

Referral Support Service

Paediatrics

PA22 Acute Asthma in Children Aged 5 and over

Definition

Acute asthma is the progressive worsening of asthma symptoms, including breathlessness, wheeze, cough and chest tightness.

Exclude Red Flag Symptoms

- SpO₂ <92%, cyanosis
- Bradycardia <100 bpm
- Apnoea
- Marked sternal recession
- Persistent or worsening shortness of breath
- Inability to speak in full sentences/too breathless to feed
- May complain that the chest feels 'closed'
- Poor air entry
- Agitation, confusion and inability to concentrate

Paediatric Normal Values (adapted from APLS)			
Age	Resp Rate	Heart Rate	Systolic BP
Neonate <4w	40-60	120-160	>60
Infant <1 y	30-40	110-160	70-90
Toddler 1-2 yrs	25-35	100-150	75-95
2-5 yrs	25-30	95-140	85-100

Low Threshold for Admission

- Extreme low birth weight
- Prolonged NICU/SCBU
- Congenital heart disease
- Significant co-morbidity
- Reduced feeding <50%
- Previous severe episode
- Attack in late afternoon, at night
- or early in the morning
- Poor mental health or psychosocial stressors
- Recent hospital admission
- Already taking oral steroids or high doses of inhaled steroids
- Food allergy

General Points

- Acute wheeze is one of the most common reasons for emergency department attendance and hospital admission in children
- Triggers can include viral infections, dust, smoke, fumes, changes in the weather, grass and tree pollen, animal fur and feathers, strong soap and perfume
- Each year, there are still a small proportion of avoidable deaths in children and young people resulting from asthma

Differential Diagnoses

It is important to differentiate between viral induced wheeze, other causes of wheeze and asthma.

- **Pneumonia:** pyrexia >38.5°C, productive cough, asymmetry on auscultation
- **Epiglottitis:** dysphagia, drooling
- **Croup:** inspiratory stridor
- **Hyperventilation:** breathlessness with light headedness and peripheral tingling
- **Foreign body:** localized wheeze and reduced air entry
- **GORD:** excessive vomiting
- **Anaphylaxis**

Assessment

Acute Asthma: Traffic light system for children			
	Green – Moderate	Amber – Severe	Red – Life Threatening
Activity	<ul style="list-style-type: none"> Alert Normal 	<ul style="list-style-type: none"> Altered response to social cues No smile Reduced activity Irritable 	<ul style="list-style-type: none"> Unable to rouse or if roused does not stay awake Weak, high pitched or continuous cry Appears ill
Skin	<ul style="list-style-type: none"> Normal skin colour 	<ul style="list-style-type: none"> Normal skin colour Pallor reported by parent/carer Cool peripheries 	<ul style="list-style-type: none"> Pale, mottled, ashen Cold extremities
Respiratory distress	<ul style="list-style-type: none"> No respiratory distress 	<ul style="list-style-type: none"> Tachypnoea Moderate recessions 	<ul style="list-style-type: none"> Significant respiratory distress Grunting Apnoeas Nasal flaring Severe recessions
Verbal	<ul style="list-style-type: none"> Able to talk in full sentences 	<ul style="list-style-type: none"> Unable to complete a sentence in one breath Too breathless to talk or feed 	<ul style="list-style-type: none"> No able to talk Not responding Confusion Agitation
Respiratory rate	<ul style="list-style-type: none"> 1-5y: ≤ 40 breaths/min >5y: ≤ 30 breaths/min 	<ul style="list-style-type: none"> 1-5y: 40-60 breaths/min >5y: > 30 breaths/min Use of accessory muscles 	<ul style="list-style-type: none"> All ages: >60 breaths/min Cyanosis Poor respiratory effort Exhaustion
Auscultation	<ul style="list-style-type: none"> Good air entry Mild-moderate wheeze 	<ul style="list-style-type: none"> Decreased air entry with marked wheeze 	<ul style="list-style-type: none"> Silent chest
O ₂ Sats in air	<ul style="list-style-type: none"> $\geq 95\%$ 	<ul style="list-style-type: none"> 92-94% 	<ul style="list-style-type: none"> ≤ 92
PEFR	<ul style="list-style-type: none"> $> 50\%$ best or predicted 	<ul style="list-style-type: none"> 33-50% best or predicted 	<ul style="list-style-type: none"> $<33\%$ best or predicted
Hydration	<ul style="list-style-type: none"> CRT <2 secs Tolerating 75% of fluid Moist mucous membranes Occasional cough induced vomiting 	<ul style="list-style-type: none"> 50-75% fluid intake over 3-4 feeds Cough induced vomiting Reduced urine output 	<ul style="list-style-type: none"> $< 50\%$ fluid intake over 2-3 feeds Significantly reduced urine output
Circulation	<ul style="list-style-type: none"> 2-5y: ≤ 140 bpm >5y: ≤ 125 bpm 	<ul style="list-style-type: none"> 2-5y: >140 bpm >5y: > 125 bpm 	<ul style="list-style-type: none"> Hypotension

Moderate	Severe / Life Threatening
<ul style="list-style-type: none"> Give 2-10 puffs of salbutamol via spacer \pm facemask (given 1 puff at a time, inhaled separately) Reassess 15-30 minutes post intervention Consider prednisolone 1-2mg/kg once daily for 3 days 	<ul style="list-style-type: none"> Immediate assessment by a doctor Refer to hospital ED resus urgently via ambulance (999) High flow oxygen via face mask to achieve SpO₂ $>94\%$ Give 10 puffs of salbutamol via face mask or via O₂-driver nebuliser If poor response add nebulised ipratropium bromide Continue with further doses of bronchodilator while awaiting transfer

Good Response	Poor Response
<ul style="list-style-type: none"> Send home with personalised patient action plan Check inhaler technique Continue salbutamol 2-4 puffs, 4 hourly for 24 hours, then PRN Arrange follow-up in 2-4 weeks with practice nurse 	<ul style="list-style-type: none"> Consider hospital admissions/999 If clinical concern discuss with paediatrician on-call If SpO₂ $<94\%$ give O₂ Consider further dose of salbutamol while awaiting transfer If poor response add nebulised ipratropium bromide

Acute Management

Acute Asthma Drug Doses	
Prednisolone (oral)	<2y: 10mg 2-5y: 20mg 5-7y: 30-40mg >7y: 40mg (1-2mg/kg per dose)
Salbutamol (nebs)	2-5y: 2.5mg >5y: 5mg
Ipratropium Bromide (nebs)	2-11y: 250 micrograms 12-17y 500 micrograms

Prednisolone

- Three days is usually sufficient, but tailor length to response
- Those already receiving maintenance steroid tablets should receive prednisolone 2mg/kg (max 60mg)
- Tapering unnecessary unless course exceeds 14 days

Indicators for Nebulised Bronchodilators

- SpO₂ <94%
- Unable to use inhaler and spacer
- Severe respiratory distress

Patient information leaflets/ PDAs

Patient.info/chest-lungs/asthma-leaflet
Oxfordhealth.nhs.uk/Asthma-advice-for-children.pdf

Personalised Patient Action Plan

Child Asthma.org.uk/globalassets/health-advice/resources/children/my-asthma-plan
Young Person Asthma.org.uk/globalassets/health-advice/resources/adults/asthma-action-plan

References

- National Institute for Clinical Excellence [NICE] (2020) [*Asthma: Diagnosis, monitoring and chronic asthma management*](#) [Viewed 16 Aug 2021]
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- National Institute for Clinical Excellence [NICE] (2021) [*Asthma – Clinical Knowledge Summaries*](#). [Viewed 16 Aug 2021]

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