

OREGON PUBLIC HEALTH DIVISION • OREGON HEALTH AUTHORITY

RESPIRATORY SYNCYTIAL VIRUS (RSV) IN OREGON

That coughing neonate, infant, or child in your care may have more than “just a cold.” Your wheezing patient in long-term care facility may have something more than “just a virus and let’s wait and see.” How often do you consider that the virion of Respiratory Syncytial Virus (RSV) lurks in their pulmonary system? And what types of treatment decisions does this trigger for you? Perhaps the information in this *CD Summary* may “shed” some light.

ILLNESS

Although RSV is not a household name, families and health systems have felt its burden with significant impacts to ambulatory care and inpatient services.^{1,2}

RSV is an enveloped RNA virus of the paramyxoviridae family, whose more famous members include measles and mumps viruses.^{3,4*} RSV is transmitted by droplets, direct contact, or fomites (stethoscopes, neckties, rings, toys, you name it!).⁴

After an average incubation period of 4–6 days, RSV manifests its presence with upper respiratory symptoms that may include mild fever, rhinorrhea, cough, and sneezing. In young infants, anorexia and fussiness are also observed. RSV is usually self-limiting, with full recovery made in 1–2 weeks. Complications, however, may include severe bronchiolitis, airway inflammation and obstruction, characterized by wheezing, hypoxia, and cyanosis. Studies show that RSV inhibits proliferation of bronchial cilia, contributing to severe complications and often requiring hospitalization, oxygen, tracheal suctioning, intubation and mechanical ventilation.^{1,2,5}

WHO IS AT RISK?

Most susceptible are infants 2–4 months of age — i.e., about when maternal antibodies and the protection they lend have waned. Other risk factors are premature birth, low

birth weight, or congenital or chronic cardiopulmonary disease. RSV is the most common cause of bronchiolitis and pneumonia in children <12 months of age; annually it is estimated that 125,000 U.S. infants — about 3% of the birth cohort — require hospitalization for RSV infection; 2% of them die.¹ Extrapolating from national rates we estimate that 84 hospitalizations, 213 ED visits, and 589 ambulatory care visits result from RSV infection each year among Oregon infants.⁶

RSV also is a significant problem for children and adults living in crowded situations, especially where people are smoking, in those ≥65 years of age, and in other adults with cardiopulmonary disease or impaired immunity.^{4,7} In the U.S., RSV accounts for 2%–5% of all adult community-acquired pneumonia cases.⁴ RSV attack rates in nursing homes across the U.S. are approximately 5%–10% per year with a 2%–8% case-fatality rate, or about 10,000 RSV deaths per year among persons ≥65 years old. Given 2010 census estimates of 7,549 Oregonians residing in long-term-care facilities (LTCFs) in 2010, as many as 755 such Oregonians may have been infected with RSV, with perhaps as many as 50 deaths.^{6,8}

PREVENTION: PALIVIZUMAB

Naturally acquired RSV immunity is incomplete, lasting just up to three years with recurrent RSV exposure and infection. Healthy older kids and adults seem to be relatively protected against severe RSV illness.¹

Several RSV vaccine trials are in the pipeline. Pending the development of a vaccine, prevention consists of monthly administration of palivizumab, a humanized mouse monoclonal antibody, the only product licensed to reduce the risk of RSV lower respiratory tract disease; it is labeled for use in infants and children with chronic lung disease, history of preterm birth, or congenital heart disease (see Table for full list of indications).

Palivizumab is administered intramuscularly at a dose of 15 mg/kg every 30 days, ideally beginning at the start of the RSV season, for a maximum of five doses during the season. Although costly (>\$8,000 per season⁹), palivizumab reduces RSV-related hospitalization rates by 39%–82% in high-risk infants; however, its effectiveness depends on optimal timing of doses.

Predicting the timing of the RSV season is tricky, so following trends via *RSV Oregon*, OHA’s weekly electronic RSV surveillance bulletin, may pay off in fewer complications and hospitalizations.

