

**MANAGEMENT OF DOMESTIC ANIMAL RABIES EXPOSURES**  
**NEW JERSEY DEPARTMENT OF HEALTH**  
**March 2016**

**Authority:** New Jersey law requires that whenever a dog, cat, or other animal has been known or suspected to have been bitten by an animal known or suspected to be affected by rabies, the owner of the animal or any person with knowledge of the incident shall notify the local health department with jurisdiction where the animal is located (N.J.S.A. 26:4-78). The Health Officer has the authority to serve notice on the owner of the animal requiring euthanasia or confinement for up to 6 months and observation for the emergence of clinical signs of rabies (N.J.S.A. 26:4-83).

**DEFINITIONS:**

**Known rabid animal:** Any animal confirmed rabid through laboratory testing

**Suspect rabid animal:**

- Any bat, raccoon, skunk, fox, or groundhog, unless found negative for rabies through laboratory testing
- Other wildlife and domestic animals showing clinical signs of rabies (abnormal behavior with neurologic impairment), unless found negative for rabies through laboratory testing
- Any mammal with clinical signs of rabies submitted for rabies laboratory testing that is found unsatisfactory for testing by the Rabies Laboratory staff

In general, fights between dogs and cats are not usually considered to be rabies exposures unless one of the animals is considered a “suspect rabid animal” due to clinical signs of rabies or a positive laboratory test for rabies.

**Personal Protective Equipment:** Veterinarians, veterinary technicians, and animal control officers should always wear gloves and eye protection when handling animals recently attacked (i.e., within two hours) by a known or suspect rabid animal to prevent exposure to saliva from the attacking animal that may be present on the attacked animal’s fur. After handling recently attacked animals, hands should be thoroughly washed with soap and water and all surfaces in contact with the animal thoroughly disinfected.

**Proof of Vaccination:** A fully completed rabies vaccination certificate signed by a veterinarian licensed to practice in the State where vaccination was administered, which includes the specific vaccine used, date of vaccination and duration of immunity.

**Prospective Serologic Monitoring Protocol:** A process to determine if a dog or cat has been previously vaccinated with a USDA licensed rabies vaccine but for which the owner cannot produce a vaccine certificate or other vaccination documentation. The

protocol requires vaccination and serum collection within 96 hours of the exposure and a second serum collection 5 days later to determine if the exposed animal has an immune response indicative of past vaccination (2-fold rise in titer and second titer is > 0.5 IU/ml) and therefore can be observed by the owner for 45 days. If these conditions are not met, the animal must remain in strict quarantine for 4 months or be euthanized.

**Strict Quarantine:** Confinement of the animal in a secure enclosure that prevents direct contact with people and other animals

**Domestic Animal Rabies Exposures** are defined as follows:

**Exposure Category 1:** Visible bite wound or wounds known to have been sustained from a known or suspect rabid animal.

**Exposure Category 2:** Situations in which saliva or central nervous system tissue from a known or suspect rabid animal is likely to have had direct contact with mucous membranes (eyes) or a break in the skin of the animal. An example of this would be a dog fighting face to face with a raccoon or having a skunk in its mouth.

**Exposure Category 3:** Wounds of unknown origin suspected by a veterinarian to be bite wounds.

**Exposure Category 4:** Situations when an animal may have been near a known or suspect rabid animal but direct contact was not witnessed. Examples of this include a sick raccoon is found near a yard where dogs are kept or a bat is found in a room with a cat. If the suspect rabid animal is tested and found to be negative for rabies, the potentially exposed animal would not need to be confined and observed.

**I. ANIMAL CONFINEMENT GUIDELINES - EXPOSURE CATEGORIES 1 or 2:**

NOTE: A Rabies Advisory Notice shall be given to the owner by the attending veterinarian or local health department in the event of an exposure.

**A. Dogs, cats and ferrets with proof of current rabies vaccination (i.e., the duration of immunity from the last vaccination has not expired):**

1. The attending veterinarian shall immediately administer rabies booster vaccination and issue a Rabies Advisory Notice to the animal owner.
2. The animal shall be kept under the owner's control (i.e. kept inside a building or pen, or on a leash under the immediate control of an adult) and observed for clinical signs of rabies for **45 days**. Any illness in an exposed animal should be reported immediately to the local health department.

