

## DEFINITION

- Viral infection of the voicebox (larynx)
- The croupy cough is tight, low-pitched, loud and barky (like a barking seal)
- The voice or cry is hoarse (laryngitis)
- Some children with croup develop stridor (a harsh, raspy, tight sound with breathing in)
- Caution: You must rule out respiratory distress in these calls
- COVID-19 infections can present with these respiratory symptoms. If the child is not vaccinated AND COVID-19 exposure is possible, use the COVID-19 protocol for these clinical presentations. It will adequately cover triage and care advice. If you need more detailed information, use 2 protocols.

## TRIAGE ASSESSMENT QUESTIONS

### Call EMS 911 Now

Severe difficulty breathing (struggling for each breath, unable to speak or cry because of difficulty breathing, making grunting noises with each breath, severe retractions)

*Triage Tip: Listen to the child's breathing.*

Croup started suddenly after choking on something and symptoms continue

*R/O: airway foreign body*

Bluish (or gray) lips or face now

*R/O: cyanosis and need for oxygen*

Child has passed out or stopped breathing

*R/O: apnea, cough syncope*

Croup started suddenly after bee sting, taking a prescription medicine or high-risk food

*R/O: anaphylaxis*

Sounds like a life-threatening emergency to the triager

### See More Appropriate Protocol

Diagnosed with croup recently and has been treated with a steroid

*Go to Protocol: Croup on Steroid Follow-up Call (Pediatric)*

Choked on a small object that could be caught in the throat (R/O: airway FB)

*Go to Protocol: Choking - Inhaled Foreign Body (Pediatric)*

Doesn't match the criteria for croup

*Go to Protocol: Cough (Pediatric)*

### Go to ED Now

Drizzling or spitting out saliva (because can't swallow)

*R/O: epiglottitis, retropharyngeal or peritonsillar abscess, airway FB*

Not able to speak (complete loss of voice, not just hoarseness or whispering)

*R/O: bacterial tracheitis or severe croup*

Sudden onset of stridor and fever after 3 or more days of croup

*R/O: bacterial tracheitis*

Age < 12 weeks with fever 100.4° F (38.0° C) or higher by any route (rectal reading preferred)

*R/O: sepsis*

Fever and weak immune system (sickle cell disease, HIV, chemotherapy, organ transplant, adrenal insufficiency, chronic steroids, etc)

*R/O: serious bacterial infection. Note: if available, refer to established specialist.*

## **Go to ED/UCC Now (or to Office Now per Practice Policy)**

High-risk child (e.g., underlying heart, lung or severe neuromuscular disease)

*Reason: high risk for respiratory distress*

SEVERE chest pain

*R/O: pneumonia*

Difficulty breathing present when not coughing

*Triage Tip: Listen to the child's breathing.*

Stridor (harsh sound with breathing in) present now

Age < 12 months and any stridor

*Reason: high risk age for stridor*

Lips have turned bluish, but only during coughing spells

*R/O: hypoxia, pneumonia*

Rapid breathing (Breaths/min > 60 if < 2 mo; > 50 if 2-12 mo; > 40 if 1-5 years; > 30 if 6-11 years; > 20 if > 12 years old)

*R/O: respiratory distress. Caution: do not attribute abnormal RR to fever.*

Retractions - skin between the ribs is pulling in (sinking in) with each breath (includes suprasternal retractions)

*Reason: severe croup*

Can't move neck normally

*R/O: retropharyngeal abscess*

Age < 3 months with croupy cough

*R/O: pneumonia, chlamydia, pertussis*

Child sounds very sick or weak to the triager

*Reason: severe acute illness or serious complication suspected*

## **Go to Office Now**

Fever > 105° F (40.6° C)

*R/O: serious bacterial infection, bacterial tracheitis*

Dehydration suspected (e.g., no urine in > 8 hours, no tears with crying, and very dry mouth)

### See in Office Today

Stridor occurred but not present now

*Reason: may need oral Decadron*

Had croup before that needed decadron

Continuous (nonstop) cough

*Reason: severe croup*

Earache is also present

### See in Office Today or Tomorrow

Fever returns after going away > 24 hours and symptoms worse or not improved

*R/O: otitis media, sinusitis, new URI*

Age 3-6 months and fever with cough

Fever present > 3 days

*R/O: pneumonia*

### See in Office Within 3 Days

Vomiting from hard coughing occurs 3 or more times

Croup is a recurrent problem (occurred 3 or more times)

