

Babesiosis (*Babesia*)

Disease Category: Zoonotic-Arboviral Disease

Timeframe to follow-up: Same day

See the link to the [Disease Investigation Process document](#)

Signs and Symptoms ^{1,2}	Many people with <i>Babesia</i> infection are often asymptomatic or have mild/nonspecific symptoms. However, some may experience flu like symptoms such as fever, malaise, chills, sweats, fatigue, headache, body aches/myalgia, loss of appetite, anorexia, and/or nausea. The infection can also be severe among people who are immunocompromised, those who do not have a spleen, neonates and the elderly. Severe babesiosis can cause hemolytic anemia, adult respiratory distress syndrome, disseminated intravascular coagulation, congestive heart failure, renal impairment, shock, or splenic rupture, many of which require hospitalization.
Incubation ^{2,3}	Usually, 1 to 4 weeks; range 1- 6 weeks after a tick bite
Case Classification ⁴	Clinical criteria: fever (reported by patient or healthcare provider), anemia, thrombocytopenia, chills, sweats, myalgia or arthralgia. Confirmed: meets laboratory evidence criteria AND at least one of the objective or subjective clinical criteria. Probable: meets presumptive laboratory evidence AND meets at least one of the objective clinical criteria.
Differential Diagnosis ⁵	Human Anaplasmosis, Lyme disease, Tick-borne relapsing fever, Colorado tick fever, rocky mountain spotted fever, other rickettsial infections, malaria, ehrlichiosis, Q fever, typhoid fever, and other tick-borne infections.
Treatment ^{6,7}	Most asymptomatic patients do not require treatment. For ill patients a 7-to-10-day course of two prescription medications (atovaquone and azithromycin) is the standard treatment (duration and additional medications can be used for immunocompromised patients). For highly immunocompromised patients, supportive care, blood transfusions, exchange transfusions, dialysis, mechanical ventilation, antipyretics, and vasopressors may be necessary.
Duration ³	Symptoms usually persist for 7- 10 days (in healthy individuals) and can be much longer for immunocompromised individuals.
Exposure ^{1,3}	Tick bites (from blacklegged or deer ticks), blood transfusion, congenital transmission.
Laboratory Testing	Local Health Authority can arrange testing if an outbreak is suspected OR for contacts:

	• NSPHL specimen testing • SNPHL specimen testing • CDC Parasites: Blood Parasite Identification- CLIA
Control of Contacts	The disease does not spread through person-to-person contact and does not require any contact-related control measures.
Key areas of focus during investigation	Travel history, outdoor activities, or exposure to animals—especially in the Northeast or Midwest—to assess potential tick exposure. Also note any recent blood transfusions.
Public Health Actions ⁸	Reports of Babesiosis 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 • 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	• Northern Nevada Public Health (NNPH) • Southern Nevada Health District (SNHD) • Carson City Health and Human Services (CCHHS) • Central Nevada Health District (CNHD) • Nevada Department of Wildlife (NDOW) • Nevada Department of Agriculture (NDA)

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BABESIOSIS

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 by the health authority, following the specified format and procedure.⁸

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.^{8,9,10}

2. *Laboratories*

Laboratories must notify the health authority within the first working day after identifying the case.⁸ 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.^{8,11}

3. *Local Health Authority (LHA)*

LHA's must notify the Office of State Epidemiology (OSE) within 7 days after completing the case investigation.¹²

II. THE DISEASE AND ITS EPIDEMIOLOGY

A. Background

Babesiosis is an infectious disease caused by a microscopic parasite, most commonly transmitted to humans through the bite of blacklegged (deer) ticks. While some individuals remain asymptomatic, others may develop flu-like symptoms. Babesiosis is both preventable and treatable with appropriate medical care and education. Most cases occur during the warmer months (spring and summer) and in areas with woods, bushes, or tall grass.^{1,2,3}

B. Etiologic Agent

Babesiosis is caused by parasites of the genus *Babesia*, primarily *Babesia microti* in the United States. These microscopic parasites are transmitted predominantly through the bite of infected *Ixodes scapularis* ticks, commonly known as black legged or deer ticks that infect red blood cells.^{1,2,3}

