

New Online

Views **713** | Citations **0** | Altmetric **36**

PDF

 Full Text

 Share

 Cite

 Permissions

## Original Investigation

ONLINE FIRST

April 1, 2019

# Association of Rhinovirus C Bronchiolitis and Immunoglobulin E Sensitization During Infancy With Development of Recurrent Wheeze

Kohei Hasegawa, MD, MPH<sup>1</sup>; Jonathan M. Mansbach, MD, MPH<sup>2</sup>; Yury A. Bochkov, PhD<sup>3</sup>; [et al](#)

» [Author Affiliations](#)

*JAMA Pediatr.* Published online April 1, 2019. doi:10.1001/jamapediatrics.2019.0384

 Editorial Comment

## Key Points

**Question** Is severe bronchiolitis by different rhinovirus species during infancy associated with distinct risks of developing recurrent wheeze?

**Findings** In this cohort study of 716 infants who were hospitalized for bronchiolitis, compared with respiratory syncytial virus infection, rhinovirus C infection was associated with a higher risk of developing recurrent wheeze by age 3 years. Furthermore, infants with rhinovirus C infection and IgE sensitization (to food or aeroallergen) in infancy had 3-fold higher risks of recurrent wheeze while those without sensitization had no significant differences.

**Meaning** The study identifies infants at higher risk of developing recurrent wheeze and informs strategies to develop targeted preventive therapies.

## Abstract

Our website uses cookies to enhance your experience. By continuing to use our site, or clicking "Continue," you are agreeing to our [cookie policy](#) | [Continue](#)

**Importance** Rhinovirus infection in early life, particularly with allergic sensitization, is associated with higher risks of developing recurrent wheeze and asthma. While emerging evidence links different rhinovirus species (eg, rhinovirus C) to a higher severity of infection and asthma exacerbation, to our knowledge, little is known about longitudinal associations of rhinovirus C infection during infancy with subsequent morbidities.

**Objective** To examine the association of different viruses (respiratory syncytial virus [RSV], rhinovirus species) in bronchiolitis with risks of developing recurrent wheeze.

**Design, Setting, and Participants** This multicenter prospective cohort study of infants younger than 1 year who were hospitalized for bronchiolitis was conducted at 17 hospitals across 14 US states during 3 consecutive fall to winter seasons (2011-2014).

**Exposures** Major causative viruses of bronchiolitis, including RSV (reference group) and 3 rhinovirus species (rhinovirus A, B, and C).

**Main Outcomes and Measures** Development of recurrent wheeze (as defined in national asthma guidelines) by age 3 years.

**Results** This analytic cohort comprised 716 infants who were hospitalized for RSV-only or rhinovirus bronchiolitis. The median age was 2.9 months (interquartile range, 1.6-3.8 months), 541 (76%) had bronchiolitis with RSV only, 85 (12%) had rhinovirus A, 12 (2%) had rhinovirus B, and 78 (11%) had rhinovirus C infection. Overall, 231 (32%) developed recurrent wheeze by age 3 years. In the multivariable Cox model, compared with infants with RSV-only infection, the risk of recurrent wheeze was not significantly different in those with rhinovirus A or B (rhinovirus A: hazard ratio [HR], 1.27; 95% CI, 0.86-1.88; rhinovirus B: HR, 1.39; 95% CI, 0.51-3.77; both  $P > .10$ ). By contrast, infants with rhinovirus C had a significantly higher risk (HR, 1.58; 95% CI, 1.08-2.32). There was a significant interaction between virus groups and IgE sensitization on the risk of recurrent wheeze ( $P$  for interaction  $< .01$ ). Only infants with both rhinovirus C infection and IgE sensitization (to food or aeroallergens) during infancy had significantly higher risks of recurrent wheeze (HR, 3.03; 95% CI, 1.20-7.61). Furthermore, compared with RSV-only, rhinovirus C infection with IgE sensitization was associated with significantly higher risks of recurrent wheeze with subsequent development of asthma at age 4 years (HR, 4.06; 95% CI, 1.17-14.1).

