



Rabies

Investigation Guideline

(Includes Potential Exposure Management)

Contents

CASE DEFINITIONS – Animal Rabies (CDC 1997)	1
CASE DEFINITIONS – Human Rabies (CDC 2011)	1
LABORATORY ANALYSIS	2
EPIDEMIOLOGY	3
DISEASE OVERVIEW	4
NOTIFICATIONS	5
Use of press releases	5
INVESTIGATION GUIDELINES	6
Identify if there was any human or animal exposure	7
Assess the risk of rabies transmission	8
Algorithm: Human Exposure to Potentially Rabid Animal	11
Disposition (management) of the exposing animal	12
Recommendations on rabies post-prophylaxis (PEP) treatment – humans	13
Rabies immunizing products (Table 1):	13
Rabies postexposure prophylaxis schedule – ACIP Recommendations 2010	14
Quarantine or management of exposed, non-human animal	15
MANAGING SPECIAL SITUATIONS	19
A. Human Rabies Case	19
B. Euthanasia of owned animals	20
C. Educating the Public	21
D. Wildlife Die-offs	21
DATA MANAGEMENT AND REPORTING	22
ADDITIONAL INFORMATION / REFERENCES	23
ATTACHMENTS	24
APPENDIX A – Animal Rabies Test Requisition Form	A
APPENDIX B – Rabies Case Investigation Worksheet	B
APPENDIX C – Part III of the Compendium of Animal Rabies Prevention and Control: Vaccines	C
APPENDIX D – Kansas Regulations Pertaining to Rabies Control	D
APPENDIX E – Rabies Contact Investigation in EpiTrax	E
APPENDIX F – Possible Human Rabies – Patient Information Form (CDC)	
APPENDIX G – Sample Animal Euthanasia Consent Form	
APPENDIX H – Public Service Announcements and Press Releases	
APPENDIX I – Rabies Fact Sheets	
APPENDIX J – Recommendations of the Advisory Committee on Immunization Practices (ACIP)	

Revision History:

Date	Replaced	Comments
03/2016	10/2014	<p><u>Laboratory Analysis</u>: addition of information on prospective serologic monitoring of exposed cat or dog. <u>Identify ...exposure</u>: clarification on 10-day period to examine for potential exposures. <u>Disposition ... of the exposing animal</u>: additional guidance on strays. <u>Quarantine or management of exposed, non-human animal</u>: modified to agree with recommendation released in the March 1, 2016 Memorandum.</p> <p><u>Attachments</u>: Removed Compendium of Animal Rabies Prevention and Control, 2011 and replaced with link to the 2016 compendium.</p>
10/2014	04/2014	Minor edits in Epidemiology section. Updated patient assistance program information.
04/2014	06/2010	Provided further guidance on identifying potential exposures (i.e. vet staff). Added contact information for Sanofi Pasteur patient assistance program. Updated data management – including contact data entry. Added additional information on press releases and notifications. Replaced 72 hour description from waiting period to hold animals and added clarification that health officer can waive for testing purposes.
06/2010	03/2010	Changes to Investigation Protocol: 1) Description added on day 0 for bite exposures; 2) Updates to patient assistance program contact information; 3) Notes on post-exposure vaccination of immunosuppressed individuals
		(02/2012) Removed references to KS-EDSS. Updated human rabies case definition to 2011 and Part III Compendium to 2011 version
03/2010	10/2009	Changes to Investigation Protocol: 4-dose vaccine schedule

Rabies (Including Management of Potential Exposures) Disease Management and Investigation Guidelines

CASE DEFINITIONS – Animal Rabies (CDC 1997)

Laboratory Criteria for Case Classification:

- A positive direct fluorescent antibody test (preferably performed on central nervous system tissue), or
- Isolation of rabies virus (in cell culture or in a laboratory animal)

Case Classification:

- **Confirmed:** A clinically compatible case that is laboratory confirmed.
-

CASE DEFINITIONS – Human Rabies (CDC 2011)

Clinical Description for Public Health Surveillance:

Rabies is an acute encephalomyelitis that almost always progresses to coma or death within 10 days after the first symptom.

Laboratory Criteria for Case Classification:

1. Detection of Lyssavirus antigens in a clinical specimen (preferably the brain or the nerves surrounding hair follicles in the nape of the neck) by direct fluorescent antibody test, or
2. Isolation (in cell culture or in a laboratory animal) of a Lyssavirus from saliva or central nervous system tissue, or
3. Identification of Lyssavirus specific antibody (i.e. by indirect fluorescent antibody (IFA) test or complete rabies virus neutralization at 1:5 dilution) in the CSF, or
4. Identification of Lyssavirus specific antibody (i.e. by indirect fluorescent antibody (IFA) test or complete rabies virus neutralization at 1:5 dilution) in the serum of an unvaccinated person, or
5. Detection of Lyssavirus viral RNA (using reverse transcriptase-polymerase chain reaction [RT-PCR]) in saliva, CSF, or tissue.

(Serological criteria are not used in confirming animal rabies.)

Case Classification:

- **Confirmed:** A clinically compatible case that is laboratory confirmed by testing at a state or federal public health laboratory.

LABORATORY ANALYSIS

A. Human Samples:

- The Centers for Disease Control and Prevention (CDC) performs human specimen testing for both antemortem and postmortem diagnosis.
- Contact KDHE-BEPHI at 1-877-427-7317 to coordinate collection and submission of specimens.
- For further guidance, refer to the [Managing Special Situations – Human Rabies Case](#).

B. Animal Testing for Prospective Serologic Monitoring of Exposed Cat or Dog

- Prospective serologic monitoring can document prior vaccination by evidence of an anamnestic response to a booster vaccine.
- The protocol only applies to a dog or cat which is under investigation for a potential rabies exposure and has been, or very likely has been, previously vaccinated with a USDA-licensed rabies vaccine.
 - The dog or cat must have been seen by a veterinarian immediately following an exposure to a confirmed or suspected rabid animal.
 - The veterinarian must report the case to with KDHE or local public health authorities. The public health authorities, based on what is known about the animal's vaccination history and the specifics of the current rabies exposure, will determine whether prospective serologic monitoring is indicated and permitted in their jurisdiction.
- If permitted, the public health authorities will work with the veterinarian and the owner to define a timeline during which the protocol must be implemented.
 - Test, submission and all associated fees will be assumed by the animal owner and submitting veterinarian.
 - The veterinary visit in which the first serum is collected and the rabies vaccine that is administered must occur as soon as possible following the exposure and should not exceed 96 hours post exposure.

C. Animal Testing for Rabies infection:

- Kansas State University Rabies Laboratory (KSU-RL) performs animal testing for the Kansas Department of Health and Environment (KDHE).
 - There is a charge to cover processing and testing.
 - PRIOR to preparation and shipping of specimens, consult with KSU Rabies Laboratory at 785-532-4483 to coordinate specimen submission.
 - Use the [Animal Rabies Test Requisition Form \(Appendix A\)](#).
- Animals can only be tested for rabies infection after euthanasia. A fresh, undamaged cross-section of the brainstem and cerebellum is required.
 - Euthanize in accordance with the [American Veterinary Medical Association's Guidelines on Euthanasia](#).
 - It is preferred that the whole bat be submitted for testing. For animals

- larger than a bat, send animal heads only.
- Exercise caution when decapitating the animal. Do not damage the brain or brain stem or put people at risk of exposure.
- Contact KDHE-BEPHI at 1-877-427-7317 if only formalin-fixed brain is available.
- Packaging of animal specimens:
 - Pack the head or small animal in a primary leak-proof container.
 - The primary container is placed into a secondary container with enough cold packs to maintain refrigerator temperatures until reaching the lab. (Dry ice is not recommended as it may freeze the head.)
- Shipping of animal specimens:
 - KSU-RL offers \$6.00 flat rate shipping labels that can be used to ship rabies specimens <15 lbs. This option provides guaranteed overnight delivery from anywhere in Kansas to KSU-RL via UPS.
 - To purchase these labels, contact KSU-RL at 866-512-5650.
 - Labels should arrive in the mail one day after purchasing.
 - When using these labels, make sure to ship your package via UPS GROUND
 - **DO NOT select the overnight option** – the specimen will be delivered overnight via UPS GROUND without the selection
 - Samples should be sent to:
 - Veterinary Diagnostic Laboratory/RABIES Laboratory
 - College of Veterinary Medicine
 - Kansas State University – VCS Building
 - 1800 North Denison Ave.
 - Manhattan, KS 66506-5601

EPIDEMIOLOGY

With few exceptions, rabies occurs worldwide. The World Health Organization estimates up to 55,000 human deaths occur annually, mostly in rural areas of Africa and Asia. In the United States, between 2003 and June 2013, 34 cases of human rabies were recorded. The last reported human case of rabies in Kansas was in 1968. During 2012, the Centers for Disease Control and Prevention (CDC) recorded 6,162 cases of rabies in animals. Approximately 92% of the cases were in wildlife and 8% in domestic animals. In wildlife, the major animal groups were raccoons (1,953), bats (1,680), and skunks (1,539). Cats represented the largest number of rabies positive domestic animals (257), followed by cattle (115), and dogs (84). In 2013, the Kansas State Veterinary Diagnostic Laboratory (KSVDL) reported 59 cases of rabid animals in Kansas. Seventy-six percent of cases were in wildlife and 24% were in domestic animals. In wildlife, the majority of cases were reported in skunks (37) and bats (6). One rabid raccoon was reported. Cases in dogs (4) and cows (4) represented the majority of cases in domestic animals.

DISEASE OVERVIEW

A. Agent:

A *Rhabdovirus* of the genus *Lyssavirus* causes rabies.

