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Approximately 10-20% of patients treated with a short course of antibiotics will experience long-term symptoms.1

In Lyme disease treatment, there are two phases of interest regarding bacterial growth:

- The logarithmic (log) phase: a period of exponential (rapid) growth, such as an acute infection.
- The stationary phase: a period when bacterial population growth has stabilized. In this phase, *Borrelia burgdorferi* is more resistant to antibiotics.

All forms of a Lyme infection must be addressed for a patient to regain health.

## SOURCES

Visit projectlyme.org/lyme-persists for direct links and in-depth breakdowns of studies from research institutions including Johns Hopkins University, Columbia University, Tulane University, and more.

## THE SCIENCE

CDC-recommended antibiotic treatment is not supported by scientific research.2

While the optimal treatment has yet to be determined, research shows that the most successful Lyme disease treatment involves a combined approach that addresses all forms of the infection.3

### Spirochetes

The corkscrew-shaped cells for which *Borrelia burgdorferi*, the causative agent of Lyme disease, is known.

### Round Body Forms

Spirochetes have been shown to turn into round-shaped forms in response to unfavorable environmental conditions, including antibiotic exposure. In vitro studies have found round bodies to be more resistant to antibiotics, with the ability to revert to spirochetes when conditions are suitable.4

### Biofilms

Biofilms are microcolonies of spirochetes and round bodies shielded from hostile environments by a protective layer, shown in vitro to be the most antibiotic-resistant form of *B. burgdorferi*.5