

## Lyme Disease and Other Health Threats

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Fairfax County is a relatively safe place from environmentally-linked diseases compared to other parts of the world. Much of this good news stems from implemented sanitation practices to reduce threats like plague or cholera. Amongst the list of regional concerns is Lyme disease, so let's examine the illness, how the pathogen is acquired, and how to prevent its spread.

Lyme disease is an ailment appearing on several continents. It gained North American notoriety in 1975 after an outbreak in Lyme, Connecticut. Symptoms may include a telltale bull's-eye rash, fever, and body aches, especially in the joints. Special antibiotics clear the infection. Left untreated, it can impact the joints, onset heart complications, and cause neurological damage. In America, the causative agent is a bacterium, *Borrelia burgdorferi*. This troublemaker has a complex means of transmission. First, the bacteria reside in a "reservoir," meaning an animal that harbors the disease. Whereas many animals including shrews, deer, robins, and even pets may serve as reservoirs, rodents (e.g., white-footed mice, chipmunks, and voles) are the biggest group of carriers. A "vector" is a secondary animal that spreads the disease from a reservoir to a host. In Lyme disease's case, the East Coast vector is the black-legged tick (*Ixodes scapularis*), informally called "deer ticks." Ticks have four life stages: egg, larva, nymph, and adult, and require a blood meal at each phase after hatching. A tick emerges from its egg free of *B. burgdorferi*. The tick, at any hatched stage, becomes a disease vector after feasting on an animal reservoir, and for simplicity, we'll say the tick picks up the bacteria during its larval meal. The infected tick, in its nymph and adult phases, is now capable of spreading the bacteria when it feeds on its next victim. Since black-legged tick larvae and nymphs draw blood meals from many host species (especially small animals) and prefer deer in the adult phase, infected nymphs are responsible for 95% of human Lyme disease infections. In order to transmit *B. burgdorferi*, typically the tick must be embedded for at least 24 hours thereby enabling the bacteria to transfer as part of the backwash from their blood meal. Detecting ticks early and removing the attached ones with tweezers (not alcohol or matches) minimizes the risk of bacteria transferring from the tick to you. The Lyme disease explosion over the past decades is blamed on steep reductions of natural rodent and deer predators, enabling the prey populations (*Borrelia* reservoirs) to skyrocket—and the tick populations enjoy the ride!

American dog ticks (*Dermacentor variabilis*) and lone star ticks (*Amblyomma americanum*) also reside in Northern Virginia. They may not be vectors for Lyme disease, but can transmit other pathogens, such as Rocky Mountain spotted fever. General precautions against getting ticks include wearing light-colored long pants and sleeves, tucking the pants into socks, and spraying clothes with insect repellents while working outdoors. When venturing in parks or undergrowth, routinely check yourself for ticks.

In the KPW area, most of the ticks occur near or on residential properties because people inadvertently invite ticks, or at least the critters which transport ticks. Folks offer shelter to rodent populations by planting copses of non-native invasive plants, like [Japanese barberry](#), on which no local herbivores graze. Since deer and other animals avoid these alien plants, the branches form barriers impenetrable to rodent predators, such as minks, barred owls, and red-tailed hawks. Though snakes can still slither through these defenses for a meal, small animals feel welcomed and proliferate in such habitats. As a result, a published study from the Maine Medical Center Research Institute found up to twice as many black-legged ticks around exotic invasive shrubs as existed in native "control" areas. Another way people shelter rodents is by dumping yard debris piles, offering similar defenses as thickets. In July, Invasive Management Area (IMA) volunteers dismantled a huge debris pile, and sure enough we found a vole within minutes of work; other expected wildlife included a couple of beautiful snakes, loads of American cockroaches, and a termite colony! Several neighbors throughout KPW with properties next to flood plains commented about rodent problems, especially during heavy rains. What happened is that people piled up yard debris, the rodent boarding house flooded, and the critters sought higher ground. Often, the closest and most attractive refuge uphill is the house of the person who heaped the mound in the first place.

In addition to shelter, food entices rodents. Rodent chow includes bird feeder spill, kitchen scraps, and even pet waste. Several neighbors mentioned how a previous resident left food out for wildlife, dumped yard debris in the woods, and ended up with a rat colony that required bulldozers and professional eradication! I encountered two rats so far, one was on parkland where an individual routinely leaves people-food for ducks and geese. The second was trapped by my home since one of my neighbors likes feeding mice—and lured more than mice!

I can attest to the impacts of too many rodents, not enough natural predators, tick dispersal, and Lyme disease's ramifications. Before replacing exotic plants with natives around the yard, ticks were especially problematic in a *Forsythia* coppice. A couple of years ago, my dog became excessively lethargic and suffered severe stomach problems. Veterinary blood tests confirmed that he contracted Lyme disease. Since he hardly ever travels outside of the neighborhood, he likely picked up the tick somewhere in KPW if not my backyard. Cured by antibiotic treatments, he has permanent stomach sensitivity; previous existing conditions make joint assessment difficult. In another case, I saw a young man whose total paralysis is a Lyme disease consequence.

Folks, dense rodent populations, the ticks they carry, and tick-borne diseases are serious threats. If you created a debris pile or planted a thicket attracting rodents, you might increase localized health risks to your family members, your pets, and yourself. Whereas some guidelines to fashion an uninviting landscape to rodents all but denude and pave a yard, the important concept is to remove food sources and keep areas open for predator access. Properly dispose of yard debris via curbside pick-up. When composting, use enclosed bins which stand a foot above ground level. Replace deer-resistant non-native bushes with spacious native species.

This article is merely an introduction to the mentioned health concerns. If you are concerned that you have Lyme disease, consult your doctor. Additional information on Lyme disease and ticks may be found at:

<https://www.fairfaxcounty.gov/health/fightthebite/tick-diseases>  
<https://medlineplus.gov/lymedisease.html>

If you would like to read "hard core science," contact me for studies supporting this article. Find more information on rodents at:

<https://www.fairfaxcounty.gov/health/environment/rats-mice>  
<https://multco.us/health/staying-healthy/pest-prevention-and-control/rats>

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