
Rabies: Questions and Answers

Information about the disease and vaccines

What causes rabies?

Rabies is caused by a virus. The virus invades the central nervous system and disrupts its functioning.

How does rabies spread?

The rabies virus is transmitted in the saliva of infected animals. People usually become infected with the virus by being bitten by an infected animal, but any contact with the saliva of an infected animal (alive or dead) can potentially lead to infection if the person has an opening in the skin or the saliva gets into their eyes, nose, or mouth.

You cannot get rabies from the blood, urine, or feces of a rabid animal, or from just touching or petting an animal.

How long does it take to show signs of rabies after being exposed?

For rabies, the incubation period is more variable than with other infections. The incubation period in humans is usually several weeks to months, but ranges from days to years.

What are the symptoms of rabies?

The rabies virus attacks the nervous system (brain and spinal cord). The first symptoms of rabies are similar to a flu-like illness--fever, headache, and general discomfort. Within days, the disease can progress to symptoms such as anxiety, confusion, agitation, abnormal behavior, delirium, and hallucinations.

Once symptoms appear, the disease is almost always fatal. Therefore, any person who has been bitten, scratched, or somehow exposed to the saliva of a potentially rabid animal should see a physician as soon as possible for postexposure treatment.

How serious is rabies?

Rabies is an extremely painful and deadly disease. As mentioned above, if prompt and appropriate post-exposure treatment is not received, the disease is fatal. Each year rabies kills approximately 50,000 people around the world. Deaths from rabies are rare in the United States because of the wide availability of rabies vaccine and rabies immune globulin.

What should I do if a neighborhood dog bites my child?

Rabies is not common in dogs, cats, ferrets, and livestock in the United States because most are vaccinated against rabies. However, you should get medical

attention for any animal bite. If the pet appeared healthy at the time your child was bitten, it can be confined for 10 days and observed; no anti-rabies treatment need be given to your child. If the pet appeared ill at the time it bit your child, it should be evaluated by a veterinarian for signs of rabies. Your physician will be able to give you more specific advice for your situation.

If rabies isn't common in U.S. dogs and cats anymore, is there anything to worry about?

Unfortunately, the rabies hosts have changed from domestic animals to wild ones. Before 1960, the majority of rabies cases in the United States involved domestic animals; now more than 90% of all animal cases reported to the Centers for Disease Control and Prevention occur in wildlife.

What animals usually get infected with rabies?

Wild animals accounted for 92% of reported cases of rabies in 2006. Raccoons continued to be the most frequently reported rabid wildlife species (37.7% of all animal cases during 2006), followed by bats (24.4%), skunks (21.5%), foxes (6.2%), and other wild animals (0.6%).

While rabies is not commonly found in rabbits, squirrels, and rodents, any mammal can be infected by rabies.

On a camping trip we woke up to find a bat in our tent. Should we have been concerned?

Yes. Because bats have small teeth and claws, it is possible to be bitten by a bat and not know it. Therefore, if you find you've been sleeping in the same room with a bat you should see a doctor as soon as possible. This also applies if a bat is found in a room with a child or a mentally impaired or intoxicated person.

The bat should be tested for rabies if possible. Call animal control or a wildlife conservation officer for help in capturing the bat if there is any question of exposure.

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

If you're sure no family members or pets have possibly been bitten by the bat, confine the bat to a room and leave one window open for the bat to exit. If the bat doesn't leave, call animal control for assistance.

or for advice in safely capturing the bat. Bats that are the easiest to approach and capture (unable to fly, etc.) are the most likely to have rabies, so it is best to never handle any bat.

I've been bitten by a raccoon—what should I do?

If you've been bitten or scratched by any animal, you should

1. Clean the area immediately with soap and water for at least 5 minutes.
2. See a health professional as soon as possible, ideally within 24–48 hours.
3. Notify your state or local health department.

How is rabies diagnosed?