C. Description of Illness

Some individuals with babesiosis may remain asymptomatic, while others can develop flu-like symptoms. These symptoms may include fever, chills, sweats, headache, body aches, loss of appetite, nausea, and fatigue. Babesiosis can also result in hemolytic anemia, as the parasite destroys red blood cells. The illness may become serious, and even life-threatening,

for individuals without a spleen; those with weakened immune systems due to conditions such as cancer, lymphoma, or HIV; those with significant underlying health issues such as liver or kidney disease; and adults over the age of 50.^{1,2}

D. Disease Burden in Nevada

Babesiosis is not considered endemic in Nevada, and cases are very rarely identified or reported within the state. Most cases are reported in parts of the Northeast and Upper Midwest of the United States.¹

See the [Nevada Office of State Epidemiology Communicable Disease Dashboard](#) for Nevada specific data on Babesiosis (Zoonotic & Vector- Borne disease section) OR see the [Nevada Office of State Epidemiology Monitoring Zoonotic Diseases Dashboard](#) for Nevada specific data on Babesiosis (Parasite section).

E. Reservoirs

The life cycle of *Babesia microti* involves two hosts: a rodent—most commonly the white-footed mouse—and a tick. The rodent serves as the primary reservoir, infecting ticks during their blood meals. Once a tick becomes infected with *Babesia microti*, it can transmit the parasite to humans during subsequent blood meals.³ Humans are considered dead-end hosts; however, the only confirmed—and less common—forms of human-to-human transmission are through blood transfusions or congenital transmission from an infected mother to her fetus.^{1,2}

F. Modes of Transmission

Babesiosis can be transmitted through multiple routes; however, the most common mode of transmission is the bite of an infected tick, typically a blacklegged (deer) tick. Less common forms of transmission include receiving a blood transfusion from an infected individual or congenital transmission from an infected mother to her fetus.^{1,2,6}

G. Incubation Period

Symptoms (for symptomatic individuals) can start around a week after infection but most commonly develop over a few weeks, months or even longer.¹ For transfusion-associated cases, a study found a median incubation period following a blood transfusion of 27 days but can be longer.²

H. Period of Communicability

Person to person transmission is rare but can occur via blood transfusion from an infected individual to a healthy individual. Transmission from blood transfusion can occur months to over a year after the blood donor became infected.¹³

I. Testing

When healthcare providers are considering a babesiosis diagnosis, they should explicitly request a manual (non-automated) review of the peripheral blood smear. It is typical to detect *Babesia* parasites through light-microscopic examination of blood smears in symptomatic patients with acute infection. Although sometimes multiple smears may need

to be examined. When distinguishing *Babesia* and *Plasmodium* parasites (especially *Plasmodium falciparum*) and artifacts like stain or platelet debris can be challenging. It may be necessary for confirmation through a reference laboratory to confirm diagnosis through a blood-smear examination and other routes such as molecular or serologic methods tailored to the species or specific situation/setting.^{2,6}

J. Treatment

Treatment consists of 7 to 10 days of prescription medication (atovaquone and azithromycin preferably). Treatment can be longer for those who are immunocompromised and experiencing persistent or relapsing symptoms despite antibiotic therapy. All patients with acute illness should have peripheral blood smears conducted to monitor *Babesia* parasitemia. Immunocompromised patients should have testing daily until parasitemia is less than 4% then can move to weekly blood smear tests until results are negative.^{2,7}

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

III. EPIDEMIOLOGIC CASE INVESTIGATION

The public health authority should begin investigating the case of Babesiosis, step by step, within the same 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 [Babesiosis most recent case definition \(2025, CDC\)](#).*

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. (DUTIES AND POWERS RELATING TO THE PRESENCE OF COMMUNICABLE DISEASES)

C. Step 3: Identify potential sources of infection

The investigation focuses on exposures in the first couple of weeks (tickborne transmission) and weeks to months (blood transfusion transmission) before onset.¹³ Ask about any risk factors for infection, travel or outdoor recreation (especially in the Northeast or Midwest),

exposures to animals or recent blood transfusions.¹⁴ Main source of infection of babesia is through the bite of an infected tick, typically the black legged/deer tick. Other less common sources of infection are blood transfusions and congenital transmission.¹⁴

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

	Symptomatic	Asymptomatic
Sensitive Occupation*	N/A	N/A
Childcare/School Attendee	N/A	N/A
Case in a Medical Facility	Follow standard precautions	Follow standard precautions
General Population	N/A	N/A

2. Exclusion Notifications

The disease does not usually spread through person-to-person contact.

