Outpatient Croup Care Guideline

CHOC Children's

Inclusion Criteria
- Age 6 mo to 6 years
- Barky cough
- Stridor
- Hoarse voice/cry

Exclusion Criteria
- Outside age range
- Toxic appearance
- Pre-existing upper airway abnormality
- Known neuromuscular disease or Down Syndrome
- Poor response to therapy
- Possibility of epiglottitis or bacterial tracheitis

Severity

Mild
- No stridor at rest (may be present with agitation)
- Occasional barky cough
- No or minimal retractions
- No distress or agitation

Dexamethasone
0.6 mg/kg oral or IM (max 10 mg)

- Discharge home
- Phone follow-up or RTC in 24 hours

Moderate
- Stridor at rest
- Frequent barky cough
- Mild to moderate retractions
- No or minimal distress or agitation

Minimize agitation during evaluation and treatment

Racemic Epinephrine
2.25%, 0.05 mL/kg (max 0.5 mL) in 3 mL NS by nebulizer
and
Dexamethasone
0.6 mg/kg oral or IM (max 10 mg)

Observe for minimum of 2 hours and up to 4 hours

Improved

Meets Discharge Criteria
- No stridor at rest
- No retractions
- Taking oral fluids
- Parents able to return if needed

Yes

- Discharge home
- RTC in 24 hours

No

Transfer to ED

Not improved or worsening

- Consider second dose of Racemic Epinephrine
- Transfer to the ED

Severe
- Prominent stridor
- Frequent barky cough
- Marked or severe retractions
- Significant distress or agitation

- Minimize agitation during evaluation and treatment
- O2 if pulse ox < 92%. If no pulse ox, give blow by O2

Racemic Epinephrine
2.25%, 0.05 mL/kg (max 0.5 mL) in 3 mL NS by nebulizer
and
Dexamethasone
0.6 mg/kg oral or IM (max 10 mg)

- Arrange for urgent EMS transfer to ED
- Close observation of vital signs and respiratory status

Consider second dose of Racemic Epinephrine after 30-60 minutes if no improvement or worsening

Transfer to ED

Go to ED Croup Guideline

Approved EBM Committee 5-20-15

Reassess the appropriateness of Care Guidelines as condition changes. This guideline is a tool to aid clinical decision making. It is not a standard of care. The physician should deviate from the guideline when clinical judgment so indicates.

Notes for Outpatient Croup Care Guideline

CHOC Children's

Consider an alternative diagnosis if

- Absence of cough
- Drooling or difficulty swallowing
- Trismus, meningismus
- Choking episode
- Angioedema
- Age outside normal range
- Poor response to treatment
- Toxic appearance
- Fever > 39 C
- Recurrent croup

Alternative diagnoses to rule out

- Epiglottits
- Bacterial tracheitis
- Retropharyngeal Abscess
- Allergic reaction or Hereditary Angioedema
- Trauma
- Foreign Body
- Congenital airway abnormality (e.g Laryngomalacia, Hemangioma)
- Spasmodic Croup

Severity

1. Scoring system on the algorithm is adapted from the Alberta Clinical Practice Guideline Working Group
2. Potential signs of impending respiratory failure
   - Marked retractions
   - Decreased breath sounds
   - Marked tachycardia (out of proportion to the fever) or bradycardia
   - Cyanosis or pallor
   - Decreased level of consciousness

