

# Wisconsin Rabies Prevention Flowchart

## **Purpose of this flowchart**

The goal of all rabies prevention information, including this flowchart, is to prevent human cases of rabies while avoiding the unnecessary administration of postexposure prophylaxis.

We hope that this document enables local health department staff to become more efficient and self-directed when managing commonly encountered rabies exposure situations

## **Limitations and Caveats**

Although no set of general recommendations can address every possible rabies exposure scenario, this flowchart should be able to provide guidance for the management of the more common and straightforward situations that local public health department staff must address. This document was never intended to be all-inclusive of every contingency. In fact, some exposure circumstances were deliberately omitted from these recommendations, either because they are uncommonly encountered or because their complexities do not lend themselves to simple answers. These guidelines are not meant to be a substitute for basic knowledge about rabies and its prevention, nor will they obviate the need for good judgement and common sense. It is the user's responsibility to recognize when the circumstances of an exposure are not exactly addressed by this algorithm, and in such cases, to consult with knowledgeable experts about such situations.

## **Information Sources**

This flowchart is based on information from multiple sources, both published and unpublished. The primary reference, and one which should be required reading for anyone involved with rabies issues, is the January 8, 1999 issue of Morbidity and Mortality Weekly Report - Recommendations and Reports. This document is available at <http://www.cdc.gov/mmwr/PDF/rr/rr4801.pdf>. In addition to recommendations about potential rabies exposures, it contains information on the biologics used for rabies pre- and post-exposure prophylaxis, vaccination regimens, adverse reactions, precautions and contraindications, and treatment outside of the USA.

Another valuable written resource is the Compendium of Animal Rabies Prevention and Control updated annually, also published in the MMWR, available at <http://s94745432.onlinehome.us/Rabies2005.pdf>.

The Wisconsin statutes on rabies control can be found in s.95.21 at

[http://folio.legis.state.wi.us/cgi-bin/om\\_isapi.dll?infobase=stats.nfo&jump=95.21](http://folio.legis.state.wi.us/cgi-bin/om_isapi.dll?infobase=stats.nfo&jump=95.21)

## **Consultation Services**

- A. The Communicable Disease Epidemiology Section of the Wisconsin Division of Public Health offers consultation on situations involving potential human exposures to rabies. Local health department staff or health care providers can call 608/267-7321 during regular office hours, or the DPH emergency answering service at 608/258-0099 on nights and weekends in order to consult with an epidemiologist. Please note that this emergency number is intended for use by health department staff and health care providers ONLY.
- B. Questions regarding the submission of specimens for rabies testing to the State Laboratory of Hygiene, or about the reporting of test results can be addressed to the SLH Rabies Unit at 608/262-7323 during regular office hours.
- C. To consult about potential animal exposures to rabies, callers can contact Dr. Yvonne Bellay at the Wisconsin Division of Animal Health at 608/224-4888. It should be noted that domestic animals which are exposed to rabies constitute a very real threat to their human owners. Accordingly, Wisconsin statute 95.21 also addresses animal exposures to rabies and defines circumstances under which such an animal is subject to quarantine.

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*An electronic version of this algorithm can be found at <http://hanplus.wisc.edu/DISEASES/rabies/introduction.htm>*

## **Rabies Exposure Defined**

Rabies is transmitted only when the virus is introduced into bite wounds or open skin wounds or onto mucous membranes. Two general categories of exposure are recognized:

**1. Bite:** All bites that penetrate or abrade the epidermis, regardless of anatomic location, constitute an exposure.

**2. NonBite:** The contamination of open wounds, abrasions, mucous membranes, or scratches with saliva or other potentially infectious material (neural tissue, cerebrospinal fluid, salivary gland tissue) constitutes an exposure. Because the rabies virus is inactivated by desiccation and ultraviolet irradiation, in general, if the material containing the virus is dry, the virus can be considered non-infectious. It is rare for nonbite exposures to result in rabies. Clinicians are urged to consult with public health officials before initiating post-exposure prophylaxis for nonbite exposures.

