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## The Return of Measles

Measles, an acute viral respiratory illness, was nearly eradicated in the United States after a vaccine became available in the early 1960s. During the pre-vaccine era, measles killed 450-500 people per year in the U.S. and resulted in 48,000 annual hospitalizations. In 2008, due to international travel and unvaccinated populations, measles resurfaced in the U.S. Currently, the U.S. is experiencing a large, multi-state outbreak of measles linked to an amusement park in California. The outbreak started in December 2014 and has spread to more than a dozen other states.

Measles is highly contagious and is transmitted by direct contact with infectious droplets that are expelled into the air through breathing, coughing or sneezing. It is characterized by a prodrome of fever, malaise, cough, coryza, and conjunctivitis (the three “C”s), a pathognomonic enanthema (Koplik spots), followed by a maculopapular rash (Figure 1). The rash usually appears about 14 days after a person is exposed and spreads from the head to the trunk to the lower extremities. Patients are considered to be contagious from four days before to four days after the rash appears. Although measles is rarely fatal, complications include ear infection, pneumonia, encephalitis, and death.

Healthcare providers should consider measles in patients presenting with febrile rash illness and clinically compatible measles symptoms, especially if the patient recently traveled internationally or was exposed to a person with febrile rash illness. **Healthcare providers should report suspected measles cases to Philadelphia Department of Public Health (PDPH) immediately upon suspicion.** Rapid PDPH response is required to identify potential contacts. Measles is one of the most contagious of all infectious diseases; approximately 9 out of 10 susceptible persons with close contact to a measles patient will develop measles.

Laboratory confirmation is essential for all sporadic measles cases and all outbreaks. Detection of measles-specific IgM antibody and measles RNA by real-time polymerase chain reaction (RT-PCR) are the most common methods for confirming measles infection. Healthcare providers should obtain both a serum sample and a throat swab (or nasopharyngeal swab) from patients suspected to have measles at first contact with them. Urine samples may also contain virus, and when feasible to do so, collecting both respiratory and urine samples can increase the likelihood of detecting measles virus. PDPH can assist with diagnostic testing at public health laboratories.

The measles, mumps, and rubella vaccine (MMR) is 95% effective at preventing illness. Children should receive two doses of measles-containing vaccine; one when they are 12-15 months old, and the second when they are 4-6 years old. Healthcare workers born in 1957 or later who have not had the MMR vaccine, or don't have an up-to-date blood test that shows immunity to measles or mumps (i.e., no serologic evidence of immunity or prior vaccination) should get two doses of MMR.

Suspected cases of measles are immediately notifiable to PDPH, Division of Disease Control and should be reported within 24 hours by calling **215-685-6748**. The Health Department will assist with confirmatory testing, investigation, and prophylaxis of contacts.

Figure 1. Head and shoulders of boy with measles displaying maculopapular rash. Source: Centers for Disease Control and Prevention



### References:

- Frequently Asked Questions about Measles in the U.S. Centers for Disease Control and Prevention website. <http://www.cdc.gov/measles/about/faqs.html#measles-elimination> Updated Feb. 3, 2015. Accessed Feb. 23, 2015.
- Measles Cases and Outbreaks. Centers for Disease Control and Prevention website. <http://www.cdc.gov/measles/cases-outbreaks.html>. Updated Feb. 23, 2015. Accessed Feb. 23, 2015.
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- Press Release: Measles Still Threatens Health Security. Centers for Disease Control and Prevention website. <http://www.cdc.gov/media/releases/2013/p1205-measles-threat.html>. Updated Dec. 5, 2013. Accessed Feb. 23, 2015.
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- U.S. Multi-State Measles Outbreak 2014-2015. Centers for Disease Control and Prevention website. <http://www.cdc.gov/measles/multi-state-outbreak.html>. Updated Feb. 23, 2015. Accessed Feb. 23, 2015.

**We want your feedback!**

Please go to <https://www.surveymonkey.com/r/PDPHACD> to complete an A.C.D. Newsletter Survey.

