Croup

Inclusion Criteria:

Previously healthy children aged 6 months to 6 years with signs and symptoms of viral illness with associated barky cough and inspiratory stridor

Exclusion Criteria:

Alternative diagnosis should be considered if:

- Toxic Appearance: Pallor, lethargic, acute/abrupt onset and unimmunized status should prompt consideration for bacterial tracheitis / epiglottitis
- Drooling or difficulty swallowing (FB, retropharyngeal abscess)
- Expiratory wheezing
- Known previous history: Laryngo/ tracheomalacia, or previously diagnosed vascular ring/sling/ tracheoesophageal fistula
- Prior non-elective intubation in past 6 months, or prolonged intubation
- Recurrent episodes, two episodes in last 30 days, three episodes in 1 year.

Croup Severity Score				
Air Entry	Normal (0)	Decreased (1)	Markedly Decreased (2)	
Chest Wall Retractions	None (0)	Mild (1)	Moderate (2)	Severe (3)
Cyanosis	None (0)	With Agitation (4)	At Rest (5)	
Level of Consciousness	Normal (0)	Disoriented (5)		
Stridor	None (0)	With Agitation (1)	At Rest (2)	

Generally, lab tests, respiratory pathogen panels (RPP), and X-Ray (chest and/or lateral neck) do not change outcomes in typical croup and are not required

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Mild Croup Score < 2	Moderate Croup Score 3 to 7	Severe Croup Score 8 to 11	Impending Respiratory Failure Score >12
Single dose of PO/IM/IV dexamethasone 0.3-0.6mg/kg (MAXIMUM dose 16mg) – PO preferred route unless unable to tolerate PO *Multiple studies have shown mild croup can be treated with lower dosing of dexamethasone down to 0.15mg/kg.			
Education regarding illness course, concerning symptoms and when to seek medical assessment.	Minimize intervention/stress Place child in position of comfort *	Minimize intervention/stress Place child in position of comfort* Give racemic epi neb (2.25% or 0.5ml in 2.5mL of saline).	Minimize intervention/stress Place child in position of comfort*, O2 via NC or mask should be administered. **Hypoxemia is rare in croup and should be as a sign of impending respiratory failure**. Give racemic epi neb (2.25% or 0.5ml in 2.5mL of saline). Consider IM epi, Heliox 70/30, or HFNC.
Home treatment: Antipyretics, cool-mist, oral fluids	May consider trial of racemic epinephrine (2.25% or 0.5ml in 2.5mL of saline). If racemic epi given, minimum 3-hour observation	Repeated doses of nebulized racemic epinephrine may be needed	Nebulized racemic epinephrine repeated doses as needed.
Discharge home with follow up in 24-48hrs	Hospitalization is generally not needed but may be warranted for persistent or worsening symptoms or if repeated doses of racemic epinephrine are needed.	Hospital admission is warranted If repeat racemic epi nebulizers are needed, oxygen requirement or stridor at rest.	Contact pediatric ICU or Anesthesiology for airway stabilization and for further management. Call for transfer to tertiary care facility. Update Pediatric ENT for assistance with further management.
*Place child in parents lap during exam, minimize agitation and intervention including IV, blood draws, etc. Involve parents in placing exam, placing nasal cannula and in giving medications. Involve Child Life specialist for distractions if available			

ED Discharge Criteria

- Receives 1 dose of dexamethasone
- Minimum of 2h since last racemic epinephrine treatment (if received)
- ≤ 2 racemic epinephrine within 4 hours
- Mild or improved croup symptoms
  - Minimal/improved or no stridor – refer to scoring
  - Minimal/improved or no suprasternal or intercostal retractions at rest – refer to above scoring
- Able to talk and feed without difficulty
- No supplemental oxygen or hydration requirement

Inpatient Admission Considerations (does not substitute for clinical judgment)

- Receives ≥ 3 racemic epinephrine or requires racemic epinephrine more frequently than Q2 hours x 2 doses in the ED and/or
- Persistent stridor at rest, respiratory distress, tachypnea or
- Inadequate hydration or
- Need for supplemental oxygen or
- Concern for alternative diagnosis
- Does not exceed floor care limitations:
  - Floor can administer racemic epinephrine Q2hours; Floor cannot start heliox or positive pressure ventilation.
  - If a child is unable to go more than 2 hours between racemic epi nebs, needs hourly treatments/ assessments, or fails to respond to interventions, should consider ICU level of care.

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Inpatient Clinical Recommendations

- There is no indication for cool mist humidified oxygen therapy for the hospital treatment of croup
- Most children show rapid improvement with racemic epinephrine, failure to respond should prompt consideration of alternative diagnosis
- Lab testing, respiratory pathogen panels, neck imaging do not alter the management of croup
- No indication for home racemic epinephrine nebulizer treatments
- No strong indication for repeat doses of steroids at time of discharge except croup associated with COVID-19. Those patients may need repeat dosing of steroids within 24-48 hours

ENT Consultation Criteria

- ENT Inpatient Consultation for direct laryngoscopy/ bronchoscopy or bedside flexible laryngoscopy if history of intubation, recurrent episodes outside normal age range (< 6 months, > 6 years), concern for airway anomalies, atopy or GERD
- Consider consultation if fail to improve after 36hrs hours of receiving first steroid dose, racemic epinephrine and observation

Inpatient Discharge Criteria:

- Minimal stridor at rest. No signs or symptoms of significant respiratory distress
- Adequate oral hydration
- Greater than 4-6 hours since last racemic epinephrine
- No oxygen requirement for several hours
- Appropriate follow up for the child in the outpatient setting

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