Animal Bites and Rabies

Investigative Guidelines

July 2026

1. DISEASE REPORTING

1.1 Purpose of Reporting and Surveillance

1. To assess the risk of rabies in persons bitten or otherwise possibly exposed to recommend rabies post-exposure prophylaxis (RPEP) to those who need it, and to provide counseling and reassurance to those who don't.
2. As necessary to arrange for the capture and either confinement (10-day observation) of a live dog, cat or ferret, or the laboratory examination of an animal head. This may involve coordination with other agencies, e.g., the Humane Society, county sanitarians, animal control and local law enforcement.
3. To identify zoonotic sources of infection.

1.2 Reporting Requirements

1. Anyone with knowledge of any physical contact with bats or a humans being bitten by potentially rabid animals (e.g., physicians, veterinarians, animal control personnel, law-enforcement officials, or animal owners), is required to report such incidents to the Local Health Department (LHD) within one working day.
2. Laboratories: Any confirmed case of rabies in an animal and any suspected or confirmed case of human rabies must be reported immediately (day or night) to the LHD. If the LHD cannot be reached, the Acute and Communicable Disease Prevention (ACDP) Section of Oregon Health Authority (OHA) should be contacted at 971-673-1111.

1.3 Local Health Department Reporting and Follow-Up Responsibilities

1. Investigate **all** reports of animal bites, on the day of the report whenever possible.
2. Determine, in consultation with OHA on-call staff as necessary, whether the exposure constitutes a significant risk for rabies, in which either empiric RPEP or testing of the animal is to be recommended. (N.B., a recommendation to test the animal should be made if, and only if, RPEP would be recommended if the animal proves to be rabid.) If testing is to be recommended, solicit approval from OHA staff for testing at OHA expense.
3. Enter into Orpheus any exposure, associated details, and ultimate disposition in which
    - empiric RPEP is recommended; or

- testing of the animal is recommended.

Note: entry into Orpheus of any other instances of animals biting humans is encouraged for general surveillance purposes, but not required.

4. When feasible, recommend quarantine of dogs, cats, or ferrets that bite humans. See §4.1.
5. Assist relevant parties in the shipment, at OHA expense, of animals recommended to be tested following significant exposure of humans, to the Oregon State University Veterinary Diagnostic Laboratory (OSU VDL, 541-737-3261), with prior approval from OHA's on-call epidemiologist. In the absence of OHA approval, the sender will be responsible for the cost of rabies testing.
6. Investigate immediately any suspected case of human rabies, in close collaboration with OHA epidemiologists.

2. THE DISEASE AND ITS EPIDEMIOLOGY

2.1 Etiologic Agent

The rabies virus, a bullet-shaped RNA virus of the Rhabdovirus family, genus *Lyssavirus*.

2.2 Description of Illness

Rabid animals can show a range of symptoms, often described as either "dumb" or "furious" rabies; they may progress from one state to the other. Dumb rabies — the most common form in dogs — is characterized by reclusive behavior, drooling, anorexia, a startle response to sudden noise or light exposure and irritation around the site of the bite resulting in frequent licking and biting of the area. Furious rabies is marked by excitation and aggressiveness, notably biting of objects, animals, humans, or even self. They may manifest an apparently disordered appetite, eating and chewing stones, earth and rubbish (pica). Salivation is profuse, and there is usually a change in voice. Central nervous system (CNS) signs of rabies may include ascending paralysis, incoordination, convulsions and blindness. Rabid wild animals often seem to lose their fear of people; nocturnal and crepuscular creatures may disport themselves during daylight hours. Infected bats may act strangely—crawling around, hissing, etc. Paralysis eventually sets in and the rabid animal may be unable to eat and drink (hydrophobia — "fear of water").

It is important to remember that these signs and behaviors are not pathognomonic for rabies. Behavioral changes and clinical signs caused by a variety of infectious and non-infectious processes (e.g., pesticide exposure, heavy-metal poisoning, trauma) can mimic those associated with rabies.

2.3 Reservoirs

Almost all terrestrial mammals can be infected in theory, but in practice only one or two species tend to be significant reservoirs in endemic areas. In Oregon, Washington, and Idaho, bats are the only reservoir species, and other animals

— notably bat predators such as foxes, coyotes or cats — are rarely infected as "spill-over" from rabid bat populations. In other parts of the U.S., skunks, raccoons and foxes are (in addition to bats) important reservoirs. In some parts of the world, dogs and other carnivores may be important reservoirs.

