

# Rabies

## DISEASE IN ANIMALS

Rabies is a highly fatal RNA virus that targets the saliva and nervous system of mammals. The major wildlife reservoirs in Ohio are bats, skunks and raccoons, which can then transmit the virus to other wildlife (particularly carnivores), domestic animals and humans. This zoonotic disease requires immediate veterinary and public health management.

**Reporting:** Veterinarians suspecting rabies in an animal with neurologic disease are required to hold that animal and report it to the [local health department](#) (LHD). Confirmed rabies cases are required to be reported to the Ohio Department of Agriculture (ODA) at (614) 728-6220 or (800) 300-9755.

**Transmission:** Rabies is transmitted when virus-laden saliva or nervous tissue from an infected animal is introduced into an open wound or mucous membrane. A bite is the primary means of transmission. It typically takes one to three months from exposure before onset of clinical signs. Domestic animals are usually only infectious a couple days before they become symptomatic. The length of viral shedding varies by species.

**Clinical signs:** Early signs are highly variable and may resemble a toxic event or other neurologic disease, including distemper. Rabid animals often display abnormal behavior either appearing aggressive (furious form) or lethargic or paralytic (dumb form). The rabid animal typically becomes uncoordinated, and this is followed by seizures and/or general paralysis. Hypersalivation and difficulty swallowing may or may not occur. Once clinical, death usually occurs within three to seven days.

### **Diagnostics:**

- Direct Fluorescent Antibody (DFA) on fresh brain tissue is the definitive test late in the disease when the animal is shedding virus. Positive DFA tissues can be submitted to CDC for monoclonal antibody testing to determine the variant.
- Direct Rapid Immunohistochemical Test (dRIT): utilized by USDA Wildlife Services as part of a surveillance program for raccoon-rabies. This is a screening test only and should not be used for public health specimens (i.e. animals that have exposed humans or pets).
- Serology: not a reliable indicator of infection or effective immunity. Positive titers can be used to indicate previous vaccination but are not a reliable indicator of protection.
- There are no reliable tests during the incubation period, that time after the animal's exposure but before clinical illness.

### **Case classification:**

- Suspected: Neurologic illness in a mammal with no other obvious cause, especially if it is unvaccinated or has had recent exposure to a wild mammal or bat. A cat, dog, or ferret that has bitten a person in the last 10 days is considered suspect until appropriate quarantine or testing is completed. A positive dRIT samples are considered suspect until confirmed by CDC.
- Confirmed: A positive DFA brain tissue sample, or other confirmatory test conducted by CDC.

### **Sample Submission:**

- ODHL is the only lab in Ohio that performs DFA testing on animals for rabies
- Contact the LHD for information on using the ODH courier service
- A [Rabies Submission Form](#) should be completed and accompany each sample for testing
- Never send a live animal
- The entire body of small mammals such as bats or rodents can be submitted whole. Only the head of larger animals such as cats and dogs should be submitted. For very large animals (horses and cattle), only the brain should be submitted (ODA may accept entire heads and send the brain to ODHL).

- Place the specimen in a water-tight bag, keep the sample refrigerated or packed with ice, but do not freeze
- Sample viability could be compromised if shipped on a Friday or holiday so it is best to keep the sample at refrigerator temperatures until the next business day. Please call the ODH Zoonotic Disease Program at (614) 752-1029 if the need for testing is urgent.

## DISEASE IN HUMANS

**Reporting:** Report immediately via telephone the case or suspected case and/or a positive laboratory result to the LHD where the patient resides. If unknown, report immediately to the LHD within the jurisdiction of the health facility or ODH.

**Human illness:** The incubation period can vary from about 10 days to rarely over a year. The average incubation period is 31 to 90 days. The prodromal period in human rabies usually lasts two to 10 days. Pain and paresthesia are common at the wound site. Non-specific complaints such as general malaise, chills, fever, headache, sore throat and fever are commonly reported, as are behavioral changes such as apprehension, anxiety, agitation, irritability, insomnia and depression. This is followed by neurologic symptoms which are difficult to distinguish from other causes of encephalitis. An excitation or furious phase includes hyperesthesia and extreme sensitivity to light and sound, dilation of pupils and increase in salivation. Ascending or asymmetric paralysis can occur. Swallowing dysfunction due to muscle spasms is seen in most patients. Some experience laryngopharyngeal contractions when just looking at liquid and stop swallowing their own saliva. This excitation phase can persist until death or change to a generalized paralysis. In some cases paralytic symptoms predominate in the disease course. Patients with furious rabies usually die within a week, while those with paralytic rabies (often seen with bat-strain rabies) may survive up to 30 days.

**Personal protection:** Pre-exposure rabies prophylaxis is recommended for those who regularly handle high-risk animals or work in occupations that have an elevated risk of rabies exposure. Persons handling potentially rabid animals should take precautions, including proper training, to avoid being bitten. To avoid contact with neural tissue when performing decapitations for rabies testing, minimum protection should include gloves, eyewear, and a protective apron. To ensure appropriate public health response, all mammal bites and potential rabies exposures must be reported to the LHD.

## FOR MORE INFORMATION

### **Disease in Animals**

[Iowa State University Center for Food Security and Public Health Animal Disease Factsheets](#)  
[NASPHV Rabies Compendium](#)

### **Disease in Humans**

[ODH Infectious Disease Control Manual](#)  
[CDC Rabies Information for Health Care Professionals](#)  
[ODH Zoonotic Disease Program Rabies Web Page](#)