Practice Guideline
Croup

**Inclusion Criteria:**
- Child 6 mos-6 years
- Barky cough
- Stridor

**Exclusion Criteria:**
- Recent airway procedure or intubation
- Concern for foreign body aspiration
- History of: prolonged intubation, tracheomalacia, laryngomalacia, vascular sling, tracheo-esophageal fistula, airway abnormality, congenital heart disease, chronic lung disease, immunocompromised

**Not routinely recommended:**
- Chest/neck x-ray
- Antibiotics
- Viral studies

Child 6 mos-6 years presents with barky cough and/or stridor

**Initial triage:**
- Toxic-appearing
- Altered mental status
- Excessive drooling

**Perform History and Physical Exam**

**Mild Croup**
Barky cough with any of the following:
- Barky cough alone
- Hoarse voice, no stridor
- Mild coarse stridor with no increased work of breathing
- Stridor only when agitated

**Medication Dosing:**
- **Dexamethasone** 0.6 mg/kg (max 10mg) PO/IM/IV (crushed tabs or IV solution can be given PO)
- **Nebulized epinephrine** 2.25%
  - < 5kg: 0.25 mL
  - ≥ 5 kg: 0.5 mL

**Moderate Croup**
Stridor at rest with any of the following:
- Moderate retractions
- Anxious
- Decreased air entry
- Moderate tachypnea

**Severe Croup**
Stridor at rest with any of the following:
- O2 sat 90-95%
- Severe retractions
- Severe tachypnea
- Markedly decreased air entry
- Grunting, head bobbing, see-saw breathing

**Dexamethasone PO***
- Nebulized Racemic Epi*

**Clinically improved??**
- Complete improvement
- NO or partial improvement

**Repeat nebulized Racemic Epi** in 15-20 mins and consider cardiac monitoring
- Consider Alternate Diagnoses#

**Severe croup clinically improved??**
- Complete improvement
- NO or partial improvement

**Repeat Racemic Epi**
- Strongly consider Alternate Diagnoses#
- Consider intubation
- Arrange for PICU admit or transfer via EMS

**Consider discharge if following criteria met:**
- If given Racemic Epi neb, and observed for 2-3 hrs with no return of symptoms
- No retractions, increased work of breathing, stridor at rest
- Tolerating PO intake

**Arrange for inpatient admission—if not available transfer via ALS**

**Exit Guideline**
- Assess and stabilize ABCs
- Initiate ALS / PICU transport to higher level of care

**#Alternate Diagnoses:** Bacterial tracheitis, Epiglottitis, Foreign body aspiration, Retro-pharyngeal or Para-pharyngeal abscess, Pneumonia, Bronchiolitis, Chemical inhalation

**Clinically improved:** Resolution of stridor, retractions, and tachypnea. Normal air entry

**Exit Guideline**
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Introduction/Pathophysiology

Laryngotracheitis (classically referred to as croup) is an inflammatory process of the upper airway (larynx and trachea). It is most commonly caused by a viral infection, most typically parainfluenza virus. It is most commonly seen in children 6-36 months of age, rarely over 6 years of age and is most common in the fall/winter season.

Signs and Symptoms

The following are commons signs and symptoms seen in croup:
- Congestion, nasal irritation
- Coryza
- Barking cough (typically lasts up to 3 days)
- Hoarse voice
- Stridor at rest or increased with agitation
- Fever

The following are NOT commonly seen in croup and other diagnoses should be considered:
- Hypotension
- Excessive drooling/inability to control secretions
- Toxic appearing
- Purulent secretions
- Throat pain
- Muffled voice
- Neck mass/swelling
- Rarely, hypoxia/cyanosis

Diagnosis

The diagnosis of croup is primarily a clinical diagnosis. Radiographs and laboratory testing are generally not indicated unless: 1) The course is atypical such as not responding promptly to treatment or recurrent croup or 2) the presentation has atypical features, such as those symptoms listed above including toxic appearance, cyanosis and neck mass.

Differential diagnosis includes Bacterial Tracheitis, Epiglottitis, Foreign Body Aspiration, Retropharyngeal or Parapharyngeal Abscess, Pneumonia, Bronchiolitis, Chemical Inhalation.

Treatment

- **Dexamethasone** - Indicated in all cases of croup. It should be given in the least invasive way possible, preferably PO when possible. Dosing is 0.6 mg/kg with a max dose of 10mg. If you do not have the liquid form available, you can also give crushed tabs or the IV solution by mouth.

- **Nebulized Racemic Epinephrine 2.25%** - Indicated in moderate to severe croup associated with respiratory distress, increased work of breathing and stridor at rest. Recommended dosing is 0.25 mL for <5Kg and 0.5 mL of ≥5Kg.

- Recurrent croup may require further outpatient workup (for tracheomalacia, laryngomalacia, vascular sling, tracheoesophageal fistula, etc.)

Croup Quality Measures

- Rate of antibiotic prescriptions or delivery in ED
- Rate of x-ray use
- Rate of viral testing
- Transfer rate
- Rate of ED return visit < 48 hrs

Acknowledgements

Boston Children’s Croup EBG (Weiner et al.), Seattle Croup Clinical Pathway (Enriquez et al.), CHOP Clinical Pathway (Piccione et al.)

References