

STATE OF COLORADO

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Dedicated to protecting and improving the health and environment of the people of Colorado

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Determining the Need for Rabies Post-Exposure Prophylaxis Following a Dog or Cat Bite in Colorado Updated November 18, 2009

The necessity to administer rabies post-exposure prophylaxis (PEP) to a patient that has sustained a dog or cat bite can be a complex decision based on numerous variables that often can not be objectively assessed. National recommendations on rabies PEP are provided by the Advisory Committee on Immunization Practices and are published in the Centers for Disease Control & Prevention Morbidity and Mortality Weekly Report *Human Rabies Prevention – United States, 2008*. This document is the primary reference for national rabies PEP recommendations and can be viewed at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr57e507a1.htm>.

However, as national guidelines they are generalized for the entire country and refer to local and state public health officials for PEP recommendations for dog and cat bites based on the local epidemiology of rabies. With the reemergence of rabies in a terrestrial species (non bat mammals such as skunks) on the eastern plains of Colorado, the risk of spillover infections in other animals, including domestic pets, increases. The need for administering rabies PEP in persons bitten by a dog or cat may vary considerably within the state depending on the presence of skunk rabies in an area. This document provides Colorado-specific perspectives to assist public health officials in determining whether PEP is indicated in situations involving exposure to domestic dogs or cats.

Executive Summary

- The risk of rabies exposure from a domestic dog or cat bite remains extremely low in Colorado and rarely requires rabies PEP even if the biting animal is not located.
- The presence or absence of endemic skunk rabies in an area does not change the investigative process for determining whether or not to recommend PEP following an exposure to a dog or cat.
- In skunk rabies endemic areas, the risk of a dog or cat being infected with rabies does increase and under some circumstances, this potential risk might result in a recommendation for PEP in incidents in which the biting animal is unavailable for observation or testing.
- Recommendations for PEP are based on the assessment of rabies exposure risk. If a properly conducted assessment indicates very low risk, then PEP should not be recommended.
- The need for rabies PEP remains a medical urgency, not an emergency.

Epidemiologic Considerations

- Over the past decade, <100 dogs and approximately 200-300 cats have been reported with rabies annually in the United States
 - The overwhelming majority of rabid dogs and cats are reported from areas in which rabies is endemic in a terrestrial species.
- Over the past 30 years, Colorado has reported only 4 indigenously acquired cases of rabies in domestic animals
 - A cat in 1985 (Grand County) infected with a bat variant virus
 - A cat in 2008 (Cheyenne County) infected with a skunk variant virus
 - A horse and cow in 2009 (El Paso County) infected with a skunk variant
- Over the past 30 years, Colorado has reported 4 cases of imported rabies in domestic animals.
 - An infected dog traveling through the state in 1981

- An infected dog imported from a skunk rabies endemic area in 2003.
 - A steer (2005) and a bull (1991) from states with endemic terrestrial rabies
- The last case of indigenously acquired rabies in a dog occurred in 1974 (El Paso County) in an area where skunk rabies was circulating.
- Over the past 30 years, there have been documented spillover infections from bats to other wildlife species including fox, skunks and a bobcat.
 - Most of these rabid animals were reported from rural counties that had submitted few, if any, specimens for rabies testing over the years.
 - For most of these animals, the infected animal's bizarre behavior prompted it to be tested

In summary, rabies in domestic animals is a rare event in the U.S. and that even in areas with limited surveillance, rabid animals tend to stand out. Most dog and cat bites in Colorado will not require PEP.

Skunk Rabies

- Skunk rabies has probably circulated at low levels on the eastern border of Colorado undetected for many years.
 - The recent western movement of skunk rabies is likely a true expansion
 - From 1988-91 an outbreak of skunk rabies occurred around Wray, Yuma County. No human exposures or spillover to other species were detected.
- Due to resource limitations and the rural nature of eastern Colorado, surveillance will be insufficient to accurately determine where skunk rabies is currently circulating on the eastern plains.
- Based on available surveillance data, a determination should be made if rabies is likely to be circulating in the local skunk population. Local public health can consult with CDPHE to estimate the likelihood that rabies is circulating in a local skunk population. Local public health officials should become familiar with Division of Wildlife and their local animal control agency, staff, and resources, to help assess the level of surveillance present within their jurisdiction.
 - Political boundaries (county line, city limit) may not work well.
 - Example: several rabid skunks have been reported from Lincoln and eastern Arapahoe counties, thus in this area the disease should be considered endemic. However, labeling all of Arapahoe County as an endemic county would not be accurate since no skunk rabies has been reported in the urbanized western half of the county where a reasonable number of specimens have been tested. A PEP recommendation for a dog bite with similar circumstances may be different for the two ends of this county.

Based on distribution of rabid skunks over the past 3 years, skunk rabies should be considered endemic in all eastern plains counties (see map on CDPHE rabies webpage for current distribution of skunk rabies): www.cdphe.state.co.us/dc/zoonosis/rabies, even if no specimens have tested positive from a particular county. Insufficient numbers of skunks have been tested in most counties to be able to exclude the presence of rabies. This would include rural, eastern sections of Front Range counties.

