

Relapsing Fever *Borrelia* Species

Indications for Ordering

- Detect infections caused by relapsing fever *Borrelia* species (RFB)
- Relapsing fever *Borrelia* species include, but are not limited to
 - *B. hermsii*
 - *B. miyamotoi*
 - *B. parkeri*
 - *B. turicatae*

Test Description

Test methodology

Qualitative real-time polymerase chain reaction (PCR)

Tests to Consider

Typical testing strategy

Parasites smear (Giemsa stain), blood

- Traditional method to detect relapsing fever spirochetes
- Very poor sensitivity and requires considerable experience

Primary test

[Relapsing Fever *Borrelia* Species by PCR 3000010](#)

- Detects but does not differentiate nucleic acid from
 - *B. hermsii*
 - *B. miyamotoi*
 - *B. parkeri*
 - *B. turicatae*

Disease Overview

Prevalence and/or incidence

- True incidence unknown due to poor predicate methods of detection
- Recent identification of RFB in the Northeast and Northern U.S. has led to expanded testing and detection rates
- <500 cases reported in 20 years in the Western U.S. using primarily blood smears

Symptoms

- Recurring febrile episodes lasting ~3 days, separated by a 7-day afebrile period
 - 3 episodes typically experienced if untreated
- Headaches, myalgia, chills, nausea in >75% of patients
- Arthralgia, vomiting in >50% of patients

Diagnostic issues

Even in endemic regions of the U.S., many physicians are not aware of this infection

Test Interpretation

Sensitivity/specificity

- Analytical sensitivity
 - *B. hermsii* – 5,000 copies/mL
 - *B. crocidurae* (plasmid) – 125,000 copies/mL
- Analytical specificity
 - No cross-reactivity observed for 68 organisms tested, including *B. burgdorferi*, *B. garinii*, and *B. afzelii*, the causative agents of Lyme borreliosis

Results

- Detected
 - Patient's blood contains nucleic acid from RFB
- Negative
 - No RFB nucleic acid detected

Limitations

- Negative result does not rule out
 - Presence of PCR inhibitors in specimen
 - Assay-specific nucleic acid in concentrations below the level of detection

References

Centers for Disease Control and Prevention. [Tickborne Relapsing Fever](http://www.cdc.gov/relapsing-fever/clinicians/index.html) (TBRF). www.cdc.gov/relapsing-fever/clinicians/index.html [Last reviewed Oct 2015; last updated Jan 2016]