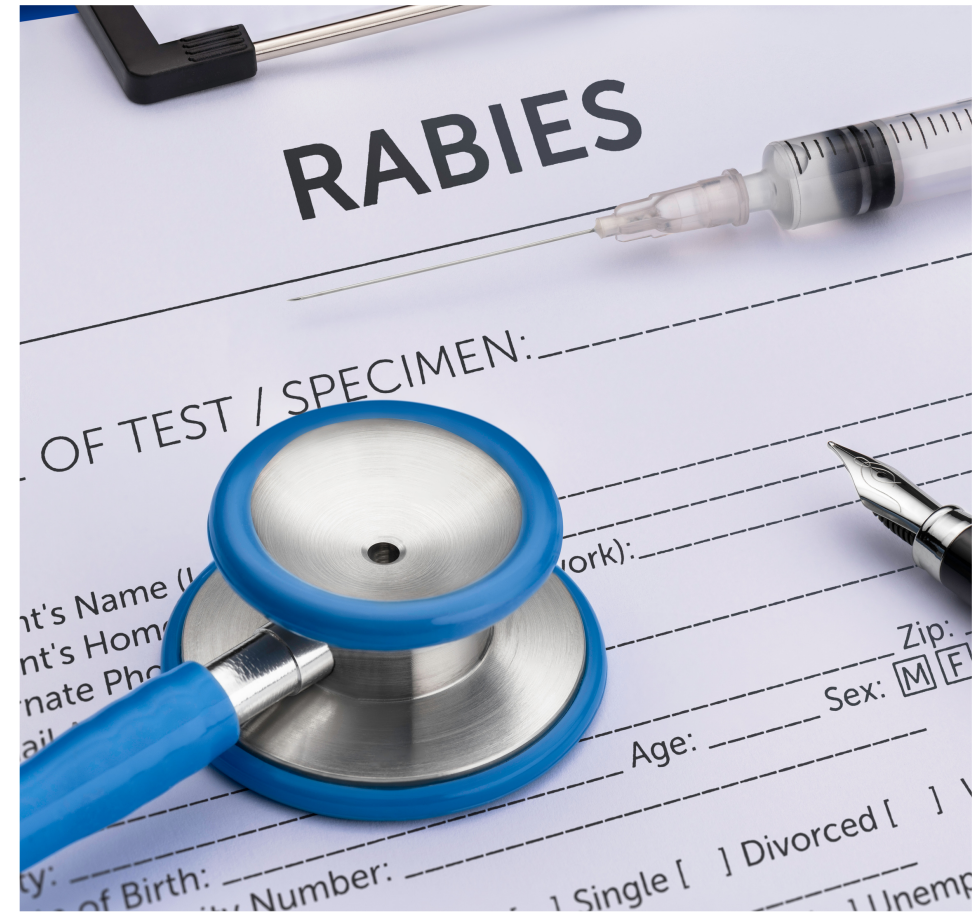
KANE COUNTY HEALTH DEPARTMENT

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kanehealth.com




# RABIES VACCINATION GUIDE

## FOR HEALTHCARE PROVIDERS

**November, 2022**

# Contents


3 **Introduction**

4 **What is Rabies?**

5 **Local Epidemiology**

6 **The Problem of Incorrect Administration of Rabies Post-Exposure Prophylaxis (PEP)**

7 **Reporting Potential Human Exposure to Rabies to KCHD**

8 **Managing Animal Bites**

9 **Assessing the Need for Rabies PEP**

- 12 Bat Exposure
- 14 Provoked and Unprovoked Dog and Cat Bites
- 16 Wild Animal
- 17 Livestock
- 18 Exotics
- 19 Domestic or Wild Rodent or Rabbit
- 20 Bird, Reptile, Amphibian or Insect

21 **Proper Administration of Rabies PEP**

26 **IDPH PEP Administration Poster**

27 **Additional Resources**

# Introduction



Rabies is typically fatal to unvaccinated patients; however, the prompt administration of postexposure prophylaxis (PEP) can prevent disease.

Because the administration of rabies PEP is expensive and time-consuming, healthcare providers must carefully assess each case to determine if the administration of PEP is warranted.

The Kane County Health Department (KCHD) has developed this toolkit to help healthcare providers understand rabies, its prevalence in Illinois, what constitutes a human rabies exposure, and when and how to administer rabies PEP.

**The Kane County Health Department does not administer rabies pre- or post-exposure prophylaxis.**

## The Kane County Health Department Communicable Disease Team

The Kane County Health Department, following guidance from the Illinois Department of Public Health (IDPH), is your partner in assessing potential human rabies exposure to determine the necessity for rabies PEP. Contact us at 630-208-3801 with questions about the content of this guide, to report cases or to discuss a potential exposure.

# What is Rabies?



Rabies is a viral disease of mammals most often shed in the salivary glands and transmitted through an open wound caused by the bite of a rabid animal. The vast majority of rabies cases reported each year occur in wild animals like bats, raccoons, skunks, and foxes.

The rabies virus infects the central nervous system, ultimately causing death if not treated. The early symptoms of rabies in people are similar to that of many other illnesses, including fever, headache, and general weakness or discomfort. As the disease progresses, more specific symptoms appear and may include insomnia, anxiety, confusion, slight or partial paralysis, excitation, hallucinations, agitation, hyper salivation (increase in saliva), difficulty swallowing, and hydrophobia (fear of water). Death usually occurs within 15 days of the onset of these symptoms. The incubation period is 1-3 months, but can be longer.

The rabies virus is not able to invade intact skin. It can be killed by UV light (sunlight), drying, soap and water and any disinfectant. Rabies cannot be transmitted by blood, urine, or feces.

In the United States, human rabies is uncommon, with 1-8 cases per year and ~ 20,000 – 40,000 human exposures per year. Approximately 7,000 – 10,000 animals test positive for rabies each year.

Reference: Rabies Exposure & Treatment Information for Physicians: When to treat and when not to treat, Connie Austin DVM MPH PhD, Illinois Department of Public Health, May 2017

# Local Epidemiology

In Illinois, almost all cases of animal rabies occur in bats; however, most bats do not carry rabies. In 2021, Kane County Animal Control submitted 50 animal specimens for rabies lab analysis. Of those 50 specimens submitted, 3 bats tested positive for rabies; all of the other animals were negative.

**Number of Each Animal Specimens Submitted for Rabies Testing in 2021**




The IDPH Rabies Surveillance Map gives historical information on positive animal cases by county and year.

# The Problem of Incorrect Administration of Rabies Post-Exposure Prophylaxis

The Kane County Health Department has identified four ways in which rabies PEP procedures are commonly mishandled:

1. PEP administered to patient when not indicated
2. Potential human exposure not reported to KCHD
3. PEP administered on incorrect schedule
4. PEP administered in incorrect body location

# Reporting Potential Human Exposure to Rabies to KCHD

Per the Joint Committee on Administrative Rules Control of Communicable Disease (CD) Code Section 690, potential rabies exposure must be reported within 24 hours. Report rabies exposure to the Kane County Health Department at 630-208-3801. Refer to your organization's policy regarding reporting to the Kane County Health Department and the Illinois National Electronic Disease Surveillance System (I-NEDSS).

