

Brucellosis

Disease Category: Zoonotic

Timeframe to follow-up: The same day the report is received

See the link to the Disease Investigation Process document

Signs and Symptoms	- Initial: Fever, sweats, malaise, anorexia, muscle/joint/back pain, fatigue. - Chronic: Recurrent fevers, arthritis, endocarditis, neurologic symptoms, chronic fatigue, depression, swelling of the liver or spleen, swelling of the testicle or scrotum area.
Incubation	Usually 2-4 weeks; range 5 days to 6 months
Case Classification	Clinical criteria: fever and ≥ 1 of the following: night sweats, arthralgia, headache, fatigue, anorexia, myalgia, weight loss, arthritis/spondylitis, meningitis, or focal organ involvement (endocarditis, orchitis/epididymitis, hepatomegaly, splenomegaly) Confirmed: A clinically compatible illness with definitive laboratory evidence. Probable: A clinically compatible illness with either: 1. an epidemiologic link to a confirmed human or animal brucellosis case OR 2. Presumptive laboratory evidence.
Differential Diagnosis	Bacterial endocarditis, Q fever, viral hepatitis, leptospirosis, lymphoma, malaria, rickettsioses, tuberculosis, toxoplasmosis, tularemia, typhoid, vasculitis.
Treatment	Combination therapy of oral doxycycline or trimethoprim-sulfamethoxazole plus rifampin for minimum of 6 weeks. For serious infections or complications, addition of gentamicin and possible extension of therapy for 4-6 months.
Duration	Acute illness symptoms can persist for days to weeks. Chronic infections can last months to years. Death is rare.
Exposure	Zoonotic disease of wild and domestic animals. Eating undercooked meat or consuming unpasteurized/raw dairy products; inhalation of the bacteria (e.g., laboratory, clinical, veterinarians, hunters); bacteria entering the body through skin wounds or mucous membranes. Person-to-person spread of brucellosis is extremely rare.
Laboratory/Testing	Recovery of Brucella species from blood, bone marrow, or other tissue specimens. Serologic testing with a $\geq$fourfold increase in antibody titers between acute and convalescent phase serum specimens collected at least 2 weeks apart. Most patients with active infection in an area where brucellosis is not endemic will have a titer of 1:160 or greater within 2 to 4 weeks of clinical disease onset. Testing at NSPHL and CDC. Special precautions needed. Local Health Authority can arrange testing if an outbreak is suspected OR for contacts: NSPHL resources

Control of Contacts	Disease does not have person to person contact. However, other similarly exposed persons should be identified and assessed for risk. Recommendations for monitoring, PEP, or treatment (if already symptomatic) should be advised based on the situation.
Key areas of focus during investigation	Travel, exposure to animals, and food habits, including ingestion of unpasteurized milk or cheese, and occupational history.
Public Health Actions	Reports of Brucellosis 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. 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 • Identify if dealing with a select agent • Prepare a case report and submit to the Chief Medical Officer (through OSE) within 7 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	Carson City, Douglas and Lyon Counties Carson City Health & Human Services (CCHHS) (775) 887-2190 Clark County Southern Nevada Health District (SNHD) (702) 759-1300 Washoe County Northern Nevada Public Health (NNPH) (775) 328-2447 All Other Counties Nevada Division of Public and Behavioral Health (DPBH) (775) 400-0333

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BRUCELLOSIS

I. DISEASE REPORTING (1-5)

A. Legal Reporting Requirements (1-5)

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 by the health authority, following the specified format and procedure.

1. Health Care Providers and Health Care Facilities (2, 3)

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

2. Laboratories (4)

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.

3. Local Health Authority (LHA) (1,5)

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

II. THE DISEASE AND ITS EPIDEMIOLOGY (6-11)

A. Background (6, 8)

Brucellosis is a widespread, zoonotic, bacterial disease caused by various *Brucella* species. People can get brucellosis by having direct contact with infected animals, mainly cattle, sheep, goats, swine and dogs. Direct contact can include touching an infected animal, consuming infected animal products such as undercooked meat and raw dairy, or by inhaling airborne disease particles. Working in animal settings or with animal products may cause increased exposure to *Brucella* bacteria as well as consuming unpasteurized milk or cheese from infected goats or sheep. Brucellosis can have a large range of symptoms that may occur for a long period of time before being diagnosed. It is extremely rare for brucellosis to spread from person to person.

