

# Animal Bite/Exposure Surveillance Protocol

Rabies is a preventable viral disease of mammals most often transmitted through saliva from the bite of a rabid animal<sup>1</sup>. Raccoon strain rabies is endemic in West Virginia, making animal bite reporting the first step in preventing human disease<sup>2, 12</sup>.

## Provider Responsibilities

1. Report any animal bite/exposure to the local health department of the victim's residence within **24 hours**.
2. Using the WVEDSS form, provide all victim information and animal information indicated in the provider sections of the form (yellow section). This form is found at:  
<http://www.wvidep.org/Portals/31/PDFs/animalBiteForm.pdf> .
3. If necessary, consult with the local or state public health officers regarding the need for post exposure prophylaxis (PEP). Additional guidance is available in the MMWR (March 19, 2010, volume 59, no. RR-2) at:  
<http://www.cdc.gov/mmwr/PDF/rr/rr5902.pdf>

## Laboratory Responsibilities

All requests for animal rabies testing should be arranged through the Office of Laboratory Services at (304)558-3530, extensions 2611 or 2602. Requests for human rabies testing are arranged through the Division of Infectious Disease Epidemiology (DIDE) at 1-800-423-1271 (in state calls) or (304)558-5358.

## Public Health Action

1. Identify the offending animal for quarantine or testing ASAP; following guidelines in the DC-4 available at:  
<http://www.wvidep.org/Portals/31/Reports/DC4/RABIES%20GUIDE%20FINAL%20%20June%202010.pdf>
2. Provide up-to-date information concerning PEP to animal bite victim and physician. Guidance available at:  
<http://www.wvidep.org/Portals/31/PDFs/IDEP/rabies/SUMMARY%20OF%20RABIES%20POST%20EXPOSURE%20PROPHY%20REVISED%20APRIL%202010.pdf>

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3. Enter case information in WVEDSS at <https://phin.wvdhhr.org>
  - a) County of victim (must be WV resident to be entered into WVEDSS).
    - 1) If resident of another county -- enter into WVEDSS and case will be assigned to the county of the patient.
    - 2) If resident of another state -- do not enter in WVEDSS, contact resident state of victim to report the case or contact DIDE for interstate notification.
  - b) Fill out form completely and forward for regional review when complete.

## **Disease Control Objectives**

Prevent rabies through rapid identification of cases potentially exposed to the rabies virus so appropriate treatment or post exposure prophylaxis can be quickly administered.

## **Disease Prevention Objectives**

To prevent rabies transmission through:

1. Educating the public about animal bite prevention, vaccination of dogs, cats, and ferrets.
2. Educating the public on animal bite reporting and seeking medical attention.
3. Educating physicians on appropriate management of animal bite cases.

## **Disease Surveillance Objectives**

1. Characterize demographic and risk characteristics of bite victims
2. Characterize risk characteristics of biting animals
3. Assess appropriateness of PEP administration and quality of management of animal bites

## **Public Health Significance**

One of every two Americans will be bitten by an animal at some point<sup>3</sup>. Mammalian bites account for approximately 1% of all visits to emergency rooms, resulting in about 2 million bite wounds costing \$30 million dollars yearly<sup>4</sup>. Annual

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mortality rate from dog bites is reported as 6.1 per 100 million population, based on a yearly average of 19 reported deaths from dog bites per year in the United States<sup>5,6</sup>. Although 90% of animal bites are perpetrated by dogs and cats, the vast majority of human rabies cases are caused by bat exposures<sup>7</sup>. From 1995 – 2009 a total of 44 cases of human cases were reported (with a 95.5% case-fatality rate), with all but one of the domestic exposures being due to bat-strain rabies<sup>8</sup>. The first case of raccoon-strain rabies in a human occurred in Virginia in 2003. Animal bite surveillance provides the first step in identifying the need for PEP in order to prevent rabies in humans.

## Clinical Description

The incidence of animal bites is considerably higher among children, particularly those five to nine years of age<sup>4-6</sup>. Incidence decreases as age increases. Injuries inflicted by dogs are most common (80-90%), with cats being the next most common species involved<sup>3,4</sup>. Doberman pinschers, German shepherds, and pit bull terriers are the most common purebred canines implicated in fatal attacks<sup>6,9</sup>.

## Etiologic Agent

Rabies virus belongs to the order Mononegavirales, viruses with nonsegmented, negative-stranded RNA genomes. Within this group, viruses with a distinct "bullet" shape are classified in the *Rhabdoviridae* family; which includes at least three genera of animal viruses, *Lyssavirus*, *Ephemerovirus*, and *Vesiculovirus*. The genus *Lyssavirus* includes the rabies virus<sup>10</sup>.

## Reservoir

Although all species of mammals are susceptible to rabies virus infection, only a few species are important as reservoirs for the disease<sup>11</sup>. In the United States, several distinct rabies virus variants have been identified in terrestrial mammals, including raccoons, skunks, foxes, and coyotes. In addition to these terrestrial reservoirs, several species of insectivorous bats are also reservoirs for rabies. Raccoons serve as the primary reservoir of rabies in West Virginia<sup>12</sup>.

