

Ticked-Off

What Anyone Who Spends Time Outdoors Should Know about Ticks Bet Zimmerman Smith

Ticks love me. It's not mutual. While bluebirding or working in our 30-acre wildlife refuge, I've contracted tickborne maladies at least five times, and it's pure misery. But I may have finally figured out how to beat them.

If you're not worrying about ticks, you should be—if not for yourself, then for the sake of your family, friends, or pets. The number of people sickened by tick bites is rising dramatically. Different species of ticks are showing up in new locations. And since just 1981, scientists have discovered 15 new diseases spread by ticks. I never heard of Bourbon or Powassan virus until this year. Both can be deadly, and there's no cure.

Part of the problem is variety. Multiple pathogens¹ and different species of tick vectors² are involved. A relatively paltry amount of money is spent on research. So there's a lot we still don't know.

What we do know is that that reports to the CDC³ indicate that hundreds of thousands of people have contracted tickborne ailments. The real numbers of tick-sickened could be ten times higher, since many cases are misdiagnosed or not reported.⁴

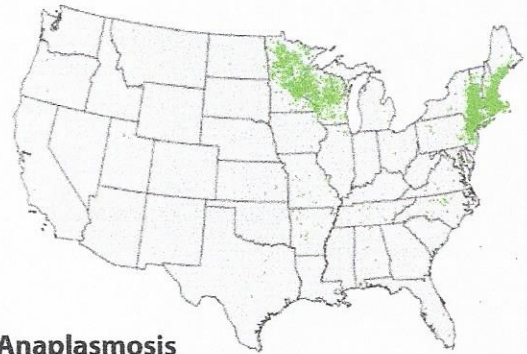
Lyme disease is the most commonly diagnosed tickborne contagion. It is caused by the bite of a miniscule blacklegged tick. Lyme disease has shown up in nearly every state, although about 95% of reported cases occur in in the Northeast, mid-Atlantic, and upper Midwest (Figure 1). In addition to high taxes, my home state of Connecticut enjoys the highest incidence of Lyme disease in the U.S. In fact, Lyme disease was named for a town in Connecticut. In 1977, a cluster of children in Lyme mysteriously came down with symptoms of rheumatoid arthritis, leading to the discovery in 1983 of a bacterium in ticks that causes the disease.

¹ A *pathogen* is a bacterium, virus, or other microorganism that can cause disease.

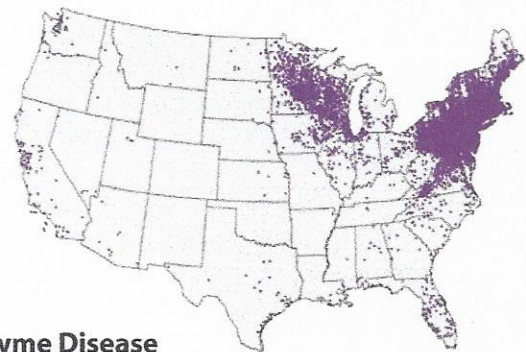
² A *vector* is an organism, like a tick, that transmits a disease or parasite.

³ The Centers for Disease Control, which is the U.S. federal agency that tracks this stuff.

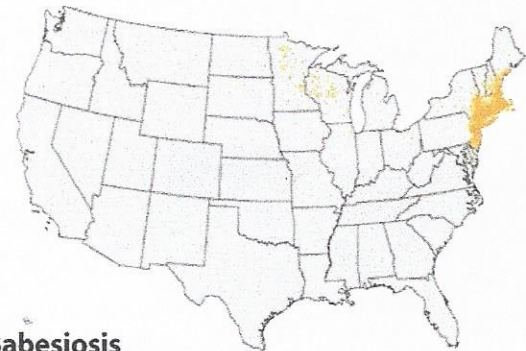
⁴ I think the reported cases of anaplasmosis are way too low. In just six months in one county in Connecticut, our veterinarian said 622 cases of anaplasmosis were diagnosed in dogs.



