

Referral Support Service

Paediatrics

PA04 Croup

Definition

A common cause of upper airway obstruction in children as a result of oedema of the larynx and trachea triggered by a recent viral infection.

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

It is characterized by hoarseness, barking cough, inspiratory stridor and variable respiratory distress.

Exclude Red Flag Symptoms

- Stridor at rest
- Difficulty breathing/suprasternal recession
- Pallor or cyanosis
- Severe coughing spells
- Drooling or difficulty swallowing
- Fatigue
- Prolonged symptoms (longer than 7 days)

Low Threshold for Admission

- Has a history of severe obstruction, or previous severe croup
- Known structural upper airways abnormalities, e.g. laryngomalacia, tracheomalacia, vascular ring, Down's syndrome
- Age < 6 months
- Immunodeficiency
- Inadequate fluid intake, or refusing fluids
- Poor response to initial treatment
- Uncertain diagnosis
- Late evening or night-time presentation
- Long distance from hospital setting

General Points

- Parainfluenza virus type 1 is the most common cause
- Usually occurs from 6 months to 6 years
- Affects about 3% of children per year
- In the UK, hospital admissions usually peak in September to December
- Symptoms are typically worse at night
- Most patients can be safely managed in the community, but up to 30% require

hospitalization, of these less than 2% require intubation

- Symptoms are usually at their worst during the first 24 hours
- Symptoms typically resolves within 48 hours, but some symptoms can last up to 2 weeks

Differential Diagnoses

About one in five children presenting with acute stridor do not have croup, it is important to consider alternative diagnoses.

	Croup	Tracheitis	Epiglottitis	Foreign body	Angioedema
Aetiology	Parainfluenza, adenovirus, influenza	Staph aureus	Hib -check vaccine record	Foreign body	Allergic, hereditary, unknown
Age	6m-6y	Any age	2-6y	Any age	Any age
Onset	Abrupt onset	Gradual onset	Very sudden onset	Sudden onset	Sudden onset
Pyrexia	Mild pyrexia	T > 38 °C	T > 38 °C	Apyrexial	Apyrexial
Clinical Features	<ul style="list-style-type: none"> • Barking cough • Stridor 	<ul style="list-style-type: none"> • Barking cough • Stridor • Not responding to croup treatment 	<ul style="list-style-type: none"> • Looks toxic • Drooling • Agitated 	<ul style="list-style-type: none"> • Choking • Stridor • Well child 	<ul style="list-style-type: none"> • Face and tongue swelling • Often with urticaria and wheeze

N.B. Croup may present with other coincidental diagnosis, e.g. asthma, pneumonia, otitis media

Assessment

The child should be assessed where they are most settled (e.g. on parent's lap). Assess the clinical severity of the airway obstruction (not the loudness of the stridor) using the Westley Croup Score. The scores are a guide only and should be superseded by clinical judgement (especially if the child is tiring)

