

Rabies Information

Questions About Rabies

(Adopted from the National Center for Infectious Diseases web site)

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What is rabies?

Rabies is an acute viral disease that attacks the central nervous system of its victim. Sometimes called hydrophobia, or fear of water, rabies has afflicted animals and humans since ancient times.

Rabies is most often passed from animal to animal, or animal to human, through bites. The rabies virus in the attacker's saliva is passed through the puncture wound into the victim's skin. The virus also can be transmitted by licking when saliva is deposited on broken skin.

In humans it can take as little as nine days or as long as one year or more for the horrible symptoms of rabies to appear. Most people who contract rabies, however, develop symptoms within 60 days after being exposed.

The earliest symptoms of clinical rabies infection in humans are pain or numbness at the site of the bite, fever, sore throat, nausea, vomiting, diarrhea, abdominal pain, and lethargy. In some individuals, early nervous system effects may be indicated by apprehension, anxiety, agitation, nervousness, insomnia, or depression.

Symptoms progress rapidly, usually in a matter of days, to include paralysis, spasms of the throat, delirium, hallucinations, coma, cardiac arrhythmia, and finally, death.

The delay between exposure and the onset of symptoms, called the incubation period, permits humans the time to seek effective treatment. Modern rabies treatment, if begun in time, allows our bodies to fight off the virus.

Because of the success of rabies vaccination programs, domestic animals, especially dogs, are usually well protected from contracting rabies and from passing it on to humans.

It is important to be aware, however, that cats, dogs, cattle, horses, mules, sheep, goats and swine are all susceptible to contracting this disease. In fact, cats have accounted for the greatest proportion of rabies cases reported to the Center for Disease Control since 1988.

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How do I know if an animal is rabid?

Few areas in the United States are free from the threat of rabies because wild animals move from place to place. In recent years, 85 - 90% of reported animal rabies cases involved wild animals. Nonetheless, unvaccinated or stray domestic animals, such as dogs and cats, are still the greatest threat to humans.

Most people associate bats with the threat of rabies, but bats are only one of the species that carry and spread the disease. The worst rabies culprits, in order of incidents of reported exposures are: skunks, raccoons, bats, cats, foxes, cattle, dogs, horses/mules, mongooses (in Puerto Rico), groundhogs, sheep, goats and swine. In Florida, the worst rabies culprits are raccoons, foxes, and bats.

In contrast, rats, mice, squirrels, hamsters, guinea pigs, gerbils, chipmunks and rabbits are rarely infected with rabies.

Most people think rabid animals can easily be spotted because they drool excessively and foam at the mouth. In fact, most animals will display these symptoms only in the latter stages of infection, and sometimes not even then.

A better way to identify animals that pose a risk is to recognize unusual or abnormal behavior. Rabid animals, wild or domestic, may stagger, appear restless, be aggressive, change the tone of their barks or growls, or appear to be choking. Wild animals sometimes lose their fear of humans and act friendly. Animals that usually are active at night may become active during the day. Passive animals sometimes become fierce and aggressive.

Infected wild animals can easily pass rabies to pets or domestic animals. Grazing horses or cattle are infected when bitten by skunks, raccoons, or foxes they encounter in their pastures. Dogs and cats can also be exposed in encounters with infected wild animals. Humans who are later in contact with these animals are then placed at risk.

Any unfamiliar animal, wild or domestic, acting in a strange or unusual manner should be treated with caution and avoided.

How do humans contract rabies?

Humans do not contract rabies from other humans. There has never been a recorded case of human-to-human rabies transmission.

Instead, rabies is transmitted in the saliva of rabies infected animals. When a person is bitten, or receives a lick to an open scratch, wound, or mucus membrane, the virus can enter the body. Bites on the head and neck are especially dangerous because of the proximity to the brain.

Human rabies is not often seen by physicians in the U.S. and is difficult to diagnose because of the complexity and variety of the symptoms. Every possible exposure must be evaluated by a medical professional.

If there is any question of possible exposure, don't waste a minute! Call your physician, or local health department. If you are at risk and require treatment, they can get you started promptly to prevent the disease.

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Where is rabies found?

Because of the migratory nature of many wild animals, rabies can be spread to all parts of the country. The expansion of civilization into wildlife habitats and the adaptation of wildlife to the urban setting also increase the potential for rabies transmission.

Since 1975, there has been a slow but steady spread of the disease in certain regions:

- Skunks in the country's midsection, ranging from Texas and New Mexico to Montana and east to Ohio.
- Raccoons in the mid Atlantic area ranging from Pennsylvania, New Jersey, and Delaware south to Florida.
- Foxes in the Northeast ranging from Maine south to New York and Connecticut, and also in Alaska.
- Bats, concentrated in the southwest, but present in nearly every state.