*R/O: allergic croup or underlying abnormality of larynx*

Barky cough present > 10 days

*R/O: asthma, FB*

Triager thinks child needs to be seen for non-urgent problem

Caller wants child seen for non-urgent problem

### Home Care

Mild croup with no stridor

### Home Care Advice for Croupy Cough

- 1. Reassurance and Education - Croupy Cough:**
  - Most children with croup just have a barky cough.
  - Some develop tight breathing (called stridor).
  - Stridor is a loud, harsh sound when breathing in. It comes from the area of the voicebox.
  - Remember, coughing up mucus is very important for protecting the lungs from pneumonia.
- 2. First Aid For Stridor (Harsh sound with breathing in):**
  - Breathe warm mist in a closed bathroom with the hot shower running. Do this for 20 minutes.
  - You could also use a wet washcloth held near the face.

- Caution: Do not use very hot water or steam which could cause burns.
  - If warm mist fails, breathing cold air may also help.
  - If the weather is cold, stand by an open window or take your child outside for a few minutes. If the weather is not cold, stand near an open freezer or refrigerator.
3. **Calm Your Child if He or She has Stridor:**
    - Crying or fear can make stridor worse.
    - Try to keep your child calm and happy.
    - Hold and comfort your child.
    - Use a soothing, soft voice.
  4. **Hard Coughing Treatment:**
    - **Age** less than 1 year: Keep your baby well hydrated with breast milk or formula. Reason: makes it easier to cough up mucus.
    - **Age** 1 year and older: For hard coughing, use **Honey** 1/2 to 1 tsp (2 to 5 ml). Reason: soothes the throat and loosens the cough.
    - **Age** 6 years and older: For hard coughing, use **Cough Drops** (throat drops) or hard candy. Reason: decreases the tickle in the throat. Note: also continue honey.
    - **Caution:** avoid cough drops before 6 years. Reason: risk of choking.
    - Mild coughing doesn't need any treatment except staying well hydrated.
  5. **OTC Cough Medicine - Not Advised:**
    - OTC cough medicines are not approved by the FDA until 6 years of age.
    - Reasons: not safe and can cause serious side effects. Also, no proven benefit for children.
    - Finally, honey has been shown to work better. Caution: Avoid honey until 1 year old.
    - Triager Advice: If the caller insists on using one and the child is over 6 years old, use one with dextromethorphan (DM).
    - Follow the dosing instructions on the package.
    - Indication: Give only for severe coughs that interfere with sleep, school or work.
    - Don't use under 6 years of age. Reason: cough is a protective reflex.
  6. **Coughing Attacks - Warm Mist and Fluids:**
    - Any age: Breathe warm mist (such as with shower running in a closed bathroom).
    - Age 1 year and older: Also sip some warm clear fluids, such as apple juice or herbal tea.
    - Reason: Both relax the airway and loosen up any phlegm.
    - What to Expect: The coughing attack should stop. But, your child will still have their baseline cough.
  7. **Encourage Fluids:**
    - Encourage your child to drink adequate fluids to prevent dehydration.
    - This will also thin out the nasal secretions and loosen the phlegm in the airway.
  8. **Humidifier:**
    - If the air is dry, run a humidifier in the bedroom.
    - Reason: Dry air makes croup worse.
  9. **Fever Medicine:**
    - For fever above 102° F (39° C), give acetaminophen (e.g., Tylenol) or ibuprofen.
    - For fevers 100-102 F (37.8 to 39 C), fever medicines are not needed. Reason: Fever turns on your body's immune system. Fever helps fight the infection.
  10. **Sleep Close By to Your Child:**
    - If your child had any stridor, sleep in the same room for a few nights.
    - Reason: stridor can get worse during the night.
  11. **Avoid Tobacco Smoke:**
    - Active or passive smoking makes coughs much worse.

