Bottom Line Recommendations: Summary of Pediatric Emergency Care Information for Healthcare Providers.

Croup

Croup is the most common cause of upper airway obstruction in children. It is characterized by acute onset of barky cough +/- stridor. The typical age of presentation is between 6 months and 5 years with a peak around 2 years. In children with severe symptoms, poor or transient response to croup treatment, OR presentation outside the typical age range, consider alternative causes of upper airway obstruction, including foreign body, bacterial tracheitis, epiglottitis, and retropharyngeal abscess.

- Give a **single dose of PO dexamethasone** to **ALL** children presenting to the ED with croup. Evidence supports 0.15–0.6 mg/kg, but 0.6 mg/kg (MAX 12 mg) is the most widely used dose in practice.
- Use nebulized epinephrine in **SEVERE** croup to provide transient improvement in upper airway obstruction.
- If oral steroids are not tolerated or are contraindicated, use budesonide 2 mg nebulized (can be administered together with epinephrine, if required).
- Minimize interaction and place the child in a position of comfort (e.g., caregiver's lap) in a quiet environment, as agitation can precipitate significant respiratory distress.
- X-rays are not routinely needed to diagnose croup but may be useful when considering other diagnoses.
- Do not use antibiotics as croup symptoms are triggered by a viral infection. Treat fever, if required.

Assessment and Management

- Croup severity scores have been validated for research purposes but not for routine clinical care.
- The key clinical findings that differentiate croup severity and guide management are:
    1) Stridor
    2) Indrawing
    3) Level of consciousness (LOC)
    4) Oxygenation
- Altered LOC, hypoxia/cyanosis and/or marked decreased air entry are hallmarks of impending respiratory failure.
- Risk factors for severe croup include: history of previous severe croup, pre-existing narrowing of upper airway, pre-existing reduced airway tone (e.g., Trisomy 21), younger age. Croup is uncommon under 6 months and rare under 3 months, consider alternative diagnosis.

Severity	Clinical Signs	Management
Mild	• No stridor (or soft, transient stridor only with activity) • No to mild indrawing with activity	Discharge home after a single dose of PO dexamethasone without ED observation.
Moderate	• Easily audible, persistent stridor at rest • Mild to moderate indrawing at rest • O_2 sat ≥ 92%	Observe after a single dose of PO dexamethasone until stridor at **REST** and indrawing resolve (usually 2-4 hours).

Severe	• Stridor at rest (often biphasic) • Severe indrawing at rest • Agitation • O_2 sat ≥ 92% at rest (although can have transient decrease with severe agitation)	• Treat with epinephrine 5 mg by nebulization (using 1 mg/mL injectable formulation*) **AND** PO dexamethasone. • Repeat doses of nebulized epinephrine may be required in severe croup. • Observe children treated with nebulized epinephrine in the ED for a minimum of **2 HOURS** before discharge home. *Racemic epinephrine is no longer available in Canada but is equally efficacious.
Impending Respiratory Failure	Severe signs PLUS: • Altered LOC • Marked decreased air entry • O_2 sat < 92% at rest • Cyanosis	• Treat with nebulized epinephrine Q15 min PRN (dose as above). • Dexamethasone 0.6 mg/kg (MAX 12 mg) may be given IM/IV if altered LOC. • If LOC, air entry and/or cyanosis do not improve after 3 doses of nebulized epinephrine, activate difficult airway team OR clinician with the most pediatric airway experience (e.g., ENT, anesthesia, pediatrics) for possible advanced airway. • Consider alternate diagnoses such as bacterial tracheitis, epiglottitis or retropharyngeal abscess. • Currently, there is not enough evidence to support the routine use of heliox in croup.[1] A trial of heliox may be considered in the setting of impending respiratory failure but should not delay definitive airway management. • Contact PICU/Pediatric Referral Centre/Transport Team

Criteria for Safe Discharge Home

- Absence of inspiratory stridor and signs of respiratory distress (suprasternal, intercostal and/or chest wall indrawing) **at rest**.
- Caregiver is able to bring child back to the ED if there is any clinical deterioration.
- Provide reassurance and croup education for caregiver, including return to ED instructions. A child in respiratory distress is very scary for both the patient and the caregiver.
- For more information, refer caregivers to the Croup Video: a barky seal-like cough on the TREKK website.

Criteria for Hospital Admission

- Persistence of stridor at rest and signs of respiratory distress **>4 hours** after treatment with dexamethasone and repeated doses of nebulized epinephrine.
- Barriers to patient returning to ED for care.

Criteria for Admission/Transfer to PICU

- Persistent severe croup despite treatment with dexamethasone and 2 doses of nebulized epinephrine OR impending respiratory failure at any time.
- Contact PICU/Pediatric Referral Centre/Transport Team.

Scan or click the QR code to learn more and
to see a full list of references and development team members

The Children's Hospital Foundation of Manitoba