Rabies facts and figures

Rabies cases have occurred in every state in the United States except Hawaii, according to the Centers for Disease Control and Prevention (CDC), in Atlanta, Ga. The East Coast is the hardest hit. In 1997, a total of 8,513 cases of rabies were reported in the United States, with 8,509 of those cases being in animals and four being in humans. Of the 8,509 rabid animals, 7.2% were in domestic animals (dogs, cats, cattle, horses, and mules included). That number was up 6.3% from 1996 figures.

Various parts of the country are plagued by different strains of rabies, which are identified by their most common carriers. In Michigan, the bat and skunk strains are the most prevalent. These two strains are common in other midwestern states as well. To the East, the raccoon strain--which tends to make its victims more aggressive than other strains--predominates, being responsible for the greatest share of rabies cases from Maine to Florida and as far west as eastern Ohio. In fact, the virulent raccoon strain is the most common among all rabies strains, accounting for 50.5% of all reported rabies cases in 1997. (The number of raccoon-strain rabies cases in the Northeast has increased dramatically over the past five years or so, due in large part to raccoons' migrating from the Southeast.) The canine strain (found in foxes, coyotes, and to a lesser extent wolves) is the most common in Texas and the western parts of the United States and Canada.

Rabies cases in the western U.S. tend to be clustered around major metropolitan areas, such as Denver and Salt Lake City. People tend to build structures that wild animals like, such as garbage dumpsters and drainage ditches. They're attracted by the lure of the food and the shelter.

What precautions should I take?

Although pet vaccinations and tighter animal control laws are doing a good job of limiting the spread of rabies, the danger still exists. We should all observe some simple, basic precautions to protect ourselves:

- Broward County law requires all cats and dogs (four months and older) to receive a yearly rabies vaccination and wear a county license tag. Though you can purchase an identification tag without a rabies vaccination, the county license tag proves your pet received its yearly vaccination. Yearly vaccinations protect you, your pet, and your family.
- Avoid contact with animals. A skunk or raccoon that acts friendly or is seen during daylight hours is unusual and should be avoided. Unprovoked attacks are frequently clear evidence of rabies. Take special care to stay away from animals that seem to be ill or acting strangely. Even some animals which look healthy could be infectious.
- Teach your children to stay away from wild animals and unknown cats and dogs. Make sure they tell you immediately if they are bitten or scratched by an animal.
- Dog owners must confine their pets to their property. When off the owner's property, the dog must be on a leash.
- Keep cats indoors as much as possible.
- Keep pets away from wildlife especially at night when wildlife are most active.
- Do not leave pet food outside because it will attract wildlife to your property for a free meal.
- Do not feed wildlife.
- Avoid touching dead animals. If you must do so, wear gloves. In the event of a bite or other potential exposure, seek expert treatment and advice from your physician or health department.

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What should I do if exposed?

Doctors call it "exposure" when people are licked by potentially rabid animals.

If you think you may have been exposed to rabies, wash the affected area immediately with soap and water. Then call your doctor or health department.

Exposure is sometimes difficult to determine because rabid animals who bite humans may not have begun to display outward signs of infection.

Because doctors do not want to treat a patient for rabies without solid evidence of exposure, you and your doctor must weigh some important factors before treatment:

- Was the bite from an animal species that is susceptible to rabies? Wild animal bites, especially from skunks or raccoons, are always suspect.
- If a domestic animal was involved, was it acting strangely? Was the animal vaccinated against rabies? If the exposure was from a lick, was it near an open scratch, wound, or mucous membrane such as the mouth, nose, or eyes?
- Is rabies present in your area?

You and your physician must quickly evaluate the answers to these questions. If the animal is dead, you should save the carcass for examination (remember to wear gloves). If the animal is alive, try to capture it for examination or observation. Be careful to avoid further risk during the capture. If the animal escapes, note its description for later identification.

Tell your physician everything about the potential exposure.

How is rabies treated?

Some people are afraid to seek treatment for exposure to rabies because they have heard about a long series of painful shots in the stomach. Thankfully, that is ancient history!

"Post-exposure" treatment is administered after a bite or lick from a suspected rabid animal. In the United States, it consists of a series of only five injections in the arm. An injection of anti rabies globulin is also administered at the time of the first treatment.

This anti rabies treatment with vaccine and globulin has proven 100% effective if administered within 14 days of exposure. Doctors don't want you to wait that long. Treatment should start as soon as possible.