3. The veterinarian shall notify the local health department if the exposed animal does not receive a rabies booster vaccination within 96 hours of exposure and the Health Officer shall order the exposed animal to be kept under the owner's control (i.e. kept inside a building or pen, or on a leash under the immediate control of an adult) and observed for clinical signs of rabies for **4 months**.
4. Veterinarians or other persons aware of a ferret exposed to rabies shall report the situation to the local health department and the New Jersey Division of Fish and Wildlife, Exotic and Nongame Permits Office at 908-735-5450 or email [EXOTICPERMITS@dep.nj.gov](mailto:EXOTICPERMITS@dep.nj.gov) .

**Note:** Animals that have received a rabies booster vaccination due to exposure, as required in Section I. A. page 2, would not need an additional booster if exposed to rabies again within 3 months.

**B. Dogs, cats and ferrets that have never been vaccinated against rabies** (including when reports of past vaccination cannot be verified):

1. **Euthanasia is strongly recommended.** If the exposed animal has bitten a human within 10 days of the date of euthanasia, a specimen should be submitted for rabies testing.
2. The attending veterinarian shall report to the local health department if the owner chooses not to euthanize the animal.
3. The Health Officer shall order the exposed dog or cat to be **confined and observed for 4 months in strict quarantine** (i.e., no human or animal contact) in a kennel or cage in a veterinary hospital, animal control facility, or commercial boarding establishment, or escape-proof pen at the owner's home. The local health department shall approve confinement facilities and perform unannounced inspections to ensure compliance with the quarantine order. Any illness in an exposed animal should be reported immediately to the local health department.
4. The attending veterinarian shall administer a rabies vaccine **within 96 hours of exposure**.
5. Veterinarians or other persons aware of a ferret exposed to rabies shall report the situation to the local health department and the New Jersey Division of Fish and Wildlife, Exotic and Nongame Permits Office at 908-735-5450 or email [EXOTICPERMITS@dep.nj.gov](mailto:EXOTICPERMITS@dep.nj.gov).

6. **Ferrets shall be confined and observed for six months in strict quarantine.**
7. The exposed animal shall be strictly confined between the time of the exposure and final disposition of the animal. The final disposition shall occur within 10 days of the exposure.

**C. Ferrets that are overdue for rabies booster vaccination:**

1. Veterinarians or other persons aware of a ferret exposed to rabies shall report the situation to the local health department and the New Jersey Division of Fish and Wildlife, Exotic and Nongame Permits Office at 908-735-5450 or email [EXOTICPERMITS@dep.nj.gov](mailto:EXOTICPERMITS@dep.nj.gov) .
2. Situations should be evaluated by the Health Officer on a case by case basis taking into consideration factors such as the severity of the exposure, time elapsed since last vaccination, number of past vaccinations to determine if the exposed ferret must be either euthanized or receive an immediate booster vaccination and placed into observation or strict quarantine for **6 months**.

**D. Dogs and cats that are overdue for rabies booster vaccination and the owners have appropriate documentation of past vaccination with a USDA-licensed rabies vaccine at least once previously:**

1. The attending veterinarian shall administer rabies booster vaccination immediately and issue a Rabies Advisory Notice.
2. The animal shall be kept under the owner's control (i.e. kept inside a building or pen, or on a leash under the immediate control of an adult) and observed for clinical signs of rabies for **45 days**. Any illness in an exposed animal should be reported immediately to the local health department.
3. The veterinarian shall notify the local health department if the exposed animal does not receive a rabies booster vaccination after exposure and the Health Officer shall order the exposed animal to be kept under the owner's control (i.e. kept inside a building or pen, or on a leash under the immediate control of an adult) and observed for clinical signs of rabies for **4 months**.

**Note:** Animals that have received a rabies booster vaccination due to exposure, as required in Section I. A. page 2, would not need an

additional booster if exposed to rabies again within 3 months.

**E. Dogs and cats that are previously vaccinated without appropriate documentation of receiving a USDA-licensed rabies vaccine at least once previously:**

1. The animal can be treated as unvaccinated as in Section I. B., page 3 or
2. The attending veterinarian may request guidance from local health departments to use **Prospective Serologic Monitoring** prior to rabies booster vaccination, to document previous vaccination.

