

## Beyond the Bite

**More than discomfort, fleas and other bugs can cause serious illnesses in dogs.**

*Karla Rugh, DVM*

Fleas, ticks, and mosquitoes are more than just itchy annoyances to your dog. They're also transmission agents for a host of diseases, including some that can be fatal.

**Lyme disease**

Cause: Ticks carrying *Borrelia burgdorferi*.

Transmitted by: Deer ticks (*Ixodes pacificus*, *Ixodes scapularis*).

How it happens: Immature ticks (nymphs or larvae) become infected after feeding on infected hosts, such as rodents. After molting, the immature ticks pass the infection to other animals.

Symptoms: Listlessness, fever, anorexia, weakness, joint pain, and lameness are the most common symptoms, but kidney failure, heart abnormalities, facial paralysis, and seizures can also occur.

Treatment: Antibiotics and supportive care, such as fluid therapy and medications, to treat specific symptoms.

**Canine ehrlichiosis**

Cause: Ticks with *Ehrlichia canis*, *Ehrlichia ewingii*.

Transmitted by: Primarily brown dog ticks (*Rhipicephalus sanguineus*), but also American dog ticks (*Dermacentor variabilis*) and Lone Star ticks (*Amblyomma americanum*).

How it happens: The tick becomes infected while feeding on an infected dog, then passes the disease to another dog.

Symptoms: *Ehrlichia canis* invades and multiplies within certain white blood cells found in the general circulation system and the liver, spleen, and lymph nodes. Acute symptoms include fever, enlarged lymph nodes, anorexia, listlessness, exercise intolerance, stiffness, swelling of the limbs or scrotum, coughing, and shortness of breath. Mild anemia may occur, along with a decreased platelet count and increased bleeding tendencies. Recovery may occur spontaneously or the disease may become chronic.

In chronic ehrlichiosis, accumulation of infected white blood cells in organs and blood vessels causes symptoms such as spleen enlargement, kidney failure, respiratory problems, inflammation of the anterior chamber of the eye, and meningitis. Severe weight loss frequently occurs.

Chronic ehrlichiosis also decreases bone marrow function, which reduces the number of circulating normal white blood cells and platelets. The reduction in disease-fighting white blood cells makes the dog more susceptible to other infections. Platelet reduction leads to abnormal bleeding throughout the body, evidenced by blood in the urine or stool and variably-sized hemorrhages that are visible on the gums, skin, and other areas.

Treatment: Antibiotics; supportive care such as fluid therapy, blood transfusions in severe cases, and medications to treat specific symptoms.

**Rocky Mountain spotted fever**

Cause: Ticks carrying *Rickettsia rickettsii*.

Transmitted by: Rocky Mountain wood tick (*Dermacentor andersoni*), American dog tick (*Dermacentor variabilis*).

How it happens: The tick passes the infective agent to the dog during feeding.

Symptoms: Fever, anorexia, arthritis, coughing, difficulty breathing, swelling of the face or limbs. Neurological symptoms, such as altered mental states, incoordination and hypersensitivity to touch, commonly occur. Damage to the blood vessels can lead to gangrene of the extremities or disseminated intravascular coagulation, a life-threatening disorder characterized

by depletion of the blood's clotting factors.

Treatment: Antibiotics plus supportive care, such as fluid therapy or medication for treatment of symptoms.

Tick paralysis

Cause: Toxin in tick saliva.

Transmitted by: Paralysis tick (*Ixodes holocyclus*), Rocky Mountain wood tick (*Dermacentor andersoni*), American dog tick (*Dermacentor variabilis*) and others.

How it happens: Toxins in the tick's saliva are injected into the dog during prolonged feeding — four days or more.

Symptoms: Progressive paralysis, starting with incoordination and weakness of the hindquarters, then progressing within hours. Paralysis of the respiratory muscles can cause death.

Treatment: Prompt removal of the offending tick results in full recovery within one to three days.

Heartworm disease

Cause: Mosquitoes with *Dirofilaria immitis*.

How it happens: The female mosquito ingests immature heartworms (microfilariae) while feeding on an infected dog. The microfilariae develop in the mosquito, which subsequently introduces them into another dog while feeding. The microfilariae migrate through the body, ending up in the arteries in the lungs, where they develop into adults and begin producing more microfilariae. With heavy infections, the adult heartworms can invade the vessels between the heart and the lungs, and even the heart itself.