**Bats warrant special consideration when deciding whether a nonbite exposure has occurred. If your situation involves a nonbite exposure to a bat, please read the section below, otherwise, proceed to the next page.**

### **Bats - What constitutes an exposure?**

The vast majority of human rabies cases in the USA have resulted from virus types that are carried by bats. Significantly, most of these case patients did not report having been bitten by a bat. This suggests that some bites or scratches from bats may be so minor as to go unnoticed, disregarded, or forgotten, yet can still result in transmission of the rabies virus. Accordingly, criteria for considering whether a person has sustained a potential rabies exposure are different when bats are involved. Clearly, a bite, scratch, or mucous membrane contact with a bat should be considered a potential rabies exposure. However, postexposure prophylaxis should also be considered whenever direct contact between a human and a bat has occurred, unless the person can explicitly rule out the possibility of a bite, scratch, or mucosal exposure.

Furthermore, prophylaxis can be considered for persons who were in the same room as a bat, but who might be unaware that a bite or direct contact had 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).

In all instances of potential bat exposures, the bat in question should be safely collected, if possible, and submitted for rabies diagnosis. This will eliminate the need to consider prophylaxis in most cases. It is important to note that these recommendations regarding postexposure prophylaxis for bat contact exist because of the possibility that a bite or scratch from a bat may go unnoticed due to the patient's age or level of consciousness. They should NOT be construed to mean that simply being in the same area as a bat constitutes an exposure for a competent conscious adult or older child.

**If you have determined that an exposure has occurred,  
proceed to the next page to begin the algorithm.**

### **What species of animal is involved?**

- ✓ If **dog, cat, or ferret**, go to SECTION 1 on page 4
- ✓ If **bat**, go to SECTION 2 on page 5
- ✓ If a **wild carnivore** (includes fox, skunk, weasel, bobcat, raccoon, coyote, mink, and all other wild carnivores), go to SECTION 3 on page 5
- ✓ If a **rodent or rabbit** (mouse, rat, chipmunk, squirrel, hamster, gerbil, guinea pig, rabbit, hare), go to SECTION 4 on page 6
- ✓ If domestic **livestock** (cattle, horse, sheep, pig, goat), go to SECTION 5 on page 7

*For potential rabies exposures involving species other than those above, it is advisable to consult with the Division of Public Health.*

## Section 1 – Dog, cat, ferret\*\*

Is the animal available for quarantine/observation or for testing?

YES

NO

Is animal showing signs of rabies?  
(Typically requires veterinary consultation)

YES

NO

■ Have animal euthanized and submit brain for rabies testing ASAP.  
■ Begin PEP\* while test results are pending.

■ Quarantine & observe animal for 10 days regardless of rabies immunization status. As long as the animal remains healthy, no need for PEP\* of bite victim.  
■ If animal develops signs of rabies during this observation period, euthanize and test for rabies ASAP. Begin PEP while results are pending.

If the animal is injured or extraordinarily vicious, and owner consents, it may be euthanized and tested for rabies.<sup>¶</sup> If animal is not exhibiting signs of rabies, PEP may be withheld pending lab results.

<sup>¶</sup> Once an animal is quarantined, it should not be euthanized without the consent of the officer or agency that imposed the quarantine.

■ Considering searching for animal<sup>¶</sup>

■ If animal cannot be found, PEP\* nearly always indicated.

If the animal is known to have been current on rabies vx. and had been vaccinated more than once during its lifetime, and the bite was provoked, then the risk of rabies transmission may well be low enough to forego PEP, although the risk is not zero. Consult with physician and public health officials.