- The dog or cat owner wishing to pursue Prospective Serologic Monitoring shall promptly engage the services of a New Jersey licensed veterinarian to complete all the provisions of the protocol and be responsible for all of the associated costs.
- This procedure would entail vaccinating the dog or cat **within 96 hours** of exposure and collecting 2 serum samples to document evidence of an anamnestic (immune) response to rabies booster vaccinations.

The dog or cat undergoing Prospective Serologic Monitoring shall remain in strict confinement until the results are received and evaluated by the attending veterinarian, in consultation with the Health Officer, which may take 4 weeks or more. Any illness in an exposed animal should be reported immediately to the local health department.

- If an adequate anamnestic response is documented, the animal would be considered previously vaccinated (Section I. A, page 2) and shall be kept under the owner's control (i.e. kept inside a building or pen, or on a leash under the immediate control of an adult) and observed for clinical signs of rabies for **45 days** from the date of exposure. Any illness in an exposed animal should be reported immediately to the local health department
- If the immune response is inadequate, the animal would be considered unvaccinated and placed into **strict quarantine for 4 months or euthanized** as described in Section I.B., page 3.
- The full Prospective Serologic Monitoring protocol is described at the end of this guidance and on the NASPHV website: <http://nasphv.org/Documents/NASPHVSerologicMonitoring2016.pdf>

**II. ANIMAL OBSERVATION PERIODS - EXPOSURE CATEGORIES 3 or 4:**

NOTE: A Rabies Advisory Notice shall be given to the owner by the attending veterinarian or local health department in the event of an exposure.

**A. If the animal is currently vaccinated or with proof of past vaccination:**

1. A report to the local health department is not necessary.
2. The attending veterinarian shall administer a rabies booster vaccination to the exposed animal as soon as possible.
3. The animal shall be kept under the owner's control (i.e. kept inside a building or pen or on a leash under the immediate control of an adult) and observed for clinical signs of rabies for **45 days**. Any illness in an exposed animal should be reported immediately to the local health department.
4. The veterinarian shall notify the local health department if the exposed animal does not receive a rabies booster vaccination after exposure and the Health Officer shall order the exposed animal to be kept under the owner's control (i.e. kept inside a building or pen, or on a leash under the immediate control of an adult) and observed for clinical signs of rabies for **4 months**.

**Note:** Animals that have received a rabies booster vaccination due to exposure, as required in Section I. A. page 2, would not need an additional booster if exposed to rabies again within 3 months.

**B. If there is no documentation of current or past vaccination:**

1. A report to the local health department is not necessary.
2. The attending veterinarian shall administer a rabies vaccination to the exposed animal as soon as possible.
3. The animal shall be kept under the owner's control (i.e. kept inside a building or pen, or on a leash under the immediate control of an adult) and observed for clinical signs of rabies for **4 months**. Any illness in an exposed animal should be reported immediately to the local health department.

### **III. Summary of Animal Confinement Periods Utilized in Rabies Control**

**10-day period:** Used by local health departments when a dog, cat, ferret or other domestic animal bites a human.

If rabies virus was present in saliva at the time of the bite, the biting animal would exhibit clinical signs of rabies or would develop signs within three days of the bite. If the dog or cat is free of clinical signs of rabies for a period of 10 days following the bite, rabies virus was not in the saliva at the time of the bite and the bite victim is not at risk of infection. There has never been a human case of rabies in the US from a dog, cat, or ferret that was confined and observed to be healthy for a period of 10 days from the date of the bite.

**45-day period:** Used when a previously immunized dog, or cat, is vaccinated against rabies after it is bitten or exposed to a rabid or suspect rabid animal.

This observation period is necessary because it is possible, but very unlikely, for a currently vaccinated animal that receives a rabies booster vaccination after exposure to still develop rabies. Exposed domestic animals should be vaccinated as soon as possible after the bite or exposure.

**4-month period:** Used when a dog or cat not immunized against rabies is bitten or exposed to a rabid or suspect rabid animal.

**6-month period:** Used when a ferret not immunized against rabies is bitten or exposed to a rabid or suspect rabid animal.

Unvaccinated domestic animals are of greatest concern because they have a significant chance of developing rabies if exposed to the virus. The incubation period for domestic animals infected with rabies is variable and generally 3 -16 weeks.