B. Clinical Description:

Rabies virus infects the central nervous system, causing encephalopathy and ultimately death. Early symptoms of rabies in humans are nonspecific: fever, headache, and general malaise. As the disease progresses, neurological symptoms appear: insomnia, anxiety, confusion, slight or partial paralysis, excitation, hallucinations, agitation, hypersalivation, difficulty swallowing, and hydrophobia. Death usually occurs within days of symptom onset.

In animals, there are two types of rabies. One type is encephalitic (furious) rabies where animals are hostile, bite at objects, and have an increase in saliva. The second form is paralytic or paralytic (dumb) rabies where an animal is timid and shy. It often rejects food and has paralysis of the lower jaw and muscles. Signs of animal rabies include: changes in behavior, general sickness, problems swallowing, an increase in saliva, wild animals appearing abnormally tame or sick, animals that bite at everything if excited, difficulty moving or paralysis and, death.

C. Reservoirs:

In the United States, raccoons, skunks, foxes and bats are the major reservoirs. In developing countries, dogs remain a problem. Small rodents and lagomorphs (e.g., squirrels, hamsters, guinea pigs, gerbils, chipmunks, rats, mice, wild rabbits and hares) are not known to transmit rabies to humans and are not usually found to be infected with rabies. The exception is rodents and lagomorphs caged outdoors.

D. Mode(s) of Transmission:

Rabies is spread through the saliva of infected animals through a bite, scratch or contact with mucous membranes or a break in the skin. Skin breaks or mucous membrane exposure to nervous tissue (e.g., brain, spinal cord) of an infected animal may also pose a risk of transmission.

E. Incubation Period:

In humans, usually 14-56 days; range 10 days to ≥ 1 year. Period tends to shorten as severity of exposure increases and/or proximity to the central nervous system decreases (e.g. a bite to the face). In animals, generally 15-50 days, but variable and in rare cases even several months or longer.

F. Period of Communicability:

Dogs, cats and ferrets can shed the virus in their saliva up to 10 days before onset of clinical signs and throughout the course of disease. Wild animals, such as skunks, bats, and foxes, may have virus present in saliva for longer periods before onset of clinical symptoms.

G. Susceptibility and Resistance:

All mammals are susceptible to rabies.

H. Treatment:

Experimental treatment options for humans may be available on a case-by-case basis. However, once symptoms occur, the outcome is almost always fatal.

NOTIFICATIONS (ANIMAL RABIES)

The Kansas Department of Health and Environment's (KDHE) Bureau of Epidemiology and Public Health Informatics (BEPHI) will identify potential cases from:

1. Reports from veterinarians, upon the suspicion of disease in an animal
2. Reports from anyone with knowledge of humans being bitten by potentially rabid animals (e.g., physicians, veterinarians, animal control personnel, law enforcement officials, or animal owners)
3. Positive or unsuitable laboratory reports from the KSU Rabies Laboratory (KSU-RL).

Further information on the processing of KSU-RL Reports:

- KDHE-BEPHI receives ALL positive and unsuitable test reports for specimens submitted to the KSU-RL.
- KDHE-BEPHI then faxes those positive or unsuitable laboratory reports to the local public health official with jurisdiction over the area that the animal was found.
- Negative test reports are not sent to the local public health jurisdiction.
 - KSU Rabies Laboratory will only notify the submitter of the negative specimen by fax (i.e. report to veterinarian submitting the head).
 - For a local health jurisdiction to receive notification of a negative test result, a request for notification of all laboratory test results should be coordinated through KDHE-BEPHI. The local health jurisdiction could also request that the veterinarian involved with the case communicate any test results received.

Use of press releases

Press releases and PSA's available for local health department use to educate the public. These are located under [attachments](#).

The Kansas State University Rabies Laboratory also provides a press release to veterinarians submitting positive specimens.

- This is done only if requested by the veterinarian.
- The template used by KSU is included under [attachments](#).
- It is the responsibility of the local health department to coordinate with the submitting veterinarian at the time of the initial investigation of a positive rabies lab to determine if the veterinarian plans to use the KSU press release.

INVESTIGATION GUIDELINES

The investigator should be aware that:

- **Rabies is a fatal disease;**
- **Prompt investigation is required** by the local health department for:
 - Any report of an animal bite or exposure and
 - All positive (or unsuitable) lab reports.
- Potential scenarios that could be investigated in your jurisdiction:
 - Evidence of a rabid animal
 - A person was exposed to an animal
 - An animal was exposed to an animal

The investigation will depend upon the scenario presented:

<u>Scenarios:</u>	<u>Refer to page(s):</u>
A. Receipt of positive or unsuitable animal rabies laboratory report (or a verbal account of a situation involving a potentially rabid animal):	
1) Identify if a human or animal was exposed to the “rabid” animal. <ul style="list-style-type: none"> • <i>Positive lab reports with an exposure</i> consider high risk; start post-exposure prophylaxis (PEP) and/or begin to manage exposed animals. • Unsuitable laboratory reports are investigated as if positive. 	7
2) Report findings and actions to KDHE-BEPHI.	22
B. A person was bitten or exposed to animal saliva or brain material:	
1) Assess the risk of rabies transmission.	8 - 11
2) Decide on disposition* of the exposing animal (source of exposure).	12
3) Recommend rabies PEP to those who need it and provide reassurance to those who don't.	13 - 14
4) If PEP is recommended, follow up with the case and/or the medical provider to assure the treatment regime is completed.	
5) Report findings and actions to KDHE-BEPHI.	22
C. An animal was bitten or exposed to animal saliva or brain material:	
1) Assess the risk of rabies transmission.	8 - 10
2) Decide on disposition* of the exposing animal (source of exposure).	12
3) Recommend quarantine or other disposition of the animal that was potentially exposed to rabies.	15 - 18
4) Follow-up to assure compliance with recommendations.	
5) Report findings and actions to KDHE-BEPHI	22
D. For cases of Human Rabies, see Managing Special Situations	19 - 20

* *Disposition refers to how will the animal be tested or observed to determine if it has rabies.*

Identify if there was any human or animal exposure

When first starting an investigation, identify the potential sources of reliable information. The following individuals will serve as important sources:

- 1) Animal health professionals (veterinarians and assistants, animal control). These professionals should serve as the initial contact as they may already have collected important details on the situation.
- 2) Animal owners (both owners of the exposing and exposed animals)
- 3) Others in contact with or knowledge of the exposing animal.

As efforts begin to identify potentially exposed humans or animals:

- 1) Examine 10 days back from the first signs of illness (i.e., change in behavior, no appetite, lethargy, incoordination, etc.) to identify all potential exposures.
- 2) Consider all information collected in your interviews.
- 3) Consider all potential contacts – INCLUDING animal control or law enforcement officers.
- 4) Exposure is evaluated as defined below.

Exposure: any penetration of the skin by the teeth or any contamination of mucous membranes or fresh, open cuts in the skin with saliva or brain material.

- *Rabies virus is found in the saliva and brain matter of infected animals.*
- *Rabies virus is inactivated by drying, UV irradiation and other factors and does not persist in the environment. If the suspect material is dry, the virus can be considered non-infectious.*

Bite exposures: any penetration of the skin by the teeth. All bites, regardless of body site or degree of gross trauma, represent potential risk.

Non-bite exposures: surgical recipient of infected tissue, exposure to a large amount of aerosolized virus (laboratory); infectious saliva or brain material in contact with mucous membranes (eyes or mouth) or fresh, open cuts in skin

Bat exposures: Direct contact with a bat or finding a bat in the same room as a person who might be unaware that a bite or direct contact occurred (i.e. sleeping person awakes with bat in room or a bat in the room with a previously unattended, unprotected child, or mentally disabled or intoxicated person.)

- Situations not considered to be a bat exposure:
 - Those in the room can credibly state there was no direct contact with a bat.
 - Finding a bat OUTSIDE of the room the person was in (i.e., hallway or other side of open door).
- Undetected exposure is less likely when protection like mosquito netting is used while sleeping or when bats are observed outdoors, in a room open to the outside or in settings where they are normally present.

Assess the risk of rabies transmission

Animal exposures are classified into three categories:

- high risk,
- low risk, and
- no risk.

A risk assessment is used to decide if the animal could be infected with rabies and if other action is needed, including post-exposure prophylaxis (PEP).

The risk assessment is based upon the following the following criteria:

- The [type of exposure](#), as defined above.
- The risk that the animal is rabid.

The risk that an animal is rabid depends on the following circumstances:

- Is it a species that can be infected with and transmit rabies?
- Was it possible that the animal had contact with any rabies vectors?
- Is/was the animal exhibiting signs of rabies?
 - Dogs, cats and ferrets: variety of signs, including lethargy, inappetence, fear, aggression, excessive drooling, difficulty swallowing, staggering and seizures.
 - Horses, cattle, sheep and goats: above signs, as well as depression, self mutilation, or increased sensitivity to light.
 - Wild animals may only exhibit unusual behavior which may include being fearless of humans or appearing tame.

1. Use the [“Rabies Case Investigation Worksheet” \(Appendix B\)](#); collect:

- Date person or animal was bitten or exposed;
- Severity of wound or extent of exposure and anatomical site;
- Type of animal;
- Availability for testing or observation (results of testing, if available);
- Vaccination status of exposing animal;
- Other Exposure Details / Circumstances:
 - Location and way to identify exposing animal and its owner;
 - Circumstances of bite;
 - First signs of abnormal animal behavior in exposing animal;
 - Exposing animal’s exposure to wildlife or other rabies vectors.

2. Review the type of animal causing the exposure vs. the nature of rabies:

Bats: Rabid bats are increasingly implicated as an important wildlife reservoir. Transmission can occur from minor, seemingly underappreciated or unrecognized bites from bats. Make every effort to safely capture and test the bat involved in an exposure incident. They are considered a high risk exposure. Regard as rabid unless negative by laboratory tests.

