

# **Lyme Disease Investigation Guideline**

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# Lyme Disease

## Disease Management and Investigative Guidelines

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### CASE DEFINITION (CDC 2008)

#### A. Clinical Description for Public Health Surveillance (*Not intended for clinical diagnosis*):

A systemic, tick-borne disease with protean manifestations which include dermatologic, rheumatologic, neurologic, and cardiac abnormalities. The best clinical marker for the disease is erythema migrans (EM); the initial skin lesion that occurs in 60%-80% of patients.

For purposes of surveillance, definitions of EM and late manifestations include:

- *EM*. A skin lesion that typically begins as a red macule or papule and expands over a period of days to weeks to form a large round lesion, often with partial central clearing. A single primary lesion must reach greater than or equal to 5 cm in size across its largest diameter. Secondary lesions also may occur. Annular erythematous lesions occurring within several hours of a tick bite represent hypersensitivity reactions and do not qualify as EM. For most patients, the expanding EM lesion is accompanied by other acute symptoms, particularly fatigue, fever, headache, mildly stiff neck, arthralgia, or myalgia. These symptoms are typically intermittent. The diagnosis of EM must be made by a physician. Laboratory confirmation is recommended for persons with no known exposure.
- *Musculoskeletal system*. Recurrent, brief attacks (weeks or months) of objective joint swelling in one or a few joints, sometimes followed by chronic arthritis in one or a few joints.
  - Manifestations not considered as criteria include chronic progressive arthritis not preceded by brief attacks and chronic symmetrical polyarthritis. Additionally, arthralgia, myalgia, or fibromyalgia syndromes alone are not criteria for musculoskeletal involvement.
- *Nervous system*. Any of the following, alone or in combination: lymphocytic meningitis; cranial neuritis, particularly facial palsy (may be bilateral); radiculoneuropathy; or, rarely, encephalomyelitis. Encephalomyelitis must be confirmed by demonstration of antibody production against *Borrelia burgdorferi* in the cerebrospinal fluid (CSF), evidenced by a higher titer of antibody in CSF than in serum.
  - Headache, fatigue, paresthesia, or mildly stiff neck alone, are not criteria for neurologic involvement.
- *Cardiovascular system*. Acute onset of high-grade (2nd-degree or 3rd-degree) atrioventricular conduction defects that resolve in days to weeks and are sometimes associated with myocarditis.
  - Palpitations, bradycardia, bundle branch block, or myocarditis alone are not criteria for cardiovascular involvement.

**Note:** For the purpose of surveillance, late manifestations are only considered as evidence of Lyme disease when an alternate explanation is not found.

**B. Laboratory Criteria for Case Classification:**

For the purposes of surveillance, a qualified laboratory assay is defined as:

- A positive culture for *B. burgdorferi*, or
- Two-tier testing interpreted using established criteria, or
- Single-tier IgG immunoblot seropositivity interpreted using established criteria. (See CDC References on Established Criteria on page 7.)

**C. Exposure:** Having been (less than or equal to 30 days before onset of EM) in wooded, brushy, or grassy areas (i.e., potential tick habitats) in a county in which Lyme disease is endemic. A history of tick bite is not required.

**D. Disease endemic to county:** A county in which at least two confirmed cases have been acquired in the county or in which established populations of a known tick vector are infected with *B. burgdorferi*.

**E. Case Classification:**

- Confirmed: **a)** a case of EM with a known exposure (as defined above), or **b)** a case of EM with laboratory evidence of infection (as defined above) and without a known exposure or **c)** a case with at least one late manifestation that has laboratory evidence of infection.
- Probable: Any other case of physician-diagnosed Lyme disease that has laboratory evidence of infection (as defined above).
- Suspect: **a)** a case of EM where there is no known exposure (as defined above) and no laboratory evidence of infection (as defined above), or **b)** a case with laboratory evidence of infection but no clinical information available (e.g. laboratory report only).

**Note:** Lyme disease reports will not be considered cases if the medical provider specifically states it is not a case of Lyme disease, or if the only symptom listed is "tick bite" or "insect bite."