# Respiratory Syncytial Virus (RSV)

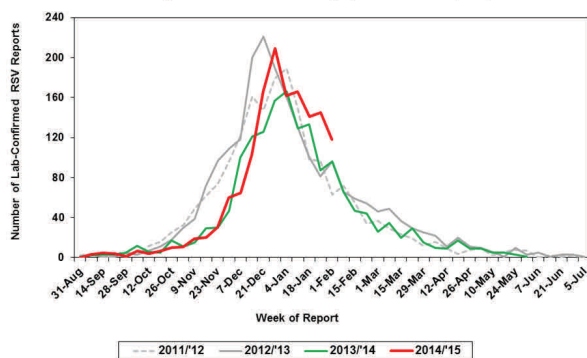
## Background

RSV is an enveloped RNA virus that infects ciliated cells of the respiratory tract epithelium.<sup>1</sup> The virus consists of two antigenic subgroups, A and B, with a combined 31 different genotypes.<sup>2</sup> RSV is an important cause of acute febrile respiratory illness among all ages, and is one of the leading causes of bronchiolitis and pneumonia in infants and older adults. In the United States, RSV contributes annually to over 100,000 hospitalizations in children aged less than 1 year.<sup>3</sup> The seasonality of RSV can vary by geographic latitude.<sup>3</sup> In northern temperate climates, the onset of RSV typically occurs during the fall and resolves in the spring. Figure 1 demonstrates RSV activity in Philadelphia. Almost all children will have been infected with RSV by the age of 2; however, initial exposure to the virus can be serious with 5 to 20 out of 1000 cases requiring hospitalization.<sup>4</sup> Most infants and children infected with RSV will recover in 1 to 2 weeks and will not require hospitalization. Risk factors for hospitalization include prematurity, age less than 6 months, history of a chronic lung or heart condition, and having a suppressed immune system.<sup>5</sup> RSV infection can be confirmed through the use of diagnostic laboratory tests including viral culture, rapid antigen tests, immunofluorescence and reverse transcriptase PCR (RT-PCR). Because patients infected with RSV typically present with constitutional symptoms, it can easily be mistaken for other respiratory viruses.<sup>6</sup> Laboratory confirmation of RSV infection is not only beneficial for developing treatment plans, but also aids in our surveillance efforts for enumerating localized RSV activity.



## Laboratory-Based Surveillance for RSV (Counts): Philadelphia, 2011/2012 through 2014/2015 Seasons\*

\*Based on five hospital laboratories with RSV testing capabilities across respiratory virus seasons



## Prevention and Treatment

RSV can be spread through inhalation of respiratory droplets and direct and indirect contact with nasal or oral secretions from an infected person. Therefore, educating patients on frequent hand washing and practicing good respiratory hygiene are essential in preventing the spread of infection. Current treatments for RSV infection are mainly supportive; however patients with a history of severe infection or those who are at risk of developing bronchiolitis may be prescribed beta-adrenergic agents or the antiviral agent Ribavirin.<sup>7</sup> While a safe and effective vaccine against RSV is not currently available, researchers are working towards this development. Surveillance data will assist in the identification of targeted groups for immunization once an approved vaccine enters the market.

## Policy Update

In July 2014 the American Academy of Pediatrics (AAP) revised their recommendations for the use of palivizumab, a prophylactic monoclonal antibody therapy, advising that only high-risk patients, including infants born at less than 29 weeks gestation, infants with chronic heart or lung disease, children aged less than 2 years who will be severely immunocompromised during RSV season, and children aged less than 1 year who have disease or abnormalities contributing to ineffective cough should be prescribed prophylactic palivizumab.<sup>8</sup> While this revision has decreased the number of children who are recommended to receive the prophylactic treatment, the AAP believes that those infants and young children who will truly benefit from taking the drug are still included in the guidelines.

## Reporting

**Pursuant to 28 PA Code 27.22 RSV is a reportable condition for clinical laboratories within the state of Pennsylvania. The Philadelphia Department of Public Health will also be collecting risk factor information for any fatal cases or outbreaks associated with the virus. For more information, please visit PDPH's Health Information Portal for reporting guidelines and data collection forms.**

### References:

1. Zhang L, Peeples ME, Boucher RC, Collins PL, Pickles RJ. Respiratory Syncytial Virus Infection of Human Airway Epithelial Cells Is Polarized, Specific to Ciliated Cells, and without Obvious Cytopathology. *Journal of Virology* 2002;76(11):5654-5666. DOI:10.1128/JVI.76.11.5654-5666.2002.
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3. RSV Trends and Surveillance. Centers for Disease Control and Prevention website. <http://www.cdc.gov/rsv/research/us-surveillance.html>. Updated December 4, 2014. Accessed January 16, 2015.
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5. RSV Symptoms and Care. Centers for Disease Control and Prevention website. <http://www.cdc.gov/rsv/about/symptoms.html>. Updated December 4, 2014. Accessed January 14, 2015.
6. Tregoning JS, Schwarze J. Respiratory Viral Infections in Infants: Causes, Clinical Symptoms, Virology, and Immunology. *Clinical Microbiology Reviews* 2010;23(1):74-98. doi:10.1128/CMR.00032.
7. American Academy of Pediatrics. Respiratory Syncytial Virus. In: Pickering LK, Baker CJ, Kimberlin DW, Long SS, eds. *Red Book: 2012 Report of the Committee on Infectious Diseases*. Elk Grove Village, IL: American Academy of Pediatrics; 2012: 609-618.
8. American Academy of Pediatrics. Updated Guidance for Palivizumab Prophylaxis Among Infants and Young Children at Increased Risk of Hospitalization for Respiratory Syncytial Virus Infection. *Pediatrics*. 2014; 134(2): 415-420.

**REPORT OUTBREAKS AND REPORTABLE DISEASES AND CONDITIONS TO PDPH**

PHONE: (215) 685-6748

FAX: (215) 238-6947

Reporting requirements and forms are posted online at [hip.phila.gov](http://hip.phila.gov)

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