Wild Terrestrial Carnivores: Wild terrestrial carnivores are an important rabies reservoir. Skunks are most often infected with rabies in Kansas. Suggestive clinical signs of rabies among wildlife cannot be interpreted reliably. Vaccines given to wildlife are of unknown efficacy and should be disregarded. Regard as rabid unless animal is negative by laboratory tests.

- ***It is illegal to keep skunks, raccoons, foxes, and coyotes as pets (K.A.R. 28-1-14); they must be sacrificed and tested.***

Wild animal hybrids: The period of rabies virus shedding is unknown and vaccines given to hybrids are of unknown efficacy and are disregarded. Hybrids of species that transmit rabies are managed as wild carnivores and regarded as rabid unless the animal tests negative for rabies.

- **Wolf-dog hybrids:** Because wolves and dogs have a very similar genetic makeup and many animals advertised as “wolf-dogs” might actually be dogs, each wolf hybrid situation should be evaluated individually – taking into account the likelihood that it is a hybrid, the severity of the wound and assessment by the bite victim and healthcare provider.
- ***Wild species cross-bred with domestic dogs and cats, whether owned or un-owned, shall be sacrificed immediately and the head submitted for laboratory examination for evidence of rabies (K.A.R. 28-1-14).***

Dogs, Cats, and Ferrets:

- **Stray or Feral:** More likely to have had contact with wild animals and less likely to have been vaccinated. Treat as wild carnivores and regard as rabid unless animal tests negative for rabies.
- **Domestic:** Those with up-to-date rabies vaccinations are unlikely rabid. A healthy dog, cat or ferret is of low risk and can be observed. If there are signs of rabies, considered the animal rabid unless negative by lab tests.

Livestock: Vaccinated and/or healthy animals are unlikely to be rabid. Investigate livestock exhibiting signs of rabies or that died suddenly as a suspect rabies case. Consult with KDHE-BEPHI.

Large rodents (woodchucks and beavers): Large rodents have been found to have rabies in the Eastern U.S. where the raccoon-variant rabies virus is circulating. This “raccoon strain” has not been identified in Kansas. The risk while low should be evaluated in consultation with KDHE-BSE.

Small rodents and lagomorphs: Squirrels, chipmunks, rats, mice, hamsters, guinea pigs, and gerbils and lagomorphs (rabbits and hares) are rarely infected and have not been known to transmit rabies to humans. No risk; unless the circumstances of the exposure or the animal’s past exposure to rabies vectors suggest differently. (i.e., recent history of pet rabbit bitten by wild carnivore)

Non-mammalian animals: Non-mammals do not transmit rabies. No risk.

3. Investigate the circumstances of exposure:

Talk to the exposed person and/or other witnesses to get an account of what occurred. Make a distinction between a provoked and unprovoked bite considering the animal's "normal" behavior. An unprovoked bite may be attributable to rabies. Provoked bites are less likely to reflect behavioral changes associated with rabies. Examples of provoked bites:

- Bites by unfamiliar or non-domesticated animals the person was interacting with (e.g., petting a stray, feeding or cornering wild animals)
- Bites by an injured animal (e.g. dog hit by a car).
- Bites by an animal protecting "their space" (e.g. a front yard, their food)

4. Consider what is known about the exposing animal:

- Animals up-to-date with an approved vaccine for their species are unlikely to be rabid. ([Appendix C](#): listing of approved rabies vaccines.)
- Animals that had the opportunity to be in contact with wildlife are at a higher risk for rabies.
- Bites by animals with a previous history of menacing or biting are less likely to reflect changes in behavior that may be attributable to rabies.

5. Make a decision (Use "[Rabies Exposure Algorithm](#)" below):

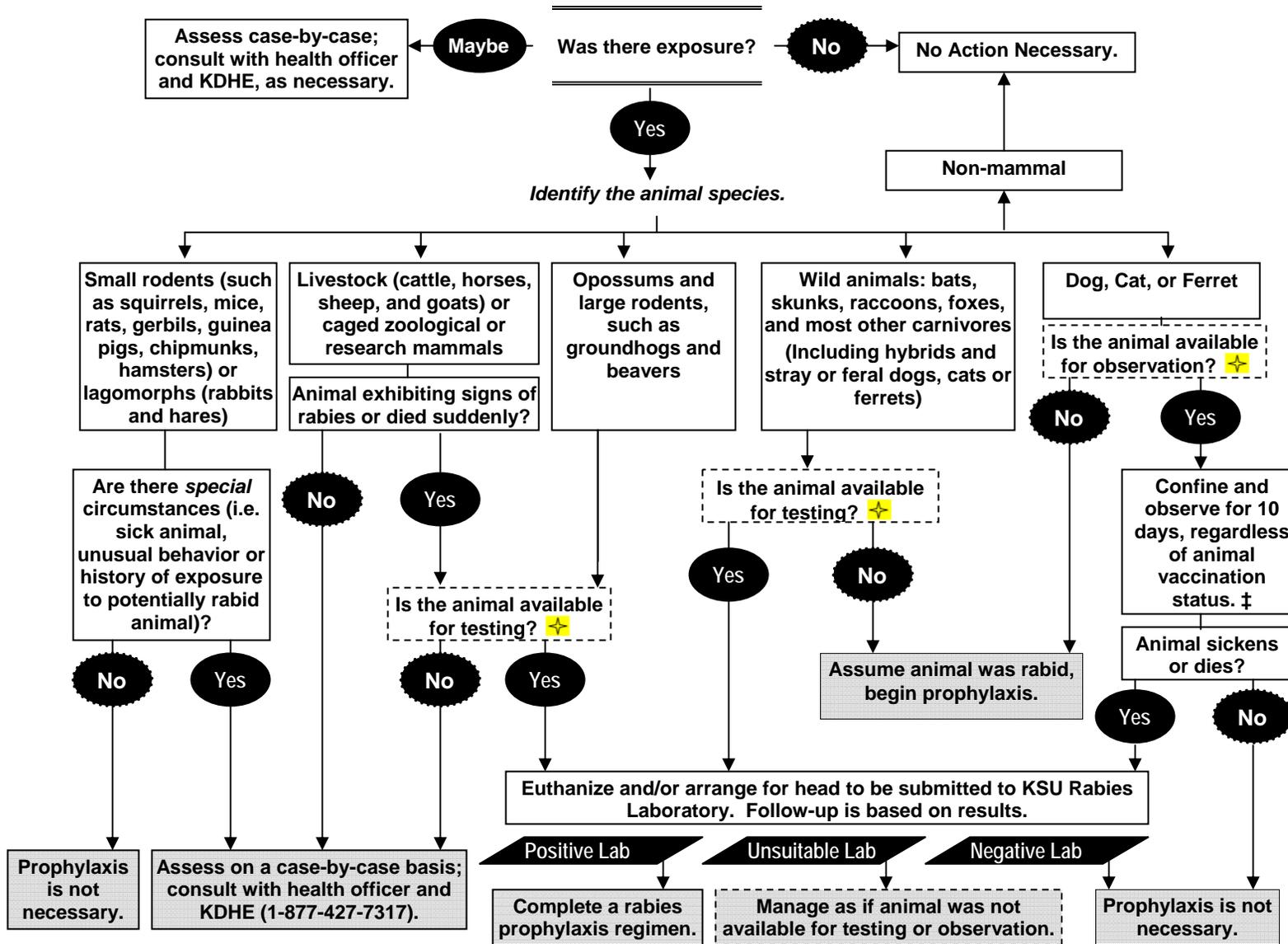
Review information collected to determine the risk of rabies transmission:

- No risk: PEP, confinement and/or testing is not indicated.
- Low risk: Confinement or testing is indicated. PEP is offered based on the results of confinement or testing.
- High risk: Immediate testing of the animal and initiation of prophylaxis is indicated. Prophylaxis can be stopped if testing results are negative.

Examples of high risk situations:

- Exposure to a bat or animal testing positive for rabies.
- Exposure to a mammal exhibiting signs and symptoms of rabies.
- Non-provoked bite above the shoulder by wild carnivores or unvaccinated dog or cat that has potential exposure to rabies vectors.
- Bite or exposure to a wild carnivore, dog, cat or ferret that cannot be located and positively identified for testing within a reasonable amount of time based on the severity of the wound.

Rabies Exposure Assessment Algorithm: Human Exposures to Potentially Rabid Animal



Notes:

- 1) **Exposure:** any penetration of the skin by the teeth or any contamination of mucous membranes or fresh, open cuts in the skin with saliva or brain material. Please refer to note 2) for bats.
- 2) **Bat Exposure:** Every effort should be made to safely capture and test the bat involved. If the patient can provide an adequate testimony that while conscious, no direct exposure occurred then no PEP is necessary. If the patient is an unobserved child, or was an unobserved person who was asleep, intoxicated or mentally challenged, then PEP may be indicated if testing cannot be done.
- 3) **Immediate care:** Proper wound care should always occur. (i.e. cleaning area, tetanus booster and/or antibiotics, as needed)
- 4) **For consultation:** Contact a KDHE epidemiologist on call 24 hours/day any day.

✦ Exposed individuals may be offered post-exposure prophylaxis (PEP) at anytime during the period of testing or observation if the situation is considered one of high risk for potential rabies transmission. If the animal is later determined not rabid, treatment should be stopped.

On a case-by-case basis, it may be allowable to wait to identify an animal's owner or to capture an offending animal (assuming the correct animal can be positively identified). The local health officer can waive any holding period in lieu of the urgency of the situation.

‡ For the 10 day observation period, day 0 is the day that the bite or exposure occurred.

