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Division of Communicable and Environmental  
Diseases and Emergency Preparedness

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## INTRODUCTION

The purpose of this manual is to provide current information on rabies control in Tennessee. It is intended for use by local health departments, animal control programs, veterinarians, and healthcare providers. Recommendations contained in this manual are based on the following publications:

- “Human Rabies Prevention—United States, 2008: Recommendations of the Advisory Committee on Immunization Practices” (<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5703a1.htm>)
- “Use of a Reduced (4-Dose) Vaccine Schedule for Postexposure Prophylaxis to Prevent Human Rabies: Recommendations of the Advisory Committee on Immunization Practices” (<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5902a1.htm>)
- *Compendium of Animal Rabies Prevention and Control, 2016*, the National Association of State Public Health Veterinarians (<http://www.nasphv.org/Documents/NASPHVRabiesCompendium.pdf>)
- Tennessee Code Annotated: Title 68, Chapter 8 (<http://www.lexisnexis.com/hottopics/tncode/>)
- Rules of the Tennessee Department of Health (<http://www.tn.gov/sos/rules/1200/1200-14/1200-14-01.20110731.pdf>)
- Rules of the Tennessee State Board of Veterinary Medical Examiners (<http://www.state.tn.us/sos/rules/1730/1730.htm>)

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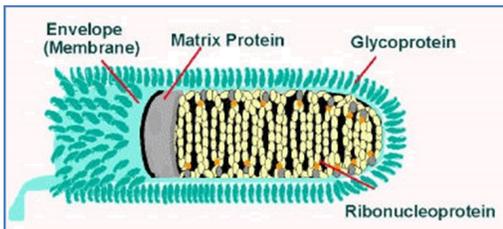
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## OVERVIEW

Rabies is a viral disease of mammals that is present in most countries of the world. All species of mammals, including humans, are susceptible to rabies virus infection, but only a few species are important as reservoirs for the virus. In the United States, distinct strains (variants) of rabies virus are maintained in populations of raccoons, skunks, foxes, and several species of bats.

Virus is present in the saliva and central nervous system (CNS) of a rabid animal. Rabies virus is typically transmitted when a susceptible animal is exposed to the saliva of a rabid animal. The length of time between infection with rabies virus and onset of disease, or the incubation period, usually ranges from about 3 weeks to 3 months; however, incubation periods ranging from less than 10 days up to several years have been documented. During incubation, the virus travels from the exposure site (i.e. bite wound) to the CNS by means of the peripheral nerves. The virus replicates in the brain, causing encephalitis, and then travels to the salivary glands. At this point the animal is capable of transmitting the infection. It is important to note that the virus is not present in the salivary glands, and thus cannot be transmitted via a bite, until after it has reached the brain.



Structure of the rabies virus

Although rabies traditionally has been reported to present clinically in either an encephalitic (“furious”) or paralytic (“dumb”) form, cases can exhibit clinical signs suggestive of both categories or can have an atypical presentation. Clinical signs vary depending on animal species, virus variant, and possibly the location and severity of the exposure. No definitive species-specific clinical signs of rabies are recognized.

Early signs of illness (the prodromal phase) are characteristic of a viral syndrome and often include lethargy, fever, and not eating. Within 1-2 days neurologic signs develop, typically including altered behavior, increased salivation, and difficulty swallowing. Jumpiness, tremors, unsteadiness, and weakness are also common during the neurologic phase. The disease progresses rapidly and is almost invariably fatal. Death usually occurs less than 1 week after illness onset; occasionally animals will die acutely from rabies with no recognized illness.

Rabies may be clinically indistinguishable from other causes of encephalitis. Viruses, bacteria, fungi, protozoa, poisons, and trauma can all cause CNS disease with similar presentations. Rabies can generally be ruled out if the animal’s condition does not deteriorate rapidly or if it improves at any point. A course of illness longer than 7 days in a domestic animal is not consistent with rabies.

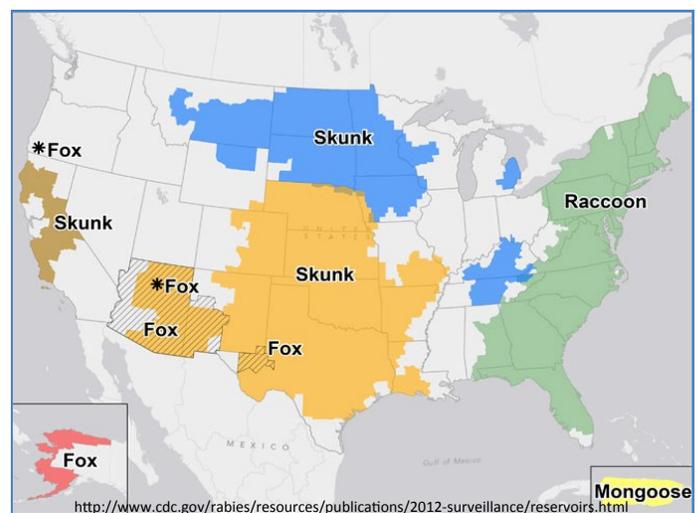
Rabies can be diagnosed in animals only by examination of brain tissue. No reliable diagnostic test exists for live animals.

## EPIDEMIOLOGY

### *Rabies in animals*

Rabies in the United States is maintained in wild animal populations. Raccoons, skunks, and foxes are reservoir hosts in defined geographic areas. Bats are also reservoir hosts and maintain a number bat-associated variants of the rabies virus. All states except Hawaii have reported rabies in bats.

Since the early 1980s, the predominant rabies reservoir species in Tennessee has been the striped skunk. A large in-

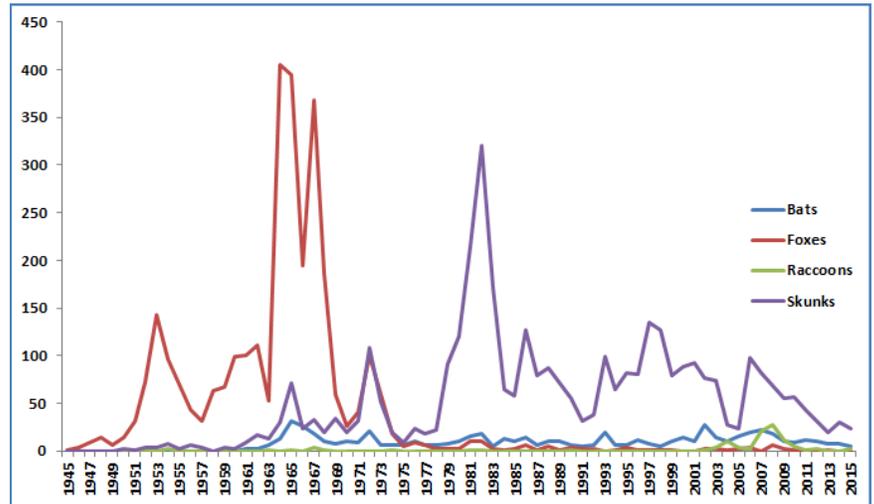


Terrestrial rabies variants in the United States

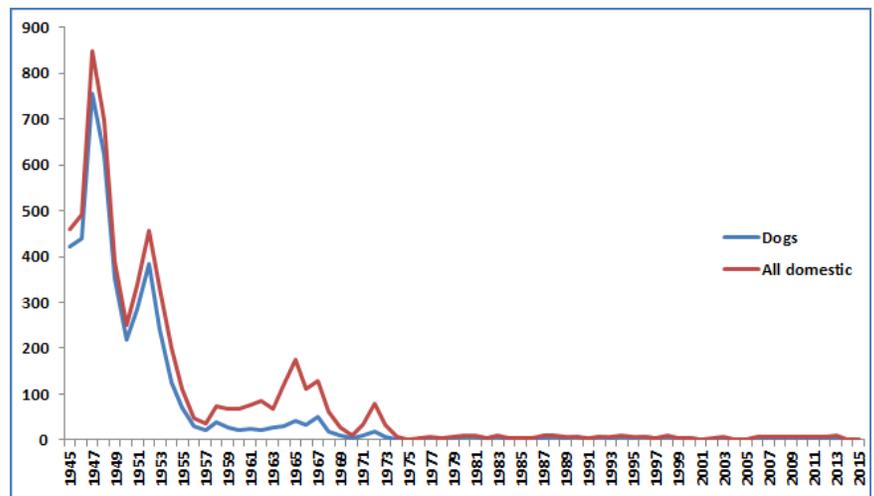
crease in skunk rabies cases was seen during 1980-1983. During 1984-2015, reports of rabies in wild animals averaged 84 (ranging from 28 to 148) per year in Tennessee, including an average of 68 skunks and 11 bats per year. Other wild animals occasionally found to be rabid were foxes and raccoons. The raccoon variant of the rabies virus was first found in the eastern Tennessee raccoon population in 2003, with 4 cases reported that year. Reported cases increased to 28 in 2008, then decreased until no cases of raccoon-variant rabies were reported in 2013. A large-scale oral vaccination program administered by the United States Department of Agriculture (USDA) has been instrumental in preventing extensive spread of raccoon rabies west of the Appalachian Mountains.

The canine rabies variant, which once circulated widely in domestic dogs, has been eliminated in the United States by pet vaccination and animal control activities. When canine variant rabies was prevalent, hundreds of cases of rabies occurred in dogs and other domestic animals each year in Tennessee. Canine variant rabies began to be controlled in the 1950s, and, since the mid-1970s, only a few cases of rabies occur in domestic animals each year.

Reports of rabies in domestic animals have averaged 6 per year in Tennessee since the mid-1970s. Most of these were dogs, with an average of 4 cases per year. Other domestic animals that are occasionally found to be rabid are cats, cattle, and horses. These domestic animal cases are due to “spillover” infection with wild animal rabies viruses, primarily skunk variant. Non-reservoir wildlife species can also be affected by spillover of rabies from reservoir species, but this is exceedingly rare in Tennessee. From 1975 to 2015, only 3 cases of rabies were reported in non-reservoir wild animals: a weasel, an opossum, and a bobcat.



Reported rabies in wild animals in Tennessee, 1945-2015



Reported rabies in domestic animals in Tennessee, 1945-2015

Cats	Cattle	Dogs	Horses	Pigs
8	4	34	12	1

Domestic animals reported rabid in Tennessee, 2005-2015

In areas where raccoon variant rabies is present, spillover infection of domestic animals and non-reservoir wild animal species is much more common than it is in Tennessee. This is likely due to the aggressive nature of raccoons as well as their overlapping habitat with many other animals. In raccoon rabies-endemic areas (primarily the eastern seaboard states), rabies is much more common in domestic cats, which are less likely to be vaccinated against rabies than dogs are; it is also occasionally found in wild species as diverse as bobcats, groundhogs, and deer.

