

# TOP 5

## Global Vector-Borne Diseases

Adam J. Birkenheuer, DVM, PhD, DACVIM

North Carolina State University

Vector-borne diseases continue to emerge in companion animals throughout the world. Contributing factors include the discovery of “new” organisms, improved understanding of “old” diseases, climate changes, urbanization (which puts pets in closer proximity to wildlife reservoirs and tick vectors), alternative forms of disease transmission, ease of animal transport, and advanced diagnostic techniques.

While many clinicians excel at diagnosing patients with classic signs and presentations, patients with atypical presentations are frequently misdiagnosed, resulting in therapies that may lead to persistent illness or even worsen disease outcomes. Likewise, overinterpreting test results can encourage clinicians to stop pursuing alternative diagnoses when vector-borne diseases are not the actual disease cause.

### Top 5 Global Vector-Borne Diseases

1. Rickettsial infections  
(Rickettsiosis/Ehrlichiosis/Anaplasmosis)
2. Babesiosis
3. Bartonellosis
4. Hemoplasmosis
5. Lyme Borreliosis

# 1

### Rickettsial infections (Rickettsiosis/Ehrlichiosis/Anaplasmosis)

*Ehrlichia* and *Anaplasma* spp have a global distribution. This is because their tick vectors (eg, *Rhipicephalus* spp, *Ixodes* spp, *Dermacentor* spp, *Amblyomma* spp) collectively span the globe. Classic signs of rickettsial infections include fever, lameness, and thrombocytopenia, which commonly trigger suspicion of rickettsial infections; however, cases with normal platelet numbers are being identified with increasing frequency. When rickettsial infections are associated with anemia, it is usually nonregenerative; immune-mediated hemolysis is rare. Other, less common signs include vasculitis, uveitis, glomerulonephritis, and leukopenia.

# 2

### Babesiosis

With at least 9 genetically distinct *Babesia* spp found in dogs and 7 in cats, babesiosis is a common global vector-borne disease. Every case a clinician sees with hemolytic anemia, thrombocytopenia, or hyperglobulinemia merits consideration for babesiosis. In addition to tick attachment, history of a dog bite (particularly by a pit bull-type dog) or blood transfusion should also raise suspicion of babesiosis. Transplacental transmission has also been reported. Protein-losing nephropathy, presumably secondary to a type III hypersensitivity reaction, has been recognized with increased frequency.

While many clinicians excel at diagnosing patients with classic signs and presentations, patients with atypical presentations are frequently misdiagnosed, resulting in therapies that may lead to persistent illness or even worsen disease outcomes.

MORE ►

3

### Bartonellosis

Nearly 20 *Bartonella* spp have been identified in dogs and cats. Fleas appear to be the primary arthropod vectors, but ticks and lice may also be involved in transmission. *Bartonella* spp are clearly an important cause of endocarditis in dogs; however, the full spectrum of disease that can be induced by *Bartonella* spp remains unknown. While endocarditis can result in valvular insufficiency with subsequent heart murmur and congestive heart failure, dogs with endocarditis often present with nonspecific signs that do not point directly to a cardiac abnormality. In 1 study, 41% of the dogs with endocarditis did not have a detectable murmur during initial examination.<sup>1</sup> In the literature, lameness or a stiff gait was commonly the chief complaint. In the absence of endocarditis, dogs with unexplained type II and/or type III hypersensitivity reactions and those with unexplained granulomatous inflammatory conditions may have bartonellosis. Diagnosis of bartonellosis can be difficult; serology, culture, and PCR should be done in parallel.

4

### Hemoplasmosis

Although the specific vector(s) associated with transmission of hemotropic *Mycoplasma* spp are poorly defined, they have a global distribution and can create confusion for clinicians. There are at least 3 hemoplasma species that can infect cats and 4 that can infect dogs. However only 1 of these species, *Mycoplasma haemofelis*, has any strong association with clinical illness in immunocompetent hosts. Diagnostic assays must distinguish to the species level, and a positive test result does not mean infection is causing signs. If a sick animal is infected with a hemoplasma species but does not respond to treatment with tetracycline or fluoroquinolone, alternative diagnoses should be pursued.

There are at least 3 hemoplasma species that can infect cats and 4 that can infect dogs.

## Not-So-Fun Facts About Vector-Borne Diseases



### Ehrlichiosis

Dogs treated with 4 weeks of doxycycline may not eliminate *Ehrlichia canis* infections; therefore, they should probably have lifelong monitoring for disease development (eg, CBC, serum chemistry, urinalysis).<sup>2</sup>

### Babesiosis

*Babesia gibsoni*, not *Babesia (canis) vogeli*, is the most commonly identified *Babesia* spp by laboratories performing *Babesia* spp PCR assay in the U.S.<sup>3</sup>

### Bartonellosis

Dogs with infective endocarditis are frequently

presented for lameness or stiff gait without evidence of cardiac disease.<sup>1</sup>

### Hemoplasmosis

There are no studies linking hemoplasmosis to anemia in immunocompetent dogs.<sup>4</sup>

### Lyme Borreliosis

No clear evidence-based recommendations address whether to treat dogs without signs of disease that test positive for exposure to or infection with *Borrelia* spp.<sup>5</sup>

5

## Lyme Borreliosis

Lyme borreliosis (LB) is an important infection on several continents, possibly more because of the angst it causes clinicians than the morbidity and mortality rates it causes in patients. It is estimated that only 5% to 10% of infected dogs develop clinical disease. Lyme borreliosis is typically characterized by lameness and fever responsive to antibiotic therapy. In general, no abnormalities are detected on CBC, serum chemistry panels, or urinalyses unless a coinfection (usually with *Anaplasma phagocytophilum*) is present. Renal disease appears rare (<1%–2% of exposed and/or infected dogs) but life-threatening disease is associated with LB, so all dogs with antibodies against *Borrelia* spp should be screened for proteinuria. The absence of disease in such a high percentage of infected and/or exposed dogs may be a source of clinical apprehension. Despite information from experimental and natural infections, no data exist to support a best

therapeutic choice for dogs without clinical signs. Whether a clinician chooses to treat or not, lifelong monitoring for clinical disease (eg, proteinuria) and vigilant use of tick control (standard LB prevention) should be strongly recommended.

## Conclusion

Clinicians need vigilance to detect vector-borne diseases and consider which diagnostics to use. Serologic and PCR-based assays in parallel maximize the chances for detecting infection with or exposure to vector-borne pathogens. Vector-borne diseases that are also important to the health of pets globally but are not discussed here include leishmaniasis and dirofilariasis.

■ **cb**

See **Aids & Resources**, back page, for references & suggested reading.



# Same Companion. Class IV Technology.

The right laser...for **ANY** practice

# Less SCRATCH.

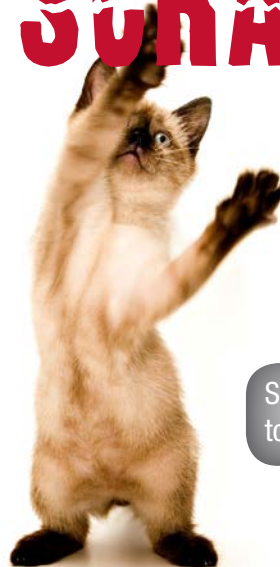
Introducing the **NEW** Companion CTL-9

Meet the newest member of the Companion Family. Get the same industry leading support, and unparalleled quality - schedule a demonstration today!

- Small Size
- Small Price
- Big Results



CompanionTherapy.com



Schedule a demonstration today, call 302.709.0408