

Public Health Brief

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Skunk-Variant Rabies Approaches Denver Metro Area: Important Vaccination and Post-Exposure Prophylaxis Recommendations for Occupational Groups at Risk of Exposure

By Nancy Williams, MD, MPH

Tri-County Health Department (TCHD) has been following the movement of skunk-variant rabies for the past several years in Colorado, where bats had historically been the most important wildlife reservoirs for rabies. However, in 2007, in rural, eastern Colorado, skunk variant rabies emerged among wildlife. In 2010, testing of deceased or euthanized skunks indicated that this rabies variant had nearly reached the suburbs of the Denver metropolitan area. This encroachment of skunk variant rabies on an urban population center is a public health concern. Skunks interact frequently with domestic animals (e.g., cats, horses, dogs) and other animals and the emergence of skunk rabies can put these animals and the humans that interact with them at risk of rabies exposure.

Some of your patients could be at increased occupational risk for exposure to rabies.

Both wild and domestic animals infected with the rabies virus have been detected in the Tri-County area. Skunk variant rabies has been found in far eastern Adams County, less than 25 miles east of the Denver metropolitan area in Arapahoe County and in the outer edges of the Denver suburbs in northeastern Douglas County.

Source: Colorado Department of Public Health and Environment (CDPHE):
http://www.cdphe.state.co.us/dc/zoonosis/rabies/2007_2010_skunkrabies.pdf

Skunk Surveillance in the Tri-County Area

Tri-County Health Department is working with CDPHE, the Colorado Division of Wildlife, and local animal control agencies to perform surveillance for skunk-variant rabies. Wild animals that have bitten domestic animals or that are behaving suspiciously for rabies are being euthanized and tested at the CDPHE laboratory. Recently deceased wildlife are also sometimes tested. CDPHE has been tracking rabies test results. Among 362 rabies-positive animals tested in 2007–2010, 220 (61%) were infected with bat-variant rabies and 142 (39%) were positive for skunk-variant rabies and in 2010 alone, 74 (53%) of 139 rabies-positive animals were infected with skunk-variant rabies.¹ CDPHE mapped the geographic distribution among animals testing positive for skunk-variant rabies January 2007–December 2010 (Figure). To date, only two animals testing positive for skunk-variant rabies have been detected west of I-25 (in El Paso and Larimer Counties). Because skunk-variant rabies-infected animals are expected to become more prevalent and to continue to move toward the Denver metropolitan area,

¹ Through December 28, 2010



CDPHE encourages the reporting of any abnormal skunk behavior (active during daytime, attacking people or pets, aggressive behavior), to local health departments (such as TCHD), animal control agencies or wildlife officials.

