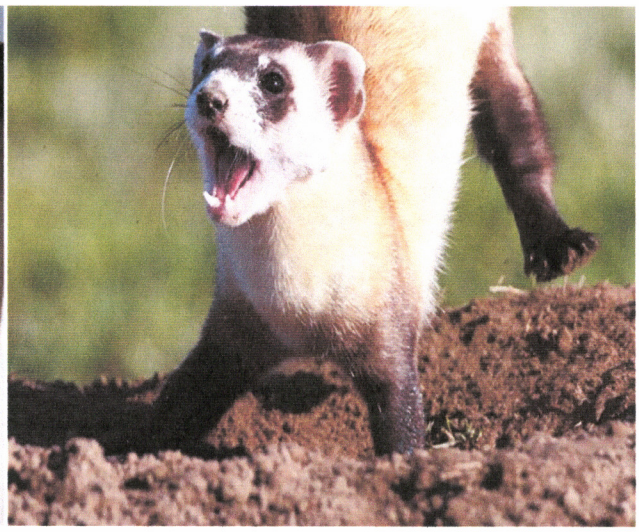
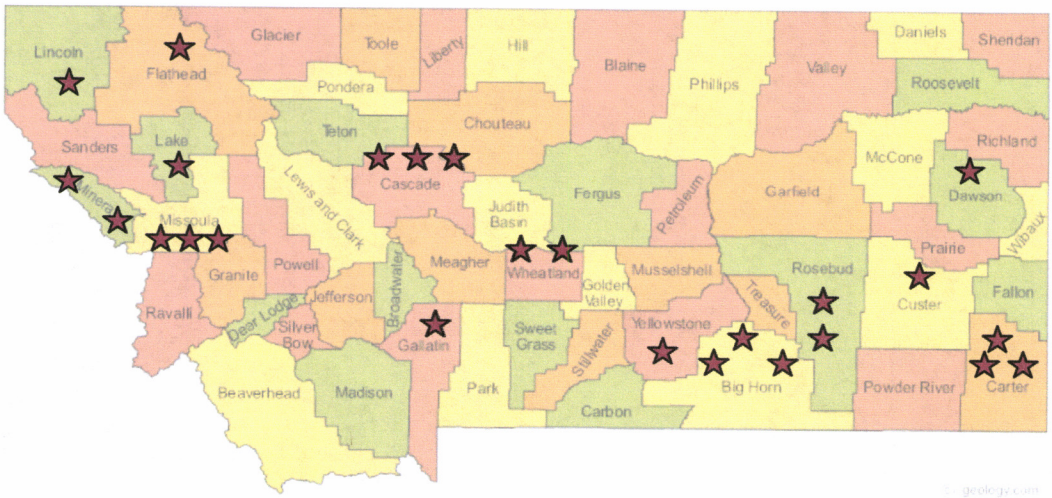
EXHIBIT 3
DATE 2-19-13
HB 495

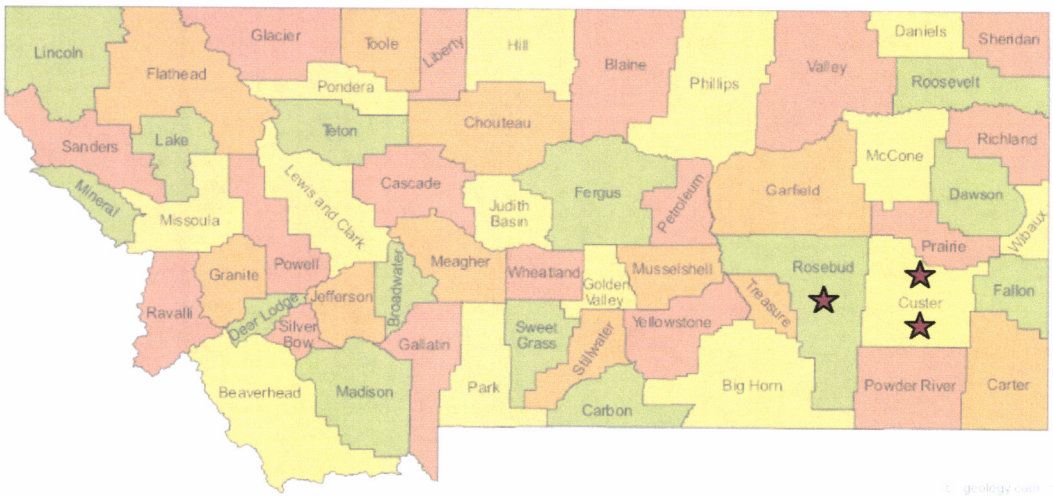
RABIES IN MONTANA





2012 Rabies in Montana

Date	County	Species
Feb 22, 2012	Big Horn	Equine
Mar 13, 2012	Rosebud	Skunk
Apr 9, 2012	Big Horn	Skunk
Apr 30, 2012	Carter	Canine
Jun 5, 2012	Custer	Bat
Jun 6, 2012	Carter	Bovine
Jun 14, 2012	Big Horn	Bat
Jul 25, 2012	Mineral	Bat
Aug 7, 2012	Cascade	Bat
Aug 8, 2012	Cascade	Bat
Aug 14, 2012	Missoula	Bat
Aug 15, 2012	Yellowstone	Skunk
Aug 17, 2012	Gallatin	Bat
Aug 21, 2012	Cascade	Bat
Aug 28, 2012	Wheatland	Bat
Aug 30, 2012	Lincoln	Bat
Sep 5, 2012	Flathead	Bat
Sep 18, 2012	Missoula	Bat
Sep 26, 2012	Mineral	Bat
Sep 27, 2012	Lake	Bat
Oct 2, 2012	Wheatland	Skunk
Oct 2, 2012	Missoula	Bat
Nov 20, 2012	Dawson	Skunk
Dec 6, 2012	Carter	Skunk
Dec 31, 2012	Rosebud	Skunk