## ***Rabies in humans***

Human rabies is very rare in the United States as a result of domestic animal vaccination, animal control activities, and effective biologics for post-exposure prophylaxis (PEP). Nationwide only 2-3 cases of rabies in humans are reported each year. Some of these cases involve immigrants or travelers who became infected abroad, usually with canine variant rabies. Domestically acquired cases are almost exclusively caused by bat variants. The most recent human rabies case in Tennessee occurred in 2002 and was due to a bat exposure.

<b>Variant</b>	<b>Indigenous</b>	<b>Imported</b>	<b>Total</b>
<b>Bat</b>	<b>14</b>	<b>2</b>	<b>16</b>
<b>Canine</b>	<b>0</b>	<b>6</b>	<b>6</b>
<b>Raccoon</b>	<b>2*</b>	<b>0</b>	<b>2</b>
<b>Unknown</b>	<b>1</b>	<b>0</b>	<b>1</b>
<b>All</b>	<b>17</b>	<b>8</b>	<b>25</b>

**Human rabies cases reported in the United States, 2005-2015**

**\*1 case was transplant-acquired**

## **EXPOSURE**

### ***Types of exposure***

Potential exposures to rabies are classified into 2 general categories: bite and non-bite. Rabies is generally only transmitted by a bite from a rabid animal, although certain non-bite situations may present a risk for transmission of the virus. Organ and tissue transplantations from donors who died of unrecognized rabies infection have resulted in secondary cases of rabies in at least 16 transplant recipients worldwide, including 5 in the United States. Though this is an extremely rare situation, it constitutes a high risk of transmission. No other laboratory-confirmed cases of human-to-human spread of rabies have ever been documented. A few cases of aerosol transmission of rabies virus have occurred in laboratories and possibly in a cave containing millions of bats. Rabies virus transmission via contamination of mucous membranes or an open wound with fresh saliva or CNS tissue is possible but unlikely.

### ***Risk assessment***

Any potential exposure to rabies requires a prompt risk assessment. The first consideration is whether the exposure was bite or non-bite. Very few documented cases of rabies in humans have involved non-bite exposures, and these resulted from highly unusual situations. Rabies virus is only present in saliva and nervous tissue of a rabid animal. Touching a rabid animal or contact with blood, urine, or feces does not constitute an exposure. The virus is fragile and does not persist in the environment; it is rapidly inactivated by sunlight, common disinfectants, and detergents. In general, if material is dry then it contains no infectious rabies virus. However, the virus can remain infectious indefinitely in frozen material.

Other considerations when assessing an exposure include the type of animal involved and the situation leading to the bite. The risk of rabies transmission from normal, healthy domestic and non-reservoir wild animals is very low, whereas the risk from rabies reservoir species (skunks, bats, and possibly raccoons in Tennessee) is high. The risk associated with exposure to any animal showing signs of illness—especially neurologic illness—is increased. Finally, the risk from an unprovoked attack is greater than that from a provoked attack. If a person is attempting to handle a wild animal, any attack should be considered provoked. Refer to the risk assessment chart (Appendix C) and consult local or state public health officials when determining the level of rabies risk involved in an exposure (Appendix N).

### ***Communication***

Epidemiologists or clinical staff at the local or state health department should be consulted when decisions are being made about testing an animal for rabies or recommending PEP for a potentially exposed person. Consultation is available with epidemiologists at the Tennessee Department of Health (TDH) central office in Nashville 24 hours a day by calling 615-741-7247. If the animal is available for testing and is considered a high rabies risk, the state public health laboratory should be notified of its impending arrival and the urgency of the test results (see Laboratory Testing section). If

the animal tests positive for rabies, the results are indeterminate, or the specimen is unsatisfactory for testing, the lab will notify appropriate points of contact in Epidemiology and Environmental Health at the TDH central office. Epidemiology and Environmental Health will then notify their counterparts in the regional and local offices. Regional and local staff will coordinate with county health departments and animal control agencies as necessary to ensure appropriate follow-up actions are taken (Appendix L).

## **PREVENTION AND CONTROL**

### ***Domestic animals***

The primary defense for domestic animals against rabies is vaccination. A number of rabies vaccines are licensed for use in dogs, cats, ferrets, horses, cattle, and sheep. Veterinarians may also consider administering vaccines off-label to other species. Vaccination of domestic animals additionally provides primary protection for humans against exposure to rabies.

NOTE: Tennessee law requires that dogs and cats over 6 months of age be currently vaccinated against rabies. Required frequency of booster vaccinations depends upon the labeled duration of the vaccine used. State law does not specify whether 1- or 3-year vaccines must be used; however, local jurisdictions may have more stringent rules regarding rabies vaccination. A dog or cat is considered currently vaccinated only if the initial vaccination was administered at least 28 days previously, a valid certificate exists, and the revaccination date on the certificate has not been reached.

### **Management of a domestic animal potentially exposed to a rabid animal**

- a) **Vaccinated**: If a domestic animal that is currently vaccinated or overdue for vaccination is exposed to a confirmed or suspected rabid animal, it should receive a booster vaccine immediately and be observed by the owner for 45 days. Any sign of illness during this time should be promptly evaluated by a veterinarian.
- b) **Unvaccinated**: If an unvaccinated domestic animal is exposed to a confirmed or suspected rabid animal, it should be euthanized immediately. Alternatively a dog or cat may be strictly isolated for 4 months such that it has no direct contact with humans or other animals (Appendix D). Other domestic species may be confined and observed for 6 months on a case-by-case basis as determined by public health officials. Rabies vaccine should be administered as soon as possible after the exposure. Any illness during the confinement period should be evaluated by a veterinarian and reported to public health.

### ***Wild animals***

The only licensed wildlife vaccine in the United States is Raboral V-RG<sup>®</sup>, which is approved for oral vaccination of raccoons and coyotes. The vaccine is composed of a recombinant vaccinia virus with the gene for the rabies virus glycoprotein inserted into its genome. The glycoprotein stimulates production of neutralizing antibodies against the rabies virus. Because the whole rabies virus is not present, there is no way the vaccine can cause rabies.



**Raboral V-RG<sup>®</sup> rabies vaccine baits**

Each year millions of vaccine baits are distributed in strategic zones along the western edge of the range of the raccoon rabies variant to prevent its spread. Parts of these bait zones are in northeastern and southeastern Tennessee. Studies have shown that the VRG vaccine is safe in more than 10 avian and 35 mammalian species. Although the vaccinia virus has been attenuated (weakened), it can very rarely cause vacciniosis in susceptible humans. Therefore, baits should not be handled if found. Questions about vaccine baits can be directed to the USDA (Appendix B).

No injectable vaccines are licensed for use in wild animals; however, wild animals kept in exhibits or zoos may be vaccinated off-label by a licensed veterinarian. Wild-caught mammals may be incubating rabies and should be quarantined for at least 6 months after capture. A captive wild mammal that is exposed to a confirmed or suspected rabid animal should be euthanized immediately. For very valuable animals, public health officials can help develop alternative post-exposure management strategies.

Wild animals should not be translocated to other areas. Rabies and numerous other diseases can be introduced into new populations, resulting in serious risks to domestic animal, wildlife, and human health.

### ***Humans***

Avoidance of wild or unfamiliar animals and vaccination of pets are the best means of protection for humans against exposure to rabies. People should not attempt to touch or feed wild or unfamiliar domestic animals and should contact animal control or wildlife officials when necessary for an animal that appears sick, injured, or otherwise in distress (Appendix M).

#### **Management of an animal that bites a human**

- a) **Dogs, cats, ferrets**: If a person is bitten by a healthy, vaccinated or unvaccinated, domestic dog, cat, or ferret, the animal should be confined and observed for 10 days from the time of the bite (Appendix D). Observation may take place at the home, an animal control facility, or a veterinary clinic (local jurisdictions may have rules requiring confinement at an animal control facility or veterinary clinic). Administration of rabies vaccine is not recommended during the observation period to avoid the risk of a rare adverse reaction causing signs that may be confused with rabies. The 10-day observation period is based on studies showing that dogs, cats, and ferrets do not shed rabies virus in their saliva for more than a few days before showing clinical signs of rabies. Therefore, if an animal remains healthy for a period of 10 days after a bite, rabies transmission was not possible at the time of the bite—regardless of the vaccination status or rabies exposure history of the animal. If the animal appears sick at the time of the bite or at any point during the subsequent 10 days, it should be evaluated by a veterinarian. If rabies is considered a possibility, the animal should be euthanized and tested. Public health officials and a healthcare provider should be consulted about the need to begin PEP immediately or to await test results.
- b) **Other domestic animals**: For potential exposures involving other domestic animal species such as livestock, public health officials should be consulted. No observation period has been established for animals other than dogs, cats, and ferrets. The animal's health and vaccination status, the circumstances of the bite, and the epidemiology of rabies in the area will be considered in determining a course of action.
- c) **Wild carnivores**: For exposures involving wild carnivore species, the animal should be considered potentially rabid and the exposed person should begin PEP as soon as possible, in consultation with the state or local health department. If the animal is available it should be tested for rabies, and, if negative, PEP can be discontinued.
- d) **Bats**: No more than 1 percent of bats in the wild are thought to be rabid; however, a bat that is seen in daytime, behaves erratically, or lands on a person is more likely to be rabid. As a rule, bats should be left alone. If a person has uncontrolled direct contact with a bat (i.e. the person cannot say with certainty that there was no possible contact with the mouth of the bat), the bat should be safely captured if possible and tested for rabies (Appendix E). If the bat is unavailable for testing, PEP should be initiated. The absence of a visible injury does not rule out the need for PEP. In most cases when a bat is seen in a house but no human contact is reported, there is no need for rabies testing or for PEP. In cases where a bat is found in the room with a sleeping or incapacitated person or a young child, and a bite cannot be definitively ruled out, the bat should be tested if available. If it is not available for testing, a healthcare provider and local or state public health officials should be consulted regarding the need for PEP.

- e) **Other wildlife:** For exposures involving non-reservoir wildlife species, public health officials should be consulted. If the animal is available it may be tested for rabies; if not, PEP may be recommended based on local rabies epidemiology and the circumstances of the bite. Some animals, such as small rodents (e.g. rats, mice, squirrels, chipmunks) and lagomorphs (e.g. rabbits, hares), are not considered a risk for rabies transmission; in most cases rabies testing of these species is not necessary and will not be performed by the public health laboratory.
- f) **Hybrids:** The offspring of wild animals crossbred to domestic dogs and cats are considered wild animals. As such, no observation period is defined for management after a bite, and no vaccines are licensed for use in these animals. Tennessee law defines a hybrid as an animal with documented genetic heritage of at least 25 percent wild animal. All other animals should be considered domestic species.