B. Etiologic Agent (7, 9)

Brucellosis is caused by certain bacteria in the *Brucella* genus categorized as brucellosis-causing *Brucella* species (BBS). There are many BBS known to infect humans, including but not limited to: *B. abortus* (cattle), *B. melitensis* (goats, sheep, camels), *B. suis* (pigs), *B. canis* (dogs), and *B. neotomae* (wood rats). There are other species of *Brucella* that are considered non-brucellosis causing *Brucella* species (nBBS), as they have not been shown to cause brucellosis disease.

1. Select Agent Designation (9)

B. abortus, *B. melitensis*, and *B. suis* were given select agent designation because the organisms are easily aerosolized and have a low infection dose. They also have a prolonged incubation period with the potential for a broad range of symptoms which creates a challenge for prompt diagnosis.

If a select agent is identified by clinical or diagnostic laboratories or other entities OR facilities that use or transfer them have any theft, loss, or release of these select agents, those facilities must immediately notify the Division of Select Agents and Toxins (DSAT) at CDC.

C. Description of Illness (6, 11)

Brucellosis can cause a range of symptoms that may occur for long periods of time before being diagnosed. The first symptoms can include a sudden severe fever or a slight fever that continues to come and go over time. People may also have headaches, loss of appetite, fatigue, muscle or joint pain, or a general sense of feeling bad. Other symptoms that may occur continuously or sporadically can include night sweats, arthritis, swelling of the testicles and scrotum, abscesses, heart infection, swelling of the liver, memory loss and confusion, and depression. Serious complications include meningitis, endocarditis, spondylitis, osteomyelitis, and less frequently, pneumonitis and aortic involvement. Osteoarticular involvement, especially of the spine, is the most common brucellosis complication, as is reproductive system involvement. Although rare, endocarditis can occur and is the principal cause of death among patients with brucellosis.

D. Disease Burden in Nevada

Human cases of brucellosis are extremely rare in Nevada.

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

E. Reservoirs (12)

Brucellosis is a zoonotic disease of wild and domestic animals. Reservoirs include infected animals and infected animal products.

F. Modes of Transmission (8)

The most common way for Brucellosis to be transmitted to the general population is by consuming undercooked meat or unpasteurized dairy products such as milk, ice cream, and cheese from infected sheep, goats or cows. Hunters, people working with animals or in slaughterhouses, and laboratory personnel have a higher risk of contracting the disease through mucous membranes, open wounds, and through inhalation through the nose and mouth. Transmission of Brucellosis from person to person is extremely rare.

G. Incubation Period (9)

The incubation period for brucellosis can range from 5 days to 6 months, but most people have symptoms between 2 to 4 weeks.

H. Period of Communicability (8)

Transmission from person to person is extremely rare.

I. Testing (9, 10)

Coordination with laboratories regarding precautions and further testing will be needed. Most commercial clinical laboratories run serological tests that can detect antibodies to *B. abortus*, *B. melitensis*, or *B. suis*. Infections with *B. canis* and Brucella RB51 cannot be detected through serology testing so labs will have to confirm these infections with a culture. When sending samples to a laboratory for culture and isolation, ensure the laboratory is aware of suspected Brucellosis so they can take proper precautions.

If Brucella species *B. suis*, *B. melitensis*, or *B. abortus* is suspected a notification to the Division of Select Agents and Toxins (DSAT) at CDC is required as these species are considered possible select agents.

J. Treatment (10, 11)

Once brucellosis has been confirmed by lab testing, antibiotic treatment should be started immediately to help prevent chronic infection-associated arthritis, endocarditis, chronic fatigue, depression, and/or swelling of the liver or spleen. A combination of doxycycline and rifampin for at least 6 weeks can be used for *B. melitensis*, *B. abortus*, *B. suis*, and *B. canis* infections. However, rifampin should not be used for *B. abortus* RB51 infection, as that strain is resistant to it. Trimethoprim-sulfamethoxazole (TMP-SMZ) should be considered instead. Depending on the timing of treatment and severity of illness, recovery may take a few weeks to several months. Though the infection can last a long time, brucellosis rarely causes death.

Provide most current treatment guidelines from Red Book to the healthcare provider or refer case to physician for proper treatment for Brucellosis.

