



Department of Health
Bureau of Epidemiology

**Merlin
Case Definitions
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1. Lyme Disease

Lyme Disease Clinical Description

This surveillance case definition was developed for national reporting of Lyme disease; it is not intended to be used in clinical diagnosis.

Clinical description:

A systemic, tickborne disease with protean manifestations, including 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, EM is defined as 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.

Acute disease presentation:

Erythema migrans (EM), single primary lesion must reach greater than or equal to 5 cm in size across its largest diameter and be physician diagnosed

Chronic disease presentation:

For purposes of surveillance, late manifestations include any of the following when an alternate explanation is not found:

- **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 for diagnosis 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.

Physician-diagnosed Lyme disease

Laboratory criteria for diagnosis:

For the purposes of surveillance, the definition of a qualified laboratory assay is

- A positive culture for *B. burgdorferi*,
- OR
- Two-tier testing interpreted using established criteria [1],
- OR
- Single-tier IgG immunoblot seropositivity interpreted using established criteria [1-4].

Exposure

Exposure is defined as 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 an area in which Lyme disease is endemic. For surveillance purposes, Florida is considered a Lyme disease endemic state. A history of tick bite is not required.

Case classification:

Confirmed:

Acute disease presentation:

- a) a case of EM and a known exposure (as defined above),
- OR
- b) a case of EM and laboratory evidence of infection (as defined above), with or without a known exposure (as defined above)
- OR

Chronic disease presentation:

- c) a case with at least one late manifestation with laboratory evidence of infection.

Probable:

A case of physician-diagnosed Lyme disease that has laboratory evidence of infection (as defined above).

Suspect:

- a) a case of EM where no laboratory evidence of infection exists (as defined above),
- OR
- b) a case with laboratory evidence of infection (as defined above) with no clinical information available (e.g., a laboratory report).

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

2. Mumps

Mumps Clinical Description

Clinical case definition:

An illness with acute onset of unilateral or bilateral tender, self-limited swelling of the parotid and/or other salivary gland(s), lasting at least 2 days, and without other apparent cause.

Clinically compatible illness:

Infection with mumps virus may present as aseptic meningitis, encephalitis, hearing loss, orchitis, oophoritis, parotitis or other salivary gland swelling, mastitis or pancreatitis.

Laboratory criteria for diagnosis:

• Isolation of mumps virus from clinical specimen,

OR

• Detection of mumps nucleic acid (e.g., standard or real time RT-PCR assays),

OR

• Detection of mumps IgM antibody,

OR

• Demonstration of specific mumps antibody response in absence of recent vaccination, either a four-fold increase in IgG titer as measured by quantitative assays, or a seroconversion from negative to positive using a standard serologic assay of paired acute and convalescent serum specimens.

Epidemiologically linked:

• Epidemiologically linked to a clinically compatible case

• Epidemiologically linked to a laboratory confirmed case

Note: to be considered a confirmed case based on epidemiologic linkage, there must be a laboratory confirmed case in the chain of transmission. If there is no laboratory confirmation in the chain of transmission please select "Epidemiologically linked to a clinically compatible case."

Case classification:

Confirmed:

A case that 1. meets the clinical case definition or has clinically compatible illness, AND 2. is either laboratory confirmed OR is epidemiologically linked to a confirmed case. Note: to be considered a confirmed case based on epidemiologic linkage, there must be a laboratory confirmed case in the chain of transmission.

Probable:

A case that meets the clinical case definition without laboratory confirmation AND is epidemiologically linked to a clinically compatible case.

Suspect:

A case with clinically compatible illness or meets the clinical case definition without laboratory confirmation (this would include those not tested as well as those tested but with negative results),

OR

a case with laboratory tests results indicative of mumps without clinical information.

Comment: With previous contact with mumps virus either through vaccination (particularly with 2 doses) or natural infection, serum mumps IgM test results may be negative; IgG test results may be positive at initial blood draw and viral detection in RT-PCR or culture may have low yield. Therefore, mumps should not be ruled out by negative laboratory results. Serologic tests should be interpreted with caution, as false positive and false negative results are possible with IgM tests. **Note:** Studies suggest that serum IgM may be negative in up to 50-60% of acute serum samples among individuals who have been previously immunized, thus, a case in a vaccinated person cannot not be ruled out on the basis of a negative IgM <http://www.cdc.gov/nip/diseases/mumps/faqs-lab-test-infect.htm>

3. Acute Q Fever

Q FEVER ACUTE Clinical Description

Acute infection: Acute fever usually accompanied by rigors, myalgia, malaise, and a severe retrobulbar headache. Severe disease can include acute hepatitis, atypical pneumonia with abnormal radiograph, and meningoencephalitis. Clinical laboratory findings may include elevated liver enzyme levels, leukocytosis, and thrombocytopenia. Asymptomatic infections may also occur.