### **Vaccination of humans**

- a) **Pre-exposure prophylaxis (Pre-EP):** Pre-EP is the use of rabies vaccine to induce immunity prior to rabies exposure. Pre-EP consists of 3 doses of vaccine, given on days 0, 7, and either 21 or 28, and is recommended for certain groups at higher than usual risk of exposure to rabies (e.g. veterinarians and their staff, animal diagnostic laboratory workers, wildlife workers, animal control officers, cavers). Pre-EP simplifies the post-exposure regimen and may protect against unrecognized exposures. Serologic titers are recommended every 2 years for groups at “frequent risk” for exposure. The Centers for Disease Control and Prevention (CDC) recommends a booster vaccine if the titer is less than complete neutralization at a 1:5 serum dilution (approximately 0.1-0.2 IU per ml) by the rapid fluorescent focus inhibition test (RFFIT). The World Health Organization (WHO) recommends a booster if the titer falls below 0.5 IU per ml. See Appendix F for more information on serologic testing recommendations and a map for the “frequent” and “infrequent” risk zones in Tennessee.

Pre-EP is also recommended for certain travelers to rabies-endemic regions where animal exposures are likely and appropriate PEP may be unavailable. Issues that should be considered are rabies epidemiology in the region, length of stay, intended activities, and local availability of modern anti-rabies biologics.

- b) **Post-exposure prophylaxis (PEP):** PEP is given after an exposure to prevent disease. PEP for persons who have not previously been vaccinated against rabies consists of a single dose of human rabies immune globulin (HRIG) on day 0 along with a course of 4 doses of rabies vaccine on days 0, 3, 7, and 14. A 5<sup>th</sup> dose on day 28 should be added for immunosuppressed individuals. Although PEP should be initiated as soon as possible after a high-risk exposure, it is not a medical emergency. Management of wounds is a priority. Proper wound care is essential and can substantially decrease the risk of rabies transmission. A wound should be washed thoroughly with soap and water and, if possible, irrigated with a virucidal solution such as povidone-iodine. Suturing ideally should be avoided. HRIG should be infused around the wound as much as is anatomically feasible and any remaining dose injected intramuscularly at a site distant from that of the initial vaccine dose. Because HRIG might partially suppress active production of antibody, no more than the recommended dose should be given. If HRIG is not available at the time of initiation of PEP, it may be given up to 7 days after the first dose of vaccine. Vaccine should be administered in the upper arm (deltoid muscle) in adults; the thigh muscle may be used in children. Rabies vaccine should not be injected into the gluteal muscles. Minor deviations from the recommended vaccination schedule are not important, but major deviations should be discussed with public health officials.

PEP for persons previously vaccinated with a modern cell-culture rabies vaccine, regardless of time since vaccination or current antibody titer, consists of wound care as described above and 2 doses of vaccine given on days 0 and 3. HRIG should NOT be administered.

Although PEP should ideally be initiated within a few days of a high-risk exposure, it is recommended at any time, regardless of the delay, as long as clinical signs of rabies have not developed. Once the rabies virus enters the CNS

it is protected from the immune system, and PEP will not be effective. However, given the long and highly variable incubation period, it is impossible to accurately assign a time limit for effective PEP. Exposures to highly innervated areas such as the face and hands have been associated with shorter incubation periods. In such cases it is especially important to begin PEP quickly when the biting animal is at high risk of being rabid (i.e. a rabies reservoir species or other animal with clinical signs and history suggestive of rabies).

See Appendix G for guidance on determining when PEP is needed and Appendix H for more information on anti-rabies biologics and where to obtain them.

<b>Post-Exposure Prophylaxis for Non-immunized Individuals</b>	
<b>Wound cleansing</b>	PEP should begin with immediate thorough cleansing of all wounds with soap and water. If available, a virucidal agent such as povidone-iodine solution should be used to irrigate the wounds.
<b>Human Rabies Immune Globulin (HRIG)</b>	If possible, the full dose should be infiltrated around wounds; any remaining volume should be administered IM at an anatomical site distant from vaccine administration. HRIG should not be administered in the same syringe as vaccine. Because HRIG might partially suppress active production of antibody, no more than the recommended dose should be given.
<b>Vaccine</b>	HDCV or PCECV 1.0 ml, IM (deltoid) on days 0, 3, 7, and 14.
<b>Post-Exposure Prophylaxis for Previously Immunized Individuals</b>	
<b>Wound cleansing</b>	PEP should begin with immediate thorough cleansing of all wounds with soap and water. If available, a virucidal agent such as povidone-iodine solution should be used to irrigate the wounds.
<b>HRIG</b>	HRIG should <b>not</b> be administered.
<b>Vaccine</b>	HDCV or PCECV 1.0 ml, IM (deltoid) on days 0 and 3.

## LABORATORY TESTING

### *The rabies test*

The TDH Division of Laboratory Services offers rabies testing services free of charge within Tennessee and tests approximately 1,500 animals per year using the direct fluorescent antibody (DFA) test. Testing is performed at the state public health laboratory facilities in Nashville and Knoxville. City and county animal control agencies, local health departments, and veterinarians may submit specimens for rabies testing. The DFA test is highly accurate and requires about 3 hours to perform.

### *Specimens for rabies testing*

#### **Acceptance policy**

Testing resources are intended for use in situations where the test result will influence public health-related decisions. Only mammals that have potentially exposed a person or domestic animal to rabies should be submitted for rabies diagnostics (see Section IV—Exposure and Appendix I for additional guidance).

#### **Collection, packaging, and identification**

Brain tissue is examined for the presence of rabies virus, so animals should be euthanized in a manner that will not damage the brain (especially the cerebellum and brain stem). The state public health laboratories do not have facilities to dispose of whole carcasses; therefore, only the head should be submitted for rabies testing. Exception: when submitting bats, ship the entire animal. For large animals such as cattle and horses, submit only the brain. Consult a

veterinarian for brain removal.

If it is not possible to recover the brain from a large animal, send the head only to either the CE Kord Animal Health Diagnostic Laboratory or the University of Tennessee College of Veterinary Medicine, Veterinary Medical Center, Diagnostic Laboratory (contact information at end of section).

Steps for preparing a specimen for shipment:

1. Within 24 hours of the animal's death, retrieve its head by severing at the midpoint between the base of the skull and shoulders.
2. Keep the specimen refrigerated but not frozen. Do not formalin fix.
3. Double bag the specimen using zip lock or heavy plastic bags, and seal each bag. If sharp edges such as bone fragments are evident, wrap the specimen in newspaper to prevent puncture of the plastic bags. Place the bagged specimen in an insulated box with enough ice packs to keep it cool. Stabilize the specimen with newspaper or absorbent paper to prevent movement or damage during transport. (Appendix J)
4. If only submitting brain tissue, place the tissue in a hard-sided container to prevent damage during transport, and double-bag the container.
5. Treat any specimen infested with fleas, ticks, maggots, ants, or other pests with parasiticide prior to packing.
6. If submitting multiple specimens, make sure each is double bagged separately to prevent cross-contamination. Each specimen must have a separate Rabies Submission Form and must be clearly identified with a specimen identification number or case number that matches the number on the test request form.
7. Tape the completed submission form (Appendix K) to the shipping container.

## Shipment

It is important to submit the animal within 48 hours of the time of death for accurate test results, as brain tissue may rapidly deteriorate. Avoid shipping specimens on weekends or holidays unless prior approval has been obtained from a TDH epidemiologist or the rabies laboratory manager. Refrigerate the specimen while awaiting shipment. Do not freeze.

Follow the shipping guidelines of your carrier. Shipping of specimens should be coordinated with the local health department or animal control agency. Ship the specimen by the fastest means possible to the laboratory facility in Knoxville or Nashville (contact information at end of section). Transport by the submitter's personal courier is preferred, but shipment by commercial couriers is acceptable, if permitted. It is against U.S. postal regulations to send this type of specimen through the mail.

Specimens arriving during weekends or holidays will be tested the next business day. All specimens should be submitted within 48 hours of death and must arrive at the lab by 12:00 PM to ensure same day testing. Those received after 12:00 PM will be tested the following business day. Complete the requisition form with as much information as possible to ensure that bite victims and submitters can be easily contacted. Required information is denoted on the form by an asterisk.

## Unsatisfactory specimens

A specimen will be reported as unsatisfactory if any of the following conditions are present:

- The specimen is received without an accompanying submission form.
- The brain material is damaged or deteriorated to the extent that anatomical features of the brain are not distinguishable.

- The required brain structures (i.e. cerebellum and brain stem) are not evident in the head submitted.
- The specimen is fixed in formalin.

NOTE: Frozen specimens are not necessarily unsatisfactory. Freezing and thawing is very damaging to brain tissue; therefore, acceptance of a frozen specimen will be determined once the specimen has thawed. Submitting a frozen specimen will result in at least a 1-day delay for rabies testing.

### ***Reporting procedure and interpretation***

Positive, indeterminate, and unsatisfactory rabies test results are reported immediately by telephone to the TDH-Environmental Health office in Nashville. Communication and follow-up then proceeds as outlined in the “Communications” section on pages 5-6. Specimens with indeterminate results are referred to the CDC for examination by additional testing methods. Negative reports are mailed to the specimen provider (Appendix L).