Rabies can be very difficult to diagnose. Laboratory tests can find rabies virus in the saliva, skin, or brain tissue of a patient; unfortunately, this is not possible until late in the disease when it is too late for treatment. Therefore, the physician or other health professional will most likely make a diagnosis based on the details of contact with a potentially infected animal and the likelihood of rabies infection in that species in that geographical location. Obviously, diagnosis is easier if the animal involved is available for testing.

What does postexposure treatment involve?

In the United States, postexposure treatment consists of one dose of immune globulin (a blood product containing antibodies to rabies virus) and a series of rabies vaccinations. More detailed information about the vaccine is found in the "Rabies Vaccine" section.

The good news is that if postexposure treatment is given correctly and in time, it is 100% effective in preventing rabies disease.

Can you get rabies from another person?

This has only occurred in a small number of cases after transplants (corneas, liver, kidneys) from an infected person. Stricter guidelines for acceptance of donor organs have been adopted as a result of these cases.

In theory, infected humans could transmit rabies through a bite or other exposure, but no laboratory-confirmed cases of rabies occurring in this way have been reported.

How common is rabies in the United States?

Rabies has been reported in every state except Hawaii. In 2006, 49 states, the District of Columbia, and Puerto Rico reported 6,940 cases of rabies in

animals and 3 human cases to CDC. The total number of reported cases increased by 8.2% from those reported in 2005 (6,418 cases).

In the last 100 years, the number of human deaths from rabies in the United States has fallen from 100 or more per year to an average of 1–2 per year. This decline is due to both the improved control and vaccination of domestic animals and to the development of effective postexposure treatment and vaccines. Although human deaths from rabies are now rare in the United States, every year approximately 40,000 persons receive postexposure treatment for rabies exposure.

How common is rabies in the world?

The rabies virus can be found everywhere except a few Caribbean islands, England, Ireland, Japan, Taiwan, Spain, and Portugal. In the United States, western Europe, Canada, and some of Latin America, rabies has been almost eliminated from domestic dogs, but is still active in the wildlife population.

Rabies is a big problem in Asia, Africa, and Central and South America. Each year rabies kills more than 50,000 people and millions of animals worldwide.

Exposure to rabid dogs is the cause of over 90% of human rabies cases and over 99% of human deaths from rabies worldwide. Although vaccination of dogs and elimination of strays has been shown to effectively prevent most cases of human rabies, the cost of such a control program is beyond the reach of most developing countries. In the United States, the estimated annual cost for rabies prevention (primarily dog vaccinations) is over \$300 million.

How can I help prevent rabies in my pet and myself?

1. Vaccinate your pets (dogs, cats, ferrets) and livestock (sheep, cattle, horses) against rabies. Don't let your pets wander unsupervised. Spay or neuter your pets; pets that are fixed are less likely to leave home and become strays.
2. Contact animal control to remove stray animals or animals acting sick or strange in your neighborhood.
3. Never touch or approach unfamiliar animals, domestic or wild. Don't touch dead animals. Teach your children the same.
4. Seal openings into your home (basement, porch, attic, and chimney openings) to prevent wild animals from gaining entrance.
5. If you do get bitten by an animal, wash the wound with soap and water for at least five minutes and then seek medical care.

What kind of vaccine is the rabies vaccine?

Although the two brands of vaccine available in the U.S. are prepared in different ways, both of them are made from inactivated, or killed, virus. Both types are considered equally safe and effective. The vaccine is given in the deltoid muscle as a series of 3–5 shots.

Who should get this vaccine?

Rabies vaccine is recommended for

- Persons in high-risk occupational groups, such as veterinarians, animal handlers, and certain laboratory workers
- Persons whose activities bring them in frequent contact with rabies virus or potentially rabid bats, raccoons, skunks, cats, dogs, or other species at risk for having rabies
- International travelers who are likely to come in contact with animals in areas where dog rabies is common, especially if they will have limited access to appropriate medical care

Can the vaccine protect you if you've already been exposed to rabies?