The CD Code definition of a potentially exposed person to be reported:

- Any contact (bite or non-bite) to a bat; or
- Any contact (bite or non-bite) from a rabies positive animal to a person; or
- Anyone who was started on rabies post-exposure prophylaxis; or
- Exposure to saliva from a bite, or contact of any abrasion or mucous membrane with brain tissue, saliva or cerebrospinal fluid from a suspect rabid person or animal. Exposure to healthy rabbits, small rodents, indoor-only domestic pets or rabies-vaccinated dogs, cats or ferrets is excluded, unless the exposure complies with the three situations listed above, or the animal displays signs consistent with rabies; or
- Any bite from a wild mammal, not including small rodents or rabbits; or
- Anyone who was in the same room as a bat and who might be unaware that a bite or direct contact has occurred (e.g., a sleeping person awakens to find a bat in the room or an adult witnesses a bat in the room with a previously unattended child, mentally disabled person, or intoxicated person) and rabies cannot be ruled out by testing the bat; or
- Anyone bitten by a non-human primate.

If the animal is available, contact Kane County Animal Control at 630-232-3555 for information about rabies testing or quarantine.

# Managing Animal Bites

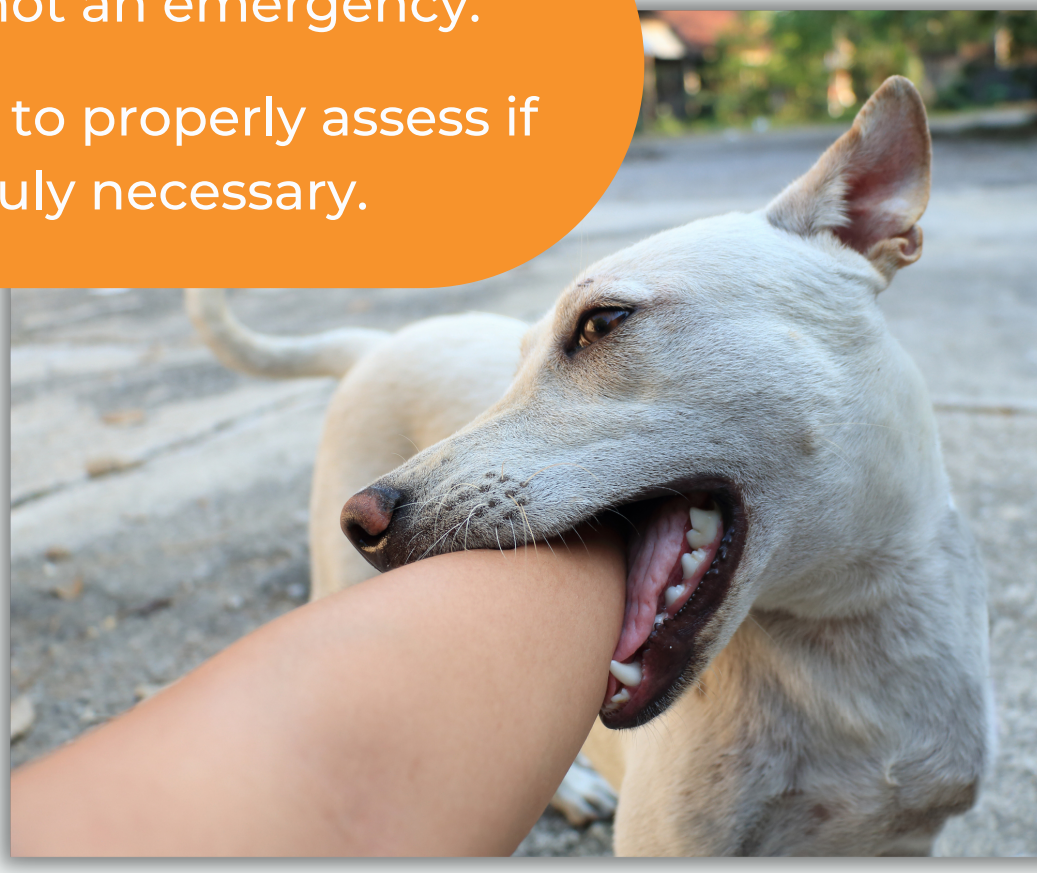
When a patient presents with an animal bite, first:

- Wash the wound well with soap and running water.
- Assess the need for tetanus vaccination booster.
- Assess the need for antibiotics.
- Assess the need for rabies PEP.

There is no early diagnostic test that can tell if a person has been infected, and treatment cannot be delayed to wait for symptoms to emerge. An immediate risk assessment must be made after the exposure.

While rabies PEP is medically urgent, it is not an emergency.

It is important to properly assess if PEP is truly necessary.



# Assessing the Need for Rabies PEP

Use the Illinois Department of Public Health (IDPH) Rabies Post-Exposure Prophylaxis Assessment Decision Trees starting on page 11, and the questions below to determine the need for rabies PEP.

### Is the bite from a species commonly affected by rabies?

- Common: bats, skunks, raccoons and foxes, deer, large rodents such as woodchucks, most other carnivores. PEP is recommended if the animal cannot be tested negative.
- Possible but not common: Unvaccinated cats, dogs and livestock
- Rare: Chipmunks, gerbils, guinea pigs, hamsters, mice, rabbits, rats, squirrels, and moles
- Never: Birds, fish, insects, lizards, snakes and turtles

Learn more: CDC PEP Recommendations based on type of animal

### What type of exposure occurred?

- **Bite exposures:** The wound broke the skin
- **Non-bite exposures:** Non-bite exposures include saliva contact to mucous membranes, saliva contact to fresh, non-scabbed skin wounds, and scratches. In general, the risk of rabies is very low following non-bite exposures; however, there are rare reports of rabies transmission by these routes suggesting that they constitute sufficient risk to consider administration of PEP on a case-by-case basis.

The following are not considered rabies exposure:

- Touching a rabid animal
- Touching something a rabid animal touched
- Being in the same room as a rabid animal
- A “dry scratch” where there was no saliva contamination

## *Assessing the Need for Rabies PEP, continued*

### Is the animal available for 10 days of observation or testing?

The 10-day confinement and observation period for dogs, cats, and ferrets has withstood the test of time as a way to prevent human rabies. The 10 day quarantine ensures that the animal can be observed for signs of rabies, and eliminates the need to destroy healthy pets to test their brains for the rabies virus.

If the domestic animal is up to date with rabies vaccination, a veterinarian visit can be conducted on days 1 and 10. If not up to date, the animal should remain at the veterinary clinic. If the animal remains well during the 10 day quarantine, this indicates it did not have the rabies virus in its saliva at the time of the bite, and therefore PEP is not recommended. Observation is not used for wild animals. If the animal is captured and tests negative for rabies after PEP has begun, PEP may be discontinued.

### What state or country did the exposure take place?

An understanding of the rabies status of animals in the area is important.

