BOTTOM LINE RECOMMENDATIONS

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 infants less than 12 months of age.

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 runny nose, cough, wheezing, crackles, increased respiratory effort, and fever.

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.[1]

Diagnosis

- Bronchiolitis is a clinical diagnosis based on the patient's history and physical exam.
- 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.[2]
- Viral testing by PCR should **only** be performed for cohorting infants admitted to hospital. Consider rapid influenza testing for high-risk patients who may benefit from antiviral treatment.[3] COVID-19 viral testing should follow local public health policies.
- Refer to 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% while awake. Transient mild desaturations during sleep are frequent, and do not warrant supplemental oxygen.[4]
- Oxygen saturations should be checked **intermittently**, not continuously, unless the patient is receiving respiratory support.[5]
- Limited suctioning to clear the nares may decrease respiratory distress in younger infants and should be considered prior to feeds.
- **High-flow nasal cannula (HFNC)** can improve work of breathing and oxygenation in infants/children with moderate-severe respiratory distress. However, trials suggest that it does not reduce the risk of subsequent ICU admission, or positive pressure ventilation (non-invasive or invasive) when compared to low-flow oxygen. Use HFNC as a rescue treatment for those who fail standard oxygen therapy and start at a dose of 2L/kg/minute.[6]
- 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 complicate a bronchiolitis episode.
- Use smaller more frequent oral feeds, if tolerated.
- Nasogastric (NG) or intravenous (IV) rehydration may be necessary for infants/children who cannot maintain oral hydration or are on positive-pressure ventilation. NG tube is the hydration method of choice since it is easier to insert and associated with fewer adverse events.[7]

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BOTTOM LINE RECOMMENDATIONS

Bronchiolitis

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MEDICATIONS

» Most of the evidence for 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 may improve clinical severity scores and nebulized hypertonic saline may slightly shorten hospitalizations. There is no evidence that either drug reduces the risk of admission, thus these treatments are **not routinely recommended in the emergency department**.

» 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.

» 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)

3% NaCl by nebulization: 4 mL

Typical clinical course

» Most infants/children do well; symptoms tend to peak around day 5 of illness.

» Approximately 2% of infants will develop severe disease requiring respiratory support or PICU care.

» Symptoms such as cough may persist for up to **3-4 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 with clear instructions.

» Having a child with difficulty breathing is very scary for both children and families. Give families reassurance and knowledge so they can feel comfortable going home, know how they can support their child and what serious symptoms to watch for. Resources to share with parents can be found in the Parent 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 for:

- Infants/children with underlying cardio-respiratory disease or immunodeficiency
- Infants less than 6 weeks of age or premature infants

Contact Pediatric Referral Centre or Transport Team for:

» Infants with apnea or persistent significant respiratory distress (oxygen saturation below 90%, nasal flaring, grunting, and/or 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).

For a full list of references and development team members, please see the following page. 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 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.

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Bronchiolitis

Bottom Line Recommendations

Bottom Line Recommendations are short summaries for healthcare providers of the latest knowledge related to the diagnosis and management of pediatric emergency conditions. This resource is not intended to be used as a step-by-step guide. It is ideal for educational purposes and to summarize existing evidence on Bronchiolitis in pediatric emergency care. Development of this resource involved a rigorous and iterative process, bringing together experts from a variety of specialties (nursing, emergency medicine, and pharmacy). For a complete list of the evidence that informed the creation of this resource visit our website here.

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Development Team

Thank you to the following **content experts** who led the development of the Bronchiolitis Bottom Line Recommendations:

Amy Plint, MD, FRCPC, *Emergency Pediatrician, Children's Hospital of Eastern Ontario (CHEO); Senior Scientist, CHEO Research Institute; Professor, Departments of Pediatrics and Emergency Medicine; Tier I Research Chair in Pediatric Emergency Medicine, University of Ottawa*

Gabrielle Freire, MDCM, FRCPC, MHSc, *Pediatric Emergency Medicine Physician, The Hospital for Sick Children (SickKids); Associate-Scientist Track Investigator, SickKids Research Institute, Assistant Professor of Pediatrics, University of Toronto*

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