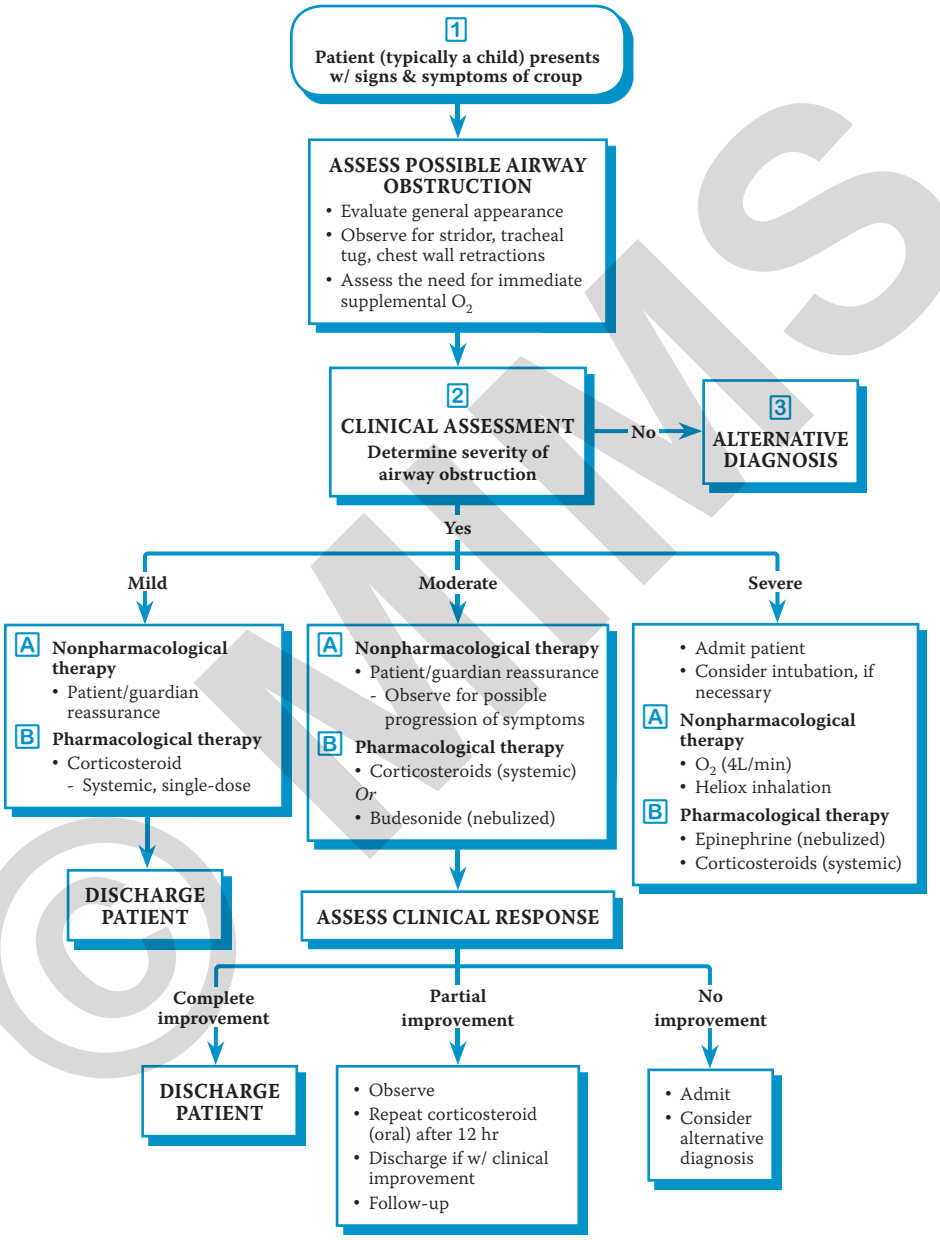
Croup (1 of 4)



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1 CROUP

Croup is often characterized by an acute, rapidly progressing resp disease
- Common cause of upper resp tract obstruction in childn
- Rarely occurs in adults
- Often self-limiting but may possibly cause severe resp obstruction
- Develops concurrent w/ coryzal disease
- Most common causes of croup:
  - Parainfluenza virus 1-3 (type 1 being most common)
  - Respiratory syncytial virus
- Occurrence of symptoms is usually at night & w/ abrupt onset, & improve during daytime

Signs & Symptoms
- Barking cough
- Dyspnea, w/ possible rapid progression to airway obstruction
- Hoarse voice
- Inspiratory stridor may be severe & may herald complete airway obstruction
- Fever may or may not occur

2 CLINICAL ASSESSMENT

Croup in children is a medical emergency requiring immediate treatment

Severity of Airway Obstruction

Mild
- Occasional barking cough
- Patient is comfortable, no cyanosis
- Intermittent stridor may or may not be observed
- Chest wall retractions minimal or none at all

Moderate
- Frequent barking cough
- Stridor persistent even at rest
- Chest wall retractions at rest are observed, tracheal tug & nasal flaring present
- Tachycardia, labored breathing, increased respiratory rate
- Irritable, little or no distress
- Symptoms may progress to severe airway obstruction, careful observation is warranted

Severe
- Frequent barking cough
- Patient appears tired, easily irritated, lethargic & exhausted, restless & agitated
- Persistent tachycardia
- Prominent stridor even at rest (inspiratory w/ or w/o expiratory stridor)
- Marked chest wall retractions, tracheal tug & nasal flaring present, markedly increased/decreased respiratory rate

