749. Healthcare Utilization After Hospitalization for Respiratory Syncytial Virus or Unspecified Bronchiolitis in the First Year of Life

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Background. Respiratory syncytial virus (RSV) is the leading cause of infant hospitalizations and risk varies by gestational age (GA). Healthcare utilization following early hospitalizations caused by RSV (RSVH) or unspecified bronchiolitis (UBH) is not well understood. This study examined healthcare resource utilization (HRU) across GA categories within 12 months after an initial RSVH or UBH occurring in the first year of life.

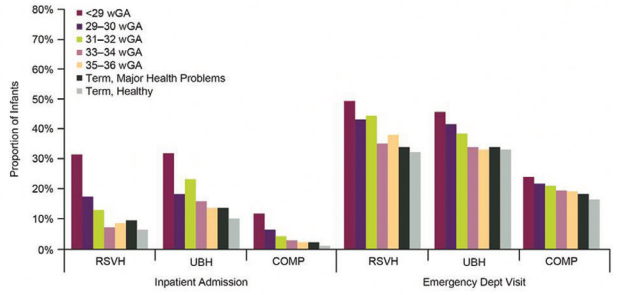
Methods. Infants born July 1, 2009 to June 30, 2015 were identified in the MarketScan Commercial (COM) and Multistate Medicaid (MED) databases and assigned to GA categories using DRG and ICD codes and to an initial hospitalization cohort using inpatient claim diagnosis codes (RSVH, UBH without RSVH, or COMP [a comparator without RSVH or UBH]). Index dates (first admission dates for hospitalized infants) were assigned to COMP infants using times from birth to index dates among RSVH infants. HRU (hospitalizations, outpatient pharmacy fills, and visits for emergency department [ED], urgent care, wellness, other office or outpatient) excluded index hospitalizations and was assessed from 14 days post-index (or discharge if later) through 12 months post-index. Results were propensity score weighted to balance pre-index characteristics (age, sex, region, GA, birth hospitalization characteristics) across cohorts. Proportions were compared with chi-squared tests.

Results. Among all infants (all GA categories combined), the proportions of RSVH and UBH cohorts with follow-up hospitalizations or ED visits were greater ($P < 0.05$) than COMP (hospitalizations: COM +5.8%, +9.3%; MED +9.1%, +12.0%; ED visits: COM +15.8%, +16.2%; MED +14.4%, +17.1%). Follow-up hospitalizations in COM and MED and ED visits in COM declined with greater GA (Figures 1 and 2). HRU in other categories (fills, visits) was significantly ($P < 0.05$) greater among RSVH or UBH infants relative to COMP for nearly all GA categories in both COM and MED.

Conclusion. Infants hospitalized for RSV or UB in their first year of life had greater use of inpatient and outpatient resources in the 12 months following their initial hospitalizations compared with nonhospitalized infants. Inpatient care during follow-up was greatest among infants born at earlier GA.

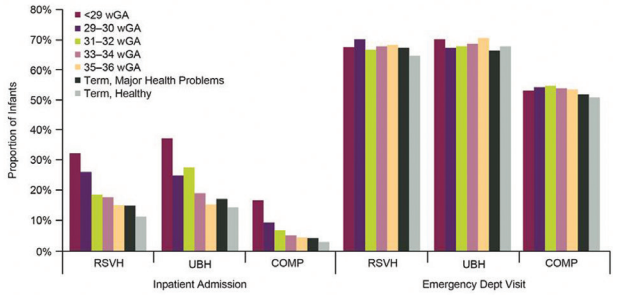
Funded by AstraZeneca

Figure 1. Healthcare Resource Utilization During Follow-up (Commercial)*



*All within cohort RSVH/ COMP and UBH/ COMP comparisons were significant ($P<0.05$).
Abbreviations: COMP, comparator without RSVH or UBH; RSVH, respiratory syncytial virus hospitalization; UBH, unspecified bronchiolitis hospitalization; wGA, weeks gestational age.

Figure 2. Healthcare Resource Utilization During Follow-up (Medicaid)*



*All within cohort RSVH/ COMP and UBH/ COMP comparisons were significant ($P<0.05$).
Abbreviations: COMP, comparator without RSVH or UBH; RSVH, respiratory syncytial virus hospitalization; UBH, unspecified bronchiolitis hospitalization; wGA, weeks gestational age.

