

# Pertusis Case Summary

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## Background

**Etiology:** Pertussis, commonly known as whooping cough, is a highly contagious respiratory disease caused by the bacterium *Bordetella pertussis*. The bacteria attach to the cilia of the upper respiratory system, releasing toxins that damage the cilia and cause inflammation of the airways.

**Epidemiology:** Pertussis affects individuals worldwide but is particularly dangerous in infants and young children. Despite the availability of vaccinations, pertussis outbreaks still occur. The disease has a cyclical epidemiology with peaks every 3-5 years. In the United States, pertussis incidence has been rising, with thousands of cases reported annually, likely due to a combination of better diagnostic capabilities, waning immunity in vaccinated populations, and vaccine refusal.

**Transmission:** The primary mode of transmission is through respiratory droplets from coughing or sneezing. It is highly infectious, with a secondary attack rate of up to 80% among susceptible household contacts. Incubation ranges from 7-10 days but can be as long as 21 days. Individuals are most contagious during the early stages, often before the whooping cough is apparent.

## Case Details

### Demographics:

- Age: 4 months
- Gender: Female
- Location: Urban community with recent pertussis outbreaks
- Vaccine History: Received the initial doses of DTaP vaccine but has not completed the full series

### Symptoms:

- Initial Phase (Catarrhal Phase): Mild coughing, runny nose, sneezing, and low-grade fever lasting 1-2 weeks
- Paroxysmal Phase: Severe coughing fits followed by a high-pitched “whoop” sound, vomiting post-coughing, exhaustion lasting 1-6 weeks or longer
- Convalescent Phase: Gradual recovery from coughing fits, which can last several weeks to months

### Testing:

- Nasopharyngeal swab or aspirate for PCR testing is the most common and sensitive test.
- Culture from nasopharyngeal swabs can confirm the diagnosis, although it is less sensitive and more time-consuming.
- Serology might be used in later stages of the disease for detection of specific antibodies.

### **Subsequent Cases**

Two other children (aged 3 years and 6 years) in the same neighborhood presented with similar symptoms. Both were unvaccinated due to parental choice. Epidemiologic linkage and similar clinical presentation suggested secondary transmissions from the index case.

### **Learning Objectives**

1. To understand the clinical presentation and progression of pertussis.
2. To comprehend the importance of vaccination in preventing pertussis.
3. To recognize the role of public health interventions in controlling outbreaks.
4. To apply appropriate diagnostic techniques for suspected pertussis cases.

### **Actions and Outcomes**

#### **Immediate Actions:**

- Isolation of the infected child and close monitoring of respiratory status.
- Administration of antibiotics (Azithromycin) to the patient and prophylactic antibiotics to close contacts.
- Notification to public health authorities for contact tracing and potential outbreak investigation.

#### ***Subsequent Actions:***

- Public health interventions including vaccination clinics and public awareness campaigns.
- Rigorous follow-up on vaccination status of siblings and neighborhood children.
- Educational outreach to healthcare providers and families on the importance of timely pertussis vaccination.

### **Reflection**

This case underscores the vulnerability of partially vaccinated infants to pertussis and highlights the critical role of herd immunity. It also points to the challenges faced in communities with vaccine hesitancy. The effectiveness of timely public

health interventions and appropriate prophylactic measures was key to preventing further spread.

### **Discussion Questions**

1. What factors have contributed to the recent resurgence of pertussis in vaccinated populations?
2. How can public health nurses effectively address vaccine hesitancy among parents?
3. What are the barriers to achieving higher vaccination rates in certain communities, and how can they be overcome?
4. Considering the cyclical nature of pertussis, what long-term strategies should be implemented to reduce outbreak potential?
5. How would you handle a situation in which a parent refuses to vaccinate their child during an active outbreak?

This case serves as an essential learning tool for public health nurses, focusing on early detection, appropriate management, and the pivotal role of vaccination in preventing pertussis.