

General Questions & Answers About Rabies

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Pets

How can I protect my pet from rabies?

There are several things you can do to protect your pet from rabies. First, visit your veterinarian with your pet on a regular basis and keep rabies vaccinations up-to-date for all cats, ferrets, and dogs. Second, maintain control of your pets by keeping cats and ferrets indoors and keeping dogs under direct supervision. Third, spay or neuter your pets to help reduce the number of unwanted pets that may not be properly cared for or vaccinated regularly. Lastly, call animal control to remove all stray animals from your neighborhood since these animals may be unvaccinated or ill.



Why does my pet need the rabies vaccine?

Although the majority of rabies cases occur in wildlife, most humans are given rabies vaccine as a result of exposure to domestic animals. This explains the tremendous cost of rabies prevention in domestic animals in the United States. While wildlife are more likely to be rabid than are domestic animals in the United States, the amount of human contact with domestic animals greatly exceeds the amount of contact with wildlife. Your pets and other domestic animals can be infected when they are bitten by rabid wild animals. When "spillover" rabies occurs in domestic animals, the risk to humans is increased. Pets are therefore vaccinated by your veterinarian to prevent them from acquiring the disease from wildlife, and thereby transmitting it to humans.



What happens if a neighborhood dog or cat bites me?

You should seek medical evaluation for any animal bite. However, rabies is uncommon in dogs, cats, and ferrets in the United States. Very few bites by these animals carry a risk of rabies. If the cat (or dog or ferret) appeared healthy at the time you were bitten, it can be confined by its owner for 10 days and observed. No anti-rabies prophylaxis is needed. No person in the United States has ever contracted rabies from a dog, cat or ferret held in quarantine for 10 days.

If a dog, cat, or ferret appeared ill at the time it bit you or becomes ill during the 10 day quarantine, it should be evaluated by a veterinarian for signs of rabies and you should seek medical advice about the need for anti-rabies prophylaxis.

The quarantine period is a precaution against the remote possibility that an animal may appear healthy, but actually be sick with rabies. To understand this statement, you have to

understand a few things about the pathogenesis of rabies (the way the rabies virus affects the animal it infects). From numerous studies conducted on rabid dogs, cats, and ferrets, we know that rabies virus inoculated into a muscle travels from the site of the inoculation to the brain by moving within nerves. The animal does not appear ill during this time, which is called the incubation period and which may last for weeks to months. A bite by the animal during the incubation period does not carry a risk of rabies because the virus is not in saliva. Only late in the disease, after the virus has reached the brain and multiplied there to cause an encephalitis (or inflammation of the brain), does the virus move from the brain to the salivary glands and saliva. Also at this time, after the virus has multiplied in the brain, almost all animals begin to show the first signs of rabies. Most of these signs are obvious to even an untrained observer, but within a short period of time, usually within 3 to 5 days, the virus has caused enough damage to the brain that the animal begins to show unmistakable signs of rabies. As an added precaution, the quarantine period is lengthened to 10 days.

For more information on recommendations about biting incidences, quarantine, and postexposure prophylaxis (PEP), see: Compendium of Animal Rabies Control, 2000 and Rabies Prevention - United States, 1999 Recommendations of the Immunization Practices Advisory Committee (ACIP).

For more information on dog bites, please see the bibliography maintained by the National Center for Injury Prevention and Control.



What happens if my pet (cat, dog, ferret) is bitten by a wild animal?

Any animal bitten or scratched by either a wild, carnivorous mammal or a bat that is not available for testing should be regarded as having been exposed to rabies. Unvaccinated dogs, cats, and ferrets exposed to a rabid animal should be euthanized immediately. If the owner is unwilling to have this done, the animal should be placed in strict isolation for 6 months and vaccinated 1 month before being released. Animals with expired vaccinations need to be evaluated on a case-by-case basis. Dogs and cats that are currently vaccinated are kept under observation for 45 days.

For information on rabies in domestic ferrets, see: Niezgoda, M., Briggs, D. J., Shaddock, J., Dreesen, D. W., & Rupprecht, C. E. (1997). Pathogenesis of experimentally induced rabies in domestic ferrets. *American Journal of Veterinary Research*, 58(11), 1327-1331.



I am moving to a rabies-free country and want to take my pets with me. Where can I get more information?

The details of regulation about importing pets into rabies-free countries vary by country. Check with the embassy of your destination country.



Human Rabies

How do people get rabies?

People usually get rabies from the bite of a rabid animal. It is also possible, but quite rare, that people may get rabies if infectious material from a rabid animal, such as saliva, gets directly into their eyes, nose, mouth, or a wound.



Can I get rabies in any way other than an animal bite?

Non-bite exposures to rabies are very rare. Scratches, abrasions, open wounds, or mucous membranes contaminated with saliva or other potentially infectious material (such as brain tissue) from a rabid animal constitute non-bite exposures. Occasionally reports of non-bite exposure are such that postexposure prophylaxis is given.

