Borrelia burgdorferi Antibodies With Reflex to ELISA

Lyme disease is one of the most common tickborne diseases in the United States. Infection is often accompanied by a characteristic erythema migrans (EM) rash, which alongside the appropriate history of tick exposure, can be used to issue a clinical diagnosis. Although laboratory testing is not always necessary for diagnosis, it is recommended for individuals with atypical presentations or specific neurologic symptoms.[1] When testing is indicated, the CDC recommends two-tiered serologic testing.[2]

For additional information, refer to the ARUP Consult Tickborne Diseases topic or Lyme Disease - Modified Two-Tiered Testing Algorithm.

Test Interpretation

Reference Range

- Negative: ≤0.90 IV
- Equivocal: 0.91-1.09 IV
- Positive: ≥1.10 IV

Results

Testing Tier	Result	Interpretation
Tier 1: VlsE1/pepC10 antibodies by ELISA	Negative	Antibodies to *Borrelia burgdorferi* were not detected. Test will not reflex to tier 2. If suspicion of recent infection (≤14 days) remains, consider testing a new specimen after 7-14 days.
	Positive/equivocal	Antibodies to *B. burgdorferi* were detected. Test will reflex to tier 2.
Tier 2: Reflex to IgM and IgG antibodies by ELISA	Negative IgM and IgG	Antibodies to *B. burgdorferi* were not detected. If suspicion of recent infection (≤14 days) remains, consider testing a new specimen after 7-14 days.
	Equivocal IgM and IgG	If tier 1 results were positive, an equivocal tier 2 result supports a diagnosis of Lyme disease. If both tier 1 and tier 2 results are equivocal, consider testing a new specimen after 7-14 days.
	Positive IgM only	IgM antibodies to *B. burgdorferi* were detected, suggesting an acute or recent infection. IgM antibody results should only be considered to suggest recent or acute infection for specimens drawn ≤30 days from symptom onset.
	Positive IgG only	IgG antibodies to *B. burgdorferi* were detected, suggesting a recent or past infection.
	Positive IgM and IgG	IgM and IgG antibodies to *B. burgdorferi* were detected, suggesting a recent or past infection.

ELISA, enzyme-linked immunosorbent assay; Ig, immunoglobulin

Limitations

- Serologic testing is not useful to assess treatment response.
- IgM antibody results should only be considered for specimens drawn within 30 days of symptom onset.

References

1. Lantos PM, Rumbaugh J, Bockenstedt LK, et al. Clinical practice guidelines by the Infectious Diseases Society of America (IDSA), American Academy of Neurology (AAN), and American College of Rheumatology (ACR): 2020 guidelines for the prevention, diagnosis and treatment of Lyme disease. *Clin Infect Dis*. 2021;72(1):1-8.

Featured ARUP Testing

Borrelia burgdorferi VlsE1/pepC10 Antibodies, Total by ELISA With Reflex to IgM and IgG by ELISA (Modified Two-Tier Testing) 3006053

Method: Semiquantitative Enzyme-Linked Immunosorbent Assay

Preferred reflex test to diagnose Lyme disease in symptomatic individuals. Reflex pattern follows the modified two-tier testing (MTTT) approach; a positive or equivocal screen is confirmed by immunoassay.

2. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Tickborne diseases of the United States: a reference manual for health care providers. 6th ed., 2022. [Last reviewed: Aug 2022; Accessed: Jun 2023]

Related Information

Tickborne Diseases
Lyme Disease - Modified Two-Tiered Testing Algorithm

ARUP Laboratories is a nonprofit enterprise of the University of Utah and its Department of Pathology. 500 Chipeta Way, Salt Lake City, UT 84108
(800) 522-2787 | (801) 583-2787 | aruplab.com | arupconsult.com
Content Review June 2023 | Last Update June 2023

Client Services - (800) 522-2787