### ***Laboratory locations and contact information***

#### **Public Health Laboratories (for rabies testing)**

<u>TDH Laboratory Services</u>	<u>Knoxville Regional Laboratory</u>
630 Hart Lane	2101 Medical Center Way
Nashville, TN 37243	Knoxville, TN 37920
Phone: (615) 262-6300	Phone: (865) 549-5201
Fax: (615) 262-6393	Fax: (865) 549-5199

#### **Animal Diagnostic Laboratories (for removal of brains from large animals—rabies testing not performed)**

<u>CE Kord Diagnostic Laboratory</u>	<u>UT CVM Diagnostic Laboratory</u>
436 Hogan Road	2407 River Drive
Nashville, TN 37220	Knoxville, TN 37996
Phone: (615) 837-5125	Phone: (865) 974-5673

## Definitions

1. **Confinement:** Restriction of an animal to a building, pen, or other escape-proof enclosure to monitor for clinical signs of rabies, typically for a 10-day observation period of a dog, cat, or ferret that has bitten a person or another domestic animal
2. **Confirmed rabies case:** An animal which has tested positive by direct fluorescent antibody (dFA) test on brain tissue
3. **CNS (central nervous system):** Brain and spinal cord
4. **Currently vaccinated:** Rabies vaccine was administered at least 28 days prior and boosters were given according to vaccine label
5. **Euthanasia:** Humane killing of an animal
6. **Domestic animal:** Companion animals (e.g. dogs, cats, ferrets) and livestock (e.g. horses, cattle, sheep, goats, pigs)
7. **HRIG (Human rabies immune globulin):** Anti-rabies antibodies that have been concentrated from the plasma of persons who have been immunized against rabies, used to bind rabies virus at the site of inoculation (bite) to prevent virus from entering nerve cells
8. **Incubation period:** The time from exposure to a disease (infection) until onset of clinical illness; typically between 3 weeks and 3 months for rabies but ranges from less than 10 days to more than a year
9. **Infectious period:** The amount of time that an infected animal or person can transmit an infectious agent to another host
10. **Off-label:** The use of a prescription drug or vaccine for a purpose or species other than that for which it is licensed
11. **PEP (Rabies post-exposure prophylaxis):** Anti-rabies biologics given after an exposure to rabies to prevent infection
  - Person not previously vaccinated: HRIG + rabies vaccine on day 0, followed by vaccine on days 3, 7, and 14
  - Person previously vaccinated (with modern cell-culture vaccine): 2 doses of vaccine, given on days 0 and 3; no HRIG given
12. **Pre-EP (Rabies pre-exposure prophylaxis):** Series of 3 doses of vaccine given to persons at higher than usual risk of rabies exposure, due to occupational, recreational, or travel-related risks
13. **Provoked attack:** An incident in which an animal bites in defense of itself or its food, territory, or young; any situation in which a person is attempting to touch or handle a wild animal should be considered provoked
14. **RFFIT (Rapid fluorescent focus inhibition test):** Serologic test to measure antibody titer
15. **Rabies exposure:** Any bite or other contact in which saliva or nervous tissue of a confirmed or suspected rabid animal enters an open wound or contacts mucous membranes (e.g. eyes, nose, mouth)
16. **Rabies reservoir:** Animal species that maintains circulation of a rabies virus variant within its population
17. **Suspected rabid animal:** In the absence of a test result, any animal reasonably believed by public health officials to potentially be rabid based on species, clinical signs, and history
18. **Unprovoked attack:** An incident in which an animal strikes for no apparent reason

## **Frequently asked questions**

### **Why does my pet need the rabies vaccine?**

Domestic animals are at risk for exposure to rabies from wild animals. If a domestic animal becomes rabid, there is a high risk of humans being exposed to rabies. To protect public health, Tennessee law requires that dogs and cats more than 6 months of age be currently vaccinated against rabies. If an unvaccinated dog or cat is exposed to rabies, it must either be euthanized or strictly isolated, with no contact with humans or other animals, for 4 months from the time of the exposure. Other domestic species must either be euthanized or isolated for 6 months from the time of exposure.

### **Is my pet required to get the rabies vaccine every year or every 3 years?**

Tennessee law does not specify whether 1-year or 3-year rabies vaccines must be used, although local jurisdictions may have stricter laws. “Currently vaccinated” means that an animal’s first vaccine was given at least 28 days previously and booster doses have been given according to the vaccine label. The revaccination date on a vaccine certificate should match the labeled duration of the vaccine used (i.e. if a 3-year vaccine is given, the revaccination date should not be recorded on the certificate as 1 year later, unless it was the animal’s first vaccination).

### **Can a vaccinated animal ever get rabies?**

No vaccine is 100% effective, but rabies in vaccinated animals is extremely rare. One study found that only 2 out of 1,104 rabid dogs were currently vaccinated. If rabies is diagnosed in a currently vaccinated animal, it should be reported to the state health department so that a thorough investigation can be conducted.

### **Can I use rabies antibody titers as a substitute for current vaccination in my dog or cat?**

Antibody titers are not accepted in lieu of rabies vaccination in Tennessee. Titers are only one marker of immunity and may not indicate complete protection. Other immunologic factors also play a role in preventing rabies, and as yet we have no way to measure those. If a pet owner and his or her veterinarian feel that vaccination is too risky for an animal due to a history of severe vaccine reactions or underlying illness, they may choose not to vaccinate the animal. However, if an unvaccinated dog or cat is exposed to a rabid animal, it must then either be euthanized or strictly isolated for 4 months. If a healthy unvaccinated pet bites a person, there will only be a 10-day observation period required (the same as for vaccinated animals).

### **Is the rabies vaccine safe?**

Rabies vaccines are made from killed virus, and very stringent requirements in the manufacturing process ensure that no live virus makes it into a vaccine. There is also a recombinant vaccine for cats in which a protein gene from the rabies virus is incorporated into a different, harmless vector virus. That vaccine is technically a live virus, but it is not the rabies virus. In either case, there is no risk of a person or animal contracting rabies from the vaccine.

There are 2 brands of rabies vaccine for humans. Both are made from killed virus and have excellent efficacy and safety records. The most common side effects of the vaccine, among humans and animals alike, are minor pain and swelling at the injection site.

### **If canine rabies has been eliminated from the United States, can my dog still get rabies?**

Although the canine variant of the rabies virus has been eliminated from the United States, dogs can still be infected with rabies from wild animals like skunks. That is why it is important to vaccinate pets and keep them from roaming. The canine rabies variant is still present in much of the world, including Central and South America. The variant could become re-established if a large enough population of unvaccinated dogs is present.

### **What if a dog or cat bites me?**

If a person is bitten by a dog or cat, the animal should be observed for 10 days from the time of the bite. It does not matter whether the animal is vaccinated against rabies or not. If the biting animal is not available for observation, discuss the situation with public health officials from the local or state health department. Rabies is now very rare in dogs and cats due to the effectiveness of vaccination and animal control activities. The chance of any apparently normal, healthy dog or cat transmitting rabies is extremely low, and if a dog or cat remains healthy for 10 days after a bite it could not have transmitted rabies at the time of the bite. If the animal appears ill or abnormal at the time of the bite or during the subsequent 10 days, it should be evaluated by a veterinarian for signs of rabies.

### **What if a wild animal bites me?**

If a person is bitten by a wild carnivore (e.g. raccoon, skunk, fox) or a bat, the animal should be killed and tested for rabies, if possible. Be careful not to destroy the animal's head. Contact your local health department or animal control agency to arrange for testing. Discuss with public health officials at the local or state health department and your physician whether to begin rabies post-exposure prophylaxis immediately or await test results. In many cases rabies testing can be completed within 24 hours.

### **Can I get rabies in any way other than a bite?**

Rabies virus is only present in saliva and nervous tissue (brain and spinal cord) of a rabid animal. It is not present in blood, urine, or other animal products such as skunk spray or bat guano. It may be possible for rabies to be transmitted if saliva or brain tissue of a rabid animal comes in contact with mucous membranes (e.g. eyes, nose, mouth) or an open wound. A scratch from a rabid animal is not considered an exposure to rabies unless the resulting wound becomes contaminated with fresh saliva. There have been a few documented cases of apparent aerosol exposure resulting in rabies in humans; however, these occurred in a laboratory with concentrated virus and in a cave containing millions of bats. The rabies virus is fragile and does not survive outside the host, so there is no risk of being exposed indirectly (e.g. bat in swimming pool, raccoon eating from dog's food dish).

**How long after an exposure can I wait to begin rabies post-exposure prophylaxis (PEP)?**

Rabies PEP should be started within a few days after a high-risk exposure (i.e. a bite from a known rabid animal), especially if the bite was to the face, head, or hands. In most animal bite cases, however, there is time to wait for capturing and observing or testing an animal. Rabies PEP is not a medical emergency, and proper wound care should take precedence. Rabies has a long and highly variable incubation period (the time period from initial infection to onset of disease), so PEP may still be effective weeks or even months after a bite.

**Where can I go to get the rabies vaccine?**

Health departments in Tennessee do not stock rabies biologics for pre- or post-exposure prophylaxis, but the local health department can provide information on where you can go for care. Generally in Tennessee, only hospital emergency departments stock the products for post-exposure prophylaxis. After the initiation of PEP, you may be able to return for follow-up doses of vaccine at an outpatient clinic or ask your primary care provider to order vaccine. If you need pre-exposure vaccination, ask your primary care provider about ordering the vaccine or check with a travel clinic.

**What should I do if I find a bat in my home?**

If you are reasonably certain that the bat has not come in contact with a person or pet, open the doors and windows and let the bat escape. If the bat bit someone or there was other uncontrolled contact (i.e. you cannot be certain that there was no contact with the bat's mouth), the bat should be safely captured and tested. See Appendix E for tips on safely capturing bats. People usually know when they have been bitten by a bat. However, bats have small teeth which may not leave obvious marks. Seek advice from your physician and the local or state health department if you awaken to find a bat in your bedroom or see a bat in the room with an unattended child.

**Should I be concerned about rabies when I travel outside the United States?**

Canine rabies is still very common throughout much of the world, especially in Africa and Asia, and tens of thousands of people die from rabies each year in these regions. Before traveling, check the rabies status of your destination. While you are abroad, take care to avoid animals. If your planned activities will bring you into contact with animals in a rabies-endemic area, and modern biologics for post-exposure prophylaxis may not be available within a 3-day window, you should consider pre-exposure vaccination.

**What should I do if my pet has fought with a wild animal?**

If your dog or cat has fought with a wild carnivore (e.g. raccoon, skunk, fox) or had direct contact with a bat and is...

- Vaccinated (whether vaccination is current or not): See your veterinarian for a rabies booster as well as treatment of any injuries. The pet should be observed at home for 45 days and examined by a veterinarian if it shows any signs of illness.

- **Never vaccinated:** If the wild carnivore tests positive for rabies or is unavailable for testing, the pet should be euthanized or strictly isolated for 4 months. Environmental health specialists from the local health department should be contacted for assistance and follow-up.

If your pet has fought with a wild animal other than a carnivore (e.g. groundhog, wild boar), discuss the situation with a public health official from the local or state health department. The species involved and the local rabies epidemiology will be considered in determining a course of action.

**My dog picked up a vaccine bait for raccoons. What should I do?**

The vaccine does not contain rabies virus and will not harm domestic animals. You should not try to remove it from the dog's mouth; doing so may cause you to be bitten. If you come into contact with the pink liquid vaccine, wash the exposed area with soap and water and call the United States Department of Agriculture's Wildlife Services office at 1-800-4-USDA-WS (1-800-487-3297) for more information.

**I found a stray dog that's wearing a rabies tag. Can I use it to find the dog's owner?**

Call the local health department (see Appendix N) with the number from the tag. If the tag was issued from that county, they can tell you which veterinary clinic it was issued to. The veterinary clinic's records should be able to determine which dog and owner the tag belongs to. If it was issued by a different county, call the Tennessee Department of Health office of Environmental Health. They will be able to tell you what county issued the tag; you can then call the health department of that county to find out what veterinary clinic the tag was issued to.