**MANAGEMENT OF DOMESTIC ANIMALS KNOWN OR SUSPECTED  
TO HAVE BEEN BITTEN OR EXPOSED TO A KNOWN OR SUSPECT RABID ANIMAL**

Exposure Category	Vaccination Status and Response	
<p><b>Category 1</b> (visible bite from known or suspect rabid animal)</p> <p><b>OR</b></p> <p><b>Category 2</b> (direct contact with known or suspect rabid animal; no visible wounds)</p>	Currently Vaccinated	Never Vaccinated
	<ul style="list-style-type: none"> <li>▪ Veterinarian administers rabies vaccine ASAP</li> <li>▪ Veterinarian issues owner the Rabies Advisory Notice</li> <li>▪ The exposed animal should be kept under the owner’s control and be observed by the owner for signs of rabies for 45 days</li> </ul>	<ul style="list-style-type: none"> <li>▪ Recommend euthanasia</li> <li>▪ Veterinarian reports to local health department if owner declines euthanasia</li> <li>▪ Health Officer issues notice to strictly quarantine the exposed animal for 4 months</li> <li>▪ Health Officer approves the quarantine enclosure</li> <li>▪ Veterinarian administers rabies vaccine before confinement begins</li> </ul>
	Previously Vaccinated with Documentation	Previously Vaccinated WITHOUT Documentation
	<ul style="list-style-type: none"> <li>▪ Veterinarian administers rabies vaccine ASAP</li> <li>▪ The exposed animal should be kept under the owner’s control and be observed by the owner for signs of rabies for 45 days</li> <li>▪ Veterinarian issues owner the Rabies Advisory Notice</li> </ul>	<ul style="list-style-type: none"> <li>▪ Treat animal as if never vaccinated (above) <u>OR</u> veterinarian may request that Health Officer assist with the Prospective Serological Monitoring protocol (see attached)</li> <li>▪ Veterinarian issues owner the Rabies Advisory Notice</li> <li>▪ Health Officer issues notice to strictly quarantine the exposed animal until serology results are interpreted</li> </ul>
<p><b>Category 3</b> (bite wounds of unknown origin)</p> <p><b>OR</b></p> <p><b>Category 4</b> (possible contact with, or in the vicinity of, a known or suspect rabid animal; no visible wounds)</p>	Currently Vaccinated or Documented Past Vaccination	No Documentation of Current or Past Vaccination
	<ul style="list-style-type: none"> <li>▪ Veterinarian administers rabies vaccine</li> <li>▪ Veterinarian issues owner a Rabies Advisory Notice</li> <li>▪ The exposed animal should be kept under the owner’s control and be observed by the owner for signs of rabies for 45 days</li> </ul>	<ul style="list-style-type: none"> <li>▪ Veterinarian administers rabies vaccine</li> <li>▪ Veterinarian issues owner the Rabies Advisory Notice</li> <li>▪ The exposed animal should be kept under the owner’s control and be observed by the owner for signs of rabies for 4 months</li> </ul>



## **Prospective Serological Monitoring Protocol, 2016**

This guidance on prospective serologic monitoring is for use with dogs and cats as referred to in Part I B.5(4b) of the NASPHV Compendium of Animal Rabies Prevention and Control, 2016.

This protocol applies only to a dog or cat:

- that has been exposed to a confirmed or suspected rabid animal and;
- that has been, or very likely has been, previously vaccinated with a USDA-licensed rabies vaccine, but for which there is no valid documentation, e.g. a rabies vaccination certificate, and;
- whose owner or guardian wants to avoid euthanasia or strict quarantine, and;
- that can immediately be managed by a veterinarian who can collect serum specimens as described below and administer a rabies vaccine.

**The justification for this recommendation relies on the information presented in the following peer-reviewed publication:**

Moore MC, David RD, Kang Q, et al. Comparison of anamnestic responses to rabies vaccination in dogs and cats with current and out-of-date vaccination status. J Am Vet Med Assoc 2015;246:205–211.

Dogs and cats that have previously received a USDA-licensed rabies vaccine which was administered in compliance with the manufacturers label insert, will mount a strong anamnestic (or secondary immune) response within days following the administration of a booster USDA-licensed rabies vaccine. The paper provides evidence that this is true regardless of the number of vaccines received (even a single vaccine) or the amount of time that has elapsed since the last vaccine was administered.