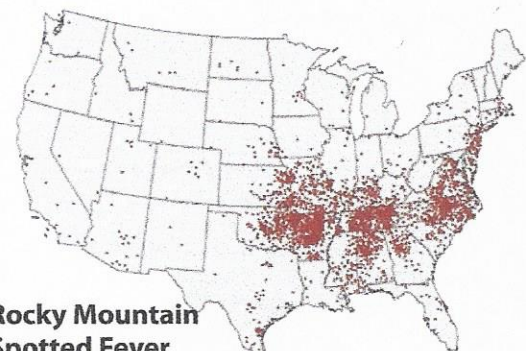
Anaplasmosis



Lyme Disease



Babesiosis



Rocky Mountain Spotted Fever

Figure 1. Selected tickborne diseases reported to the CDC, 2015, showing the infected person's county of residence, not necessarily the place where they were infected.

Last year I ended up in the hospital on an IV after coming down with a double-dose of Lyme disease and anaplasmosis from one tick bite (Figure 2). So I don't take chances anymore. But as a child, I didn't worry about ticks. In the 1960s, there were only two channels on TV and no video games, so I spent a lot of time outdoors. I recall finding an occasional dog tick about the size of a pencil eraser in my hair. But I never saw, or at least never noticed, any tiny ticks. Today, it seems like the little blacklegged ticks are just about everywhere.

If you don't live in a Lyme disease epicenter, don't feel slighted. You can still get it while traveling. Plus there are plenty of other tickborne horrors to be concerned about, including spotted fever, anaplasmosis, babesiosis, ehrlichiosis, tularemia, Powassan disease, Colorado tick fever, and heartland virus.



Figure 2. The author feeling sorry for herself in the hospital after coming down with a double-dose of tick diseases.

Ticks: What They Look Like

There are at least 90 species of ticks in the U.S., but only a handful cause diseases (as far as we know). Lyme disease, anaplasmosis, and babesiosis are transmitted by blacklegged ticks, also called deer ticks. Other ticks that can make you sick are the American dog or wood tick (*Dermacentor variabilis*), brown dog (*Rhipicephalus sanguineus*), lone star (*Amblyomma americanum*), Gulf Coast (*A. maculatum*), Rocky Mountain wood (*D. andersoni*), soft (*Ornithodoros* spp.), and groundhog (*I. cookei*) ticks.

Like spiders, all adult ticks have eight legs. (Strangely, immature larvae only have six legs.) Ticks have flat bodies until they blow up after a blood meal into greenish-gray or black blobs that look like wrinkled peas. Black-legged ticks are super small. A nymph is only about the size of a poppy seed, and adults are about the size of a sesame seed (Figure 3).

Where Ticks Can Find You

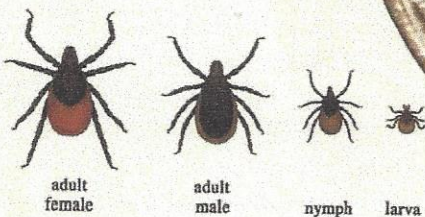
Typical blacklegged tick habitat is humid, like underneath dense forest canopy, with thick underbrush and rotting leaf litter. Ticks are common where there are lots of rodents. Ticks can be found wherever their hosts⁵ go. Think stone walls and log piles, tall grass, and under brushy shrubs. Most ticks that spread disease hang out on small rodents like mice, chipmunks, and ground squirrels. One mouse could have 50–100 ticks on it. Depending on the type of tick, they may feed on raccoons, dogs, horses, sheep, goats, deer, reptiles, amphibians, and even our beloved birds.