# Rabies Exposure Flow Chart



For animals exposed or suspected to have been exposed to a rabid animal

**\*\*Local or state public health authorities should be consulted immediately\*\***

## Domestic animals (Dogs, cats, ferrets, livestock)

### VACCINATED\*

Revaccinate immediately and observe for 45 days under owner's control.

Any illness in the animal during the observation period should be reported immediately to the local health department

*\*Either currently vaccinated or overdue for vaccination. Currently vaccinated is defined as initial dose given at least 28 days previously or boosters have been given in accordance with established guidelines.*

### UNVACCINATED

**Dog or cat:** Euthanize immediately or, if the owner is unwilling, vaccinate as soon as possible and place in strict isolation for 4 months.

**Other:** Euthanize immediately or confine and observe, on a case-by-case basis, for 6 months.

*If signs suggestive of rabies develop during the isolation period, the animal should be euthanized and tested for rabies. Contact the local health department for assistance.*

## Wild animals and hybrids (Any offspring of wild animals crossbred to domestic animals)

If exposed to a rabid animal, it should be euthanized immediately. If the owner is unwilling, consult public health authorities.

No injectable rabies vaccines are licensed for use in wild animals or hybrids; however, vaccination status may be considered by public health authorities in determining disposition of animal.

# Human that is bitten by an animal



Wash wound thoroughly with soap and water. Seek medical attention for the wound if necessary. THEN consider the type and availability of the biting animal in consultation with local or state public health authorities.



**Healthy dog,  
cat, or ferret**

Observe for 10 days. If the animal remains clinically normal, there is no need to test animal or for bitten person to receive postexposure prophylaxis.\*

OR



**Other healthy  
domestic  
animal**

Very low risk. Evaluate on a case-by-case basis in consultation with public health authorities.

**Rabies reservoir  
species (raccoon,  
skunk, fox, bat)**



Contact local health department to arrange testing of animal for rabies. If animal is not available for testing, the bitten person should receive postexposure prophylaxis.†

OR

**Other wild animal  
(non-reservoir  
species)**



Testing or postexposure prophylaxis rarely indicated. Evaluate on a case-by-case basis in consultation with public health authorities.

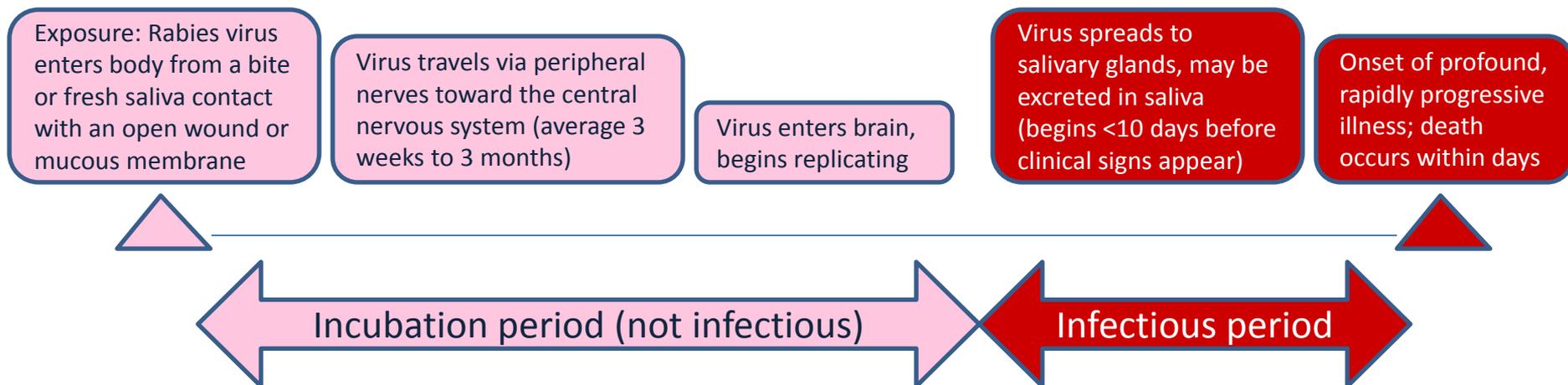
\*Any illness in animal during the observation period should be evaluated by a veterinarian and reported immediately to local health department.

†See "Human Rabies Prevention—United States, 2008", available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr57e507a1.htm>, for additional details and post-exposure prophylaxis protocols for rabies-vaccinated and unvaccinated individuals.

## How long should an animal be confined and observed?

**10 days\***: If the animal has bitten a person or other domestic animal. Strict confinement is not necessary. If the animal remains healthy for 10 days after a bite, rabies cannot have been transmitted at the time of the bite, regardless of the animal's vaccination status.

**4 months**: If a dog or cat is unvaccinated and has been bitten by a confirmed or suspected rabid animal, and the owner refuses euthanasia. Strict confinement is necessary. Public health officials should be consulted. Other species may be confined for 6 months.



\*Applies ONLY to dogs, cats, and ferrets. Viral shedding periods are not established for any other species.

## **What to do if you find a bat in your home**

### If you are certain no person or pet has come in contact with the bat:

Confine the bat to a room by closing all doors and windows leading out of the room except those to the outside. The bat will probably leave soon. If the bat does not leave, follow the steps below to safely capture the bat.

### If there may have been contact between the bat and a person or pet:

You should have the bat captured and tested. Follow the steps below to safely capture the bat and save it for testing. Call animal control or your local health department to arrange for testing.

## **How to safely capture a bat**

- Find a small container, like a box or a large can, and a piece of cardboard large enough to cover the opening in the container. Punch small air holes in the cardboard.
- Put on leather work gloves. When the bat lands, approach it slowly and place the container over it. Slide the cardboard under the container to trap the bat inside.
- If you are certain there has been no contact between the bat and a person or pet, carefully hold the cardboard over the container, take the bat outdoors, and release it (away from people and pets).
- If there is any question about contact between the bat and a person or pet, you should save the bat for testing. Tape the cardboard to the container, securing the bat inside, and contact your local health department or animal control agency to have the bat tested for rabies.

## **How to keep bats out of your house**

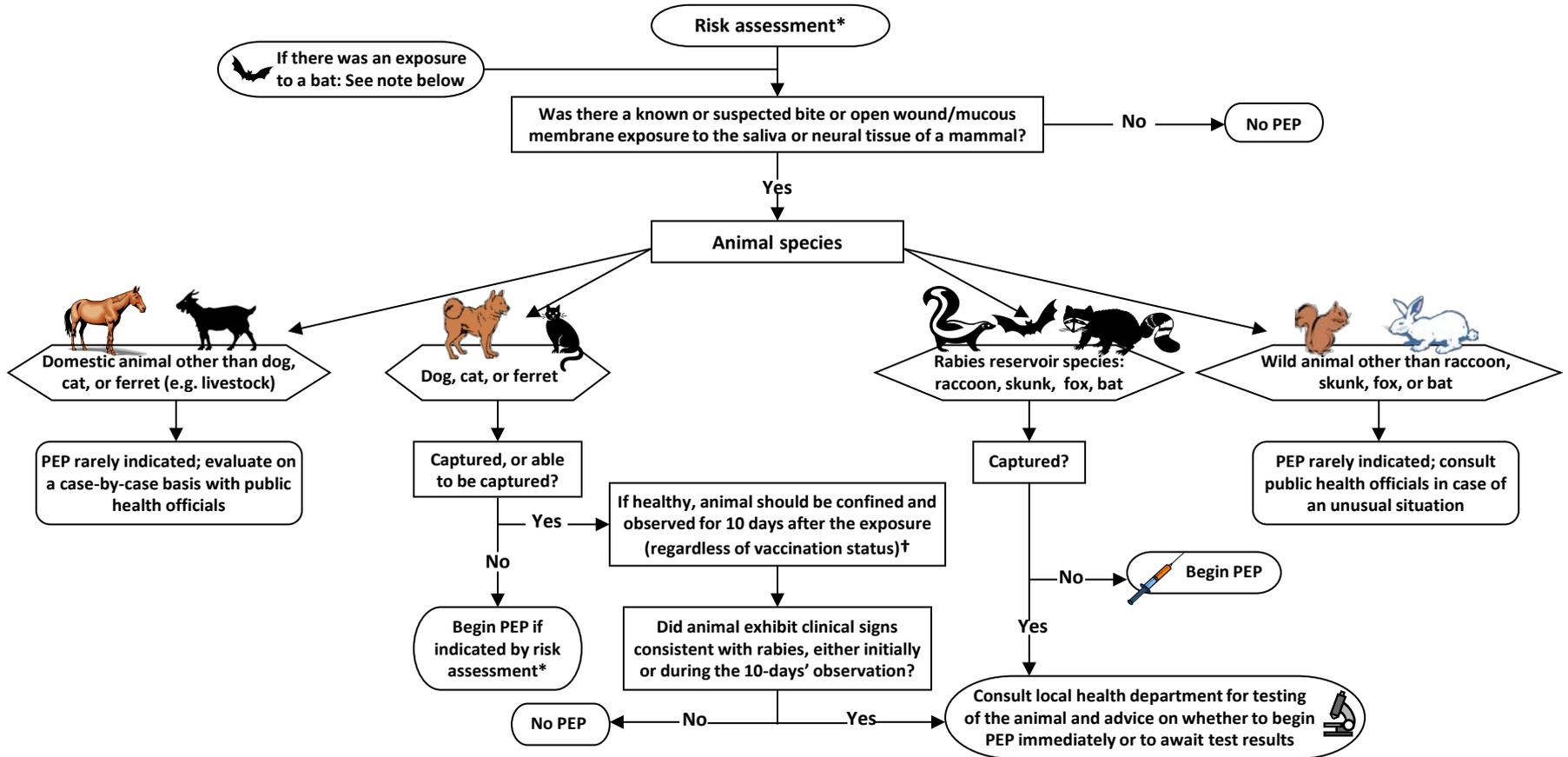
Some bats live in buildings, and there is no reason to evict them if there is little chance for contact with people. However, bats must not be allowed into your home. It is best to contact a wildlife agency or professional wildlife removal service for assistance with "bat-proofing" your home. If you choose to do the bat-proofing yourself, here are some suggestions:

- Carefully examine your home for openings that might allow bats to enter. Caulk any openings larger than a quarter-inch by a half-inch. Use window screens, chimney caps, and draft-guards beneath attic doors; fill electrical and plumbing holes with stainless steel wool or caulking; and ensure that all doors to the outside close tightly.
- Prevent bats from roosting in attics or buildings by covering outside entry points. Observe where the bats exit at dusk and keep them from coming back by loosely hanging clear plastic sheeting or bird netting over these areas. Bats can crawl out and leave but cannot re-enter. When all the bats are gone, the openings can be permanently sealed.
- Avoid sealing entries during May through August. If there are young bats present when entries are covered, many of them will die or try to make their way into your living areas.
- Most bats leave in the fall or winter to hibernate, so these are the best times to bat-proof your home.