Centers for Disease Control surveillance resources:

- Rabies Status by Country
- Rabies in the United States

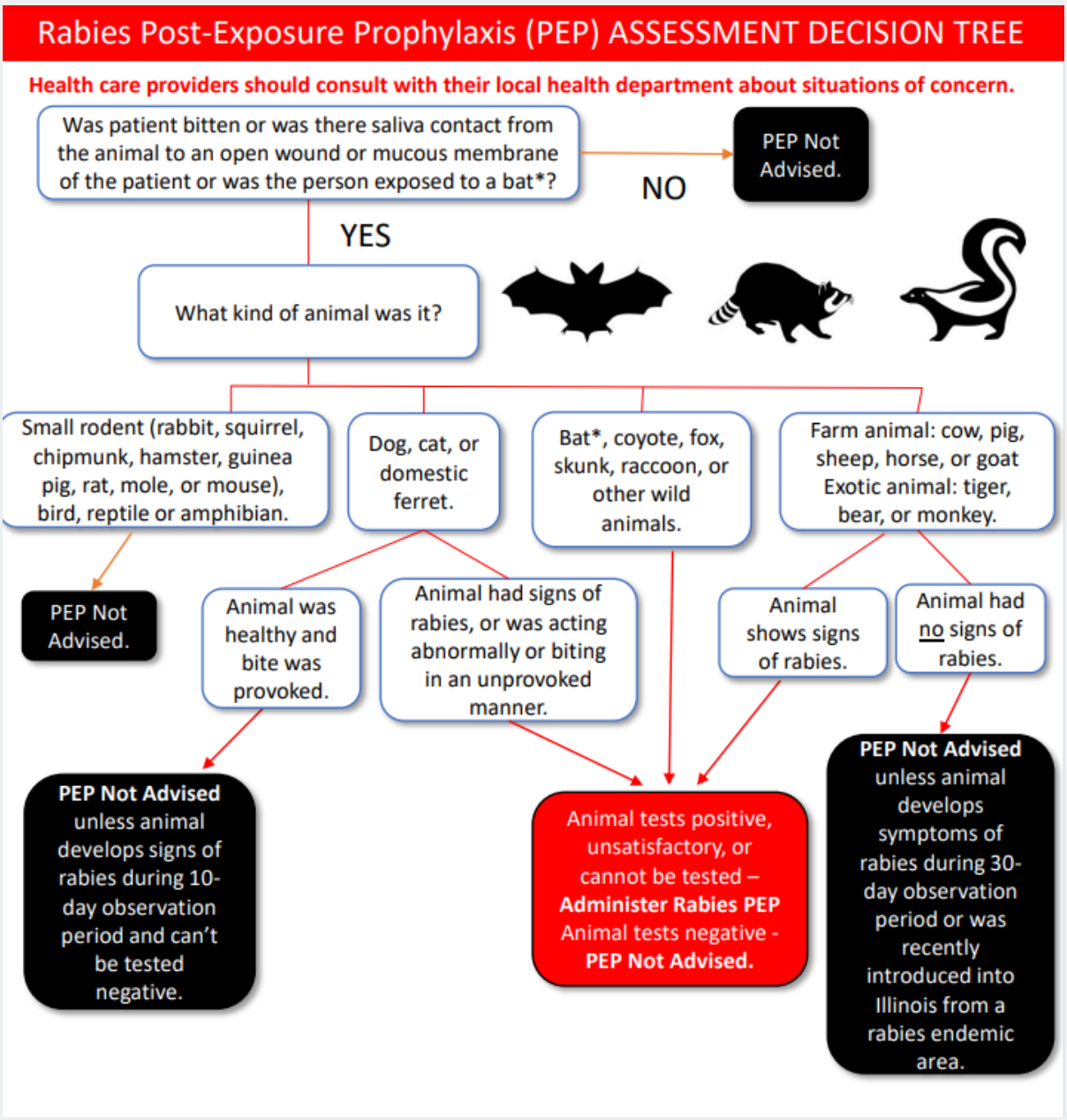
### How severe is the wound and where is it located?

The severity and location of a wound (severe wounds or obvious wounds near head and neck should be given highest priority), and the expected interval between the time of the bite and receipt of rabies test results should be considered when deciding to begin PEP while awaiting test results.

- When a bite is to an extremity, there is adequate time and it is safe for the patient to wait for completion of a 10-day observation and confinement period of the animal, or for rabies test results on the animal to determine whether or not PEP is necessary.
- Bites to the face and head are more urgent, and consultation with KCHD on these cases is recommended.
- Regardless of location, the deeper and more serious the bite wound(s), the greater the urgency for PEP.



# IDPH Rabies Post-Exposure Prophylaxis Assessment Decision Tree




This image, and all of the Rabies PEP Decision Trees and additional information can be found in the IDPH Web Portal under the CD Topics A-Z tab, then "Rabies."

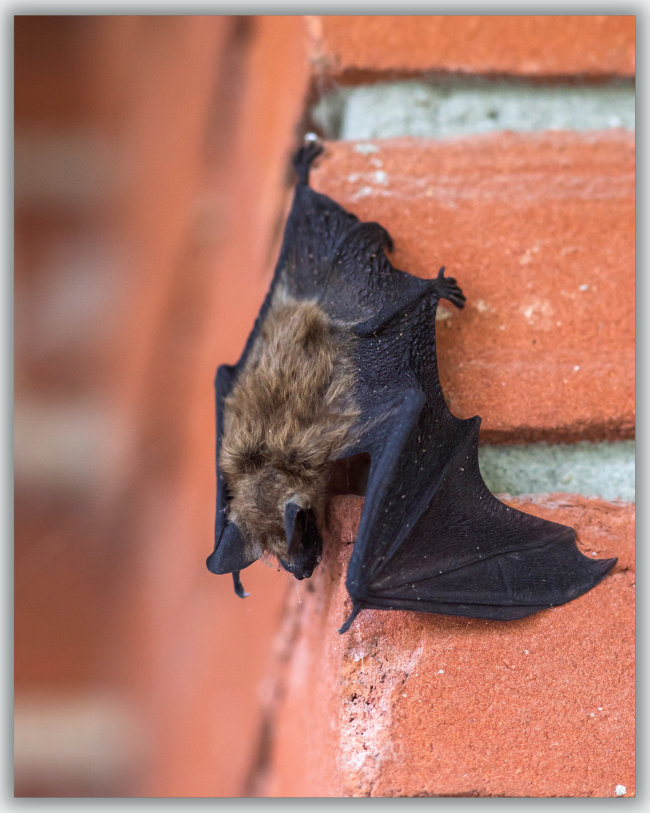
# Bat Exposure

Bat exposures are treated differently than other animal exposures, because their bites are small and may go undetected due to the small size of their teeth, and bats carry rabies more commonly than other animals. It is important to review the IDPH Rabies Post-Exposure Prophylaxis Assessment Decision Tree for recommendations on how to proceed.

**Every effort should be made to safely capture and to test the bat involved in the exposure incident.** Ask the patient if they have captured the bat, and if so, and PEP is indicated, encourage them to submit the bat to Kane County Animal Control for testing as soon as possible.