Most people do not react adversely to the rabies vaccine, but there may be some swelling, redness or soreness.

Information on horse rabies

If you own cats or dogs, chances are you don't think twice about giving them a regular rabies vaccines. But did you know that your horse is susceptible to this fatal, incurable disease? Horses can get rabies as easily as dogs and cats--perhaps even more easily, considering that they're generally kept in places where they might cross paths with rabies-infected wildlife, the most likely transmitters of the disease. Here's what you need to know about this disease, and how to keep your horse and yourself safe.

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The rabies vaccine

The rabies virus (genus *Lyssavirus*--the word *lyss* is Greek for "madness" or "rage") is a member of the *rhabdovirus* family. According to Steve Halstead, DVM, the equine, swine, and companion-animal program

veterinarian with the Michigan Department of Agriculture in Lansing, the virus can cause disease in any mammal, including humans. In fact, horses and humans are two mammalian species with above-average susceptibility to the disease. Small wildlife such as squirrels and other rodents, on the other hand, are quite resistant to developing the disease.

"We don't know why, exactly," says Halstead. (In a side note, he adds, this difference in susceptibility is one reason that handling injured or young wildlife is a bad idea: You're likely to get bitten by an animal that has a good chance of being rabid.)

Bites are the big risk, as far as rabies is concerned. The virus is found in infected animals' salivary glands and is transmitted through their saliva--usually through a bite or a scratch, but potentially also through contact with the victim's mucous membranes or an existing wound. In other words, your horse can't get rabies merely through unbroken-skin contact with a rabid animal. There must be saliva-to-wound contact (most likely a bite) or saliva-to-mucous membrane contact (such as if your horse licks the animal and ingests its saliva). Blood and urine--even skunk spray--do not contain the rabies virus.

Rabies is a disease of the central nervous system. Here's what happens when a horse or other mammal is bitten by a rabid animal. First, the virus enters the victim's body through the bite wound. It proceeds to replicate in the local area of the bite, thereby invading the local nerves. There might be some localized redness or itchiness around the bite wound, says Halstead, but in many cases, no symptoms exist. The bite wound might be so small that you won't know your horse was bitten in the first place.

Next comes the disease's incubation period, during which the rabies virus migrates (replicating by the billions as it goes) to the central nervous system and, eventually, to your horse's brain, by working its way up the local nerve pathway. The length of the incubation period varies widely, depending on where he was bitten. If the rabid animal bit him on a hind leg, for example, it could take as long as six months for the virus to reach his brain--during which time he'd show no clinical signs of illness. But if the bite were close to his brain--say, on his nose--the incubation period could be as short as two weeks. As Halstead puts it, "Once the rabies virus reaches the brain, it goes crazy."

As the virus multiplies, it actually consumes the brain matter, and the resulting symptoms vary depending on what parts of the brain the virus invades. This is the swift and final stage of the disease; by the time you see symptoms, death is at most three to five days away. "Once encephalitis develops, there's no turning back," Halstead says.

Acute rabies causes encephalitis (inflammation of brain tissue) or meningitis (inflammation of the protective membrane between the brain and the skull), according to Halstead. Symptoms can include a high fever, temporary or permanent blindness, behavior change, depression, excessive salivation, difficulty swallowing (caused by paralysis of the facial muscles and the salivary glands, where the virus is concentrated), heart arrhythmia, abnormal aggressive or excitable behavior, colic, depression, and seizures. A rabid horse or other animal might exhibit photophobia (aversion to light) or hydrophobia (thought of as "fear of water," due to apparently violent reactions to the sight of water. However, as Halstead explains, the aggression displayed might in fact result from the maddening combination of excessive thirst and an inability to drink caused by paralyzed face and throat muscles).

A rabid horse or other animal which displays aggressive behavior is said to be afflicted with the "furious" form of the disease. One which shows extreme depression and lethargy is said to suffer from the "dumb" or "stuporous" form. In horses, the latter form is more common.

If the horse is not humanely destroyed soon after he begins showing symptoms, he'll eventually lapse into a coma as the disease ravages his brain, and death soon will follow.

As Halstead explains, the rabies virus evolved to maximize its chances of survival through transmission from victim to victim. It concentrates itself in the affected animal's saliva and also commonly produces aggressive behavior. Aggressive animals are more likely to bite--and bite wounds are the virus' meal ticket, so to speak. No case of horse-to-human rabies transmission has ever been reported, says Halstead; nevertheless, the possibility still exists.

