

Q FEVER

Disease Category: Zoonotic-Arboviral

Timeframe to follow-up:

See the link to the Disease Investigation Process document

Signs and Symptoms

In humans:

- Acute: Fever, fatigue, muscle pain (myalgia), and pneumonia (flu-like symptoms). Possible occurrence of rigors, malaise, fatigue, night-sweats, dyspnea, confusion, nausea, diarrhea, abdominal pain, vomiting, non-productive cough, and chest pain. Can develop into more severe symptoms of acute hepatitis, atypical pneumonia, and meningoencephalitis
- Chronic: Additional endocarditis, chronic hepatitis, or other related conditions

In animals (specifically ruminants such as cows, sheep, and goats):

- Abortion and/or infertility

Incubation

Usually 2 weeks; range between 2-3 weeks

Case Classification (7)

Clinical criteria:

- Acute: Infection is characterized by a fever and one or more of the following: rigors, severe retrobulbar headache, acute hepatitis, pneumonia, or elevated liver enzyme levels
- Chronic: Infection is characterized by endocarditis, infection of a vascular aneurysm or vascular prosthesis, or chronic hepatitis, osteomyelitis, osteoarthritis, or pneumonitis (no other known etiology)

Laboratory Confirmed:

- Acute: 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* in a clinical specimen by immunohistochemical methods (IHC), OR
- Isolation of *C. burnetii* from a clinical specimen by culture.
- Chronic: 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

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	- Detection of <i>C. burnetii</i> DNA in a clinical specimen via amplification of a specific target by PCR assay, OR - Demonstration of <i>C. burnetii</i> antigen in a clinical specimen by IHC, OR - Isolation of <i>C. burnetii</i> from a clinical specimen by culture Probable: - Acute: 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. - Chronic: 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)
Differential Diagnosis	Differential diagnoses may make the identification of Q fever difficult, as: - Acute infection may cause general fever and pneumonia - Chronic Q fever may lead to endocarditis or hepatitis
Treatment	Without treatment, <i>most</i> cases will resolve between two and three weeks. - Doxycycline should be administered for severe developing infection - Chronic cases of Q fever should be treated by both doxycycline and hydroxychloroquine - Specific doses for treatment are dependent on the severity and duration of infection
Duration	Symptoms usually persist for 2 weeks
Exposure	- Aerosols, specifically aerosolized animal excrement or birthing products - Close proximity to ruminants (goats, sheep, cows, other livestock), especially during periods of parturition (birthing)
Laboratory Testing	Local Health Authority can arrange testing if an outbreak is suspected OR for contacts: Nevada State Public Health Laboratory – <i>Coxiella burnetii</i>
Control of Contacts	Although person-to-person infection is rare, disease contacts should be approached with standard precautions while undergoing tests and necessary education on the infection Attenuated strains of <i>Coxiella burnetii</i> are not subject to the HHS select agent regulations
Key areas of focus during investigation	Contact with and/or proximity to animals (ruminants) or their products (milk, meat, excrement, birthing material).
Public Health Actions	Reports of Q fever cases must be made to the Local Health Authority during the regular business hours of the health authority on the first working day following the identification of the case.

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	Local Health Authority to notify Office of State Epidemiology (dpbhepi@health.nv.gov) or call 775-684-5911/775-400-0333 (after hours) if outbreak suspected. For individual confirmed or probable cases: • Confirm diagnosis, if possible • Identify potential exposures • Report each week to the Chief Medical Officer the number and types of cases or suspected cases of infection • Prepare a case report and submit to the Chief Medical Officer (through OSE) within 30 days after completing the case investigation • Identify potential outbreaks from common sources • Provide education about how to prevent transmission To the best of the local health authority's ability, each step of the investigation should be completed within one working day or in alignment with NAC 441A.
Key Partner Agencies	• Nevada Department of Wildlife • Nevada Department of Agriculture • Nevada Division of Environmental Protection

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I. DISEASE REPORTING

A. Legal Reporting Requirements

A report to the health authority may be made by telephone; telecopy (in the form prescribed by the health authority); or any form of electronic communication identified (1)□

1. *Health Care Providers and Health Care Facilities*

Health providers and facilities must notify the health authority where provider is located within the first working day after identifying the case. (1) (2) (3)

2. *Laboratories*

Laboratories must notify the health authority within the first working day after identifying the case. (1) If the lab is located outside of Nevada, notify the Nevada Chief Medical Officer through the Office of State Epidemiology (OSE) within the same timeframe. (1) (4)

3. *Local Health Authority (LHA)*

LHA's must notify the Office of State Epidemiology (OSE) within 7 days after completing the case investigation. (5)

II. THE DISEASE AND ITS EPIDEMIOLOGY

A. Background

Q fever is a zoonotic disease caused by *Coxiella burnetii* bacteria. Q fever occurs globally, but cases are more common in areas where livestock are managed. Risk factors may include entering and/or residing in an area that is in close proximity to livestock or pursuing a career that requires regular contact with susceptible animals or meat, including research fields. A risk factor for the development of chronic Q fever is having a condition impairing vascular, immune, or renal functioning. Mortality in Q fever is generally low in acute infection, but it can be significantly higher in chronic disease or severe complications.