Disposition (management) of the exposing animal *

* Based on current Kansas regulations ([Appendix D](#))

When investigating a potential rabies exposure of a human or other mammal, the management of the animal causing the exposure shall be as follows:

1. **Domestic dog, cat, or ferret** that is owned or wanted shall be isolated (confined) 10 days as determined by the local health officer or designee.
 - 10-day period begins on day 0, which is the date exposure occurred and is completed at the end of day 10.
 - Confined/ isolated: animal is kept in an approved location in a manner that would not allow the offending animal to be lost to follow-up during the confinement period.
 - Locations of isolation: residence of owner, a veterinary hospital, or a facility holding a current state pound or shelter license. (Based on ability of owner to comply with isolation measures and the level of risk posed.)
 - Before or during isolation: animal exhibiting rabies symptoms shall be sacrificed and tested, by order of the local health officer or designee.
 - Release: healthy animals are released with the local health officer or designee's authorization upon the payment of any boarding fees.
2. **Stray dogs, cats or ferrets mammals** that are healthy and are to be held to await claim in a facility with a current pound or shelter license should also be observed for 10 days.
 - If the stray is euthanized, before the 10 day period is completed. Testing for rabies shall occur.
 - If the stray is or begins to experience symptoms of rabies, it shall be sacrificed immediately and tested.
 - On a case-by-case basis, it may be allowable to wait to identify an animal's owner or to capture an offending animal (assuming the correct animal can be positively identified) before taking any actions.
 - For high risk situations (due to the severity and/or location of the bite), any holding period may be waived in lieu of testing urgency.
3. **Horses, cattle or sheep** management shall be determined by the local health officer or designee in consultation with KDHE-BSE.
4. **Other mammals** which are known to be involved in rabies transmission shall be sacrificed immediately and head submitted for testing.
 - This includes hybrids of species known transmit rabies.
 - Any vaccinated mammal if its virus shedding period is unknown.
5. **Small rodents and lagomorphs** (squirrels, chipmunks, mice, rats, gerbils, guinea pigs, hamsters, rabbits, hares and other species not involved in the transmission of rabies) do not need to be sacrificed; unless circumstances, in the judgment of the local health officer or designee, indicate otherwise.
6. Disposition of mammals which are not known to be involved in rabies transmission and are maintained in zoological parks shall be in accordance with the local health officer or designee.

Recommendations on rabies post-prophylaxis (PEP) treatment – humans

The administration of rabies PEP is a medical urgency, not a medical emergency, but do not delay decisions. When a likely exposure has occurred, PEP should be administered, provided that clinical signs of rabies are not present in the person and the maximum incubation period for the rabies virus has not passed.

The local health department (LHD) and KDHE will only make recommendations about the advisability of PEP. The patient's physician has the final decision; but, during times of limited rabies biologics, KDHE will follow CDC guidance in limiting the use of rabies biologics to events in which PEP is recommended.

The Advisory Committee on Immunization Practices (ACIP) provides the recommendations on the use of rabies PEP. The recommendations are reported in the CDC Morbidity and Mortality Weekly Report – Human Rabies Prevention in the United States, 2008 ([Appendix J](#)).

Rabies biologics are available only by prescription and are not provided by KDHE. The LHD must refer clients to private physicians, internal or external clinics or hospitals. PEP treatment is a simple, effective and a relatively painless procedure. However, the financial costs associated with PEP may exceed \$3000/case.

Both manufacturers have patient assistance programs for the uninsured or underinsured. Medicaid or Medicare does pay for treatment.

- Sanofi Pasteur (HRIG and vaccine): Sanofi Foundation (Patient Assistance Program) by telephone (866-801-5655) or <https://www.visitspconline.com>
- Novartis (vaccine only): Through RX for Hope by telephone (800-589-0837) and www.rxhope.com/PAP/info/PAPInfo.aspx

Note: Pregnancy is not a contraindication to PEP.

If PEP is started and laboratory results later show an animal is negative for rabies, PEP should be discontinued.

Rabies immunizing products (Table 1):

1. Human rabies immune globulin (HRIG):
 - Provides rapid passive immunity for a short time (half-life of 21 days).
 - Administered once at beginning of post-exposure prophylaxis to provide immediate antibodies until the patient responds to the vaccine by actively producing antibodies.
 - If not administered on day 0 (first day of vaccine dose is given), it can be administered up to and including day 7.
 - HRIG may partially suppress active production of antibodies; therefore, no more than the recommended dose should be given.
 - **Never administer HRIG in the same syringe as the vaccine or into the same anatomical site.**
 - **Never give to a person who has been previously vaccinated.**
2. Human diploid cell (HDCV) or purified chick embryo cell (PCECV) vaccine:
 - Induces active immunity which requires >10 days to develop and usually persists for >2 years.
 - Administered intramuscularly (IM) in the deltoid muscle, which is the only acceptable site of vaccination for adults and older children. For younger children the anterolateral aspect of the thigh is acceptable.
 - **Never give rabies vaccine in the gluteal muscle.**

TABLE 1. Currently available rabies biologics — United States, 2008

Human rabies vaccine	Product name	Manufacturer
Human diploid cell vaccine	Imovax® Rabies*	sanofi Pasteur Phone: 800-822-2463 Website: http://www.vaccineplace.com/products/
Purified chick embryo cell vaccine	RabAvert®	Novartis Vaccines and Diagnostics Phone: 800-244-7668 Website: http://www.rabavert.com
Rabies immune globulin	Imogam® Rabies-HT	sanofi pasteur Phone: 800-822-2463 Website: http://www.vaccineplace.com/products/
	HyperRab™ S/D	Talecris Biotherapeutics Bayer Biological Products Phone: 800-243-4153 Website: http://www.talecris-pi.info

* Imovax rabies I.D., administered intradermally, is no longer available in the United States.

Rabies postexposure prophylaxis schedule – ACIP Recommendations 2010:

Note: The 2010 ACIP recommendations for post-exposure prophylaxis do differ from current rabies vaccine label instructions. Refer to the attached [MMWR for details](#).

1. Wound Treatment: Immediate and through cleansing with soap and water. If available, a virucidal agent such a povidine-iodine solution should be used to irrigate. Consider a tetanus vaccine booster. Antibiotic prophylaxis and primary wound closure depend on exposing animal, the wound(s) size and location and time interval since the bite. Avoid suturing, when possible.
2. Determine the patient’s rabies vaccination status. (A complete pre- or post-exposure vaccination with HDCV, PCECV or rabies vaccine adsorbed, or previous vaccination with any other type of rabies vaccine and documented antibody response to that vaccination is consider “previously vaccinated”.)
3. For previously vaccinated patients:
 - HRIG: Do not administer.
 - Vaccine: 1.0 mL, IM, one each day on days 0 and 3*.
4. For patients not previously vaccinated:
 - HRIG: Administer 20 IU/kg body weight. If anatomically feasible, the full dose should be infiltrated around the wound(s) and any remaining volume should be administered IM in the deltoid or quadriceps at an anatomical site distant from the vaccine administrations.
 - Vaccine: 1.0 mL, IM, one each day on days 0, 3, 7, and 14*

(For patients with immunosuppression, vaccine should be administered using all 5 doses of vaccine on days 0, 3, 7, 14, and 28)

*** For deviations from recommended postexposure vaccination schedules:**

- **Every attempt** should be made to adhere to the schedule.
- Once initiated, a delay of a few days for individual doses is unimportant. Resume as if on schedule maintaining the same interval between doses.
- The effect of longer lapses is unknown. For substantial deviations, contact the manufacturer (see [Table 1](#)) to evaluate.
 - In most cases, when substantial deviations do occur in a series, there will just be a need to assess immune status by performing serologic testing 7-14 days after the final dose.

Quarantine or management of exposed, non-human animal

* Based on current [Kansas regulations](#), [Kansas March 2016 Memorandum](#), and [Compendium of Animal Rabies Prevention and Control, 2016](#).

When investigating a potential exposure to rabies of a mammal, the management of the animal potentially exposed shall be as follows:

1. Determine the rabies immunization status of owned and wanted dogs, cats, ferrets, horses, cattle, and sheep.
 - Appropriate documentation of vaccination is verified by the owner providing a rabies vaccination certificate that contains a positive identification for each mammal showing most recent vaccination by a licensed veterinarian with an approved vaccine for species and expiration date of the rabies vaccine.
 - An animal is current on vaccination when the appropriate documentation indicates that the initial vaccination was with a USDA-licensed vaccine approved for that species administered at least 28 days previously or booster vaccinations administered in accordance with [Part III of the Compendium of Animal Rabies Prevention and Control \(Appendix C\)](#)
 - Without appropriate documentation, an animal may need to be managed as never vaccinated or with the possible use of prospective serologic monitoring. Refer to appropriate actions below.
2. The following types of actions may need to occur with the **exposed** animal:
 - **Observation:** exposed animal is kept by the owner as per normal handling procedures in a manner that allows the animal to be watched for any changes of behavior or health.
 - **Quarantine:** exposed animal is kept in a manner that assures the exposed animal is effectively restricted from any contact with other animals. This requires that there be no possibility of the animal gaining exit from or another animal gaining entry to the quarantine space. The number of human caretakers should be as few as possible while monitoring the animal for possible development of rabies.
 - **Euthanized, with testing:** If signs suggestive of rabies are present in an animal under observation or quarantine, the animal should be euthanized and tested. (Notify local health authorities of any illness.)
 - **Euthanized, without testing:** Exposed animals that are susceptible to rabies may require immediate euthanasia. The exposed animals do not need to be tested if they are not exhibiting signs of rabies unless the animal is also being investigation as a potential “exposing” animal in a separate incident.
 - Currently, there is no United States Department of Agriculture (USDA)-licensed biologics for postexposure prophylaxis of previously unvaccinated domestic animals, and there is evidence that the use of vaccine alone will not reliably prevent the disease in these animals.
3. Appropriate actions will be determined based on the **exposed** animal’s vaccination status and species:

