

## **Guidance for King County Health Care Providers on Assessment, Management, and Reporting of Suspected Rabies Exposures**

July 2011

### **Introduction**

The goal of risk assessment and patient management for potential rabies exposures from contact with bats and animal bites is to identify true exposures for administration of rabies post-exposure prophylaxis (PEP) and minimize unnecessary PEP administration. In addition to rabies PEP, prompt local wound treatment is important in the prevention of human rabies. This document is intended as a summary guide for healthcare providers on assessing, managing and reporting of animal bites and other potential rabies exposures. This document is intended to supplement and not substitute for standard references or consultation with medical experts regarding management and treatment of wounds and rabies PEP.

### **Overview**

The basic elements of preventing human rabies after animal exposure include:

1. Administer immediate wound care
2. Assess the risk of the patient's exposure to rabies
3. Administer rabies PEP when indicated
4. Assess tetanus vaccination status as part of wound management (using Tdap where indicated)
5. Report *suspected human rabies exposures* to Public Health.

Additional information and consultation can be obtained by calling Public Health at (206) 296-4774, or reviewing the Centers for Disease Control and Prevention (CDC) website, including the most recent Advisory Committee on Immunization Practices (ACIP) Recommendations, at: [www.cdc.gov/rabies/](http://www.cdc.gov/rabies/).

Administration of rabies PEP is a medical urgency, not an emergency. The decision to treat a patient with a known or suspected rabies exposure rests with the patient and the health care provider. This decision is often made in consultation with the local or state health department and based on the local epidemiology of animal rabies. More information on the epidemiology of rabies in the U.S. is available at: [www.cdc.gov/rabies/location/usa/surveillance/index.html](http://www.cdc.gov/rabies/location/usa/surveillance/index.html). Information on rabies testing of animals in Washington State is at: [www.doh.wa.gov/notify/nc/rabiesexp.htm](http://www.doh.wa.gov/notify/nc/rabiesexp.htm).

### **Legal Reporting Requirements**

Health care providers and health care facilities are required to immediately report *suspected human rabies exposures* to the local health jurisdiction (LHJ) of the bite victim's residence. In 2011, the Washington Administrative Code (WAC) notifiable disease rules were modified such that reporting of low-risk animal bites is no longer required. For example, a person bitten by his own healthy dog in King County is not reportable; but a person bitten by a dog in a rabies endemic country (e.g., in Africa, Asia, Central and South America, Middle East) is reportable.

## Local Rabies Reservoirs and Rabies in Animals

The primary rabies reservoir in Washington State and the Pacific Northwest is bats. Rabies virus likely occurs in all local bat species although a very low percentage of bats in the wild are likely infected (less than 1%). Of the bats submitted for rabies testing in Washington State (most of which are sick or injured bats associated with human exposures) around 5-10% are rabid.

There is no active surveillance system for animal rabies in Washington State. Testing is typically limited to animals that have bitten or otherwise exposed a person. Rabies has not been identified in wild terrestrial carnivores tested in Washington since 1930. During the 1920s, there were 20 rabid coyotes reported, and there was a single positive coyote in 1930. Raccoon rabies has never been reported in Washington State. Since the 1960s, the only documented cases of animal rabies in terrestrial carnivores were four skunks that were pets and not truly wild. Two of the four skunks were illegally imported into Washington and the source of rabies was thought to be from out of state, and the other two had vaccine-induced rabies after having been inappropriately given attenuated live virus rabies vaccine.

Domestic animals can also be rabid. Dog rabies was rampant in the state in the early part of the century but hasn't been seen in Washington since the 1950s, with the exception of 1 dog brought into the state from California in 1960. Importation of animals from rabies-endemic areas has the potential to expose both people and animals to rabies. In 2007, a puppy imported from India was brought into Washington briefly before being adopted and moved to Alaska. Soon after, this puppy died of canine variant rabies, which resulted in several people and one other puppy being exposed.