**Protocol for prospective serologic monitoring for decision-making regarding 4 month quarantine versus 45 day observation:**

The dog or cat must be seen by a veterinarian immediately following an exposure to a confirmed or suspected rabid animal. The veterinarian must report the case to public health authorities or the entity which serves as the local Rabies Control Authority (RCA). The RCA in New Jersey is the local health department (LHD). LHDs shall determine whether prospective serologic monitoring is indicated.

The LHD will work with the veterinarian and the owner to define a timeline during which the protocol must be implemented and the veterinarian shall be responsible for sample submission and receiving the test results. All fees for vaccination, serologic testing and other associated veterinary services will be assumed by the animal owner. The veterinary visit in which the first serum is collected and the rabies vaccine is administered must occur as soon as possible following the exposure and should not exceed 96 hours post exposure. The date of this visit will be counted as Day 0.

***On Day 0 the veterinarian shall;***

1. Collect 1-2 mL of serum. The specimen tube should be labeled with the animal's name, owner or guardian's name, and date of collection, and;
2. Keep the serum specimen refrigerated until the second specimen is collected (specimens held for more than 7 days should be frozen), and;
3. Administer a USDA-licensed rabies vaccine, and;
4. Schedule a follow up appointment to ensure the pet will return in 5 days (*but no longer than 7 days*).

***On Day 5 (but no later than day 7) the veterinarian shall;***

1. Collect a second (paired) serum specimen (1-2 mL). The serum specimen must be labeled appropriately and kept refrigerated until it is shipped. Specimens that are frozen should be shipped on dry ice.
2. Submit the paired serum specimens to an approved Rabies Laboratory for Rapid Fluorescent Focus Inhibition Test (RFFIT) testing with the appropriate forms completed.
3. Contact the LHD to document submission of the specimens.

The paired serum specimens must be delivered to an approved Rabies Laboratory. At this time, the laboratories approved and available to perform the testing are the Kansas State University Rabies Laboratory (KSU-RL) and Wadsworth Rabies Laboratory (for New York State residents only). The Centers for Disease Control and Prevention (CDC) may occasionally provide testing services by special arrangement only. Submission forms for RFFIT testing and submission instructions are posted on the KSU-RL website: <http://www.ksvdl.org/rabies-laboratory/rffit-test/rffit-submission-forms.html>

The submission form for the appropriate laboratory must be complete, accurate, and accompany properly labeled paired specimens to avoid delays in testing. Test results will typically be available within 3-4 weeks from the time testing begins. The submitting veterinarian is responsible for immediately contacting the LHD with the results to finalize recommendations for the animal.

**The dog or cat shall remain in strict quarantine during the testing process until approved by the LHD.**

Final test results will be used to determine whether the animal had been previously vaccinated for rabies. The paired serum specimens must show both a statistically significant (usually defined as two-fold) rise in titer between the first and second specimens and the second titer must be above 0.5 IU/mL. If either of these conditions is not met, the animal must be treated as previously unvaccinated for the purposes of rabies control decisions. Interpretation of the results must be done in conjunction with the laboratory performing the testing as the determination of a statistically significant change in titer is based on the laboratory's own testing performance data.

**FREQUENTLY ASKED QUESTIONS:**

**1. What if the dog or cat did not receive care immediately (within 96 hours) after the exposure?**

Such cases should be discussed with the LHD and managed on a case by case basis. Factors to consider include the number of days that have elapsed since the exposure, the severity of the exposure, number of previous vaccinations, the health of the animal and the local rabies epidemiology.

**2. What if the dog or cat cannot return to the veterinarian for collection of the second specimen on DAY 5?**

Specimens may be collected up until day 7 but not after. Delaying collection of the specimen prevents accurate interpretation of the test results as any increase in rabies antibody titer might be due to the rabies exposure itself rather than an anamnestic response to a previous vaccination.

Specimens sent to KSU-RL can be refrigerated up to 7 days prior to shipping. If specimen collection delays will result in storing a specimen longer than 7 days, the samples should be frozen and shipped on dry ice.