- **Dogs, cats, and ferrets that have appropriate documentation** of current rabies vaccination should immediately receive veterinary medical care for assessment, wound cleansing, and booster vaccination. The animal should be kept under the owner's control and observed for 45 days.
- **Dogs and cats that are overdue for a booster vaccination and have appropriate documentation** of having received a USDA-licensed rabies vaccine approved for that species at least once previously should immediately receive veterinary medical care for assessment, wound cleansing, and booster vaccination. The animal should be kept under the owner's control and observed for 45 days.
 - If booster vaccination is delayed past 96 hours, public health officials may consider increasing the observation period, taking into consideration factors such as the severity of exposure, the length of delay in booster vaccination, current health status, and local rabies epidemiology.
- **Dogs and cats that are overdue for a booster vaccination - but do not have appropriate documentation** of having received a USDA-licensed rabies vaccine approved for that species at least once previously - should immediately receive veterinary medical care for: assessment, wound cleansing, and REQUIRED consultation with KDHE or local public health authorities on the possible use of prospective serologic monitoring.
 - Prior to booster vaccination, the attending veterinarian must request guidance from KDHE or the local public health authorities.
 - During the testing process, the exposed animal must be kept in strict quarantine.
 - With an adequate anamnestic response, the animal is considered as overdue at time of exposure requiring a 45 day observation.
 - If there is inadequate evidence of an anamnestic response, the animal is considered and handled as if they were never vaccinated.
 - The exposed animal who is not a candidate for serological monitoring is treated as if they have never been vaccinated.
- **Dogs, cats, and ferrets that have never been vaccinated** against rabies should be euthanized immediately. If the owner is unwilling to have the animal euthanized, after the receipt of veterinary medical care for assessment, wound cleansing, and an immediate rabies vaccination, the animal should be placed in strict quarantine for 4 months (for dogs and cats) or 6 months (for ferrets). It is recommended that the period from exposure to vaccination not exceed 96 hours.
 - If vaccination is delayed, public health officials may consider increasing the quarantine period from 4 to 6 months, considering factors such as the severity of exposure, the length of delay in vaccination, current health status, and local rabies epidemiology.
 - Dogs, cats, and ferrets in quarantine do not need to receive the rabies vaccination 30 days prior to release from quarantine.

- **Ferrets that are overdue for a booster vaccination** should be evaluated and managed on a case-by-case basis by consulting with KDHE or local public health authorities. Factors to be considered include the severity of exposure; time elapsed since last vaccination, number of previous vaccinations, current health status, and local rabies epidemiology.
- **Cattle, sheep and horses that have appropriate documentation** of current rabies vaccination with a USDA-licensed vaccine approved for that species should be given a booster vaccination immediately and observed for 45 days.
- **Cattle, sheep and horses that are overdue for a booster vaccination** should be evaluated and managed on a case-by-case basis by consulting with KDHE or local public health authorities. Factors to be considered include the severity of exposure, time elapsed since last vaccination, number of previous vaccinations, current health status, and local rabies epidemiology.
- **Cattle, sheep and horses that have never been vaccinated** should be euthanized immediately or placed in strict quarantine for 6 months.
- **Other animals exposed to rabies** should be euthanized immediately. Animals maintained in USDA-licensed research facilities of accredited zoological parks should be evaluated and managed on a case-by-case basis by consulting with KDHE or local public health authorities.

Cattle, sheep, and other livestock slaughtered for consumption: If an exposed animal is to be slaughtered for consumption, it should be done immediately after exposure. Barrier precautions should be used by persons handling the animal, and all tissues should be cooked thoroughly. Historically, federal guidelines have required that any animal known to have been exposed to rabies within the previous 8 months be rejected for slaughter. Notify USDA Food and Inspection Service (FSIS) meat inspectors if any food animals were potentially exposed before slaughter.

Additional Notes:

- Dogs, cats, and ferrets that were under quarantine prior to the release of the [March 1, 2016 memorandum](#), should be managed as follows:
 - If the dog or cat had at least one documented rabies vaccination with a USDA-licensed vaccine approved for that species prior to exposure, and the animal received a rabies vaccine booster within 96 hours of exposure, the animal may be released from quarantine and observed for signs of rabies for 45 days post-exposure.
 - If the dog or cat does not have documentation of a rabies vaccination with a USDA-licensed vaccine approved for that species prior to exposure their quarantine can be reduced from 6 months to 4

months if the animal received a rabies vaccine booster within 96 hours of exposure otherwise the animal should remain in quarantine for 6 months.

- Dogs and cats who received the rabies vaccine booster at the beginning of quarantine no longer need to receive the rabies vaccination 30 days prior to release from quarantine.
- Ferrets that are currently in quarantine should be evaluated on a case-by-case basis by consulting with KDHE or local public health authorities. Factors to be considered include the severity of exposure, time elapsed since last vaccination, number of previous vaccinations, current health status, and local rabies epidemiology.

MANAGING SPECIAL SITUATIONS

A. Human Rabies Case

- As required by law, suspect cases of human rabies shall be reported to KDHE within four hours.
- KDHE is the primary contact for physicians for consultation about possible human rabies cases. KDHE will coordinate specimen collection and submission with CDC Rabies Laboratory.

Safe Clinical Management of Human Rabies Patients:

- Human rabies patients **do not pose** any greater risk of infection to health-care personnel than do patients with other infections.
- Adhere to standard precautions. Use gowns, goggles, masks, and gloves, particularly during intubation and suctioning.
- **Post-exposure prophylaxis:** Only when the patient has bitten another person or when the patient's saliva or other potentially infectious material (such as neural tissue) has contaminated an open wound or mucous membrane.

Initial information needed for consultation:

- Clinical signs and symptoms, including laboratory tests.
- Any suspicious animal exposure: circumstances, species, type of exposure, location and date of exposure.
- Recent travel history and/or activities of case.
- Occupational association with domestic and wild animals.
- Any recent medical procedures.

Additional case investigation (after samples are approved for CDC testing):

1. Patient history:

- Use [CDC Possible Human Rabies ---Patient Information Form \(Appendix F\)](#).
- Ensure the physician completes the clinical history of the patient.
- Provide the name and phone number of the physician who should be contacted with the test results in addition to KDHE.
- The form must accompany samples sent to the CDC Rabies Laboratory.

2. Sample Shipment:

- All samples should be considered as potentially infectious.
- Test tubes and other sample containers must be securely sealed (tape around the cap will insure that the containers do not open during transit).
- If immediate shipment is not possible, samples should be stored frozen at -20°C or below.
- Samples should be shipped frozen on dry ice by an overnight courier in water-tight primary containers and leak-proof secondary containers that meet the guidelines of the International Air Transport Association.
- KDHE will coordinate sample collection, submission and shipment with the CDC Rabies Laboratory.

3. Sample Collection - all four clinical specimens are required by CDC:
- Saliva: Using a sterile eyedropper pipette, collect saliva and place in a small sterile container which can be sealed securely. No preservatives or additional material should be added. Laboratory tests to be performed include detection of rabies RNA (by reverse transcription and polymerase chain reaction, RT/PCR, of extracted nucleic acids) and isolation of infectious virus in cell culture. Tracheal aspirates and sputum are not suitable for rabies tests.
 - Neck Biopsy: A section of skin 5 to 6 mm in diameter should be taken from the posterior region of the neck at the hairline. The biopsy specimen should contain a minimum of 10 hair follicles and be of sufficient depth to include the cutaneous nerves at the base of the follicle. Place the specimen on a piece of sterile gauze moistened with sterile water and place in a sealed container. Do not add preservatives or additional fluids. Laboratory tests to be performed include RT/PCR and immunofluorescent staining for antigen in frozen biopsy specimens.
 - Serum and cerebral spinal fluid (CSF): At least 0.5 ml of serum or CSF should be collected; no preservatives should be added. Do not send whole blood. If no vaccine or rabies immune serum has been given, the presence of antibody to rabies virus in the serum is diagnostic and tests of CSF are not needed. Antibody to rabies virus in the CSF, regardless of the immunization history, suggests a rabies virus infection. Antibody tests include indirect immunofluorescence and virus neutralization.
 - Brain Biopsy: The rarity of rabies and the lack of an effective treatment make the collection of a brain biopsy unwarranted; however, biopsy samples negative for herpes encephalitis should be tested for evidence of rabies infection. The biopsy is placed in a sterile sealed container; do not add preservatives or additional fluids. Laboratory tests to be performed include RT/PCR and immunofluorescent staining for viral antigen in touch impressions.

Note: Postmortem diagnosis of rabies is made by immunofluorescent staining of viral antigen in touch impressions of brain tissue. Portions of the medulla (brain stem), the cerebellum, and the hippocampus should be frozen and shipped on dry ice to a public health laboratory or CDC laboratory. Preservation of tissues by fixation in formalin is not recommended if rabies diagnosis is desired.

B. Euthanasia of owned animals

- When an owner is making arrangements to euthanize a pet for humane reasons, it is important to have the owner sign an animal euthanasia consent form.
- This form will describe the animal and have the owner attest that to their knowledge it has not bitten anyone in the past 10 days.
 - If an animal has bitten someone in the past ten days, the animal must undergo post-mortem rabies testing after euthanasia.
- A [Sample Animal Euthanasia Consent Form \(Appendix G\)](#) is included in supporting documents.

C. Educating the Public

- Education of the general public is a good measure to prevent exposures.
- General information can be found on the CDC Rabies website:
www.cdc.gov/rabies/
 - Rabies Exposure: www.cdc.gov/rabies/exposure/index.html
 - Animals and Rabies: www.cdc.gov/rabies/exposure/animals/index.html
- Public Service Announcements and sample press releases are available in [Appendix H](#).
- A fact sheet based on information from www.cdc.gov is available in [Appendix I](#).

D. Wildlife Die-offs:

- Local Health Departments are often called because of an animal die-off.
- These seldom have public health significance, and are best handled by contacting the county's animal control officer or the Kansas Department of Wildlife, Parks, and Tourism (KDWPT).
- The KDWPT and animal control workers understand the ecology of the area and are trained in these type of investigations.