12. **Contagiousness/Return to School:**
  - Your child can return to day care or school after the fever is gone and your child feels well enough to participate in normal activities.
  - For practical purposes, the spread of croup and colds cannot be prevented.
13. **Expected Course:**
  - Croup usually lasts 5 to 6 days and becomes worse at night.
14. **Call Back If:**
  - Stridor (harsh raspy sound) occurs
  - Croupy cough lasts over 14 days
  - Your child becomes worse
15. **Extra Advice - Triager Callback Option:**
  - For mild intermittent stridor without respiratory distress, the triager can recommend warm mist treatment (see First Aid).
  - Then callback in 30 minutes to see if the stridor is gone or still present. If still present, the child needs to be seen urgently. If the stridor is gone, the child can be seen that day by appointment.
16. **Extra Advice - COVID-19 Suspected:**
  - If COVID-19 is suspected, test your child for COVID with a home test.
  - If positive, your child will need to isolate at home. Check the CDC website for further information on isolation precautions. (<https://www.cdc.gov>)
  - Call Back If: Your child is positive and you have other questions.

## FIRST AID

### First Aid Advice For Croup With Stridor:

- For stridor (harsh sound with breathing in) or constant coughing:
- Breathe warm mist in a foggy bathroom with the hot shower running for 20 minutes. Other options: a wet washcloth held near the face or a humidifier containing warm water.
- Caution: avoid very hot water or steam which could cause burns or high body temperatures.
- If warm mist fails, breathe cool air by standing near an open refrigerator or taking outside for a few minutes if the weather is cold.
- **What to Expect:** The stridor should go away with warm mist. The cough and hoarse voice won't.

### Calm Your Child if He or She has Stridor

- Crying or fear can make stridor worse.
- Try to keep your child calm and happy.
- Hold and comfort your child.
- Use a soothing, soft voice.

## BACKGROUND INFORMATION

### Matching Pediatric Care Advice (PCA) Handouts for Callers

Detailed home care advice instructions have been written for this protocol. If your software contains them, they can be sent to the caller at the end of your call. Here are the names of the pediatric handouts that are intended for use with this protocol:

- Croup
- Fever - How to Take the Temperature

- Fever - Myths Versus Facts
- Acetaminophen (Tylenol) Dosage Table - Children
- Ibuprofen (Advil, Motrin) Dosage Table - Children

### **Stridor: A Complication of Croup**

- Stridor is a harsh, raspy, tight sound heard with breathing in
- Loud or continuous stridor means severe croup
- All stridor needs to be treated initially with warm mist
- Many children with stridor need treatment with an oral steroid (Decadron)
- See **First Aid** for treatment recommendations

### **Respiratory Distress (also known as Working Hard to Breathe or Shortness of Breath)**

- Always rule out respiratory distress. Listen for grunting, stridor, wheezing, tachypnea in respiratory calls.
- How to assess: Listen to the child's breathing early in your assessment. Reason: What you hear is more valid than the caller's answers to your triage questions.
- Reason: It's the leading cause of ED under-referral and adverse outcomes in the first 3 years of life.

### **Trouble Breathing: How to Explain Respiratory Distress to Callers**

- Trouble breathing is a reason to see a doctor right away. Respiratory distress is the medical name for trouble breathing. Here are symptoms to worry about:
- Struggling for each breath or shortness of breath
- Tight breathing so that your child can barely speak or cry
- Ribs are pulling in with each breath (called retractions)
- Breathing has become noisy (such as wheezes)
- Breathing is much faster than normal
- Lips or face turn a blue color

### **Fever Does Not Cause Tachypnea (Increased Respiratory Rates)**

- Tachypnea should not be attributed to fever.
- Tachypnea is caused by lung disease (such as pneumonia or bronchiolitis) until proven otherwise. It's often the earliest sign of mild respiratory distress and often hypoxia.
- In infants, significant nasal congestion can lead to tachypnea which can be resolved by suctioning. In young infants, obligate nasal breathing can be a factor.
- It can also be caused by metabolic acidosis, such as DKA..
- Evidence: In a cohort of over 235,000 pediatric patients presenting to emergency and urgent care, there was no association between elevated temperature and changes in respiratory rate.
- Reference: Heal C, Harvey A, Brown S, et al. The association between temperature, heart rate, and respiratory rate in children aged under 16 years attending urgent and emergency care settings. *Eur J Emerg Med.* 2022 Sep 6;29(6):413-416.