III. EPIDEMIOLOGIC CASE INVESTIGATION

The public health authority should begin investigating the case of Brucellosis, step by step, within one working day of notification or in alignment with [NAC 441A](#). If the source of infection is suspected to be an infected animal or an occupational exposure, the health authority shall immediately notify the Chief Medical Officer.

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

1. *Review scientific information in [Control of Communicable Diseases Manual](#), most recent edition.*
2. *Review Brucellosis most recent case definition [Brucellosis \(Brucella spp.\) 2025 Case Definition | CDC](#)*
3. *Determine if the case is considered infected with a select agent and possible immediate next steps.*

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. Determine if the case is considered infected with a select agent and possible immediate next steps. If the case is not infected with a select agent *Brucella* species focus on key data elements including travel, exposure to animals, and food habits including ingestion of unpasteurized milk or cheese, and occupational history. 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 (6)

The investigation focuses on exposures in the 2 to 4 weeks prior to onset. Ask about any risk factors including travel, exposure to animals, and food habits including ingestion of unpasteurized milk or cheese, and occupational history. Once the type of exposure has been determined, necessary next steps can be taken such as monitoring, post-exposure prophylaxis (PEP), or treatment. Other similarly exposed people should be identified, assessed for risk, and given guidance as well.

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

Notify the State Epidemiologist and Environmental Health Services (EHS). If the case is from a different jurisdiction send a secure notification via an internal referral form (IRF). Attach the CRF and notes, and note any specific findings that are important within the body of the email (e.g., animal, food, local exposures). EH may want to be included in the investigation as it may relate to food (particularly unpermitted) or animals and will also notify the Nevada Department of Agriculture.

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

IV. CONTROL OF CASE (9)

Determine type of exposure and necessary next steps such monitoring, post-exposure prophylaxis (PEP), or treatment. Other similarly exposed persons should be identified, assessed for risk, and given guidance as well. The identified individuals should be assessed for exposure risk using CDC's Brucellosis Reference Guide to determine guidance.

1. *Management/Exclusions for Specific Groups or Settings*

	Symptomatic	Asymptomatic
Sensitive Occupation*	NA	NA
Childcare/School Attendee	NA	NA
Case in a Medical Facility	NA	NA
General Population	NA	NA

* provide footnote about NAC for sensitive occupation

2. *Exclusion Notifications*

Disease does not require any control measures of cases. Please provide education, follow up guidance, and prevention measures.

V. CONTROL OF CONTACTS (9)

Brucellosis is not spread person to person however, people who participated in the same risk activities as the case or any acquaintance or household member with similar illness symptoms should be interviewed. Investigate symptomatic contacts in the same manner as a case.

1. *Management/Exclusions for Specific Groups or Settings*

	Symptomatic	Asymptomatic
Sensitive Occupation*	NA	NA
Childcare/School Attendee	NA	NA
Case in a Medical Facility	NA	NA
General Population	NA	NA

*provide footnote about NAC for sensitive occupation

2. *Exclusion Notifications*

Disease does not require any control measures of contacts. Please provide education, follow up guidance, and prevention measures.

VI. CONTROL OF CARRIERS

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

VII. MANAGEMENT OF SPECIAL SITUATIONS/OUTBREAK CONTROL (II)

In the event of multiple brucellosis cases, temporally or spatially clustered, immediately notify senior epidemiology staff to determine if an outbreak is occurring. If so, notify DPBH Environmental Health, local health authorities, or infection control, as appropriate. The CDC Emergency Operations Center (EOC) must also be notified within 24 hours.

VIII. PREVENTION (6, 9, 12, 13)

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

- Do not eat or drink unpasteurized milk products such as milk, cheese or ice cream.
- Do not eat undercooked meat and make sure to take proper cooking temperatures.
- Hunters should protect themselves by using proper protective equipment when harvesting or field dressing animals.
- Laboratory workers and people who work with animals should protect themselves by using the proper protective equipment.

IX. REFERENCES

1. NAC: CHAPTER 441A - INFECTIOUS DISEASES; TOXIC AGENTS SEC225.
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12. One Health Nevada. Brucellosis Overview. Available from:
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13. Nevada Office of State Epidemiology. Diseases and Conditions, Brucellosis. Available from: <https://nvose.org/diseases/brucellosis/#resources>

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
- Northern Nevada Public Health 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



Ihsan Azzam, Ph.D., M.D.
Chief Medical Officer

09/21/2026

Chief Medical Officer Approval Date