Source: CDPHE: <http://www.cdphe.state.co.us/release/2010/081810.pdf>

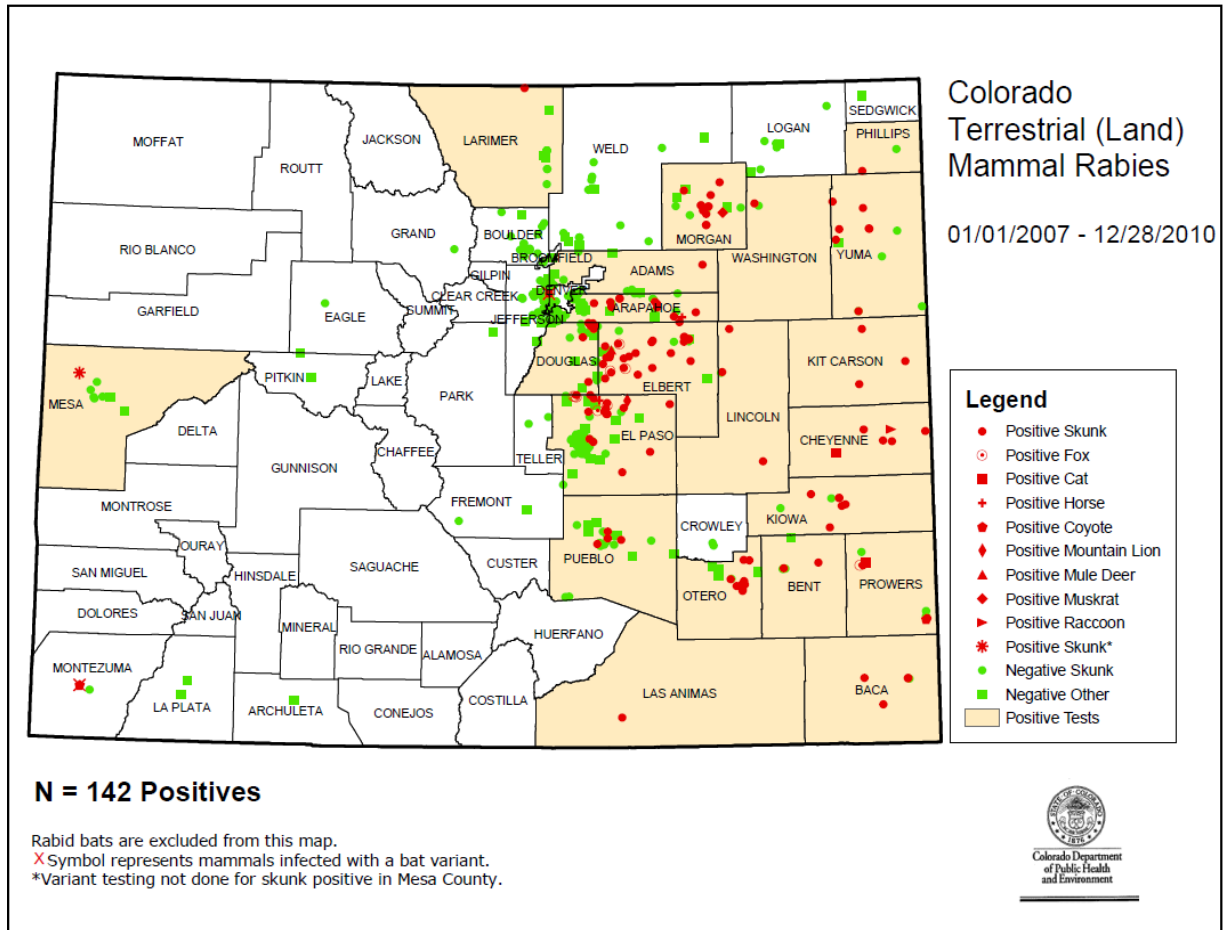


Figure. Locations of animals testing positive for skunk-variant rabies, 2007-2010 — Colorado (regularly updated as more data become available)

Source: CDPHE:

http://www.cdphe.state.co.us/dc/zoonosis/rabies/2007_2010_skunkrabies.pdf

Pre-exposure prophylaxis for High Risk Occupational Groups

According to guidelines published by the Centers for Disease Control and Prevention (CDC), persons in certain high-risk occupations should consider receipt of pre-exposure rabies prophylaxis (Table). The administration of rabies vaccination prior to exposure consists of 3 doses given over the course of 3 to 4 weeks. Pre-exposure vaccination could reduce the cost and extent of post-exposure treatment should a worker have an exposure to rabies. Pre-exposure prophylaxis also has the potential to protect against unrecognized rabies exposures. In general, TCHD



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advises medical providers to know their patients' occupations, to discuss potential for rabies exposure with people working with animals, and to consider administering the pre-exposure vaccination series when significant risk is identified.

Table. Recommendations for pre-exposure vaccination and frequency of titer (serologic) checks