When You Can Get Tick-Sick

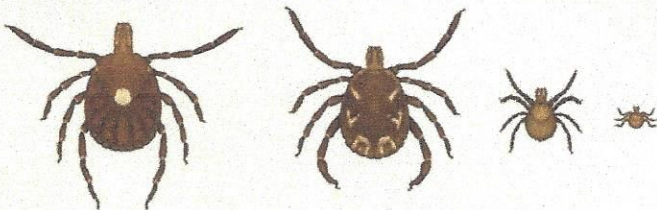
You are most likely to get infected from a tick bite from May through September. That's when people are outdoors more, and when ticks (especially nymphs) are abundant, active, and feeding. However, I've seen ticks crawling around during warm bouts of weather in the middle of winter.

Some years are worse than others. It's hard to predict when we'll have a bad year for ticks. The critters that cause disease can have a life cycle (from adult to egg) that lasts up to three years. Their populations are affected by temperature, rain, humidity, the availability of hosts, etc. For example, in 2016 in Connecticut we had a mouse population explosion as a result of a big acorn crop. So in 2017, tick numbers

Blacklegged Tick (*Ixodes scapularis*)



Lone Star Tick (*Amblyomma americanum*)



Dog Tick (*Dermacentor variabilis*)



Figure 3. Three types of ticks at various life stages compared to the size of a U.S. dime. Source: CDC

⁵ Most tick species have preferences for specific hosts, and may rely on different animals for different parts of their life cycle.

spiked—in some areas they were 300% higher than the previous year.

How You Can Get A Tickborne Illness

Ticks are like little vampires. They must drink blood at every stage of their life to survive. If they are infected with a disease-causing pathogen, they can spread it as they feed. Ticks can't jump or fly. They crawl up a blade of grass or perch on the edge of a leaf, snagging their victim as it passes by.

Depending on the kind of tick and how old it is, it can take the beastie ten minutes to two hours to get set up for a meal. They need to crawl to a spot on a suitable host, grab the skin, cut through it, and insert their feeding tube. Some ticks have barbed tubes, and some secrete a cement-like substance to stay attached as they imbibe your vital fluid. Like mosquitos, they can also secrete saliva with an anesthetic in it. If you don't realize they have bitten you, it gives them more time to dine. In fact, lots of people who get sick don't even realize they were bitten. Bites can be painless, they can be confused with bites by other bugs like chiggers, and/or they may be in an obscure location (like in your hair, or behind a knee).

The longer a tick is attached, the higher the odds of disease transmission. Studies found that rats usually didn't get infected with Lyme disease unless the tick was attached for two or three days. But we've recently learned that other diseases like Powassan virus can be transmitted in just 15 minutes.

How to Know If You Have a Tickborne Disease

A lot of people don't even know they have been infected. Some have no symptoms. Others get very sick or even die. If you contract Lyme disease and are not treated promptly, you could end up severely disabled. The bacteria can affect your joints, heart, and brain. Yet a recent national survey reported that nearly 20% of people surveyed in areas where Lyme disease is common were oblivious to the risk.

In order to figure out whether you have a tickborne disease (or two), your doctor needs to consider multiple things.

- **Your symptoms and when they started.** There may be a fever of varying degrees alternating with chills; an achy feeling all over, sometimes with headache, muscle, joint or neck pain; a rash; debilitating fatigue; nausea, vomiting; etc. About 70–80% of people get the classic “bull's-eye” rash within 3–30 days (I never did.) The rash usually (but not always) consists of a red ring with a clear

center that may be warm to the touch, and is larger than a few inches. How crummy you feel can depend on your tolerance for pain. When I got Lyme disease, I could barely walk up the stairs. The flu-like symptoms can be vague and wide-ranging. As a result, they can be misdiagnosed, particularly in geographic areas where the disease is uncommon.