**F. Laboratory Testing:**

- The State Public Health Laboratory does not provide testing and sends all specimens to the CDC. Warning: Prior consultation required from the State Epidemiology Program. CDC does not offer routine testing – illness MUST meet clinical case definition.
- For additional information and/or questions concerning isolate submission, and laboratory kits call (785) 296-1620 or refer to online guidance at [http://www.kdheks.gov/labs/lab\\_ref\\_guide.htm](http://www.kdheks.gov/labs/lab_ref_guide.htm)

**G. Bioterrorism Potential:** None.

**H. Outbreak Definition:**

- There are no formal outbreak definitions; however, the investigator may consider the possibility of an outbreak when there is an unusual clustering of cases in time and/or space.

## INVESTIGATOR RESPONSIBILITIES

### A. Investigation Related Tasks and Activities:

- 1) Confirm diagnosis with appropriate medical provider.
  - Before contacting the patient or family, first determine what information has been released about the patient's diagnosis and identify if the needed epidemiologic data can be found in the clinical record alone.
  - Obtain information that supports clinical findings in the case definition and information on the onset date of the symptoms.
  - Obtain information on any laboratory tests performed and results.
  - For hospitalization, obtain medical records, including admission notes, progress notes, lab report(s), and discharge summary.
- 2) Conduct case investigation to identify potential source of infection and/or the presence of additional cases in the community.
- 3) Educate contacts that may have been exposed to the source of infection about the risk of exposure and the symptoms of disease.
- 4) No specific public health interventions are necessary as the disease is not transmissible person-to-person.
- 5) Report all confirmed and probable cases to the KDHE Office of Surveillance and Epidemiology, using established methods.

### B. Notifications:

- 1) There are no special notifications or additional reporting requirements.
- 2) As appropriate, use the notification letter(s) and the disease fact sheet to notify the case, contacts and other individuals or groups.

## EPIDEMIOLOGY

The incidence of Lyme disease is associated with the density of infected tick vectors. While most cases in the United States have been reported in the Northeast, western states, and upper Midwest, nearly all states have reported cases. The incidence varies among states and counties and by season. Most cases occur between April and October with a peak in June and July, when the risk of contact with ticks is greatest.

## DISEASE OVERVIEW

### A. Agent:

Lyme disease is caused by the corkscrew-shaped spirochete *Borrelia burgdorferi*.

### B. Clinical Description:

While the chronology of signs and symptoms may vary significantly, there are three general stages in the clinical manifestation of Lyme disease: early localized, early disseminated, and late.

- *Early Localized*: Symptoms tend to be nonspecific and may include: fever, muscle aches, headache, mild neck stiffness, and joint pain. Erythema migrans (EM) occurs at the site of the tick bite in approximately 90% of cases. Typically, EM rashes are circular and grow to a diameter of 5-15 cm,

although the shape can be triangular, oval, or irregular. EM frequently clears in the center, resulting in the classic “bull’s-eye” presentation.

- **Early Disseminated:** In untreated persons, multiple EM rashes may appear within 3-5 weeks after the tick bite. These secondary lesions, indicative that the infection has spread into the blood, resemble the primary lesion but tend to be smaller. Common signs include: mild eye infections and paralysis of facial muscles (Bell’s palsy). Additional symptoms may include: headache, fatigue, and muscle and joint pain. Disruptions of heart rhythm occur in <10% of cases.
- **Late:** Late disease is marked by recurrent arthritis in the knees and shoulders; other joints may also be involved. Neurological signs may include: impairment of mood, sleep disorders, memory difficulties, paralysis of facial muscles, pain or tingling sensations in the extremities and less commonly, meningitis and encephalitis. Late-stage symptoms can persist for several years and tend to resolve spontaneously.

**C. Reservoirs:**

- Certain ixodid ticks that can transmit transstadially.
- Wild rodents (i.e., including mice, pack rats squirrels, shrews, and other small vertebrates) help maintain an enzootic transmission cycle.
- Deer serve as important mammalian maintenance host for vector tick species.

**D. Mode(s) of Transmission:**

Tick-borne; in experimental animals transmission by *I. scapularis* and *I. pacificus* does not occur until the tick has been attached for 24 hours or more; this may also be true in humans.

**E. Incubation Period:**

For EM, 3 to 32 days after tick exposure (mean 7 to 10 days); early stages may be inapparent and the patient may present only with late manifestations.

**F. Period of Communicability:**

Not communicable person-to-person.

**G. Susceptibility and Resistance:**

All persons are susceptible. Reinfection has occurred after treatment.

**H. Treatment:**

Amoxicillin is recommended for adults or children in early stages of disease. Doxycycline in adults and phenoxymethyl penicillin for children with early disease resolves illness and reduces the likelihood of later complications. Intravenous penicillin or ceftriaxone is effective for meningitis and late stage illness.

