

## Hospitalizations for RSV Infection Among Children Aged <5 Years, Montana, 2000 to 2011

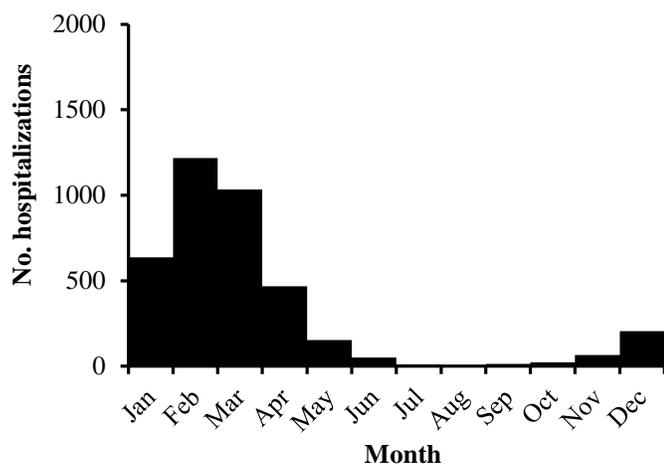
**Background:** Respiratory syncytial virus (RSV) is the leading cause of lower respiratory tract infections (LRTI) in infants and young children. Signs and symptoms of RSV bronchiolitis often include wheezing, lung hyper-expansion, and hypoxia. Annually in the U.S., RSV is estimated to cause nearly 550,000 hospitalizations among children aged <5 years (6.7 hospitalizations per 1000 children), of which 4% are for severe RSV disease. Children aged 2 to 8 months are most at-risk for RSV disease. Re-infection with RSV is common throughout childhood but is primarily limited to upper respiratory tract illness. Risk factors for severe RSV infection include prematurity, age <3 months at time of infection, congenital heart disease, chronic lung disease, and immunodeficiency.

**Etiology, Transmission, and Pathogenesis:** RSV is a paramyxovirus transmitted through direct or close contact with contaminated respiratory secretions, or via exposure to contaminated surfaces. Humans are the only known source of RSV infection. RSV is capable of persisting on hands for 30 minutes and contaminated surfaces for several hours. The incubation period of RSV is normally 4 to 6 days (range 2 to 8 days). RSV is transmitted in annual epidemics occurring during winter and early spring months. The timing and duration of RSV season can vary between seasons and by geographical location. Viral shedding normally occurs for 3 to 8 days from symptom onset, but can last up to 4 weeks in infants and those with immune compromising conditions.

**Trends:** We analyzed the Montana Hospital Association's hospital discharge database for RSV-related hospital trends. In Montana during 2000 to 2011, 3,880 RSV-coded hospitalizations (ICD-9-CM = 466.11, 480.1, 079.6) occurred among children aged <5 years and 2121 (55%) occurred among males. Over 85% of hospitalizations occurred January through April (**Figure 1**). The average annual incidence rate of RSV-coded hospitalizations for children aged <5 years was 5.5 per 1,000 population and increased over time (**Figure 2**). Of the RSV-coded hospitalizations, 97 (2.5%) were severe RSV-coded hospitalizations (ICD-9-CM codes listing endotracheal intubation [96.04], receipt of continuous mechanical ventilation [96.70–96.72], or extra-corporeal membrane oxygenation [39.65]); and 141 (3.6%) occurred among those at high-risk for severe RSV disease ( $\geq 1$  of the following conditions: premature birth (765), chronic respiratory distress arising in the perinatal period (770.7), and congenital heart disease (745–747)).

**Prevention:** Palivizumab is a monoclonal antibody licensed for the prevention of RSV LRTI for certain high-risk infants and children. The recommended dosage is 15 mg/kg given intramuscularly once per month during RSV season. Palivizumab is costly but has been estimated to reduce the rate of RSV-related hospitalizations in high-risk infants from 39% to 82%. To receive the maximum protection benefit, palivizumab should be administered before widespread RSV transmission occurs. Administering palivizumab when RSV transmission is not occurring in widespread fashion provides little benefit to the patient and is not cost-effective. Therefore, it is important to use local or state epidemiological data regarding the percentage of specimens tested for RSV that are positive to decide when palivizumab use should be authorized. The use of non-pharmaceutical interventions in the prevention of RSV infection is challenging. When possible, parents should limit exposure of high-risk children to settings where RSV transmission is likely to occur, for example childcare. Improving hand hygiene in all settings could theoretically reduce the possibility for RSV transmission.

**Figure 1.** Number of hospitalizations for RSV infections among children aged <5 years by month of admission, Montana, 2000 to 2011



**Figure 2.** Annual incidence rate of RSV-coded hospitalizations among children aged <5 years, Montana, 2000 to 2011

