

What about those long, “barky” nights?

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Section editor Judy Skanderup notes:

This article was submitted by Janielee Williamson, RN, Cochrane, Alberta. Janie is the project coordinator for a multi-centre research project across Alberta looking at the best method for disseminating practice guidelines to physicians. The project personnel are working in collaboration with the Alberta Medical Association CPG Committee to determine which method improves the delivery of best practice for children with croup, while ensuring optimum care for the child and determining which method has the best overall benefit for the health care system and the family.

All emergency department personnel are familiar with this scenario: 18-month-old boy presents to the emergency department at 2 a.m. on December 18. Parents look worried, yet they are baffled. As they tell their story, they are almost apologetic, “Really, he was much worse at home, he seems so much better since we drove to the hospital. He woke up in distress, he couldn’t breathe and he was making this awful noise when he took a breath in. And his cough – I’ve never heard anything like it – he sounded like a dog... or no, more like a seal. Really, it was terrible!”

There, in mom’s arms, is a happy, quiet boy looking around. When you try to examine him, his cry is stridorous and you hear the bark...reassuringly you smile back at the mom. “Yes, we know, and no we don’t have magic doors. HE HAS CROUP.”

Croup is a childhood respiratory illness caused by a virus. It most commonly occurs in children between six months and three years of age, but can occur in children as old as 12 to 15 years, and it has been reported in adults. Croup usually occurs in the fall and winter months, but we have seen cases in July (Denny, 1983). It is characterized by the abrupt onset of a barky cough. Other associated symptoms include inspiratory stridor (noisy breathing on inspiration), hoarseness and respiratory distress (Orenstein, 2000).

Children with croup can be categorized into four levels of severity. Determining severity is key in the management of croup because treatment should be linked to severity.

Mild croup is characterized by an occasional barky cough, no audible stridor at rest and no to mild substernal and/or intercostal indrawing (retractions of the skin of the chest wall). **Moderate**, on the other hand, is characterized by a frequent barky cough, easily audible stridor at rest, heard from a distance away from the child, and chest wall retractions at rest, but no to little distress or agitation. **Severe** is characterized by persistent barky cough, prominent inspiratory stridor and occasional expiratory stridor, marked retractions and significant distress and agitation. These children just will not settle no matter what you do. The fourth category is **impending respiratory failure**. These children may have a barky cough, but it may not be prominent. They often have stridor and retractions, but they may seem less severe. The child, in fact, may appear quieter and less distressed and seem to be improving until, on closer examination, you find that the child is lethargic with a glassy-eyed look and a decreased LOC. They may appear dusky without supplemental oxygen. To the inexperienced eye, these children appear to be improving, however, they are on the verge of respiratory failure.

Having said that, remember two-thirds of all children (in Alberta) presenting to the emergency department with croup have mild symptoms.* Children with severe croup and children with impending respiratory failure are very rare. As a note, children with croup-like symptoms who appear very toxic, have a high fever and who do not respond well to epinephrine, should be considered for bacterial tracheitis, which is believed to be a super-imposed bacterial infection of croup (Orenstein, 2000; Tong, 1996).

Stop...Look and Listen! (And then chart it...)

- Croup symptoms can occur with or without antecedent respiratory symptoms such as a runny nose, fever and cough.
- The symptoms most commonly occur in the late evening or at night, and often have an abrupt onset. On average, symptoms are at their worst when they first occur and they improve over time with episodic fluctuations.
- Croup symptoms frequently improve en route to medical care, and fluctuate significantly depending on whether the child is calm, agitated or active.
- Symptoms include: a seal-like barky cough, inspiratory stridor, hoarseness and no to moderately high fever.

- Croup symptoms usually improve during the day and often will recur on the following night (Johnson, & Williamson, 2001).
- Most children resolve their symptoms in 48 hours, but a small group of children have symptoms that persist up to a week (Johnson, & Williamson, 2001).
- Once the croup symptoms have resolved, many children develop URTI symptoms and, on occasion, a secondary bacterial infection – induced otitis media (Johnson, & Williamson, 2001; Heikkinen, Thint, & Chonmaitree, 1999; Andrade, 1998).

