SSMHealth Cardinal Glennon Children's Hospital

Evaluation and Management of Croup in the Emergency Department or Urgent Care Clinical Practice Guideline

AIM
- Sustain low unnecessary resource utilization for children with croup (testing, imaging, treatment)
- Optimize inpatient admissions and decrease unnecessary ICU admissions for patients with croup

EXCLUSION CRITERIA
- Age less than 6 months or over 6 years
- Toxic appearance
- Impending or active significant respiratory failure manifested by severe increased work of breathing, hypoxemia, poor respiratory effort, or altered mental status
- Known or suspected foreign body aspiration
- Known vocal cord paralysis/dysfunction
- Presence of tracheostomy or active airway anomaly

INCLUSION CRITERIA
- Clinical appearance consistent with croup, typically with one or more of the following
  - Barky cough
  - Hoarse voice or cry
  - Stridor
  - Fever, increased work of breathing may or may not be present and are less likely to be indicative of croup without any of the above findings
- Absence of exclusion criteria

USE WITH CAUTION/SPECIAL CONSIDERATIONS

This guideline may not consistently or appropriately apply to patients with the following conditions, despite having suspected viral croup:
- Laryngomalacia
- Tracheomalacia
- Subglottic stenosis
- Vascular ring
- History of Tracheoesophageal fistula
- Hypotonia or neuromuscular disorder
- Complex co-morbidities

ASSESS CROUP SEVERITY

Does the patient have any of the following?
1. Stridor at rest
2. Moderate to severe tachypnea
3. Moderate to severe retractions

NO →

MILD CROUP
- Administer Dexamethasone (oral)
  - 0.6mg/kg (max 12mg)
- Minimize agitation and discomfort
  - Allow child to be held/sit on parent's lap
  - Minimize agitating interventions
  - Consider antipyretic/analgesic therapy if indicated
- Ensure ability to tolerate oral fluid and assess hydration status
- Assess discharge criteria, discharge home if criteria are met and there is no other indication for admission or transfer

YES →

MODERATE/SEVERE CROUP
- Administer
  Dexamethasone (oral): 0.6mg/kg (max 12mg)
  AND
  Nebulized racemic epinephrine (0.5mL of 2.5%)
- Minimize agitation and discomfort
  - Allow child to be held/sit on parent's lap
  - Minimize agitating interventions
  - Consider antipyretic/analgesic therapy if indicated
- Ensure ability to tolerate oral fluid and assess hydration status
- Support airway and breathing as indicated

Improvement with racemic epinephrine?

NO →

CONSIDER ALTERNATIVE DIAGNOSES (See Page 2)

IF CROUP IS STILL SUSPECTED, PROCEED WITH ALGORITHM AND PROVIDE ADDITIONAL RESPIRATORY SUPPORT INTERVENTIONS AS INDICATED

YES →

OBSERVE FOR UP TO 2 HOURS
- A 2-hour observation is recommended for most patients, when able
- If a shorter period of observation is deemed necessary due to closure of a site, high clinical volume/demand, or family preference, shared decision making should be utilized to determine optimal observation period and disposition, including follow-up

RECURRENCE OF STRIDOR WITHIN OBSERVATION PERIOD
- Repeat nebulized racemic epinephrine
- Minimize agitation/discomfort
- Support airway and breathing as indicated
- Observe for up to 2 hours after administration of racemic epinephrine
  - A 2-hour observation is not required prior to admission after the 3rd dose of racemic epinephrine

DISPOSITION
- Assess Discharge Criteria and Admission/Transfer Considerations
- Disposition as appropriate

DISCHARGE CRITERIA
- No stridor at rest
- Minimal to no retractions, tachypnea, or other signs of respiratory distress
- No hypoxemia or need for respiratory support above baseline
- Ability to maintain hydration with oral intake
- Family comprehends diagnosis, treatment, goals of care, return precautions
- Family has appropriate means to communicate changes in clinical status and coordinate follow up care, including access to transportation
- No other indication for admission

CONSIDER ADMISSION OR TRANSFER

Admission Criteria
- 3 or more doses of racemic epinephrine required
  - There is minimal evidence of benefit to admission solely due to administration of 2 doses of racemic epinephrine without other admission indications or circumstances necessitating admission
- If admission is occurring after the 3rd dose of racemic epinephrine, a 2-hour observation period is not required provided the patient is otherwise stable for the anticipated level of care/unit being admitted to
- Persistent or recurrent respiratory distress, hypoxemia, or oxygen requirement above baseline
- Severe croup not improving with racemic epinephrine
- Discharge criteria not met

Transfer Considerations (Cardinal Glennon Access Center: 888-229-2424)
- Patient requires admission and is currently being treated at a facility without inpatient pediatric services
- Patient unable to receive ongoing observation or care at current facility
- For patients being considered for admission, consider Direct Admission if above admission criteria are met and patient is clinically stable

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ALTERNATIVE DIAGNOSES

Diagnostic Findings

The presence of the following MAY suggest an alternative diagnosis to croup
- Biphasic stridor
- Ill or toxic appearance
- Unvaccinated or under-vaccinated status
- Recurrent episodes of croup within 30 days
- Recurrent visit for stridor within 24 hours
- Lack of response to racemic epinephrine
- Suspected or witnessed choking episode/foreign body ingestion