2.4 Modes of Transmission

Rabies is spread by the inoculation of virus-containing saliva into broken tissue or onto mucous membranes — almost exclusively via animal bite. Person-to-person transmission of rabies has never been confirmed, other than via corneal and other organ transplants. During 2008–2017, 23 cases of human rabies were reported in the U.S., and of those, 15 were acquired within the U.S.

2.5 Incubation Period

Typically, 3–8 weeks, but highly variable. Reports as short as 5 days and >1 year have been reported for non-human animals, and an incubation period of 7 years was inferred for one human. This variation may depend on the species exposed, the size of the viral inoculum, and other factors. The proximity of the bite to the brain may also be a factor; virus inoculation into the head has a relatively short distance to travel through the nerves before reaching the brain.

2.6 Period of Communicability

Infected animals can transmit rabies only after the infection has spread to the salivary glands, which typically occurs close to or after the time that CNS signs develop. In fact, many animals will die of rabies before they begin to shed the virus. Rabies virus is shed in the saliva of infected dogs, cats and ferrets generally no more than a few days before clinical signs appear. (This is the rationale for observation of dogs, cats and ferrets for 10 days following a bite. Little or nothing is known about salivary viral shedding in other species.) Shedding may persist until, inevitably, the animal dies — typically in a few days.

2.7 Treatment

Treatment for rabies is essentially palliative. Once symptoms attributed to infection occur (both in humans and other animals), the chance of survival is virtually nil.

3. CASE DEFINITIONS, DIAGNOSIS AND LABORATORY SERVICES

With respect to concern for rabies, animal bites can be classified into three categories: high-risk, low-risk and no risk. Risk assessment hinges on the answer to two questions:

1. Was there a significant exposure to live animal saliva, such as via a bite?
2. Is there a significant risk that the animal in question was shedding rabies virus in saliva at the time of the bite?

3.1 Was there a Significant Human Exposure?

Rabies virus does not penetrate skin or clothing. Thus, unless there is a history of a bite that broke the skin, or saliva contact with broken skin or mucous membranes (including the eyes) there was no exposure. For example, those who merely pet a dog or pick up a bat later found to be rabid have not had a significant exposure. If there was no exposure, then there is no risk.

Because of the prevalence of rabies in bats, all bat bites are considered high risk, regardless of circumstances.

1. The Species of the Biting Animal

As noted above, only bats or mammals that might have been exposed to infected bats are potential sources of transmission in Oregon (absent evidence that a biting animal has recently come from out-of-state). Bats are less active in Oregon during cold weather, so there is relatively little risk of animals being bitten by bats between, say, November and March. By the same token, indoor pets cannot be exposed unless a bat flies into the house, bites them, and escapes unnoticed — a scenario that is not very plausible.

While almost all mammals can be experimentally infected with the rabies virus, in real life, many species are essentially rabies-free, due to both behavior and dietary characteristics as well as innate resistance to the virus. Lagomorphs (e.g., rabbits, hares), small rodents (e.g., mice, rats, squirrels, gerbils, hamsters), opossums, and cervids (e.g., deer, elk) all fall into this category. Absent extraordinary circumstances, bites by these animals do not merit follow-up for rabies.

2. Circumstances of the Bite

Talk to the person bitten and other witnesses to get a first-hand account of what was happening when the bite occurred. You would need to distinguish between bites that represent typical and atypical, or normal and abnormal, behavior for that animal.

Bites representing typical animal behavior (carrying low risk for rabies) include:

- Bite by an unfamiliar or non-domesticated animal with which the person interacted (e.g., petting a stray cat, feeding squirrels, breaking up a fight between animals, cornering a raccoon on the porch, etc.);
- Bite by an injured animal (e.g., a dog or cat hit by a car);
- Bite by a dog protecting “its space” (e.g., a front yard or its food).

3. Knowledge of the Offending Animal

Previous history: Bites by animals with a history of menacing or biting are less likely to reflect changes in behavior that might be attributable to rabies.

