## Lab Dept: Microbiology/Virology

## Test Name: BORDETELLA PERTUSSIS & PARAPERTUSSIS PCR

### *General Information*

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| **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*

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| **Test Indications:** | Diagnosis of *Bordetella pertussis/parapertussis* infection. |
| **Lab Testing Sections:** | Molecular Diagnostics, Mpls campus only |
| **Phone Numbers:** | 612-813-7103 |
| **Test Availability:** | Daily, 24 hours |
| **Turnaround Time:** | 8 - 24 hours |
| **Special Instructions:** | Requisition must state specific type of specimen and date/time of collection. |

### *Specimen*

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| **Specimen Type:** | Nasopharyngeal swab, bronchoalveolar lavage (BAL), bronchial wash, nasal wash/aspirate |
| **Container:** | **Twisted wire shaft swab:** BBL mini-tip CultureSwab® Amies Charcoal Transport System (blue top)<br><br>**Sterile Container:** for nasopharyngeal wash/aspirate/lavage, bronchoscopy |
| **Draw Volume:** | 1 NP swab or 1-2 mL (0.5 mL minimum) Nasal wash/aspirate, bronchoalveolar lavage (BAL), bronchoscopy samples |

**Collection:**

**Nasopharyngeal Washings:**

**1.** Tilt patient's head back at a 70° angle.
**2.** Insert rubber bulb syringe containing 1 – 2 mL of sterile saline until it occludes the nostril.
**3.** Collect specimen with one complete squeeze and release bulb.
**4.** Repeat in other nostril.
**5.** Dispense the specimen into a sterile screw cap container and transport to the lab immediately.

**Nasal Aspiration:**

**1.** Prepare suction set up on low to medium suction.
**2.** Wash hands.
**3.** Put on protective barriers (e.g., gloves, gown, mask).
**4.** Place child supine and obtain assistant to hold child during procedure.
**5.** Attach luki tube to suction tubing and #6 French suction catheter.
**6.** Insert catheter into nostril and pharynx without applying suction.
**7.** Apply suction as catheter is withdrawn.

**NP Swabs (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, place in swab transport medium and send to the lab immediately.

**Bronchoscopy:**

**1.** Specimen obtained by physician through biopsy channel of the bronchoscope.
**2.** Transfer 1-2 mL of sample into a sterile container.

**Transport/Storage:** Transport to the Laboratory at room temperature. If a delay is anticipated, refrigerate specimen at 4°C.

● NP swabs and nasal specimens are stable at room and refrigerated temperatures for 5 days.

● Bronchoscopy specimens are stable at room temperature for 4 h and refrigerated temperatures for 5 days.

**Patient Preparation:** None

**Sample Rejection:** Calcium alginate swabs (inhibitory to PCR), sputum, 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.

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***Interpretive***

**Reference Range:** Negative for *Bordetella pertussis and Bodetella parapertussis*

**Alert Values:** Positive results will be phoned to the patient's caregiver.

**Limitations:**

**1.** Negative results do not rule out *B. pertussis* and *B. parapertussis*
2. PCR detection of B. pertussis and B. parapertussis does not distinguish between viable and non-viable organism. Results should be used in conjunction with an evaluation of signs and symptoms of pertussis and available exposure information.
**3.** This assay should not be used for asymptomatic individuals.
**4.** This test should not used as a test for cure for *B. pertussis* and *B. parapertussis*.
**5.** This test does not distinguish between *B. pertussis* and *B. holmseii.* Some strains of *B. bronchiseptica* also contain the IS481 gene and will cross-react at a lower level.
**6.** The IS1001 target sequence can occasionally be found in *B. bronchiseptica.*
**7.** False-positive PCR results and pseudo-outbreaks have been associated with specimen contamination at the point of collection from some vaccines containing *B. pertussis* DNA.
**8.** False-negative results can occur when low numbers of organism are present. PCR has optimal sensitivity duirn the first 3 weeks of cough.
**9.** False-negative results may occur if *B. pertussis* and *B. parapertussis* has genomic mutations, insertions, deletions or rearrangements.
**10.** Consider culture back-up during outbreak situations to rule out possible contamination.

**Methodology:** Real-Time Polymerase Chain Reaction

**References:**

Miller, J Michael (1999) A Guide to Specimen Management in Clinical Microbiology, American Society for Microbiology, Washington DC, p100

Baron, EJ and RB Thompson Jr (2011) Specimen Collection, Transport, and Processing: Bacteriology In J. Versalovic, et al, (ed), Manual of Clinical Microbiology, 11th edition, American Society for Microbiology, Washington DC, p 237

Bordetella PCR Clinical Verification and Validation Study performed at Children's Hospitals and Clinics of MN (2015)

**Updates**

5/6/2016: Updated Test Includes and Limitations.
1/24/2018: Collection swab update.