What about investigations?

The diagnosis of croup can reliably be made on clinical presentation in combination with a history and exam. For this reason, radiological and laboratory assessments are not necessary and, in most cases, do not help (Rapkin, 1972). Croup symptoms vary relative to the agitation of the child, therefore unnecessary tests and exams have a tendency to worsen the child's condition.

How can we help?

- Keep the child as calm and as comfortable as possible. This is best achieved by allowing the child to remain in the parent's lap during assessment and treatment.*
- Avoid unnecessary treatments and procedures.*
- Blow-by oxygen is indicated in children who are in distress. Do not force a mask on, and keep in mind that mist therapy has not been shown to have any measurable benefit. Most pediatric centres across Canada no longer use croup tents. Although mist therapy has been in use for a very long time, there is no evidence to support the use of croup tents (Neto, 2002; Lavine, & Scolnik, 2001).
- Epinephrine is indicated in children with severe respiratory distress, keeping in mind that improvement occurs within minutes and begins to wear off in about an hour. Treatment with epinephrine does not affect the disease process or symptoms beyond two hours. Treatment with 1:1000 epinephrine is as effective as racemic, but requires an increased amount to be effective: 0.5 mls of racemic in 3 mls of saline or sterile water is recommended. This is equivalent to 5 mls of epinephrine 1:1000 via nebulizer (Westley, Cotton, & Brooks, 1978; Waisman, 1992).
- Dexamethasone is indicated in the treatment of all children with croup, even those with mild symptoms (Bjornson, in press). Improvement begins within two to three hours after administration and lasts for 24 to 48 hours after administration of a single dose. We recommend giving the parenteral solution orally in all children with the exception being those with severe croup with persistent vomiting. For children with severe disease, nebulized budesonide can be given with the epinephrine dose. Intra-muscular dexamethasone may be considered in a child who has persistent vomiting (Bjornson et al., in press; Luria, 2001; Geelhoed, Turner, & Macdonald, 1996; Johnson, 1996; Patel, Macarthur, & Johnson, 1996; Klassen, 1998; Duggan, 1975).

- The dexamethasone recommended dose is 0.6 mgms/kg given in a single dose (Orenstein, 2000).

So, now what? Discharge – Admit ...that is the question?

Most croup can be managed at home once the dexamethasone has been administered and the child has been observed for a sufficient period of time to determine that their symptoms have returned to mild. If, after four hours, the child continues to have stridor at rest and indrawing, this child should be admitted for observation. Children who receive epinephrine in the emergency department should be observed for two hours before they are discharged home. It is safe to discharge children home who have received epinephrine and dexamethasone in the emergency department once their symptoms return to mild, and assuming the two-hour observation period has passed (Westley, Cotton, & Brooks, 1978; Corneli, & Bolte, 1992; Ledwith, Shea, & Mauro, 1995; Chin, 2002; Sofer, Dagan, & Tal, 1991; Rizos, 1998; Kunkel, 1996; Kelley, & Simon, 1992).

Home with helpful hints

Although present guidelines suggest that most children can be managed at home with the administration of appropriate treatment, we must be cautious in transferring the burden of care back onto the parents. Parents are entitled to adequate information that enables them to safely care for their child at home. A comprehensive teaching sheet has been designed by the clinical practice guideline working group and is available online at www.albertadoctors.org. As is the case for all discharge instructions, croup teaching instructions should include:

- A brief description of the illness, what causes it and what the family can expect
- Tips on how the parent can make their child more comfortable
- What to look and listen for to ensure the child is OK
- Indications on when to call 9-1-1, and when medical attention should be accessed right away
- What medical treatments improve croup
- Reassurance
- Instructions to encourage hand-washing, the only really preventive approach for the spread of viral illnesses.

Although croup is a common childhood illness, it can represent a frightening and stressful experience for families. This may be the “sickest” their child has ever been and its abrupt onset and involvement of the respiratory system tend to validate their concerns. We now have well-documented information that clearly identifies the best management practice for croup. These guidelines, when applied in the emergency department setting with a caring and knowledgeable approach, can safely support families and children through those long ‘barky’ nights. ❖

* Based on consensus opinion.

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