Vaccination history: Considered an animal to be either vaccinated (up-to-date) or not vaccinated (incompletely vaccinated, overdue for booster or no history of vaccination). Although vaccine failure is possible, dogs, cats, and ferrets with a documentable history of *up-to-date* rabies vaccination(s) are unlikely to be rabid. Vaccines given to other species, including hybrids such as wolf-dog crosses, are of unknown efficacy and should be disregarded as mitigating factors; they have no legal standing in Oregon.

4. Laboratory Testing

Animals can only be tested postmortem for rabies by assaying brain tissue for the presence of virus. As of December 2018, rabies testing is available in Oregon only at the Oregon State University Veterinary Diagnostics Laboratory (OSU VDL).

Antemortem specimens from *humans* suspected to have rabies can be tested at the Centers for Disease Control and Prevention after consultation with an OHA epidemiologist. Required specimens will include serum, cerebrospinal fluid, saliva, and a skin biopsy from the nape of the neck that contains one or more hair follicles. Contact the OHA on-call epidemiologist for instruction on collection, handling, and shipping of human specimens.

3.3 Making A Decision

OHA epidemiologists are available 24/365 for consultation. LHD personnel are strongly encouraged to consult about all high-risk bites other than bat bites. Bat bites are always high-risk and should always be investigated as potential rabies exposures — i.e., the bat tested if possible, and if not, RPEP recommended.

4. ROUTINE CASE INVESTIGATION

4.1 Confinement

To avoid needless euthanasia of pets — and to minimize the considerable expense of animal testing — confinement and observation (sometimes misleadingly referred to as “quarantine”) is the preferred follow-up for dogs, cats and ferrets that have bitten people. Such animals should never be euthanized if they can be held under observation, preferably at the owner’s expense. Without the approval of local health officials, veterinarians and others are prohibited by law from euthanizing any mammal that has bitten a human without public health authorization (OAR 333-019-0024 and -0027).

If a dog, cat, or ferret was rabid and infectious at the time of biting, it would die from the disease within 10 days. So, if the animal is alive after 10 days, it was not rabid at the time of the bite. Should an animal that has been confined following a bite develop any signs of CNS disease, it should be euthanized immediately, and the head submitted for testing. Such symptoms include: hind leg paralysis, aimless movement, seizures, unusual voice sounds, blindness, inability to swallow, and persistent dilation of pupils.

The mechanics of animal confinement are left to the discretion of the LHD. Confinement may be at a county animal shelter or some local humane society.

At the discretion of the LHD, responsible owners may be allowed to confine low-risk dogs or cats on their own premises.

4.2 Animal Rabies Testing

OSU VDL must be notified in advance (541-737-3261) of all heads being submitted for testing. After consultation and approval by the OHA epidemiologist or the state public health veterinarian, costs of shipping and testing of animals following significant exposures of humans will be borne by OHA. In the absence of consultation and approval by OHA, the sender will be responsible for all charges related to rabies shipping and testing. Please review shipping instructions in the attached appendix from OSU VDL. Upon approval from OHA, OSU VDL will provide an electronic UPS shipping label by email to transport the specimen to the laboratory. Please ship specimens only Monday through Thursday for next-day arrival. The specimen should be accompanied by a OSU VDL submission form. For further information, please see the OHA website on rabies and scroll down to Oregon State University (OSU) Rabies Testing Information.

Laboratory Schedule

Coordinating the transportation of heads to OSU VDL is often the most important step in assuring a satisfactory and timely result. Transportation alternatives include air freight, drive-in to the lab (by the person bitten, the animal owner, or a county employee), bus service, or same- or next-day courier service (FedEx, UPS, Express Mail, etc.). Each LHD outside the Corvallis area should investigate these alternatives and establish a means of transport before the need arises. Collect the relevant information (route schedules, fees, payment options, phone numbers, etc.), and keep it current and available to the appropriate personnel.

OSU VDL will process and test all specimens received before 11 A.M. on the same day. Specimens received after 11 A.M. will be processed and tested the following day. Please do not ship samples on Friday, as OSU VDL is closed on weekends. A need for RPEP is generally urgent, but rarely emergent; usually one can wait until after a weekend. In the rare circumstance where weekend testing might be desired, RPEP should be commenced empirically, then discontinued when test results become available.

