Rabies Prevention

Rabies is one of the first diseases recognized as zoonotic, transferred from animals to humans. Public health prevention and control measures focus on the animal reservoirs for the disease.

Reservoirs

Strains of the rabies virus affect a wide range of mammals. Depending on the geographic location, terrestrial reservoir animals for rabies include dogs, foxes, raccoons, skunks, coyotes, jackals, mongooses, and other wild carnivores. In most regions including the Pacific Northwest, multiple bat species are reservoirs. Although each major reservoir has a species-specific rabies variant, these strains can and do affect other mammals including humans.

Until the 1940s, canine rabies was the major concern in most areas of the United States. Vaccination controlled canine rabies in this country but dogs contribute to the majority of the global burden of the disease, accounting for 99% of human rabies deaths. In the United States, raccoon rabies has spread to affect many eastern states. Skunk and fox rabies strains are present in southwestern and central states as well as in Alaska, and mongoose rabies occurs in Puerto Rico. Bat rabies is present in all states but Hawaii.

Up to 10% of bats tested in Washington are rabid. This reflects the fact that bats captured for rabies testing are often ill, so does not mean that 10% of healthy bats are affected. This result does support the public health recommendation for caution regarding bats that are active during daylight hours, flying erratically, or otherwise acting abnormally.
Although bats are the only animal reservoir for rabies in Washington, occasionally terrestrial mammals in the state are infected with strains of bat rabies. In the 1990s a horse (1992, Franklin County) and a llama (1994, King County) were diagnosed with rabies. Two cats have had rabies more recently, one in 2002 (Walla Walla County) and one in 2015 (Jefferson County), both infected with bat variant rabies strains.

**Prevention**

A rabid animal sheds the virus in its saliva and may have behavioral changes making it more aggressive. The virus must enter a person’s body through a bite or mucous membrane to cause infection. Even with intensive experimental treatment the survival rate is very low once rabies becomes symptomatic, so prevention is key to avoid human cases. Persons at higher risk of rabies exposures, such as veterinarians or wildlife biologists, are candidates for pre-exposure vaccination. After a bite from a rabid animal wound management including thorough cleaning is the first step in preventing rabies after exposure. Post-exposure prophylaxis is then provided to produce immunologic protection.

Suspect human rabies exposure is notifiable in Washington to assure appropriate intervention. The situation is assessed to determine if exposure to a rabid animal did or could have occurred. Since even a minor bite can transmit rabies, a person is assumed exposed to rabies in situations where exposure cannot be ruled out. Such situations include a bat in the bedroom of an unobserved infant or a sleeping person.

Testing the animal’s brain will determine whether it is rabid. A ten day observation period from the time of exposure can be done for healthy appearing dogs, cats, and ferrets that have bitten people. Experimental data show that these animals become symptomatic within ten days if shedding virus on the day when person was bitten. If the animal becomes ill during observation, it should be tested for rabies promptly. Observation periods are not reliable for any other animals including wild hybrids with dogs or cats, so testing must be done or post-exposure prophylaxis given.
If the biting animal tests positive for rabies or if the animal cannot be tested, post-exposure prophylaxis (PEP) should be given. There are two treatment components for persons who have never been vaccinated: human rabies immune globulin given as a single dose along with a four- or five-dose rabies vaccine series. Five doses are given for persons any degree of immunosuppression including malignancy, treatment for malignancy, organ transplant recipient, HIV infection, or high-dose corticosteroids. Long-standing health conditions such as renal failure, diabetes, asplenia, or cirrhosis of the liver may also result in relative immunosuppression and merit five doses. In addition to rabies PEP, tetanus vaccination and antibiotics may also be indicated for some patients.

**Exposed Animals**

There have been recent changes in the recommendations for managing certain types of domestic animals with potential exposure to an animal known or suspected to be rabid. In Washington, such exposures would include dogs, cats, or ferrets having direct contact with a bat testing positive for rabies or a bat unavailable for testing. There are several different recommendations based on the documented prior rabies vaccine doses.

A currently vaccinated dog, cat or ferret can be given a booster rabies vaccine and confined under close observation for 45 days. A dog or cat that has at least one documented previous rabies dose but is overdue can be given a booster rabies vaccine dose and confined under close observation for 45 days. A ferret with documented previous dose but overdue should be evaluated on a case-by-case basis.

An unvaccinated dog, cat, or ferret can be humanly euthanized or strictly quarantined for 120 days (cat or dog) or 180 days (ferret). A dose of rabies vaccine should be given within 96 hours of exposure or public health officials may consider extending the quarantine period for dogs or cats to 6 months.

A dog or cat that was likely vaccinated previously but without documentation can undergo prospective serologic monitoring to provide evidence of anamnestic response to the booster rabies vaccine dose. Sera should be collected at baseline and 5-7 days after the booster vaccine dose. A 2-fold rise in titer and the titer in the second serum specimen above 0.5 IU/ml provide evidence of prior vaccination and the animal can be confined under close observation for 45 days. If the anamnestic response is inadequate, the animal is considered unvaccinated and requires strict quarantine for 120 days. For details see Section 8 of the guideline for Rabies, Suspected Human Exposure: [http://www.doh.wa.gov/Portals/1/Documents/5100/420-073-Guideline-RabiesSuspectedExposure.pdf](http://www.doh.wa.gov/Portals/1/Documents/5100/420-073-Guideline-RabiesSuspectedExposure.pdf)

Potential exposures to bats and other animals are common, but it is important to prevent all human cases of rabies. Department of Health’s Office of Communicable Disease Epidemiology is available to assist Washington’s local health jurisdictions when there are questions about appropriate management of suspected human exposure. Environmental Public Health can provide guidance for domestic animal exposures.