# DIAGNOSIS AND MANAGEMENT OF CROUP

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## Clinical Practice Guidelines

# DIAGNOSIS AND MANAGEMENT OF CROUP

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**FIGURES:** 1

**KEY POINTS**:

1. Croup is a common respiratory tract infection characterized by sudden onset of a coarse, barky cough and often accompanied by inspiratory stridor.
2. Diagnosis is based on clinical presentation.
3. Early administration of oral dexamethasone is the mainstay of treatment, even in mild croup.
4. Nebulized epinephrine is indicated for symptom management in moderate to severe croup.

Croup is a self-limited respiratory illness of childhood caused by a number of different viruses. It most commonly occurs in autumn and winter. It is characterized by the abrupt onset of a seal-like barky cough and is often accompanied by inspiratory stridor, hoarseness and varying degrees of chest wall indrawing. Fever and upper respiratory tract symptoms may also be present. Children with croup should not drool or appear toxic.

**Features suggesting an alternative diagnosis:**

- High fever, toxic appearance and poor response to nebulized epinephrine suggest **bacterial tracheitis.**
- Sudden onset of symptoms with high fever, stridor, drooling, sniffing position and absence of barky cough suggest **epiglottitis.**
- Other potential causes of inspiratory stridor include **foreign body lodged in the upper esophagus**, **retropharyngeal abscess** and **hereditary angioedema.**

**Investigations:**

Most children with croup can be diagnosed based on the clinical presentation coupled with a thorough history and physical exam.[1] The vast majority of children do not require radiographs or blood work. Anterioposterior (AP) and lateral radiographs of the soft tissues of the neck may be helpful in clarifying the diagnosis in children with an atypical history or who do not respond to treatment.

Cone-shaped narrowing of the subglottic area (steeple **sign**) is suggestive of croup but may be absent in up to 50 to 60% of cases[2].

**PRACTICE POINT IF X RAYS ARE OBTAINED**
Patients should be accompanied to medical imaging by healthcare personnel competent in airway management skills as progression of upper airway obstruction can be swift.

**Emergency Department Care: (for drug dosages, see algorithm)**

- Make child with comfortable. Often this is achieved by keeping the child in the parent's arms. Avoid agitating the child with unnecessary procedures.

- Apply blow-by oxygen to children in respiratory distress.
- Children with moderate to severe symptoms (stridor at rest) should be monitored by pulse oximetry.
- Administer **nebulized epinephrine** to patients in severe respiratory distress (chest wall retractions with agitation or lethargy)[3,4]
- Administer one oral dose of **dexamethasone** to all children diagnosed with croup[5]. Consider **nebulized budesonide** in children who are too sick to tolerate oral medications. Although budesonide is just as effective as dexamethasone, it is considerably more expensive and should be reserved for children who can not tolerate oral medications.
- Mist tents, wanes, or steamers are not effective and should not be used[6].
- Antibiotics, sedatives and oral decongestants are not recommended.

**Hospital Admission**

- Admit children with significant respiratory distress (sternal wall indrawing, stridor at rest) **persisting 4 or more hours after corticosteroid administration.**
- Consider admission if there is significant parental anxiety, if the child has been brought to the hospital repeatedly for croup symptoms, if the family lives a long distance from the hospital or has inadequate transportation, or if there are concerns about the adequacy of follow- up.
- Children admitted to hospital require close monitoring of their respiratory status. Administer epinephrine if severe respiratory distress reoccurs. Contact the closest pediatric intensive care unit if epinephrine is administered more than every 2 hours.

**Complications**

- A small number of hospitalized patients may require intubation.
- Cardiopulmonary arrest can occur in patients who are not adequately monitored and managed.
- Bacterial tracheitis can cause a sudden deterioration.
- Pneumonia is a rare complication.

**Discharge**

- Most children can be managed as outpatients. Children can be safely discharged home if they have not been treated with epinephrine in the past four hours, they do not have stridor at rest, they do not have significant chest wall indrawing and the parent or caregiver can easily return to hospital if the symptoms recur at home.
- Provide parents/caregivers with written instructions and provide advice on when to return for medical care.
- No specific follow-up is required for most children with croup. Patients who have had stridor for >1 week should follow-up with their primary care provider.

# References

## Other Sources

BC Children's Emergency - www.bcch.bc.ca

## General References

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