Specimen Handling and Shipping

Animals should preferably be euthanized by lethal injection or other means that will not damage the brain and that do not place people at risk of further exposure. Heads received in poor condition often cannot be satisfactorily tested. Caution should be exercised when decapitating animals; remember, the working assumption should be that the animal is rabid. For your protection, wear heavy gloves and use goggles or a face shield to avoid splashing central nervous system tissue into the eyes or mouth.

Pack the head in a leak-proof container, and seal it with tape. If plastic bags are used, use at least two, and make sure they are sealed. The sealed head

should go into another leak-proof container with enough cold packs to maintain refrigerator temperatures until the specimen reaches the lab.

Ship refrigerated animals remain within 24 hours if possible**. Freeze animals remain if not able to ship within 48 hours of collection**. Ship overnight, Monday through Thursday only. To reduce shipping costs, the head of larger species may be sent. Label the outside of the container with "REFRIGERATED SPECIMEN." Containers must be addressed to:

Oregon State University
Veterinary Diagnostic Laboratory
134 Magruder Hall
Corvallis, OR 97331-8555

Reporting or Results

OSU VDL will notify OHA epidemiologists of all test results. The OHA epidemiologist will notify the LHD promptly. It is the responsibility of the LHD to communicate results to the person bitten and to other relevant parties (medical providers, veterinarians, etc.). For high-risk situations, make sure you know how to contact these persons promptly.

5. PROPHYLAXIS

5.1 Wound Treatment

All bite wounds should be thoroughly and immediately washed with soap and water, with copious flushing. Chlorohexidine solution or similar disinfectants can be also applied. If possible, the wound should be left open to heal. Animal-bite (especially cat-bite) wounds often become infected and may require antibiotic therapy. Check tetanus immunization status and provide a booster to persons who are not up-to-date. Patients should be encouraged to seek medical attention promptly should signs of wound infection occur.

5.2 Rabies Post-Exposure Prophylaxis (RPEP)

LHD and OHA staff can only make recommendations to patients and physicians about the advisability of RPEP. Rabies immune globulin (RIG) and rabies vaccine are available by prescription, and physicians are at liberty to take or leave our advice. N.B.: RPEP is quite expensive — several thousand dollars per course — and OHA has no funds with which to pay for it.

Although expensive, modern RPEP is simple, highly effective, and not terribly painful. The course consists of passive immunization with rabies immune globulin (RIG, Imogam®; 20 IU/kg), given as soon as possible after exposure, combined with active immunization with human diploid cell vaccine (HDCV), purified chick embryo cell vaccine (PCECV) or rabies vaccine absorbed (RVA) administered intramuscularly (IM) into the deltoid in 1-mL doses on four days (days 0, 3, 7, 14). Although RIG will need to be administered by a nurse or physician, rabies vaccine can be given by either pharmacists or medical personnel.

Rabies biologics are stocked at hospital pharmacies and several emergency departments in Oregon; they can be ordered for next-day delivery at most other

locations. As many as 50% of vaccinees may experience local reactions including pain, erythema, and swelling or itching at the injection site, or systemic reactions such as headache, nausea, abdominal pain, myalgias, and dizziness.

RPEP should not be interrupted or discontinued because of side effects short of anaphylactic reaction. Pregnancy is not a contraindication.

5.3 Pre-Exposure (Human)

Persons who live in an area with a high rate of terrestrial rabies and are at risk of being bitten or exposed to infected tissues (e.g., veterinarians, wildlife workers, laboratory personnel, animal control officers) may benefit from pre-exposure rabies prophylaxis. This regimen consists of two IM doses of HDCV on days 0 and 7. Should immunized persons subsequently be bitten by a possibly rabid animal, they will need only two 1-mL boosters of HDCV, three days apart.

6. FOLLOW-UP TO ANIMAL RABIES CASES; BAT-PROOFING

6.1 Education

Publicity surrounding the identification of a rabid animal often provides an opportunity to educate people about the importance of ongoing animal-control measures, including the following recommendations.