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750. Respiratory Virus Infections and Airflow Obstruction After Allogeneic Hematopoietic Cell Transplantation

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Background. Respiratory viruses are readily detectable in hematopoietic cell transplant (HCT) recipients in the molecular diagnostic era. The association of respiratory virus infections with acute and chronic airflow obstruction (AFO) is poorly defined.

Methods. HCT recipients were prospectively followed with weekly handheld spirometry and symptom questionnaires through 1 year after HCT. Weekly multiplex PCR testing for 11 respiratory viruses was performed through day 100 post-HCT and every 3 months and with respiratory symptoms thereafter. Standard pulmonary function testing occurred at recommended intervals. Cox proportional hazard models were used to correlate longitudinal symptomatic respiratory tract viral infections with AFO phenotypes, defined as 2- or 4-week decline (↓) of 1 second forced expiratory volume (FEV1) >10% by handheld spirometry; late AFO (FEV1/forced vital capacity [FVC] < lower limit normal predicted and FEV1 decline >10% from baseline at 3 years; or bronchiolitis obliterans syndrome (BOS; FEV1 <75%, FEV1/FVC < 0.7, and FEV1 ↓ >10% from baseline) by 3 years after HCT; late AFO and BOS were assessed by standard pulmonary function testing.

Results. Overall, 7,091 PCR tests were performed in 471 patients; 70% of patients had ≥1 respiratory virus detected. Among 437 patients who survived >4 weeks, decline of FEV-1 for 2 or 4 weeks, late AFO or BOS occurred in 11.9%, 7.1%, 15.6%, and 3.9%, respectively. In adjusted Cox models, human metapneumovirus (HMPV), influenza virus A/B, and parainfluenza virus 1–4 (PIV) upper tract infections (URI) were associated with 2 and 4 weeks FEV-1 decline (Figure 1). Late AFO and BOS were only significantly associated with RSV- or HMPV-related URI (Figure 2). Lower respiratory disease (LRD) due to HMPV (adjusted HR 11.1, $P = 0.02$) was associated with a 2- and 4-week FEV-1 decline.

Conclusion. Development of AFO after HCT is common. Respiratory viruses are significantly associated with both short-term airflow decline and long-term airflow obstruction. Interventional strategies that target multiple viruses are warranted.

Figure 1. Association of first respiratory virus URIs with 2-week airflow decline by handheld spirometry. Results from univariate (blue) and multivariable models (*orange; separate for each virus category; adjusted for recipient sex) are shown (categories without HRs have too few events to fit the model).

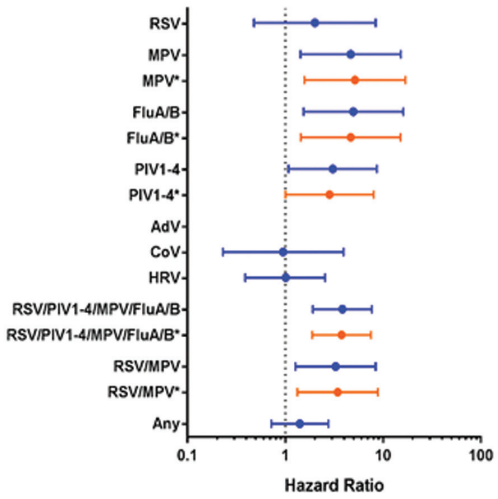
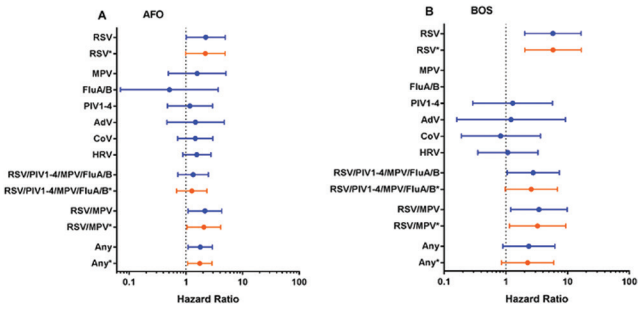


Figure 2. Association of respiratory virus URIs with late AFO (A) and BOS (B). Results from univariate (blue) and multivariable models (*orange; separate for each virus category) are shown. AFO estimates were adjusted for recipient age, recipient race and intensity of the conditioning regimen; BOS estimates were adjusted for recipient race and intensity of the conditioning regimen (categories without HRs have too few events to fit the model).