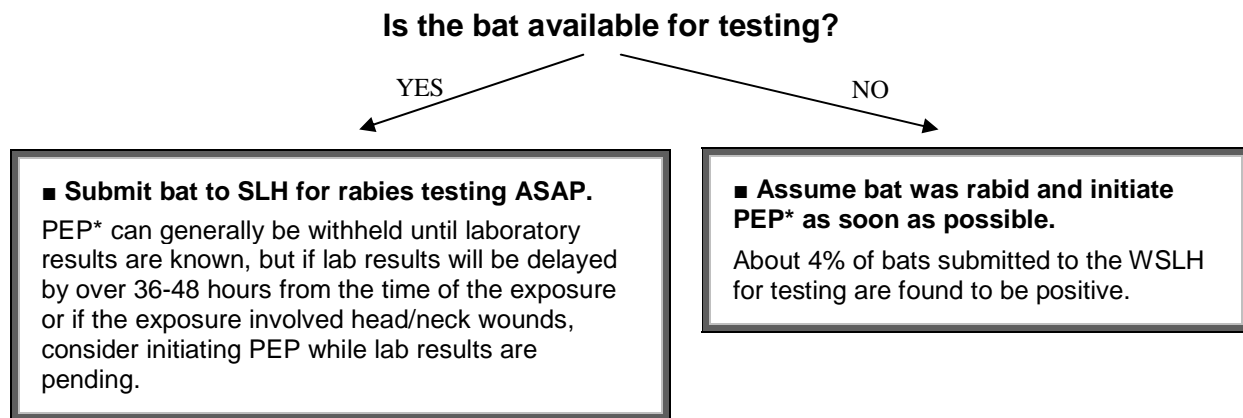
<sup>¶</sup> Confirm that bite victim will be able to identify the biting animal before initiating search.

<sup>¶</sup> The question of how long PEP\* can be delayed while searching for the animal is a judgement call. There is no unequivocally "safe" period to wait. In general, if the bite was provoked and did not involve wounds to the