Bat testing and/or PEP is indicated in response to:

- A known bite
- If there has been direct contact and bite cannot be ruled out
- Situations where exposure may have gone unrecognized, for example, an unobserved child, or a person who was asleep, mentally disabled, or intoxicated.
- If someone woke up to a bat or has bare skin contact with a bat and animal cannot be tested.

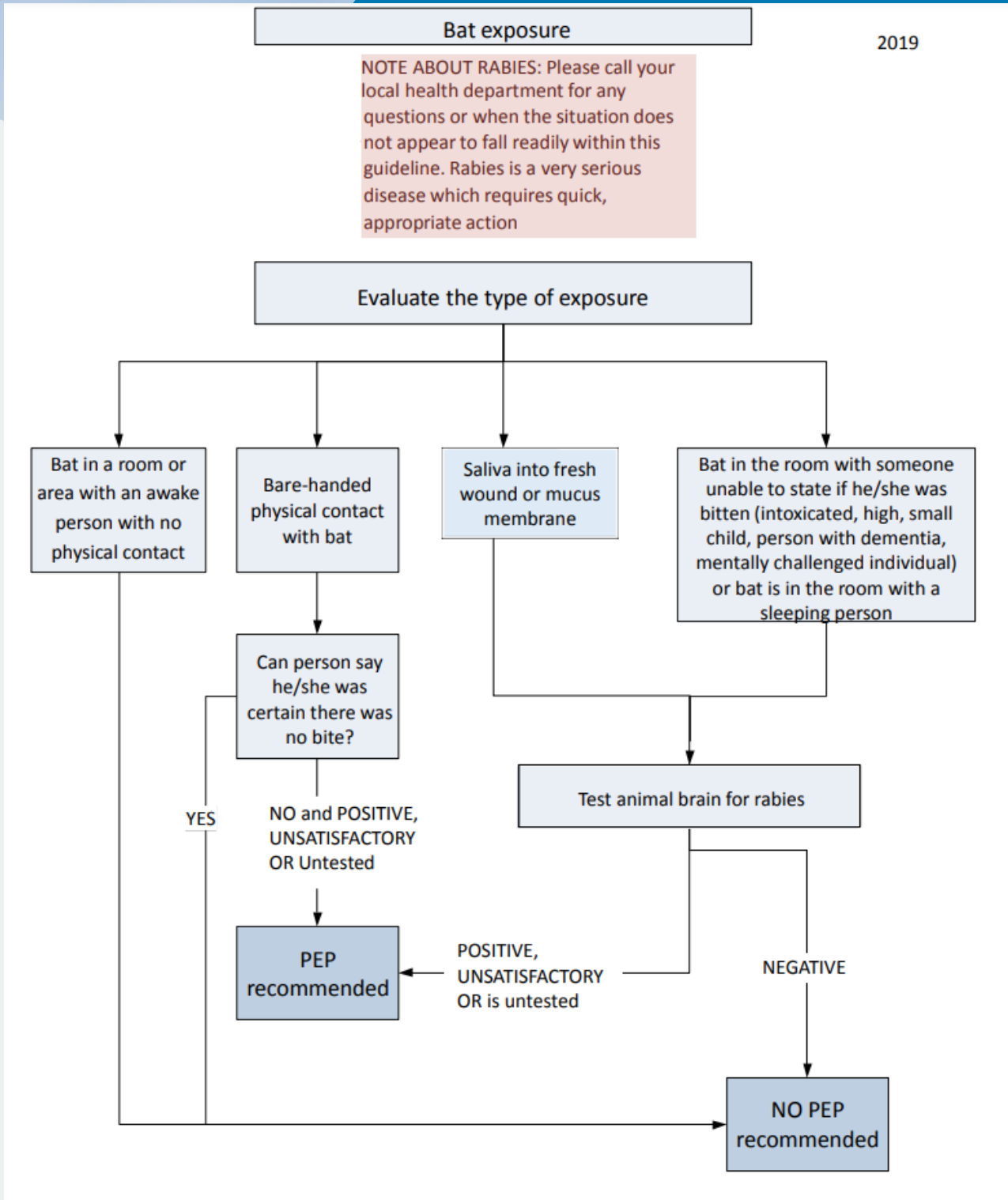


If the bat is available for testing, in most instances PEP may be deferred until results are received.

If PEP has been initiated, and then the bat tests negative, PEP may be discontinued.



# IDPH Rabies Post-Exposure Prophylaxis Assessment Decision Tree - Bat



# Provoked and Unprovoked Dog and Cat Bites

When assessing the need for PEP, the IDPH Rabies Post-Exposure Prophylaxis Assessment Decision Tree asks if the animal was healthy and the bite was provoked, or if the animal had signs of rabies, or was acting abnormally or biting in an unprovoked manner.

In general, bites received when handling or trying to feed an animal that appears healthy should be viewed as provoked. It's more likely that the animal is rabid if the attack was unprovoked.

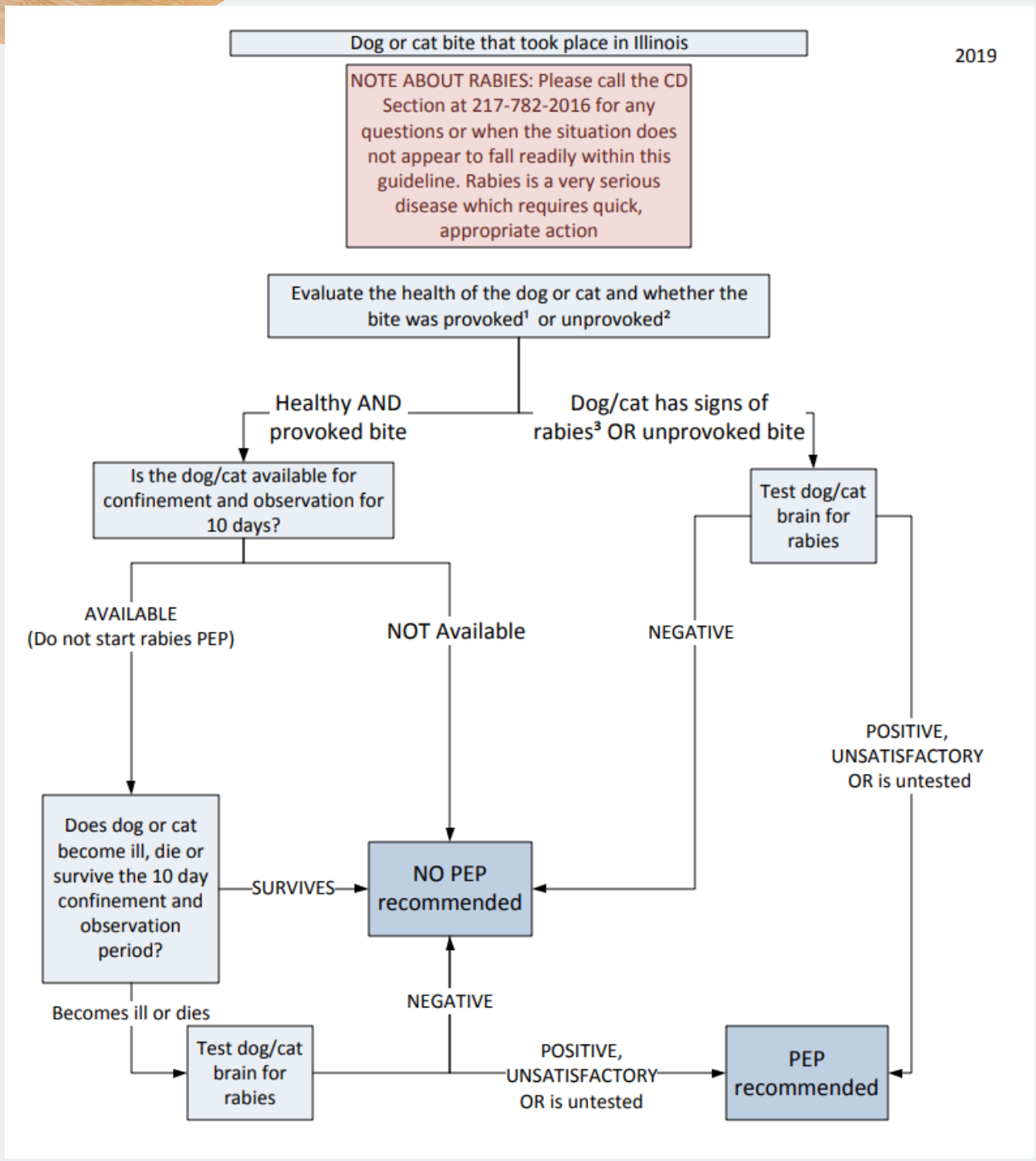
Assessing the situation when the bite occurred is important when determining if the bite was provoked or unprovoked. For dogs, cats, and ferrets, provoked exposures may include:

- Attempting to feed or taking food from an animal
- Having contact with an injured animal
- Entering an animal's territory
- Petting or playing with an animal
- Handling an animal
- Attempting to break up a fight between animals
- Walking, running, or riding a bicycle past an animal





# IDPH Rabies Post-Exposure Prophylaxis Assessment Decision Tree - Dog or Cat





# IDPH Rabies Post-Exposure Prophylaxis Assessment Decision Tree - Wild Animal

2019

Wild carnivore or other high-risk wild animal species bite that took place in Illinois (also if saliva or brain material from these species enters a fresh cut or mucus membrane)

NOTE ABOUT RABIES: Please call the CD Section at 217-782-2016 for any questions or when the situation does not appear to fall readily within this guideline. Rabies is a very serious disease which requires quick, appropriate action

Examples include fox, coyote, wolf, raccoons, skunks OR crosses of coyotes or wolves with domestic dogs

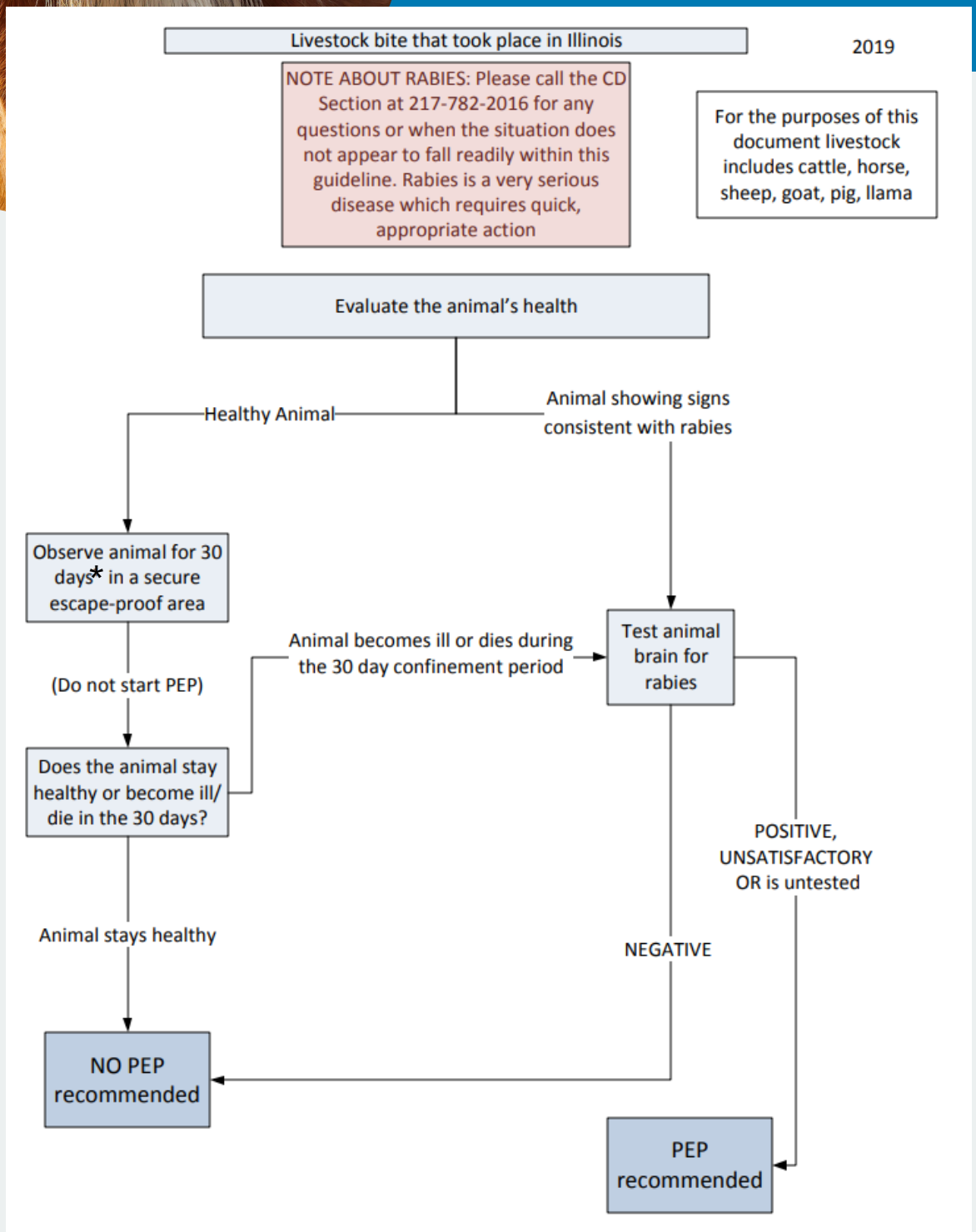
Test animal brain for rabies

NEGATIVE → NO PEP recommended

POSITIVE, UNSATISFACTORY OR is untested → PEP recommended



# IDPH Rabies Post-Exposure Prophylaxis Assessment Decision Tree - Livestock




*The 30 day confinement period duration has not been established by research studies but is the commonly accepted time period in many states. Consult with local animal control and the Illinois Department of Agriculture.



