Occupational Health - Zoonotic Disease Fact Sheet

LYME DISEASE

KEY FACTS:

- Lyme disease is caused by the bacterium Borrelia burgdorferi and is transmitted to humans through the bite of infected blacklegged ticks.
- Lyme disease is present world-wide and has been reported in all 50 states.
- To infect its host, a tick typically must be attached to the skin for at least 36 hours.

SPECIES: Humans, domestic animals, deer, and wild rodents.

CAUSATIVE AGENT: Lyme disease is caused by the bacterial spirochete *Borrelia burgdorferi.*

TRANSMISSION: *B. burgdorferi* is transmitted by a bite from an infected tick. The ticks species that are capable of carrying *B. burgdorferi* include the blacklegged tick *Ixodes scapularis* (present in eastern and midwestern United States), and the western blacklegged tick *Ixodes pacificus* (present in western United States). Humans are considered dead-end hosts and there has been no evidence of natural transmission from person to person.

DISEASE IN ANIMALS: Animals are widely asymptomatic when infected with *B. burgdorferi*. However, numerous clinical syndromes have been attributed to Lyme borreliosis in domestic animals, including limb and joint disease and renal, neurologic, and cardiac abnormalities. In dogs, intermittent, recurrent lameness; fever; anorexia; lethargy; and lymphadenopathy with or without swollen, painful joints are the most common clinical signs. The second most common syndrome associated with Lyme borreliosis is renal failure, which is generally fatal. It is characterized by uremia, hyperphosphatemia, and severe protein-losing nephropathy, often accompanied by peripheral edema.

DISEASE IN HUMANS: Tickborne zoonotic disease characterized by distinctive skin lesion resembling a "bulls eye." Initial symptoms may include malaise, fatigue, fever, headache, stiff neck, myalgia, and migratory arthralgias or lympadenopathy lasting several weeks. As the infection progresses, symptoms may progress to polyarthritis, neurological issues, cardiac abnormalities, problems with short-term memory, facial palsy, and arthritis.

DIAGNOSIS: Monitor for appearance of typical lesions after tick bites in endemic areas. Serological tests can be used to show a rise in antibodies directed against the spirochete. *Please review current literature before prescribing diagnostic testing as recommendations may have changed.*

TREATMENT: *B. burgdorferi* is sensitive to tetracyclines and penicillin. Treatment when the bull's eye rash first appears with tetracycline for adults and penicillin for children may prevent or

lessen the severity of the major late cardiac, neurologic, or arthritic complications. *Please consult your physician for treatment as recommendations may have changed.*

PREVENTION/CONTROL: Vaccine production has ceased as of 2002, so the best prevention of this disease is to wear appropriate clothing and repellant while in endemic areas. Antibiotic treatment after infection is effective in controlling the disease. To prevent and control unintended infections, use uninfected animals for research, and isolate any animals used in clinical trials. Additionally, only conduct projects in laboratories with proper engineering controls and train staff members in the proper use of required personal protective equipment when they are in spaces containing live agent.

More information on Lyme disease can be found on the Centers for Disease Control and Prevention website at: https://www.cdc.gov/lyme/