DATA MANAGEMENT AND REPORTING TO THE KDHE

- A. Organize and collect data.
- B. Report data via the state electronic surveillance system.
 - **EpiTrax Disease Name: Rabies, Animal**
 - Used by KDHE-BEPHI to enter positive or unsuitable animal rabies laboratory reports received by KDHE.
 - Used by LHD to enter, investigate, and track human exposure to potentially rabid animal (suspect cases). These animals may just be under observation and never tested.
 - The LHD should verify the information about potential contacts or explain the circumstances if there were no contacts.
 - Potential contacts (animal and human) should be recorded under the CONTACTS tab.
 - o The Contact event form should be completed for each contact.
 - o Refer to the [Rabies Contact Investigation in EpiTrax](#) document in Appendix E for more instructions.
 - **EpiTrax Disease Name: Rabies, Human**
 - Used to record all information collected on possible HUMAN RABIES cases. (**USE ONLY for human cases of acute encephalomyelitis that could possibly be attributable to rabies.**)
 - Information can be collected on the “Possible Human Rabies --Patient Information Form” and entered into the surveillance system.

Guide to Worksheets and Forms	
Rabies Case Investigation Worksheet	Used by local investigator to investigate animal or human exposures to potentially rabid animal.
Rabies Exposure Assessment Form	Available during periods of limited rabies biologics; used by medical provider to request approval to order rabies vaccine.
Possible Human Rabies – Patient Information Form	Used for cases of human rabies (those exhibiting clinical signs and symptoms).

ADDITIONAL INFORMATION / REFERENCES

- Compendium of Animal Rabies Prevention and Control, 2016
www.nasphv.org/documentsCompendia.html
- Centers for Disease Control and Prevention
www.cdc.gov/rabies/
 - Human Rabies Prevention Recommendations (CDC-ACIP)
www.cdc.gov/mmwr/preview/mmwrhtml/rr57e507a1.htm
 - Use of a Reduced (4-Dose) Vaccine Schedule for Postexposure Prophylaxis to Prevent Human Rabies (CDC-ACIP, 2010)
<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5902a1.htm>
 - Information for State Health Departments
www.cdc.gov/rabies/statehealthdept.html
- Kansas State University College of Veterinary Medicine, Rabies Laboratory
www.vet.ksu.edu/depts/dmp/service/rabies/index.htm
 - Diagnostic Testing and Results for Animals Suspected of Having Rabies: www.vet.ksu.edu/depts/dmp/service/rabies/diagnostic.htm
 - Rabies Diagnosis in Animals Submission form
www.vet.ksu.edu/depts/dmp/service/rabies/pdf/Rabies.pdf
- World Health Organization
www.who.int/health_topics/rabies/en/
- American Veterinary Medical Association
www.avma.org/public_health/default.asp#rabies
 - Compendium of Animal Rabies Prevention and Control, 2016
<http://avmajournals.avma.org/doi/pdf/10.2460/javma.248.5.505>
 - Model Rabies Control Ordinances
www.avma.org/issues/policy/rabies_control.asp
 - A Community Approach to Dog Bite Prevention
www.avma.org/public_health/dogbite/dogbite.pdf
 - AVMA Guidelines on Euthanasia
www.avma.org/issues/animal_welfare/euthanasia.pdf

ATTACHMENTS

The following Appendixes are available under attachments:

- **APPENDIX F: Possible Human Rabies – Patient Information Form (CDC)**
- **APPENDIX G: Sample Animal Euthanasia Consent Form**
- **APPENDIX H: Public Service Announcements and Press Releases**
- **APPENDIX I: Rabies Fact Sheets**
- **APPENDIX J: Recommendations of the Advisory Committee on Immunization Practices (ACIP)**
 - **MMWR (2008), Human Rabies Prevention in the United States**
 - **MMWR (2010), Use of a Reduced (4-Dose) Vaccine Schedule for Postexposure Prophylaxis to Prevent Human Rabies**

To view attachments in the electronic version:

1. Make certain you are viewing in Adobe.
2. Go to <View>; <Navigation Pane>; <Attachments> – OR – Click on the “Paper Clip”  icon at the left.
3. Double click on the document to open.

APPENDIX A – Animal Rabies Test Requisition Form

Submitting State: **Kansas**
 Nebraska RA# _____
 Other _____

Laboratory Use Only:

Lab No. _____

- Positive**
- Negative**
- Unsuitable**
- Indeterminate**

Signature/Date _____

Submit to:

Attn: Rabies Laboratory
 KSU Veterinary Diagnostic Laboratory
 1800 N. Denison Avenue
 Mosier Hall
 Manhattan, KS 66506-5601
 Phone: (785) 532-4483

SPECIMEN SUBMITTED BY

Clinic/Agency _____ Contact _____

Address _____ Phone # _____

City/State/Zip _____ Fax # _____

Do you request a faxed copy of results? No Yes

SPECIMEN HISTORY

Kind of Animal	Breed/Species	Age (approx.)	Color/Description	Gender
_____	_____	_____	_____	_____

Animal Location:

Town _____ County _____ Specific Location _____

Submitted animal's vaccination status: Current Unvaccinated Not Current Unknown

Was the animal sick or acting strangely? No Yes

Signs of Rabies: neurological disorder paralysis difficulty swallowing drooling aggression

Other, describe: _____

Date of death: _____ Manner of death _____

Date Submitted: _____

Owner/complainant name _____ Phone # _____

Address _____

City _____ State/ZIP _____

EXPOSURE HISTORY

Has the animal bitten any person? No Yes Name: _____ Date _____

If yes, please give details of incident: _____

Was this animal in contact with a pet or domestic animal? No Yes If yes: Date _____

If yes: Species _____ Vaccination status: Current Unvaccinated Not Current Unknown

If yes to any of the above: Name/Owner _____

Address _____

Telephone _____



K-State Rabies Laboratory
Rabies Diagnostic Testing
1800 N Denison Ave, Mosier Hall
Manhattan KS 66506-5601

Ph: 785-532-4483 fax: 785 532-4474 Email: rabies@vet.ksu.edu

Please call the laboratory prior to submission of samples at 785-532-4483.

Procedure for Submission of Rabies Specimen

Important tip: Healthy dogs, cats, and ferrets (regardless of vaccination status) that have bitten someone and are available for observation may be held for 10 days instead of tested as recommended by the Compendium of Animal Rabies Prevention and Control.

Specimen Preparation:

- Do not submit live animals.
- Ship only the decapitated animal head, unless it is a bat or small rodent.
- A trained, qualified person should separate the animal head from the body as soon as possible. For large animals, the calvarium should be opened and the whole brain should be submitted. To adhere to the National Standard Protocol, the minimum sample is a cross-section of the brainstem and the cerebellum. Specimens without these tissues will be reported as "Unsuitable." See our website or call for further clarification.
- Immediately chill the specimen(s) to between 32° and 45° F (eg., place in a -20 freezer for 1-2 hours).
- **DO NOT FREEZE!** Freezing may damage the brain tissue and compromise the test.

Instructions for Packaging and Shipping:

- Place each specimen within two seal-able containers (i.e., a primary plastic bag or container and a secondary plastic bag or container sealed securely to contain any fluid).
- Attach identification matching the submission form information to the outside of each double-enclosed specimen. This is essential if more than one specimen per package.
- Place double-enclosed specimen(s) inside an inner container, such as a Styrofoam box.
- Use absorbent packing material, such as newspaper or paper towels, to cushion the specimen(s) and to absorb condensation or potential leaks.
- Place frozen gel/cold packs in the inner container to ensure samples are completely surrounded and will remain cold for at least 48 hours. **DO NOT USE DRY ICE!** Ice is not recommended but if used, double-bag and seal securely to prevent leakage.
- Close the inner container and place it inside the rigid outer container (cardboard box).
- Place completed rabies submission form(s) in a plastic zip-lock bag. Then place these on top of the closed inner container/box and close the outer container.
- Secure the outer container with packing tape.
- Send the package by overnight courier. A diamond-shaped UN-3373 label on the exterior of the outer container near the "Biological Substance, Category B" statement in the "send to" address is required (see our website). The UN-3373 label must have a minimum dimension of 100 mm × 100 mm (3.9 inches).
- If the package is sent overnight through the United States Postal Service, the sample(s) may be labeled *Exempt Animal Specimen*.

The Kansas or Nebraska State Health Department as well as the submitting veterinarian will be contacted if a positive or unsuitable specimen is confirmed. When specimens are received by 12:00 pm weekdays, results are normally available by 4:30 pm. Laboratory hours are Monday-Friday, 8:00 am to 5:00 pm, excluding State Holidays.

The Compendium of Animal Rabies Prevention and Control and the Advisory Committee on Immunization Practices provide guidance that administration of rabies post-exposure prophylaxis is a medical urgency, not a medical emergency. Submissions received on Saturday will be tested the next working day. There is no routine testing on Sundays or holidays if the following day is a business day. The need for emergency testing will be evaluated on a case-by-case basis and arrangements **MUST** be made by telephone in advance.

KANSAS

Ingrid Garrison, DVM, MPH, DACVPM
State Public Health Veterinarian
KDHE
1000 SW Jackson, Suite 300
Topeka KS 66612
Phone: 785-296-1127

NEBRASKA

Annette Bredthauer, DVM, MPH, DACVPM
State Public Health Veterinarian
301 Centennial Mail South
PO Box 95007
Lincoln NE 68509-5007
Phone: 402-471-2937

An updated listing of animal rabies cases in Kansas and Nebraska is available on our web site at: **www.vet.ksu.edu/rabies**

APPENDIX B – Rabies Case Investigation Worksheet

RABIES CASE INVESTIGATION WORKSHEET

* Multiple copies of this sheet may be needed if more than one human or owner is involved.

