

INTRODUCTION

Asthma is one of the commonest of all medical conditions requiring hospitalisation in children and a significant number of children will die of asthma each year. These guidelines are concerned with an acute asthma attack.

HISTORY

The patient may have a history of increased wheezing or breathlessness, often worse late at night or early in the morning, associated with allergy, infection or exertion as a trigger.

Upper respiratory tract infections often also trigger asthma attacks in children. The child may be known to have asthma and may be on regular medications (usually inhalers: a “preventer” and /or “reliever”) and sometimes montelukast (Singulair).

An asthma “plan” may be available, these are formed by the Doctor and patient/parent to control daily symptoms as well as exacerbations.

Most younger children have their medications delivered by a spacing device, they come in various shapes and sizes.

A few children will have home nebulisers.

Children who have been previously admitted to hospital, particularly intensive care, are at risk of developing severe or life threatening symptoms again and a history of this should be sought. There is an increased risk of death in this group.

If a child is suffering from a first episode of “asthma”, an inhaled object should be considered as part of the differential diagnosis, particularly if wheezing is unilateral. It will not, however, cause problems if the child who has inhaled a foreign body is treated for asthma.

ASSESSMENT

Primary Survey

This should be undertaken as part of the routine assessment of recognition of the seriously ill child (**refer to recognition of the seriously ill child guideline**). Remember to exclude the presence of pneumothorax – **this is a rare complication of asthma**.

Respiratory Examination

Refer to recognition of the seriously ill child for details of examination of the respiratory system under “Breathing”.

Asthma usually presents to the Ambulance Service in one of two forms (**see Table 1**):

1. Life Threatening	2. Acute Severe
• SpO₂ <85% in air • silent chest • poor respiratory effort • altered consciousness • cyanosis • peak flow <33% of predicted (if attempted – not usually appropriate).	• oxygen saturations (SpO₂) less than 92% in air • too breathless to talk or feed • heart rate > 130 (2-5 years), >120 (5-18 years) (NOTE: salbutamol causes tachycardia – this is NOT included in this definition) • respiratory rate >50 breaths per minute (2-5 years), >30 breaths per minute (5-18 years) • use of accessory muscles/marked respiratory distress • peak flow (if done) 33% – 50% predicted (may be too difficult for some children when ill).

MANAGEMENT¹

General:

Start correcting:

- **AIRWAY**
- **BREATHING**
- **CIRCULATION**
- administer high concentration oxygen (O₂) (**refer to oxygen protocol for administration and information**) via a non-re-breathing mask, using the stoma in laryngectomee and other neck breathing patients. High concentration O₂ should be administered routinely, whatever the oxygen saturation.
- transport without delay to hospital.
- check peak flow if practical (take the best of three readings); this is often impractical in children during an attack and should not be pursued if it causes distress or worsening of the condition.

- administer **salbutamol²** (*refer to salbutamol protocol for dosages and information*) via an oxygen driven nebuliser, running at 6 – 8 litres per minute. Consider adding **ipratropium bromide** (*refer to ipratropium bromide protocol for dosages and information*) to the salbutamol if symptoms life threatening
- if the child becomes exhausted, bag-valve-mask ventilation will be necessary and in-line nebulisation using a **T-piece** should be used if available
- pulse oximetry is essential and ECG monitoring useful. Regular observation must be documented
- if there is no improvement after 5–10 minutes after the initial nebuliser, give a further dose of nebulised salbutamol (*refer to salbutamol protocol for dosages and information*). Ipratropium bromide (*refer to ipratropium bromide protocol for dosages and information*) should be administered at this time if it has not been given during the first nebuliser
- repeat or continuous nebulised salbutamol can be given until arrival at hospital. In children under the age of one year, salbutamol should only be repeated if there has been a positive response to the first dose. Ipratropium should be tried if salbutamol does not work – it is often more effective in very young children
- consider administering **hydrocortisone IV** (*refer to hydrocortisone protocol for dosages and information*) if there is a delay getting to hospital (30 minutes or more), but not if it will compromise other therapy or monitoring. Steroids take time to take effect, so this may help the course of the illness most in hospital.

NOTE: Advice from paediatric respiratory consultants regarding the use of parenteral (subcutaneous or intramuscular) adrenaline is that it is **NOT** recommended in children.

Provide a hospital alert message if the asthma is severe or life threatening.

Take a peak flow reading **AFTER** treatment if possible to confirm improvement.

Complete the patient clinical record form.

Special Cases

In children under the age of one year, salbutamol should only be repeated if there has been a positive response to the first dose. Ipratropium is given up to every two hours in children. Given travelling times this is likely to make Ipratropium a single dose drug.

Further Care

Remember the need to support the parents/guardians/carers of affected children.

Be clear with instructions and answers to both children and parents.

AT HOSPITAL

Give clear and concise details about the patient and any treatment given.

Handover a completed Patient Clinical Record.

Key Points – Paediatric Asthma

- Asthmatic children require high concentration oxygen therapy.
- Assessment of severity is important.
- Mainstay of treatment is nebulised salbutamol.
- Ipratropium should be used in severe cases.
- There is no place for parenteral epinephrine in treating asthma in children.

REFERENCES

- ¹ British Thoracic Society, Scottish Intercollegiate Guidelines Network. The BTS/SIGN British Guideline on the Management of Asthma. *Thorax* 2003;58(Supplement I):i1-i94.
- ² Becker AB, Nelson NA, Simons FE. Inhaled salbutamol (albuterol) vs injected epinephrine in the treatment of acute asthma in children. *Journal of Pediatrics* 1983;102:465-9.

METHODOLOGY

Refer to methodology section.