

Lyme Disease

(Lyme Borreliosis)

Basics

OVERVIEW

- One of the most common tick-transmitted diseases in the world
- Caused by spirochete species of the *Borrelia burgdorferi* group (such as *B. burgdorferi*, *B. afzelii*, *B. garinii*)
- Dominant clinical feature (dogs)—recurrent lameness due to inflammation of the joints (known as “arthritis”); sometimes lack of appetite (known as “anorexia”) and depression; may develop kidney and rarely heart or nervous system disease
- Reported in people, dogs, horses, and occasionally in cats
- Also known as “Lyme borreliosis” or “borreliosis”

GENETICS

- Certain dog breeds (such as the Bernese mountain dog) are reported to develop severe kidney failure following infection with *Borrelia*

SIGNALMENT/DESCRIPTION OF PET

Species

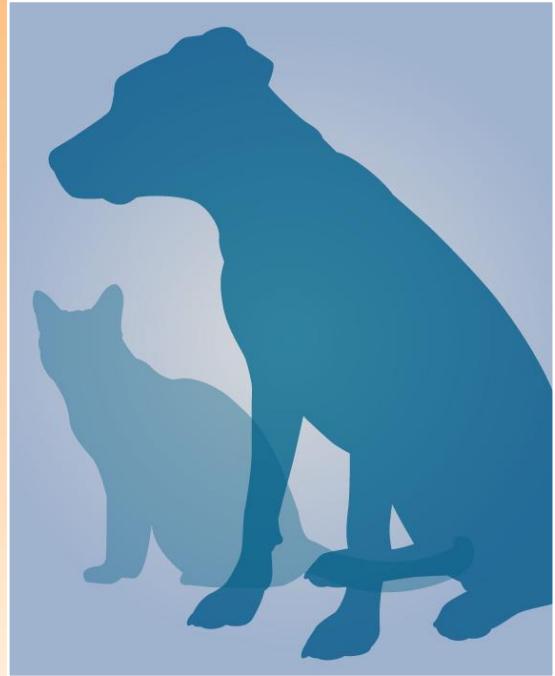
- Dogs and rarely cats

Breed Predilections

- Kidney disease: Bernese Mountain dogs in Europe

Mean Age and Range

- Experimentally, young dogs (puppies) appear to be more susceptible to disease than do adult dogs



SIGNS/OBSERVED CHANGES IN THE PET

- Recurrent lameness due to inflammation of the joints (arthritis)
- In studies, sudden (acute) form lasts for only 3–4 days; recurs days to weeks later in the same or in other legs (known as “shifting-leg lameness,” characterized by lameness in one leg, then that leg appears to be normal and another leg is involved); one or more joints may be swollen and warm; a pain response is elicited by feeling the joint; responds well to antibiotic treatment
- Affected dogs may refuse to walk or stand or may walk stiffly, with an arched back, and be sensitive to touch
- Long-term (chronic) inflammation of several joints, in which the bones around the joints are not destroyed (known as “non-erosive polyarthritis”) is found in pets with prolonged infection without adequate treatment; may persist despite antibiotic therapy
- Fever, lack of appetite (anorexia) and depression may accompany inflammation of the joints (arthritis)
- Superficial lymph nodes close to the site of the infecting tick bite may be swollen
- Kidneys—reported glomerulonephritis with immune-complex deposition in the glomeruli leading to fatal kidney disease; “glomerulonephritis” is inflammation and accompanying dysfunction of glomeruli (plural of

glomerulus) of the kidney; each kidney is composed of thousands of nephrons (the functional units of the kidney, each consisting of the glomerulus [a tuft of blood capillaries—the “blood filter”] and a series of tubes and ducts, through which the filtered fluid flows, as urine is produced); inflammation most commonly is due to the presence of immune complexes in the glomerulus

