RABIES (Human or Animal)

Disease Category: Zoonotic

Timeframe to follow-up: 1 day

See the link to the Disease Investigation Process document

Signs and Symptoms	Classic: • Fever, headache, malaise, weakness, paresthesia, pricking or itching at the exposure site. Advanced: • Encephalitis, agitation, confusion, hallucinations, aggressive behavior (thrashing, biting), hydrophobia, aerophobia, hypersalivation, motor paralysis, coma, and autonomic instability.
Incubation	Usually 1 to 3 months; range <1 week to >1 year depending on wound site, severity, distance from central nervous system, and autonomic instability.
Case Classification	Human: Confirmed: A clinically compatible case that is laboratory confirmed by testing at a state or federal public health laboratory. Clinical Description: Rabies is an acute encephalomyelitis that almost always progresses to coma or death within 10 days after the first symptom. Laboratory Criteria For Diagnosis: • Detection of Lyssavirus antigens in a clinical specimen (preferably the brain or the nerves surrounding hair follicles in the nape of the neck) by direct fluorescent antibody test, OR • Isolation (in cell culture or in a laboratory animal) of a Lyssavirus from saliva or central nervous system tissue, OR • Identification of Lyssavirus specific antibody (i.e. by indirect fluorescent antibody (IFA) test or complete rabies virus neutralization at 1:5 dilution) in the cerebrospinal fluid (CSF), OR • Identification of Lyssavirus specific antibody (i.e. by indirect fluorescent antibody (IFA) test or complete rabies virus neutralization at 1:5 dilution) in the serum of an unvaccinated person, OR • Detection of Lyssavirus viral RNA (using reverse transcriptase-polymerase chain reaction [RT-PCR]) in saliva, CSF, or tissue. Animal: Confirmed: Meets confirmatory laboratory evidence. Confirmatory laboratory evidence:

	• A positive rabies virus direct fluorescent antibody test; OR • A positive rabies virus direct rapid immunohistochemical test (dRIT); OR • A positive rabies virus test by immunohistochemistry (IHC) on formalin-fixed tissue; OR • A positive pan-lyssavirus probe-based real time reverse transcription-polymerase chain reaction RT-PCR test; OR • Detection of lyssavirus nucleic acid by genomic sequencing; OR • Isolation of rabies virus (in cell culture or in a laboratory animal).
Differential Diagnosis	Viral encephalitis, herpes simplex, West Nile virus, enteroviruses, tetanus, Guillain-Barré syndrome, botulism, poliomyelitis, acute psychosis, or adverse vaccine reaction
Treatment	Post-Exposure Prophylaxis (PEP): immediate wound cleansing with soap and water. For unvaccinated individuals, administer Rabies Immune Globulin (RIG) (20 IU/kg) on Day 0 plus a 4-dose cell-culture vaccine series (Days 0, 3, 7, 14). Previously vaccinated individuals receive 2 vaccine doses (Days 0, 3) without RIG.
Duration	Symptoms usually persist for 2 to 10 days prior to coma and death if no intensive care is provided.
Exposure	Transmitted via saliva through bites, scratches, or contact with mucous membranes or broken skin from an infected mammal. In Nevada, bats are the primary wildlife reservoir.
Laboratory Testing	• Local Health Authority can arrange testing if rabies is suspected. • The Nevada Department of Agriculture's Animal Disease Laboratory is responsible for the testing of animal cases. • Additional CDC testing information: https://www.cdc.gov/rabies/php/labs-specimens/testing.html
Control of Contacts	Disease does not spread easily person-to-person. Casual contact does not warrant prophylasis. PEP is indicated only for contacts whose mucous membranes or open wounds came into direct contact with infectious saliva or neural tissue.
Key areas of focus during investigation	Animal bite history, specifies involved (bat vs. domestic animal), status and availability of animal for 10-day quarantine or rabies testing, geographic location, travel history, and rabies vaccination history.
Public Health Actions	Reports of Rabies cases must be made to the Local Health Authority during the regular business hours of the health authority within 1 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	• Nevada Department of Agriculture • Office of State Epidemiology (OSE) • Nevada State Public Health Lab (NSPHL) • Centers for Disease Control and Prevention

