

Asthma (Children) [60, 249, 314, 324, 485]

1. Introduction

- Asthma is one of the commonest medical conditions requiring hospitalisation.
- The severity of asthma may be subdivided into mild/moderate, severe, or life-threatening (Table 3.77).
- There may be a history of increasing wheeze or breathlessness (often worse at night or early in the morning). Respiratory infections, allergy and physical exertion are common triggers.

Known asthmatics will be on regular medication, taking inhalers ('preventers' and/or 'relievers') and sometimes oral medications such as Montelukast (Singulair®) and theophyllines.

- Some children with asthma will have an individualised treatment plan with detailed information regarding their daily symptom control as well as what to do in an acute exacerbation.
- **Inhaled foreign body:** Consider an inhaled foreign body in a child experiencing their first wheezy episode, especially if there is a history of playing with small toys and the wheeze was of sudden onset and is unilateral. These children must be transferred for medical assessment. If they are unwell during transport, bronchodilators may provide some clinical benefit.

2. Severity and Outcome

- Children with previous hospital admissions (particularly intensive care admissions), are at risk of future severe or life-threatening episodes (and even death) – so this information should be sought.

Table 3.76 – RISK FACTORS FOR SEVERE ASTHMA

Risk Factors

- Previous severe or life-threatening episodes.
- Previous hospital admission for asthma especially if in the last year.
- Previous admission requiring intensive care.
- Back to back nebulisers with poor or no response.

3. Pathophysiology

- Asthma causes chronic bronchial inflammation which results in narrowing of the airways. In acute attacks, airway irritation causes smooth muscle contraction producing respiratory compromise. Inflammatory processes also cause i) excessive sputum production and ii) swelling of the bronchial mucosal which blocks the small airways.
- Inspiration (an active process) generates sufficient pressures to overcome airway narrowing but during expiration (a passive process) relaxation of the respiratory muscles causes airway narrowing, producing the characteristic wheeze.
- Various medications are used to treat asthma. In children, these are typically delivered using a spacer

device e.g. a Volumatic® or Aerochamber®. Some children may also have a home nebuliser.

4. Assessment

Following an ABC assessment, the severity of the asthma attack should be established (refer to Table 3.77 and Asthma Algorithm – Figure 3.18).

Table 3.77 – FEATURES OF SEVERITY

Life-threatening asthma

- Silent chest.
- $\text{SpO}_2 < 92\%$.
- Cyanosis $\text{PEFR} < 33\%$ best or predicted.
- Poor respiratory effort.
- Hypotension.
- Exhaustion.
- Confusion.

Acute severe asthma

- Can't complete sentences in one breath or too breathless to talk or feed.
- $\text{SpO}_2 < 92\%$.
- $\text{PEFR} 33-50\%$ best or predicted.
- Pulse:
 - >140 in children aged 2–5 years
 - >125 in children aged >5 years.
- Respiration:
 - >40 breaths/min aged 2–5 years
 - >30 breaths/min aged >5 years.

Moderate asthma exacerbation

- Able to talk in sentences.
- $\text{SpO}_2 \geq 92\%$.
- $\text{PEFR} \geq 50\%$ best or predicted.
- Heart rate:
 - $\leq 140/\text{min}$ in children aged 2–5 years
 - $\leq 125/\text{min}$ in children >5 years.
- Respiratory rate:
 - $\leq 40/\text{min}$ in children aged 2–5 years
 - $\leq 30/\text{min}$ in children >5 years.

5. Management

The Asthma Algorithm (Figure 3.18) describes the management of mild/moderate, severe and life-threatening asthma. Adrenaline and hydrocortisone are now included in the management of severe/life threatening asthma in children.

Always ask if the child has an individualised asthma treatment plan and follow it, unless clinical circumstances dictate otherwise.

For some children alternative care pathways will already have been created e.g. early referral to their GP. It is well recognised however that children with apparently minor symptoms can subsequently deteriorate and practitioners should therefore have a low threshold for onward referral (especially where an alternative pathway has not already been established).

Peak Expiratory Flow Rate Measurements (PEFR): PEFR should be attempted where possible in children before and after nebulised therapy in mild to moderate asthma. However, care should be taken in severe life-threatening attacks as it could exacerbate the attack and the patient may deteriorate. Predicted PEFR are listed in Table 3.78.