## Mode of Transmission

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Transmission of rabies virus usually begins when infected saliva of a host is passed to an uninfected animal. Various routes of transmission have been documented and include contamination of mucous membranes (i.e., eyes, nose, and mouth), aerosol transmission, and corneal or other tissue transplantations. The most common mode of rabies virus transmission is through the bite and virus-containing saliva of an infected host<sup>11</sup>.

## Incubation Period

The incubation period for rabies is highly variable. Most illnesses develop within 3 – 8 weeks following exposure; however, onset can range from a few days to several years. The type and intensity of exposure and location of the wound partly influences the incubation period<sup>11</sup>.

## Period of Communicability

Rabies virus may be excreted in the saliva of infected dogs, cats, and ferrets during illness and/or 3 - 7 days prior to illness or death; these are the only domestic animals with defined, reliable periods of communicability<sup>11</sup>. The incubation period and number of days rabies virus is shed in the saliva, prior to onset of clinical signs, are unknown for wild and exotic animals. Infected animals can transmit the rabies virus while clinically sick and for an indeterminate number of days before clinical signs become apparent<sup>1, 10-11</sup>. **Therefore, it is never appropriate to confine and observe wild or exotic animals that are involved in a human bite incident.**

## Outbreak Recognition

Outbreaks of animal rabies may be recognized as an increase in the number of cases over or above baseline incidence.

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## Case Definition

### Human Exposure

A bite or scratch from a vector species or the introduction of saliva or central nervous system (CNS) tissue from a vector species into an open, fresh wound or mucous membrane ( eye, mouth, or nose) of a human being.

### Vector Species

Species include bats or terrestrial mammals, especially carnivores. *Wild species* known to be reservoirs of rabies include, but are not limited to, raccoons, skunks, foxes, coyotes, bobcats, wolves, or any hybrids between these wild species and domestic dogs and cats.

*Domestic species* include, but are not limited to, dogs, cats, and ferrets.

### Case Classification

Confirmed: Human exposure from a vector species as defined above.

### Comment

Touching or handling a potentially rabid animal or another animal or inanimate object that had contact with a rabid animal does not constitute an exposure unless wet saliva or CNS material from the rabid animal was introduced into a fresh, open wound or had contact with a mucous membrane of a human being<sup>13</sup>.

Bats have small teeth which may leave marks that are not easily seen; so any contact with a bat in which a bite cannot be ruled out, is considered a potential exposure to rabies. A person sleeping in a room with a bat or finding a bat in the room with an unattended child, mentally impaired or intoxicated person, are examples of possible exposures.

## Laboratory Diagnosis

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The Office of Laboratory Services (OLS) is responsible for screening animal brain tissue for the presence of the rabies virus. This is the only facility in the state of West Virginia that can screen animal brain tissue for the presence of the rabies virus. A direct fluorescent antibody (DFA) staining technique is used.

Information for submitting specimens can be found on the OLS website at:

<http://www.wvdhhr.org/labservices/labs/rabies/index.cfm>

## **Preventive Interventions**

1. Educate public about pre-exposure vaccination if traveling to country with endemic animal rabies.
2. Educate public on vaccinating pets and keeping vaccinations up-to-date.
3. Educate public on avoiding stray or wild animals. Wild/domestic crossbreeds (ex. dog/wolf) should not be kept as pets.

## **Treatment**

No proven medical treatment exists for symptomatic human rabies and disease almost invariably results in death. For animal bites, wound care is important to prevent infection and, depending on the status and species of the animal in conjunction with the type of exposure, post-exposure prophylaxis (PEP) may be warranted<sup>1, 3, 4, 11</sup>. Guidance available at:

1. ACIP Recommendations on PEP<sup>13</sup>:  
<http://www.cdc.gov/mmwr/PDF/rr/rr5902.pdf>
2. CDC Recommendations on human rabies prevention (see Table 3)<sup>1</sup>:  
<http://www.cdc.gov/mmwr/pdf/rr/rr57e507.pdf>
3. Summary of Rabies Post-Exposure Prophylaxis (PEP) Recommendations:  
<http://www.wvdep.org/Portals/31/PDFs/IDEP/rabies/SUMMARY%20OF%20RABIES%20POST%20EXPOSURE%20PROPHY%20REVISED%20APRIL%202010.pdf>

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## Surveillance Indicators

1. Completeness of the key variables in WVEDSS:
  - a demographic information
  - b exposure information
  - c species information
  - d known outcomes for testing, confinement, or PEP administration
2. Proportion of cases with PEP administered properly

## References

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[http://www.cdc.gov/rabies/location/usa/surveillance/human\\_rabies.html](http://www.cdc.gov/rabies/location/usa/surveillance/human_rabies.html)

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