Yes. The vaccine is only routinely recommended for persons in groups at high-risk of exposure. Vaccinating the entire population against a rare disease they are unlikely to ever encounter isn't practical, yet anyone could have an unexpected encounter with a bat or other potentially infected animal. Fortunately, because rabies usually has a long incubation period, the body has time to respond and develop antibodies to a vaccine given after an exposure.

What does the postexposure treatment include?

An exposed person who has never received any rabies vaccine will first receive a dose of rabies immune globulin (a blood product that contains antibodies against rabies), which gives immediate, short-term protection. This shot should be given in or near the wound area.

They should also be given a series of rabies vaccinations. The first dose should be given as soon as possible after the exposure. Additional doses should be given on days three, seven, and 14 after the first shot. These shots should be given in the deltoid muscle of the arm. Children can also receive the shots in the muscle of the thigh. Properly administered postexposure treatment for rabies has never been known to fail.

The rabies vaccine is recommended for me because I'm an animal control officer. How does being treated after an exposure differ from getting vaccinated before an exposure?

Treatment after an exposure requires receiving a dose of rabies immune globulin and four doses of vaccine. Vaccination before exposure requires only three doses of vaccine and no immune globulin. Booster doses of vaccine are recommended for some persons at high risk of rabies exposure. Check with your health department.

Is an immunized person totally protected if bitten by a rabid animal?

No. A vaccinated person should receive two more doses of rabies vaccine; one dose immediately and one three days later.

What's the advantage of being immunized against rabies if you still have to receive additional doses of vaccine if you're exposed?

Being vaccinated simplifies treatment by eliminating the need for rabies immune globulin and decreasing the number of doses of vaccine needed after an exposure. This is important because many people at high risk may be working in areas where they may not be able to get immediate medical attention, or where immunizing products are not readily available. Being vaccinated might also provide protection against unknown exposures to rabies (bat bite, etc.)

Should I be concerned about rabies if I'm traveling outside the United States?

Yes. Rabies is a big problem in many other countries, especially in Asia, Africa, and Central and South America. Not only is dog rabies common there, but postexposure treatment for humans may be hard to obtain. If you are traveling to a country where rabies is common, you should talk to your health care provider about the possibility of being protected against rabies before your trip. Vaccination may be recommended depending on your planned activities and length of stay. Contact with all animals, including dogs and cats, should be avoided when traveling abroad.

Can a pregnant woman receive rabies vaccine if exposed to rabies?

Yes, she definitely needs to be protected against rabies disease; no fetal abnormalities have been reported with the rabies vaccine. She can even receive routine pre-exposure vaccination against rabies if her risk of exposure is high.

Who recommends this vaccine?

The Centers for Disease Control and Prevention (CDC), the American Academy of Pediatrics (AAP), and the American Thoracic Society all recommend this vaccine.

How safe is this vaccine?

Reactions after receiving the currently available vaccines are not common. Mild local reactions such as pain, redness, and itching at the injection site have been reported among 30%–74% of persons receiving the vaccine. More general reactions (e.g., headache, nausea, muscles aches, etc.) have been reported in 5%–40% of persons receiving the vaccine. Studies showed that most local reactions were mild and resolved spontaneously within a few days. Local pain at the injection site was the most frequently reported adverse reaction occurring in 21%–77% of persons vaccinated. Mild systemic reactions such as fever, headache, dizziness, and gastrointestinal symptoms were reported in 6.8%–55.6% of recipients. Serious reactions after vaccination are rare.

What side effects have been reported with this vaccine?

Most reactions to this vaccine are mild. Allergic reactions including swelling and non-serious difficulty breathing occurred in 6% of patients who received a booster dose of one type of rabies vaccine.

Who should NOT receive the rabies vaccine?

The rabies vaccine is not recommended for routine use in the general population. Anyone for whom the vaccine is recommended should not receive a dose when they are moderately or severely ill.

Can the vaccine cause rabies?

No.