**3. What test will be used to test the serum specimens?**

The laboratory will test the specimens using a Rapid Fluorescent Focus Inhibition Test (RFFIT). It is a serum neutralization (inhibition) test, which means it measures the ability of rabies specific antibodies to neutralize rabies virus and prevent the virus from infecting cells. These antibodies are called rabies virus neutralizing antibodies (RVNA). The current cost for RFFIT testing is \$67.00 per sample.

**4. What values will be used to determine if the dog or cat has evidence of a prior rabies vaccination and an acceptable anamnestic response?**

At least a two-fold rise in the titer values of the paired specimens, as well as a RVNA titer equal to or above 1:50 (otherwise expressed as a RVNA potency value equal to or above 0.5 IU/mL) for the second specimen, provides evidence of a robust anamnestic immune response after rabies vaccination.

**5. If the titer is equal to or above 0.5 IU/mL and there is evidence of an anamnestic response, is it impossible for the animal to go on to develop rabies?**

A specific value equal to or above 0.5 IU/mL and evidence of an anamnestic response provides assurance the animal will be protected. However, there have been rare instances in which vaccinated animals have gone on to develop rabies. Contributing factors may include other immunological factors involved in the protection from rabies infection, or the location and severity of the wound. Because of this uncertainty, confinement with observation or quarantine is warranted regardless of the presence of antibodies.

**6. Where can I find the appropriate submission forms and shipping instructions?**

When using the Kansas State University Rabies Laboratory, submission forms, shipping instructions and other guidance can be found on the KSU website. Visit <http://www.ksvdl.org/rabies-laboratory/rffit-test/rffit-submission-forms.html>.

**7. Can this protocol be used for animals other than dogs or cats such as ferrets?**

No. At this time, data regarding anamnestic responses following revaccination with rabies vaccine are only available for dogs and cats.

## **RABIES ADVISORY NOTICE**

**2016**

Rabies is a fatal disease of warm-blooded mammals caused by a virus, most frequently spread through a bite from an infected animal. An infected animal has the rabies virus in its saliva and infects other animals or people through bites and contact with saliva. Once infected animals become ill, they may bite or attack other animals or people.

This notice is being provided to you because you are the owner of an animal which has been exposed to rabies through a bite, contact with a rabid animal, has suffered a wound of unknown origin suspected to be a bite wound, or because your pet has been near or in the same area as a known or suspect rabid animal.

You are advised to notify your local health department and to seek the advice of a veterinarian if your animal(s) shows any of the following clinical signs during the period of observation: fever, loss of appetite, irritability, inability to swallow, excess salivation, unusual vocalization, abnormal behavior, restlessness, unprovoked aggression, trouble walking, tremors, seizures, or paralysis.

Rabies usually begins subtly, with pet owners first noticing that their animal stops eating and “doesn’t seem right.” The pet may then become restless, irritable, and make strange vocalizations. As the illness progresses, the animal will have a fever and nervous system impairment becomes more prominent with tremors, difficulty walking and swallowing, seizures and/or paralysis. Affected animals may or may not show signs of aggression and try to attack people or other animals. Progression to death is rapid.

Livestock animals, e.g., cattle, horses and sheep, usually develop a paralytic or “dumb” form of rabies. These animals will initially be depressed and, as the disease progresses, they may have difficulty swallowing, become weak and uncoordinated, walk in circles, eat nonedible material, and bellow repeatedly. The animal may appear to be choking or dazed and disoriented.

Infected domestic animals can shed the virus in their saliva and potentially infect people and other animals up to 5 days before the first clinical signs of rabies are apparent. Raccoons, skunks and other wildlife can shed the rabies virus in their saliva for up to 2 weeks before clinical signs are apparent and clinical signs may be mild. Persons caring for exposed animals should take precautions to prevent exposure by minimizing contact with the exposed animals and, if contact is necessary, use rubber gloves, eye protection, hand washing and other protective measures.

At the first signs of illness, isolate your exposed animal(s) from other animals and people and immediately contact your veterinarian or local health department.

If you have any questions about rabies in dogs, cats and other domestic pets, please contact your local health department ([www.localhealth.nj.gov](http://www.localhealth.nj.gov)); for questions about livestock, please contact the New Jersey Department of Agriculture, Division of Animal Health at 609-671-6400.