Rabies pre-exposure prophylaxis guide — United States, 2008

Risk Category	Nature of Risk	Typical populations	Pre-exposure recommendations
Continuous	Virus present continuously, often in high concentrations. Specific exposures likely to go unrecognized. Bite, nonbite, or aerosol exposure.	Rabies research laboratory workers; rabies biologics production workers.	Primary course. Serologic testing every 6 months; booster vaccination if antibody titer is below acceptable level.*
Frequent	Exposure usually episodic, with source recognized, but exposure also might be unrecognized. Bite, nonbite, or aerosol exposure.	Rabies diagnostic laboratory workers, cavers, veterinarians and staff, and animal-control and wildlife workers in areas where rabies is enzootic. All persons who frequently handle bats.	Primary course. Serologic testing every 2 years; booster vaccination if antibody titer is below acceptable level.*
Infrequent (greater than population at large)	Exposure nearly always episodic with source recognized. Bite or nonbite exposure.	Veterinarians and animal-control staff working with terrestrial animals in areas where rabies is uncommon to rare. Veterinary students. Travelers visiting areas where rabies is enzootic and immediate access to appropriate medical care including biologics is limited.	Primary course. No serologic testing or booster vaccination.
Rare (population at large)	Exposure always episodic with source recognized. Bite or nonbite exposure.	U.S. population at large, including persons in areas where rabies is epizootic.	No vaccination necessary

* Minimum acceptable antibody level is complete virus neutralization at a 1:5 serum dilution by the rapid fluorescent focus inhibition test. A booster dose should be administered if the titer falls below this level.

Source: CDC: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr57e507a1.htm>



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High risk occupations are those that involve contact with animals at risk for rabies, or contact with the rabies virus itself. These occupations include, but are not limited to, persons in the following groups if they handle animals:

- Veterinarians
- Veterinary technicians and other veterinary staff
- Animal Control officers
- Division of Wildlife employees
- Park service employees
- Animal Trappers/Pest Control workers
- Certain laboratorians and rabies researchers

The most commonly identified high risk occupations include animal control workers, veterinarians and their staff, division of wildlife employees, rabies researchers, and certain laboratory workers. However, animal trappers are another important and often overlooked occupational group that also works with potentially rabid animals. They might refer to their occupation as “pest control”. In 2010, TCHD conducted a survey of 57 pest control companies in our jurisdiction, and 22 (39%) reported trapping animals at risk for rabies. Of those, only 6% had written vaccination policies and 33% of individual trappers reported being vaccinated. Many of the unvaccinated trappers are sole proprietors. Additionally, while 89% reported having personal protective equipment and animal-handling policies, few (41%) had those policies in writing. Only 19% of respondents reported recent rabies education of themselves or their employees. Therefore, TCHD strongly encourages healthcare providers to consider rabies vaccination for patients who work in this industry.

Rabies Titers:

For patients who have received rabies vaccination, the frequency of recommended checking of rabies titers varies depending on the patient’s risk (Table).

Most people with occupational exposure to animals should have their titers checked every two years.

If the titer is low² the patient should then receive a single booster dose of vaccine. If the titer is adequate, then no further action is needed at that time. Giving a booster dose of vaccine without checking the antibody titer first is not recommended.

Source: CDC: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr57e507a1.htm>

Source: CDC: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr57e507a1.htm#tab6>

² Rabies titer should not be less than complete neutralization at a 1:5 serum dilution by the rapid fluorescent focus inhibition test (RFFIT)

Post-Exposure Prophylaxis (PEP)

Performing a medical evaluation of a patient who has had contact with a potentially rabid animal is important, but the decision about whether to administer PEP can be complicated. Rabies PEP is a valuable and effective tool in the prevention of this disease. However, the completion of a PEP series can place a large financial and logistical burden on patients. The decision to initiate rabies PEP often requires the assessment of multiple variables. If you are not sure whether rabies PEP is indicated for your patient, please contact Tri-County Health Department at the numbers given below.

Exposure outside the occupational setting:

Although the probability of persons in certain high-risk occupations being exposed to rabies is the greatest, anyone can be exposed. Please remember to assess rabies risk factors when patients report animal bites, handling ill-appearing animals, or finding bats in their homes.

Tri-County Health Department is always available to help determine whether rabies post-exposure prophylaxis is indicated after human exposure to a domestic or wild animal.

