

A 2-year-old boy is brought to the emergency department due to difficulty breathing that started 12 hours earlier. The child has had rhinorrhea, nasal congestion, and a dry cough that sounds "like a barking dog" for the past 3 days. His temperature is 37.7 C (99.9 F), blood pressure is 92/64 mm Hg, pulse is 122/min, and respirations are 30/min. His pulse oximetry shows 99% on room air. He has inspiratory stridor when crying. The patient is diagnosed with croup, given oral dexamethasone, and observed in the emergency department. After 20 minutes, his oxygen saturation drops to 96% on room air and respirations increase to 45/min. He develops subcostal and intercostal retractions and inspiratory stridor at rest. What is the most appropriate next step in management of this patient?

- ☐ A. Administer nebulized albuterol
- ☐ B. Administer nebulized racemic epinephrine
- ☐ C. Administer supplemental oxygen via face mask
- ☐ D. Intubate and mechanically ventilate
- ☐ E. Place a peripheral intravenous line



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- ☐ A. Administer nebulized albuterol [5%]
- ☒ B. Administer nebulized racemic epinephrine [62%]
- ☐ C. Administer supplemental oxygen via face mask [11%]
- ☐ D. Intubate and mechanically ventilate [22%]
- ☐ E. Place a peripheral intravenous line [1%]

[Proceed to Next Item](#)

Explanation:

User Id: [REDACTED]

Croup (laryngotracheitis)	
Pathogenesis	<ul style="list-style-type: none"><li>Parainfluenza viral infection → inflammation of larynx &amp; trachea</li></ul>
Epidemiology	<ul style="list-style-type: none"><li>Age 6 months to 3 years</li><li>Fall, early winter</li></ul>
Clinical features	<ul style="list-style-type: none"><li>Inspiratory stridor</li><li>"Barky," seal-like cough</li><li>Hoarse voice</li></ul>
Treatment	<ul style="list-style-type: none"><li>Mild (no stridor at rest): corticosteroids</li><li>Moderate/severe (stridor at rest):</li></ul>



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Treatment	<ul style="list-style-type: none"><li>Mild (no stridor at rest): corticosteroids</li><li>Moderate/severe (stridor at rest): corticosteroids + nebulized epinephrine</li></ul>

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**Croup** is a viral illness that causes laryngeal and tracheal inflammation leading to subglottic edema and narrowing. The classic presentation includes a "barky," seal-like cough with stridor. Mild cases (no inspiratory stridor at rest) should be treated with a single dose of **corticosteroids** (eg, dexamethasone) to decrease airway edema. Patients with moderate to severe croup (respiratory distress, stridor at rest) should be treated with corticosteroids and **nebulized epinephrine**, which constricts mucosal arterioles in the upper airway and alters capillary hydrostatic pressure, leading to decreased airway edema and reduced secretions.

**(Choice A)** Nebulized albuterol is the first-line treatment for asthma exacerbations as its beta agonist effect of bronchodilation relieves lower airway bronchospasms. Albuterol does not help reduce subglottic edema or play a role in the treatment of croup.

**(Choice C)** Although supplemental oxygen should improve hypoxemia (oxygen saturation <92%), it would not correct the underlying subglottic edema and would not be the next step in management of this patient.

**(Choice D)** Endotracheal intubation is reserved for patients who have failed treatment with corticosteroids and nebulized epinephrine and/or have signs of impending respiratory failure (eg, altered mental status, poor respiratory effort). This patient has no signs of respiratory failure and should first receive medical treatment.

**(Choice E)** Painful interventions such as intravenous line placement should be avoided.



**Treatment**

- Mild (no stridor at rest): corticosteroids
- Moderate/severe (stridor at rest): corticosteroids + nebulized epinephrine

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**(Choice E)** Painful interventions such as intravenous line placement should be avoided, if possible, as agitation can worsen upper airway obstruction.

**Educational objective:**

Croup, a viral infection that causes subglottic edema and narrowing, presents with a "barky" cough and inspiratory stridor. Patients with stridor at rest (moderate to severe croup) should be treated with corticosteroids and nebulized epinephrine, both of which can rapidly improve upper airway obstruction.

**References:**

1. [Nebulized epinephrine for croup in children.](#)
2. [Croup: an overview.](#)