## **STANDARD CASE INVESTIGATION AND CONTROL METHODS**

Standard investigation activities include the following:

- 1) Confirmation of diagnosis using case definition.
- 2) Collection of demographic data (birth date, county, sex, race/ethnicity)
- 3) Collection of clinical data and laboratory results. (Including presence of

- physician diagnosed EM and/or any other clinical manifestations.)
- 4) Determination of risk factors and transmission settings. (i.e., tick exposure)

Standard investigation **includes** completion of the General Investigation Form and Lyme Disease Supplemental Form. Further investigative activity should include:

**A. Case Investigation - Identify Potential Source of Infection:**

To help identify the source of the infection, the investigator should consider the incubation period and the following potential source(s) of infection.

- Recent travel to endemic areas or history of possible exposure to ticks. List geographic location(s) and date(s).
- Consider:
  - Exposure to animals or pets with ticks.
  - Outdoor activities.
  - Occupational risks (e.g., laboratory worker, landscape worker, etc.).
  - Any travel 30 days prior to onset that was outside of the county
- History of tick bites, include geographic location of bite and date.

**B. Contact Investigation – Identify Exposed Individuals / Populations:**

- There are no formal definitions of a contact; however, consideration should be given to individuals that were in the same geographic location as the case when they were bitten by a tick.

**C. Isolation, Work and Daycare Restrictions**

- None.

**D. Case Management, Including Follow-up of cases:**

- None.

**E. Contact Management, Including Protection of Contacts:**

- Preventive treatment is not warranted.
- Instruct those exposed to a tick to monitor themselves for symptoms. Treatment is necessary only if symptoms develop.
- Those who exhibit any signs or symptoms compatible with tick-borne illness should be referred to their medical provider for evaluation.

**F. Environmental Measures:**

Community-based integrated tick management strategies may reduce the incidence of tick-borne infections, but limiting exposure to ticks is the most effective method of prevention.

- Strategies to reduce vector tick densities through area-wide application of an acaricide (i.e., chemicals that kill ticks and mites) and control of tick habitats (e.g., leaf litter and brush) have been effective in small-scale trials.
- New methods under development include applying acaricide to rodents and deer by using baited tubes, boxes and deer feeding stations in areas where these pathogens are endemic.
- Biological control with fungi, parasitic nematodes, and parasitic wasps may play important roles in integrated tick control efforts.

## **G. Education:**

As opportunities allow, the following general messages should be distributed:

- In tick-infested areas, the highest risk of bites is occurs from March-July.
- The use of protective clothing, including light-colored garments, long pants tucked into socks, long-sleeved shirts, hats, as well as tick repellents, may reduce risk.
- Outdoor activities in tick-infested areas present opportunities for exposure.
- Keep yards clear of excessive leaves, brush, and tall grasses. Walk in the center of trails to avoid contact with tall grasses and brush.
- When camping, sleep in screened tents.
- Hunters should be aware of tick infestations on mammals, especially deer, and check for tick attachments after handling carcasses.
- Keep pets free of ticks.
- Transmission requires a long attachment. Check for ticks at regular intervals while outdoors and after spending time outdoors in tick infested areas.
- Remove attached ticks intact, do not leave embedded head parts. Use gentle, direct traction with tweezers or hemostat. Other methods, such as application of a hot match or petroleum products to the tick, are less reliable. Do not crush ticks as this may result in direct inoculation of spirochetes.

## **MANAGING SPECIAL SITUATIONS**

### **A. Outbreak Investigation:**

- Notify KDHE immediately, 1-877-427-7317.
- Active case finding will be an important part of any investigation.

### **B. Tick Removal Procedure:**

To remove attached ticks, use the following procedure:

- Do not handle the tick with bare hands because infectious agents may enter through mucous membranes or breaks in the skin. This precaution is particularly directed to individuals who remove ticks from domestic animals with unprotected fingers. Children, the elderly and immunocompromised persons may be at greater risk of infection and should avoid this procedure.
- Use fine-tipped tweezers or shield fingers with a tissue, paper towel, or rubber gloves.
- Grasp the tick as close to the skin surface as possible and pull upward with steady, even pressure. Do not twist or jerk the tick; this may cause the mouthparts to break off and remain in the skin. If this happens, remove mouthparts with tweezers.
- Do not squeeze, crush, or puncture the body of the tick because its fluids (e.g., saliva, hemolymph or gut contents) may contain infectious organisms.
- After removing the tick, thoroughly disinfect the bite site and wash hands with soap and water.