**Call a TCHD Disease Intervention Specialist at 303-220-9200 during normal business hours.
For after-hours service, please page 303-461-2342.**

Clinical References and Resources

Preexposure vaccination and booster recommendations

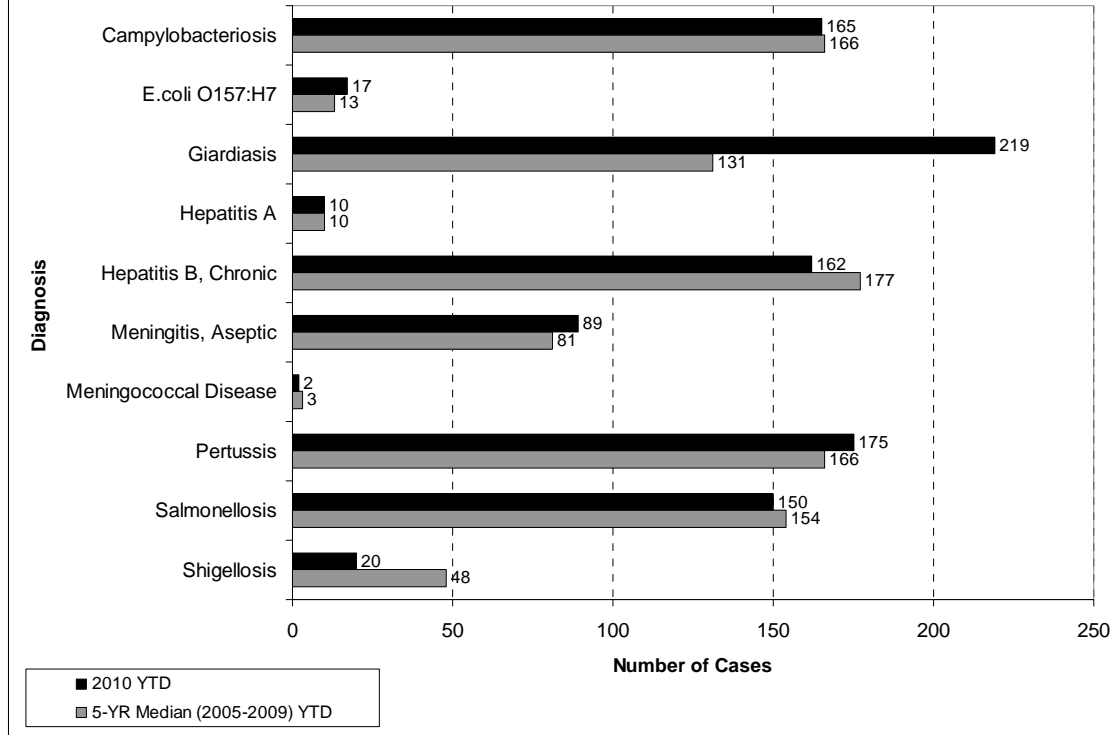
1. Centers for Disease Control and Prevention. *Human Rabies Prevention—United States, 2008: Recommendations of the Advisory Committee on Immunization Practices*. MMWR, May 7, 2008 / 57(Early Release);1-26,28.
www.cdc.gov/mmwr/preview/mmwrhtml/rr57e507a1.htm

Postexposure vaccination and booster recommendations

1. Centers for Disease Control and Prevention. *Use of a Reduced (4-Dose) Vaccine Schedule for Postexposure Prophylaxis to Prevent Human Rabies: Recommendations of the Advisory Committee on Immunization Practices*. MMWR, March 19, 2010 / Vol. 59 / No. RR-2: 1-8:
www.cdc.gov/mmwr/pdf/rr/rr5902.pdf
2. Colorado Department of Public Health and Environment. *Determining the Need for Rabies Post-Exposure Prophylaxis Following a Dog or Cat Bite in Colorado* (updated November 18, 2009):
www.cdphe.state.co.us/dc/zoonosis/rabies/dog%20or%20cat%20bite%20exposure.pdf
3. Centers for Disease Control and Prevention. (Recommended medical care following rabies exposure): http://www.cdc.gov/rabies/medical_care/vaccine.html



**Selected Diseases by Date of Report
Adams, Arapahoe, and Douglas Counties
2010 Year-to-Date through December**



For more information or questions, please contact:

Colorado Department of Public Health and Environment:
 (303) 692-2700 / (303) 370-9395 (after hours)
 Fax: (303) 782-0338
 or
 Tri-County Health Department:
 (303) 220-9200 / (303) 461-2342 (after hours)
 Fax: (303) 220-9208



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