Lab Assessment

1. No routine labs are indicated
2. X Rays not indicated unless needed to rule out another diagnosis

Dexamethasone

1. Leads to decreased croup scores at 6 hour and 12 hour, fewer return visits or admissions (RR 0.50, 95% CI 0.3-0.7), shorter ED stays and decreased use of epinephrine
2. Even in mild croup, can show a decrease in return visits (7% vs. 15%, $p<0.01$)
3. Oral and IM forms are equally effective. Can be given IV but will have a shorter duration of action.
4. Standard dose is 0.6 mg/kg (max 10 mg)
5. Oral dexamethasone is unpalatable with a concentration of 1 mg/mL. The IV solution is more palatable and concentrated (4 mg/mL), and can be given orally mixed in syrup.
6. Some studies suggest lower doses (0.15-0.3 mg/kg) may be effective for mild croup, but the data is limited. For this reason, we recommend using the standard 0.6 mg/kg) dose in this guideline.
7. Onset in 1 hour. Able to make decisions regarding hospitalization by 4-6 hr.
8. Use of repeated doses unclear. If given for several days in a row may lead to worsening of viral or bacterial illness.

Budesonide

1. Nebulized budesonide is as effective as dexamethasone
2. Single dose of 2mg = 2mL via nebulizer
3. In general, no advantage to using this over dexamethasone.

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Prednisolone

1. Limited number of studies with small numbers of patients
2. Usual dose is 2 mg/kg for 3 days
3. One study of 87 patients with mild-moderate croup showed no statistical difference in additional visits (2% dexamethasone vs. 7% prednisolone) or duration of symptoms compared to dexamethasone, but may have been underpowered to show a difference.
4. One study showed fewer return visits in group treated with dexamethasone vs. prednisolone [9.6% vs. 29.7%, RR 0.3 (95% CI, 0.2-0.6)]
5. No studies looking at prednisone.

Nebulized Epinephrine

1. Racemic Epinephrine classically used.
2. Significant improvement in croup scores within 30 minutes.
3. Effect only lasts 2 hours, leading to return to baseline symptoms (rebound). If unable to observe for at least 2 hours in the office, consider transfer to the ED.
4. Does not alter the natural history of croup. Needs to be given with dexamethasone.
5. Can be repeated in 20-60 minutes as needed in severe croup or impending respiratory failure. Consider cardiac monitor if giving frequent doses.
6. If two doses given in the office, needs to be transferred to the ED for admission.
7. Nebulized L-epinephrine (standard epinephrine used in resuscitation) is equally effective. Dose 0.5 mL/kg/dose of 1:1000 (max dose 5 mL).

Therapies with no proven effectiveness

- Humidified mist has no proven effectiveness in patients seen in the office, but is commonly still used as an adjunct therapy in the home setting.
- Antibiotics
- Antitussives
- Antihistamines
- Decongestants
- Nebulized Bronchodilators

Discharge Criteria

- No stridor at rest
- No retractions
- Taking oral fluids
- Parents able to return if needed

Croup Care Guideline
Emergency Department

CHOC Children's

Inclusion Criteria
- Age 6 mo to 6 years
- Barky cough
- Stridor
- Hoarse voice/cry

Triage
ESI level is dependent on level of respiratory distress

Exclusion Criteria
- Outside age range
- Toxic appearance
- Pre-existing upper airway abnormality
- Known neuromuscular disease or Down Syndrome
- Poor response to therapy
- Possibility of epiglottitis or bacterial tracheitis

Severity

Mild
- No stridor at rest (may be present with agitation)
- Occasional barky cough
- No or minimal retractions
- No distress or agitation

Dexamethasone
0.6 mg/kg oral or IM (max 10 mg)

- Discharge home
- Phone follow-up or return to clinic/PMD in 24 hours

Moderate
- Stridor at rest
- Frequent barky cough
- Mild to moderate retractions
- No or minimal distress or agitation

Minimize agitation during evaluation and treatment

Racemic Epinephrine
2.25%, 0.05 mL/kg (max 0.5 mL) in 3 mL NS by nebulizer
and
Dexamethasone
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Observe for minimum of 2 hours and up to 4 hours

Severe
- Prominent stridor
- Frequent barky cough
- Marked or severe retractions
- Significant distress or agitation

- Minimize agitation during evaluation and treatment
- O2 if pulse ox < 92%. If no pulse ox, give blow by O2