Impending Resp Failure
- Barking cough (may not be prominent)
- Audible stridor at rest
- Chest wall retractions
- Irrational behavior, decreased level of consciousness
- Hypotonia
- Pallor, cyanosis w/o supplemental O_2

Lab Tests

Oximetry
- Determines oxygen saturation
- Clinical assessment is more important than oximetry results
  - Patient with symptoms of severe resp obstruction may present w/ nearly normal oxygen saturation on oximetry

3 ALTERNATIVE DIAGNOSIS

Diphtheria
- Characterized by malaise, sore throat, anorexia, & low-grade fever
- W/in 2-3 days, pharyngeal exam may show a typical gray-white membrane adherent to the tissue that bleeds when attempted to be removed
- W/ insidious course but sudden respiratory obstruction may occur

Epiglottitis
- Characterized by sudden onset of high fever, dysphagia, drooling & anxious appearance
- Patient prefers to sit forward in sniffing position
- Barking cough is rarely observed

Tracheitis
- Patient appears febrile, toxic & gives poor response to Epinephrine

Other Causes of Stridor
- Foreign body
- Retropharyngeal abscess
- Hereditary angioedema

A NON-PHARMACOLOGICAL THERAPY

Parent/Guardian Reassurance
- Actions that minimize anxiety are appropriate until the airway is secure
- Child should be held & comforted
- Avoid anxiety-provoking maneuvers (eg blood extraction, IV line placement, placing the child in a supine position or direct inspection of the oral cavity) until the airway is secure

Helium-Oxygen (Heliox) Inhalation
- Further studies are needed to prove the use of heliox in patients w/ croup
- May be useful in reducing resistance of airflow & turbulence, thereby decreasing the work during respiration in patients w/ croup

Oxygen Therapy
- Provide supplemental O_2 if necessary

Humidification therapy
- Also called mist therapy, uses humidified air to help reduce mucosal surface dryness & thickening of secretions
- Recommended for children hospitalized due to croup
- Has not been proven to be an effective treatment to reduce croup severity

A PHARMACOLOGICAL THERAPY

Epinephrine (Nebulized)
- Should be given to patients w/ severe resp distress
- Reduces symptoms w/in min but exerts no effect beyond 1 hr
- Hold discharge & observe patient for at least 2 hr after administration of Epinephrine
- Nebulized Epinephrine w/ oral Dexamethasone is indicated for moderate to severe croup

Corticosteroid (Systemic)
- Eg Dexamethasone, Prednisolone
- Should be given to childn diagnosed w/ croup
- Improves symptoms & reduces risk of hospital admission
- Well-absorbed, relatively safe
- Multiple doses do not provide additional benefit over a single dose
- Should not be given to a child w/ known immune deficiency or recent varicella exposure

Dexamethasone
- Recommended first-line corticosteroid therapy for croup due to its long half-life

Corticosteroid (Nebulized)
- Eg Budesonide
- May be given to childn diagnosed w/ croup who are intolerant to Dexamethasone
- Administration may cause more agitation to the child
- Not routinely given to a child due to its cost, length of administration & anxiety that it causes
  - Indicated only in patients w/ persistent vomiting & w/ severe resp distress
  - Budesonide may be mixed w/ Epinephrine & administered simultaneously

Dosage Guidelines

ADRENERGIC AGONIST		
Drug	**Dosage**	**Remarks**
Epinephrine (Adrenaline)	**Nebulization:** **Racemic Epinephrine** 0.5 mL of 2.25% soln in 3 mL NS or sterile water **L-Epinephrine** 5 mL of 1:1,000 soln	**Adverse Reactions** • CNS effects (anxiety, cerebral hemorrhage, dizziness, headache, insomnia); GI effects (dry throat, loss of appetite, N/V); Neuromuscular effects (tremor, weakness); Resp effects (dyspnea, pulmonary edema); Others (ocular effects, diaphoresis) **Special Instruction** • Patient should be observed for at least 2 hrs after treatment w/ Epinephrine

CORTICOSTEROID (INHALED)		
Drug	**Dosage**	**Remarks**
Budesonide	**Nebulization:** 2 mg as a single dose **or** 1 mg x 2 doses 30 min apart	**Adverse Reactions** • CNS effects (headache, dizziness); GI effects (N/V, abdominal pain, wt gain, diarrhea); Resp effects (rhinitis, throat irritation, cough, hoarseness, *Candida* infection in oropharynx); Dermatologic effects (urticaria, rash, dermatitis, skin irritation); Hypersensitivity reaction (contact dermatitis, anaphylaxis); Other (adrenal suppression) **Special Instructions** • Rinse mouth after treatment to decrease oral candidiasis • Contraindicated in primary treatment of status asthmaticus, acute asthma

CORTICOSTEROIDS (SYSTEMIC)		
Drug	**Dosage**	**Remarks**
Dexamethasone	0.15-0.6 mg/kg PO/IM as a single dose	**Adverse Reactions** • CNS effects (headache, dizziness); GI effects (N/V, abdominal pain, wt gain, diarrhea); Resp effect (pulmonary edema); Dermatologic effects (urticaria, rash, dermatitis, skin irritation); Hypersensitivity reaction (contact dermatitis, anaphylaxis); Other effects (adrenal suppression, infection) **Special Instructions** • Take w/ food • Should discontinue treatment gradually
Prednisolone	1-2 mg/kg PO/IM as a single dose	

All dosage recommendations are for children w/ normal renal & hepatic function unless otherwise stated.
Not all products are available or approved for above use in all countries.
Products listed above may not be mentioned in the disease management chart but have been placed here based on indications listed in regional manufacturers' product information.
Specific prescribing information may be found in the latest MIMS.

Please see the end of this section for the reference list.