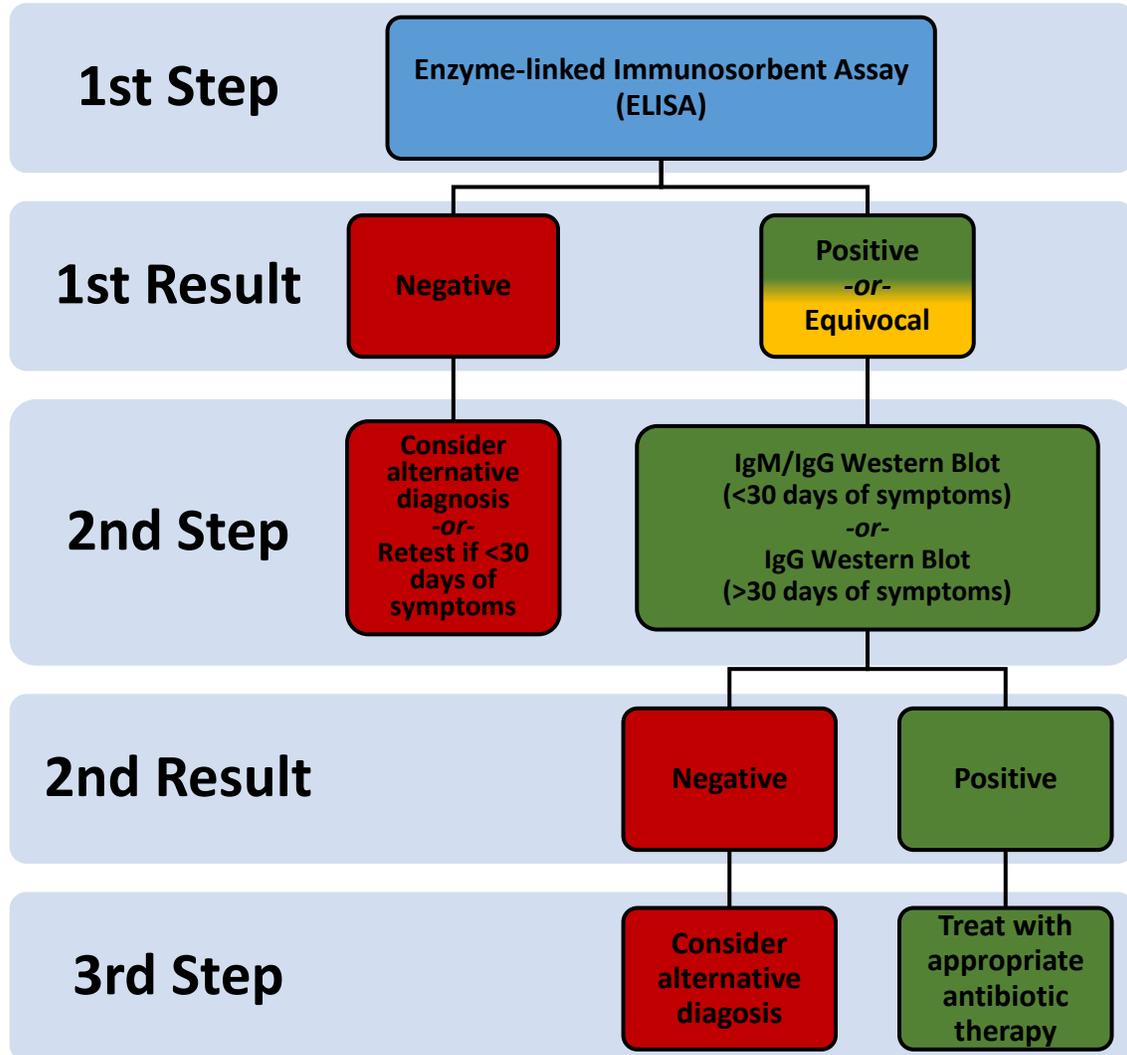


A Patient-centered Guide to Lyme Disease Testing

The tests used to detect Lyme disease can sometimes be confusing, but there is a method behind the madness. This document aims to explain in relatively simple terms the Center for Disease Control's currently recommended two-step test. These tests are used to test blood for evidence of antibodies against the bacteria that cause Lyme disease in North America: *Borellia burgforferi* and *Borellia mayonii*.¹



THE 1st STEP AND RESULTS

Lyme disease testing measures a person's antibodies (immune response) to the bacteria that causes the disease. The initial test, known as an **ELISA** (short for enzyme-linked immunosorbent assay), is designed to be very **sensitive**. This means that the test casts a very wide net that definitely catches anyone who has Lyme disease, but it also means that it might accidentally catch a few patients that don't actually have Lyme disease (called a **false positive**.) Although there are false positives this is considered a good test as we can be confident that we won't miss anyone who might need treatment. However, it also means a second test is needed to determine who is actually positive for Lyme disease rather than a false positive. So if a patient tests positive or **equivocal** (meaning that the test was sort of positive and sort of negative) they move on to the second test to confirm the diagnosis.²

THE 2nd STEP AND RESULTS

The next test is called a **western blot**, which is a type of immunoblot that looks for the antibodies that the body makes against very specific **antigens** (pieces of the bacterium). This test produces something that looks a little bit like the barcode used on grocery items with several lines (or **bands** as they are called in the immunoblot.) Each line represents antibodies found in the patient's blood that react to a different component of the bacteria. As with barcodes, the presence of any one or two lines is not particularly meaningful. Instead, it is the combination of multiple specific lines, indicating antibodies to multiple specific antigens, that identifies infection with the bacteria associated with Lyme.

The immunoblot is a **qualitative** test, which means the result is either "yes, you have Lyme disease" or "no, you don't have Lyme disease" without any middle ground. It is not correct to interpret a test as being "mildly" or "somewhat positive" for Lyme disease. Finally, if the result of this test is negative there is a high degree of certainty that the patient doesn't have Lyme disease given the previous screening ELISA test.³

ADDITIONAL INFORMATION

Immunoblot tests for Lyme disease can detect two different classes of antibodies that our bodies produce: IgM and IgG. The IgM antibodies are made at the first sign of infection, so testing for this class of antibody can be helpful for identifying patients during the first few weeks of infection. However, IgM antibodies are more likely to give a false positive result. On the other hand, the IgG antibodies, made later in the course of an infection, are much less likely to produce a false positive, but can take 30 days for our bodies to produce enough to be detected on the immunoblot.³ Therefore it is recommended that:

- The immunoblot should not be run without first performing the ELISA
- The immunoblot should not be run if the ELISA test results are negative
- A positive IgM immunoblot is only meaningful if it is found within the first 4 weeks of illness
- If a patient has been ill for longer than 30 days and the IgG immunoblot is negative it is unlikely that the patient has Lyme disease even if the IgM immunoblot is positive.

FAST FACTS

- Not everyone who is bitten by a tick that is carrying Lyme disease will become infected
- If a tick carrying Lyme disease is removed with 24hr of attaching there is an almost 0% chance that the Lyme disease will be transmitted⁴
- If a tick carrying Lyme disease is removed with 48hr of attaching there is a less than 1/5 chance that the Lyme disease will be transmitted⁴
- The telltale rash of Lyme disease, known as **erythema chronicum migrans**, is sufficiently distinctive to allow for clinical diagnosis without performing recommended two-step testing⁵

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