Bat-variant rabies has been identified rarely in wild terrestrial carnivores in the Northwest, including:

- 15 rabid foxes, 1 goat, and 1 coyote in Oregon (2000-March 2011),
- 1 rabid bobcat (2001) and 1 rabid skunk (2004) in Idaho, and
- 1 beaver (late 1980s-possible skunk variant but error in testing cannot be ruled out), 4 rabid skunks (2004) and 1 rabid cat (2007) in British Columbia,<sup>1</sup> Canada.

These situations demonstrate the risk for rabies spillover from bats to wild animals is always present.

Since the 1970s, 5 domestic animals in Washington State have been identified as rabid, all with bat variant virus (confirmed in all but the Benton County horse, for which bat variant rabies virus was presumed), including a llama (King County, 1994), a horse (Benton County, 1992), two cats (Thurston County, 1976; Walla Walla County, 2002; both unvaccinated), and two dogs (Thurston, 1977; Pierce, 1987; both unvaccinated); rabies was suspected in the Pierce County dog in 1987, but infection was not confirmed.

## Human Rabies in Washington

The most recent human cases of rabies in Washington State occurred in 1995 and 1997, both with bat-variant rabies. Prior to that, the last identified human case of rabies occurred in 1939 from the bite of a rabid dog.

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<sup>1</sup> British Columbia, Canada has also identified rabies in a cat in 1969 (presumed bat variant virus), a horse in 1984 with bat variant virus, 3 cats in the 1992 (one with skunk variant virus), and one beaver with possible skunk variant virus in the late 1980s.

## Basic elements of preventing human rabies after animal exposure

### 1. Administer immediate wound care

- Prompt irrigation and cleansing of bite wounds and scratches (i.e., with sterile saline and/or a dilute virucidal agent such as a povidone-iodine solution) are important measures for preventing rabies. In animal studies thorough wound cleansing alone without other post-exposure prophylaxis has been shown to markedly reduce the likelihood of rabies.
- Irrigate puncture wounds copiously with sterile saline.

### 2. Assess the risk of human exposure to rabies, taking into consideration the species and behavior of the animal and the geographic location of the exposure. An algorithm is available to aid assessment-see [Resources](#). Rabies infection can occur more quickly when virus is introduced into the face and neck because of the shorter path to the central nervous system. Therefore potential rabies exposures to the head and neck should be treated urgently. PEP should be started immediately and testing of available animals will be arranged by Public Health.

- **[Exposure to a bat](#) or any [rabid-acting mammal](#) (domestic or wild) including a dog, cat or ferret.**
  - If animal or bat is available, Public Health will arrange testing for rabies.
  - For all rabid-acting mammal bites and for bat [bites](#) to the head and neck begin PEP immediately; if test result is negative, discontinue PEP.
  - For other bat exposures including bites to other areas of body and exposures with no known bite:
    - If bat is available for testing, Public Health will arrange testing of the bat. PEP may be delayed until test results are available; begin PEP if test result is positive or indeterminate for rabies. If the bat tests negative for rabies, PEP is not indicated.
    - If the bat is NOT available for rabies testing, rabies PEP is generally recommended unless exposed person is an adult and is certain that contact did not occur (see [Exposure to a bat](#)). The decision to treat is ultimately at the discretion of the patient and health care provider after a discussion of the risks and benefits of PEP.
- **Wild terrestrial carnivore exposure - not raccoon** (e.g. skunk, fox, coyote, wolf, bobcat, hybrid canine or feline, or wild primate)
  - If animal is available report to Public Health to arrange testing for rabies as soon as possible. Begin PEP immediately; if testing is negative, discontinue PEP.
  - If the animal is NOT available for rabies testing, rabies PEP is recommended.
- **Raccoon exposure**
  - Exposure occurred in an area where rabies is endemic in wild terrestrial carnivores (i.e., outside Washington state):
    - If raccoon is available, notify Public Health as soon as possible to arrange for rabies testing.
    - Begin PEP immediately; if testing is negative, and then discontinue PEP.
    - If the animal is NOT available for rabies testing, rabies PEP is recommended.
  - Exposure occurred in Washington state:
    - No need to test raccoon unless [rabid acting](#) or other reason to suspect rabies.
    - Rabies PEP at the discretion of the treating health care provider.
    - Note: CDC guidance is to consider all wild carnivores potentially rabid, but raccoon rabies has not been documented in Washington or surrounding states.
- **Exposure to a normally appearing and behaving dog, cat, or ferret**
  - Exposure occurred in a canine rabies endemic area outside of the United States; or animal imported from or traveled to a rabies endemic area within the last 6 months including Asia, Africa, Eastern Europe, Middle East, India, South/Central America; or animal had contact with a bat or other potentially rabid animal:

- Confine and observe the animal for 10 days (or test) when possible. If animal is available for testing, notify Public Health to arrange testing as soon as possible.
- PEP recommended if the animal is not available for 10-day observation or testing.
- Provide patient with discharge instructions including recommendation to:
  - Confine and observe the animal for 10 days when possible.
  - Contact Public Health immediately if animal develops signs of rabies within 10 days. If animal is alive after 10 days, PEP not indicated.
  - Contact Public Health to discuss testing for rabies if an animal needs to be euthanized for other indications prior to completing the 10 day confinement and observation period.
- Exposure occurred in the United States:
  - Recommend animal be confined and observed for 10 days. Observe healthy-appearing pets at owner's home, or through animal control agency. Animal quarantine is not arranged by Public Health.
  - PEP not recommended unless animal develops signs of rabies within 10 days. If animal dies or develops signs of rabies in 10 days, report to Public Health immediately ([rabid acting](#) definition)
  - If animal is not available for observation, PEP not recommended unless animal was [rabid acting](#).
  - Provide patient with discharge instructions including recommendation to:
    - Contact the appropriate animal control agency to report the incident and options for management of the animal (for persons bitten in King County and the animal cannot be observed for 10 days after the exposure occurred)
    - Notify Public Health if the animal develops signs of rabies within 10 days of exposure.
- **Rodent (small rodents including squirrel, opossum, chipmunks, rat, mouse, gerbil, hamster, and larger rodents including beaver and woodchuck) or lagamorph (rabbit, hare) exposure**
  - Rodents are not reservoirs of rabies virus. Rabies PEP is almost never indicated for exposure to small rodents and lagamorphs; these mammals are rarely infected with rabies and have not been known to transmit rabies to humans.
  - Rabies in these animals is primarily a potential concern in areas with terrestrial rabies in other species.
  - No need to test unless [rabid acting](#) or other reason to suspect rabies.
- **Livestock (e.g., cattle, horse, sheep) exposure**
  - No need to test unless [rabid acting](#) or other reason to suspect rabies. Livestock should be evaluated by a veterinarian.

### 3. Administer rabies PEP if indicated

- Obtaining vaccine and RIG
  - Providers can order rabies biologics from the manufacturer or distributor and have them delivered within 1 to 2 days.
  - For information on rabies biologics, including ordering information, see the 2008 Recommendations of the Advisory Committee on Immunization Practices, Human Rabies Prevention, online at: [www.cdc.gov/rabies/](http://www.cdc.gov/rabies/) (Table 1).
- Initiating rabies PEP
  - Use the correct route of administration and dose when administering RIG and rabies vaccine ([www.cdc.gov/rabies/resources/acip\\_recommendations.html](http://www.cdc.gov/rabies/resources/acip_recommendations.html)).
    - The dose of RIG is 20 IU/kg. It should be thoroughly infiltrated in the area around and into the wounds. Any remaining volume should be injected intramuscularly, at a site distant from vaccine administration.

