

LYME DISEASE

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 horses, cattle, and cats
- Also known as “Lyme borreliosis” or “borreliosis”

GENETICS

- Genetic basis known for mice; suspected for people; not established for dogs

SIGNALMENT/DESCRIPTION of ANIMAL

Species

- Dogs and rarely cats

Breed Predispositions

- Kidney disease: Labrador retriever, golden retriever, Bernese Mountain dog

Mean Age and Range

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

SIGNS/OBSERVED CHANGES in the ANIMAL

- Recurrent lameness due to inflammation of the joints (arthritis)
- Sudden (acute) form lasts for only 3 to 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
- Long-term (chronic) inflammation of several joints, in which the bones around the joints are not destroyed (known as “nonerosive polyarthritis”) is found in animals with prolonged infection without adequate treatment; may persist despite antibiotic therapy
- Affected dogs may walk stiffly with an arched back and may be sensitive to touch
- 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
- Kidney failure (signs include vomiting; diarrhea; lack of appetite [anorexia]; weight loss; increased urination [known as “polyuria”] and increased thirst [known as “polydipsia”]; fluid build-up in the tissues, especially the legs and under the skin [known as “peripheral edema”] or fluid build-up 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 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 patient 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](#)
- 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 animal 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 3 to 5 days of antibiotic treatment
- If no improvement within 3 to 5 days, consider a different diagnosis

PREVENTIONS AND AVOIDANCE

- Mechanical removal of ticks—groom animals 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
- 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 3 to 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)