

## Commissioner's Corner

### Rabies Prevention

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Rabies is an acute viral infection of mammals caused by serotype 1 of the genus *Lyssavirus*, family Rhabdoviridae. This virus attacks the central nervous system causing a multitude of symptoms including irritability, anxiety, headache, fever, and muscle spasms, especially of the throat muscles. Ultimately, paralysis, convulsions, delirium and death occur. The symptoms usually last from two to six days during which time the patient is often conscious and aware.

The incubation period for rabies in humans ranges from ten days to eight months, depending on the location of the injuries and the amount of virus entering the wound. Generally, the further the wound is from the central nervous system the longer the incubation period.

It is also possible to develop rabies without a bite wound. The contamination of wounds, mucous membranes and scratches with saliva and nervous tissue may be considered a rabies exposure and requires further evaluation. Other non-bite exposures that have resulted in human rabies include exposure to extensive amounts of aerosolized rabies virus (in the lab or in bat caves) and corneal or organ transplants from an infected donor.

The most recent cases in organ recipients occurred in May 2004. One of the recipients died of intraoperative complications. The remaining four recipients (one iliac artery, one liver and two kidneys) died of rabies less than 30 days after transplant. For a detailed discussion of these cases visit [www.cdc.gov/mmwr/preview/mmwrhtml/mm53d709.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm53d709.htm).

Rabies virus is highly susceptible to dessication. Therefore if the substance containing the virus is dry, the rabies virus is inactivated.

Although it is possible for any mammal to acquire rabies, those most commonly found with the disease in the United States are raccoons, bats, foxes, skunks, and coyotes. Although not common, rabies has occurred in deer, otters, woodchucks, opossum, and rabbits.

In Westchester County prior to 1991, there were fewer than five rabid animals discovered in any given year; all were bats. With the incursion of the raccoon strain of rabies, the number and variety of rabid animals in the county increased dramatically. Since 1991, when Westchester County had its first case of terrestrial rabies, a total of 711 animals has tested positive for rabies. Of these, 92 were bats and the remainder were terrestrial animals (including 385 raccoons, 188 skunks and 24 cats). During 2004, 686 animals from Westchester County were tested for rabies. A total of 46 of these were found to be rabid.

Human rabies in the U.S. is usually associated with the bat strain of rabies. The most current data from the Centers for Disease Control show that from 1990 through 2000 there were 32 cases of human rabies in the U.S., 26 of which were acquired in this country. Twenty-four of the U.S. acquired cases were due to bat rabies. Fifteen of the bat rabies cases (including two from New York State) were from unknown exposures. In other words, the patient was not aware of a bat bite or contact.

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The Advisory Committee on Immunization Practices has revised its guidelines and now requires the rabies post-exposure prophylaxis of anyone who had contact with a bat, or who discovered a bat in the room where he or she had been sleeping, whether or not there is evidence of a bite. The complete Recommendations and Report for Human Rabies Prevention published in the MMWR is available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/00056176.htm>.

There are currently only six documented cases of patients surviving clinical rabies. The most recent case involved a 15-year-old Wisconsin girl who was bitten by a bat in September 2004. She is the first person to survive rabies without receiving pre- or post- exposure rabies prophylaxis. Instead, the patient underwent experimental treatment involving a drug-induced coma and anesthetic and antiviral drugs. Although, she has sequelae involving balance, speech and muscle control, therapy is ongoing and she has been able to return to high school on a very limited basis. For a complete summary of this case visit the Centers for Disease Control website at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5350a1.htm>.

Prior to this case, the fatality rate in patients without a history of rabies vaccination was 100%. To date, only one of the six documented rabies survivors has recovered completely.

Post-mortem rabies diagnosis is performed by microscopic examination of fresh brain tissue via an immunofluorescence staining technique. Results are confirmed by virus isolation in a cell culture system. Blood serum, nuchal skin, cerebrospinal fluid, and saliva are used to diagnose rabies in clinically ill humans.

In addition to the cost in human lives lost to rabies, there is also a financial cost in providing rabies post-exposure prophylaxis to those who have been exposed to known or suspect rabid animals. In Westchester County during 2004 alone, 432 people received rabies post-exposure prophylaxis at a cost of approximately \$432,000.

There is also a cost to the owners of pets exposed to known or suspect rabid animals. These pets may have to be placed in a strict 6-month quarantine enclosure, given rabies booster shots or possibly euthanized.

Westchester physicians have an important role to play in providing information to their patients on rabies prevention and may be called upon to provide pre-exposure rabies prophylaxis for those whose activities put them at risk for rabies, such as veterinarians, wildlife trappers, animal shelter workers, and animal control officers. Physicians are also required to report any known or suspect rabies exposures, including but not limited to animal bites or scratches, to the Westchester County Department of Health by calling 914-813-5000 (24 hours per day, 7 days per week). ♦