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RABIES

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

Rabies is an acute, progressive viral encephalomyelitis affecting humans and other mammals, causing severe central nervous system pathology. It is almost uniformly fatal once clinical signs and symptoms manifest (6). In Nevada, rabies is maintained primarily in wild animal populations, specifically bats (7). While human rabies cases in the U.S. remain rare due to routine domestic animal vaccination, active surveillance, and rapid access to post-exposure-prophylaxis (PEP), untamed or wild animal exposures continue to present a critical public health risk. Since bat bites can be tiny and go unrecognized or unreported, any direct contact with or indoor exposure to a bit requires immediate public health evaluation (6).

B. Etiologic Agent

Rabies virus is a neurotropic RNA virus belonging to the genus Lyssavirus within the family Rhabdoviridae (8). Multiple lyssavirus species exist, but classic rabies virus (Rabies lyssavirus) accounts for the vast majority of human and animal cases globally (9).

C. Description of Illness

Clinical rabies begins with prodromal symptoms such as fever, headache, malaise, and localized paresthesia or pain at the wound site. Within days, the illness progresses to either 1) encephalitic rabies (80% of cases) characterized by agitation, confusion, hyperactivity, hydrophobia, and aerophobia, or 2) paralytic rabies (20% of cases), presenting with flaccid muscle weakness. Both forms progress to delirium, coma, autonomic dysfunction, and death, usually due to respiratory arrest (8).

D. Disease Burden in Nevada

Animal rabies is endemic in Nevada wildlife, primarily among bat populations. Terrestrial animal rabies (i.e., raccoons, skunks, foxes) is not currently endemic in Nevada, but bat rabies is detected annually across northern and southern Nevada counties. Human rabies cases in Nevada remain rare due to public education, PEP access, and animal control measures (7).

See the Nevada Office of State Epidemiology Communicable Disease Dashboard for Nevada specific data on animal rabies (Monitoring Zoonotic Diseases in Nevada).

E. Reservoirs

In Nevada, the primary reservoir species is the bat (i.e., Myotis species, Brazilian free-tailed bat) (7). Nationwide, other reservoirs include racoons, striped skunks, and foxes (8). Domestic pets such as dogs, cats, and ferrets and livestock are spillover hosts (8).

F. Modes of Transmission

Transmission occurs primarily through the bite of an infected, rabid mammal introducing virus-laden saliva into muscle or subcutaneous tissue. Non-bite exposures such as contamination of open wounds or mucous membranes with rabid animal saliva or neural tissue, are rare modes of transmission. Direct bat encounters without an obvious bite wound constitute a high-risk exposure category. Person-to-person transmission is extremely rare, limited almost exclusively to organ transplantation (8).

G. Incubation Period

The incubation period is usually 1 to 3 months, but may range from less than 1 week to over 1 year. Incubation length depends on factors such as the site of exposure relative to the central nervous system, severity of the wound, viral load, and host immune response (8).

H. Period of Communicability

In domestic dogs, cats, and ferrets, the virus is shed in saliva for a brief period, typically beginning a few days before clinical onset and continuing throughout the illness until death (rarely exceeds 10 days). In bats and wild carnivores, viral shedding duration can vary and is not well defined. Humans are potentially infectious via saliva throughout the clinical disease course (8).

I. Testing

Animal diagnosis is performed via Direct Fluorescent Antibody (DFA) testing on fresh brain tissue in consultation with the Nevada State Public Health Laboratory and local health authority. Human antemortem testing requires multiple specimens (saliva, serum, CSF, and a nuchal skin biopsy containing hair follicles) submitted to CDC in coordination with NSPHL and local health authority (8).

J. Treatment

There is no effective antiviral treatment once clinical symptoms manifest. Clinical care is supportive and palliative. PEP administered immediately after an exposure is nearly 100% effective. PEP consists of wound washing, Human Rabies Immune Globulin (RIG) at 20 IU/kg on Day 0, and a 4-dose rabies vaccination series on Days 0, 3, 7, and 14 (plus Day 28 if immunocompromised) (8).