Note: Serologic profiles of pregnant women infected with acute Q fever during gestation may progress frequently and rapidly to those characteristic of chronic infection.

Clinical evidence:

Acute Q fever: Acute fever and one or more of the following: rigors, severe retrobulbar headache, acute hepatitis, pneumonia, or elevated liver enzyme levels.

I. Acute Q fever Laboratory evidence:

Laboratory confirmed:

- Serological evidence of a fourfold change in immunoglobulin G (IgG)-specific antibody titer to *C. burnetii* phase II antigen by indirect immunofluorescence assay (IFA) between paired serum samples, (CDC suggests one taken during the first week of illness and a second 3-6 weeks later, antibody titers to phase I antigen may be elevated or rise as well) **or**
- Detection of *C. burnetii* DNA in a clinical specimen via amplification of a specific target by polymerase chain reaction (PCR) assay, **or**
- Demonstration of *C. burnetii* antigen in a clinical specimen by immunohistochemical methods (IHC), **or**
- Isolation of *C. burnetii* from a clinical specimen by culture.

Laboratory supportive:

- Has a single supportive IFA IgG titer of >1:128 to phase II antigen (phase I titers may be elevated as well).
- Has serologic evidence of elevated IgG or IgM antibody reactive with *C. burnetii* antigen by enzyme-linked immunosorbent assay (ELISA), dot-ELISA, or latex agglutination.

Exposure:

Exposure is usually via aerosol, is broadly interpreted, and may be unknown (especially for chronic infection), but often includes the presence of goats, sheep, or other livestock, especially during periods of parturition. Direct contact with animals is not required, and variable incubation periods may be dose dependent.

Case definition tables:

Confirmed acute Q Fever: A laboratory confirmed case that either meets clinical case criteria or is epidemiologically linked to a lab confirmed case.

Probable acute Q Fever: A clinically compatible case of acute illness (meets clinical evidence criteria for acute Q fever illness) that has laboratory supportive results for past or present acute disease (antibody to Phase II antigen) but is not laboratory confirmed.

Clinical Presentation and Epidemiology

Acute infection: Acute fever usually accompanied by rigors, myalgia, malaise, and a severe retrobulbar headache. Severe disease can include acute hepatitis, atypical pneumonia with abnormal radiograph, and meningoen­cephalitis. Clinical laboratory findings may include elevated liver enzyme levels, leukocytosis, and thrombocytopenia. Asymptomatic infections may also occur.

1. Acute fever Yes No NA
2. One or more of the following: rigors, severe retrobulbar headache, acute hepatitis, pneumonia, or elevated liver enzyme levels Yes No NA
3. Epidemiologically linked to a lab confirmed case Yes No NA

Symptoms:		Selected Symptoms:
FATIGUE FEVER MALAISE SEVER RETROBULBAR HEADACHE SWEATS	<input type="button" value="Add >>"/> <input type="button" value=" << Remove"/>	

Lab Results

1. Serological evidence of a fourfold change in immunoglobulin G (IgG)-specific antibody titer to *C. burnetii* phase II antigen by indirect immunofluorescence assay (IFA) between paired serum samples,(CDC suggests one taken during the first week of illness and a second 3-6 weeks later, antibody titers to phase I antigen may be elevated or rise as well) Yes No NA
2. Detection of *C. burnetii* DNA in a clinical specimen via amplification of a specific target by polymerase chain reaction (PCR) assay Yes No NA
3. Demonstration of *C. burnetii* antigen in a clinical specimen by immunohistochemical methods (IHC) Yes No NA
4. Isolation of *C. burnetii* from a clinical specimen by culture Yes No NA
5. Has a single supportive IFA IgG titer of >1:128 to phase II antigen (phase I titers may be elevated as well) Yes No NA
6. Has serologic evidence of elevated IgG or IgM antibody reactive with *C. burnetii* antigen by enzyme-linked immunosorbent assay (ELISA), dot-ELISA, or latex agglutination Yes No NA

Imported: ACQUIRED IN FLORIDA
Origin:
Outbreak:

Q FEVER CHRONIC Clinical Description

Chronic Infection: Infection that persists for more than 6 months. Potentially fatal endocarditis may evolve months to years after acute infection, particularly in persons with underlying valvular disease. Rare cases of chronic hepatitis without endocarditis, osteomyelitis, osteoarthritis, and pneumonitis have been described.

