



Ticks Have Just Been Removed from My Dog. Is My Family at Risk for Tick-Borne Infectious Disease?

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There are numerous tick species that vary in geographic distribution worldwide. Different tick species preferentially transmit different pathogenic organisms. In addition, both dogs and humans can be sequentially or simultaneously infested with more than one tick species. A single tick can transmit more than one organism and cause coinfection in the tick-infested host. These and other factors can complicate determining a family's risk for tick-borne disease. Consider this:

In General

- ▶ Ticks can transmit bacteria, protozoa, rickettsiae, and viruses to dogs and humans in the same household or geographic location; however, in most instances, an infected dog does not pose a risk for transmission of tick-borne infectious agents to humans, as dogs are also accidental hosts.¹
- ▶ Transmission of tick-borne agents most frequently occurs when the tick obtains a blood meal from an animal or human.

- ▶ Transmission rarely occurs when a dog ingests the tick.
- ▶ Tick-borne organisms such as *Anaplasma phagocytophilum* (ie, anaplasmosis), *Ehrlichia* spp (ie, ehrlichiosis), and *Rickettsia rickettsii* (ie, Rocky Mountain spotted fever and other spotted-fever-group rickettsiae) typically induce acute, mild-to-potentially-severe illness in dogs and humans, whereas other organisms such as *Babesia* spp, *Bartonella* spp, *Borrelia* spp, and some *Ehrlichia* spp induce chronic, insidious infections that can cause complex illnesses in dogs and humans.²
- ▶ Because dogs can be persistently (ie, for months to years) infected with several tick-borne zoonotic pathogens, they serve as reservoir hosts for some tick-borne pathogens.
 - If a previously infected tick or a tick that acquires an infection from a dog detaches before ingesting a complete blood meal, the tick could subsequently transmit the agent after attaching to a human.
 - This is considered a rare event in

nature, as most attached ticks feed to repletion before detaching, laying eggs, and dying.

- Dogs can also serve as a transport host to carry ticks from the outdoor environment into the house, where the tick could drop off of the dog and attach to a human.

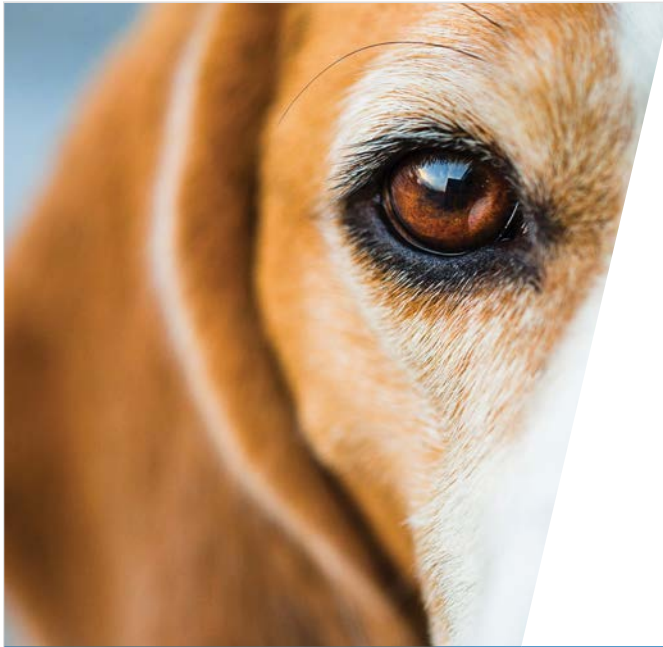
Prevention

- ▶ The old adage *An ounce of prevention is worth a pound of cure* is applicable to any discussion of tick-borne infectious diseases in dogs or humans.
- ▶ Preventing infestations is key to preventing tick-borne diseases, which can be difficult to diagnose, are challenging to effectively treat, and can result in serious morbidity or mortality.
- ▶ The advent of new, safe, and long-lasting acaricides that can repel and kill ticks makes the prevention of tick-borne disease an important priority for veterinarians and pet owners.
- ▶ Based on experimental and natural infection studies, application of acaricide products can decrease the risk for transmission of *Borrelia burgdorferi*, the cause of Lyme borreliosis, as well as several other tick-transmitted infections among dogs and humans.
- ▶ In the author's opinion, *appropriate*, year-round use of an acaricide product that repels and kills any tick that comes in contact with the dog could prevent dogs from developing persistent infections and could prevent inadvertent transport of ticks into the home environment.

Human Health

- ▶ Pets, owners, and veterinary professionals share environmental and occupational risks, respectively.

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TALKING POINTS ▶ CONTINUED FROM PAGE 21

- ▶ If a pet is acquiring ticks, there is a risk for humans acquiring ticks in the same environment.
- ▶ Owners should avoid tick habitats (eg, high grass, brush, woodlines), use a tick-repellent product, and perform frequent tick checks to prevent a tick-borne infection.
- ▶ Environmental acquisition of a tick-borne disease is much more likely

than acquisition from a pet dog.

One More Thought ...

Because tick-transmitted pathogens induce persistent bloodstream infections in animals, veterinary professionals and others with extensive arthropod or animal contact should avoid needle sticks and direct contact with various biologic fluids. Blood samples from

tick-infested animals with acute febrile illness should be labeled with a zoonosis biosafety warning to protect laboratory diagnosticians. ■

References

1. Wenner Moyer M. Tick trouble. *Nature*. 2015;524:406-408.
2. Drexler N, Miller M, Gerding J, et al. Community-based control of the brown dog tick in a region with high rates of Rocky Mountain spotted fever, 2012-2013. *PLoS One*. 2014;9(12):e112368