

# Rabies

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## What Is Rabies?

Rabies is a zoonotic disease (a disease passed to humans from animals) that is caused by a virus. It affects the nervous system of warm-blooded mammals and is usually spread by an infected animal biting another animal or person. Rabies is a fatal disease that almost always leads to death unless treatment is provided soon after exposure. In Arkansas, rabies lives and circulates in wild skunks and bats. Any mammal can become infected with rabies, including domestic pets such as dogs and cats, agricultural animals such as cows and horses, and people when they are exposed to rabid wildlife.

## Key Facts About Rabies

- More than 60,000 people die of rabies every year, mostly in Asia and Africa, and many are children under 15 years of age.
- Rabies is adapted to live and multiply best in certain kinds of mammals, each with a specific strain or variant of rabies. The strains of rabies in the United States are bat, skunk, raccoon, fox and coyote.
- Dogs are the source of the vast majority of human rabies deaths in the world, but the U.S. no longer has the dog strain of rabies.
- In the U.S., humans who die of rabies almost always have been exposed to a rabid bat and either didn't realize it, or more likely, ignored the bite.

## Symptoms of Rabies in Humans

The rabies virus infects the central nervous system, causing

disease in the brain and death. The early symptoms of rabies in people are similar to that of many other illnesses and often include fever, headache and general weakness or discomfort. There may be tingling where the bite occurred. As the disease gets worse, more symptoms appear and may include anxiety, confusion, slight or partial paralysis, excitation, hallucinations, agitation, sleeplessness, increase in saliva, difficulty swallowing and hydrophobia (fear of water). Death usually occurs within days of the onset of these symptoms.

## Symptoms of Rabies in Animals

Rabies causes an acute encephalitis or brain disease in all warm-blooded mammals, and the outcome is almost always fatal. The first signs of rabies may be nonspecific and include not feeling well, fever, changes in behavior and loss of appetite. Signs progress within days to severe brain disease that can include imbalance and staggering, weakness, paralysis of one muscle or several, seizures, difficulty breathing, difficulty swallowing, excessive salivation, abnormal behavior, aggression and/or self-mutilation, and death.

## Rabies in Wild Animals

All species of mammals are susceptible to rabies virus infection, but only a few species are important as reservoirs (where the disease lives in the wild) for the disease. In the United States, distinct strains of rabies virus have been identified in bats, raccoons, skunks, foxes and coyotes. Most rabies cases in the United States are in wild animals (92%) rather than domestic animals like dogs, cats, cattle, horses, etc.

Geographic boundaries of currently recognized reservoirs for rabies in terrestrial mammals (those that live on the ground) are shown on the map below. Bat rabies is all across the United States, except in Hawaii, which is rabies-free.



Courtesy of the CDC

## Rabies in Domestic Animals

Domestic species accounted for 8% of all rabid animals reported in the United States. Cases of rabies in cats are routinely 3-4 times that of rabies reported in cattle or dogs nationally, but in Arkansas, dogs are much more common to have rabies than cats. Arkansas averages two rabid dogs every year but only one rabid cat and one rabid cow per year. It is totally preventable in these animals with vaccinations. Arkansas state law requires all dogs and cats to be vaccinated against rabies by a licensed veterinarian. Vaccines are available but not required for ferrets, cattle, horses and sheep.

## Routes of Transmission

The overwhelmingly most common way rabies virus is passed to another animal or person is through a bite and virus in the saliva of an infected host getting into the wound. There are some other rare ways it also can be transmitted, such as saliva or brain tissue getting into a wound or cut in the skin, or getting into "wet" mucous membranes (i.e., eyes, nose, mouth), and corneal and organ transplan-

tations. The virus must get into the body, and once inside, it slowly moves up tiny nerve endings to larger nerves to the spinal cord and eventually to the brain. This process may take weeks to months. It does NOT go into the blood stream, which would allow it to get to the brain very quickly. This gives more time for the preventive shots to work.

## Treatment in Humans if Exposure Occurs

Wash any bite wounds immediately. One of the best ways to decrease the chance for infection is to wash the wound thoroughly with soap and water. Immediately consult with your doctor and state (or county) public health department who will help the person decide if rabies preventive shots (post-exposure prophylaxis or PEP) are needed. The rabies preventive shots are no longer painful injections into the stomach area, but instead are four shots given in the upper arm just like any other vaccine. Another drug is given only once, and it usually is injected around the bite wound if that is possible.

## Incidence of Rabies in Arkansas

From 1990 through 2011, Arkansas' yearly average was 47 rabid animals per year, mostly skunks (average of 33 per year) and bats (average of 9 per year). But 2012 and 2013 saw a large increase in rabies, and now the average is 55 rabid animals each year, with skunks (average of 40 per year) and bats (average of 10 per year) still being the majority of cases. In fact, in 2013 there were 152 positive rabies cases of which 118 were in skunks, 26 in bats, 3 cases each in dogs and cats, and 1 case each in a cow and horse. Arkansas does NOT have the raccoon strain of rabies, which is very common in all of the eastern states.

## Conclusion

Rabies is a very significant zoonotic disease in Arkansas that is vaccine-preventable. Vaccination of animals (mostly dogs) has reduced the number of human (and animal) rabies cases in many countries, including the United States. Any animal bites, but especially those of bats, should not be ignored and should be reported to a physician or to the health department.

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