- Rabies vaccine should be administered intramuscularly in the **deltoid for adults and children**. Use the **anterolateral thigh for infants**. Do not give rabies vaccine in the gluteus (buttocks), as vaccine failure has occurred when administered this way and the dose is not considered valid.
  - Information on administration of RIG is at: [www.cdc.gov/rabies/medical\\_care/hrig.html](http://www.cdc.gov/rabies/medical_care/hrig.html)
  - A RIG and rabies vaccine administration diagram can be downloaded from the Public Health website (see [Resources](#))
- Completing rabies PEP for a person administered rabies PEP doses outside the U.S.
  - Public Health can help assess the need for additional vaccination, RIG, or serologic testing after PEP has been administered outside the U.S.
  - Document and if possible make photocopies of any records the patient has for rabies PEP doses (vaccine brand name, manufacturer, dose, dates, name and location of facility where administered) outside the U.S.
- Rabies PEP dosing schedule ([www.cdc.gov/rabies/resources/acip\\_recommendations.html](http://www.cdc.gov/rabies/resources/acip_recommendations.html)).
  - For individuals not previously immunized against rabies, following the day 0 dose (the first dose), additional doses of rabies vaccine are due on day 3, 7, and 14. Persons with immune deficiency require a fifth dose on day 28.
  - For uninsured and underinsured patients, patient assistance and other programs may be able to help with the provision of rabies vaccine and RIG. More information is available online at: [www.cdc.gov/rabies/medical\\_care/programs.html](http://www.cdc.gov/rabies/medical_care/programs.html)
  - Public Health-Seattle & King County (PHSKC) administers rabies PEP only to patients who already have a primary care provider at a PHSKC primary care clinic.

#### 4. Assess tetanus vaccination status as part of wound management

- The person should receive a tetanus-containing vaccine (use Tdap when indicated) if tetanus vaccine has not been given for 5 or more years. See ACIP recommendations at: [www.cdc.gov/vaccines/pubs/ACIP-list.htm](http://www.cdc.gov/vaccines/pubs/ACIP-list.htm)
- Tetanus immune globulin (TIG) should be given as part of wound management for persons who have not received at least three prior doses of tetanus vaccination, or for whom tetanus vaccination history is unknown or uncertain. For persons receiving TIG for wound management, a primary series of tetanus vaccinations should be initiated simultaneously.
- AAP recommends that TIG also be administered for tetanus-prone wounds in patients infected with human immunodeficiency virus (HIV), regardless of the history of tetanus vaccinations.<sup>2</sup>

#### 5. Report suspected rabies exposures to Public Health.

- A suspected human rabies exposure is a reportable condition to the county where the patient lives. For King County residents, please call Public Health to report a case and for consultations and questions (206-296-4774). Outside of business hours, press 1 to be connected to an operator and ask to speak to the physician or epidemiologist on call.
- For Washington State residents residing outside of King County, call their [Local Health Jurisdictions](#) or Washington State Department of Health (206-418-5500; 24-hour contact, 1-877-539-4344).
- For questions regarding Animal Control, contact the county where the bite occurred.
- **Arrange animal testing when indicated by calling Public Health.** Reporting and consultation with Public Health (206-296-4774) is required before testing can be done by Washington State Public Health Laboratories in Shoreline at: [www.doh.wa.gov/EHSPHL/PHL/](http://www.doh.wa.gov/EHSPHL/PHL/). Public Health will facilitate testing when indicated.
- Public Health has recommended discharge instructions for health care facilities and health care providers seeing patients bitten by dogs, cats and ferrets in King County (see next page for Health Care Provider Resources for Suspected Rabies Exposures).

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<sup>2</sup> American Academy of Pediatrics (AAP) Red Book, 2009.

