

Rabies

Neil W. Dyer

DVM, DACVP

Director, NDSU Diagnostic Laboratory

Charles L. Stoltenow

DVM, DACVPM

Extension Veterinarian

Rabies is a fatal viral infection. Transmission of rabies almost always occurs by a saliva-laden bite. Infection through fresh wounds or mucous membranes is less likely but possible. Because the virus travels along nervous tissue, blood-borne spread of rabies is very unusual.

Droplet infection (aerosol) is possible, particularly in congregations of cave-dwelling bats where saliva droplets are dispersed in the air.

The virus may be present in saliva three to five days (domestic dogs and cats) and up to eight days (skunks) before clinical signs are observed. From the time of the bite, signs of disease typically occur in 14 to 90 days, but the incubation period can vary considerably. Reports from available literature documents incubation periods as short as nine days and as long as seven years. This variability is due to a variety of factors such as the location of the wound, severity of the wound, distance from the brain, and amount and strain of virus introduced.

The virus remains at the bite site for a considerable amount of time where it replicates in muscle cells and then travels along nerves to the spinal cord and brain. From the brain, the virus travels to salivary glands, where it can be transmitted through a bite.

Infection is characterized by apprehension, excitability, headache, fever, malaise and sensory changes at the bite site. As the disease progresses there is paralysis, difficulty swallowing, delirium and convulsions. Paralysis, coma and death (usually two to seven days after clinical signs of disease are observed) are the eventual end. Death is usually due to respiratory failure.

Rabies has a worldwide distribution and can potentially infect any warm-blooded animal. In the United States,

the virus is perpetuated in wildlife. In the northern Great Plains, specifically North Dakota, skunks are the primary carrier. Rabid skunks frequently undergo a behavioral change that increases potential human exposure. Rabies must be considered in any animal that shows signs of nervous system disease. Behavioral change and unexplained paralysis should create a high level of suspicion. Anorexia, apprehension, nervousness, irritability, hyperexcitability, isolation, in-coordination, altered vocalization, changes in temperament, and uncharacteristic aggressiveness are all warning signs of rabies.

The disease in humans and animals

- Rabies exists in both furious and dumb (or paralytic) forms.
 - In furious rabies, the animal is irrational and will attack other animals, people or moving objects at the slightest provocation or noise. Animals assume an alert posture and expression with dilated pupils, and may chew or swallow foreign objects. Muscular incoordination, paralysis and death follow.
 - In dumb rabies there is paralysis of the throat and jaw muscles, profuse salivation and difficulty swallowing (hydrophobia). The jaw may be dropped. Death eventually occurs as well.

SEPTEMBER 2001



North Dakota State University
 Fargo, North Dakota 58105

EXPOSURE POINTS!

Rabid animals with oral abnormalities such as paralysis or difficulty chewing or swallowing are sometimes examined by owners and veterinarians for a foreign object or the purpose of administering medication — thus creating exposure to the infective saliva.

Symptoms

- Cattle with the furious form will attack. Animals are alert and there is intermittent bellowing.
- Horses show distress and agitation. They may roll and create the impression of an episode of colic, or attempt to strike or bite.
- Foxes and coyotes may invade yards or homes and attack pets or people.
- Raccoons and skunks are fearless, sometimes ataxic (uncoordinated), aggressive and become active during the day. They may attack domestic pets. The rabies virus has not been isolated from skunk spray.
- Bats may be seen during the daytime, resting on the ground, or attacking people and animals.
- Rodents and lagomorphs (rabbits) are rarely rabid, but each case should be evaluated on an individual basis.

Prevention

- Do not perform oral examinations on animals which appear to have difficulty chewing or swallowing, show any type of oral or facial paralysis, or show excessive salivation.
- Make sure companion animals are current on their rabies vaccinations. Licensed vaccines are available for dogs, cats, ferrets and horses.
- Contact your physician immediately if there is any question of human rabies exposure.
- Contact local animal control authorities and avoid contact with skunks or raccoons are seen during daytime in unusual locations.

Testing

- Microscopic examination of tissue can lead a pathologist to suspect rabies, but a 100 percent diagnosis cannot be made on that alone. The definitive and most common method of diagnosis is called the fluorescent antibody (FA) test, and it is very effective. If results are inconclusive, alternative tests are available.
- Whenever a HUMAN exposure is involved, brain tissue must be examined at the North Dakota Public Health Laboratory, 1205 Avenue A West, Bismarck, ND 58501. The phone number is (701) 328-5262.

- Suspected rabies cases not associated with human exposure are examined only at the North Dakota State University, Veterinary Diagnostic Laboratory, Fargo, ND 58105. The phone number is (701) 231-8307.
- There is no difference in the quality and type of processing at either laboratory, but state law requires human cases be processed at the Public Health Laboratory.

Number of non-human exposure rabies cases in North Dakota since 1984.

1984	138	1992	160
1985	151	1993	57
1986	163	1994	14
1987	129	1995	32
1988	105	1996	76
1989	58	1997	91
1990	97	1998	155
1991	107	1999	147

For more information on this and other topics, see: www.ag.ndsu.nodak.edu

