

## FAST FACTS: Pertussis Testing

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### Recommended Screen – Pertussis PCR Panel (BORDPCR)

- This PCR panel utilizes the multi-target detection approach recommended by the Centers for Disease Control and Prevention. PCR targets include real-time PCR testing for the IS481 gene of *B. pertussis*, the pIS1001 gene from *B. parapertussis*, and the hIS1001 gene from *B. holmseii*. Reflex testing for the pertussis toxin gene is used as needed to detect dual infections with *B. parapertussis* and *B. holmseii*. The analytical sensitivity of this panel is approximately 3 colony forming units/assay.
- The clinical sensitivity of PCR testing has been reported to be 70-99% with specificities of 80-100%.
- The best specimen for PCR testing is an NP swab tipped with Rayon or Dacron (not cotton) or a nasal aspirate. Throat and anterior nasal swabs are not acceptable because they provide unacceptably low rates of detection
- Do not submit specimens in Regan-Lowe Medium.
- *B. pertussis* can be detected in young children with pertussis for 3 or more weeks after treatment. **The utility of repeat testing to assess treatment efficacy is questionable.**
- Optimal specimen timing for PCR testing is 0-3 weeks after the onset of cough. In infants and unvaccinated individuals, an accurate diagnosis may be made for up to 4 weeks after symptom onset.
- Persistence of *B. pertussis* DNA in untreated adults and vaccinated individuals is variable.
- **Indeterminate results** can occur and when present, they may represent a mixed infection, low level positive results in one or more assays, or reactivity patterns that do not match expected values. Retesting may be indicated in these cases.
- Cross reactions can occur when the specimen contains high levels of *Bordetella bronchiseptica*.

### *Bordetella pertussis* Culture (BORD)

- Cultures are slow, requiring 7-10 days for a negative result. Positive cultures can usually be resulted in 4-7 days.
- Culture sensitivity is 12-60% but the test is very specific.
- The highest sensitivity occurs:
  - When specimens are collected within first 2 weeks after cough onset.
  - In young patients
  - In unvaccinated patients
  - When specimens are collected before antibiotic treatment
- If the specimen cannot be plated immediately, it must be placed into Regan-Lowe transport medium.

### *Bordetella pertussis* Antibody Testing (BORDABAR)

- Serologic assays can be useful for confirming diagnosis, especially during suspected outbreaks.
- Generally, serologic tests are more useful for diagnosis in later phases of the disease.
- For a single point serology, the optimal timing for specimen collection is 2 to 8 weeks following cough onset, when the antibody titers are at their highest; however, serology may be performed on specimens collected up to 12 weeks following cough onset.

### *Bordetella pertussis* DFA (BPDFA)

- DFA testing is not recommended because the procedure lacks sensitivity and specificity.

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