



Ticks And What To Do About Them

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The first rule to avoid a Tick bite is simply to stay away from the parasitic critter. Easier said than done, and once again, “social distancing” from this miniscule and pernicious creature becomes the order of the day.

**“Please Allow Me to Introduce Myself...
...I’ve Been Around for A Long, Long Year”**

To begin, ticks, at the taxonomic classification Order level are known as Ixodida. At the superior “Phylum” level, they are Arthropods and are easily recognized by their paired jointed legs. They belong to one of three classes of the Chelicerata Sub-phylum, known as Arachnids. Their distinguished fellow classmates include spiders and scorpions.¹

There are two sub-class “families” of ticks in the USA: Ixodidae and Argasidae. Ixodidae are known as hard outer shell ticks and include about 700 species. They live about 3 years. Whereas, Argasidae are soft-shelled, number about 200 species, and have an approximate 4-year lifespan. Both tick-family groups victimize our Cairns and us. Generally, adult ticks are about 3 to 5 mm long. Nymph ticks, the immediate pre-adult life stage, are often poppy-seed size, the most active, and most likely to transmit Lyme disease.^{1,2,3}

Here is a celebrity list comprising the most villainous tick types who live at home here in the USA: American Dog Tick (*Dermacentor Variabilis*), Blacklegged “Deer” Tick (*Ixodes Scapularis*), Brown Dog Tick (*Rhipicephalus Sanguineus*), Groundhog Tick (*Ixodes Cookei*), Lone Star Tick (*Amblyomma Americanum*), Pacific Coast Tick (*Dermacentor Occidentalis*), Rocky Mountain Wood Tick (*Dermacentor Andersoni*), Soft Ticks (*Ornithodoros*), and Western Blacklegged Tick (*Ixodes Pacificus*). Please click the Link, [LymeDisease.org: Types of Ticks](https://www.LymeDisease.org:TypesofTicks), for details about each one.³

The Attack: Offense and Defense

Many of our Cairns and us have been bitten at one time or another by a tick. Their approach and technique of attack is clever, ruthless, and efficient. Common hearsay centers on the tick's ability to fly or jump onto their victim. Not true: they don't, and they can't! Instead, the tick employs a behavior, known as "questing"; whereby, the tick will use its hind legs (i.e., third and fourth pair of legs) to cling onto a leaf or a blade of grass. The tick then stretches out its top pair of legs (better visualized as arms) and fans the air which activates specialized organs to sniff for the stuff that our Cairns and we release, including carbon dioxide, pheromones, ammonia and body heat. On a good fishing day, they will easily catch us. The initial tick bite, itself, is usually not painful, and more so, not even felt. This should not be surprising, as the tick's saliva has anesthetic properties that prevent the victim-host from realizing that he or she has been attacked. The tick might be tiny, but it is built like a tank, designed - in effect - with invisibility attributes, and relentless in its parasitic mission. What can we do? So, "an ounce of prevention is worth a pound of cure." If we are unable to stay away from them, then we should cover up with appropriate clothing, including long socks-over-pants and long-sleeve shirts. A recent article about ticks suggests to the ladies, as the times are what they are, to ensure that trendy socks do not conflict with face masks. When outside with your Cairn, try to walk on cut grass, harder, more visible surfaces. Preferably, your clothing should be light-colored. This will help you to identify more easily a tick that has become a passenger on you before it settles down for dinner. While you are out in the field and when you return home, plan to stop and make "tick checks" on both your Cairn and you.⁴