**Conclusions and Relevance** This multicenter cohort study of infants hospitalized for bronchiolitis demonstrated between-virus differences in the risk of developing recurrent wheeze. Infants with rhinovirus C infection, along with IgE sensitization, had the highest risk. This finding was driven by the association with a subtype of recurrent wheeze: children with subsequent development of asthma.

Our website uses cookies to enhance your experience. By continuing to use our site, you are agreeing to our [cookie policy](#) | [Continue](#)

## Editorial

Respiratory Syncytial Virus, Rhinoviruses, and Recurrent Wheezing

 **Full Text**

Advertisement

## Read More About

Asthma

Infectious Diseases

Neonatology

Pediatrics

Pulmonary Medicine

---

**New!** *JAMA Network Open* is now accepting submissions. [Learn more.](#)

---

### **\*\* SCHEDULED MAINTENANCE \*\***

Our websites may be periodically unavailable between 11:00PM CT May 18, 2019 and 5:00AM CT May 19, 2019 for regularly scheduled maintenance.

## Trending

### Opinion

Respiratory Syncytial Virus, Rhinoviruses, and Recurrent Wheezing

*April 1, 2019*

### Research

Association of Diagnostic Criteria With Urinary Tract Infection Prevalence in Bronchiolitis

*March 1, 2019*

### Research

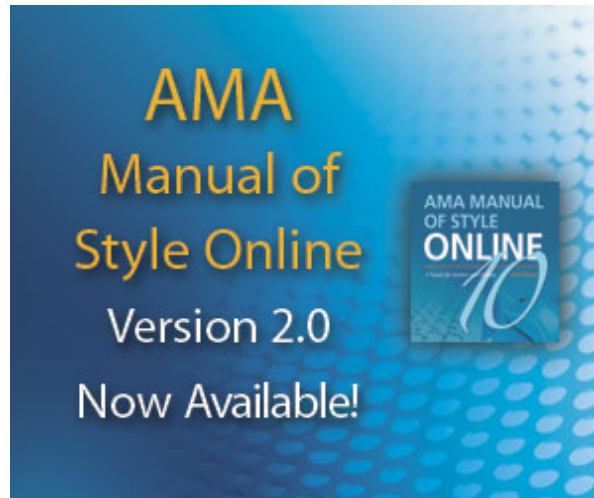
IgE-Mediated Allergy and Risk of Complicated Appendicitis in a Pediatric Population

*October 1, 2018*

Our website uses cookies to enhance your experience. By continuing to use our site, or clicking "Continue," you are agreeing to our [cookie policy](#) | [Continue](#)

## Select Your Interests

Advertisement



---

### JOB LISTINGS ON JAMA CAREER CENTER®

#### Chief Medical Officer

Washington D.C.

#### Physician Director of Primary Care

Bangor, Maine

#### Permanent Career Physician Opportunities in Beautiful SW NM

Silver City, New Mexico

#### Medical Director for Internal & Family Medicine

Tampa Bay, Florida

#### Public Health - Chief Medical Officer - MD/DO

Springfield, Missouri

See more at JAMA Career Center

## Others Also Liked

### Providing the Right Expectations: Understanding the Pathophysiology of Pain

Mark S. Gold, MD, myCME, 2019

Our website uses cookies to enhance your experience. By continuing to use our site, or clicking "Continue," you are agreeing to our [cookie policy](#) | [Continue](#)

### Exploring novel ways to manage patients with relapsed/refractory multiple myeloma - focus on the clinical development of selinexor

Touch Oncology (Videos), 2018

**Explain acute and chronic pain pathways and underlying mechanisms and how they relate to clinical assessment and appropriate management of pain.**

Mark S. Gold, MD, myCME, 2019

---

Powered by **TREND MD**

## Trending

---

**Fracture Risk After Roux-en-Y Gastric Bypass vs Adjustable Gastric Banding**

JAMA Surgery | *Research* |  
May 15, 2019

---

**External Validation of a Scoring System for Predicting Fracture Risk After Ischemic Stroke**

JAMA Neurology |  
*Research* | May 13, 2019

---

**Hip Fracture Prevention in Older Adults in 2019**

JAMA | *Review* |  
May 10, 2019

Our website uses cookies to enhance your experience. By continuing to use our site, or clicking "Continue," you are agreeing to our [cookie policy](#) | [Continue](#)