge from the emergency service the child should meet certain discharge criteria and have relevant discharge plans completed.\textsuperscript{36-39} If the child is not suitable for discharge, admission to the children’s inpatient services is required.

See flowchart Appendix 2—Admission/discharge criteria for children presenting with acute asthma.\textsuperscript{49} When a decision is made to transfer a child to a Level 6 facility, referral must be made through RSQ.\textsuperscript{40} Activation of the QLD emergency medical system coordination centre (QCC)

Further information on the preparation of a infant prior to transport can be obtained through RSQ Clinical Guidelines paediatric section (page 31-35).\textsuperscript{40}

Statewide RSQ clinical guidelines—Paediatrics

**Supporting Documents**

- Acute asthma flow chart
- Admission/discharge criteria for children with acute asthma
- Asthma in children fact sheet
Consultation

Key stakeholders who reviewed version 1.1 were:
- Director of Paediatric Emergency Medicine, Children’s Health Services
- Clinicians (medical, nursing, allied health) working within Level 4, Level 5 and Level 6 Children’s Health and Metro Children's Health Services in emergency, inpatient and ambulatory services
- Children’s Health Services District clinical leaders — medical, nursing and allied health
- District Chief Executive Officers — Children’s Health Services, Metro South, Metro North and West-Moreton Health Service Districts
- Queensland Health Services — Manager Clinical Standards.

Key stakeholders who reviewed this version (1.3) were:
- Director of Paediatric Emergency Medicine, Children’s Health Services
- Clinicians (medical, nursing, allied health) – Emergency, Respiratory and Paediatric Intensive Care and Pharmacy Departments working within Lady Cilento Children's Hospital, Brisbane

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- Dr John Gavranich—Director of Paediatrics, Ipswich Hospital
- Dr Sharon Anne McAuley —Staff Specialist, Emergency Services, Lady Cilento Children's Hospital
- Dr Katie Tinning - Staff Specialist, Emergency Services, Lady Cilento Children’s Hospital
- Dr Michelle Davison—Staff Specialist, Emergency Services, The Prince Charles Hospital
- Shahn Horrocks—Nurse Practitioner, Emergency Services, Gold Coast and Logan Hospitals
- Andrea Hetherington—Clinical Nurse Consultant (Paediatrics) Emergency Services, Logan Hospital
- Elizabeth Ruddy—Associate Nurse Unit Manager, Patient Flow and Safety Unit, Lady Cilento Children's Hospital.
- Michele Cree – Pharmacist Critical Care Lead, Lady Cilento Children’s Hospital

Definition of terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>BiPAP</td>
<td>Bi-level positive airway pressure</td>
</tr>
<tr>
<td>Children</td>
<td>0-14 years of age</td>
</tr>
<tr>
<td>CHS</td>
<td>Children’s Health Services</td>
</tr>
<tr>
<td>CPAP</td>
<td>Continuous positive airway pressure</td>
</tr>
<tr>
<td>CRP</td>
<td>C-reactive protein</td>
</tr>
<tr>
<td>CXR</td>
<td>Chest x-ray</td>
</tr>
<tr>
<td>FBC</td>
<td>Full blood count</td>
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<tr>
<td>HR</td>
<td>Heart rate</td>
</tr>
<tr>
<td>INH</td>
<td>Inhaler</td>
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<tr>
<td>IV</td>
<td>Intravenous</td>
</tr>
<tr>
<td>Acronym</td>
<td>Definition</td>
</tr>
<tr>
<td>---------</td>
<td>------------</td>
</tr>
<tr>
<td>MDI</td>
<td>Metered dose inhaler</td>
</tr>
<tr>
<td>NaCl</td>
<td>Sodium chloride</td>
</tr>
<tr>
<td>NBM</td>
<td>Nil by mouth</td>
</tr>
<tr>
<td>NEB</td>
<td>Nebuliser</td>
</tr>
<tr>
<td>NIV</td>
<td>Non-invasive ventilation</td>
</tr>
<tr>
<td>PICU</td>
<td>Paediatric Intensive Care Unit</td>
</tr>
<tr>
<td>PO</td>
<td>Orally</td>
</tr>
<tr>
<td>RR</td>
<td>Respiratory rate</td>
</tr>
<tr>
<td>RSQ</td>
<td>Retrieval Services Queensland</td>
</tr>
<tr>
<td>SaO2</td>
<td>Oxygen saturations</td>
</tr>
<tr>
<td>U&amp;E's</td>
<td>Urea and electrolytes (serum electrolyte analysis)</td>
</tr>
<tr>
<td>VBG</td>
<td>Venous blood gas</td>
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References and suggested reading


