Bronchiolitis
Clinical Pathway Synopsis

Objective of Clinical Pathway

The objective of the Bronchiolitis Clinical Pathway is to provide care standards for the patient presenting with signs and symptoms of bronchiolitis. The aim of the Bronchiolitis Clinical Pathway is to minimize variation of care through guidance for evaluation, diagnosis, and treatment.

Epidemiology

Bronchiolitis is a common infection of the lower respiratory system and is one of the most frequent causes of hospitalization for patients under the age of 12 months (Pelletier et al., 2021). Infection is due to viral agents, most commonly respiratory syncytial virus (RSV), and results in inflammation and edema of the bronchioles, leading to mucus production (Ralston et al., 2014). Typical symptoms of bronchiolitis include coughing and rhinitis initially, sometimes progressing to wheezing, tachypnea, and increased work of breathing, which may manifest as use of accessory muscles or nasal flaring (Ralston et al., 2014).

According to the American Academy of Pediatrics (AAP) Clinical Pathway authored by Ralston et al. (2014), bronchiolitis is diagnosed based on the patient's clinical history and physical symptoms while considering risk factors for severe illness, such as prematurity or comorbidities. Patients with severe disease may experience increased work of breathing, apnea, or the need for supplemental oxygen or intravenous (IV) hydration and have higher rates of morbidity and mortality (Ralston et al., 2014). The aim of the Bronchiolitis Clinical Pathway is to provide guidance for evidence based, standardized diagnoses of and care for patients presenting with signs and symptoms of bronchiolitis.

Target Users

- Physicians (Emergency Department, Urgent Care, Hospital Medicine, Ambulatory, Fellows, Residents)
- Nurse Practitioners
- Nurses
- Respiratory Therapists

Target Population

Inclusion Criteria

- Infants up to 24 months of age presenting with bronchiolitis

Exclusion Criteria

- Infants less than 60 days of age with fever (see Febrile Infant Clinical Pathway)
- Patients with alternative diagnoses, such as:
    - Sepsis
    - Asthma
    - Pneumonia
    - Congestive heart failure
    - Pertussis
    - Chronic lung obstruction
    - Airway obstruction (croup, foreign body aspiration, etc.)

AGREE II

The Bronchiolitis Clinical Practice Guideline of the American Academy of Pediatrics (AAP) provided guidance to the Bronchiolitis Clinical Pathway committee (Ralston et al., 2014). See Table 1 for AGREE II.

Table 1

AGREE II[a] Summary for the AAP Bronchiolitis Clinical Practical Guideline, Ralston et al., (2014)

Domain	Percent Agreement	Percent Justification^
Scope and purpose	100%	The aim of the guideline, the clinical questions posed and target populations **were** identified.
Stakeholder involvement	87%	The guideline **was developed** by the appropriate stakeholders and represents the views of its intended users.

** These products do not establish a standard of care to be followed in every case. It is recognized that each case is different, and those individuals involved in providing health care are expected to use their judgment in determining what is in the best interests of the patient based on the circumstances existing at the time. It is impossible to anticipate all possible situations that may exist and to prepare pathways for each. Accordingly, these products should guide care with the understanding that departures from them may be required at times.*

Rigor of development	96%	The process used to gather and synthesize the evidence, the methods to formulate the recommendations and to update the guidelines **were** explicitly stated.
Clarity and presentation	87%	The guideline recommendations **are** clear, unambiguous, and easily identified; in addition, different management options are presented.
Applicability	53%	The guideline **did not** fully address implementation barriers and facilitators, utilization strategies, nor resource costs associated implementation.
Editorial independence	96%	The recommendations **were not** biased with competing interests.
Overall guideline assessment	90%	
See Practice Recommendations		

Note: Three EBP Scholars completed the AGREE II on this guideline.
^Percentage justification is an interpretation based on the Children's Mercy EBP Department standards.

Practice Recommendations

Please refer to the American Academy of Pediatrics (AAP) Clinical Practice Guideline: The Diagnosis, Management, and Prevention of Bronchiolitis (Raltson et al., 2014) for full practice recommendations, evaluation, and treatment recommendations.

Additional Questions Posed by the Clinical Pathway Committee

1. For hospitalized infants ≤ 24 months of age with bronchiolitis receiving treatment with high flow nasal cannula (HFNC), does oral feeding vs. no oral feeding (nasogastric tube [NGT] feeds or intravenous [IV] fluids with no enteral feeds) impact patient outcomes?
2. For hospitalized children ≤ 24 months of age with bronchiolitis, does use of nebulized 3% hypertonic saline (HS) impact patient outcomes?
3. For children ≤ 24 months of age with bronchiolitis, does the use of albuterol versus not using albuterol impact the outcomes of oxygen saturation, clinical severity score, length of stay, time to resolution, and readmission rates when managed in either the inpatient or outpatient environments?

