

Borrelia burgdorferi Antibodies With Reflex to ELISA

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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 <i>Borrelia burgdorferi</i> 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 <i>B. burgdorferi</i> were detected. Test will reflex to tier 2.
Tier 2: Reflex to IgM and IgG antibodies by ELISA	Negative IgM and IgG	Antibodies to <i>B. burgdorferi</i> 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 <i>B. burgdorferi</i> 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 <i>B. burgdorferi</i> were detected, suggesting a recent or past infection.
	Positive IgM and IgG	IgM and IgG antibodies to <i>B. burgdorferi</i> 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.

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.

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.
2. Centers for Disease Control and Prevention. **Tickborne diseases of the United States: a reference manual for healthcare providers.** 6th edition, 2022. Last reviewed Aug 2022; accessed Jun 2023.

Related Information

[Tickborne Diseases](#)
[Lyme Disease - Modified Two-Tiered Testing Algorithm](#)

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