# IDPH Rabies Post-Exposure Prophylaxis Assessment Decision Tree - Exotics

Exotic or zoo animal bite that took place in Illinois

2019

NOTE ABOUT RABIES: Please call the CD Section at 217-782-2016 for any questions or when the situation does not appear to fall readily within this guideline. Rabies is a very serious disease which requires quick, appropriate action

Examples: tigers, bears, zebras, etc.

Consult with IDPH

**Factors which need to be considered in the recommendation**

1. Likelihood of exposure to rabies (factors such as animal housing, how long the animal was in Illinois, whether it was indoors or outdoors)
2. Pre-exposure rabies vaccination status of bitten individual (may want to get the 2 booster dose if this is a zoo employee)
3. The endangered species status/rarity of the animal

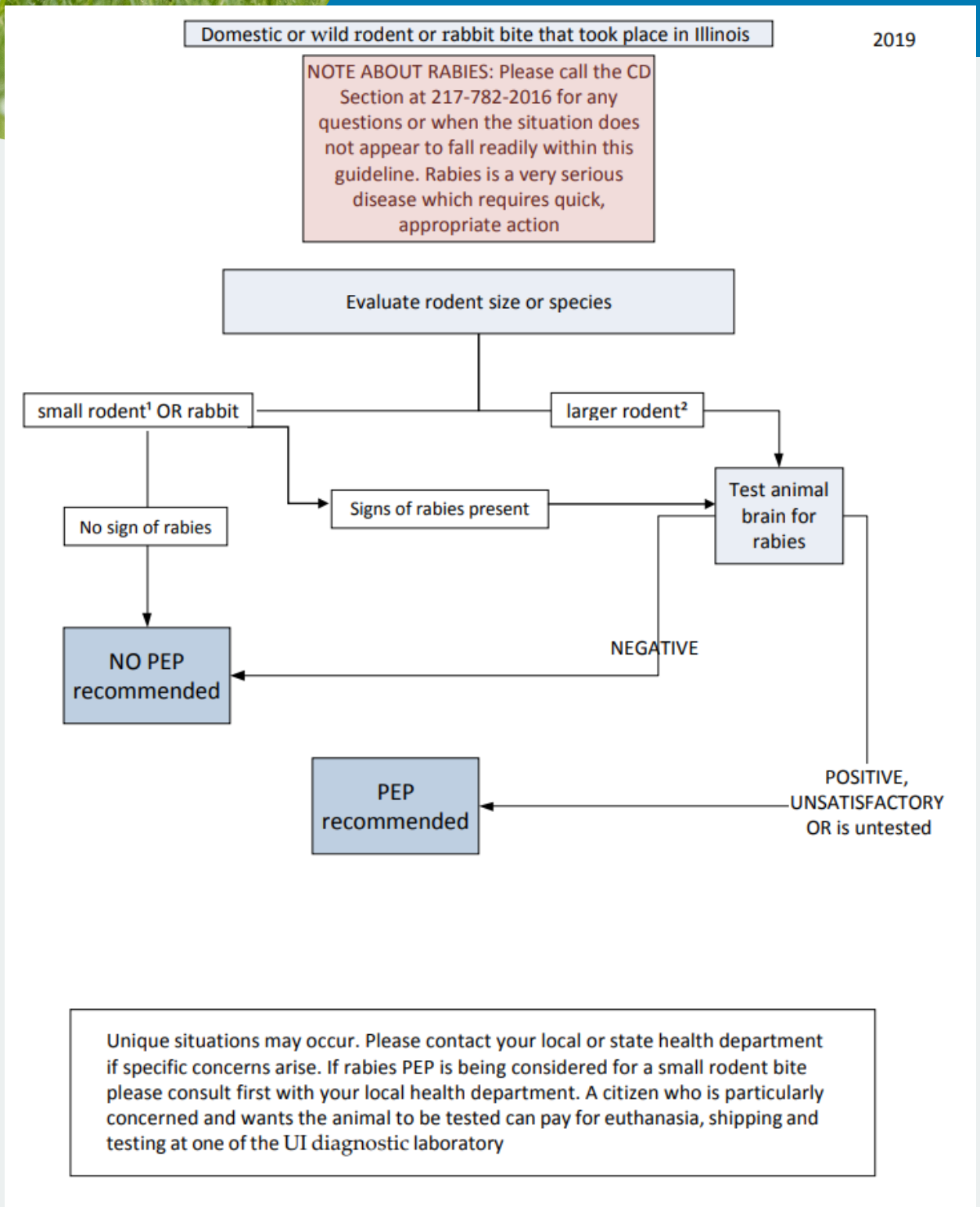
Zoo animals are rarely euthanized and tested for rabies. Often, if there is an exposure of concern the bitten person may need to receive rabies PEP.

Animal will need to be observed for 30 days.

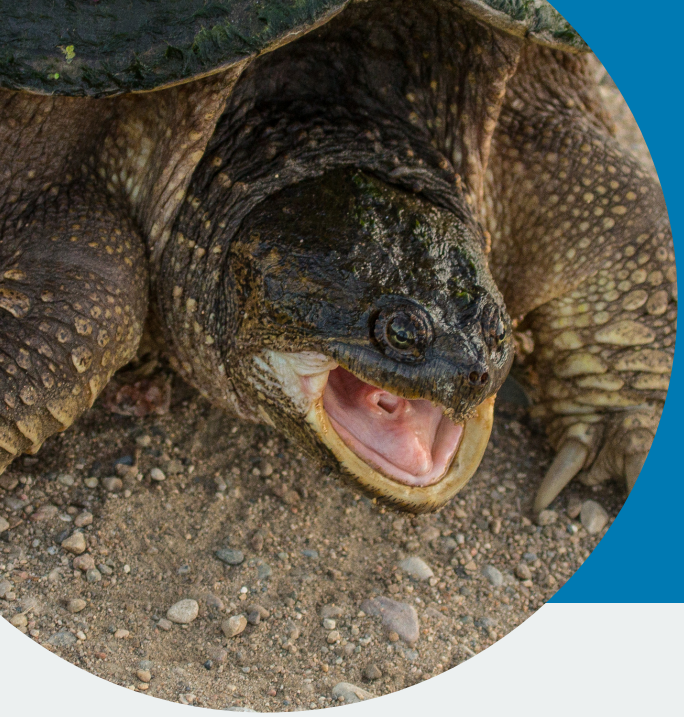
4. Health of the animal



# IDPH Rabies Post-Exposure Prophylaxis Assessment Decision Tree - Domestic or Wild Rodent or Rabbit




Unique situations may occur. Please contact your local or state health department if specific concerns arise. If rabies PEP is being considered for a small rodent bite please consult first with your local health department. A citizen who is particularly concerned and wants the animal to be tested can pay for euthanasia, shipping and testing at one of the UI diagnostic laboratory



# IDPH Rabies Post-Exposure Prophylaxis Assessment Decision Tree - Bird, Reptile, Amphibian or Insect

Bird, reptile, amphibian, or insect bites

2019

NOTE ABOUT RABIES: Please call the CD Section at 217-782-2016 for any questions or when the situation does not appear to fall readily within this guideline. Rabies is a very serious disease which requires quick, appropriate action

No PEP recommended
These species do not carry rabies

Reptiles include snakes, lizards, iguanas
Amphibians include frogs and toads

# Proper Administration of Rabies PEP

## IDPH Summary of the Rabies PEP Regimen

Rabies exposures should be treated as soon as possible. PEP is indicated regardless of the length of the delay, provided that clinical signs of rabies are not present. If clinical signs of fever and encephalitis are present, giving rabies PEP can result in adverse consequences. Because rabies infection makes the blood-brain barrier more permeable, giving rabies vaccine and immune globulin once clinical signs are present can result in an immune response that can cause more damage in the CNS system.