1. Avoid physical contact with bats (and other wild animals, for that matter) — healthy, sick, alive, or dead. Bats are an important and interesting part of the natural world, providing many benefits (such as insect control). But a high percentage of those tested have rabies.
2. Do not hand feed or otherwise handle stray animals or wildlife.
3. Report all animal bites promptly to the local health department or animal-control agency.
4. Make every effort to capture stray or wild animals that have bitten people, if it can be done safely, so that the animals can be tested for rabies if indicated.
5. Vaccinate all dogs and cats to create an immune barrier between these frequently handled animals and wildlife.
6. Control populations of stray or unwanted animals.

6.2 Animals Exposed to Known or Suspected Rabid Animals

Unimmunized dogs or cats with known contact with a rabid animal should be humanely euthanized. If the owner will not permit this, the animal must undergo a supervised quarantine for 4 months, with rabies vaccine administered at the time of entry into quarantine to bring the animal up to current rabies vaccination status. Administration of vaccine should be done as soon as possible. It is recommended that the period from exposure to vaccination not exceed 96 hours. If vaccination is delayed, public health officials may consider increasing the quarantine period for dogs and cats from 4 to 6 months. Unimmunized ferrets should be quarantined for 6 months.

A dog, cat or ferret with a current rabies vaccination that has had a known contact with a rabid animal should be revaccinated and confined at home for 45 days (indoors, in a fenced yard, or on a leash at all times).

For other situations, see the National Association of State Public Health Veterinarians (NASPHV) Compendium of Animals and Rabies Control.

6.3 Bat Control

Houses and out buildings can be bat-proofed by covering large openings with screen wire and caulking or closing holes to less than 1 cm (3/8 in.) in diameter. Doors and windows should be screened. Fireplace dampers should be closed during warm months.

For those interested in encouraging bat colonies, bat boxes are easily constructed (plans are available from various sources). They should be located away from human habitations.

With care, bats can be removed safely from a dwelling. Wait for the bat to settle on a reasonably flat surface, then trap it under a wide-mouthed jar or can. Use a piece of cardboard as a temporary cover. When the bat settles to the bottom of the jar, slide the cardboard off and immediately put the jar lid in place. Sick or injured animals should be euthanized humanely using gas anesthesia, 4% CO, or CO_2 (see AVMA euthanasia guidelines). Please note that putting the jar or can in the freezer is *not* considered to be humane euthanasia.

7. MANAGING SPECIAL SITUATIONS

7.1 Curious Animal Behavior

Rabies is only one of many conditions that can affect animal behavior. Trauma, pesticide and other poisons, and infectious diseases can all trigger rabies-like signs. Unless humans are bitten by these animals, there should be no public health concern about rabies.

Canine distemper, for example, often affects Oregon raccoons, causing muscle twitching, convulsions with salivation and chewing movements, and ascending paralysis with ataxia. Foxes, coyotes, mink, and skunks are also susceptible to canine distemper, but outbreaks in these species have not been reported in Oregon. Infected animals may come out during the day and may approach humans or domestic pets without fear. A definitive diagnosis of distemper can be made by sending the animal to OSU VDL (541-737-3261) for necropsy and histopathology studies. Call to find out the cost per animal.

7.2 Wildlife Die-offs

Local Health Departments are often called because of animal die-offs. These reports are best handled by contacting the nearest area office of the Department of Fish and Wildlife; their staff is well versed on the ecology of the area and are trained in these investigations.

7.3 Suspected Human Rabies

Contact OHA immediately at 971-673-1111.

Humans suspected of having rabies can be tested antemortem; nuchal-skin biopsies, corneal-impression smears, neutralizing antibody titers and other tests must by performed at CDC after consultation by OHA.

UPDATE LOG

July 2026: Updated “Freeze animals remain if not able to ship within 48 hours of collection” (Emilio DeBess)

December 2018: Changes in testing procedures; clarification of Orpheus data-entry requirements; OSPHL no longer testing for rabies (Paul Cieslak)

July 2017: Updated Section 6.2 Quarantine and link to Compendium (Emilio DeBess)

Jan 2015: Animal bites and rabies positive animals and human are reportable condition and should be entered into the Orpheus database. (Emilio DeBess)

June 2014: Updated human vaccine information. (Emilio DeBess)

March 2011: Clarified language (overall). Updated ACIP recommendation on the number of rabies vaccines required for post exposure prophylaxis and updated time of vaccination when animals are quarantined for 6 months (animal to animal rabies exposure). (Emilio DeBess)