Inhalation of aerosolized rabies virus is also a potential non-bite route of exposure, but other than laboratory workers, most people are unlikely to encounter an aerosol of rabies virus.

Other contact, such as petting a rabid animal or contact with the blood, urine or feces (e.g., guano) of a rabid animal, does not constitute an exposure and is not an indication for prophylaxis.



How soon after an exposure should I seek medical attention?

Medical assistance should be obtained as soon as possible after an exposure. There have been no vaccine failures in the United States (i.e., someone developed rabies) when postexposure prophylaxis (PEP) was given promptly and appropriately after an exposure.



What medical attention do I need if I am exposed to rabies?

One of the most effective methods to decrease the chances for infection involves thorough washing of the wound with soap and water. Specific medical attention for someone exposed to rabies is called postexposure prophylaxis or PEP. In the United States, postexposure prophylaxis consists of a regimen of one dose of immune globulin and five doses of rabies vaccine over a 28-day period. Rabies immune globulin and the first dose of rabies vaccine should be given by your health care provider as soon as possible after exposure. Additional doses of rabies vaccine should be given on days 3, 7,

14, and 28 after the first vaccination. Current vaccines are relatively painless and are given in your arm, like a flu or tetanus vaccine.



Will the rabies vaccine make me sick?

Adverse reactions to rabies vaccine and immune globulin are not common. Newer vaccines in use today cause fewer adverse reactions than previously available vaccines. Mild, local reactions to the rabies vaccine, such as pain, redness, swelling, or itching at the injection site, have been reported. Rarely, symptoms such as headache, nausea, abdominal pain, muscle aches, and dizziness have been reported. Local pain and low-grade fever may follow injection of rabies immune globulin.



What if I cannot get rabies vaccine on the day I am supposed to get my next dose?

Consult with your doctor or state or local public health officials for recommended times if there is going to be a change in the recommended schedule of shots. Rabies prevention is a serious matter and changes should not be made in the schedule of doses.



Can rabies be transmitted from one person to another?

The only well-documented documented cases of rabies caused by human-to-human transmission occurred among 8 recipients of transplanted corneas, and recently among three recipients of solid organs (see MMWR article). Guidelines for acceptance of suitable cornea and organ donations, as well as the rarity of human rabies in the United States, reduce this risk. In addition to transmission from cornea and organ transplants, bite and non-bite exposures inflicted by infected humans could theoretically transmit rabies, but no such cases have been documented. Casual contact, such as touching a person with rabies or contact with non-infectious fluid or tissue (urine, blood, feces) does not constitute an exposure and does not require postexposure prophylaxis. In addition, contact with someone who is receiving rabies vaccination does not constitute rabies exposure and does not require postexposure prophylaxis.

For more information on person-to-person transmission of rabies, see: Fekadu, M., Endeshaw, T., Alemu, W., Bogale, Y., Teshager, T., & Olson, J. G. (1996). Possible human-to-human transmission of rabies in Ethiopia. *Ethiopia Medical Journal*, 34, 123-127.



Wild Animals

What animals get rabies?

Any mammal can get rabies. The most common wild reservoirs of rabies are raccoons, skunks, bats, foxes, and coyotes. Domestic mammals can also get rabies. Cats, cattle, and dogs are the most frequently reported rabid domestic animals in the United States.



How can I find out what animals have rabies in my area?

Each state collects specific information about rabies, and is the best source for information on rabies in your area. In addition, the CDC publishes rabies surveillance data every year for the United States. The report, entitled Rabies Surveillance in the United States, contains information about the number of cases of rabies reported to CDC during the year, the animals reported rabid, maps showing where cases were reported for wild and domestic animals, and distribution maps showing outbreaks of rabies associated with specific animals. A summary of the report can be found in the Epidemiology section of this web site.



What is the risk of rabies from squirrels, mice, rats, and other rodents?

Small rodents (such as squirrels, rats, mice, hamsters, guinea pigs, gerbils, and chipmunks,) and lagomorphs (such as rabbits and hares) are almost never found to be infected with rabies and have not been known to cause rabies among humans in the United States. Bites by these animals are usually not considered a risk of rabies unless the animal was sick or behaving in any unusual manner and rabies is widespread in your area. However, from 1985 through 1994, woodchucks accounted for 86% of the 368 cases of rabies among rodents reported to CDC. Woodchucks or groundhogs (*Marmota monax*) are the only rodents that may be frequently submitted to state health department because of a suspicion of rabies. In all cases involving rodents, the state or local health department should be consulted before a decision is made to initiate postexposure prophylaxis (PEP).