Next line of defense: chemicals. Do the benefits of medications that prevent harmful tick bites outweigh possible injury that might arise from toxicity of their chemical composition? Every 30 days from the beginning of March through December (in my NJ climate), I give my younger Cairns, Rollie and Charlie, a NexGard pill. They are indeed an effective preventative against the bite, as I seldom find a tick on them. If I do, the tick would not have been on them for long, as it is still on top of, or within the dog's coat, and therefore, the tick would not have yet made its way onto the skin and taken its bite. As commonly reported, a tick will not pass onto its host a Tick-Borne Disease, until it has been attached for 24 hours. Some say 36 hours. Regardless, just make every effort to prevent the bite from happening. From time-to-time, I might find a tick on one of the dog's bedding or laying at the bottom of one of their cages. In all such instances, when found, the tick has already expired due to the NexGard. Now, here is the rub! On my 12-year-old Cairn, Rocky, after years of administering NexGard to him, I started to use a topical treatment, named Frontline Gold. It is also effective, however, not as easy to use and provide as the NexGard pill. Why would I go to the trouble to use a more difficult-to-apply protective regiment? Because - four hours after giving Rocky a NexGard pill this last summer, he experienced for the first time a

significant episode of stumbling and confusion that lasted about another four hours. Due to the incident, my Vet recommended changing Rocky's tick-preventive medication to a more indirect topical one, Frontline Gold. Many thanks to Cheri Eagleson, one of our Foundation trustees, who directed me to a U.S. Food and Drug Administration ("FDA") alert concerning [isoxazoline](#), a pesticide chemical compound. Isoxazoline is an ingredient found in certain flea and tick medications, including Bravecto, Credelio, NexGard, Simparica, and Revolution Plus. In its report, "the FDA is alerting pet owners and veterinarians of the potential for neurologic adverse events in dogs and cats when treated with drugs that are in the isoxazoline class."⁵ Many spot-on/topical pesticides, such as Frontline Gold, and tick/flea collars, do not contain the isoxazoline ingredient. Here is a Link to this recent [FDA Fact Sheet and Alert concerning Isoxazoline](#). It is a short/quick read and is worth discussing with your Vet. Link: FDA Fact Sheet - Isoxazoline.⁶ Furthermore, writing for Dogs Naturally Magazine about Isoxazoline, Emily Vey reminds me of Rocky's incident when she comments:

The problem with poisoning fleas and ticks is that you have to first poison the host ... that's your dog. The premise behind Isoxazolines is that your dog is a lot larger than a flea ... it's assumed a little bit of poison won't hurt him. And that might be true in most cases. The problem is, nobody has asked this question ... what happens if I give my dog a **small amount of poison every month for years?**⁷

Regarding tick bite prevention, there is a promising "chemical, nootkatone...[It] smells and tastes like grapefruit and is naturally found in the rind of the fruit, as well as in Alaskan yellow cedar trees."⁸ Mark Dolan of the Centers for Disease Control and Prevention ("CDC") explains that it is "non-greasy, dries very quickly, and it has a very pleasant, citrus-y grapefruit odor to it."⁹ But does it work?

'This stuff has incredible knock-down, Dolan says...'It kills ticks very, very quickly, usually within about 15 seconds'...It kills by blocking receptors on insects' nerve cells for a neurotransmitter called octopamine [comparable to adrenaline in humans]. That makes the insects hyperactive. 'They basically vibrate themselves to death'...[Dolan] thinks nootkatone is likely to be so nontoxic that it could be an ingredient in 'the world's first insecticidal soap...If you come in from your garden, you could shower with this soap, which would not only repel ticks and mosquitoes, or ticks that may be on you,...but ticks that may be actively feeding on you, it would cause them to detach and possibly kill them.'¹⁰

The "insect repellent shows promise as a protector against ticks in particular", insect toxicology expert Joal Coats told Insider. **Compared to synthetic chemicals like DEET, Nootkatone is equally effective at repelling mosquitos but much better at warding off ticks.**¹¹

HEALTH.COM's *Healthy Living Newsletter* reports:

Nootkatone is also approved as a food additive and is classified as 'generally considered safe' by the Food and Drug Administration (FDA). The EPA confirmed to *The New York Times* that it is considered nontoxic to humans and other mammals, birds, fish, and bees. While nootkatone is approved as an active ingredient in insect repellent, it's unlikely nootkatone bug spray will be available before 2022, because any manufactured products containing the ingredient will also need to be tested and registered by the EPA separately.¹²

We should all keep our radar focused on Nootkatone's related product development.