A: Complete this Section for the Animal(s) Causing the Exposure

Number of animals causing exposure? _____, List each separately below:

<u>Species/Description</u>	<u>Proof of Current Rabies Vaccination</u>		<u>Animal Available for Testing/ Observation?</u>	
_____	Yes	No	Yes	No
_____	Yes	No	Yes	No
_____	Yes	No	Yes	No
_____	Yes	No	Yes	No

Animal health status: was/were the animal(s) exhibiting signs and/or symptoms of rabies? Yes No

Was it possible that the animal(s) had a chance of having contact with any potential rabies vectors? Yes No

Comments: _____

Owner's name and contacting information (or note that animal is not owned or wanted):

B: Complete this Section for Potential Human Exposures to Rabies

C: Complete this Section for Potential Animal Exposures to Rabies

Name: _____
 Age: _____ Sex: _____
 Contacting info (address / phone numbers / guardians):

How many animals exposed? _____
 Owner's name: _____
 Owners contacting info (address / phone numbers):

Medical Provider: _____
 Telephone number: _____

Veterinarian's name: _____
 Telephone number: _____

Did the victim previously complete a rabies vaccine series?
Yes No

Has the victim had tetanus vaccine within the past 5 years?
Yes No

If no, tetanus vaccine is needed.

List each animal separately:

Species	Proof of current rabies immunization
_____	Yes No

Exposure date: _____
 Type of exposure: _____
 Anatomical site: _____
 Describe events which led to exposure:

Exposure date: _____
 Type of exposure: _____
 Describe events which led to exposure:

D: Complete this Section for the Person or Animal Identified in B or C above

Has the person or animal been potentially exposed to rabies? Yes No

If yes, complete Sections E and (F or G). If no, investigation is complete.

APPENDIX C – Part III of the Compendium of Animal Rabies Prevention and Control: Vaccines

Part III: Rabies Vaccines Licensed and Marketed in the United States and Rabies Vaccine Manufacturer Contact Information

Adverse events after receipt of vaccine should be reported to the vaccine manufacturer (Tables 1 and 2) and to USDA, Animal and Plant Health Inspection Service, Center for Veterinary Biologics (http://www.aphis.usda.gov/animal_health/vet_biologics/vb_adverse_event.shtml; telephone: 800-752-6255).

TABLE 1. Rabies vaccines licensed and marketed in the United States, 2011

Product name	Produced by	Marketed by	For use in	Dose	Age at primary vaccination*	Booster recommended	Route of vaccination
Monovalent (inactivated)							
Rabvac 1	Boehringer Ingelheim Vetmedica, Inc.† License no. 112	Boehringer Ingelheim Vetmedica, Inc.	Dogs	1 mL	3 mos [§]	Annually	IM or SC
			Cats	1 mL	3 mos	Annually	IM or SC
Rabvac 3	Boehringer Ingelheim Vetmedica, Inc. License no. 112	Boehringer Ingelheim Vetmedica, Inc.	Dogs	1 mL	3 mos	1 yr later and triennially	IM or SC
			Cats	1 mL	3 mos	1 yr later and triennially	IM or SC
			Horses	2 mL	3 mos	Annually	IM
Rabvac 3 TF	Boehringer Ingelheim Vetmedica, Inc. License no. 112	Boehringer Ingelheim Vetmedica, Inc.	Dogs	1 mL	3 mos	1 yr later and triennially	IM or SC
			Cats	1 mL	3 mos	1 yr later and triennially	IM or SC
			Horses	2 mL	3 mos	Annually	IM
Continuum Rabies	Intervet, Inc. License no. 165A	Intervet, Inc.	Dogs	1 mL	3 mos	1 yr later and triennially	SC
			Cats	1 mL	3 mos	1 yr later and quadrennially	SC
EquiRab	Intervet, Inc. License no. 165A	Intervet, Inc.	Horses	1 mL	4 mos	Annually	IM
Prorab 1	Intervet, Inc. License no. 165A	Intervet, Inc.	Dogs	1 mL	3 mos	Annually	IM or SC
			Cats	1 mL	3 mos	Annually	IM or SC
			Sheep	2 mL	3 mos	Annually	IM
Defensor 1	Pfizer, Inc. License no. 189	Pfizer, Inc.	Dogs	1 mL	3 mos	Annually	IM or SC
			Cats	1 mL	3 mos	Annually	SC
Defensor 3	Pfizer, Inc. License no. 189	Pfizer, Inc.	Dogs	1 mL	3 mos	1 yr later and triennially	IM or SC
			Cats	1 mL	3 mos	1 yr later and triennially	SC
			Sheep	2 mL	3 mos	Annually	IM
			Cattle	2 mL	3 mos	Annually	IM
Rabdomun	Pfizer, Inc. License no. 189	Schering-Plough Animal Health	Dogs	1 mL	3 mos	1 yr later and triennially	IM or SC
			Cats	1 mL	3 mos	1 yr later and triennially	SC
			Sheep	2 mL	3 mos	Annually	IM
			Cattle	2 mL	3 mos	Annually	IM
Rabdomun 1	Pfizer, Inc. License no. 189	Schering-Plough Animal Health	Dogs	1 mL	3 mos	Annually	IM or SC
			Cats	1 mL	3 mos	Annually	SC
Imrab 1	Merial, Inc. License no. 298	Merial, Inc.	Dogs	1 mL	3 mos	Annually	SC
			Cats	1 mL	3 mos	Annually	SC
Imrab 1 TF	Merial, Inc. License no. 298	Merial, Inc.	Dogs	1 mL	3 mos	Annually	SC
			Cats	1 mL	3 mos	Annually	SC
Imrab 3	Merial, Inc. License no. 298	Merial, Inc.	Dogs	1 mL	3 mos	1 yr later and triennially	IM or SC
			Cats	1 mL	3 mos	1 yr later and triennially	IM or SC
			Sheep	2 mL	3 mos	1 yr later and triennially	IM or SC
			Cattle	2 mL	3 mos	Annually	IM or SC
			Horses	2 mL	3 mos	Annually	IM or SC
			Ferrets	1 mL	3 mos	Annually	SC

See table footnotes on page 11.

TABLE 1. (Continued) Rabies vaccines licensed and marketed in the United States, 2011

Product name	Produced by	Marketed by	For use in	Dose	Age at primary vaccination*	Booster recommended	Route of vaccination
Imrab 3 TF	Merial, Inc. License no. 298	Merial, Inc.	Dogs	1 mL	3 mos	1 yr later and triennially	IM or SC
			Cats	1 mL	3 mos	1 yr later and triennially	IM or SC
			Ferrets	1 mL	3 mos	Annually	SC
			Cattle	2 mL	3 mos	Annually	IM or SC
Imrab Large Animal	Merial, Inc. License no. 298	Merial, Inc.	Horses	2 mL	3 mos	Annually	IM or SC
			Sheep	2 mL	3 mos	1 yr later and triennially	IM or SC
			Monovalent (rabies glycoprotein, live canary pox vector)				
PureVax Feline Rabies	Merial, Inc. License no. 298	Merial, Inc.	Cats	1 mL	3 mos	Annually	SC
Combination (inactivated rabies)							
Continuum DAP-R	Intervet, Inc. License no. 165A	Intervet, Inc.	Dogs	1 mL	3 mos	1 yr later and triennially	SC
Continuum Feline HCP-R	Intervet, Inc. License no. 165A	Intervet, Inc.	Cats	1 mL	3 mos	1 yr later and triennially	SC
Equine Potomavac + Imrab	Merial, Inc. License no. 298	Merial, Inc.	Horses	1 mL	3 mos	Annually	IM
Combination (rabies glycoprotein, live canary pox vector)							
PureVax Feline 3/ Rabies	Merial, Inc. License no. 298	Merial, Inc.	Cats	1 mL	8 wks	Every 3 wks until 3 mos and annually	SC
					3 mos		
PUREVAX Feline 4/ Rabies	Merial, Inc. License no. 298	Merial, Inc.	Cats	1 mL	8 wks	Every 3 wks until 3 mos and annually	SC
					3 mos		
Oral (rabies glycoprotein, live vaccinia vector): restricted to use in state and federal rabies control programs							
Raboral V-RG	Merial, Inc. License no. 298	Merial, Inc.	Coyotes Raccoons	N/A	N/A	As determined by local authorities	Oral

Abbreviations: IM = intramuscular; N/A = not applicable; SC = subcutaneous; TF = thimerosal free.

* Minimum age (or older) and revaccinated 1 year later.

† Fort Dodge Animal Health was recently acquired by Boehringer Ingelheim Vetmedica, Inc.

§ One month = 28 days.

TABLE 2. Rabies vaccine manufacturer contact information

Manufacturer	Phone number	Internet address
Boehringer Ingelheim Vetmedica, Inc.	800-638-2226	Not available
Intervet, Inc.	800-441-8272	http://www.intervetusa.com
Merial, Inc.	888-637-4251	http://us.merial.com
Pfizer, Inc.	800-366-5288	http://www.pfizerah.com

APPENDIX D – Kansas Regulations Pertaining to Rabies Control

KANSAS STATE STATUTES AND REGULATIONS

Statute: 75-5661

Concerning Rabid Mammals (1996 Legislative Session. Senate Bill 540. Effective July 1, 1996.)

Section 1. (a) As used in this section, "exposed to rabies" means a bite, scratch or abrasion by a known or suspected rabid mammal, or open wound or mucous membrane contact with the saliva or brain tissue from a known or suspected rabid mammal.

(b) Any law enforcement officer or local health officer, upon private or public property, may take up any mammal that has exposed to rabies a person or other mammal.

(c) The mammal shall be managed in a manner as described in rules and regulations adopted by the secretary of health and environment.

Sec. 2 K.S.A 47-125 is hereby repealed.

Sec. 3. This act shall take effect and be in force from and after its publication in the statute book. (Effective July 1, 1996).