- Kidneys—loss of protein through the kidneys (condition known as “protein-losing nephropathy”) with resulting low levels of albumin (the type of protein lost through the kidneys) in the blood (condition known as “hypoalbuminemia”)
- Kidney failure (signs include vomiting; diarrhea; lack of appetite [anorexia]; weight loss; increased urination [known as “polyuria”] and increased thirst [known as “polydipsia”]; fluid buildup in the tissues, especially the legs and under the skin [known as “peripheral edema”] or fluid buildup in the abdomen [known as “ascites”])
- Heart abnormalities—reported, but rare; include complete heart block
- Nervous system complications—rare

CAUSES

- *Borrelia burgdorferi*—transmitted by slow-feeding, hard-shelled tick species of the genus *Ixodes* (such as *Ixodes scapularis* [the deer tick], *Ixodes pacificus*, *Ixodes ricinus*, *Ixodes persulcatus*)
- Infection—only after a tick (nymph or adult female) carrying *Borrelia* has been attached to the host for at least 18 hours

RISK FACTORS

- Roaming in tick-infested environment, where Lyme borreliosis is common (known as an “endemic area”)

Treatment

HEALTH CARE

- Outpatient
- Keep pet warm and dry

ACTIVITY

- Reduced activity advisable until clinical signs improve

DIET

- No change needed

SURGERY

- Tapping the joint and removing joint fluid (known as “aspiration of synovial fluid”) may be considered for diagnostic purposes

Medications

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive

- Most commonly used antibiotics—doxycycline, amoxicillin, or azithromycin
- Doxycycline—preferred in pets that have both *Borrelia* and *Anaplasma phagocytophilum* infections at the same time (*Anaplasma* is another tick-borne agent that causes disease)
- Antibiotics do not eliminate the infection; consequently, persistent infection with a very low bacterial burden remains; treatment significantly improves clinical signs and disease
- Recommended treatment period—4 weeks
- Steroids—initially may cause signs to improve; may cover up or mask effects of antibiotics for diagnostic purposes; may increase clinical signs later by decreasing the ability of the pet to develop a normal immune response (known as “immunosuppression”)
- Nonsteroidal pain medications—use judiciously to avoid covering up or masking signs; use only as directed by your pet's veterinarian

Follow-Up Care

PATIENT MONITORING

- Improvement in sudden (acute) inflammation of the joints caused by *Borrelia* (known as “Lyme arthritis”) should be seen within 2–5 days of antibiotic treatment
- If no improvement within 2–5 days or if signs worsen, consider a different diagnosis

PREVENTIONS AND AVOIDANCE

- Mechanical removal of ticks—groom pets daily; discuss appropriate technique for removing ticks from your pet with the veterinarian
- Prevention of tick attachment—products to kill ticks (known as “acaricides”) and tick repellents are available commercially as spot-on topical products, sprays or collars; any such product should be used only according to label directions (*do not use permethrin on cats*)
- Vaccines—are available commercially for dogs; talk to your pet's veterinarian about the vaccine and vaccination protocols
- Tick population control in the environment—restricted to small areas; limited success by reducing deer and/or rodent population

POSSIBLE COMPLICATIONS

- Fatal kidney failure
- Heart block
- Central nervous system disorders

EXPECTED COURSE AND PROGNOSIS

- Recovery from sudden (acute) lameness expected 2–5 days after initiation of antibiotic treatment
- Disease may be recurrent with intervals of weeks to months; responds again to antibiotic treatment

Key Points

- Treatment of Lyme disease requires regular administration of antibiotics as prescribed by your pet's veterinarian
- Prevent tick attachment—products to kill ticks (acaricides) and tick repellents are available commercially; any such product should be used only according to label directions (*do not use permethrin on cats*)
- Diagnosis of Lyme disease (Lyme borreliosis) in a pet increases the risk to people living in the same area, as the people may be infected with *Borrelia* if they come into contact with ticks in the environment; they too should prevent tick attachment to themselves and should inform their personal physician of the pet's diagnosis if they become ill