### Immunocompetent Persons who have NOT Previously Received Rabies Vaccine

Use of a Reduced (4-Dose) Vaccine Schedule for Post exposure Prophylaxis to Prevent Human Rabies (ACIP)

Rabies PEP for Immunocompetent Individuals Without Previous Rabies Pre-Exposure Vaccination and Without Previous Rabies PEP

Rabies PEP Immunocompetent Without Previous Vaccine

**The following is an excerpt from the ACIP recommendations:**

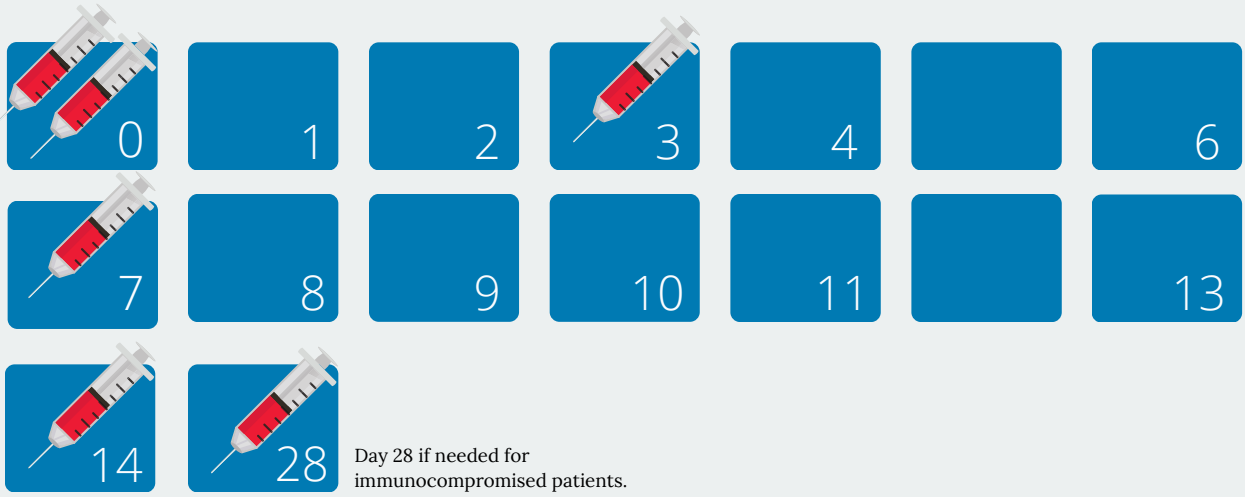
Administer four 1mL vaccine doses of vaccine. The first dose of the four-dose regimen should be administered as soon as possible after exposure. The date of the first dose is considered day 0 of the PEP series. Additional doses are administered on days 3, 7, and 14 after the first vaccination. RabAvert® and ImoVax® are the two U.S. licensed rabies vaccines.

### Human Rabies Immune Globulin (HRIG)

Administer HRIG once on day 0 at the time PEP is initiated, in conjunction with the vaccine. If HRIG was not administered when vaccination was begun on day 0, it can be administered up to and including day 7 of the PEP series.

## *Proper Administration of Rabies PEP, continued*

**Figure: Vaccine and HRIG Schedule**




**Immunocompromised Persons**
If rabies PEP is needed in immunosuppressed persons, a fifth dose should be given. Sera should be collected on day 15 of the series and at the time of completion of the series for Rapid Fluorescent Foci Inhibition Test (RFFIT) testing. If the person has not responded with antibody production, consult public health authorities as additional vaccination doses may be needed.

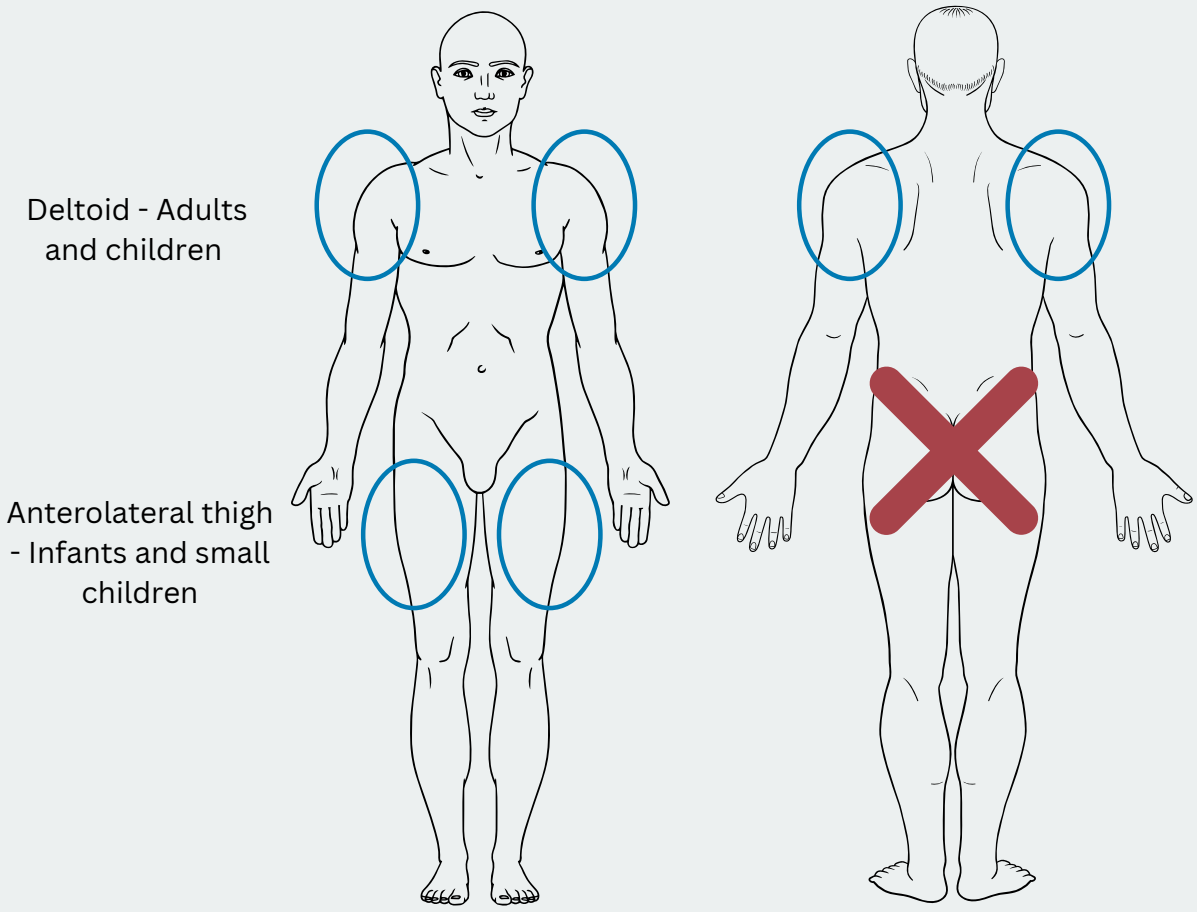
**Persons Previously Vaccinated for Rabies**
A person can be considered previously immunized if they received a full series of post- exposure or pre-exposure AFTER 1980 when the newer vaccines were used regardless of whether a titer was taken. In this case, rabies PEP consists of 2 doses of vaccine at Days 0 and 3. If rabies pre-exposure or post-exposure vaccination was done prior to 1980, the person would have to have had a documented rabies titer by RFFIT to qualify as previously vaccinated. HRIG should not be administered.