41. Children Services Capability Framework 3.1,
43. BTS/SIGN British Guidelines on the management of asthma. Oct 2014


Guideline revision and approval history

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<thead>
<tr>
<th>Version No.</th>
<th>Modified by</th>
<th>Amendments authorised by</th>
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Keywords
- Asthma, Wheeze, Emergency, 00700

Accreditation references
- NSQHS Standard: 4, 12
Appendix 1: Emergency Management of Children with Acute Asthma

A child presents to the emergency service with clinical features suggesting acute asthma

Assess Severity
Consider pre-hospital management given

Initial Severity
MILD - Salbutamol (INH) - Consider steroids (PO) if prolonged episode or history of severe episodes

Moderate - Oxygen to maintain SaO2 >92% - Salbutamol burst therapy -INH or NEB with 3 x q20 min doses - Steroids (PO)

Severe - Notify ED Consultant - Oxygen - Salbutamol continuous (NEB) - Steroids (PO or IV) - Ipratropium (NEB) - Monitor SaO2

LIFE THREATENING (Resuscitate using ABCD)
Call ED Consultant
Treatment:
- Oxygen
- Salbutamol continuous (NEB)
- Magnesium (IV)
- Steroids (IV)
- Ipratropium (NEB)

Monitor - SpO2, ECG, HR, RR investigations
- U&L, Mg, BNP, CRP blood cultures CXR
- Other options - Salbutamol IV bolus/infusion
- Magnesium (IV)
- Aminophylline (IV)
- Consider NN (NHIC, CPAP or BIPAP) or intubation & ventilation

Continuous review improving?
- Contact ED Consultant - Taper salbutamol q60 min

Arrange Admission - Contact paediatric inpatient team

Salbutamol (INH) <20kg < 6 years 6 puffs (600 mcg) via MDI and spacer or 2.5mg nebulised
Salbutamol burst therapy (INH) >20kg > 6 years 12 puffs (1200 mcg) via MDI and spacer or 5mg nebulised

Salbutamol continuous (NEB) 4 mL load into neb then 20mL/hr or neat salbutamol nebuliser solution (5mg/mL)

Steroids (PO) Prednisolone 1-2 mg/kg/day (2mg/kg 1st dose) for 3 days
Steroids (IV) Methylprednisolone 1 mg/kg q 6-8hr or Hydrocortisone 4 mg/kg q 4-5hr
Ipratropium (NEB) <20 kg 250 mcg q20 mins x 3 via nebuliser then 2 puffs (40mcg) q6h
>20 kg 500 mcg q20 mins x 3 via nebuliser then 4 puffs (80mcg) q6h
Magnesium Sulphate (IV) Bolus 0.2 mmol/kg (maximum dose of 8 mmol)

NB: Maximum dose/kg calculated on maximum of 40kg

Discharge to Home
- Ensure meets discharge criteria
- Self-administer as required
- Provide parents/care with discharge information
- Suggest review by GP in 2-3 days

Transfer to Level 6 paediatric service Contact RIG 1300 799 127
Arrange transfer to PICU Contact PICU Team

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Appendix 2 : Admission and discharge criteria for children with acute asthma

Criteria for discharge from the emergency service

Criteria for discharging a child with acute asthma from the emergency service includes:
- maintaining SaO₂ of ≥ 93% in room air
- not tachypnoeic
- no or mild work of breathing only
- good air entry with minimal wheeze
- clinically stable on 3rd hourly bronchodilator
- provide individualised asthma action plan
- provide discharge script for prednisolone
- follow up care arranged - in most cases it is appropriate for the child to be reviewed by their local General Practitioner within the next 2-3 days
- parent information sheet given and discussed.

When discharging a child with acute asthma, their social circumstances should be considered and appropriately addressed after the initial assessment and observation period:
- time of day
- parents/carers comprehension and compliance
- access to transport should return be required
- distance to local hospital.

Criteria for admission to children’s inpatient service

Criteria for admission to the children’s inpatient service for a child with acute asthma includes:
- does not meet discharge criteria
- SaO₂ < 93% in room air, therefore requiring supplemental oxygen.

Criteria for admission to a Level 6 emergency or PICU service

Consultation with the paediatric specialty team in the current facility and/or discussion with a Level 6 children’s health service via Retrieval Services Queensland (RSQ) is required when:
- severe asthma not responding to treatment or life-threatening asthma
- requirement for respiratory support (high flow oxygen, BiPap, intubation and ventilation) as indicated by failure to maintain saturations despite supplemental oxygen, or severe respiratory distress
- signs of progressive fatigue.