## DATA MANAGEMENT AND REPORTING TO THE KDHE

- A. Organize, collect and report data with the “General Investigation Form(s)” and “Lyme Disease Supplemental Form”.
- B. Report data electronically via KS-EDSS or by fax, include:
  - At a minimum, data collected during the investigation that helps to confirm or classify a case.
  - All information collected on the General Investigation and supplemental form(s).

## ADDITIONAL INFORMATION / REFERENCES

- A. **Treatment / Differential Diagnosis:** American Academy of Pediatrics. 2006 Red Book: Report of the Committee on Infectious Disease, 27th Edition. Illinois, Academy of Pediatrics, 2006.
- B. **Epidemiology, Investigation and Control:** Heymann. D., ed., Control of Communicable Diseases Manual, 18th Edition. Washington, DC, American Public Health Association, 2004.
- C. **Case Definitions:** CDC Division of Public Health Surveillance and Informatics, Available at: [http://www.cdc.gov/ncphi/diss/nndss/casedef/case\\_definitions.htm](http://www.cdc.gov/ncphi/diss/nndss/casedef/case_definitions.htm)
- D. **Animals in Public Places Compendium:**  
[http://www.kdheks.gov/epi/human\\_animal\\_health.htm](http://www.kdheks.gov/epi/human_animal_health.htm)
- E. **CDC References on Established Criteria for Interpreting Testing:**
  - Centers for Disease Control and Prevention. Recommendations for test performance and interpretation from the Second National Conference on Serologic Diagnosis of Lyme Disease. MMWR Morb Mortal Wkly Rep 1995; 44:590–1. Accessed at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/00038469.htm>
  - Dressler F, Whalen JA, Reinhardt BN, Steere AC. Western blotting in the serodiagnosis of Lyme disease. J Infect Dis 1993; 167:392–400.
  - Engstrom SM, Shoop E, Johnson RC. Immunoblot interpretation criteria for serodiagnosis of early Lyme disease. J Clin Microbiol 1995; 33:419–27.
  - Centers for Disease Control and Prevention. Notice to readers: caution regarding testing for Lyme disease. MMWR Morb Mortal Wkly Rep 2005; 54:125–6. Accessed at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5405a6.htm>
- F. **Surveillance for Lyme Disease --- United States, 1992—2006 (CDC,2008):**  
<http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5710a1.htm>
- G. **Additional Information (CDC):** <http://www.cdc.gov/health/default.htm>

# Kansas Disease Investigation Guidelines

## General Investigation Form

Investigation Information		
<b>Case Type:</b> <input type="checkbox"/> Human Case <input type="checkbox"/> Non-human Case	<b>Disease Name:</b> _____	
<b>Classification:</b> <input type="checkbox"/> Suspect <input type="checkbox"/> Probable <input type="checkbox"/> Confirmed	<b>KS-EDSS Investigation ID:</b> _____	
<b>Outbreak:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No	<b>Outbreak Name:</b> _____	<b>Outbreak #:</b> _____
<b>Onset Date:</b> _____	<b>Diagnosis Date:</b> _____	<b>Report Date:</b> _____
<b>Assigned to (Investigator):</b> _____	<b>Patient Died:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	
Patient Information		
<b>Name Type:</b> <input type="checkbox"/> Default/Common <input type="checkbox"/> Legal <input type="checkbox"/> Maiden <input type="checkbox"/> Nickname		
<b>Last:</b> _____	<b>First:</b> _____	<b>Middle:</b> _____
<b>Street:</b> _____	<b>City/State:</b> _____	<b>Zip:</b> _____
<b>Evening Phone #:</b> _____	<b>Daytime Phone #:</b> _____	
<b>Sex:</b> <input type="checkbox"/> Failure to Report <input type="checkbox"/> Female <input type="checkbox"/> Male <input type="checkbox"/> Other <input type="checkbox"/> Transexual <input type="checkbox"/> Unknown		
<b>Race:</b> <input type="checkbox"/> American Indian or Alaska Native <input type="checkbox"/> Asian <input type="checkbox"/> Black or African American <input type="checkbox"/> Native Hawaiian or Other Pacific Islander <input type="checkbox"/> White <input type="checkbox"/> Unknown		
<b>Hispanic / Latino Ethnicity:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No		
<b>Date of Birth:</b> _____	<b>Age:</b> _____	<b>Age Unit:</b> <input type="checkbox"/> Days <input type="checkbox"/> Weeks <input type="checkbox"/> Months <input type="checkbox"/> Years
Parent Information (if under 18)		
<b>Last:</b> _____	<b>First:</b> _____	<b>Middle:</b> _____
<b>Street:</b> _____	<b>City/State:</b> _____	<b>Zip:</b> _____
<b>Evening Phone #:</b> _____	<b>Daytime Phone #:</b> _____	
Work / Occupation or School / Grade		
<b>Worksites / School:</b> _____		
<b>Occupations / Grade:</b> _____		
Travel History		
<b>1<sup>st</sup></b>	<b>Destination:</b> _____	<b>Depart Date:</b> _____ <b>Return Date:</b> _____
<b>2<sup>nd</sup></b>	<b>Destination:</b> _____	<b>Depart Date:</b> _____ <b>Return Date:</b> _____
<b>3<sup>rd</sup></b>	<b>Destination:</b> _____	<b>Depart Date:</b> _____ <b>Return Date:</b> _____
<b>4<sup>th</sup></b>	<b>Destination:</b> _____	<b>Depart Date:</b> _____ <b>Return Date:</b> _____



