

## April Update from the Field 2021: Ticks

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### **Ticks positive for Lyme disease causing bacteria present on white-tailed deer in Northeast Iowa**

Finnegan, B., T. Holman, and K. Grussendorf. "Ticks positive for Lyme disease causing bacteria present on white-tailed deer in Northeast Iowa." *J Allergy Infect Dis* 1, no. 2 (2020): 21-24.

In Iowa there has been an upward trend in the number of cases of Lyme disease. Due to this increase, it is important to understand the transmission pattern and the factors that play a role in the spread of this disease. Lyme disease is caused by the bacterium, *Borrelia burgdorferi*, and is transmitted by *Ixodes scapularis*, within the United States. *I. scapularis* has a two-year life cycle that includes three life stages: larva, nymph, and adult, and requires a blood meal between each stage. Ticks can pick up *B. burgdorferi* through a blood meal at any stage. It is the nymph stage that is the most active and most likely to infect humans. The final blood meal, taken as an adult, usually occurs upon the reproductive host, *Odocoileus virginianus*, (white-tailed deer). Since white-tailed deer play such an important role in the life cycle of *I. scapularis*, it is essential to get a better understanding of this relationship. 111 ticks were collected from 60 harvested deer, during the first shotgun season of hunting in December 2018, from Northeast Iowa. The deer were from 11 different counties throughout Iowa, 5 of these counties having deer with infested adult *I. scapularis*. 96 of the total ticks tested positive for the presence of *B. burgdorferi*. Of the counties with *I. scapularis* collected, all had at least one tick positive for *B. burgdorferi*.

### ***Ixodes scapularis*: Vector to an Increasing Diversity of Human Pathogens in the Upper Midwest**

Wolf, Matthew J., Hannah R. Watkins, and William R. Schwan. "*Ixodes scapularis*: Vector to an Increasing Diversity of Human Pathogens in the Upper Midwest." *WMJ: official publication of the State Medical Society of Wisconsin* 119, no. 1 (2020): 16.

The black-legged tick, *Ixodes scapularis* (*I. scapularis*), is now recognized as the deadliest tick vector in the United States. The Upper Midwest, particularly Wisconsin and Minnesota, are endemic to a diversity of tick-transmitted infectious diseases. Although *Borrelia burgdorferi*, the agent of Lyme disease, still accounts for the majority of diagnosed infections, *I. scapularis* is known to transmit other bacterial, viral, and parasitic agents. To provide an overview of the array of pathogenic microorganisms carried by *I. scapularis* ticks in the Upper Midwest. A literature review was conducted to collect and analyze current information about *I. scapularis* lifestyle, transmission, microorganisms carried by the arthropod vector, and the diseases that occur as a result of infections with these microorganisms in the Upper Midwest. Diagnosis of co-infection from tick-borne zoonosis in humans has increased over the last 2 decades. Since *I. scapularis* can transmit multiple pathogens, it is clinically important because different diagnostic testing and treatment strategies may need to be implemented for a patient with *I. scapularis*-borne

infection(s). This review has concentrated on I scapularis-transmitted diseases affecting the Upper Midwest and has explored the ecology of the I scapularis vector and its role in pathogen transmission.

### **Stemming the Rising Tide of Human-Biting Ticks and Tickborne Diseases, United States**

Eisen, Lars. "Stemming the rising tide of human-biting ticks and tickborne diseases, United States." *Emerging Infectious Diseases* 26, no. 4 (2020): 641.

Ticks and tickborne diseases are increasingly problematic. There have been positive developments that should result in improved strategies and better tools to suppress ticks, reduce human tick bites, and roll back tickborne diseases. However, we equally need to address the question of who is responsible for implementing the solutions. The current model of individual responsibility for tick control evolved from a scenario in the 1990s focusing strongly on exposure to blacklegged ticks and Lyme disease spirochetes in peridomestic settings of the northeastern United States. Today, the threat posed by human-biting ticks is more widespread across the eastern United States, increasingly complex (multiple tick species and >10 notable tickborne pathogens), and, across tick species, more spatially diffuse (including backyards, neighborhood green spaces, and public recreation areas). To mitigate tick-associated negative societal effects, we must consider shifting the responsibility for tick control to include both individual persons and professionally staffed tick-management programs.