## Health Care Provider Resources for Suspected Rabies Exposures

Public Health “Animal bites and rabies” website – Go to [www.kingcounty.gov/health/cd](http://www.kingcounty.gov/health/cd) and click either A for animal bites or R for rabies. The website includes the following resources:

- Summary of health care provider guidelines for human rabies infection. This algorithm provides clinical guidance for the management of the more common potential rabies exposure situations. It is not intended to be a stand alone document or substitute for clinical knowledge about rabies and its prevention, and it cannot address every possible rabies exposure scenario. Consult Public Health for guidance as needed at 206-296-4774.
- Rabies vaccine and RIG administration diagram
- Fact sheets and patient education materials
- Suggested discharge instructions for public health management of persons bitten by dogs, cats, and ferrets in King County
- Links to CDC resources

Report suspected rabies exposures to King County residents and request guidance for assessment and management: Call the Communicable Disease Epidemiology and Immunization Program at 206-296-4774. For calls after hours and on weekends, follow the directions for contacting the public health official on call.

Report suspected rabies exposures to animals in King County: Call the Zoonotic Disease Program at 206-205-4394. See list of reportable conditions by veterinarians and contact information for reporting cases at: [www.kingcounty.gov/healthservices/health/ehs/zoonotics.aspx](http://www.kingcounty.gov/healthservices/health/ehs/zoonotics.aspx) - see “Reportable Diseases and the Veterinarian” under “Resources for Veterinarians.” The page also has patient education materials about rabies in bats, pets, and other animals.

Request rabies testing of potentially rabid animals:

- If a human was potentially exposed to the animal, call Public Health - Seattle & King County at 206-296-4774. Testing will be done at the Washington State Public Health Laboratories in Shoreline **only** after consultation with Public Health.
- For bats with animal contact only (no human contact), testing can be done at the Oregon State Veterinary Laboratory on a fee-for-service basis. Information on testing is available at: [www.kingcounty.gov/healthservices/health/ehs/zoonotics.aspx](http://www.kingcounty.gov/healthservices/health/ehs/zoonotics.aspx) - Select *Testing of bats in King County*. Animals exposed to bats in King County should be reported (see reporting of suspected rabies exposures in animals above).

Pet Licensing and Animal Services in King County:

- [www.kingcounty.gov/healthservices/health/ehs/zoonotics.aspx](http://www.kingcounty.gov/healthservices/health/ehs/zoonotics.aspx) (bottom of right column)

Questions on rabies vaccine or rabies immune globulin (RIG) usage, administration, and adverse reactions:

- Consult your pharmacist, or call Public Health at 206-296-4774.
- See the Public Health Animal Bites and Rabies website (above)

Information for persons bitten by dogs, cats or ferrets in King County:

- Online at [www.kingcounty.gov/healthservices/health/communicable/providers/tools.aspx](http://www.kingcounty.gov/healthservices/health/communicable/providers/tools.aspx)

Contact information for Public Health – Seattle & King County Veterinarian (for animal behavior and exposure issues): 206-205-4394

Contact info for Washington State Local Health Jurisdictions: [www.doh.wa.gov/lhjmap/lhjmap.htm](http://www.doh.wa.gov/lhjmap/lhjmap.htm)

Contact info for Washington State Department of Health: 206-418-5500; 24-hour contact, 1-877-539-4344).

CDC rabies resources and ACIP recommendations: [www.cdc.gov/rabies/](http://www.cdc.gov/rabies/)



## Definitions of Rabies Exposure Terms

**Animal Confinement or Quarantine:** Restriction of an animal to a building, pen, or other suitable escape-proof enclosure. At the first indication of the animal becoming ill, changing behavior, or refusing to eat or drink, it is the responsibility of the owner or custodian to notify Public Health or Animal Control Agency and take the animal to a veterinarian for examination. Animal control agencies and public health can order confinement or quarantine of animals.