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751. Acute Respiratory Illness Hospitalizations Among Young Children: Multi-Center Viral Surveillance Network, United States, 2015–2016

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Background. Viral infections are a significant cause of severe acute respiratory illnesses (ARI) in young children. Understanding the current epidemiology of these viruses is important for informing treatment and prevention measures. We describe the New Vaccine Surveillance Network (NVSN) and report preliminary results from 2015 to 2016.

Methods. Prospective active surveillance for hospitalized ARI was conducted from November 1, 2015 to June 30, 2016 among children <5 years of age at seven pediatric hospital sites (figure) using a broad case definition based on admission diagnoses. Parent interviews and medical chart reviews were performed, and mid-turbinate nasal and throat flocked swabs and/or tracheal aspirates were tested for adenovirus, human metapneumovirus (HMPV), influenza, parainfluenza viruses (PIV) 1–3, respiratory syncytial virus (RSV), and rhinovirus/enterovirus using molecular diagnostic assays at each site. Asymptomatic controls <5 years of age were also enrolled.

Results. Among 2,974 hospitalized children with ARI whose specimens were tested for viruses, 2,228 (75%) were <2 years old, with 745 (25%) 0–2 months, and 309 (10%) 3–5 months old. The majority were male (58%; n = 1,732) and 63% (n = 1,093) had no documented comorbid conditions. The median length of stay was 2 days; 1,683 (57%) received supplemental oxygen, 435 (15%) were admitted to intensive care, 95 (3%) required mechanical ventilation, and 1 (<1%) died. Viruses were detected in 2,242 (75%) children with ARI, with >1 virus detected in 234 (8%). RSV was detected in 1,039 (35%) children with ARI, HMPV in 245 (8%), influenza in 104 (4%), and PIV-1, PIV-2, and PIV-3 in 49 (2%), 2 (<1%), and 78 (3%), respectively. Rhinovirus/enterovirus was detected in 849 (29%) and adenovirus in 118 (4%) children with ARI, but were also detected in 18% (n = 227) and 5% (n = 60), respectively, of the 1,243 controls tested; the other viruses were more rarely detected in controls.

Conclusion. During the 2015–2016 season, viral detections were common in young children hospitalized for ARI at seven US sites. NVSN combines clinical data with current molecular laboratory techniques to describe respiratory virus epidemiology in cases of hospitalized pediatric ARI in order to inform current and future prevention, treatment, and healthcare utilization measures.

Figure. New Vaccine Surveillance Network (NVSN) site locations, 2015–16

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752. Geographic Analysis of Latent Tuberculosis Screening: A Health System Approach

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Background. Targeted testing and treatment of latent tuberculosis infection is a key element of tuberculosis (TB) elimination in the United States. In particular, foreign-born persons from TB-endemic countries are high priority for latent TB screening.

Methods. We used the DEDUCE interface to query the electronic medical records of all patients presenting to Duke University Health System from January 1, 2010 to November 1, 2017. Latent tuberculosis screening was identified using CPT codes for the tuberculin skin test (TST) and/or interferon gamma release assays (IGRA). Patients' home addresses were mapped to census tracts; demographic data for these tracts were obtained from the American Community Survey. Higher-risk foreign born persons were defined as persons born in Africa, Asia, or Latin America.

Results. Thirty-six thousand eight hundred and twenty-five patients received 48,419 TSTs and 5,366 received 5,746 IGRAs during the study period. Excluding census tracts with fewer than 20 Health System patients (to reduce referral bias), census tracts with a higher proportion of higher risk residents had a greater proportion of Health System patients screened for latent TB (P < 0.001, figure). Health system patients residing in census tracts with greater proportions of higher risk foreign born residents were more likely to be screened with TST than with an IGRA (P < 0.001).

Conclusion. Latent TB screening was significantly but weakly associated with a greater proportion of higher risk foreign born persons in a given census tract, and persons residing in such tracts were more likely to be screened with TST, which is not preferred due to cross-reaction with the BCG vaccine. Focusing latent TB screening on higher risk areas and using more IGRAs will be necessary to optimize TB prevention efforts.