Skunk rabies should NOT be considered to be circulating in Front Range cities along the I-25 corridor from where a reasonable number of samples have been submitted and are negative. In communities where the human and domestic pet population is concentrated (suburban or urban) where veterinary and animal control services are present, if no skunks have tested positive for rabies, it can be assumed that no skunk rabies is present. Additionally, there is no evidence that skunk rabies is present in any areas west of I-25 at this time. These recommendations may be updated as the distribution of skunk rabies changes in Colorado.

PEP Recommendations

- A dog or cat bite in a skunk endemic area is not an automatic indication for PEP. It does, however, increase the probability that a recommendation to initiate PEP will be made when the biting dog or cat is not located.
- For dog and cat bites in areas where skunk rabies is not present, PEP would usually NOT be indicated even if the biting animal is not located unless there were very unusual circumstances surrounding the bite.
- The process for determining whether or not to recommend PEP following an exposure to a dog or cat, as outlined in Human Rabies Prevention – United States, 2008, does not change.
 - Consider circumstances of the bite, animal behavior, penetration of skin, incidence of rabies in the area and availability of the biting animal for testing or observation.
 - Avoid the “What if” game, focus on the known facts.
- The dog or cat bite should be reported to local animal control to attempt to locate the animal for a 10-day observation/quarantine. Dogs or cats that are alive and well following a 10-day quarantine did not have rabies virus

in their saliva at the time of the bite. Alternatively, if a biting animal is euthanized and tests negative for rabies, there is also no chance of rabies virus being present in the saliva at the time of the bite.

- In areas where skunk rabies is considered endemic, and a dog or cat is not available for quarantine or testing, a thorough assessment of the circumstances surrounding the dog or cat bite is essential in assessing the risk for rabies exposure. Examples of key information on circumstances include:
 - health status of biting animal
 - whether biting animal was likely to be owned versus stray, and
 - clues on whether the bite was provoked such as whether there was an attempt by bite victim to handle an unfamiliar dog or cat, startling of animal, or in a dog's territory.These and other clues that the bite was provoked and from a healthy appearing animal decreases the risk of behavioral changes in the animal were due to illness with rabies and decreases the risk of rabies being shed in the saliva at the time of the bite. **A rabies risk assessment algorithm on dog and cat bites is available for local public health agencies.**
- Rabies PEP is a medical urgency: initiation of PEP can be safely delayed for 24-72 hours in low risk bite incidents to facilitate locating the biting animal or get test results
- For low risk bites (see dog and cat bite algorithm), victims should be advised to actively look for the biting animal prior to initiating PEP. This is critical in skunk endemic areas where treatment might be recommended if the animal is not found. The bite victim or family members should not attempt to capture the dog or cat that bit them, to avoid further bites. An exception to this would be when humane traps (e.g. Have a Heart trap) can be rented from local animal control for capturing a stray/feral cat.
 - Report the bite to local animal control
 - Drive or walk in the neighborhood where the bite occurred.
 - Ask the patient if they have ever seen the animal before. If yes, there is a good chance the biting animal can be located.
 - Most bites will be from owned animals that live in the vicinity and were running at large
 - Stray dogs and feral or barn cats often establish a territory and will be seen again, especially if they've had access to food.
 - Visual observation that a biting animal is alive and not exhibiting overt neurological illness several days after a bite incident, even if the animal can not be captured, would argue against the need for PEP ("observation on the run").
- For high risk bites, PEP should be initiated immediately. Treatment can be discontinued following a negative rabies test or locating the biting animal for observation. Circumstances that indicate a high risk for rabies exposure from a dog or cat bite in an area with skunk rabies may include:
 - Abnormal or bizarre behavior (biting at air, attacking inanimate objects)
 - Clinically ill with neurological signs, motor control deficits or overt aggression
 - Unprovoked, sustained attack
 - Owner reports sudden, unexplained behavior changes
 - Owner reports recent contact (within previous 6 months) of pet dog or cat with skunks or bats
- **For dog and cat bites in areas where skunk rabies is endemic, PEP will usually be indicated when the biting animal is not located unless the circumstances suggest a low risk of rabies exposure (see dog and cat bite algorithm for examples).**

Communicating with Bite Victims and Healthcare Providers

- The only zero risk options for a dog or cat bite are: test the biting animal, place the biting animal under 10-day observation or initiate PEP. Locating the biting animal is the best resolution.
- Most dog and cat bites in Colorado will not require PEP.
- Recommendations for PEP are based on the risk assessment of rabies exposure. If a properly conducted assessment indicates very low risk then PEP should not be recommended.

Public health makes PEP recommendations based on the investigation of a bite incident; the physician and patient will ultimately make the final decision. Many healthcare providers are not aware of rabies epidemiology in their area and are not familiar with ACIP recommendations. Therefore, both the victim and their provider should be provided with a clear explanation from public health officials including such information.