# Indications for Rabies Postexposure Prophylaxis (PEP)

General guidance only, to be used in combination with public health consultation



\*Risk assessment includes the species of animal, its health/vaccination status, the circumstances of the exposure, and local rabies epidemiology. A non-bite exposure or a bite from an apparently healthy dog or cat, even if unvaccinated, is very unlikely to transmit rabies and rarely requires PEP. Possible exposure to rabies is a medical urgency, not an emergency. There is time to allow local animal control to attempt to locate the animal for observation or testing, as appropriate.

†The local health department should generally be involved in monitoring animals during the 10-day observation period; however, local animal control may perform this function in some areas.

Bat exposures: PEP is recommended for a person who has direct contact with a bat, unless the person can be certain that no bite occurred or the bat tests negative for rabies. When a bat is found indoors and there is no history of contact, the risk of exposure to rabies is typically very low. PEP can be considered for persons who were in the same room with a bat and might be unaware that direct contact had occurred (e.g. a deeply sleeping person awakens to find a bat in the room, or a bat is found in the room with an unattended child or incapacitated adult), and the bat is not available for testing. In such cases PEP is not warranted for other household members.

Public health officials are available by telephone 24 hours per day for consultation; however, health departments in Tennessee do not stock anti-rabies biologics for PEP. CDC no longer recommends a 5<sup>th</sup> dose of rabies vaccine for PEP in immunocompetent persons, although product package inserts do not reflect this change.

**Tennessee Department of Health Epidemiologist On Call: 615-741-7247**

**Anti-rabies biologics approved for use in humans**

<b>Biologic</b>	<b>Product name</b>	<b>Manufacturer</b>	<b>Dose</b>	<b>Route</b>
Human diploid cell vaccine	Imovax® Rabies	Sanofi Pasteur	1.0 mL	Intramuscular <sup>a</sup>
Purified chick embryo cell vaccine	RabAvert®	Novartis	1.0 mL	Intramuscular <sup>a</sup>
Rabies immune globulin	Imogam® Rabies-HT	Sanofi Pasteur	20 IU/kg	Local <sup>b</sup>
	HyperRAB® S/D	Talecris	20 IU/kg	Local <sup>b</sup>

<sup>a</sup>The deltoid muscle should be used in adults and adolescents; the quadriceps may be used in young children. Rabies vaccine should never be administered in the gluteal muscles.

<sup>b</sup>As much product as is anatomically feasible should be infiltrated into and around the wound, with any remaining dose administered intramuscularly in the deltoid or quadriceps, distant from the site of vaccine administration.

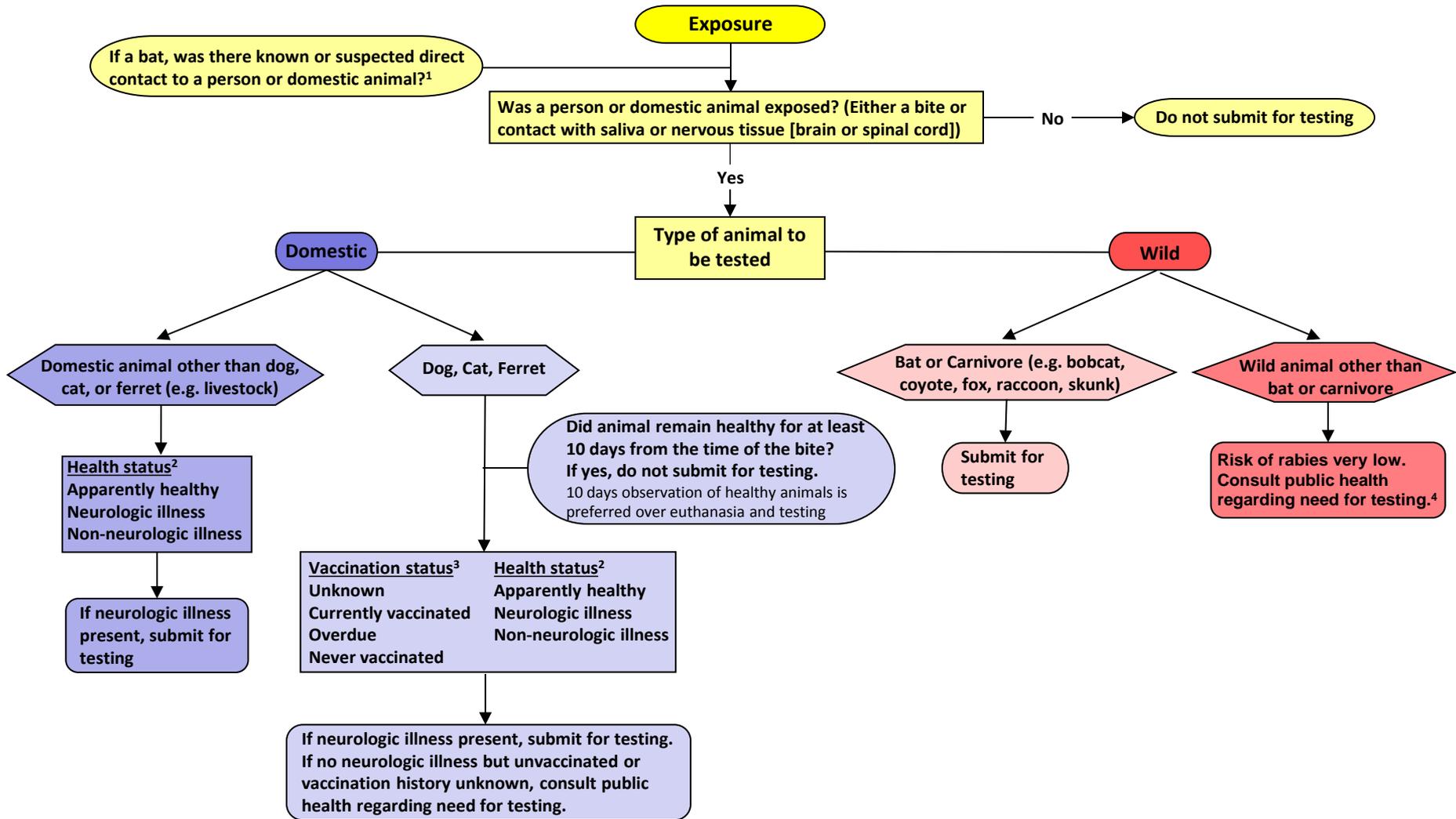
**Where to obtain anti-rabies biologics**For post-exposure prophylaxis:

Hospital emergency departments are the only facilities that routinely stock human rabies vaccine and immune globulin for post-exposure use in Tennessee. Health departments (except those containing a travel clinic) do not stock or otherwise provide these biologics but can assist in locating a hospital that does. After initiation of the post-exposure prophylaxis series, you may be able to obtain the follow-up doses at an outpatient clinic or arrange with your primary care provider to order and administer the vaccine.

For pre-exposure prophylaxis:

A travel clinic is often the best place to obtain vaccine for pre-exposure prophylaxis. Otherwise, you may be able to arrange with your primary care provider to order and administer the vaccine.

# Guidelines for animal submission for rabies testing



<sup>1</sup> If a bat was in the room with a sleeping person or an unattended young child or pet, unrecognized direct contact may be suspected.

<sup>2</sup> If animal was healthy at the time of bite/exposure, it is very unlikely to be rabid. Neurologic illness greatly increases the likelihood of rabies.

<sup>3</sup> If animal has ever received at least 2 rabies vaccines, it is very unlikely to be rabid.

<sup>4</sup> Small rodents (e.g. squirrels, chipmunks, mice, hamsters, rats) are not considered a risk for rabies transmission and generally will not be tested.

Tennessee Department of Health: 615-741-7247

## ITEMS NEEDED:

- 2 heavy zip lock bags or trash bags
- 1 insulated cardboard box
- 1 envelope
- Packing tape
- Newspaper/packing paper
- Cold packs
- Rabies Submission Form

**STEP 1:** Place animal head in a zip lock or heavy plastic bag and make sure it is adequately sealed. \*\*If there are any bone fragments that might puncture the bag, wrap head in several layers of newspaper/absorbent paper.\*\*

**STEP 2:** Place first bag into a second zip lock or heavy plastic bag and make sure it is adequately sealed. Label the specimen bag with the corresponding submitter number given on the Submission Form (if applicable).

**STEP 3:** Place labeled specimen in an insulated cardboard box surrounded by ice packs. Fill any empty space with newspaper to stabilize the specimen and prevent movement during transport.

**STEP 4:** Make sure the insulated cardboard box is sealed, and place the Rabies Submission Form in an envelope taped to the top of the box with the appropriate address.

### TDH Laboratory Services-Nashville

ATTN: Rabies Lab  
630 Hart Lane  
Nashville, TN 37243  
Phone: (615) 262-6300  
Fax: (615) 262-6393

### Knoxville Regional Laboratory

ATTN: Rabies Lab  
2101 Medical Center Way  
Knoxville, TN 37920  
Phone: (865) 549-5201  
Fax: (865) 549-5199

## Rabies Specimen Packaging Instructions





Tennessee Department of Health  
Division of Laboratory Services  
Rabies Submission

