

# 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)