



Bordetella pertussis and B. parapertussis Real-Time PCR

Molecular Detection of *B. pertussis* and *B. parapertussis* in respiratory specimens using qualitative real-time PCR testing

Clinical Background

Bordetella pertussis is the etiologic agent of whooping cough and *Bordetella parapertussis* can also cause a pertussis-like illness. *B. pertussis* is more prevalent than *B. parapertussis*, but both are contagious and contribute to respiratory disease. They are fastidious, gram negative bacilli that require special media for culture isolation and long incubation times (3-7 days).

The Centers for Disease Control (CDC) has stated that there has been a resurgence of pertussis. The incidence of pertussis in the general population has been on the rise since 1991 and there was an 82% increase in total number of cases reported to the CDC in 1993.

The use of molecular amplification offers higher test performance than culture. Real-time PCR has contributed substantially to improving both the laboratory diagnostic support and patient care. The use of real-time PCR testing will improve both sensitivity, due to the low limit of detection and turn-around-time for optimal patient management and infection control.

Test Performance Verification

In house test performance was compared to reference lab testing (Real-time PCR) and culture for both *Bordetella pertussis* and *B. parapertussis*. The following summary table shows the performance characteristics for this real-time PCR test:

Test Variable	<i>B. pertussis</i>	<i>B. parapertussis</i>
Sensitivity	100	100
Specificity*	85.7	100
NPV	100	100
PPV	93.3	100

* *B. bronchiseptica* and *B. holmsei* showed some cross-reactivity.

Test Limitations

- This test is intended for use with respiratory specimens.
- A negative test result does not rule out the presence of bacteria below the test sensitivity.
- This test may not distinguish *B. pertussis* from either *B. holmsei* or *B. bronchiseptica*

Methodology

EraGen MultiCode®-RTx System using real-time PCR testing on the Roche LightCycler® 2.0

Test Ordering Information

Test Name	Test Code
Bordetella pertussis and B. parapertussis Real-Time PCR	6637

Specimen Collection and Transport

Specimen Type: Nasopharyngeal swab in viral transport media

Other specimen types: Nasopharyngeal aspirate/wash and bronchial wash

Specimen Stability

Ambient Stability: 2 days

Refrigerated (2-8°C): 1 week

Frozen Stability (-20°C or lower): 1 month

Local Transport: Refrigerated **Long Distance:** frozen

CPT Code

87798 x 2	Infectious agent detection by nucleic acid amplified probe technique
-----------	--

References

1. Centers for Disease Control. Resurgence of Pertussis—United States, 1993. Morbidity and Mortality Weekly Report. 42(49), December 17, 1993
2. Mandell, G. L., J. E. Bennett, and R. Dolin. 2010. Mandell, Douglas, and Bennett's principles and practice of infectious diseases, 7th ed. Churchill Livingstone/Elsevier, Philadelphia, PA.
3. Persing, D. H. 2011. Molecular microbiology: diagnostic principles and practice, 2nd ed. ASM Press, Washington, DC.
4. Versalovic, J., and American Society for Microbiology. 2011. Manual of clinical microbiology, 10th ed. ASM Press, Washington, DC.