**Endemic areas for rabies:** Asia, Africa, Eastern Europe, Middle East, India, South/Central America. In the U.S., raccoon rabies is endemic in the East Coast, skunk rabies in the central states, and fox rabies in the south west states and Alaska. See: CDC website: [www.cdc.gov/rabies/](http://www.cdc.gov/rabies/) for WHO rabies site ([www.who.int/rabies/en/](http://www.who.int/rabies/en/)) click on epidemiology (left column, then on essential rabies maps, bottom right)

**Human Exposure to Rabies:** Any bite, scratch, or other situation in which saliva, or CNS tissue, of a potentially rabid animal entered, or could have entered, an open wound, fresh wound, or comes in contact with a mucous membrane by entering the eye, mouth or nose. Touching or handling a potentially rabid animal does not constitute an exposure unless wet saliva, or CNS tissue, entered a fresh, open wound or had contact with a mucous membrane. Handling an inanimate object that has had contact with a rabid animal does not constitute an exposure. Likewise, contact with the urine, feces, or blood of a potentially rabid animal does not constitute an exposure. Bats require special consideration. Any physical or direct contact with a bat should be considered a potential rabies exposure. Bat bites may not leave visible marks because some bats have tiny razor-sharp teeth. Therefore if a bat is found in a room with a person who cannot be certain that exposure did not occur (e.g., unattended infant or child, intoxicated adult, sleeping person), CDC recommends that the situation be approached as if a bite occurred. See: [www.cdc.gov/rabies/exposure/type.html](http://www.cdc.gov/rabies/exposure/type.html)

**Human Rabies Immune Globulin (RIG):** A blood plasma product that contains a high titer of rabies antibody and gives rapid, temporary immunity against rabies. It is part of the post-exposure prophylaxis regimen for rabies exposures in persons who have not previously received a rabies immunization series.

**Provoked Attack or Provoked Bite:** An attack (or bite) is considered to be "provoked" if it occurred as part of normal animal behavior. Examples of human behaviors that may elicit an attack from a normally behaving animal include but is not limited to: entering an animal's territory; attempting to pet or handle an unfamiliar animal; startling an animal; running or bicycling past an animal; assisting an injured or sick animal; trying to capture an animal; or removing food, water, or other objects in the animal's possession or acting in an aggressive manner toward an animal. Consultation with the public health veterinarian may help to determine if an attack was provoked.

**Rabies Post-Exposure Prophylaxis (PEP):** Use of rabies vaccine and, in persons who have not previously received a rabies immunization series, rabies immune globulin (RIG) to prevent rabies infection after exposure to the rabies virus has occurred.

**Rabies Vaccine:** Induces active immunity against rabies virus in which the immune system produces antibodies against rabies. This immune response takes approximately 7 to 10 days to develop and persists for 2 years or more.

**Rodent:** Rodents are the order of animals in the Rodentia family. These include but are not limited to: rats and mice, guinea pigs and hamsters, beavers, muskrats, porcupines, woodchucks, chipmunks, squirrels, prairie dogs, marmots, chinchillas, voles, lemmings, and many others.

**Signs of Rabies Infection in Animals, "Rabid acting":** Behavior changes consistent with rabies, including erratic conduct (a friendly dog becomes withdrawn or belligerent, an aloof animal becomes friendly); unusual aggression, excitation and agitation; difficulty with coordination and walking; depraved appetite (eating wood, soil, stones, plants, or other foreign objects); increased salivation, drooling or foaming at the mouth with head held characteristically downward; hoarse, throaty bark or snarl; muscular tremors or seizures (especially in cats); dilated pupils, vacant stare. Some animals may develop paralytic or "dumb rabies" in which the animal is abnormally passive instead of agitated. There are numerous common diseases and conditions of animals that can produce these behaviors and signs. When an evaluation of animal behavior is important in determining the management of a possible human exposure to rabies, consult with the public health veterinarian (See contact information in Resources).

**Wild Carnivore:** Wild animals that eat meat as all or as part of their usual diet. These include, but are not limited to raccoon, skunk, fox, coyote, bear, cougar, bobcat, wolf, weasel, mink, hybrid canine or feline, or wild primate.