Rabies and potential rabies exposures in Washington State and King County - 2014

Rabies is a preventable viral infection of humans and other mammals that is most often transmitted through the bite of a rabid animal. The rabies virus infects the central nervous system (the brain and the spinal cord). Proper treatment obtained promptly after exposure to a rabid animal can prevent rabies in humans, but once symptoms begin rabies is almost always fatal. About one or two human rabies deaths occur annually in the U.S.

Rabies testing in 2014
In Washington State rabies testing of animals is performed by the WA State Public Health Laboratory (WA PHL). The WA PHL only tests animals that have potentially exposed people to rabies. Animals that have exposed pets can be tested at the Veterinary Diagnostic Laboratory at Oregon State University (OSU) at the pet owner’s expense. From 2005 to 2014, bats represented 55% of all animals tested annually; cats represented 23% and dogs 14%. The document, Washington State Animals Tested for Rabies, produced by the WA State Department of Health, displays results of all animals tested for rabies from 1988 to 2014. Statewide during 2014, 276 bats were tested, with 15 (5%) identified as positive for rabies. Also during 2014, 75 cats, 53 dogs, 12 raccoons, and 19 other animals were tested; all of which were negative for rabies.

A total of 77 animals from King County were tested for rabies in 2014, including 45 at the WA PHL and 32 at OSU. Six different types of animals were tested: 64 bats, eight cats, two raccoons, one dog, one mink, and one weasel. Testing for both human and animal exposures peaked in July and August, and 56% of all tests were conducted from July - September (Figure 1). This pattern is typical across years. The California myotis and the Big brown bat were the two most common species tested (Table 1). Four of the 64 tested bats (6%), including three big brown bats and one silver-haired bat were positive for rabies in 2014. Two of these bats had exposed people. The other two bats exposed a total of four dogs. Fortunately, all four dogs were up-to-date on their rabies vaccinations. They received booster vaccinations and remained healthy after their 45-day confinement period.

Rabies post-exposure prophylaxis in 2014
Rabies post-exposure prophylaxis (PEP) is administered to persons who have been exposed to a rabid animal, or to a potentially rabid animal when 1) the animal is not available for rabies testing or 2) the animal cannot be confined and observed for signs of rabies for 10 days (cats, dogs and ferrets only). In most years, roughly two-thirds of rabies PEP given in Washington State has been due to bat exposures, with about 10-15% due to raccoon exposures, 10% due to dog bites (mostly international), and the remainder due to other animal exposures. In 2014, rabies PEP was recommended to 93 King County residents who were reported to Public Health with animal exposures. Of these, 59 (63%) were exposed in King County, 12 (13%) in other areas of the United States and 22 (24%) abroad. Most (68/71, 96%) of the suspected domestic rabies exposures resulted from exposures to bats.

History of animal rabies in Washington State and neighboring areas
Bats are currently the only known reservoir of rabies in Washington State, and between 5% and 10% of the 400 to 600 bats tested each year are positive for rabies. However, it is estimated that no more than 1% of bats in nature are infected with rabies, the difference being that healthy, non-rabid bats are less likely to be found on the ground or otherwise captured and tested.
Rabies was last identified in wild terrestrial carnivores in Washington State in 1930. During the 1920s, there were 20 rabid coyotes. 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 were illegally imported and the source of rabies was from out of state; the others had inappropriately been given attenuated live virus rabies vaccine. It must be noted, however, that only a small number of animals are tested for rabies and there is no active surveillance for rabies in wild carnivores in this state.

Dog rabies was rampant in Washington State in the early part of the last century but has not been detected here since the 1950s, with the exception of one dog brought into the state from California in 1960. The combination of rabies vaccination campaigns (which were often sponsored by local veterinary associations) and municipal animal control efforts to rein in strays reduced the problem to the rarity it is today. Importation of animals from rabies-endemic areas has the potential to expose both people and animals to rabies, and recent international importation of dogs highlights the need for continued awareness of rabies by veterinarians and the public health community. For example, in 2007 a puppy from India was brought into Washington then moved to Alaska. Soon after, the puppy died of canine variant rabies. Several people in Washington and Alaska and one other puppy were exposed. In 2008, three dogs being imported to Washington were exposed to a rabid dog as part of the Baghdad Pups rescue operation; they all required 6 month confinement.

Other animals recently identified as rabid in the Pacific Northwest have all had confirmed or presumed bat variant rabies. Since 1980, three rabid domestic animals have been identified in Washington, including a cat (2002, Walla Walla Co.), a llama (1994, King Co.), and a horse (1992, Franklin Co.). In 1987 rabies was suspected in a Pierce County dog that had been exposed to a rabid bat 6 months before the development of neurologic signs; a preliminary rabies test was positive, but rabies was not confirmed after further analysis by CDC. In neighboring states and provinces, Oregon identified 25 rabid foxes from 2000 through 2014, one rabid goat (2010), and two rabid coyotes (2011 and 2013); Idaho found one rabid bobcat (2001) and two rabid skunks (2004 and 2014); and British Columbia, Canada, identified four rabid wild skunks (2004) and one rabid cat (2007).