Etiologic Agent

Coxiella burnetii is an extremely infectious gram-negative bacterium part of the Proteobacteria phylum. The bacterium is found naturally in the feces, urine, milk, and birthing material of select animals, such as goats, sheep, and cows. A wide variety of other animal species can be infected with *C. burnetii* as well as surrounding environments. The bacterium is extremely infectious, sometimes requiring less than 10 bacteria to cause illness. *C. burnetii* is resistant to heat, drying, and many disinfectants, making it particularly threatening if not under control. (6) (9) (10) (11) (12)

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B. Description of Illness

Q fever in humans may cause fever, fatigue, muscle pain (myalgia), and pneumonia, making it difficult to differentiate from other illnesses. Rigors, malaise, fatigue, night-sweats, dyspnea, confusion, nausea, diarrhea, abdominal pain, vomiting, non-productive cough, and chest pain are also characteristic of Q fever infection. However, infection while already suffering from a compromised immune system, heart disease, aneurysms, or other related condition can lead to the development of chronic Q fever. Opposed to the influenza-like symptoms of acute Q fever, chronic Q fever can lead to endocarditis or hepatitis and is heavily associated with increased mortality and morbidity. In ruminants, Q fever can cause abortion and/or infertility. (6) (8) (11) (12) (13)

C. Disease Burden in Nevada

According to current data, Q fever is not endemic to Nevada. There have been zero cases or notable trends in recent years.

See the [Nevada Office of State Epidemiology Communicable Disease Dashboard](#) for Nevada specific data on Q fever (Monitoring Zoonotic Diseases in Nevada section).

D. Reservoirs

The main reservoir for Q fever is domestic ruminants, or herbivorous mammals. *C. burnetii* infection in other animals often causes no symptoms but can lead to human acquisition. (12)

E. Modes of Transmission

Q fever can be transmitted to humans via inhalation of aerosols contaminated with the bacteria from animal waste or soil. Uncommon forms of transmission include the consumption of unpasteurized milk, tick bites, and extremely rare human-to-human. (14)

F. Incubation Period

Acute Q fever has an incubation period of approximately 2-3 weeks. (14)

G. Period of Communicability

Not specified by the CDC.

H. Testing

Acute Q fever can be diagnosed using either indirect immunofluorescence assay (IFA), polymerase chain reaction (PCR) assay, immunohistochemical (IHC) methods, or isolation of specimen by culture. Additional information about testing in Nevada can be found at the [Nevada State Public Health Laboratory](#) website. (13)

I. Treatment

The most effective form of treatment for acute Q fever is doxycycline, particularly for severe infections. Without treatment, most cases will resolve between two and three weeks. Chronic cases of Q fever should be treated by both doxycycline and hydroxychloroquine. Specific doses for treatment are dependent on the severity and duration of infection. Treatment should be reassessed if the patient shows no signs or symptoms of infection. (14)

Provide most current treatment guidelines from [Red Book](#) to the healthcare provider or refer case to physician for proper treatment for Q fever.

III. EPIDEMIOLOGIC CASE INVESTIGATION

The public health authority should begin investigating the case of Q fever, step by step, within one working day of notification or in alignment with [NAC 441A](#).

A. Step 1: Review relevant information about the disease.

1. *Review scientific information in [Control of Communicable Diseases Manual](#), most recent edition.*
2. *Review Q fever most recent case definition ([2009 CDC](#)).*

B. Step 2: Begin investigating the case.

1. *Contact Reporting Source and/or Reported Case*

Upon receiving an initial case report, review lab test results and available clinical details and epidemiologic factors. Please make three attempts to contact the case (text and phone calls) on separate days, at different times of the day (morning, afternoon, late afternoon). Document all attempts to contact a reporting source and/or reported case, preferably in the “Encounters” tab of EpiTrax. Please use case report forms (CRF) to gather accurate information about the case. Focus on the key data elements listed above. Filling out an electronic version of the CRF in EpiTrax (called a Confidential Morbidity Report (CMR) in EpiTrax) is preferred. If used, the completed PDF version should be attached to the CMR in EpiTrax. The CRF should be completed within 7 days of completing the investigation of the case. (5)

C. Step 3: Identify potential sources of infection

The investigation focuses on exposures in the 2-3 weeks before symptom onset. Ask about any risk factors associated with infection. Traveling to rural areas/farmland and exposure to domestic ruminants or their products/excrement are risk factors for Q fever. (12)