Please choose at least one of the following symptoms for the determination of the DX Status:

Clinical evidence: Chronic Q fever: Newly recognized, culture-negative endocarditis, particularly in a patient with previous valvulopathy or compromised immune system, suspected infection of a vascular aneurysm or vascular prosthesis, or chronic hepatitis, osteomyelitis, osteoarthritis, or pneumonitis in the absence of other known etiology.

Chronic Q fever Laboratory evidence:

Laboratory confirmed:

- Serological evidence of IgG antibody to *C. burnetii* phase I antigen $\geq 1:800$ by IFA (while phase II IgG titer will be elevated as well, phase I titer is higher than the phase II titer), **or**
- Detection of *C. burnetii* DNA in a clinical specimen via amplification of a specific target by PCR assay, **or**
- Demonstration of *C. burnetii* antigen in a clinical specimen by IHC, **or**
- Isolation of *C. burnetii* from a clinical specimen by culture.

Laboratory supportive:

- Has an antibody titer to *C. burnetii* phase I IgG antigen $>1:128$ and $< 1:800$ by IFA.

Note: Samples from suspected chronic patients should be evaluated for IgG titers to both phase I and phase II antigens. Current commercially available ELISA tests (which test only for phase 2) are not quantitative, cannot be used to evaluate changes in antibody titer, and hence are not useful for serological confirmation. IgM tests are not strongly supported for use in serodiagnosis of acute disease, as the response may not be specific for the agent (resulting in false positives) and the IgM response may be persistent. Complement fixation (CF) tests and other older test methods are neither readily available nor commonly used. For acute testing, CDC uses in-house IFA IgG testing (cutoff of $>1:128$), preferring simultaneous testing of paired specimens, and does not use IgM results for routine diagnostic testing. Serologic test results must be interpreted with caution, because baseline antibodies acquired as a result of historical exposure to Q fever may exist, especially in rural and farming areas.

Exposure:

Exposure is usually via aerosol, is broadly interpreted, and may be unknown (especially for chronic infection), but often includes the presence of goats, sheep, or other livestock, especially during periods of parturition. Direct contact with animals is not required, and variable incubation periods may be dose dependent.

Case definition tables:

Confirmed chronic Q Fever: A clinically compatible case of chronic illness (meets clinical evidence criteria for chronic Q fever) that is laboratory confirmed for chronic infection.

Probable chronic Q Fever: A clinically compatible case of chronic illness (meets clinical evidence criteria for chronic Q fever) that has laboratory supportive results for past or present chronic infection (antibody to Phase I antigen).

Case Information

Case #: **New**

FL Disease Code: Q FEVER CHRONIC - 08302

DX Status:

Investigator:

CHD Ref#:

Outcome:

Set Dx Status

Clinical Presentation and Epidemiology

Chronic Infection: Infection that persists for more than 6 months. Potentially fatal endocarditis may evolve months to years after acute infection, particularly in persons with underlying valvular disease. Rare cases of chronic hepatitis without endocarditis, osteomyelitis, osteoarthritis, and pneumonitis have been described.

Please choose at least one of the following symptoms for the determination of the DX Status:

Symptoms:

CHRONIC HEPATITIS
CULTURE-NEGATIVE ENDOCARDITIS
OSTEOARTHRITIS
OSTEOMYELITIS
PNEUMONITIS
SUSPECTED INFECTION VASCULAR A

Add >>

<< Remove

Selected Symptoms:

Lab Results

1. Detection of *C. burnetii* DNA in a clinical specimen via amplification of a specific target by polymerase chain reaction (PCR) assay Yes No NA
2. Demonstration of *C. burnetii* antigen in a clinical specimen by immunohistochemical methods (IHC) Yes No NA
3. Isolation of *C. burnetii* from a clinical specimen by culture Yes No NA
4. Serological evidence of IgG antibody to *C. burnetii* phase I antigen >1:800 by IFA (while phase II IgG titer will be elevated as well; phase I titer is higher than the phase II titer) Yes No NA
5. Has an antibody titer to *C. burnetii* phase I IgG antigen >1:128 and < 1:800 by IFA Yes No NA