RSV SURVEILLANCE

It’s difficult to be precise about the true incidence of RSV in Oregon, because RSV

Table. CDC recommendations for palivizumab in infants**

Age	Indication	Timing
1–12 months	≤28 weeks’ gestational age	RSV season-any
<3 months	29–32 weeks’ gestational age, plus ≥1 risk factor: a) child care attendance b) sibling < 5 years of age	RSV season-start
<6 months	29–32 weeks’ gestational age	RSV season-start
Any age	<35 weeks’ gestational age, plus 1 risk factor: a) congenital airway abnormality b) congenital neuromuscular disease that compromises handling of respiratory secretions	RSV season-any
<2 years	Cyanotic or complicated congenital heart disease.	RSV season-any
<2 years	Received TX for chronic lung disease within 6 mos. of RSV season	RSV season-start

*And canine distemper and rinderpest, according to our State Public Health Vet.

**For dosing recommendations, please review CDC and AAP guidelines listed below.¹⁰



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infection is neither reportable nor always tested for; however, 22 laboratories for 36 hospitals in Oregon and southwest Washington voluntarily and regularly report to the Oregon Health Authority (OHA) the total number of RSV tests performed during the preceding week, and, of those, the number detecting RSV. OHA publishes weekly aggregate results in *RSV_Oregon*.

OHA has adapted the CDC definition of the “RSV season”: we consider it to have begun in the first of two consecutive weeks during each of which $\geq 10\%$ of RSV tests reported in Oregon and southwest Washington are positive; the season is considered over when we have two consecutive weeks during each of which $< 10\%$ are positive. For most of the nation, RSV

season begins some time during mid-October to mid-November. As seen in the figure, RSV season in Oregon often lags behind that of the rest of the country, typically starting between the end of November and the end of December, and running for an average of 22 weeks. The 2011–2012 RSV season officially commenced the week ending December 31, 2011, with positive RSV tests peaking at “only” 27% during the first week of March. The 2012–2013 RSV season began the week ending December 8, 2012; however, this RSV season has clearly been more severe than the previous (Figure).

FOR MORE INFORMATION

- For current RSV data in Oregon or to subscribe to *RSV_Oregon*, visit: <http://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/>

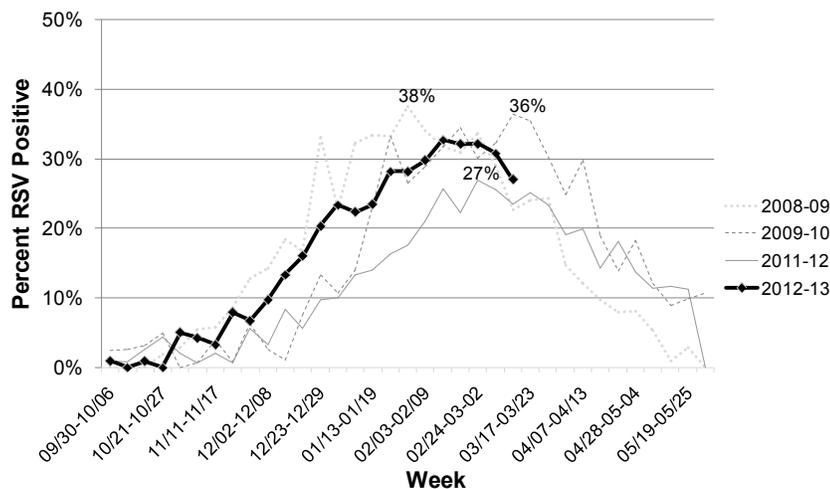
DiseaseSurveillanceData/Pages/RespiratorySyncytialVirusSurveillanceData.aspx

- For national RSV data: www.cdc.gov/surveillance/nrvss/rsv/

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Figure. RSV specimen positivity, by week and season, Oregon & southwest Washington, 2008–13



Note: RSV data reporting always begins with CDC’s MMWR week 40, which for season 2012–2013 was the week ending with October 06, 2012.