**History of human rabies and rabies exposures in Washington State**

The most recent human cases in Washington State occurred in 1995 in a 4-year old child in Lewis County and in 1997 in a 64-year old man from Mason County. Both cases were due to bat variant rabies. In the 1995 case, a bat had been found in the child’s bedroom, but because the family could find no bite wounds medical attention was not sought until signs of rabies developed about three weeks later. In the Mason County case, rabies was diagnosed post-mortem (the man had been hospitalized for possible tetanus); there was no known bat exposure but the victim was not interviewed specifically about bat exposure.

Five King County residents have been exposed to rabid bats in King County in recent years. In 2009, a person unpacking a suitcase after a trip from the east coast was exposed to a rabid bat hidden inside. It was not known if the bat got into the suitcase during the trip or when the suitcase was left outside on the porch after arriving home. In 2011, a person was bitten by a rabid bat when reaching under the refrigerator after hearing a noise. In 2012, a person touched a rabid bat that was clinging to a can hanging on the patio. There were two human exposures to rabid bats in 2014. In one case a bat brushed up against a person’s bare leg, was captured, euthanized and tested positive for rabies. In the other case, a bat rehabilitator was bitten through gloves by a bat that subsequently tested positive for rabies. All five people received rabies PEP and remain healthy.
**Interspecies rabies transmission**

Usually interspecies transmission of rabies virus results in one fatal event and very rarely secondary transmission. Arizona, however, continues to experience an outbreak of bat variant rabies that is spreading among skunks and foxes. In recent years, a number of bat variant rabies cases have been identified in foxes in three southwestern Oregon counties, although it is unknown at this point whether secondary transmission is happening. After the initial detections of the rabid foxes, an enhanced surveillance system was established in these counties. Veterinarians and the Oregon Department of Fish and Wildlife are submitting all suspect animals to the Veterinary Diagnostic Laboratory at OSU for rabies testing. One of the foxes identified with rabies in 2012 was found dead next to a 15-year old wounded cat in the owner’s greenhouse. The cat was not vaccinated for rabies and had to complete a 6-month confinement period in the greenhouse.\(^5\)\(^6\)

**Evaluation of humans exposed to bats and other animals**

Potential human exposures that should be evaluated by Public Health include a bite or scratch from a bat, direct skin contact with a bat, a bat found in a room where a person was asleep or where children have been playing unattended, and bites or scratches from domestic or wild animals showing signs suggestive of rabies. Animal bites to people in foreign countries where rabies may be endemic, especially those from bats, primates, dogs, cats or wild carnivores, should also be reported to Public Health at 206-296-4774.

**Evaluation and management of pets exposed to bats**

When a cat, dog or ferret has been exposed to a bat, ideally the bat is tested for rabies. However, Public Health does not provide testing for animal-only exposures; it is the responsibility of the pet owner and/or the veterinarian to arrange and pay for the costs of rabies testing. The test fee is currently $88 at the OSU laboratory and results are available in 24-48 hours. Complete shipping instructions and the lab requisition form are available at Public Health: Testing bats for rabies in King County. If the bat is not available for testing, the pet should be vaccinated or revaccinated for rabies as soon as possible and confined for 45 days (if current on rabies vaccination) or 180 days (if not current on rabies vaccination) and observed for signs of rabies. The Seattle-King County Public Health Veterinarian (206-263-8454) should be consulted to assist in determining how to properly confine the pet (it can usually be done at the owner’s home).

Rabies vaccination is required statewide for cats, dogs and ferrets, which “must be vaccinated against rabies and revaccinated following veterinary and vaccine manufacturer instructions.” See WAC 246-100-197. Unfortunately, even with the legal requirements, not all pets are vaccinated or current on their rabies vaccination and this can lead to longer confinement periods or even the need for euthanasia for unvaccinated pets exposed to a rabid bat. It is not unusual for Public Health to hear about strictly indoor cats exposed to bats – this occurs when bats get into homes through various means or when resourceful cats manage to catch bats while hunting from upper level balconies and decks. Veterinarians and pet owners both have the responsibility for keeping all pets vaccinated and up-to-date on boosters.

**Additional information**

Additional information about bats and rabies, including safely catching a bat, rabies testing, and wildlife control services that can assist with removal of bats from residences is available at Public Health: Bats and Rabies.
Figure 1: Animals from King County tested for rabies, 2012 – 2014

![Bar chart showing the number of tests by month from 2012 to 2014](chart.png)

Table 1: Bat species from King County tested for rabies in 2014 (N=64)

<table>
<thead>
<tr>
<th>Bat species</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>California myotis (<em>Myotis californicus</em>)</td>
<td>21</td>
</tr>
<tr>
<td>Big brown (<em>Eptesicus fuscus</em>)</td>
<td>13</td>
</tr>
<tr>
<td>Little brown (<em>Myotis lucifugus</em>)</td>
<td>10</td>
</tr>
<tr>
<td>Silver-haired (<em>Lasionycteris noctivagans</em>)</td>
<td>10</td>
</tr>
<tr>
<td>Yuma myotis (<em>Myotis yumanensis</em>)</td>
<td>4</td>
</tr>
<tr>
<td>Long-eared myotis (<em>Myotis evotis</em>)</td>
<td>2</td>
</tr>
<tr>
<td>Fringed myotis (<em>Myotis thysanodes</em>)</td>
<td>2</td>
</tr>
<tr>
<td>Species not identified</td>
<td>2</td>
</tr>
</tbody>
</table>

References
5. Rabies-positive animals in Oregon, Oregon Health Authority 2013