

Addendum 3: Rabies

Rabies is a viral infection of the central nervous system that is transmitted in the saliva of infected animals. Most infections occur when people are bitten by an infected animal. The rabies virus cannot cross intact skin, but infection can occur if the saliva gets into a person's eyes, nose, or mouth. One cannot get rabies from the blood, urine, or feces of a rabid animal, or from just touching or petting an animal.

Of all the zoonotic diseases, rabies is one of the most feared and misunderstood, even though its threat to humans in the United States is very small. In the last 100 years, the number of human deaths from rabies in the U.S. has fallen from 100 or more per year to an average of one or two (CDC - Rabies in the U.S. - Rabies, accessed 2022). The decline in rabies cases is due to both the improved control and vaccination of domestic animals and to the development of effective post-exposure treatment and vaccines.

Rabies and Wildlife

The Centers for Disease Control and Prevention (CDC) reports that, for the past 80 years, rabies has been reported more frequently in wildlife than in domestic animals ("CDC - Rabies in the U.S. - Rabies," accessed 2022). The CDC also reports that about 5,000 cases of rabies in animals are reported each year, and over 90% of those cases are in wildlife ("CDC - Rabies in the U.S. - Rabies," accessed 2022).

Since 1954, there have been 25 human deaths from rabies in Canada, the most recent being in Ontario in 2012 (Public Health Agency of Canada, 2018). The number of rabies infections reported in animals declined dramatically between 2000 and

2013, from 670 animals to 116, respectively. In subsequent years, reports have fluctuated up and down, but have not gotten anywhere near the number of cases from 2000 (Public Health Agency of Canada, 2018). The animals most often reported to be rabies-positive in recent years are bats, foxes, skunks, and raccoons (Public Health Agency of Canada, 2018).

Mexico ended the threat of rabies transmission to humans from dogs through a vaccination campaign and, in 2019, the country was the first to be officially certified with that distinction by the World Health Organization (Davies, 2019). Other animals in the country, including bats and cattle, still carry and can transmit the virus.

Rabies and Bats

According to the CDC, 70% of rabies infections in humans reported between 1960 to 2018 were contracted from bats ("CDC - Rabies in the U.S., 2020). Even then, the incidence is very low at about 62 cases over almost 60 years (Ross Johnson, 2022). It has not always been clear how humans acquire rabies from bats. In many cases, the fact that those people who died from rabies had contact with a bat was established only after the death of the person. It may be that the bite wounds are so small that they had not been noticed.

The number of rabid bats is indeed very small — The CDC estimates that around one percent of the bat population in the U.S. has rabies (Wilke, 2019). As a precaution, if you ever encounter a sick bat, call a wildlife rehabilitation center for advice and do not handle the bat. If a bat dies or bites a human, rabies tests should be done im-

mediately on the bat. If rabies is confirmed, post-exposure treatment should be started right away.

Rabies and Feral Cats

Firstly, **no person in the U.S. has died of rabies acquired from a cat since 1975.** This last incident occurred in Minnesota, when a 60-year-old man was bitten on the finger and died approximately seven weeks later (Brunt et al., 2021). Cats are less susceptible to rabies than many other animals, and in fact there is no cat-specific rabies — cats are infected with whichever species-specific strain is present in the infecting animal, such as raccoons, skunks, or bats. (The same is true for humans.) When cats do get rabies, they usually get the “furious” type; they stop eating, become very aggressive, and make unprovoked attacks on other animals and humans. **Rabid cats usually die within four to six days.** Generally, the CDC recommends a 10-day rabies quarantine for cats who have come in contact with a wild animal. Some health departments, such as the one in Maryland, insist on a six-month quarantine period.

Lethal vs. Nonlethal Solutions

The main response to rabies in the U.S. in the past has been to try to reduce the vector species by killing groups of those animals. This effort has proven totally ineffective, hastening the spread of the disease by removing healthy animals, and thus creating territorial “vacuums” for other animals of those species to enter. The mid-Atlantic epidemic was actually caused by hunters bringing infected raccoons into the region from Florida.

In Western Europe, the very successful oral vaccine VRG (vaccinia-rabies glycoprotein), developed in the U.S., has proven

to be an effective, economical, and humane control for rabies. Wildlife vaccination via food bait has blocked the spread of the disease and prevented small outbreaks from becoming major epidemics by maintaining healthy populations of key vector species as immune barriers (Browne, 1994). A new oral vaccine, ONRAB (AdRG1.3 or human adenovirus-rabies virus glycoprotein), has shown promise in Canadian studies and is being investigated in the U.S. in Ohio, Vermont, New York, New Hampshire, and West Virginia. ONRAB is different in that it cannot induce rabies in humans or domestic animals who come into contact with it (Canadian Centre, 2012). Early trials have shown ONRAB to be significantly more effective than VRG in vaccinating raccoon populations (Fehliner-Gardiner et al., 2012). This is particularly important, as raccoons are the primary carriers of rabies in the U.S. and a threat to pass the virus to community cats.



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Alley Cat Rescue Advocates a Comprehensive Nonlethal Rabies Control Program Based on Three Primary Initiatives:

1. Implement widespread oral vaccine immunization barriers for key wildlife vector species, primarily raccoons and skunks.
2. Educate the public on steps to

minimize human risk from wildlife rabies, including vaccinating outdoor cats and dogs and reporting sick bats to wildlife groups or the local health department. (Do not kill bats indiscriminately. They are a vital asset to our environment.)

3. Recognize and support the vaccination and nonlethal management of feral cat colonies as an effective and important part of a comprehensive control program.

Preventing Rabies in Feral Cats

The most effective means of stabilizing and reducing populations, controlling rabies, and protecting human health is to sterilize and return healthy vaccinated cats back to their supervised colonies. This helps to reduce roaming for mates, searching for food, and fighting; reducing these behaviors also reduces the transmission of other diseases. As mentioned previously, vaccinated colonies also create a buffer zone between humans and wildlife.