D. Step 4: Initiate control measures for case and/or for contacts (see Section IV – Section VI below).

E. Step 5: Provide Education and Prevention messaging to the case and/or contacts (see Section IX below).

IV. CONTROL OF CASE

1. Management/Exclusions for Specific Groups or Settings

Coxiella burnetii is a select agent with the potential to become a severe threat to health. Although quarantine guidelines are not specified by the CDC for the containment of Q fever, standard precautions must be taken at any transmission location. The extent and source of an outbreak must be confirmed and reported through the [National Notifiable Disease Surveillance System](#) and to the Chief Medical Officer. Reporting categories are chronic or acute Q fever. Subsequential reporting is dependent on if the outbreak is linked to animal or occupational exposure. Testing for the infectious agent may be performed via collection of clinical specimens or demonstration of a serological response upon laboratory testing. (1) (15)

2. Exclusion Notifications

Attenuated strains of *Coxiella burnetii* are not subject to the HHS select agent regulations. (13)

V. CONTROL OF CONTACTS (IF APPLICABLE)

A contact of Q fever is an individual that has been exposed to animal waste or products contaminated with *Coxiella burnetii* bacteria or another person with diagnosed Q fever infection. (6)

1. Management/Exclusions for Specific Groups or Settings

The control of contacts occurs when taking standard precautions during investigation procedures, including the official diagnoses and subsequential education on the infection for the contact.

2. Exclusion Notifications

Attenuated strains of *Coxiella burnetii* are not subject to the HHS select agent regulations. (16)

VI. CONTROL OF CARRIERS (IF APPLICABLE)

A carrier state has not been documented for Q fever and thus no carrier-specific control measures are needed.

VII. MANAGEMENT OF SPECIAL SITUATIONS/OUTBREAK CONTROL

Coordinate with senior epidemiology staff to determine if an outbreak is occurring. If so, notify DPBH Environmental Health, local health authorities, or infection control, as appropriate.

(1) Outbreak Resulting from Occupational Exposure

Occupations that require regular exposure to domestic ruminants or their products make individuals more susceptible to acquiring Q fever. Infection can be the result of aerosolized waste or soil, or contact with ruminant products (e.g., meat, dairy, birthing material). (7) (8)

(2) Foodborne Transmission

Q fever may be acquired through the consumption of unpasteurized milk or raw/undercooked meat. (6)

(3) Transmission at a Farm/Ruminant-Holding Facility

Since *Coxiella burnetii* is most commonly transmitted via aerosolized excrement, acquisition of Q fever is most likely to occur in areas where cattle, sheep, and goats are being held. For this reason, the dust and feces in barns tend to carry *Coxiella burnetii* bacteria, making people sleeping in these areas exceedingly susceptible to infection. (14)

(4) Transmission Near a Helicopter Zone

The landing and/or taking off of helicopters causes surrounding dust, soil, and dried excrement to be brought up into the air, making inhalation of *Coxiella burnetii* bacteria and infection with Q fever more likely for people in nearby areas. (14)

In all special outbreak situations (1-4), a public health authority must perform a coordinated response. Investigating the case of infection must involve:

- (a) confirming the diagnosis
 - (b) determining the extent of the outbreak
 - (c) identifying the source or suspected source of infection
- After proper investigation procedures are executed and the infection source or potential source is identified, the outbreak must be reported to the Chief Medical Officer.
 - Steps for the sterilization, eradication, or removal of potential sources of infection will occur after identifying the exposure as the result of animal or occupational contact. (1) (14)

VIII. PREVENTION

The investigator should reference the most recent disease specific public educational materials from the CDC. The [Nevada OSE website](#) also provides information about Q fever, as does the [One Health Nevada website](#).

Medical procedures that do not generate aerosols (e.g. drawing blood) pose little-to-no risk for the transmission of Q fever. However, for general prevention, still consider the following:

- Adherence to standard occupational precautions (e.g. minimizing unnecessary contact with potential sources of Q fever infection).
- Maintaining good sanitation practices, including the disposal and/or destruction of potential contaminants.
- Compliance with research safety standards as well as keeping sanitation resources readily available to eliminate the possibility of facility outbreaks. (14)

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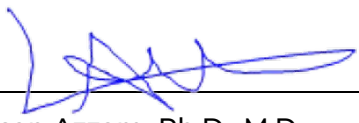
X. ACKNOWLEDGEMENTS

This document was developed based on the content and format of the disease investigation guidelines of several state and local health jurisdictions:

- Oregon Health Authority Investigative Guidelines
- Washington State Department of Health Reporting and Surveillance Guidelines
- Washoe County Health District Epidemiology and Communicable Disease Program Investigation of Communicable Disease Manual

The Nevada Office of State Epidemiology would like to acknowledge the work of these great partners.

XI. UPDATE LOG



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Chief Medical Officer

5/22/2026
Chief Medical Officer Approval Date

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