Tick-Borne Disease ("TBD")

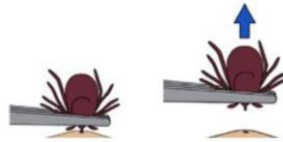
Not that the tick should be defended for its nature, but one important fact to note: the tick is not born with the various bacteria that cause Tick-Borne Diseases.¹³ On the other hand, they are extremely wellengineered transmitters of them. The tick becomes infected with a bacterium, such as *Borrelia burgdorferi*, by feeding on animals such as birds or mice and other mammals that are already infected.¹⁴ The *Borrelia burgdorferi* is a Spirochaete bacterium¹⁵ which is spiral-shaped, kind of like a corkscrew¹⁶ (i.e., not causing a good feeling when they invade our Cairns' or our bodies.) It should be noted that Vectors are defined as "living organisms that can transmit infectious pathogens between humans, or from animals to humans."¹⁷ *Borrelia burgdorferi* is the cause of the most common vector-borne disease in the United States which just so happens to be Lyme Disease.¹⁸ In the USA, the most common TBDs are: Anaplasmosis, Babesiosis, *Borrelia mayonii*, *Borrelia miyamotoi*, Bourbon virus, Colorado tick fever, Ehrlichiosis, Heartland virus, Lyme disease, Powassan disease, *Rickettsia parkeri* rickettsiosis, Rocky Mountain spotted fever (RMSF), STARI (Southern tick-associated rash illness), Tickborne relapsing fever (TBRF), Tularemia, and 364D rickettsiosis. Here is Link that discusses in detail these sixteen USA TBDs and six common TBDs outside of the USA: [CDC List of TBDs: Inside and Outside the USA](#)¹⁹

Now What? Look at That: This "&#*%!" Tick Has Bitten My Pup!

How often have we groomed or given our Cairn a good rubbing only to feel that dreadful little bump under their coat and then to find that a tick has bitten and been feasting on our dog for a while. No need to panic or to rush. However, the tick should be removed close to the time that you have spotted it: not many hours later in the day. By not waiting to extract the tick; you improve the probability of preventing infection. Per the CDC, here are recommended steps for tick removal:

How to Remove a Tick

- 1) Use fine-tipped tweezers to grasp the tick as close to the skin's surface as possible.
- 2) Pull upward with steady, even pressure. Don't twist or jerk the tick; this can cause the mouth-parts to break off and remain in the skin. If this happens, remove the mouth-parts with tweezers. If you are unable to remove the mouth easily with clean tweezers, leave it alone and let the skin heal.
- 3) After removing the tick, thoroughly clean the bite area and your hands with rubbing alcohol or soap and water.
- 4) Never crush a tick with your fingers. Dispose of a live tick by putting it in alcohol, placing it in a sealed bag/container, wrapping it tightly in tape, or flushing it down the toilet.²⁰



For further reference, here is a Link to a video that shows a professional removing a tick that has bitten a particularly good and patient Nova Scotia Duck Tolling Retriever. Perhaps, the procedure could be performed a bit quicker; however, the video does provide a good visual description of tick removal. Link: [How To Take a Tick Off Your Dog](#)²¹

There are vaccines to terminate the *Borrelia burgdorferi* bacterium that causes Lyme Disease. Each of my three Cairns have been vaccinated with no adverse reactions. The first-year regimen consisted of an initial vaccination, followed by a booster vaccination two weeks later. Subsequently, each Cairn receives an annual booster injection. Nobivac by Merck Animal Health is the Lyme vaccine which is administered via injection by my own Vet. Important to emphasize that the vaccine protects against Lyme Disease caused by the *Borrelia burgdorferi* bacterium. NexGard and Frontline Gold medications, which are discussed above, help solely to prevent the initial tick bite.