head/neck or to highly innervated areas, and if the wound was washed thoroughly with soap and water within 15 minutes of incurring it, it is usually reasonable to delay PEP for 48-72 hours after a bite incident involving a cat, dog, or ferret if there is a realistic chance of capturing the biting animal.

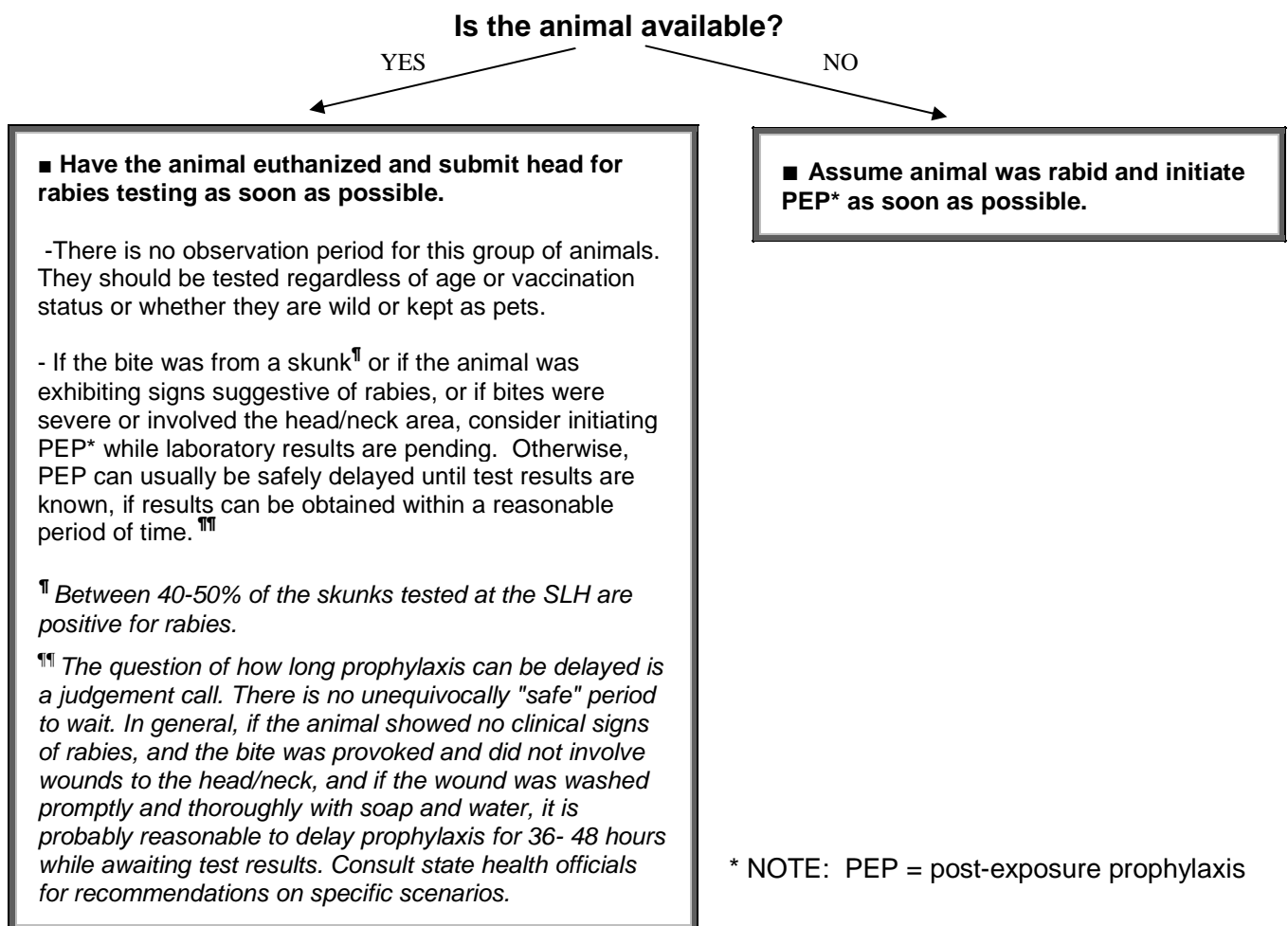
\* NOTE: PEP = post-exposure prophylaxis