Alternative Diagnoses to Croup include, but are not limited to:
- Bacterial tracheitis
- Epiglottitis
- Airway anomaly
- Foreign body aspiration
- Anaphylaxis
- Mass effect
  - Retropharyngeal abscess
  - Hemangioma
  - Mediastinal Mass
  - Intracranial Mass

GUIDELINE DISCLAIMER

This guideline was developed by the listed authors using publicly available evidence and expert opinion and is approved for clinician use in the SSM Health System by the below committees. The guideline is intended for use by providers treating pediatric patients and may broadly be provided to the majority of patients being treated for the addressed condition(s). The guideline is not meant to replace clinical judgement in individual cases, and care must be taken to address the needs of each individual patient and family to ensure appropriate, timely, and quality care is provided in each clinical encounter. As medicine is always changing and evolving, SSM Health, the listed authors and committees, and any other party involved in the authorship and distribution of this guideline is not responsible for errors, omissions, or outcomes related to clinician use of the guideline

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References

1. Hester G, Nickel AJ, Watson D, et al. Use of a Clinical Practice Guideline and Orderset to Reduce Hospital Admissions for Croup. *Pediatrics*. 2022; 150(3):e2021054507.
2. Bergmann KR, Lefchak B, Nickel A, et al. Variation in Organizational Clinical Practice Guidelines for Croup. *Hosp Pediatr*. 2023; 13(9):e241-e245.
3. Lefchak B, Nickel A, Lammers S, et al. Impact of Clinical Practice Guidelines on Hospital Utilization in Children with Croup. *Hosp Pediatr*. 2023; 13(9):768-774.
4. Maalouli W, Petersen A, Strutt J, et al. Prediction Model for Croup Admission Need. *Hosp Pediatr*. 2022; 12(8):711-718.
5. Pound CM, Knight BD, Webster R, et al. Predictors of Hospitalization for Children with Croup, a Population-Based Cohort Study. *Hosp Pediatr*. 2020; 10(12):1068-1077.
6. McDaniel CE, Leyenaar J, Sullivan E, et al. Pediatric Conditions Requiring Minimal Intervention or Observation After Interfacility Transfer. *J Hosp Med*. 2021; 16(7):412-415.
7. Asmundsson AS, Arms J, Kaila R, et al. Hospital Course of Croup After Emergency Department Management. *Hosp Pediatr*. 2019; 9(5):326-332.
8. Maalouli WM, Hodges JS. Croup Admissions: Can We Shrink the Elephant in the Room? *Pediatr Emerg Care*. 2021; 37(12):e940-e943.
9. Hancock WC, Scott M, Winer JC. Predictors of Inpatient Racemic Epinephrine Use in Patients Admitted with Croup. *Hosp Pediatr*. 2023; 13(3):258-264.
10. Walsh PS, Zhang Y, Lipshaw MJ. Variation in Emergency Department Use of Racemic Epinephrine and Associated Outcomes for Croup. *Hosp Pediatr*. 2023; 13(2):167-173.
11. Hester G, Barnes T, O'Neill J, et al. Rate of Airway Intervention for Croup at a Tertiary Children's Hospital 2015-2016. *J Emerg Med*. 2019; 57(3):314-321.
12. Rudinsky SL, Sarieff GQ, Law W, et al. Inpatient Treatment after Multi-Dose Racemic Epinephrine for Croup in the Emergency Department. *J Emerg Med*. 2015; 49(4):4018-414.
13. Udoh I, Heegeman D, Ravi S. Retrospective Evaluation of Return Rates in Pediatric Patients Treated with Inhaled Racemic Epinephrine for Croup. *WMJ*. 2022; 121(1):26-29.
14. Bagwell T, Hollingsworth A, Thompson T, et al. Management of Croup in the Emergency Department: The Role of Multidose Nebulized Epinephrine. *Pediatr Emerg Care*. 2020; 36(7):e387-e392.
15. Jafari K, Gupta A, Caglar D, et al. Potentially Avoidable Emergency Department Transfers for Acute Pediatric Respiratory Illness. *Acad Pediatr*. 2025; 25(1):102553.
16. Garzon Mora N, Jaramillo AP, Briones Andriuoli R, et al. An Overview of the Effectiveness of Corticoids in Croup: A Systematic Literature Review. *Cureus*. 2023; 15(10):e46317.
17. Jiang W, Hall M, Berry JG. Comparative Effectiveness of Dexamethasone Versus Prednisone in Children Hospitalized with Acute Croup. *Hosp Pediatr*. 2022; 12(10):892-898.
18. Parker CM, Cooper MN. Prednisolone Versus Dexamethasone for Croup: A Randomized Controlled Trial. *Pediatrics*. 2019; 144(3):e20183772.
19. Reyes MA, Etinger V, Hronek C, et al. Pediatric Respiratory Illnesses: An Update on Achievable Benchmarks of Care. *Pediatrics*. 2023; 152(2):e2022058389.