Imported: ACQUIRED IN FLORIDA

Origin:

Outbreak:

4. Rocky Mountain Spotted Fever: New Case Definition

Rocky Mountain Spotted Fever Clinical Description

Clinical description:

Rocky Mountain spotted fever (RMSF) is an illness caused by *Rickettsia rickettsii*, a bacterial pathogen transmitted to humans through contact with ticks. *Dermacentor* species of ticks are most commonly associated with infection, including *Dermacentor variabilis* (the American dog tick), *Dermacentor andersoni* (the Rocky Mountain wood tick), and more recently *Rhipicephalus sanguineus* (the brown dog tick). Disease onset averages one week following a tick bite. Age specific illness is highest for children and older adults. Illness is characterized by acute onset of fever, and may be accompanied by headache, malaise, myalgia, nausea/vomiting, or neurologic signs; a macular or maculopapular rash appears 4-7 days following onset in many (~80%) patients, often present on the palms and soles. RMSF may be fatal in as many as 20% of untreated cases, and severe, fulminant disease can occur. Acute illness is best detected by polymerase chain reaction (PCR) and immunohistochemical methods (IHC) in skin biopsy specimens, and occasionally by PCR in appropriate whole blood specimens taken during the 1st week of illness, prior to antibiotic treatment. Serology can also be employed for detection, however an antibody response may not be detectable in initial samples, and paired acute and convalescent samples are essential for confirmation.

Clinical evidence:

Any reported fever AND one or more of the following: rash, headache, myalgia, anemia, thrombocytopenia, or any hepatic transaminase elevation.

Fever

Rash, headache, myalgia, anemia, thrombocytopenia, or any hepatic transaminase elevation

Laboratory criteria for diagnosis:

Laboratory confirmed:

- Serological evidence of a fourfold change in immunoglobulin G (IgG)-specific antibody titer reactive with *Rickettsia rickettsii* antigen by indirect immunofluorescence assay (IFA) between paired serum specimens (one taken in the first week of illness and a second 2-4 weeks later),

OR

- Detection of *R. rickettsii* DNA in a clinical specimen via amplification of a specific target by PCR assay,

OR

- Demonstration of spotted fever group antigen in a biopsy/autopsy specimen by immunohistochemical methods (IHC),

OR

- Isolation of *R. rickettsii* from a clinical specimen in cell culture.

Laboratory supportive:

- Has serologic evidence of elevated IgG or IgM antibody reactive with *R. rickettsii* antigen by IFA, enzyme-linked immunosorbent assay (ELISA), dot-ELISA, or latex agglutination.

Note: Current commercially available ELISA tests are not quantitative, cannot be used to evaluate changes in antibody titer, and hence are not useful for serological confirmation. IgM tests are not strongly supported for use in serodiagnosis of acute disease, as the response may not be specific for the agent (resulting in false positives) and the IgM response may be persistent. Complement fixation (CF) tests and other older test methods are neither readily available nor commonly used. CDC uses in-house IFA IgG testing (cutoff of >1:64), preferring simultaneous testing of paired specimens, and does not use IgM results for routine diagnostic testing.

Exposure:

Exposure is defined as having been in potential tick habitats within the past 14 days before onset of symptoms. A history of a tick bite is not required.

Case classification:

Confirmed:

A clinically compatible case (meets clinical evidence criteria) that has *laboratory confirmed* results.

Probable:

A clinically compatible case (meets clinical evidence criteria) that has *laboratory supportive* results.

Suspect:

A clinically compatible case with no supportive laboratory results.

Note: Recently, a growing number of case reports have included commercial laboratory results as supportive evidence. For example, the previous case definitions have used the word "antibody." A review of testing protocols and reagents distributed to the state laboratories reveal that these existing tests were specific for IgG-class immunoglobulins. With the increased availability of IgM testing at commercial laboratories, it becomes necessary to clarify the traditional meaning of the word "antibody" as used in all previous definitions and routinely used by rickettsial laboratories. The use of IgM is less supported by scientific evidence, and actually is complicated by false negatives when IgG is present and false positives when rheumatoid factor or cross-reactive, non-rickettsial, antibodies are present. Thus, IgM testing cannot be recommended for confirmation of cases at this time.