Racemic Epinephrine
2.25%, 0.05 mL/kg (max 0.5 mL) in 3 mL NS by nebulizer
and
Dexamethasone
0.6 mg/kg oral or IM (max 10 mg)

Close observation of vital signs and respiratory status

Meets Discharge Criteria
- No stridor at rest
- No retractions
- Taking oral fluids
- Parents able to return if needed
- Able to return to clinic/PMD in 24 hours

Improved

Not improved or worsening

Consider second dose of Racemic Epinephrine after 30-60 minutes if no improvement or worsening

Admit
VS
Outpatient Observation
- Physicians document reason for inpatient placement

Outpatient Observation Criteria
Severe croup symptoms for outpatient treatment that has failed including 1 or more of the following:
- Increased respiratory rate
- Moderate to severe stridor at rest
- Marked retractions
- Restlessness
- Clinical response to outpatient therapy uncertain
- Outpatient supervision by parents or caregivers uncertain

Inpatient Criteria
Admission is indicated for 1 or more of the following:
- Progressive stridor
- Cyanosis or pallor
- Hypoxia
- Altered level of consciousness
- Tachypnea
- Significant finding or clinical condition judged too severe or too persistent to be within scope of observation care
- Require supplemental oxygen or respiratory treatment for over 24 hours that are performable only in acute inpatient setting
- Other treatment or monitoring requiring inpatient admission

Go to Inpatient Croup Guideline

Approved EBM Committee 7-15-15

Inpatient Croup Care Guideline

CHOC Children's

Inclusion Criteria: Previously healthy children 6 months – 3 yrs of age who:

- Have persistent respiratory distress
- Require frequent racemic epinephrine
- Are not deemed eligible for outpt management (social situation, uncertainty of diagnosis, severity of symptoms, etc)

Exclusion Criteria: PICU status, fever ≥ 39°C, toxic appearance, hypoxemia, or other suspicion of bacterial infection

Assessment
Accurate history and physical including immunization history, O_2 saturation

Treatment

- Dexamethasone 0.6mg/kg (max 10 mg) oral or IM one time (if not already given)
- Nebulized racemic epinephrine 0.5mL in 3 mL NS q 2 hr PRN for inspiratory stridor at rest or respiratory distress

Continued Considerations

- Consider additional dose of Dexamethasone if no clinical improvement
- If toxic appearing, consider alternative diagnoses and further work-up (see recommendations/considerations)

Discharge Criteria

- No stridor at rest
- No respiratory distress
- No racemic epinephrine for 6 hours
- Received steroids
- Tolerating po
- Has PMD follow up available

Recommendations/ Considerations

Croup mainly occurs in children from 6 months - 3 years of age with a mean age of 18 months.

Most cases are viral in origin (mainly parainfluenza) and occur during spring and late fall.

Rare causes of stridor (bacterial tracheitis & epiglottitis) must be considered and excluded. Consider CBC, blood culture, lateral neck xray (with caution due to risk of laryngospasm).

If < 6 months of age, consider structural or acquired etiologies, i.e. tracheomalacia, subglottic stenosis, vocal cord paralysis.

There is insufficient evidence supporting the use of cool mist in the treatment of croup (Moore M, Little P – see references).

Severity Classifications of Croup

Mild: occasional barking cough, no stridor at rest, mild or no suprasternal or subcostal retrations
Moderate: frequent barking cough, audible stridor at rest, visible retractions but little distress or agitaiton
Severe: frequent barking cough, prominent inspiratory (& occasional expiratory) stridor, conspicuous retractions, decreased air entry on auscultation, significant distress & agitation
Impending respiratory failure: lethargy, dusky appearance, decreasing retractions

Patient Education
Kids Health handout on Croup – parent version (English and Spanish)

Approved Evidence Based Medicine Committee
1-15-14
Previous versions - 5-21-08, 7-15-09, 9-27-10

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Croup Care Guideline

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