

The Bite That Kills

There are few diseases as uniformly fatal as rabies. Although very aggressive symptomatic treatment has been reported to result in some survivors, the vast majority of human infections result in painful death.

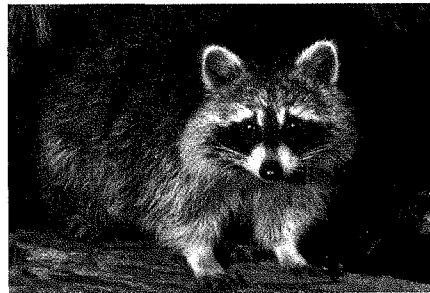
Rabies is caused by an RNA virus with a predilection for the nervous system of mammals. The virus is transmitted through saliva, virtually always from the

bite of an infected animal. Although the incubation period averages a few weeks, it can range from days to years. Once the virus has settled in the brain and symptoms such as behavior change and seizures begin, virtually no treatment is successful. On the other hand, if an injury carrying a risk of rabies is recognized and treated immediately, it is almost always possible to prevent infection.

The first step in prevention is recognizing the types of exposures that carry risk. Although most mammals, in theory, can carry rabies, bats, skunks, raccoons, and foxes are the most common. The latter three account for most positive animals studied by the New York State Health Department laboratories, but that may be because bats are less likely to be captured and submitted for testing. Throughout the country, the vast majority of confirmed human cases have resulted from bat exposure.

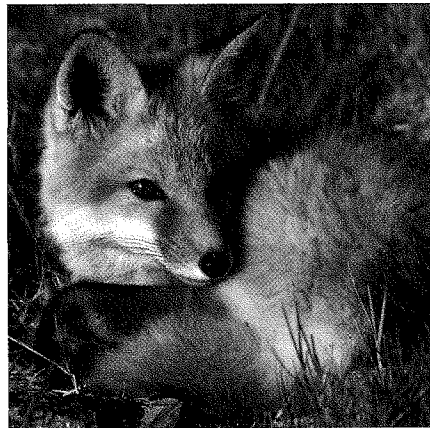
The most dangerous exposures are actual bites, where the animal inflicts injury that can be contaminated with saliva. Exposure of saliva to existing skin wounds, or to mucous membranes such as the eyes, is also a risk, albeit far less.

The first step after such an injury is ensuring that the patient and those around him or her do not become bitten again. In the front country, this usually involves summoning law enforcement to identify and secure the animal for study. This, of course, is rarely an option in the backcountry, particularly if the exposure is from a bat.



Raccoon and fox photographs by Gerry Lemmo

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Vigorous soap and water cleansing of the injury is the next step. While this is the case for any wound, it is particularly important in the case of an animal bite. No attempt should be made to close the wound in the field.

The next step is getting the patient to a physician or emergency department. The provider there will almost assuredly contact the local or state

health department, since the next steps vary considerably with geographic location and type of animal.

If it is determined that the injury presents a real risk of rabies, there is a standardized protocol for prevention which is virtually always effective. First of all, the patient is given an injection of antibodies against the virus, called rabies immune globulin. If possible, this is injected directly into the wound. These antibodies can attack and neutralize the virus as soon as they contact it.

At the same time, the patient is given the first of four doses of rabies vaccine. The vaccine does not attack the virus directly, but stimulates the patient's own immune system to produce antibodies. Three additional doses of vaccine are given over the next two weeks.

Rabies vaccine may also be used by individuals at high risk for exposure to the virus, such as animal handlers, veterinarians, or spelunkers. Even if one has previously received rabies vaccine, a physician should be consulted after exposure and additional booster doses may be recommended.

There is an interesting history to all of this. Louis Pasteur, the great French microbiologist, developed the first rabies vaccine and successfully used it on a child in 1885. Early forms of the vaccine were not very pure, and were associated with extremely painful local reactions. Somehow, the notion that rabies vaccine is excruciatingly painful has persisted. Actually, modern rabies vaccines are no more painful than a flu shot.



Tom Welch, MD, is professor and chair of pediatrics at Upstate Medical University in Syracuse and an active member of the Wilderness Medical Society. He is a licensed professional guide and a certifying instructor for the Wilderness Education Association, and has guided groups in the Adirondacks, Montana, and Alaska. More information is available at his website and blog: www.adirondoc.com. Infectious disease specialist Leonard Weiner, MD, reviewed this column and provided helpful comments.