

Ticks And Canine Disease

The rise of ticks in the United States and the risk to your patients.

The Growing Threat

Ticks now pose a greater threat to dogs across the country than ever before.¹ Several species of ticks – and the diseases that they can transmit – are now commonly found in parts of the country where they previously did not exist.

What's to Blame?²⁻⁶

Some potential causes include:

- Reforestation
- Wildlife conservation, relocation and restocking
- Climate changes
- Migratory birds
- Decreased environmental pesticide application
- Increased human involvement in forested areas

A Year-Round Threat

Ticks are more than just a summer nuisance. These hardy parasites can thrive – and hunt – in temperatures as low as 40 degrees.⁷ The rising populations of ticks across the U.S. have led to an increased risk of exposure for many pets. Given the resilience of ticks, this risk can be high for many months of the year, even year-round in some areas.

Where Ticks Prey

Ticks lurk in many of the places dogs love to go, including:

- Parks
- Nature trails
- Wooded areas
- Campsites

Even in urban areas, ticks can be brought into residential yards by hosts like white-tailed deer, raccoons, wild turkeys, coyotes, and the neighbors' pets.²

Tick-Borne Diseases



Blacklegged (deer) tick⁸
(*Ixodes scapularis*)

Associated with:

- Lyme disease
- Anaplasmosis



American dog tick⁸
(*Dermacentor variabilis*)

Associated with:

- Rocky Mountain spotted fever
- Tularemia



Brown dog tick⁸
(*Rhipicephalus sanguineus*)

Associated with:

- Rocky Mountain spotted fever



Lone star tick⁸
(*Amblyomma americanum*)

Associated with:

- Ehrlichiosis
- Tularemia

**Complete Tick Life Cycle =
Often Two – Three Years**



Blacklegged Tick and Canine Lyme Borreliosis (CLB)

In North America, only one tick genus of veterinary importance has been found to effectively harbor and transmit the bacterial agent of canine Lyme borreliosis (CLB). The genus *Ixodes* includes the blacklegged tick (*Ixodes scapularis*) and the Western blacklegged tick (*Ixodes pacificus*).

I. scapularis is mainly found in the eastern half of the United States, though drier and hotter microclimates within this zone may not harbor as many ticks.

I. scapularis is a three-host tick, successively feeding on a different host during each of its three growth phases. It is mainly a forest dweller, spending most of its life either in the leaf litter – where moisture is high and the risk of drying out is low – or on leafy green vegetation lower than knee-height.⁹

The larval deer tick stage, active in August and September, is pathogen-free. CLB is carried by the nymphal and adult deer tick stages, which are active May through July and October through August, respectively.¹⁰

Lyme Disease Today

Canine Lyme disease has become a major concern in the United States and Europe over the last 20 years. More recently, the disease has been increasing in parts of the U.S. that previously only had sporadic cases. Practitioners face many challenges when it comes to Lyme disease.

- 1. Diagnosis:** Verifying a sick dog that is serologically positive actually has Lyme disease.
- 2. Treatment:** Determine what antibiotic to use, how much and for how long.
- 3. Monitoring:** Determine when, and how, practitioners should monitor non-clinical dogs for evidence of *Borrelia burgdorferi* infection.
- 4. Prevention:** Consider how practitioners can prevent Lyme disease from affecting their patients.

Diagnosis: The apparent lack of clinical signs in many dogs with Lyme infection can make the diagnosis of Lyme disease difficult. In fact, clinical signs, including those below, are observed in just 10% of infected dogs¹¹:

- Lameness
- Lethargy
- Joint/limb swelling
- Fever
- Lymphadenopathy

Staying Alert

The key word is vigilance. Even if you do not live in a state that is known to be endemic for CLB, remember that many dogs and their owners routinely travel in and out of areas thick with *Ixodes scapularis* ticks carrying or infected with *Borrelia burgdorferi*. Awareness, knowledge of testing, treatment and prevention procedures are important for veterinary staff members, regardless of geographic location.

Areas Inhabited by Blacklegged Ticks⁸



A multipronged approach is important to help protect your patients against Lyme disease and the ticks that transmit it.

- **Vaccinate.**
- **Use tick control.**
- **Remove ticks daily:** It takes approximately 48 hours for an infected tick to transmit *Borrelia burgdorferi* to a dog.¹² Pet owners in areas with a heavy tick burden should examine their pet for ticks daily, and carefully remove any tick they find.

¹ Dryden MW. Flea and tick control in the 21st century, challenges and opportunities. *Vet Derm.* 2009;20:435-440.

² Blagburn BL, Dryden MW. Biology, treatment and control of flea and tick infestations. *Vet Clin N Am.* 2009;39(6):1173-1200.

³ Childs JE, Paddock CD. The ascendancy of *Amblyomma americanum* as a vector of pathogens affecting humans in the United States. *Annu Rev Entomol.* 2003;48:307-337.

⁴ Paddock CD, Yabsley MJ. Ecological havoc, the rise of white-tailed deer, and the emergence of *Amblyomma americanum*-associated zoonoses in the United States. In: Childs JE, Mackenzie JS, Richt JA, eds. *Wildlife and Emerging Zoonotic Diseases: The Biology, Circumstances and Consequences of Cross-Species Transmission*. Berlin Heidelberg New York: Springer Science + Business Media; 2007:290-324.

⁵ Foley JE, Nieto NC, Foley P. Emergence of tick-borne granulocytic anaplasmosis associated with habitat type and forest change in northern California. *Am J Trop Med Hyg.* 2009;81(6):1132-1140.

⁶ Ogden NH, St-Onge L, Barker IK, et al. Role of migratory birds in introduction and range expansion of *Ixodes scapularis* ticks and of *Borrelia burgdorferi* and *Anaplasma phagocytophilum* in Canada. *Appl Environ Microbiol.* 2008;74(6):1780-1790.

⁷ Tick Populations To Explode In 2013. Veterinary Practice News website. <http://www.veterinarypracticenews.com/March-2013/Tick-Populations-To-Explode-In-2013/>. Published March 28, 2013. Accessed July 12, 2017.

⁸ Center for Disease Control - Tick Geographic Distribution. http://www.cdc.gov/ticks/geographic_distribution.html. Accessed July 12, 2017.

⁹ Piesman J, Schwan TG. Ecology of *Borreliae* and Their Arthropod Vectors. In: Samuels DS, Radof JD, eds. *Borrelia, Molecular Biology, Host Interaction and Pathogenesis*. Norfolk, UK: Caister Academic Press; 2010:261-263.

¹⁰ Life-cycle of *Ixodes scapularis* (a.k.a. blacklegged or deer tick). University of Rhode Island Tick Encounter Resource Center website. <http://www.tickencounter.org/PDF/LifeCycleOfIxodesScapularis.pdf>. Accessed July 12, 2017.

¹¹ Littman MP, Goldstein RE, Labato MA, Lappin MR, Moore GE. ACVIM small animal consensus statement on Lyme disease in dogs: Diagnosis, treatment, and prevention. *J Vet Intern Med.* 2006;20:422-434.

¹² Kelly C, Lake S, Mather T. Estimation of the transmission probability of Lyme borreliosis. *Biometrical J.* 1999;6:735-751.