\*\* Authority to quarantine ferrets does not yet exist in statute, however the authority to order a ferret sacrificed and tested for rabies does exist. Therefore, voluntary compliance with a quarantine is the less onerous option

## Section 2 – Bats



## Section 3 – Wild Carnivores



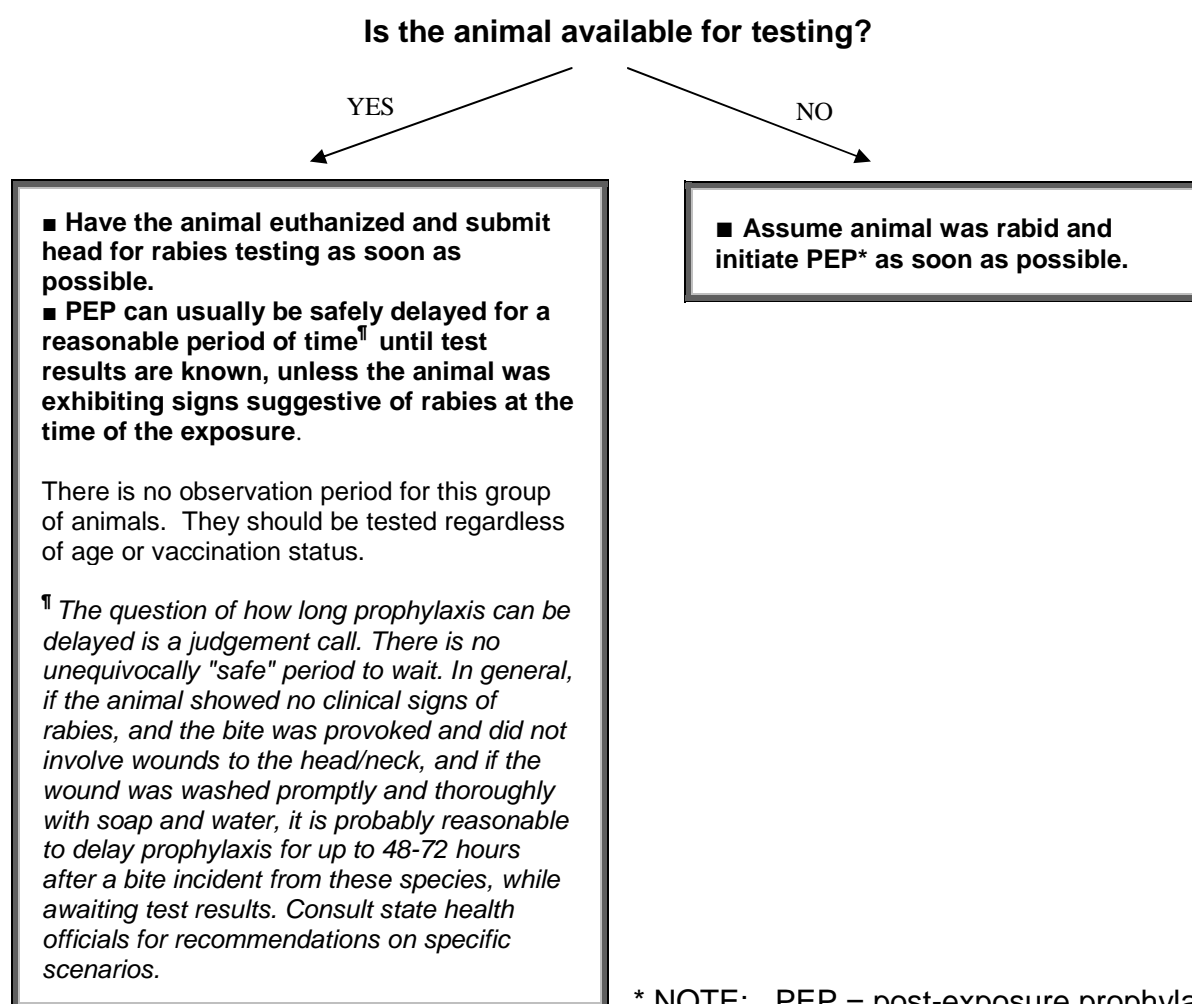
## **Section 4 – Rodents, Rabbits, and Hares**

### **A. Small rodents and lagomorphs**

Small rodents (e.g., squirrels, hamsters, guinea pigs, gerbils, chipmunks, rats, and mice) and lagomorphs (rabbits and hares), whether wild or kept as pets, are almost never found to be infected with rabies and have not been known to transmit rabies to humans. Thus, bites from these animals virtually never require PEP\* or even testing of the animal, unless unusual circumstances are present (e.g., animal particularly aggressive or overtly sick).