It is unfortunate that the Lyme disease vaccine for humans was discontinued almost two decades ago. The CDC writes: "The only vaccine previously marketed in the United States, LYMERix®, was discontinued by the manufacturer in 2002, citing insufficient consumer demand."²² There are many of us who benefited previously from the vaccine and believe its production should be reconsidered. The CDC site states:

Tickborne diseases increasingly threaten the health of people in the United States. The growing threat includes newly discovered disease-causing germs, an increasing number of tickborne illnesses, expanding geographic ranges for ticks, and a novel tick species found in the US. New tools for preventing tickborne diseases are urgently needed, and everyone should take steps to help protect themselves from tick bites.²³

If your Cairn, or you, do get tagged by a TBD, there are often antibiotics to treat the malady. For example, Doxycycline, a tetracycline antibiotic, is the standard medicine prescribed to treat Lyme Disease, the most prevalent Tick-Borne Disease, and some of the other TBDs. Yes, Doxycycline is often prescribed for both your Cairn and you. A word of caution: if prescribed Doxycycline, STAY OUT OF THE SUN! I have to admit that I learned this the hard way. Sunscreen, even with a 100 SPF, won't make any difference. The resulting sun poisoning can become so bad that in my case, the Lyme Disease-causing corkscrew Spirochaetes complained, "we're no longer working on this guy" and tried to go on strike. Seriously, not a good situation.

AKC Discussion of the Flea and Tick Season

Here is a video link to an interview by AKC TV's host, Marissa Sarbak, of Dr. Jerry Klein, AKC Chief Veterinary Officer. The interview took place during the Spring of last year, as the flea and tick season was beginning to ramp up. It is quite informative, easy to watch, and includes an excellent Question and Answer format. The video runs about 22 minutes. Enjoy it and may your Cairns and you stay safe and well. Link: [AKC: Year 2020 Flea and Tick Season](#) ²⁴

Bibliography: Ticks and What To Do About Them

[1] WikipediA, (2020) Tick. [online] Available at: https://en.wikipedia.org/wiki/Tick#Taxonomy_and_phylogeny [Accessed 08-15-2020].

[2] easybiologyclass 2020, (2020) Classification of Arthropoda with Identification Characters for Each Sub-Phylum and Class. [online] Available at: <https://www.easybiologyclass.com/classification-of-arthropoda-with-identification-characters-for-each-sub-phylum-and-class/> [Accessed 08-15-2020].

[3] LymeDisease.org, (2020) Types of Ticks. [online] Available at: <https://www.lymedisease.org/types-oficks/> [Accessed 08-15-2020].

[4] The Alpena News - Chris Engle, The Nature of Things, (2020) A few good things (and the obvious bad ones) about ticks. [online] Available at:

<https://www.thealpenanews.com/opinion/editorials-andcolumns/2020/08/a-few-good-things-and-the-obvious-bad-ones-about-ticks/> [Accessed 08-15-2020].

[5] & [6] U.S. Food & Drug Administration, (2020) Fact Sheet for Pet Owners and Veterinarians about Potential Adverse Events Associated with Isoxazoline Flea and Tick Products. [online] Available at:
<https://www.fda.gov/animal-veterinary/animal-health-literacy/fact-sheet-pet-owners-andveterinarians-about-potential-adverse-events-associated-isoxazoline-flea>
[Accessed 12-05-2020].

[7] Dogs Naturally Magazine, Inc. by Emily Vey, (2020) New FDA Warning About Flea And Tick Medications. [online] Available at:
<https://www.dogsnaturallymagazine.com/new-fda-warning-about-flea-and-tick-medications/> [Accessed 12-05-2020].

[8] INSIDER - Andrea Michelson, (2020) A grapefruit-scented perfume ingredient that's toxic to ticks and mosquitoes is the first new insect repellent to be approved in a decad. [online] Available at:
<https://www.insider.com/nootkatone-oil-found-in-grapefruit-is-approved-tick-mosquito-repellent-2020-8> [Accessed 08-15-2020].