**Avoid upsetting the child unnecessarily.
DO NOT EXAMINE THE THROAT.**

Assessment

Traffic light system for identifying severity of illness			
	Green – Low Risk	Amber – Intermediate Risk	Red – High Risk
Activity	<ul style="list-style-type: none"> • Responds normally to social cues • Content/smiles • Stays awake/awakens quickly • Strong normal cry 	<ul style="list-style-type: none"> • Altered response to social cues • No smile • Reduced activity • Parental anxiety 	<ul style="list-style-type: none"> • Not responding normally or no response to social cues • 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 • CRT >3 secs
Respiratory	<ul style="list-style-type: none"> • No respiratory distress 	<ul style="list-style-type: none"> • Tachypnoea 	<ul style="list-style-type: none"> • Significant respiratory distress • Grunting • Apnoeas
Respiratory rate	<ul style="list-style-type: none"> • <12m: <50 breaths/min • >12m: <40 breaths/min 	<ul style="list-style-type: none"> • <12m: 50-60 breaths/min • 1-5y: 40-60 breaths/min 	<ul style="list-style-type: none"> • All ages:>60 breaths/min
Cough	<ul style="list-style-type: none"> • Occasional barking cough. No stridor at rest 	<ul style="list-style-type: none"> • Stridor when distressed with barking cough 	<ul style="list-style-type: none"> • Stridor at rest with barking cough
O₂ Sats in air	<ul style="list-style-type: none"> • ≥ 95% 	<ul style="list-style-type: none"> • 92-94% 	<ul style="list-style-type: none"> • ≤ 92%
Chest recessions	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Moderate 	<ul style="list-style-type: none"> • Severe
Nasal flaring	<ul style="list-style-type: none"> • Absent 	<ul style="list-style-type: none"> • May be present 	<ul style="list-style-type: none"> • Present
Circulation	<ul style="list-style-type: none"> • Tolerating 75% of fluid • Occasional cough induced vomit 	<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% or less fluid intake over 2-3 feeds • Cough induced vomiting frequently • Significantly reduced urine output
	All green	Any amber and no red	If any red
	<ul style="list-style-type: none"> • Can be managed at home • Consider giving one dose of dexamethasone 150 micrograms/kg orally • Prednisolone (1-2mg/kg) is an alternative • Give croup advice leaflet 	<ul style="list-style-type: none"> • Give one dose of dexamethasone 150 micrograms/kg orally • Prednisolone (1-2mg/kg) is an alternative • If you feel the child is ill, needs O₂ support or will not maintain hydration discuss with paediatrician on-call 	<ul style="list-style-type: none"> • Refer immediately to emergency care – consider 999 • Bleep paediatrician on-call • Consider appropriate means of transport • If appropriate commence relevant treatment to stabilise child for transfer • Consider starting high flow oxygen support

Measuring O₂ Saturations

- A saturation probe needs to cover a child's finger or toe with a good seal
- If there is a large gap it will underestimate the child's saturations
- An adult probe on the big toe of a child could be used in a child 5 years or over
- Use a paediatric probe in children under 2 years

**DO NOT be falsely reassured by normal O₂ Saturations.
Hypoxaemia is a severe/critical feature of upper airway obstruction**

Management

- Provide a calm reassuring atmosphere, keeping the child with parents whenever possible
- Steroid treatment reduces the severity and duration of symptoms

When to Arrange Emergency Hospital Admission

- Admit all children with moderate or severe croup
- Impending respiratory failure

While awaiting admission to hospital

- Give controlled supplementary oxygen to all children with symptoms of severe illness or impending respiratory failure
- Administer a dose of oral dexamethasone (150 micrograms/kg)
- If the child is too unwell to receive medication, inhaled budesonide (2mg nebulised as a single dose) or intramuscular dexamethasone (0.6 mg/kg as a single dose) are possible alternatives

When to Consider Hospital Admission

- A respiratory rate > 60 breaths/minute
- Fever or 'toxic' appearance
- Have an underlying condition increasing their risk of severe illness (see 'low threshold for admission' section)

Low Risk for Community Management

- Give one dose of dexamethasone 150 micrograms/kg orally
- Prednisolone (1-2mg/kg) is an alternative
- Paracetamol and Ibuprofen can be used to manage pain and fever, these can be purchased over the counter

Patient information leaflets/ PDAs

Patient.info/chest-lungs/cough-leaflet/croup

oxfordshireccg.Paediatric-croup-advice-sheet.pdf

References

- Gates A et al. *Glucocorticoids for croup in children*. Cochrane Database of Systematic Reviews 2018, Issue 8. Art No. CD001955. DOI: 10.1002/14651858.CD001966.pub4
- National Institute for Clinical Excellence [NICE] (2019) [Croup](#). [Viewed 16 Aug 2021]

Responsible Consultant: Dr Rebecca Proudfoot
Responsible GP: Dr Rebecca Brown
Responsible Pharmacist: Faisal Majothi

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