# Supplemental Laboratory Report Form

**Lab Reports**

Laboratory Name: \_\_\_\_\_

Lab Report Date: \_\_\_\_\_

Ordering Provider Name: \_\_\_\_\_

Phone: \_\_\_\_\_

Facility: \_\_\_\_\_

Specimen Accession Number: \_\_\_\_\_

Specimen Collection Date: \_\_\_\_\_

Organism Name: \_\_\_\_\_

Organism Species: \_\_\_\_\_

Organism Serogroup: \_\_\_\_\_

Organism Serotype: \_\_\_\_\_

**PFGE Results**

Pattern 1      KS: \_\_\_\_\_

Other State: \_\_\_\_\_

CDC: \_\_\_\_\_

Pattern 2      KS: \_\_\_\_\_

Other State: \_\_\_\_\_

CDC: \_\_\_\_\_

Pattern 3      KS: \_\_\_\_\_

Other State: \_\_\_\_\_

CDC: \_\_\_\_\_

**Additional Results Information**

Reported Test Name:

Coded Result:

Text Result:

Numeric Result:

Comments:

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# Supplemental Contact Form

**Contacts**

**Last:** \_\_\_\_\_ **First:** \_\_\_\_\_ **Middle:** \_\_\_\_\_

**Street:** \_\_\_\_\_ **City/State:** \_\_\_\_\_ **Zip:** \_\_\_\_\_

**Evening Phone #:** \_\_\_\_\_ **Daytime Phone #:** \_\_\_\_\_ **E-mail:** \_\_\_\_\_

**Sex:**  Failure to Report  Female  Male  Other  Transexual  Unknown

**Race:**  American Indian or Alaska Native  Asian  Black or African American  Native Hawaiian or Other Pacific Islander  White  Unknown

**Hispanic / Latino Ethnicity:**  Yes  No

**Date of Birth:** \_\_\_\_\_ **Age:** \_\_\_\_\_ **Age Unit:**  Days  Weeks  Months  Years

**Worksites / School:** \_\_\_\_\_

**Occupations / Grade:** \_\_\_\_\_

**Exposure Information**

**Contact Type:**  Household  Sexual  Other: \_\_\_\_\_ **Partner / Cluster Code:** \_\_\_\_\_

**Date of First Exposure:** \_\_\_\_\_ **Date of Last Exposure:** \_\_\_\_\_ **Frequency:** \_\_\_\_\_

**Nature of Exposure:** \_\_\_\_\_ **Comments:** \_\_\_\_\_

**Testing and Treatment Information**

**Clinic Code:** \_\_\_\_\_ **Examination Date:** \_\_\_\_\_

**Examination Test:** \_\_\_\_\_ **Examination Result:** \_\_\_\_\_

**Prophylaxis/empiric treatment date:** \_\_\_\_\_ **Drug / Dosage:** \_\_\_\_\_

**Provider (Name / Facility):** \_\_\_\_\_

**Disposition and Diagnosis Information**

**Initiation Date:** \_\_\_\_\_ **Disposition Date:** \_\_\_\_\_ **Disposition:** \_\_\_\_\_

**Diagnosis:** \_\_\_\_\_ **Referral Type:**  Patient  Provider **Post-test Counseled :**  Yes  No

**Currently Assigned To:** \_\_\_\_\_ **Follow-up Date:** \_\_\_\_\_

**Risk Factors**

**Pregnant:**  Yes  No **If Yes, # of Weeks:** \_\_\_\_\_

**Risk factors for complications in contact:**  None  Pregnant Woman  HIV Seropositive  Unimmunized  Index case is a super-spreader