Symptoms: Initially, heartworm infection may cause few symptoms, especially in sedentary dogs. As the disease progresses, coughing, shortness of breath, and exercise intolerance occur. Severe infection can cause heart failure and death.

Treatment: Heartworm infections are initially treated with a medication that kills the adult heartworms. Four to six weeks later, another medication is administered to kill the microfilariae.

West Nile virus infection

How it happens: Mosquitoes feed on birds that carry the virus, then transmit the virus to dogs, other animals, and humans.

Symptoms: Infection often causes no symptoms. In dogs or puppies with a weakened immune system, infection may cause listlessness, lack of appetite, incoordination, shaking, head tilting, circling, and convulsions.

Treatment: Supportive care such as fluid therapy, anticonvulsants, and other medications, depending on symptoms.

Flea bite dermatitis

Cause: Allergic reaction to flea saliva.

How it happens: Saliva deposited by the flea during biting triggers the allergic reaction.

Symptoms: Itchy reddened skin, hair loss.

Treatment: Elimination of fleas is essential. Topical ointments, antihistamines, dietary supplementation with essential fatty acids (omega-3 and omega-6), and sometimes glucocorticoids ("cortisone") for relief of symptoms.

Tapeworms

Cause: Fleas carrying *Dipylidium caninum*.

How it happens: Fleas become infected when they ingest tapeworm eggs passed in the feces of an infected dog. Non-infected dogs acquire tapeworms by ingesting infected fleas during grooming.

Symptoms: Usually none, but increased appetite and weight loss can occur with heavy infections.

Treatment: Tapeworm medication.

#### Thwart the threat: Prevention Tactics

Many tick, flea, and mosquito control products can be purchased without a veterinarian's prescription at pet-supply stores and other retail outlets. Whether you use an over-the-counter or veterinarian-prescribed preventive, always follow label instructions, especially with regard to age, dosage, and application recommendations. If you have any questions about a product, consult with your veterinarian. Minimal age recommendations differ, so always check product labels before use.

#### TICKS

For your dog: Collars (especially those containing amitraz, which kills ticks by paralyzing their mouthparts), spot-ons.

Examples: Imidacloprid+permethrin spot-on, fipronil spot-on, fipronil+methoprene spot-on, selamectin spot-on (some ticks).

In the environment: Eliminate tick hiding places by mowing your lawn and removing overgrown brush. Fence your yard to keep out tick-bearing wild animals, such as deer. Apply methoprene+permethrin spray to control ticks for about four weeks.

#### FLEAS

For your dog: Collars, oral medications, sprays, spot-ons. Most effective products break the flea life cycle by killing adults and/or eggs on dog.

Examples: Imidacloprid spot-on, imidacloprid+permethrin spot-on, fipronil spot-on, fipronil+methoprene spot-on, selamectin spot-on, lufenuron oral medication, pyriproxifen or methoprene collars.

In the environment: Inside, thoroughly vacuum to eliminate eggs and larvae, remove flea excrement (primary food for larvae), and stimulate newly-developed adult fleas to emerge from their cocoons, making them vulnerable to pesticides and preventives.

Put mothballs, flea powder, or a few pieces of a flea collar in vacuum bag or canister. After vacuuming, seal bag or canister contents in a garbage bag and dispose in an outside trash container.

Wash your dog's bedding, cushions, etc. Apply household insecticide (spray, fogger, or carpet granules) that combines insect growth regulators (keeps eggs from hatching) with permethrin (kills adults). Treat your yard — especially your dog's favorite resting spots and frequently traveled paths — with growth regulator and permethrin spray.

#### MOSQUITOES

For your dog: Mosquito repellent specifically formulated for dogs, spot-ons.

Example: Imidacloprid+permethrin spot-on.

Heartworm preventives: diethylcarbamazine (oral, daily), ivermectin, moxidectin (oral, monthly), selamectin (spot-on, monthly), milbemycin oxime (oral, monthly).

In the environment: Reduce mosquito numbers by eliminating standing water; keep rain gutters clean; aerate ornamental ponds and water gardens or stock with mosquito-loving fish. Keep your dog inside during early morning and early evening hours when mosquitoes are most active. Avoid wet, marshy areas and deep woods.

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