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

III. EPIDEMIOLOGIC CASE INVESTIGATION

The public health authority should begin investigating the case of rabies, 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 Rabies, Human most recent case definition (2011, CDC). If relevant, review Rabies, Animal most recent case definition (2023, 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. Attempt to contact the provider to discuss the clinical context before contacting the case. 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 in the table above. Filling out an electronic version of the CRF in EpiTrax (called a Confidential Morbidity Report (CMR) in EpiTrax) is preferred when available. 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 12 months before onset, species involved, domestic vs. wild, pet vaccination status, exposure circumstance (provoked vs. unprovoked), exact geographic location, and animal availability for quarantine or testing. If a bat encounter occurred indoors, evaluate for unrecognized exposure (i.e., bat in a room with a sleeping person or young child) (8).

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*	Exclude from work/patient care immediately upon suspicion. Place under strict contact and droplet isolation in medical setting.	No exclusion required. PEP recommended.
Childcare/School Attendee	Exclude immediately. Require hospital admission or palliative care setting.	No exclusion required. PEP recommended if exposed.
Case in a Medical Facility	Place patient in standard, contact, and droplet precautions. Restrict non-essential personnel and mandate PPE (gown, gloves, eye protection, mask).	No exclusion for healthcare personnel exposed unless symptomatic. PEP indicated for mucosal or non-intact skin contact with patient saliva.
General Population	Isolate in an acute care hospital setting.	No exclusion required. Ensure PEP administration.

* provide footnote about NAC for sensitive occupation

2. Exclusion Notifications

Inform facility administrators, infection preventionists, and local health officials immediately if a symptomatic human case is admitted or evaluated.

V. CONTROL OF CONTACTS (IF APPLICABLE)

Contacts include healthcare personnel, household members, or first responders with direct mucosal or non-intact skin contact with saliva or neural tissue from a confirmed or suspected human or animal case.

1. Management/Exclusions for Specific Groups or Settings

	Symptomatic	Asymptomatic
Sensitive Occupation*	Exclude immediately.	No exclusion; initiate PEP promptly.
Childcare/School Attendee	Exclude immediately.	No exclusion; initiate PEP promptly.
Case in a Medical Facility	Exclude healthcare worker immediately; evaluate for rabies.	No exclusion; provide immediate PEP evaluation.
General Population	Isolate and evaluate clinically.	No exclusion. Recommend immediate PEP if exposure criteria met.

*provide footnote about NAC for sensitive occupation

2. Exclusion Notifications

Notify contacts of exposure status, evaluate need for PEP, and notify local health officials of any exposed individuals failing to complete the recommended PEP series.

VI. CONTROL OF CARRIERS (IF APPLICABLE)

A carrier state has not been documented for rabies 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.

Issue public health advisories warning the community about rabid wildlife in specific geographic areas.

Organize emergency pet vaccination clinics if domestic animal exposure is widespread.

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 rabies. Include a bullet point list for prevention tips.

- Ensure all dogs, cats, and ferrets are kept up-to-date on rabies vaccination.
- Avoid contact with wild animals, especially bats, skunks, raccoons, and foxes.
- Never touch or pick up bats, sick animals, or unfamiliar domestic animals.
- Bat-proof homes and structures by sealing openings larger than 3/8 inch.
- Teach children never to touch wild animals or unfamiliar pets.
- Report strange animal behavior or stray animals to local animal control authorities.
- Wash any animal bite or scratch thoroughly with soap and running water for at least 15 minutes immediately after exposure (6) (7).

IX. References

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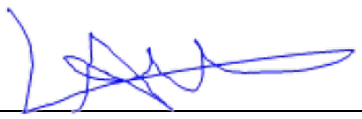
X. ACKNOWLEDGEMENTS

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
- Northern Nevada Public Health (formerly known as 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

10/19/2026

Chief Medical Officer Approval Date