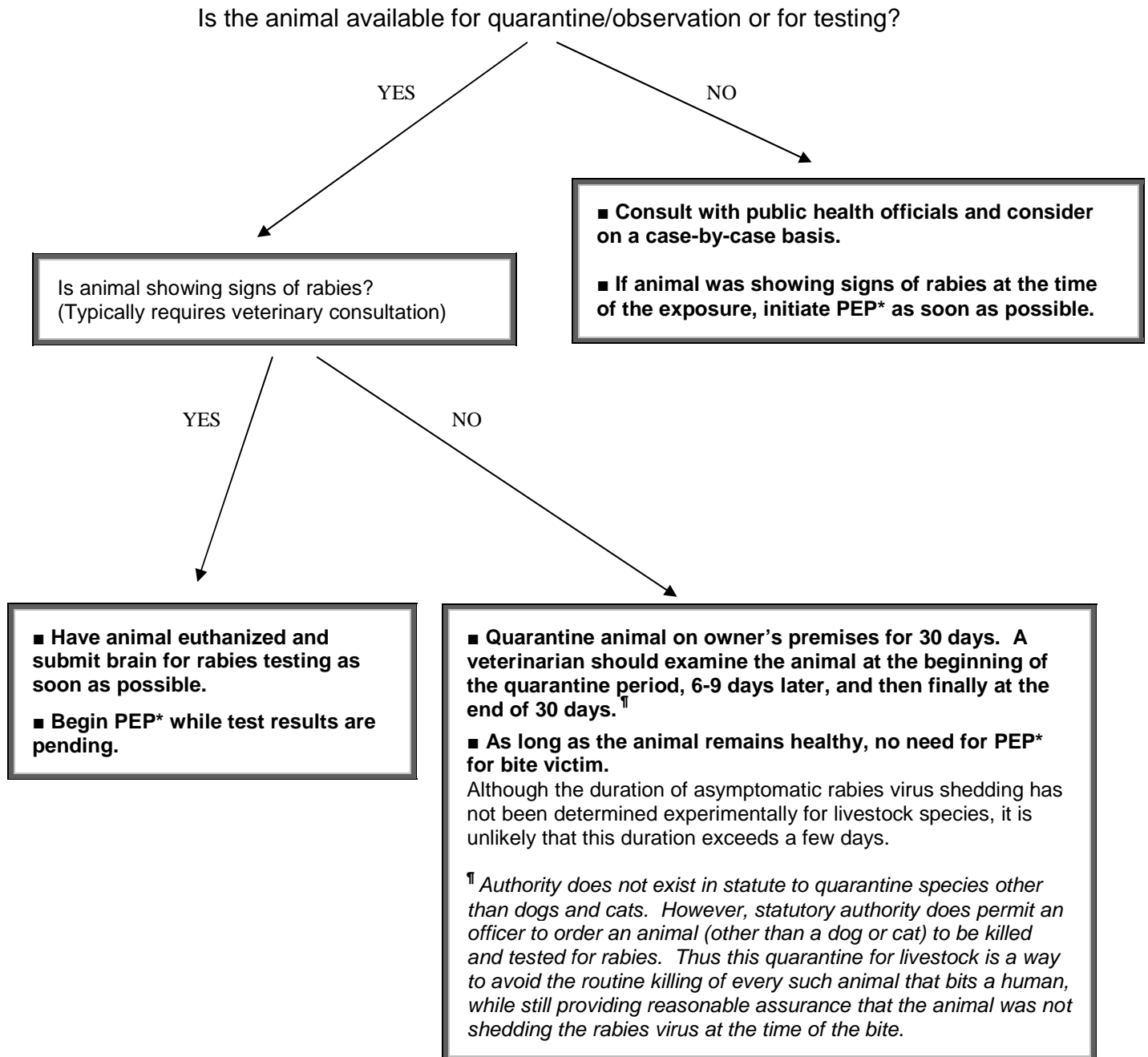
In all cases involving small rodents, the state or local health department should be consulted before a decision is made to test the animal for rabies or to initiate postexposure prophylaxis

### **B. Large rodents (muskrat-size or larger) - includes woodchucks, beaver, muskrat**



\* NOTE: PEP = post-exposure prophylaxis

## Section 5 – Livestock



\* NOTE: PEP = post-exposure prophylaxis

## **Rabies Quarantines for Dogs, Cats, and Ferrets**

*This information is meant to serve as an overview of rabies quarantines. The actual statutory language can be found at: [http://folio.legis.state.wi.us/cgi-bin/om\\_isapi.dll?infobase=stats.nfo&jump=95.21](http://folio.legis.state.wi.us/cgi-bin/om_isapi.dll?infobase=stats.nfo&jump=95.21)*

■ **Rationale:** The purpose of the 10 day quarantine is simple: For dogs, cats, and ferrets, the interval between the beginning of rabies virus shedding in the saliva and the onset of overt clinical signs of rabies virtually never exceeds five days (a ten day interval is used to provide a margin of safety). Therefore if the animal remains healthy for ten days after the bite, it means that the animal was not shedding rabies virus at the time of the bite, and that the bite victim does not require post-exposure prophylaxis (PEP).

The ten day interval does NOT pertain to the incubation period of rabies, nor does it imply that PEP can be safely delayed for ten days after the exposure occurs.

■ **Legalities:** In order for a quarantine to be legally binding, it must be issued **in writing** (although verbal instructions can be given initially), and **can only be issued by certain individuals** (a full-time health officer, a peace officer, a humane officer and a few other officials; see State Statute 95.21). A physician or a veterinarian in private practice cannot issue a legal quarantine.