Regulations: K.A.R. 28-1-13 and 28-1-14

28-1-13. Rabies control; isolation of mammals causing exposure to rabies for observation and examination; quarantine of mammals exposed to rabies.

(a) In conjunction with investigation of the exposure to rabies of a human or other mammal by another non-human mammal, the isolation of the mammal causing exposure to rabies shall be as follows.

(1) An owned or wanted dog, cat, or ferret shall be isolated for 10 days as determined by the local health officer or the local health officer's designee at one of the following locations:

(A) the residence of the owner of the dog, cat, or ferret;

(B) in a veterinary hospital; or

(C) at a facility holding a current state pound and shelter license. During this time the local health officer or the local health officer's designee shall determine whether or not the dog, cat, or ferret is suffering from rabies, and if not, the local health officer or the local health officer's designee shall authorize the release of the dog, cat, or ferret upon payment by the owner of the boarding fee.

(2) Stray, unclaimed, or unwanted dogs, cats, or ferrets shall be sacrificed immediately and the head submitted for laboratory examination for evidence of rabies infection.

(3) The management of horses, cattle, and sheep shall be determined by the local health officer or the local health officer's designee.

(4) Mammals, other than dogs, cats, ferrets, horses, cattle, or sheep, including the offspring of wild species cross-bred with domestic dogs and cats, skunks, foxes, raccoons, coyotes, bats, and other species known to be involved in the transmission of rabies, whether owned or unowned, shall be sacrificed immediately and the head submitted for laboratory examination for evidence of rabies infection. Any mammal that has been vaccinated may be sacrificed and tested if the period of virus shedding is unknown for that species.

(5) Mammals, including rabbits, hares, gerbils, guinea pigs, hamsters, mice, rats, squirrels, chipmunks and other species not known to be involved in the transmission of rabies, need not be sacrificed and submitted for laboratory examination for evidence of rabies infection, unless the circumstances of the potential exposure to rabies incident, in the judgment of the local health officer or the local health officer's designee, indicate otherwise.

(6) The disposition of mammals which are not known to be involved in the transmission of rabies, and which are maintained in zoological parks, shall be in accordance with the judgment of the local health officer or the local health officer's designee.

(b) Quarantine of mammals exposed to rabies by a known or suspected rabid mammal shall be as follows:

(1) Stray, unclaimed, or unwanted dogs, cats, or ferrets shall be sacrificed immediately.

(2) Dogs, cats, or ferrets which have an owner, are wanted by that owner, and are not immunized against rabies shall be quarantined for six months at one of the following locations as determined by the local health officer or the local health officer's designee:

(A) the residence of the owner of the dog, cat, or ferret;

(B) in a veterinary hospital; or

(C) at a facility holding a current state pound and shelter license.

These dogs, cats, or ferrets shall be immunized against rabies one month before release from quarantine. The local health officer or the local health officer's designee shall authorize the release of the dog, cat, or ferret upon payment of the boarding fee.

(3) Dogs, cats, ferrets, horses, cattle, and sheep which have an owner, are wanted by that owner, and for which the owner produces rabies vaccination certificates containing the following shall be immediately re-vaccinated and kept under the owner's control and observed for 45 days:

(A) the expiration date of the rabies vaccination; and

(B) positive identification for each of these mammals showing that the mammals are currently vaccinated by a licensed veterinarian with an approved vaccine for that species.

(4) Horses, cattle, and sheep not vaccinated with an approved vaccine for that species shall be sacrificed immediately, or quarantined for six months under conditions satisfactory to the local health officer or the local health officer's designee. The local health officer or the local health officer's designee shall authorize the release of the horse, cow or sheep upon payment of any boarding fees.

(5) Other mammals shall be sacrificed immediately, except for those mammals currently vaccinated with an approved vaccine for that species. Mammals that have been appropriately vaccinated may be immediately re-vaccinated and quarantined for at least 90 days under conditions satisfactory to the local health officer or the local health officer's designee. (Authorized by K.S.A. 65-128, K.S.A.65-101; implementing K.S.A. 65-101; effective May 1, 1982; amended May 1, 1986; amended July 5, 1996; amended April 24, 1998)

28-1-14. Rabies control in wildlife mammals.

(a) The possession or sale of skunks, raccoons, foxes and coyotes for keeping of these mammals as pets shall be prohibited.

(b) Removal of musk glands of skunks for purposes of attempted domestication shall be prohibited.

(c) Except as permitted by the secretary, attempts to immunize skunks, coyotes, raccoons, foxes, and other wildlife mammals known to be involved in the transmission of rabies shall be prohibited.

(d) Subsections (a) and (b) of this regulation shall not apply to bonafide zoological parks or research institutions. (Authorized by and implementing K.S.A. 65_101; effective May 1, 1982; amended May 1, 1983; amended July 5, 1996)

APPENDIX E – Rabies Contact Investigation in EpiTrax

Rabies Contact Investigation in Eptrax

-After notification of a positive or unsuitable rabies test result, follow-up to assess for any human and/or animal exposure to that rabid animal according to the information in this DIG.

-When it has been determined that a human or humans and/or animal or animals have been exposed to a potential rabid animal, please complete the following steps in Eptrax to add them as a contact/s:

FOR HUMAN CONTACTS

1. Click on the “*Contacts*” tab.
 - a. Enter person’s *first name* and *last name*.
 - b. Select appropriate choice for *disposition* (usually going to be ‘preventative treatment,’ ‘refused preventative treatment,’ or ‘not infected’). Not infected is used usually when a local health department enters a dog bite where the dog is available for 10 day observation and the dog survives the period; therefore, the person was not infected.
 - c. Enter *disposition date* (if receiving PEP, enter first date of PEP given – if PEP was refused or person was not infected or exposed, enter the date exposure occurred on).
 - d. Select appropriate choice for *contact type* (usually going to be ‘other,’ ‘household ’or ‘healthcare/healthcare worker’). Household is used when animal causing exposure is owned and the human contact is the owner or other person in the household. Healthcare/healthcare worker is used when a vet, vet tech, etc. has been exposed.
 - e. Enter person’s *phone number*.
2. Click “*Save & Continue*” in the upper right hand corner.
3. Click on “*Edit Contact.*”
 - a. Under the “*Demographics*” tab, enter the human contact’s:
 - i. *Address*
 - ii. *Date of birth* (if known)
 - iii. *Birth gender* (if known)
 - iv. *Ethnicity* (if known)
 - v. *Race* (if known)
 - vi. *Primary language* (if known)
 - vii. *Phone number* should already be entered
 - b. Click “*Save & Continue*” in the upper right hand corner.
 - c. If human received PEP, click on the “*Clinical*” tab.
 - i. Enter all doses and dates of PEP. This should normally include one dose of human rabies immunoglobulin (HRIG) and 4 doses of vaccine (5 doses if person is immunocompromised). This will be different if HRIG was not able to be given within the designated time period (will then only include 4 doses or 5 doses of vaccine) or if human contact has received pre-PEP (will only include 2 doses of vaccine). To do this:
 - Click on drop down menu of “*Treatment given*” and choose ‘Yes.’

- Click on drop down menu of “*Treatment*” and choose ‘Rabies immune globulin’ or whichever vaccine (e.g., ‘Human rabies vaccine dose 1’) you are currently entering.
 - Enter the date rabies immunoglobulin or vaccine was received in “*Date of treatment.*” Nothing needs to be entered in “*Date treatment stopped.*”
- d. Click “*Save & Continue*” in the upper right hand corner.
 - e. Under the “*Investigation*” tab click on “*Animal Rabies Contact, Potential Human Exposure Form*” on the left hand side of the page under “*Forms in Use.*”
 - i. Click on the “*Exposure*” tab.
 - Fill out ALL INFORMATION within this tab UNLESS the type of exposure is ‘no exposure’ (usually only the case when information is entered prior to getting entire exposure history) then check that option and only fill out “*Describe the exposure incident*” to describe why it was not an exposure. If no way to tell if exposure was provoked or unprovoked then can leave that question blank.
 - ii. Click on the “*Post-Exposure Treatment*” tab.
 - Fill out ALL INFORMATION within this tab (including the fields that automatically populate based on particular responses).
 - f. Click “*Save & Continue*” in the upper right hand corner.

FOR ANIMAL CONTACTS – animals exposed to potential rabid animal

1. Click on the “*Contacts*” tab.
 - a. Enter the specie of animal exposed (e.g., dog, cat, etc.) as *first name* and owner’s last name as *last name*.
 - b. Select appropriate choice for *disposition* (most of the time will be ‘other’).
 - c. Enter *disposition date* (if exposed animal is being observed or quarantined, enter that start date – if animal is unable to be located or not infected or exposed, enter the date exposure occurred on).
 - d. Select ‘animal’ for *contact type*.
 - e. Enter owner’s *phone number*.
2. Click “*Save & Continue*” in the upper right hand corner.
3. Click on “*Edit Contact.*”
 - a. Under the “*Demographics*” tab:
 - i. Enter the exposed animal owner’s *address*
 - ii. *Birth gender* of animal (if known)
 - iii. *Phone number* should already be entered
 - b. Click “*Save & Continue*” in the upper right hand corner.
 - c. Under the “*Investigation*” tab click on “*Animal Rabies Contact, Potential Animal Exposure Form*” on the left hand side of the page under “*Forms in Use.*”
 - i. Click on the “*Animal Information*” tab.
 - Fill out ALL INFORMATION within this tab (including the fields that automatically populate based on particular responses).

- ii. Click on the “*Exposure*” tab.
 - Fill out ALL INFORMATION within this tab (including the fields that automatically populate based on particular responses). Make sure to fill out the *contact animal disposition* section (observation or quarantine section). If animal is being observed or quarantined then do not approve the case until after the observation or quarantine period is complete so that you can fill in the *observation/quarantine complete date* field and *did the animal survive the observation/quarantine period* field.
- d. Click “*Save & Continue*” in the upper right hand corner.