

## **Croup**

**(Laryngo-Tracheo Bronchitis)**

- 1. Epidemiology**
  - a. Incidence of complicated croup cases
    - i. Hospitalizations: 1-15% of US cases (20,000 per year)
    - ii. Intubations: 1-5% of cases hospitalized
  - b. Boys affected more than girls by ratio of 1.4 to 1
  - c. Outbreaks and epidemics occur in autumn to early winter
  - d. Affects ages under 10 years (peaks at age 1-2 years)
- 2. Pathophysiology**
  - a. Subglottal infection
- 3. Etiology**
  - a. Parainfluenza virus type 1
  - b. Parainfluenza virus types 3, 2
  - c. Respiratory Syncytial Virus (RSV)
  - d. Influenza A and Influenza B
  - e. Mycoplasma pneumoniae
- 4. Symptoms (Gradual Onset)**
  - a. Fever
  - b. Coryza (acute rhinitis) precedes other symptoms by several days
  - c. Upper respiratory symptoms rapidly develop
    - i. Hoarseness
    - ii. Cough: "Barking" Or "Seal-like"
    - iii. Inspiratory Stridor
  - d. Symptoms worse at night
- 5. Signs**
  - a. "Sound worse than they look" (Opposite of Epiglottitis)
  - b. Mild to Moderate respiratory distress
  - c. Mild Wheezes
- 6. Labs**
  - a. Complete Blood Count with mild Leukocytosis
- 7. Radiology: Neck XRay**
  - a. Subglottic Narrowing
  - b. "Steeples" sign on PA Neck XRay (40-50% of croup cases)
  - c. Narrowing of subglottic region from mucosal edema
  - d. Images

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Click picture to enlarge while on the Internet (Used with permission from MedPix)

- 8. Differential Diagnosis (Croup is diagnosis of exclusion)**
  - a. Epiglottitis**
  - b. Bacterial tracheitis**
  - c. Peritonsillar Abscess**
  - d. Foreign-body obstruction**
    - i. History of choking episode (88%)**
    - ii. Neck XRay PA and Lateral if object is radiopaque**
- 9. Management: Emergency Department and Inpatient**
  - a. Keep Patient Calm!**
  - b. Humidified Oxygen**
    - i. Use Humidified Oxygen Tent for Infants**
  - c. Nebulized Racemic Epinephrine**
    - i. Pharmacokinetics**
      - 1. Effects last 90 to 120 minutes**
    - ii. Precautions**
      - 1. Avoid too frequent use due to tachyphylaxis**
      - 2. Observe 2-4 hours after racemic epinephrine**
    - iii. Dose**
      - 1. Nebulizer mix: Racemic Epinephrine (2.25%)**
        - a. Child under 6 months: 0.25 ml & 2-3cc NS**
        - b. Child: 0.5 ml & 2-3cc NS**
        - c. Adolescent: 0.75 ml & 2-3cc NS**
      - 2. Frequency of dosing**
        - a. Nebulized Racemic Epinephrine may be repeated in 30 minutes**
        - b. Monitor Heart Rate closely with repeat dosing**
  - d. Corticosteroids**

- i. Dexamethasone (Decadron)**
  - 1. Indications**
    - a. Moderate Croup with 2-3 awakenings on prior night**
  - 2. Contraindications**
    - a. Exposure to Varicella Zoster within prior 3 weeks**
    - b. Varicella Virus Vaccine (Varivax) in prior 2 weeks**
  - 3. Preparations**
    - a. Dexamethasone (Decadron)**
      - i. 0.6 mg/kg IM/IV/PO**
      - ii. Oral as effective as intramuscular**
    - b. Nebulized Budesonide or Dexamethasone**
      - i. Effective, but IM/IV/PO Dexamethasone (Decadron) preferred**
  - 4. Efficacy in Croup**
    - a. Clinical improvement**
      - i. Improvement onset in 6 hours**
      - ii. Improvement continues for 12-24 hours**
    - b. Decreases need for intubation by 80%**
    - c. Adverse Effects**
      - i. Increased appetite**
      - ii. Increased aggressiveness**
- e. Antibiotics**
  - i. Not indicated unless concurrent bacterial infection**
- f. Helium Added to Oxygen**
  - i. May prevent intubation in borderline patients**
- g. Intubation**
  - i. Indicated less frequently now with above management**
  - ii. Significant risk of subglottic stenosis**
  - iii. Use ET Tube at least 1 size smaller than predicted**