Child younger than 5  Age > 65  Otherwise immunosuppressed (s/p transplant, high dose steroids, etc)

# Lyme Disease Supplemental Form

## Kansas Department of Health and Environment

### Epidemiologic Case History

\* indicates required fields

<b>Case Type*</b> <i>Human Case    Non Human Case</i>	<b>Classification*</b> <i>Confirmed    Not a Case    Probable    Suspect    Deleted    Unknown</i>
<b>Supplemental Form Status</b> <i>Not Done    Form Complete    Form in Progress    Form Approved    Form Sent to CDC</i>	
<b>Report Date*</b> <small>mm/dd/yyyy</small>	
<b>Date Investigation Started</b> <small>mm/dd/yyyy</small>	

### Patient Demographic Information

\* indicates required fields

<b>Last Name*</b>	<b>First Name*</b>	<b>Middle Name</b>	<b>Name Type*</b>	<b>Age</b>
<b>Age Unit</b> <i>Days    Weeks    Months    Years</i>			<b>Date of Birth</b> <small>mm/dd/yyyy</small>	
<b>Race*</b> <small>(Check all that apply)</small> <i>American Indian or Alaska Native    Asian    Black or African American Native Hawaiian or Other Pacific Islander    White    Unknown</i>				
<b>Ethnicity*</b> <i>Hispanic or Latino    Not Hispanic or Latino    Unknown</i>				
<b>Sex*</b> <i>Failure to Report    Female    Male    Other    Transexual    Unknown</i>				
<b>Street Address</b>				
<b>City</b>	<b>County</b>	<b>State</b>	<b>Zip</b>	
<b>Evening Phone</b> <small>###-###-####</small>			<b>Daytime Phone</b> <small>###-###-####</small>	
<b>Occupation</b>				

### Person Providing Report

<b>Name of Reporting Facility*</b>
------------------------------------

# Symptoms and Signs of Current Episode

<b>Dermatologic</b>		<b>Rheumatologic</b>	
<b>Erythema migrans</b> <small>(Physician diagnosed EM at least 5 cm in diameter?)</small> <i>Yes No Unknown</i>		<b>If yes, date of onset:</b> <small>mm/dd/yyyy</small>	
		<b>Arthritis Characterized By Brief Attacks of Joint Swelling</b> <i>Yes No Unknown</i>	
<b>Neurologic</b>			
<b>Bell's Palsy or Other Cranial Neuritis</b> <i>Yes No Unknown</i>		<b>Radiculoneuropathy</b> <i>Yes No Unknown</i>	
		<b>Lymphocytic meningitis</b> <i>Yes No Unknown</i>	
		<b>Encephalitis/Encephalomyelitis</b> <i>Yes No Unknown</i>	
<b>CSF Tested for Antibodies to B. burgdorferi</b> <i>Yes No Unknown</i>		<b>Antibody to B. burgdorferi Higher in CSF or Serum</b> <i>Yes No Unknown</i>	
<b>Cardiologic</b>			
<b>2nd or 3rd Degree Atrioventricular Block</b> <i>Yes No Unknown</i>			
<b>Other Clinical</b> <b>List Other Clinical Here</b>			
<b>Date of Onset</b> <small>mm/dd/yyyy</small>		<b>Date of Diagnosis</b> <small>mm/dd/yyyy</small>	
		<b>Date of Report to Health Agency</b> <small>mm/dd/yyyy</small>	
<b>Other History</b>			
<b>Was the Patient Hospitalized for the Current Episode?</b> <i>Yes No Unknown</i>			
<b>Name of Antibiotic(s) Used This Episode</b>			
<b>Use in Days</b>	<b>Was the Patient Pregnant at the Time of Illness?</b> <i>Yes No Unknown</i>		<b>Which Country Was the Patient Most Likely Exposed?</b>
<b>Which State Was the Patient Most Likely Exposed</b> <small>(Select one)</small>			
<b>Laboratory Results</b>			
<b>Serologic Test Results</b> <i>Positive Negative Equivocal Not Done/Unknown</i>		<b>Culture Results</b> <i>Positive Negative Equivocal Not Done/Unknown</i>	
<b>Other</b> <small>(Specify)</small>		<b>Other Result</b> <small>(specify)</small> <i>Positive Negative Equivocal Not Done/Unknown</i>	
<b>List Bands Detected by Western Blot</b>			
<b>Identification</b>			
<b>Reporting Information</b>			
<b>Physician's Name</b>		<b>Address</b>	
		<b>Phone</b> <small>###-###-####</small>	
<b>Person Completing Form</b> <small>(If not the same)</small>		<b>Address</b>	
		<b>Phone</b> <small>###-###-####</small>	

