

# Bronchiolitis

**Bronchiolitis is a common viral illness. It is usually caused by Respiratory Syncytial Virus (RSV) and typically occurs during the late fall and winter months. Children less than 2 years of age are most affected, with the largest burden of illness being in children less than 12 months of age. It is unknown how the COVID-19 pandemic will impact the incidence of bronchiolitis in winter 2020/21.**

**THE ILLNESS IS CHARACTERIZED BY** acute inflammation in the airways, edema & necrosis of epithelial cells lining the small airways, bronchospasm, and increased mucus production.

» **CLINICAL SIGNS AND SYMPTOMS INCLUDE** coryza, cough, wheezing, crackles, increased respiratory effort, and fever.

## Diagnosis

- » Bronchiolitis should be diagnosed on the basis of the patient’s history and physical exam.
- » The diagnosis is typically made for a first episode of wheezing in children less than 24 months of age in winter months.
- » Routine laboratory tests and chest x-rays are **NOT** helpful in diagnosing or managing bronchiolitis; use of chest x-rays is associated with inappropriate use of antibiotics.
- » Viral testing should **only** be performed for cohorting infants admitted to hospital, if necessary.
- » COVID-19 viral testing should be considered in patients presenting with bronchiolitis.
- » Consult [TREKK’s Fever in Young Infants Recommendations](#) for infants 0-60 days with febrile bronchiolitis.

## Treatment

- » **Supportive care is the cornerstone of treatment.**
- » The main management goals are to ensure adequate oxygenation and hydration.



### OXYGENATION

- » Supplemental oxygen is only necessary if oxygen saturations are persistently less than 90%.
- » Oxygen saturations should be checked **intermittently**, not continuously.
- » Limited suctioning to clear the nares may decrease respiratory distress in infants less than 4 months of age.
- » **High-flow nasal cannula** can improve work of breathing and oxygenation in infants/children with moderate-severe respiratory distress. We recommend starting at a dose of 2L/kg/minute.
- » Infants/children with signs of respiratory failure (respiratory acidosis, altered mental status, and/or apnea) or persistent severe respiratory distress will need advanced respiratory support with **non-invasive ventilation** (CPAP, BiPAP) or **invasive ventilation, and admission to a PICU.**

### HYDRATION

- » Poor feeding and dehydration can be seen in infants/children with bronchiolitis.
- » Use smaller more frequent oral feeds if tolerated.
- » Nasogastric or intravenous (IV) rehydration may be necessary for infants/children who cannot maintain oral hydration.

### MEDICATIONS

- » The majority of evidence for bronchiolitis treatment is for infants less than 12 months of age with a first episode of wheezing in the winter months. **The following treatment recommendations are intended for this population.**

**There is no evidence to support any of the following treatments for bronchiolitis, THEREFORE:**



- » **DO NOT** use salbutamol
- » **DO NOT** use ipratropium bromide
- » **DO NOT** use inhaled corticosteroids
- » **DO NOT** use antibiotics
- » **DO NOT** use oral bronchodilators
- » **DO NOT** use systemic corticosteroids

## EPINEPHRINE AND HYPERTONIC SALINE

- » There is **equivocal** evidence that nebulized epinephrine and hypertonic saline may have some benefit in bronchiolitis, thus these treatments are **not routinely recommended**.
- » If they are to be used, a single trial, rather than repeated treatments, is recommended. Perform a pre- and post-treatment assessment to document whether the child's work of breathing/respiratory status has improved.
- » Typical dosage:
  - » Epinephrine by nebulization (use 1 mg/mL injectable solution):
    - Less than 10 kg: 3 mg (3 mL)
    - Greater or equal to 10 kg: 5 mg (5 mL)
  - » Sodium Chloride 3% by nebulization: 4 mL

## Typical clinical course

- » Most infants/children do well; symptoms of bronchiolitis tend to peak around day 5 of illness.
- » Approximately 2% of infants with bronchiolitis will develop severe disease requiring respiratory support or PICU care.
- » Patient-level risk factors for severe bronchiolitis include: less than 2 months of age, history of prematurity, and presence of underlying cardio-respiratory disease or immunodeficiency.
- » Symptoms such as cough may persist for up to **3 weeks**.

## Criteria for safe discharge home

- » Infants/children with mild respiratory distress, oxygen saturation greater or equal to 90%, and adequate oral hydration may be safely discharged home.
- » Bronchiolitis resources to share with parents can be accessed in the [Patient and Family section of the TREKK website](#).

## Criteria for hospital admission

- » Admit infant/child to hospital if:
  - » Persistent oxygen saturation below 90% and requiring supplemental oxygen; AND/OR
  - » Unable to maintain oral hydration and requiring IV or NG fluids; AND/OR
  - » Persistent moderate or severe respiratory distress.
- » Consider admission or a period of observation in the ED to document adequate feeds and oxygenation (e.g. 4-6 hours) for:
  - » Infants/children with underlying cardio-respiratory disease or immunodeficiency.
  - » Infants less than 6 weeks of age or premature infants.

## Contact Pediatric Referral Site or provincial transport service for:

- » Infants presenting with apnea or those with persistent significant respiratory distress (oxygen saturation below 90%, nasal flaring and/or grunting, retractions), especially if risk factors for severe bronchiolitis are present (less than 2 months of age, history of prematurity, underlying cardio-respiratory disease or immunodeficiency).

**The purpose of this document is to provide healthcare professionals with key facts and recommendations for the diagnosis and treatment of bronchiolitis in children in the emergency department.** This summary was produced by the bronchiolitis content advisor for the TREKK Network, Dr. Amy Plint of CHEO and Dr. Gabrielle Freire of the Hospital for Sick Children, and uses the best available knowledge at the time of publication. However, healthcare professionals should continue to use their own judgment and take into consideration context, resources and other relevant factors. The TREKK Network is not liable for any damages, claims, liabilities, costs or obligations arising from the use of this document including loss or damages arising from any claims made by a third party. The TREKK Network also assumes no responsibility or liability for changes made to this document without its consent.

This summary is based on:

- 1) American Academy of Pediatrics, [Clinical Practice Guideline: The diagnosis, management and prevention of bronchiolitis](#), Pediatrics 2014; 134: e1474-e1502.
- 2) O'Brien S, et al for the PREDICT Network. [Australasian Bronchiolitis Guidelines](#). Journal of Pediatrics and Child Health 2019;55:42-53.
- 3) Fernandes RM, Bialy LM, Vandermeer B, et al. [Glucocorticoids for acute viral bronchiolitis in infants and young children](#). Cochrane 2013; Jun 4;2013(6).
- 4) Gadomski AM, Scribani MB. [Bronchodilators for bronchiolitis in infants with first-time wheezing](#). Cochrane summary 2014.
- 5) Zhang L, Mendosa-Sassi RA, Wainwright C, Klassen TP. [Nebulised hypertonic saline solution for acute bronchiolitis in infants](#). Cochrane Database Syst Rev 2017; Dec 21;12(12).
- 6) Freire G, et al. [Predicting escalated care in infants with bronchiolitis](#). Pediatrics 2018;142(3):e20174253.
- 7) Schuh S, et al. [Predictors of critical care and mortality in bronchiolitis after emergency department discharge](#). J Pediatr 2018;199:217-222.