**Deviations from Recommended Post-Exposure Vaccination Schedule**
Every attempt should be made to adhere to the recommended vaccination schedules. Once vaccination is initiated, delays of a few days for individual doses are unimportant, but the effect of longer lapses of weeks or more is unknown. Most interruptions in the vaccine schedule do not require reinitiation of the entire series. For most minor deviations from the schedule, vaccination can be resumed as though the patient were on schedule.

## *Proper Administration of Rabies PEP, continued*

As much of the RIG dose as is anatomically feasible should be infiltrated in the area around and in the wounds. Any remaining dose should be given intramuscularly. Rabies vaccine should be administered by intramuscular injection into the deltoid muscle in adults and children or the anterolateral thigh in infants. RIG administration into the gluteus is not recommended due to possible damage to the sciatic nerve and possible vaccine failure.

**Figure: Human Rabies Immune Globulin and Rabies Vaccine Administration Sites**



## *Proper Administration of Rabies PEP, continued*

**Table 3. Rabies postexposure prophylaxis guide – United States, 2008**

| Animal Type | Evaluation and disposition of animal | Postexposure prophylaxis recommendations |
|---|---|---|
| Dogs, cats, and ferrets | Healthy and available for 10-day observation | Persons should not begin prophylaxis unless animal develops clinical signs of rabies* |
| | Rabid or suspected rabid | Immediately begin prophylaxis |
| | Unknown (e.g. escaped) | Consult public health officials |
| Skunks, raccoons, foxes, and most other carnivores; bats† | Regarded as rabid unless animal proven negative by laboratory tests§ | |
| Livestock, small rodents (rabbits and hares), large rodents (woodchucks and beavers) and other mammals | Consider individually | Consult public health officials. Bites from squirrels, hamsters, guinea pigs, gerbils, chipmunks, rats, mice, other small rodents, rabbits and hares almost never require anti-rabies postexposure prophylaxis |

* During the 10-day quarantine period, begin post-exposure prophylaxis at the first sign of rabies in a dog, cat, or ferret that has exposed someone. If the animal exhibits clinical signs of rabies, it should be euthanized immediately and tested.
† Post-exposure prophylaxis should be initiated as soon as possible following exposure to such wildlife. Unless the animal is available for testing and public health authorities are facilitating expeditious laboratory testing, or the animal has already tested negative for rabies. Discontinue vaccine if appropriate laboratory diagnostic test (i.e., the direct fluorescent antibody test) is negative.
§ The animal should be euthanized and tested as soon as possible. Holding for observation is not recommended.

Table adapted from: https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5703a1.htm

## *Proper Administration of Rabies PEP, continued*

| Summary of the Rabies PEP Regimen | | |
|---|---|---|
| Product | Recommended time of administration | Administration details |
| HRIG | Day 0 (if not administered on day 0 can be given up to and including day 7 of the first dose of vaccine) | 20 IU/kg. If anatomically feasible, infiltrate the bite wound with the full dose. Any remaining volume should be given IM at a site distant from vaccine administration. The deltoid, (opposite arm from where vaccine is given) is recommended. If a non-bite exposure occurred, HRIG can be given IM at a site distant from vaccine administration (deltoid opposite arm from where vaccine is given). Not needed for patient previously given full series of rabies PEP or patient pre-exposure vaccinated for rabies. |
| Rabies vaccine dose 1 | Day 0 | Administered IM. In deltoid for adults. For small children, anterolateral aspect of the thigh is also acceptable. The gluteal area should NEVER be used because it results in lower titers. |
| Rabies vaccine dose 2 | Day 3 | See vaccine dose 1 information |
| Rabies vaccine dose 3 | Day 7 | See vaccine dose 1 information |
| Rabies vaccine dose 4 | Day 14 | See vaccine dose 1 information |
| Rabies vaccine dose 5 (immunocompromised patients only) | Day 28 | See vaccine dose 1 information |

Table adapted from: https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5703a1.htm

# RABIES POST-EXPOSURE PROPHYLAXIS (PEP): HOW TO ADMINISTER



## What is PEP?

The treatment plan for someone exposed to rabies that includes wound cleaning, HRIG*, and vaccinations

*For previously unvaccinated

Safe and Effective for pregnant women and children

## How to administer PEP

-Immediately treat wound with soap and water, if available use a virucidal agent (eg. povidine-iodine).

- Administer HRIG for previously unvaccinated – 20 IU/kg of body weight (applies to children as well).

- Administer first vaccine (NOT in the same site as HRIG).

## Administration Site

-HRIG is to be administered directly to wound site (the rest of the volume given IM) and NEVER in the same syringe as the vaccine or same location as vaccine.

- Vaccine MUST be administered intramuscularly in the deltoid (arm) area for adults.

-For infants, vaccine may be injected into deltoid area or the anterolateral aspect of the thigh.

## Patient Not Previously Vaccinated:

-Administer HRIG on day 0

-Vaccines on days 0, 3, 7, and 14

(add day 28 if immunocompromised)

## Patient Previously Vaccinated:

-Do not administer HRIG

-Vaccines on days 0 and 3

Questions? Contact your local health department

Source: Advisory Committee on Immunization Practices, CDC.gov

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
IDPH
PROTECTING HEALTH, IMPROVING LIVES

# Additional Resources

CDC: Precautions or Contraindications for Rabies Vaccination: Immunosuppression, pregnancy, and allergies

CDC: Rabies Vaccination: Information for Healthcare Providers

CDC: Rabies Vaccine Side Effects

Rabies Advisory Committee on Immunization Practices (ACIP) Vaccine Recommendations

RabAvert Package Insert

IDPH Rabies Information for the Public

**If you have additional questions, please consult with the Kane County Health Department, especially in situations of concern.**

Kane County Health Department
1240 N. Highland Ave.
Aurora, IL 60506
24-hour phone: 630-208-3801
Web: kanehealth.com
Email: askus@co.kane.il.us

Kane County Animal Control
4060 Keslinger Road
Geneva, IL 60134
Phone: 630-232-3555
Web: kanecountypets.com
Email: animalcontrol@co.kane.il.us