

IN THIS ISSUE: PERTUSSIS (“WHOOPING COUGH”)**Pertussis (“Whooping Cough”)****Introduction**

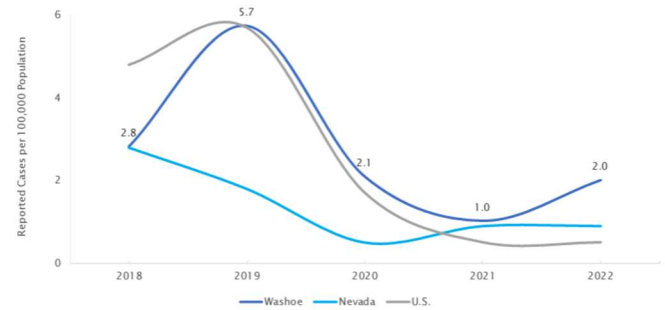
Pertussis is a respiratory disease, also known as whooping cough, caused by the bacterium *Bordetella pertussis*. The bacteria attacks the cilia in the upper respiratory pathway by releasing toxins that causes inflammation in the respiratory tract.¹

Epidemiology

Pertussis is a highly communicable disease that is most commonly spread person-to-person when persons come into contact with respiratory droplets or airborne droplets of respiratory secretions.³ It is less commonly spread by contact with an infected person’s contaminated items. While there is no distinct seasonal pattern, pertussis numbers have shown a higher likelihood to increase in the late-summer and fall based on yearly case reporting trends. Infection and immunization do not provide lifelong immunity to individuals.² Some studies show infection can provide immunity for 4 to 20 years.³

Incidence of pertussis is cyclical, reported cases have been climbing since the 1990’s until the start of the COVID-19 pandemic.² It is likely that mitigation factors (i.e., masking, social distancing) lowered transmission. However, preliminary 2024 data shows three times as many cases reported to date as compared to 2023.⁴ Washoe County saw a peak in 2019 (5.7 cases per 100,000) followed by a decrease during the pandemic years. In 2022, Washoe County had higher reported cases counts as compared to Nevada and the U.S [Fig.1]. While pertussis can cause illness in any age, infection rates disproportionately affect infants and young children and can cause serious or life-threatening complications.³

Figure 1: Pertussis Incidence by Year and Geographic Location, 2018-2022



Source: 2022 Washoe County Annual CD Summary

Risk Factors

Those who are unvaccinated or not fully vaccinated are at higher risk of infection. However, certain factors increase the risk of complications, those include:

- Age: children 6 years and younger who have not received all five vaccinations are at risk. Children under the age of one are at higher risk for life-threatening complications and often require hospitalization.
- Medical conditions: immunocompromised individuals or patients with respiratory issues (moderate to severely medically treated asthma).
- Pregnancy: women in their third trimesters are more prone to pertussis.³

Prevention

Vaccination is recommended for all infants and children, preteens, pregnant women, and adults who have never been immunized. There are two FDA approved vaccines for pertussis. Diphtheria, tetanus, and pertussis (DTaP) is given to infants and children younger than 7 years of age and administered at 2, 4, 6, 15 months of age, and when entering school. Tetanus, diphtheria, and pertussis (Tdap) is given to persons 7 years and older.³ Tdap should be administered every 10 years.⁶

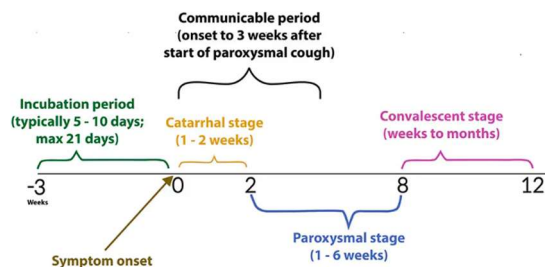
Signs & Symptoms

Once exposed, symptoms typically develop within 7 to 10 days but can range from 5 to 21 days.² If left untreated or treated too late, the cough may gradually improve but could take weeks to months to resolve.² The infectious period starts in catarrhal stage through the third week after the onset of paroxysms or until 5 days after the start of effective antimicrobial treatment.¹ The duration of illness can range from 6-10 weeks.

Pertussis occurs in three distinct stages [Fig 2].

- Stage 1 (Catarrhal): coryza; low-grade fever; mild, occasional cough which gradually becomes more severe; and apnea (in infants).
- Stage 2 (Paroxysmal): paroxysms of numerous, rapid cough (usually at night); long inspiratory breaths with a high-pitched 'whoop' at the end of cough; cyanosis; exhaustion; and post-tussive vomiting.
- Stage 3 (Convalescent): gradual recovery; less persistent, paroxysmal cough that disappears in 2-3 weeks.³ Residual cough can persist for weeks to months; it is usually triggered by other respiratory infections or irritants.⁵

Figure 2: Pertussis Disease Progression



Source: <https://www.cdc.gov/pertussis/hcp/clinical-signs/index.html>

Diagnosis & Testing

Healthcare providers should obtain a nasopharyngeal swab or aspirate from all individuals suspected of having pertussis. Culture testing is the gold standard and can be collected during the first two weeks following cough onset. **Polymerase chain reaction (PCR) testing can be used up to three to four weeks following cough onset.** Serology testing can be used from two to twelve weeks following cough onset.³

Treatment

Early initiated antimicrobial therapy is most effective in the duration and severity of illness, especially if initiated 1-2 weeks prior to onset of paroxysmal cough. **Do not delay treatment while waiting for laboratory results** if clinical history suggests pertussis infection; if the person is at higher risk for severe or complicated disease; or if the person will have contact with someone at higher risk for severe disease (i.e., pregnant women in third trimester).³ Suggested guideline for treatment includes:

- Children (<1 yr. of age and older): within 3 weeks of cough onset
- Infants (>1 yr. of age): within 6 weeks of cough onset.
- Pregnant women (especially those near term): within 6 weeks of cough onset.

Recommended antimicrobial therapies include azithromycin, clarithromycin, or erythromycin. Providers may also consider trimethoprim-sulfamethoxazole. After paroxysmal cough onset, antimicrobial therapies have no discernable effect on course of illness but are still recommended to limit transmission.³

Individuals, regardless of immunization status, who have been in close contact with those diagnosed with pertussis, should be monitored for respiratory symptoms for 21 days after last exposure. Contacts experiencing symptoms should be tested for pertussis and treated empirically. People in sensitive occupations (childcare, schools, and healthcare) with confirmed pertussis should be excluded from work, childcare, or school until completion of 5 days of antimicrobial therapy. If untreated, individuals should be excluded 21 days from cough onset. Postexposure prophylaxis (PEP) within 21 days of exposure is recommended for all household contacts as well as non-household contacts that are at high risk or will have close contact with those at high risk of severe pertussis (i.e., infants, pregnant women, persons in close contact with infants). Pertussis immunizations should be initiated as soon as possible for close contacts who are unimmunized or underimmunized.^{2,3}

Reporting

The list of reportable communicable diseases and reporting forms can be found at:

<http://tinyurl.com/WashoeDiseaseReporting>

Report communicable diseases to Northern Nevada Public Health. To report a communicable disease, please call 775-328-2447 or fax your report to the NNPH at 775-328-3764.

Acknowledgement

Thank you to all health care providers, infection control practitioners, laboratory staff, as well as schools and daycares for their reporting and collaboration to make this work possible.

References

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