Recommendation Specific for Children's Mercy

Children's Mercy adopted most of the practice recommendations made by the AAP Clinical Practice Guideline: The Diagnosis, Management, and Prevention of Bronchiolitis (Raltson et al., 2014). Deviations include:

*A **conditional recommendation** is made against use of nebulized 3% HS. Eleven randomized control trials showed a shorter length of stay for patients receiving treatment with HS, MD = -6.47 hours, 95% CI [-12.72, -0.22], p = .04. There was no difference in the need for oxygen supplementation, duration of oxygen supplementation, or improvement of clinical severity scores for patients receiving treatment with HS when compared to no treatment with HS. The potential for shorter length of stay was balanced against the associated costs (monetary and otherwise). See Critically Appraised Topic for substantiation of recommendations.*

Measures

Outcome:

- The percentage of patients with bronchiolitis undergoing/receiving one or more of the process measures listed below

Process measure:

- Provider orders for bronchiolitis education
- Order set utilization
- Viral testing (rapid RSV or respiratory panel PCR)
- CBC testing
- Blood culture
- Chest x-ray
- Patients receiving albuterol
- Patients receiving systemic steroids
- Patients receiving antibiotic(s)

Balancing measure:
- Length of stay
- Readmissions within 72 hours
- Cost

Value Implications

The following improvements may increase value by reducing healthcare costs and non-monetary costs (e.g., missed school/work, loss of wages, stress) for patients and families and reducing costs and resource utilization for healthcare facilities.
- Decreased risk of overdiagnosis
- Decreased risk of overtreatment (i.e., treatment with hypertonic saline, antibiotics, or albuterol when not indicated)
- Decreased frequency of admission
- Decreased inpatient length of stay
- Decreased unwarranted variation in care

Organizational Barriers and Facilitators

Potential Barriers
- Variability of acceptable level of risk among providers
- Challenges with follow-up faced by some families

Potential Facilitators
- Collaborative engagement across care continuum settings during Clinical Pathway development
- High rate of use of Clinical Pathway
- Standardized order set for Urgent Care Clinic, Emergency Department, Hospital Medicine, and Pediatric Intensive Care

Diversity/Equity/Inclusion

Our aim is to provide equitable care. These issues were discussed with the Committee, reviewed in the literature, and discussed prior to making any practice recommendations.

Order Sets
- IP Bronchiolitis EBP Pathway

Education Materials
- Bronchiolitis Education for Outpatients
  - Brochure intended for distribution to patients' caregivers
  - Available in English and Spanish
  - Also available in Epic Education: PT EDU Bronchiolitis Family Engagement
- Bronchiolitis Education for Inpatients
  - Brochure intended for distribution to patients' caregivers
  - Available in English and Spanish
- How to use a manual nasal aspirator
  - Handout intended for distribution to patients' caregivers
  - Available in English and Spanish

Clinical Pathway Preparation

This product was prepared by the Evidence Based Practice (EBP) Department in collaboration with the Bronchiolitis Clinical Pathway Committee, composed of content experts at Children's Mercy. Literature analysis for additional questions posed by the Bronchiolitis Clinical Pathway Committee was performed by EBP Scholars and the EBP team. If a conflict of interest is identified, the conflict will be disclosed next to the committee member's name.

Bronchiolitis Clinical Pathway Committee Members and Representation

- Amanda Nedved, MD | Urgent Care | Committee Chair
- Paul Bauer, MD | Critical Care Medicine | Committee Member
- Erin Scott, DO | Emergency Department | Committee Member
- Matthew Johnson, MD | Hospital Medicine | Committee Member
- Jonathan Hartley, DO | Hospital Medicine | Committee Member
- Megan Collins, MD, MPH | Hospital Medicine | Committee Member
- Jeremy Beyer, MD | Pediatric Resident | Committee Member
- Shautonja Woods, BHS, RRT | Respiratory Care | Committee Member
- Ginny Nyberg, MSN, RN | Clinical Practice and Quality | Committee Member
- Christine Claeys, RN, BSN, CCRN-K | Clinical Practice and Quality| Committee Member

EBP Committee Members

- Kathleen Berg, MD, FAAP | Hospitalist, Evidence Based Practice
- Megan Gripka, MPH, MLS (ASCP) SM | Evidence Based Practice
- Kelli Ott, OTD, OTR/L | Evidence Based Practice

Clinical Pathway Model Development Funding

The development of this pathway was underwritten by the following departments/divisions: Urgent Care, Emergency Department, Hospital Medicine, Critical Care Medicine, Respiratory Care.

Conflict of Interest

The contributors to the Bronchiolitis Clinical Pathway have no conflicts of interest to disclose related to the subject matter or materials discussed in this care process.

Approval Process

- This product was reviewed and approved by the Bronchiolitis Clinical Pathway Committee, Content Expert Departments/Divisions, and the EBP Department; after which they were approved by the Medical Executive Committee.
- Products are reviewed and updated as necessary every 3 years within the EBP Department at CM. Content expert teams are involved with every review and update.

Review Requested

Department/Unit	Date Obtained
Critical Care Medicine	June 2023
Emergency Department	June 2023
Hospital Medicine	June 2023
Respiratory Care	June 2023
Urgent Care	May 2023

Version History

Date	Comments
October 2016	Version one- algorithm development
July 2023	Version two- update algorithm and associated educational brochures
March 2026	Version three- Not a full review. Updated to include Epic Order Set and education names, remove Associated Policies

Date for Next Review:

- July 2026

Implementation & Follow-Up

- Once approved, the pathway was presented to appropriate care teams and implemented. Care measurements will be assessed and shared with appropriate care teams to determine if changes need to occur.
- Order sets consistent with recommendations were created or updated for each care setting.

- Additional institution-wide announcements were made via email, hospital website, and relevant huddles.
- Metrics will be assessed and shared with appropriate care teams to determine if changes need to occur.

Disclaimer

When evidence is lacking or inconclusive, options in care are provided in the supporting documents and the order sets that accompany the clinical pathway.

These pathways do not establish a standard of care to be followed in every case. It is recognized that each case is different, and those individuals involved in providing health care are expected to use their judgment in determining what is in the best interests of the patient based on the circumstances existing at the time.

It is impossible to anticipate all possible situations that may exist and to prepare clinical pathways for each. Accordingly, these pathways should guide care with the understanding that departures from them may be required at times.

References

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