- **Lifestyle.** Where you live and where you've been. Whether other people in your area have also been getting tickborne ailments. Whether you are outdoors a lot in tick-infested areas. Whether you have outdoor pets that bring ticks indoors.
- **Whether you know you were bitten by a tick and when.** Only ticks that attach and feed can transmit disease. But about 2/3 of people with Lyme disease don't recall being bitten. Being bitten by a tick doesn't automatically mean you will get sick. Not all ticks are infected with a pathogen. In some areas, only 1/4 of nymphs and 1/2 of adult ticks carry the Lyme disease pathogen. The timing of symptom onset can vary from two days to weeks after the tick bite.
- **Your medical history.** Older people and those with compromised immune systems may be more vulnerable. A physical exam will look for rashes, check for aches and pains, and explore other potential problems you might not think of as being related to a tick bite, like nausea or double vision.
- **Laboratory Testing** is important to avoid misdiagnosis. But it can take a while for an infection to show up in your blood—usually 20–30 days after onset (some sources say it can take six weeks). If you are tested too soon (e.g., in the first 7–10 days of illness for Lyme disease) you may get a false negative. Also, some blood tests are too general to pick up a specific illness. A Lyme disease test could be negative, but you could still have babesiosis. In my opinion, the **Tickborne Disease Antibodies Panel** is the way to go. It's a more definitive test that looks for babesiosis, anaplasmosis, and Lyme disease.

How to Protect Yourself

Forget vaccines unless you're a dog. There is nothing on the market right now that prevents tickborne disease in humans.⁶ The standard advice of “be

⁶ GlaxoKlineSmith had developed a vaccine called LYMERix that was approved in 1998. It reduced new infections in vaccinated adults by nearly 80%. But the company pulled it from the market in 2002 after negative media coverage, fears of side effects, and declining sales.



Figure 4. Ticked Off: Bet and her rescue coonhound decked out to prevent tick bites.

careful, use repellent, and do tick checks" didn't save me. And staying indoors is not an option. So I came up with special **Ticked-off Advice**, added in bold below.

When possible, avoid areas that are wooded, brushy, with high grass or leaf litter. When in ticky-type areas:

- Wear long sleeves and pants. **Tuck your shirt into your pants, and your pants into your socks. Wear closed-toe shoes.**
- Wear light-colored clothing (so ticks show up) **impregnated with tick repellent like Permethrin—especially socks.** I have a jacket, shirt, pants, socks, and gaiters I got through Amazon.com. The insecticide lasts through 70 washes (but I minimize washing—I think this is **the most important and effective change I've made**).
- Use repellent when outdoors. This is especially important for diseases for which there is no cure. **Strong DEET (20% or more)** works well, but only lasts about four hours. You can also use Picaridin or IR3535 on exposed skin. **Spray your hat/hair, neck and shoes.**
- **Try eating a lot of garlic or taking garlic pills.** When I worked in tick-infested Long Island, there was only one outdoor technician who never got Lyme disease. He swore it was all the garlicky Italian food he ate. I now take a 1000 mg soft gel of garlic daily.
- **Don't sit on the ground, stone walls, or log piles.**
- Conduct regular full-body tick checks, especially your ankles. Don't forget underarms, inside belly button, head, and private parts. Also examine gear and pets, since ticks could hitchhike into your home on them.

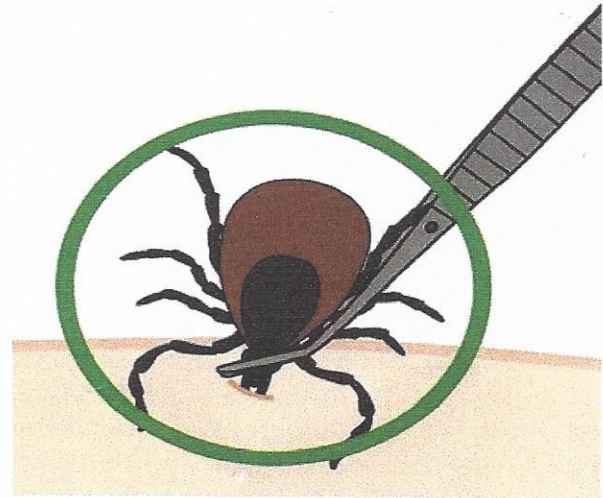


Figure 5. The proper way to remove an embedded tick. See text for details. Source:Wikihow