V. CONTROL OF CONTACTS

All contacts: There are some circumstances where babesiosis can be transmitted to another person.¹ These individuals should be monitored for any signs and symptoms consistent with babesiosis and tested/treated accordingly.

- Getting a blood transfusion that has the parasite in it.
- If a mother has babesiosis, she might pass it to her baby during pregnancy or when the baby is born.

VI. CONTROL OF CARRIERS

Investigate carriers in the same manner as a case. Babesiosis can recur even after antimicrobial treatment¹⁸, and individuals can become reinfected if they are exposed to tick bites. Thus, it is important to emphasize prevention measures.

1. Carrier Management/Exclusions

The FDA considers transfusion-transmitted babesiosis relevant under 21 CFR 630.3(h)(2) and has required regional testing or pathogen reduction in the 15 states with identified Babesia risk (Nevada is not included). For states not required to test, the FDA recommends that

donor centers update their Donor History Questionnaires to ask whether the donor has ever had a positive test result for *Babesia*.¹⁵ In states that do not perform Babesia testing on blood donations (including Nevada), donors who report a history of a positive Babesia test should be indefinitely deferred—or deferred for at least two years from the date of the positive test—and then reevaluated according to section V.A.4.c of the FDA's 'Recommendations for Reducing the Risk of Transfusion-Transmitted Babesiosis'.¹⁶

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.

Transfusion-associated Babesiosis

Investigations with potential transfusion-associated cases require medical and public health collaboration. The infected blood donor should be investigated immediately and avoid future blood donations. For cases of *Babesia* occurring in new geographic areas it is important to further look into tick vectors, reservoir hosts, and identify or characterize the species.¹³ In regard to blood transfusions, if a blood donation tests reactive for Babesia, consignees (organization/facility distributing the blood) must be notified of all identified blood components collected from the infected donor from the past 12 months prior to the date of the reactive test. Consignees are then encouraged to notify recipient's physicians about possible risk and evaluated for evidence of Babesia infection.^{13,16} Outside of blood transfusions, the disease does not spread through person-to-person contact and does not require any contact-related control measures.

Congenital transmission of Babesiosis

Newborn infant should be monitored for signs and symptoms consistent with babesiosis and tested/treated accordingly.

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 Babesiosis as does the [One Health website](#). Below are prevention tips:

- There is no vaccine for babesiosis but there are preventative measures individuals can take to reduce tick exposure.⁶
- Before you go outdoors¹⁷
 - Know where ticks live
 - Ticks live in grassy, bushy, and/or wooded areas. Animals (wild or domestic) can also have ticks on them from being outdoors. Spending time outdoors by doing things such as walking your dog, hiking, hunting, camping or gardening could put you in close contact with ticks.
 - Treat your clothing or gear (boots, clothing, camping gear, etc.) with repellent products containing 0.5% permethrin.

- Avoid contact with ticks by staying on designated trails and avoiding wooded or bushy areas.
 - Use [EPA registered insect repellents](#) to properly repel insects including ticks.
- After you come indoors ¹⁷
 - Check your clothing for ticks after spending time outside. Ticks can be brought into the house from clothing and need to be removed if found. Tumble drying clothing on high heat for 10 minutes can kill ticks not found on dry clothing after being outside. Damp clothes will need additional drying time and if clothes need washed, it is recommended to wash with hot water.
 - Examine your pets and gear before bringing them into your house/indoors. Ticks can be brought into the home from pets and gear used outside. Carefully examine pets and gear before bringing inside.
 - Shower soon after being outdoors as showering within 2 hours of coming indoors has shown a reduced risk of getting tickborne diseases. Showering can help remove unattached ticks and provides a good opportunity to do a body check for ticks.
 - Check your body immediately after being outdoors for ticks. It is important to conduct a full body check by using a full-length mirror or hand-held mirror to check all parts of the body for ticks. When checking yourself or loved ones for ticks make sure to look:
 - Under the arms
 - In and around the ears
 - Inside the belly button
 - Back of the knees
 - In and around the hair
 - Between the legs
 - Around the waist
- Reduce risk of ticks around homes ¹⁷
 - Pesticides can be used around the home/yard to reduce ticks and risk of infection. For more information click [here](#).
 - Maintaining a clean and clear yard can help reduce tick populations around your house. This includes mowing the lawn frequently to reduce bushy/grassy areas, removing leaf litter, and fencing to discourage unwelcome animals around the house.

IX. REFERENCES

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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 Approval Date