For Internal Use Only

For Internal Use Only

**State ID No.**

**CDC-ID No.**

**Date Reported to CDC**

mm/dd/yyyy

# **Public Health Fact Sheet**

## **Lyme Disease**

### **What is Lyme disease?**

Lyme disease is caused by a spirochete and is spread by infected ticks. Both people and animals can be infected.

### **Where is Lyme disease found?**

Lyme disease is most commonly found along the East Coast, the upper Midwest and the valleys of the far West but cases have been reported in most States.

### **What are the symptoms of Lyme disease?**

Early stage (days to weeks): An early symptom is often, but not always, a rash where the tick was attached; it usually appears from 3-30 days after the initial bite. The rash often begins as a small red area then grows to 5-15 cm in diameter; the center often clears so it looks like a donut. Flu-like symptoms, such as fever, headache, stiff neck, sore and aching muscles and joints, fatigue and swollen glands are common in the early stage. These symptoms often resolve without treatment in few weeks and most people resolve the infection at this point. People that do not resolve the infection may have more serious medical problems later. Early treatment with antibiotics clears up the rash within days and usually prevents later problems.

Late stage (months to years): Three major organ systems: the joints, nervous system and heart can be affected. About 60% of people with untreated disease get arthritis in their large joints; it may move from joint to joint and become chronic. About 10-20% develops nervous system problems including: meningitis (an inflammation of the membranes covering the brain and spinal cord), facial weakness (Bell's palsy) and weakness or pain in the hands, arms, feet and/or legs. These symptoms can last for months. The heart may also be affected resulting in a decreased heart rate and fainting.

### **How is Lyme disease diagnosed?**

Lyme disease is easy to diagnose when someone gets the classic rash. It is more difficult to diagnose without the rash since its symptoms resemble many other diseases. To help diagnose these cases, doctors can have a patient's blood tested for antibodies to the Lyme disease bacteria.

### **How is Lyme disease treated?**

Prompt treatment of early symptoms with certain antibiotics can prevent more serious problems later. The treatment of Lyme disease in its later stages is more difficult and may be less likely to be effective.

*This fact sheet is for information only and is not intended for self-diagnosis or as a substitute for consultation. If you have any questions about the disease described above or think that you may have an infection, consult with your healthcare provider. This fact sheet is based on the Centers for Disease Control and Prevention's topic fact sheets.*

### **How can you prevent Lyme disease?**

The only known way to get Lyme disease is from the bite of an infected tick. The best way to prevent Lyme disease is to avoid areas where the ticks are likely to be found. If you live in or visit a high-risk area, you should follow these precautions:

- Wear a long-sleeved shirt and long pants and tuck your pant legs tightly into your socks.
- Use insect repellents that contain DEET on your clothes or exposed skin, or those that contain permethrin on your clothes.
- Check for ticks at least once every day if you are in a high risk area. Their favorite places are on the legs, in the groin, in the armpits, along the hairline, and in or behind the ears.
- Remove any ticks promptly using fine point tweezers. The tick should not be squeezed or twisted, grasp it close to the skin and pull straight out with steady pressure.
- Know the symptoms of Lyme disease. If you have been someplace likely to have ticks between early spring and early autumn and you develop Lyme disease symptoms, especially if you get a rash, see a doctor right away.

### **Where can I get more information?**

- Your Local Health Department
- Kansas Department of Health and Environment, Office of Surveillance and Epidemiology (877) 427-7317
- <http://www.cdc.gov/health/default.htm>
- Your doctor, nurse, or local health center

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