Whooping Cough
Testing by Real-Time PCR, Test # 8099
Bordetella pertussis & parapertussis

During the first half of 2012, increased pertussis activity or outbreaks have been reported in a majority of states, and Washington declared a pertussis epidemic in April. As of July 5, 2012, 37 states have reported increases in disease compared with the same time period in 2011. Provisional counts from CD surveillance system indicate that more than 17,000 cases of pertussis were reported to CDC through July 12, 2012. Nine pertussis-related deaths have been reported during that same time period. The majority of deaths continue to occur among infants younger than 3 months of age.

With the continuing resurgence of pertussis, health care professionals will see more patients with suspected pertussis. PCR is an important tool for timely diagnosis of pertussis and is available at Sparrow Laboratories. PCR is a molecular technique used to detect DNA sequences of the Bordetella pertussis and Bordetella parapertussis bacteria and unlike culture, does not require viable (live) bacteria present in the specimen.

Clinical Background

Pertussis is also known as whooping cough. Early signs and symptoms of pertussis are often non-specific, making it difficult to determine clinically who has pertussis in the earliest stages. Only patients with signs and symptoms consistent with pertussis should be tested by PCR to confirm the diagnosis.

From the onset of symptoms, the disease can take 6-8 weeks to resolve. Pertussis is highly contagious, infecting 80-90% of susceptible individuals. The incubation period is 4 to 21 days post exposure. Though mortality from this disease is low among healthy adults, they are a potential reservoir for pediatric infections. Pertussis can be very severe in young infants and adults age 60 years and older. Early diagnosis is essential to limit complications and minimize transmission of the disease. The incidence rate of pertussis among infants exceeds that of all other age groups. The second highest rates of disease are observed among children 7 - 10 years old. In infants younger than 12 months of age who get pertussis, more than half must be hospitalized. Hospitalization is most common in infants younger than 6 months. Of those infants who are hospitalized with pertussis approximately:

- 50% will have apnea
- 20% get pneumonia
- 1% will have seizures
- 1% will die
- 0.3% will have encephalopathy

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Epidemiology

Pertussis is an acute infectious disease caused by the bacterium Bordetella pertussis. In the 20th century, pertussis was one of the most common childhood diseases and a major cause of childhood mortality in the US. Before the availability of pertussis vaccine in the 1940s, more than 200,000 cases of pertussis were reported annually. Since widespread use of the vaccine began, incidence has decreased more than 80% compared with the pre-vaccine era.

Since the 1980s there’s been an increase in the number of reported cases of pertussis. In 2010, 27,550 cases of pertussis were reported. Several factors have likely contributed to the increase in reported cases, including increased awareness and improved recognition of pertussis among clinicians, greater access to and use of laboratory diagnostics especially PCR testing, increased reporting to public health departments, and waning immunity from vaccines. However, CDC believes that much of the disease goes unrecognized and unreported.

Optimal Timing for Testing Pertussis by PCR

PCR has optimal sensitivity during the first 3 weeks of cough when bacterial DNA is still present in the nasopharynx. After the 4th week of cough, the amount of bacterial DNA rapidly diminishes which increases the risk of obtaining falsely-negative results.

PCR testing following antibiotic therapy can also result in falsely-negative findings. The exact duration of positivity following antibiotic use is not well understood, but PCR testing after 5 days of antibiotic use is generally not recommended.

Optimal Specimen Collection for Pertussis PCR Testing

Specimens for PCR testing should be obtained by aspiration or swabbing the posterior nasopharynx. Throat swabs and anterior nasal swabs have unacceptably low rates of DNA recovery and should not be used for pertussis diagnosis. The swab tips may be polyester (such as Dacron®), rayon, or nylon-flocked. Cotton-tipped or calcium alginate swabs are not acceptable as residues present in these materials inhibit PCR assays. If feasible, nasopharyngeal (NP) aspirates that flush the posterior nasopharynx with a saline wash are preferred over swabs because this method results in a larger quantity of bacterial DNA in the sample.

Turnaround time and Days test performed

1 to 3 days

For questions please call Sparrow Laboratories at 517.364.7800

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