### **Causes of a Croupy Cough**

- **Viral Croup.** Viruses (usually parainfluenza) are the most common cause of croup symptoms. Many respiratory viruses can infect the vocal cord area and cause narrowing. Even influenza (the flu) can do this. A fever is often present with the barking cough.
- **Allergic Croup.** A croupy cough can occur with exposure to pollens or allergens in a barn. A runny nose, itchy eyes and sneezing are also often present.
- **Inhaled Powder.** Breathing in any fine substance can trigger 10 minutes of severe coughing. Examples are powdered sugar, flour dust or peanut dust. They can float into the lungs. This is not an allergic reaction.

- **Airway Foreign Body (Serious).** Suspect when there is a sudden onset of coughing and choking. Common examples are peanut and seeds. Peak age is 1 to 4 years.
- **Food Allergy (Serious).** Croup symptoms can also be caused by a food allergy. This can be life-threatening (anaphylaxis). Examples are nuts or fish.

### **Stridor Severity Scale (Schmitt)**

- **Mild:** Intermittent stridor only present with crying, coughing or agitation.
- **Moderate:** Intermittent stridor at rest, as well as with crying or agitation.
- **Severe:** Continuous stridor at rest. Most of these children also have retractions or other signs of respiratory distress. More serious if can't feed, sleep or engage in normal activities.
- **Lesson:** Consensus is that all stridor needs treatment with steroids. However, once treated, intermittent brief stridor usually does not need re-treatment. Exception: intermittent stridor that interferes with normal activities does need additional treatment.

### **Stridor and Decadron**

A single oral dose of dexamethasone (Decadron) has been shown to have the following benefits for croup: (Clin Evid Concise. 2006; 15: 87-92)

- Improved croup scores
- More rapid clinical improvement
- Decreased return visits to the ED or office
- Decreased hospital admission rates (13-fold)
- Shorter hospital stays for those admitted
- The usual dosage of Decadron is 0.6 mg/kg/dose (maximum dose between 10 and 20 mg)

In this Croup protocol, all children with stridor are referred in for an evaluation and possible treatment with Decadron. Children with barky cough alone are not referred in.

### **Decadron Facts**

- Onset of action based on changes in Croup Scores: 30 minutes (previously thought to be 4 hours)
- Peak Action: 24 hours
- Half Life: 36-48 hours
- Dosage: 0.6 mg/kg/dose oral or IM. Max dose: 10 mg.
- Oral efficacy is equal to IM efficacy. IM needed for children who vomit oral dose
- Number of doses for croup: 1 dose is the standard treatment for any stridor. Reason: long duration of action. Some physicians give a second dose if symptoms become worse and more than 24 hours have passed since first dose. If croup score requires intervention before 24 hours, racemic epinephrine neb is given. Decadron would not be helpful.
- Caution: a second dose of Decadron is not given without first assessing the child in person. Not a telephone decision.

### **Cold Air for Croup Symptoms**

- A controlled trial randomized patients 3 months to 10 years with moderate croup.
- Method: Randomized to either receive 30-minute exposure to outdoor cold (<10 C or 50 F ) air or indoor room air immediately after triage. Note: in addition, all patients received a single dose of oral dexamethasone after triage. (Siebert 2023)
- Results: Patients who were exposed to cold air showed a significant decrease in croup severity score from baseline at 30 minutes after triage compared to those exposed to room air after receiving dexamethasone.
- Perspective: There are no studies that compare cold air to warm mist.
- Limitations: Outdoor cold air therapy may only be available to be used seasonally or in colder climates.

- Exposure to refrigerator or freezer air is a practical alternative.
- Conclusion: Cold air can be used in telephone advice. It is part of the care advice in this Croup protocol.

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<b>Company:</b>	Schmitt-Thompson Clinical Content
<b>Content Set:</b>	Office Hours Telehealth Triage Protocols   Pediatric
<b>Version Year:</b>	2025
<b>Last Revised:</b>	6/25/2025
<b>Last Reviewed:</b>	7/7/2025