**Place State Lab Accession  
Label Here**  
(TDH use only)

**\*Indicates required fields**

SPECIMEN COLLECTION INFORMATION		SUBMITTER INFORMATION	
*Kind of Animal:		*Submitting Facility:	Submitter Number:
*Date Specimen Collected:		Address:	
Specimen Collector Name:		City:	County:
Phone Number of Collector: ( ) -		State:	Zip Code:
Animal Collection Site (Address or GPS):		Phone Number: ( ) -	Fax Number: ( ) -
City:	State:	E-mail Address:	
Zip Code:	*County:		
* REASON FOR SUBMISSION (Provide details below)		*PUBLIC HEALTH CONTACT	
<input type="checkbox"/> Person Exposed <input type="checkbox"/> Other Animal Exposed <input type="checkbox"/> Surveillance Program		<input type="checkbox"/> Has a Public Health Official been contacted regarding this submission? <input type="checkbox"/> Yes <input type="checkbox"/> No Name of contact: _____	
Was the attack provoked? <input type="checkbox"/> Yes <input type="checkbox"/> No	Date of Death: __/__/__	<input type="checkbox"/> Natural Death <input type="checkbox"/> Euthanized	
OWNER OF ANIMAL			
Last Name:		First Name:	Middle Initial:
Address:		Phone Number: ( ) -	
City:	County:	State:	Zip Code:
*PERSON EXPOSED <input type="checkbox"/> Yes <input type="checkbox"/> No			
Last Name:		First Name:	Middle Initial:
<input type="checkbox"/> Male <input type="checkbox"/> Female	Date of Birth: __/__/__		
Address:		Phone Number: ( ) -	
City:	County:	State:	Zip Code:
Date of Exposure: __/__/__	Exposure Type: <input type="checkbox"/> Bite <input type="checkbox"/> Saliva Contact <input type="checkbox"/> Neurological Tissue <input type="checkbox"/> Scratch		
	Exposure Site: <input type="checkbox"/> Arm <input type="checkbox"/> Foot <input type="checkbox"/> Hand <input type="checkbox"/> Head <input type="checkbox"/> Leg <input type="checkbox"/> Throat <input type="checkbox"/> Torso		
*OTHER ANIMAL EXPOSED <input type="checkbox"/> YES <input type="checkbox"/> NO			
Type of Animal Exposed:		Date of Exposure: __/__/__	
Owner Last Name:		Owner First Name:	Owner Middle Initial:
Address:		Phone Number: ( ) -	
City:	County:	State:	Zip Code:
ADDITIONAL SPECIMEN INFORMATION			
Vaccination History:			
List of Clinical Signs:			
Date of First Clinical Signs: __/__/__			
Additional Information:			
LABORATORY FACILITIES		Billing Information (TDH use only)	
<input type="checkbox"/> Nashville Central Laboratory, 630 Hart Lane Nashville, TN 37216 615-262-6350			
<input type="checkbox"/> Knoxville Regional Laboratory, 2101 Medical Center Way Knoxville, TN 37920 865-549-5201			

**Rabies laboratory result notification procedure**

Urgent results: These are positive or unsatisfactory rabies test results, as well as situations in which testing cannot be completed or confirmation is pending further analysis at CDC. Urgent results will be reported by the state public health laboratory to the TDH-Environmental Health (EH) office by telephone. Public health veterinarians will be notified via email. Outside of normal office hours, unless prior arrangements have been made, laboratory personnel should report these results to the on-call epidemiologist (615-741-7247).

EH will perform the following functions when notified of an urgent lab result:

- EH central office will notify the local environmental health specialist, the district supervisor, the regional field office manager (or metro county director of environmental health), and the central office public health veterinarians.
- The local environmental health specialist or supervisor will notify the specimen submitter, animal owner, and person bitten.
- EH or local animal control staff will follow up on all potential animal exposures to rabies.
- Any potential human exposures to rabies will be referred to communicable disease staff at the local health department or regional health office.

Central office public health veterinarians will contact communicable disease staff at the metro/regional health office to verify that appropriate follow-up is completed for all potential human exposures to rabies.

Negative tests: The state public health laboratory will mail a copy of the test result to the specimen submitter. These copies are mailed the morning after testing is completed (typically 2 business days after receipt of specimen).

**ANIMAL CONTROL AGENCIES IN SELECTED METRO COUNTIES**

<b>COUNTY</b>	<b>ADDRESS</b>	<b>PHONE</b>
Anderson	Oak Ridge Animal Shelter 395 Belgrade Road Oak Ridge, TN 37830	(865) 425-3423
Blount	Blount County Animal Shelter 233 Currie Avenue Maryville, TN 37804	(865) 980-6244
Bradley	Cleveland Animal Shelter 360 Hill Street Southeast Cleveland, TN 37311	(423) 479-2122
Davidson	Metro Animal Care and Control 5125 Harding Place Nashville, TN 37211	(615) 862-7928
Greene	Greene County Animal Control 990 Hal Henard Road Greeneville, TN 37743	(423) 798-1777
Hamilton	McKamey Animal Center 4500 North Access Road Chattanooga, TN 37415	(423) 305-6500
	East Ridge Animal Services 1015 Yale Street East Ridge, TN 37412	(423) 664-0271
Knox	Young-Williams Animal Center 3201 Division Street Knoxville, TN 37919	(865) 215-6599
Madison	Jackson-Madison County Rabies Control 146 Miller Avenue Jackson, TN 38301	(731) 668-4211
Maury	Maury County Animal Shelter 1233 Maple Ash Avenue Columbia, TN 38401	(931) 381-0532
Montgomery	Animal Control and Adoption Services 616 North Spring Street Clarksville, TN 37040	(931) 648-5750
Putnam	Cookeville-Putnam County Animal Shelter 2650 Gainesboro Grade Cookeville, TN 38501	(931) 526-3647
Robertson	Robertson County Animal Control 2900 West County Farm Road Springfield, TN 37172	(615) 384-5611
	Springfield Animal Control 507 Industrial Drive Springfield, TN 37172	(615) 384-9289
Rutherford	Pet Adoption and Welfare Services 285 John R Rice Boulevard Murfreesboro, TN 37129	(615) 898-7740
Shelby	Memphis Animal Services 2350 Appling City Cove Memphis, TN 38133	(901) 636-1416
	Bartlett Animal Shelter 5220 Shelter Run Lane Bartlett, TN 38135	(901) 385-6484
	Collierville Animal Services 603 E. South Street Collierville, TN 38017	(901) 457-2670
Sullivan	Sullivan County Animal Shelter 380 Massengill Road Blountville, TN 37617	(423) 279-2741

No guarantees can be made as to the completeness or accuracy of this list. The following websites may contain more up-to-date information:

[http://health.state.tn.us/hcf/facilities\\_listings/facilities.htm](http://health.state.tn.us/hcf/facilities_listings/facilities.htm);

<http://www.vet.utk.edu/cait/counties.php>

**ANIMAL CONTROL AGENCIES IN SELECTED METRO COUNTIES**

Sumner	Sumner County Sheriff's Division of Animal Control 117 West Smith Street Gallatin, TN 37066	(615) 452-2616
Tipton	Tipton County Animal Control 8621 Hwy 51 South Brighton, TN 38011	(901) 837-5919
Washington	Washington County-Johnson City Animal Shelter 525 Sells Avenue Johnson City, TN 37604	(423) 926-8769
White	White County Animal Control Shelter 5600 Gum Springs Mountain Road Sparta, TN 38583	(931) 761-3647
Williamson	Williamson County Animal Control and Adoption Center 106 Claude Yates Drive Franklin, TN 37064	(615) 790-5590
Wilson	Wilson County Animal Control 378 Dump Road Lebanon, TN 37087	(615) 444-9775
	Mt. Juliet Animal Control 115 Industrial Drive Mount Juliet, TN 37122	(615) 773-5533
	Lebanon Animal Control 406 Tennessee Boulevard Lebanon, TN 37087	(615) 444-0825

No guarantees can be made as to the completeness or accuracy of this list. The following websites may contain more up-to-date information:

[http://health.state.tn.us/hcf/facilities\\_listings/facilities.htm](http://health.state.tn.us/hcf/facilities_listings/facilities.htm);

<http://www.vet.utk.edu/cait/counties.php>

## LOCAL HEALTH DEPARTMENTS

COUNTY		STREET ADDRESS	PHONE	FAX
Anderson		710 North Main Street Clinton, TN 37716	(865) 425-8800	(865) 457-4252
		<a href="http://www.achealthdept.org/">http://www.achealthdept.org/</a>		
Bedford		140 Dover Street Shelbyville, TN 37160	(931) 684-3426	(931) 684-5860
Benton		225 Hospital Drive Camden, TN 38320	(731) 584-4944 (731) 584-4539	(731) 584-8831
Bledsoe		1185 Alvin York Highway Pikeville, TN 37367	(423) 447-2149	(423) 447-6777
Blount		301 McGhee Street Maryville, TN 37801	(865) 983-4582	(865) 983-4574
		<a href="http://www.blounttn.org/health.asp">http://www.blounttn.org/health.asp</a>		
Bradley		201 Dooley Street Southeast Cleveland, TN 37311	(423) 728-7020	(423) 479-6130
Campbell		162 Sharp-Perkins Road Jacksboro, TN 37757	(423) 562-8351	(423) 562-1593
Cannon		301 West Main Street Woodbury, TN 37190	(615) 563-4243 (615) 563-4202	(615) 563-6212
Carroll		633 High Street Huntingdon, TN 38344	(731) 986-1990 (731) 986-1993	(731) 986-1995
Carter		403 East G Street Elizabethton, TN 37643	(423) 543-2521	(423) 543-7348
Cheatham		162 County Services Drive, Suite 200 Ashland City, TN 37015	(615) 792-4318	(615) 792-6794
Chester		301 Quinco Drive Henderson, TN 38340	(731) 989-7108	(731) 989-9686
Claiborne		620 Davis Drive Tazewell, TN 37879	(423) 626-4291	(423) 626-2525
Clay		115 Guffey Street Celina, TN 38551	(931) 243-2651	(931) 243-3132
Cocke		430 College Street Newport, TN 37821	(423) 623-8733	(423) 623-0874
Coffee	Manchester Clinic	800 Park Street Manchester, TN 37355	(931) 723-5134	(931) 723-5148
	Tullahoma Clinic	615 Wilson Avenue Tullahoma, TN 37388	(931) 455-9369	(931) 455-4827
Crockett		209 North Bells Street Alamo, TN 38001	(731) 696-2505 (731) 696-4410	(731) 696-3165 (731) 696-4370
Cumberland		1503 South Main Street Crossville, TN 38555	(931) 484-6196	(931) 456-1047
Davidson		2500 Charlotte Avenue Nashville, TN 37209	(615)340-5616	(615)340-5665 (615)340-2131
		<a href="http://www.nashville.gov/Health-Department.aspx">http://www.nashville.gov/Health-Department.aspx</a>		
Decatur		155 North Pleasant Street Decaturville, TN 38329	(731) 852-2461	(731) 852-3794
DeKalb		254 Tiger Drive Smithville, TN 37166	(615) 597-7599	(615) 597-1349
Dickson	Dickson Clinic	301 West End Avenue Dickson, TN 37055-2013	(615) 446-2839	(615) 441-1900
	White Bluff Clinic	200 School Road White Bluff, TN 37187	(615) 797-5056	(615) 797-5051
Dyer		1755 Parr Avenue Dyersburg, TN 38024	(731) 285-7311 (731) 285-7359	(731) 285-2610
Fayette		90 Yum Yum Road Somerville, TN 38068	(901) 465-5243	(901) 465-5245
Fentress		240 Colonial Circle, Suite A Jamestown, TN 38556	(931) 879-9936	(931) 879-9938
Franklin		338 Joyce Lane Winchester, TN 37398	(931) 967-3826	(931) 962-1168
Gibson	Trenton Clinic	1250 Manufacturer's Row Trenton, TN 38382	(731) 855-7601 (731) 855-7602 (731) 855-7604	(731) 855-7603
	Milan Clinic	6501 Telecom Drive Milan, TN 38358	(731) 686-9240	(731) 686-0962