■ **Home quarantine versus isolation:** If the animal is current on its rabies immunizations (as evidenced by a valid certificate of rabies vaccination or if verified by a licensed veterinarian), the quarantining officer may (but does not have to) permit the quarantine/observation period to be performed on the owner's premises. Even vaccinated animals must be quarantined because of the possibility of a vaccine failure. Such failures are rare, but have been well-documented.

If the animal is not currently immunized, the quarantine must be performed at an isolation facility.

■ **Veterinary examinations:** Regardless of whether the quarantine is done at an isolation facility or on the owner's premises, three examinations of the animal must be performed by a licensed veterinarian. These examinations are to be performed on the first day of quarantine, on the last day of quarantine, and on one intervening day.

*A fact sheet on dog and cat quarantines suitable for distribution to animal owners is available from the Department of Agriculture, Trade and Consumer Protection.*



# RABIES POSTEXPOSURE PROPHYLAXIS SCHEDULE <sup>1</sup>

Adapted from: Centers for Disease Control and Prevention. Human rabies prevention — United States, 1999: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 1999;48(No. RR-1):[page 12] <http://www.cdc.gov/epo/mmwr/preview/mmwrhtml/00056176.htm>.

## **I. FOR PERSONS NOT PREVIOUSLY VACCINATED:**

- A. Wound cleansing - All postexposure treatment should begin with immediate thorough cleansing of all wounds with soap and water. If available, a virucidal agent such as a povidone-iodine solution should be used to irrigate the wounds.
- B. Rabies Immune Globulin - Administer 20 IU/kg body weight. If anatomically feasible, the full dose should be infiltrated into and around the wound(s); any remaining volume should be administered IM at an anatomical site distant from vaccine administration. Also, RIG should not be administered in the same syringe as vaccine. Because RIG might partially suppress active production of antibody, no more than the recommended dose should be given.  
RIG is administered only once (i.e., at the beginning of antirabies prophylaxis) to provide immediate antibodies until the patient responds to the vaccine by actively producing antibodies.
- C. Vaccine - HDCV<sup>2</sup>, RVA<sup>3</sup>, or PCEC<sup>4</sup> 1.0 mL, intramuscular (deltoid area<sup>5</sup>), one each on days 0<sup>6</sup>, 3, 7, 14, and 28.  
Both RIG and vaccine should be used, regardless of how long ago the exposure occurred. There is no approved regimen in the USA that omits the use of RIG for persons who were not previously vaccinated.

## **II. FOR PERSONS WHO HAVE BEEN PREVIOUSLY VACCINATED:**<sup>7</sup>

- A. Wound cleansing - All postexposure treatment should begin with immediate thorough cleansing of all wounds with soap and water. If available, a virucidal agent such as a povidone-iodine solution should be used to irrigate the wounds.
- B. Rabies Immune Globulin - RIG should **NOT** be administered.
- C. Vaccine - HDCV<sup>2</sup>, RVA<sup>3</sup>, or PCEC<sup>4</sup> 1.0 mL, intramuscular (deltoid area<sup>5</sup>), one each on days 0<sup>6</sup> and 3.

<sup>1</sup> These regimens are applicable for all age groups, including children.

<sup>2</sup> HDCV = human diploid cell vaccine

<sup>3</sup> RVA = rabies vaccine adsorbed

<sup>4</sup> PCEC = purified chick embryo cell vaccine

<sup>5</sup> The deltoid area is the only acceptable site of vaccination for adults and older children. For younger children, the outer aspect of the thigh may be used. Vaccine should never be administered in the gluteal area.

<sup>6</sup> Day 0 is the day the first dose of vaccine is administered.

<sup>7</sup> "Previously vaccinated" is defined as any person with a history of a completed preexposure or postexposure regimen of vaccination with HDCV, RVA or PCEC; or a person who has had a previous vaccination with any other type of rabies vaccine and a documented history of antibody response to the prior vaccination.