- **As soon as you get home, strip down and throw your clothes in the dryer for 10 minutes on high heat (20 minutes if they're damp) to kill ticks you missed during a check.**
- **Bathe or shower as soon as you come indoors.** This is a good time to again check all over for ticks. Be aware that you can't easily drown ticks, as they can reportedly survive underwater for two or three days.
- **Treat outdoor pets with tick-preventive.** I like the **Seresto collar** for dogs—it lasts for eight months, and prevents a bite. Frontline Gold is a topical medicine applied monthly, and works better on resistant ticks than regular Frontline, but the dog can still get bitten (but the tick dies). For cats, try a collar or Bravecto topical.

If you find an embedded tick, remove it right away (Figure 5). But **never be like my husband and panic and yank it out.** In particular, **don't squeeze the body during removal**, as you could end up injecting yourself. Also, **DON'T** use a match or try to smother it with Vaseline or dish soap, or other suggestions you hear about on social media. They either don't work or can cause the tick to act like a syringe, injecting disease into the wound. Instead:

1. Use a pair of fine-tipped tweezers. There are a variety of commercial tick removal devices out there, but most don't work better than tweezers. **I do like the Tick Key and the O'Tom Tick Twister.**
2. Grasp the tick as close to the skin as possible.
3. Pull upward (away from your skin) with steady, even pressure. (Twisting could break off the mouthparts in your skin.)
4. Then **disinfect the bite area and your hands** with rubbing alcohol, iodine, or soap and water.

Dispose of the tick in alcohol or down the toilet (don't miss the water). Mark the calendar so you can watch for the onset of symptoms. **I put the tick inside folded clear tape and stick on the bite-day** on my calendar.

Tick-proof your yard. Some researchers report that simply clearing leaf litter can reduce the number of ticks by about 90%. Another study found that 82% of deer ticks were found within nine feet of the edge of the lawn. Think **clean and tidy**. Remove leaf litter, tall grass, and create a three-foot-wide barrier of wood chips, cedar sawdust, or gravel between woods and underneath play equipment. Mow frequently. Thin out trees. Stack wood neatly in a dry area to discourage rodents.

What to Do If You Are Infected

Don't wait to be treated. You could end up with severe long-term problems like chronic neurological, cardiac, or rheumatologic problems, cognitive impairment, chronic pain, or worse.

The antibiotic doxycycline works on several different tickborne illnesses caused by bacteria. Doctors disagree about the appropriate length of treatment, but 28 days is typical. The drug does make you sensitive to sunlight (even brief exposure can cause a rash or sunburn). It can also make you feel tired or nauseous.

Some people feel better within a few days of starting treatment; others don't feel completely well for months. Even after finishing treatment, an estimated 10–25% of Lyme disease patients report milder symptoms like fatigue, and aches and pains. I have one friend who said he didn't get his energy back for a year. But since many people who never had Lyme disease experience similar symptoms, there has been scientific and political controversy within the medical community on the existence and appropriate treatment of "chronic Lyme disease" or "post-treatment Lyme Disease syndrome" (PTLDS). Regardless of what scientists think or know right now, if your symptoms linger, get help.

The Bottom Line

Half of people interviewed in one study admitted they didn't routinely take steps to protect themselves against tick bites during warm weather. Don't mess around with ticks. I spent about \$200 on tick-repellant clothing, and it was worth every penny. It takes me 10 minutes to spray and don my "ticked-outfit." I no longer head outdoors without it. I haven't gotten a single tick bite since I started my ticked-off program.

For additional information:

<https://www.cdc.gov/ticks/index.html>

Bet Zimmerman Smith monitors 100 nestboxes in NE Connecticut and maintains the educational website Sialis.org. She is a life member of NABS and serves on the Board of Directors.
