
Lab Dept: Molecular Diagnostics

Test Name: BORDETELLA PERTUSSIS & PARAPERTUSSIS PCR

General Information

Lab Order Codes: BORDP

Synonyms: Bordetella pertussis and parapertussis PCR; Pertussis PCR; Whooping cough PCR

CPT Codes: 87798 x2 – Infectious agent detection by nucleic acid, not otherwise specified; amplified probe technique, each organism

Test Includes: Detection of *Bordetella pertussis* and/or *Bordetella parapertussis* DNA by PCR from symptomatic patients suspected of having pertussis (whooping cough). This assay is not meant to be used for testing asymptomatic patients. This assay targets the *Bordetella pertussis* insertion sequence IS481 and *Bordetella parapertussis* insertion sequence IS1001.

Logistics

Test Indications: Diagnosis of *Bordetella pertussis/parapertussis* infection.

Lab Testing Sections: Molecular Diagnostics, Mpls campus only

Phone Numbers: 612-813-7103

Test Availability: Samples accepted daily, 24 hours
Testing performed 0600-1400

Turnaround Time: 3 - 24 hours

Special Instructions: Requisition must state specific type of specimen and date/time of collection.

Specimen

Specimen Type: Flocked Nasopharyngeal (NP) Swab

Container: **Flocked NP Swab:** mini-tip flocked swab in Universal Transport Media (UTM)

CHC# 32788: Kit, Mini Tip Flock Swab w/UTM



Draw Volume: 1 Flocked NP swab in 3 mL UTM

Collection: **Flocked NP Swab (1):**

1. Carefully insert a flexible-shaft mini-tip swab containing a dry tip into the nasopharyngeal cavity until resistance is encountered.
2. Rotate the swab slowly on the nasopharyngeal membrane for 5-10 seconds to absorb secretions.
3. Remove the swab, break off into into swab transport medium at the score line, and send to the lab immediately.

NOTE: Vaccines contain high copy numbers of *B. pertussis* DNA, which can be aerosolized, causing false-positive *B. pertussis* PCR results. Take caution to avoid contamination during collection.

Transport/Storage: Transport to the Laboratory at room temperature. If a delay is anticipated, refrigerate specimen at 2-8°C.

- Specimens are stable at room temperature for 7 days.

Patient Preparation: None

Sample Rejection: Calcium alginate swabs (inhibitory to PCR); sputum, nasal wash, nasal swab, any other respiratory specimens; specimen not submitted in appropriate transport container; improperly labeled specimen. If an unacceptable specimen is received, the patient's care giver will be notified and another specimen will be requested before the specimen is discarded.

Interpretive

Reference Range:

Negative for *Bordetella pertussis* and *Bordetella parapertussis*

Alert Values:

Positive *Bordetella pertussis* results will be phoned to the patient's caregiver.

Limitations:

1. Results from this test must be considered in conjunction with the clinical history, epidemiological data, and other laboratory information available to the clinician evaluating the patient.
2. The detection of bacterial nucleic acid is dependent upon proper sample collection, transport, handling, storage, and preparation. Failure to observe proper procedures in any one of these steps can lead to incorrect results.
3. IS481 is also present in *Bordetella holmesii*. Additional testing should be performed if necessary to differentiate between *Bordetella holmesii* and *Bordetella pertussis*.
4. The prevalence of bacterial infections may affect the test's predictive value.
5. Negative results do not rule out *Bordetella* infections and should not be used as the sole basis for treatment or other patient management decisions.
6. False-negative results may occur if the bacteria have genomic mutations, insertions, deletions, or rearrangements or if performed very early in the course of illness.
7. False-negative results may occur if inadequate numbers of bacteria are present in the specimen due to improper collection, transport or handling. False-negative results may also occur if the bacteria are present at a level that is below the analytical sensitivity of the assay.
8. As with other tests, false-positive results may occur. Repeat testing may be required in some in some settings.
9. This test cannot rule out diseases caused by other bacterial or viral pathogens.
10. This test is a qualitative test and does not provide the quantitative value of detected organisms present.
11. The performance of this test has not been established for patients without symptoms of *Bordetella* infection.
12. The performance of this test has not been established for monitoring treatment of *Bordetella* infection.
13. The performance of this test has not been established for use in donor screening tests.
14. Vaccines contain high copy numbers of *B. pertussis* DNA, which can be aerosolized, causing false-positive *B. pertussis* PCR results.

Methodology:

Real-Time Multiplex Polymerase Chain Reaction (PCR)

References:

Simplexa Bordetella Direct Package Insert, REF MOL2750, Rev. 02. (December, 2018). In: DiaSorin Molecular

Tan TJTPidj. Summary: epidemiology of pertussis. 2005;24(5):S35-S38

Persing DH, Tenover FC, Tang Y-W, Nolte FS, Hayden RT, Belkum Av. Molecular microbiology: diagnostic principles and practice. ASM press; 2011

Buckingham L. Molecular diagnostics: fundamentals, methods and clinical applications. FA Davis; 2019

Salimnia H, Lephart PR, Asmar BI, Prebelich D, Paulson E, Fairfax MRJJocm. Aerosolized vaccine as an unexpected source of false-positive Bordetella pertussis PCR results. 2012;50(2):472-474

Mandal S, Tatti KM, Woods-Stout D, et al. Pertussis pseudo-outbreak linked to specimens contaminated by Bordetella pertussis DNA from clinic surfaces. 2012;129(2):e424-e430

Updates

5/6/2016: Updated Test Includes and Limitations.

1/24/2018: Collection swab update.

9/25/2018: Update Container to include NP Swab

10/18/2018: Updated alert value specific to Bordetella pertussis only.

1/21/2020: Updated for flocked NP swab collection only

11/11/2020: Updated collection swab info.