[9] & [10] NPR by Richard Knox, (2011) Repelling Bugs With The Essence Of Grapefruit. [online] Available at:
<https://www.npr.org/2011/04/18/135468567/repelling-bugs-with-the-essence-ofgrapefruit#:~:text=That%27s%20why%20the%20CDC%20is,y%20grapefruit%20od or%20to%20it.%22> [Accessed 08-15-2020].

[11] INSIDER - Andrea Michelson, (2020) A grapefruit-scented perfume ingredient that's toxic to ticks and mosquitoes is the first new insect repellent to be approved in a decad. [online] Available at:
<https://www.insider.com/nootkatone-oil-found-in-grapefruit-is-approved-tick-mosquito-repellent-2020-8> [Accessed 08-15-2020].

[12] HEALTH.COM's Healthy Living Newsletter, (2020) Nootkatone Is a New Bug Spray Ingredient That Repels Ticks, Mosquitoes, and Other Insects—Here's What to Know. [online] Available at:
<https://www.msn.com/en-us/health/medical/nootkatone-is-a-new-bug-spray-ingredient-that-repelsticks-mosquitoes-and-other-insects-heres-what-to-know/ar-BB17YLE5> [Accessed 08-15-2020].

[13] AmericanPest, (2017) How Do Ticks Get Lyme Disease?. [online] Available at:
<https://www.americanpest.net/blog/post/how-do-ticks-get-lyme-disease> [Accessed 08-15-2020].

- [14] Global Lyme Alliance, (2019) ABOUT TICKS & LYME DISEASE. [online] Available at: <https://globallymealliance.org/about-lyme/prevention/about-ticks/> [Accessed 08-15-2020].
- [15] WikipediA, (2020) Borrelia burgdorferi. [online] Available at: https://en.wikipedia.org/wiki/Borrelia_burgdorferi [Accessed 08-15-2020].
- [16] WikipediA, , (2020) Spirochaete. [online] Available at: <https://en.wikipedia.org/wiki/Spirochaete> [Accessed 08-15-2020].
- [17] World Health Organization, (2020) Vector-borne diseases. [online] Available at: <https://www.who.int/news-room/fact-sheets/detail/vector-borne-diseases> [Accessed 08-15-2020].
- [18] Centers for Disease Control and Prevention, (2020) Lyme Disease. [online] Available at: <https://www.cdc.gov/lyme/> [Accessed 08-15-2020].
- [19] Centers for Disease Control and Prevention, (2020) Diseases Transmitted by Ticks. [online] Available at: <https://www.cdc.gov/ticks/diseases/index.html> [Accessed 08-15-2020].
- [20] Centers for Disease Control and Prevention, (2019) Tick Removal. [online] Available at: https://www.cdc.gov/ticks/removing_a_tick.html [Accessed 08-15-2020].
- [21] McCann Dog Training, (2019) How To Take A Tick Off Your Dog - Professional Dog Training Tips. [online] Available at: https://www.youtube.com/watch?app=desktop&v=BZ6_zWmzeMg&feature=youtu.be [Accessed 08-15-2020].
- [22] Centers for Disease Control and Prevention, (2020) Lyme Disease Vaccine. [online] Available at: <https://www.cdc.gov/lyme/prev/vaccine.html#:~:text=The%20only%20vaccine%20previously%20marketed,longer%20protected%20against%20Lyme%20disease.> [Accessed 08-15-2020].
- [23] Centers for Disease Control and Prevention, (2019) Lyme and Other Tickborne Diseases Increasing. [online] Available at: <https://www.cdc.gov/media/dpk/diseases-and-conditions/lyme-disease/index.html> [Accessed 08-15-2020].
- [24] AKC TV, (2020) Flick and Tick Season (Year 2020). [online] Available at: <https://akc.tv/watch/19/2346/video-3/flea-and-tick-season/> [Accessed 08-15-2020].

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