## LOCAL HEALTH DEPARTMENTS

	Humboldt Clinic	149 North 12 <sup>th</sup> Street Humboldt, TN 38343	(731) 784-5491	(731) 784-1726
Giles		209 Cedar Lane Pulaski, TN 38478	(931) 363-5506	(931) 424-7020
Grainger		185 Justice Center Drive Rutledge, TN 37861	(865) 828-5247	(865) 828-3594
Greene		810 West Church Street Greenville, TN 37744	(423) 798-1749	(423) 798-1755
	<a href="http://www.greenecountytngov.com/s_health_department.php">http://www.greenecountytngov.com/s_health_department.php</a>			
Grundy		1372 Main Street Altamont, TN 37301	(931) 692-3641 (931) 692-3418	(931) 692-2201
Hamblen		331 West Main Street Morristown, TN 37815	(423) 586-6431	(423) 586-6324
Hamilton		921 East Third Street Chattanooga, TN 37403	(423) 209-8000 (423) 209-8010	(423) 209-8001
	<a href="http://health.hamiltontn.org/">http://health.hamiltontn.org/</a>			
Hancock		178 Willow Street Sneedville, TN 37869	(423) 733-2228	(423) 733-2428
Hardeman		10825 Old Highway 64 Bolivar, TN 38008	(731) 658-5291 (731) 658-9538	(731) 658-6536
Hardin		1920 Pickwick Street Savannah, TN 38372	(731) 925-2557 (731) 925-4476	(731) 925-3100
Hawkins	Rogersville Office	201 Park Boulevard Rogersville, TN 37857	(423) 272-7641	(423) 921-8073
	Church Hill Office	247 Silver Lake Road Church Hill, TN 37642	(423) 357-5341	(423) 357-2231
Haywood		950 East Main Street Brownsville, TN 38012	(731) 772-0463 (731) 772-0464	(731) 772-3377
Henderson		90 Rush Street Lexington, TN 38351	(731) 968-8148 (731) 968-6398	(731) 968-4777
Henry		803 Joy Street Paris, TN 38242	(731) 642-4025 (731) 642-5169	(731) 644-0711
Hickman		111 Murphree Avenue Centerville, TN 37033	(931) 729-3516	(931) 729-5029
Houston		60 East Court Square Erin, TN 37061	(931) 289-3463	(931) 289-3499
Humphreys		725 Holly Lane Waverly, TN 37185	(931) 296-2231	(931) 296-4590
Jackson		600 North Murray Street Gainesboro, TN 38562	(931) 268-0218	(931) 268-0872
Jefferson		931 Industrial Park Road, Suite 200 Dandridge, TN 37725	(865) 397-3930	(865) 397-1246
Johnson		715 West Main Street Mountain City, TN 37683	(423) 727-9731	(423) 727-4153
Knox		140 Dameron Avenue Knoxville, TN 37917	(865) 215-5300	(865) 215-5295
	<a href="http://www.knoxcounty.org/health/">http://www.knoxcounty.org/health/</a>			
Lake		400 Highway 78 South Tiptonville, TN 38079	(731) 253-9954 (731) 253-9955	(731) 253-9956
Lauderdale		500 Highway 51 South Ripley, TN 38063	(731) 635-9711 (731) 635-4661	(731) 635-3630
Lawrence		2379 Buffalo Road Lawrenceburg, TN 38464	(931) 762-9406	(931) 766-1592
Lewis		51 Smith Avenue Hohenwald, TN 38462	(931) 796-2204	(931) 796-1625
Lincoln		1000 Washington Street West, Ste A Fayetteville, TN 37334	(931) 433-3231	(931) 438-1567
Loudon		600 Rayder Avenue Loudon, TN 37774	(865) 458-2514	(865) 458-8587
Macon		601 Highway 52 Bypass East Lafayette, TN 37083	(615) 666-2142	(615) 666-6153
Madison		804 North Parkway Jackson, TN 38305	(731) 423-3020	(731) 927-8600
	<a href="http://www.madisoncountypublichealthnow.com/">http://www.madisoncountypublichealthnow.com/</a>			
Marion		24 East Seventh Street Jasper, TN 37347	(423) 942-2238	(423) 942-9186

## LOCAL HEALTH DEPARTMENTS

Marshall		206 Legion Street Lewisburg, TN 37091	(931) 359-1551	(931) 359-0542
Maury		1909 Hampshire Pike Columbia, TN 38401	(931) 388-5757	(931) 560-1119
McMinn		393 County Road 554 Athens, TN 37303	(423) 745-7431	(423) 744-1604
McNairy		725 East Poplar Avenue Selmer, TN 38375	(731) 645-3474	(731) 645-4530
Meigs		389 River Road Decatur, TN 37322	(423) 334-5185	(423) 334-1713
Monroe		3469 New Highway 68 Madisonville, TN 37354	(423) 442-3993 (423) 442-5934	(423) 442-9468
Montgomery		330 Pageant Lane Clarksville, TN 37040	(931) 648-5747	(931) 645-9019
Moore		251 Majors Boulevard, Room 1 Lynchburg, TN 37352	(931) 759-4251	(931) 759-6380
Morgan		1111 Knoxville Highway Wartburg, TN 37887	(423) 346-6272	(423) 346-2349
Obion		1008 Mt. Zion Road Union City, TN 38261	(731) 885-8722 (731) 885-8723 (731) 885-8724	(731) 885-4855
Overton		5880 Bradford-Hicks Drive Livingston, TN 38570	(931) 823-6260	(931) 823-5821
Perry		31 Medical Drive Linden, TN 37096	(931) 589-2138	(931) 589-5414
Pickett		1013 Woodlawn Drive Byrdstown, TN 38549	(931) 864-3178	(931) 864-3376
Polk	Benton Center	2279 Parksville Road Benton, TN 37307	(423) 338-4533	(423) 338-1959
	Copper Basin Center	840 Cherokee Trail Copperhill, TN 37317	(423) 496-3275	(423) 496-4442
Putnam		701 County Service Drive Cookeville, TN 38501	(931) 528-2531	(931) 526-7451
Rhea		344 Eagle Lane Evansville, TN 37332	(423) 775-7819	(423) 775-8078
Roane		1362 North Gateway Avenue Rockwood, TN 37854	(865) 354-1220	(865) 354-0112
Robertson		800 South Brown Street Springfield, TN 37172	(615) 384-0208	(615) 384-0245
Rutherford	Main facility	100 West Burton Murfreesboro, TN 37130	(615) 898-7780	(615) 898-7829
	North Rutherford Facility	108 David Collins Drive Smyrna, TN 37167	(615) 355-6175	(615) 459-7996
Scott		344 Court Street Huntsville, TN 37756	(423) 663-2445	(423) 663-9252
Sequatchie		16939 Rankin Avenue North Dunlap, TN 37327	(423) 949-3619	(423) 949-6507
Sevier		719 Middle Creek Road Sevierville, TN 37862	(865) 453-1032	(865) 429-2689
Shelby		814 Jefferson Avenue Memphis, TN 38105	(901) 222-9000	(901) 222-9060
Smith		251 Joy Alford Way Carthage, TN 37030	(615) 735-0242	(615) 735-8250
Stewart		1021 Spring Street Dover, TN 37058-0497	(931) 232-5329	(931) 232-7247
Sullivan		154 Blountville Bypass Blountville, TN 37617	(423) 279-2777	423) 279-2797
Sumner	Gallatin Clinic	1005 Union School Road Gallatin, TN 37066	(615) 206-1100	(615) 206-9742
	Hendersonville Clinic	351 New Shackle Island Road Hendersonville, TN 37075	(615) 824-0552	(615) 824-9771
	Portland Clinic	214 West Longview Drive Portland, Tennessee 37148	(615) 325-5237	(615) 325-5549

**LOCAL HEALTH DEPARTMENTS**

Tipton		4700 Mueller Brass Road Covington, TN 38019	(901) 476-0235	(901) 476-0229
Trousdale		541 East Main Street Hartsville, TN 37074	(615) 374-2112	(615) 374-1119
Unicoi		101 Okolona Drive Erwin, TN 37650-2167	(423) 743-9103	(423) 743-9105
Union		4335 Maynardville Highway Maynardville, TN 37807	(865) 992-3867	(865) 992-7238
Van Buren		907 Old McMinnville Street Spencer, TN 38585	(931) 946-2643 (931) 946-2438	(931) 946-7106
Warren		1401 Sparta Street McMinnville, TN 37110	(931) 473-8468	(931) 473-0595
Washington		219 Princeton Road Johnson City, TN 37601	(423) 975-2200	(423) 975-2210
Wayne		102 JV Mangubat Drive Waynesboro, TN 38485	(931) 722-3292	(931) 722-7249
Weakley		9852 Highway 22 Dresden, TN 38225	(731) 364-2210 (731) 364-2258	(731) 364-5846
White		135 Walker Street Sparta, TN 38583	(931) 836-2201	(931) 836-3580
Williamson	Franklin Clinic	1324 West Main Street Franklin, TN 37064	(615) 794-1542	(615) 790-5967
	Fairview Clinic	2629 Fairview Boulevard Fairview, TN 37062	(615) 799-2389	(615) 799-2260
Wilson		927 East Baddour Parkway Lebanon, TN 37087	(615) 444-5325	(615) 444-2750

**REGIONAL HEALTH OFFICES**

REGION		ADDRESS	PHONE	FAX
East		2101 Medical Center Way Knoxville, TN 37920	(865) 546-9221	(865) 594-6008
Mid-Cumberland		710 Hart Lane Nashville, TN 37247	(615) 650-7000	(615) 262-6139
Northeast		185 Treasure Lane Johnson City, TN 37604	(423) 979-3200	(423) 979-3297
South Central		1216 Trotwood Avenue Columbia, TN 38401	(931) 380-2532	(931) 380-3364
Southeast		1301 Riverfront Parkway, Suite 209 Chattanooga, TN 37402	(423) 634-3124	(423) 634-3139
Upper Cumberland		1100 England Drive Cookeville, TN 38501	(931) 528-7531	(931) 520-0413
West	Jackson Office	295 Summar Street Jackson, TN 38301	(731) 423-6600	(731) 935-7093
	Union City Office	1010 Mt. Zion Road Union City, TN 38261	(731) 884-2645	(731) 884-2650