For more information about rabies in rodents and lagomorphs, see: Childs, J. E., Colby, L., Krebs, J. W., Strine, T., Feller, M., Noah, D., Drenzek, C., Smith, J.S., & Rupprecht, C. E. (1997). Surveillance and spatiotemporal associations of rabies in rodents and lagomorphs in the United States, 1985-1994. *Journal of Wildlife Diseases*, 33(1), 20-27.



Bats & Rabies

See also Q & A about Rabies and Bats and Summer Camps.

Do bats get rabies?

Yes. Bats are mammals and are susceptible to rabies, but most do not have the disease. You cannot tell if a bat has rabies just by looking at it; rabies can be confirmed only by having the animal tested in a laboratory. To minimize the risk for rabies, it is best never to handle any bat.



What should I do if I come in contact with a bat?

If you are bitten by a bat -- or if infectious material (such as saliva) from a bat gets into your eyes, nose, mouth, or a wound -- wash the affected area thoroughly and get medical attention immediately. Whenever possible, the bat should be captured and sent to a laboratory for rabies testing.

People usually know when they have been bitten by a bat. However, because bats have small teeth which may leave marks that are not easily seen, there are situations in which you should seek medical advice even in the absence of an obvious bite wound. For example, if you awaken and find a bat in your room, see a bat in the room of an unattended child, or see a bat near a mentally impaired or intoxicated person, seek medical advice and have the bat tested.

People cannot get rabies just from seeing a bat in an attic, in a cave, or at a distance. In addition, people cannot get rabies from having contact with bat guano (feces), blood, or urine, or from touching a bat on its fur (even though bats should never be handled!).



What should I do if I find a bat in my home?

If you see a bat in your home and you are sure no human or pet exposure has occurred, confine the bat to a room by closing all doors and windows leading out of the room except those to the outside. The bat will probably leave soon. If not, it can be caught, as described below, and released outdoors away from people and pets.

However, if there is any question of exposure, leave the bat alone and call animal control or a wildlife conservation agency for assistance. If professional assistance is unavailable, use precautions to capture the bat safely, as described below.

What you will need:

- leather work gloves (put them on)
- small box or coffee can
- piece of cardboard
- tape

When the bat lands, approach it slowly and place a box or coffee can over it. Slide the cardboard under the container to trap the bat inside. Tape the cardboard to the container securely. Contact your health department or animal control authority to make arrangements for rabies testing.



How can I tell if a bat has rabies?

Rabies can be confirmed only in a laboratory. However, any bat that is active by day, is found in a place where bats are not usually seen (for example in rooms in your home or on the lawn), or is unable to fly, is far more likely than others to be rabid. Such bats are often the most easily approached. Therefore, it is best never to handle any bat.



Travel

Should I be concerned about rabies when I travel outside the United States?

Yes. Rabies and the rabies-like viruses can occur in animals anywhere in the world. In most countries, the risk of rabies in an encounter with an animal and the precautions necessary to prevent rabies are the same as they are in the United States. When traveling, it is always prudent to avoid approaching any wild or domestic animal.

The developing countries in Africa, Asia, and Latin America have additional problems in that dog rabies is common there and preventive treatment for human rabies may be difficult to obtain. The importance of rabid dogs in these countries, where tens of thousands of people die of the disease each year, cannot be overstated. Unlike programs in developed countries, dog rabies vaccination programs in developing countries have not always been successful. Rates of postexposure prophylaxis in some developing countries are about 10 times higher than in the United States, and rates of human rabies are sometimes 100 times higher. Before traveling abroad, consult a health care provider, travel clinic, or health department about your risk of exposure to rabies and how to handle an exposure should it arise.



Should I receive rabies preexposure vaccination before traveling to other countries?

In most countries, the risk of rabies and the precautions for preventing rabies are the same as they are in the United States. However, in some developing countries in Africa, Asia, and Latin America, dog rabies may be common and preventive treatment for rabies may be difficult to obtain. If you are traveling to a rabies-endemic country, you should consult your health care provider about the possibility of receiving preexposure vaccination against rabies. Preexposure vaccination is suggested if:

1. Your planned activity will bring you into contact with wild or domestic animals (for example, biologists, veterinarians, or agriculture specialists working with animals).
2. You will be visiting remote areas where medical care is difficult to obtain or may be delayed (for example, hiking through remote villages where dogs are common).
3. Your stay is longer than 1 month in an area where dog rabies is common (the longer you stay, the greater the chance of an encounter with an animal).



If I get preexposure vaccination before I travel, am I protected if I am bitten?

No. Preexposure prophylaxis is given for several reasons. First, although preexposure vaccination does not eliminate the need for additional therapy after a rabies exposure, it simplifies therapy by eliminating the need for human rabies immune globulin (HRIG) and decreasing the number of doses needed—a point of particular importance for persons at high risk of being exposed to rabies in areas where immunizing products may not be readily available. Second, it may protect persons whose postexposure therapy might be delayed. Finally, it may provide partial protection to persons with inapparent exposures to rabies.



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