Diagnosing rabies in horses

Rabies cannot be diagnosed through blood, saliva, or urine tests or by any other means in a living animal. The only way to obtain a definitive diagnosis is by examining the victim's brain tissue--which, naturally, can't be done until after death has occurred. (Different tests can be done in humans.) Using a special stain (a direct fluorescent antibody test or dFA), researchers can identify Negri bodies (clusters of the rabies virus) in affected brain matter. If a veterinarian suspects rabies, he or she most likely will order a necropsy and will notify public health officials if rabies is determined to have been the cause of death.

Given the fact that antemortem (before death) tests can't determine the presence of the rabies virus, veterinarians occasionally have to do a bit of detective work when presented with a horse whose symptoms could be either rabies or another, possibly treatable ailment. Some symptoms, such as fever, colicky behavior, or lack of coordination, might be present in horses with other neurologic diseases. So what's the tip-off? How does a veterinarian know whether the horse's condition is treatable or whether euthanasia is the only option?

The first question, of course, is whether the horse has a current rabies vaccination. According to Halstead, there have been no reported cases of rabies in horses with properly administered rabies vaccinations. Second, the veterinarian will consider the evidence. If the horse is exhibiting rabies-like symptoms two months after his owner watched him get bitten by a raccoon in his pasture, the diagnosis is likely to be a no-brainer. If the horse is showing multiple symptoms, and one or more appear neurological, that's another red flag. Third, the veterinarian will consider the horse's history. If the horse is known to suffer from periodic bouts of mild colic, for instance, and he's exhibiting identical symptoms this time, chances are it's just another tummy ache. But if he's acting colicky and abnormally aggressive, or salivating excessively, or having trouble swallowing, the signs might point toward rabies.

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Cause and prevention of horse rabies

Most horses are housed in environments that overlap with wildlife habitats--in the country, near woods, canyons, and other areas that wild critters call home. Wild animals are bound to cross arenas and pastures from time to time, and some might decide to venture into the barn for a late-night snack or even to take up residence. That's why horse owners should "assume that exposure to rabies can happen," Halstead says, and take precautions accordingly.

Quarantine, agonizing suffering, certain death--that's what's in store for your horse if he contracts rabies. Even if you live in an area with a low incidence of reported rabies cases, or if your horse lives in a padded stall with a live-in barn manager, why take the risk--however small--when prevention is so easy and inexpensive? As Halstead points out, "No horse is supervised 24-hours a day. You can't know what's happening in the barn every minute."

Even if you bar the doors tight against wandering raccoons and other small animals, you might not be able to prevent a bat from flying in and nesting in the eaves, for example. One rabid, uncoordinated bat that falls into your horse's stall plus one curious horse could well equal one lethal bite.

Several pharmaceutical manufacturers offer rabies vaccines, and four are licensed for use in horses. The vaccines are inexpensive--your veterinarian probably will charge you around \$15, says Halstead. A booster given at 12-month intervals is all that's needed after the initial vaccination. (The time of year of the initial vaccination doesn't matter, he says, as long as the vaccine is administered at the same time each year.) He points out that some states prohibit persons other than licensed veterinarians from purchasing or administering rabies vaccine. "But many veterinarians, knowing the importance of this vaccine, will administer it for little more than cost, simply to ensure that their patients get vaccinated properly and regularly and that the vaccine itself is handled properly."

Some veterinarians, he says, even offer low-cost clinics for horses similar to the rabies clinics for dogs and cats that you'll occasionally see advertised in your local newspaper or at your Humane Society or veterinarian's office.

Foals as young as three months of age can (and should) be vaccinated against rabies, with regular follow-up annual boosters. One important note: Rabies vaccine is effective only when administered prior to exposure. The vaccine has no effect after your horse is bitten or otherwise exposed. The only rabies "cure" in existence is the administration of an antibody, followed by a series of five vaccinations, given to people who have encountered a known rabid animal. No such treatment exists for horses or any other animals.

Keeping your horse on a regular schedule of rabies vaccinations is tantamount, of course. However, Halstead stresses the importance of contacting your veterinarian promptly if an unvaccinated horse displays any symptoms of rabies--particularly if you know he tangled with a wild animal a few weeks or months before. Even if every horse on your property is vaccinated against rabies, call your local animal-control department if you spot a raccoon, skunk, fox, coyote, bat, opossum, or any other wild animal (especially a dog or a cat) behaving strangely, particularly if it appears more aggressive or tame than you'd expect, or if you notice excess salivation or lack of coordination. Never approach such an animal yourself, and get your own animals out of harm's way until the suspect animal is removed