

Study sheds light on new Lyme disease-causing bacteria

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A new species of bacteria that causes Lyme disease needs the same amount of time for transmission after a tick bite compared to previously implicated bacteria, according to new research by the Centers for Disease Control and Prevention (CDC). Existing guidelines for frequent tick checks and prompt removal of attached ticks remain the same.

The duration of attachment of a single nymphal blacklegged tick (*Ixodes scapularis*) needed for the tick to be likely to transmit the bacterial species *Borrelia mayonii*, identified in 2016, is 48 hours or more, according to the study. By 72 hours, however, likelihood of [transmission](#) has risen significantly. This timeframe aligns with existing research on *Borrelia burgdorferi*, previously the sole bacteria species known to cause Lyme [disease](#) in the United States. The research is published in the Entomological Society of America's *Journal of Medical Entomology*.

"Our findings show that recommendations for regular tick checks and prompt tick removal as a way to prevent transmission of Lyme disease spirochetes to humans via the bites of infected ticks applies to the newly recognized *B. mayonii* as well as *B. burgdorferi*, for which these recommendations originally were developed," says Lars Eisen, Ph.D., CDC research entomologist and senior author of the study.

The study authors tested transmission rates of *B. mayonii* from ticks to mice at four time intervals: 24, 48, and 72 hours after attachment and after the tick's full feed. Their experiment focused on nymphal-stage ticks (the more common source of pathogen transmission, compared to

larval or adult ticks) and exposed the mice to a single infected tick each. They found no evidence of transmission by single nymphs infected with *B. mayonii* in the first 24 or 48 hours, but 31 percent of mice examined after 72 hours were found to be infected. In mice examined after a tick's complete feed (4-5 days), the infection rate was 57 percent.

"Our findings underscore the importance of finding and removing ticks as soon as possible after they bite," says Eisen.

Lyme disease is the most commonly reported vector-borne illness in the [United States](#), with around 300,000 people estimated to be diagnosed each [year](#), mostly in the Northeast and upper Midwest regions. The blacklegged tick is the primary vector of Lyme disease as well as at least a dozen other [illnesses](#).

To reduce the risk of tick bites and tickborne diseases, [CDC recommendations](#) include:

- Avoid wooded and brushy areas with high grass and leaf litter.
- Use insect repellent when outdoors.
- Use products that contain permethrin on clothing.
- Bathe or shower as soon as possible after coming indoors to wash off and more easily find ticks.
- Conduct a full-body tick check after spending time outdoors.
- Examine gear and pets, as ticks can come into the home on these and later attach to people.

The bacterial species *B. mayonii* was discovered when six patients exhibiting symptoms of Lyme disease at the Mayo Clinic in Rochester, Minnesota, in 2013 showed unusual blood-test results. The discovery of the new species was confirmed in 2016.

"There is much still to discover about *B. mayonii*, including to clarify the

geographic range of this emerging human pathogen in the U.S., to determine how commonly different life stages of the blacklegged [tick](#) are infected with *B. mayonii*, and to find out whether the same vertebrate animals that serve as natural reservoirs for *B. burgdorferi* play the same role also for *B. mayonii*," says Eisen.

More information: Marc C. Dolan et al, Transmission of the Lyme Disease Spirochete *Borrelia mayonii* in Relation to Duration of Attachment by Nymphal *Ixodes scapularis* (Acari: Ixodidae), *Journal of Medical Entomology* (2017). [DOI: 10.1093/jme/tjx089](https://doi.org/10.1093/jme/tjx089)

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