2013 YTD Rabies in Montana

Date	County	Species
Jan 17, 2013	Custer	Skunk
Jan 25, 2013	Rosebud	Skunk
Jan 28, 2013	Custer	Skunk

CD Epidemiology Surveillance Snapshot

Prepared by the
DPHHS Communicable Disease Epidemiology Section
406-444-0273 1400 Broadway, Cogswell 216 Helena, MT 59620-2951

MONTANA DPHHS

January 2013

Human Exposures to Dogs and Cats Tested for Rabies, 2008 to 2011

Background: Human exposures to animals infected with rabies virus is a public health risk. To minimize the potential for human exposure to rabies, the Centers for Disease Control and Prevention (CDC) recommends all domestic dogs, cats, and ferrets receive rabies vaccinations. However, no statewide law exists in Montana requiring rabies vaccination for these animals and only certain Montana counties have rabies vaccination ordinances. Domestic animals involved in human biting incidents are often quarantined to assess for development of rabies, or are euthanized and tested for rabies. These incidents result in significant public health costs, including but not limited to activities related to animal control, public health investigation, laboratory testing, and administration of rabies post-exposure prophylaxis (rPEP). The estimated average cost of rPEP is $2315 per course. In Montana, human exposure to an animal known to be infected with rabies is a reportable event. During 2008 to 2011, the administration of rPEP was not an explicitly reportable event.

Etiology, Transmission, and Pathogenesis: Rabies is caused by an acute infection with rabies virus. All mammals are susceptible to rabies infection. In the U.S., rabies virus is enzootic among bats, raccoons, skunks, foxes, and coyotes. In Montana, rabies is enzootic among bats and among skunks east of the Continental Divide. Through effective rabies vaccination programs in the United States, the number of rabies-infected dogs has decreased from nearly 7000 in 1947 to 71 in 2006. Presently, more cats than dogs are reported as rabies positive. Rabies virus is typically transmitted to humans through the bite or scratch of a rabies-infected animal. Other rare forms of transmission include aerosols, organ transplantation, and splashes to mucous membranes. The incubation period is normally 3 to 8 weeks, but is highly variable, ranging from a few days to up to several years. Human rabies is almost universally fatal. The clinical syndrome for rabies includes a non-specific prodrome, neurological signs similar to encephalomyelitis that continue to progress, and negative test results for other etiologies. Human rabies is preventable by the timely administration of rPEP. There is no approved treatment for human rabies. An experimental protocol using antiviral drugs has been used in the treatment of human rabies. Only 5 (16%) of the 31 patients known to have received this protocol survived.

Trends: Only 20 (36%) Montana counties are known to legally require rabies vaccination for dogs and 16 (29%) for cats (**Table**). During 2008 to 2011, 920 domestic dogs, cats, and ferrets were tested for rabies by the Montana Veterinary Diagnostic Laboratory, including 471 (51%) cats, 448 (49%) dogs, and 1 (0%) ferret. Two (<1%) dogs and 2 (<1%) cats tested positive for rabies. Montana had an average rate of 11.9 cats and 11.3 dogs tested per 100,000 human population/year. Average annual rabies testing rates varied greatly by county from 0 to 143 tests per 100,000 human population/year for cats and 0 to 86 tests for dogs. Cat and dog testing rates did not differ significantly between counties with and without rabies vaccination ordinances. Of the animals tested, 822 (89%) were associated with human exposures. Data pertaining to the number of rPEP courses administered in Montana during 2008 to 2011 resulting from exposure to dogs, cats, and ferrets, and the resultant costs incurred, were not readily ascertainable.

Prevention: Rabies prevention can be categorized into animal and human prevention opportunities.
ANIMAL: One of the most important ways to prevent human rabies is by ensuring domestic dogs, cats, and ferrets are adequately vaccinated against rabies. The presence and enforcement of laws requiring rabies vaccinations for all domestic dogs, cats, and ferrets in Montana would expectedly increase the number of domestic pets vaccinated against rabies. Pet owners should also minimize the potential for their pets to interact with wildlife. In jurisdictions with animal control authorities, stray animals should be reported to prevent expansion of these populations as these animals have the possibility of being unvaccinated and carrying the rabies virus.

HUMAN: Persons exposed to saliva or neurological tissue of animals potentially infected with rabies should be evaluated urgently and treatment decisions should not be delayed. Wounds should be cleansed immediately with soap and water. Healthcare providers should immediately report all animal bites to their local public health department and consult with public health officials regarding the need for rPEP. Public health consultation following animal bites is important to ensuring appropriate decisions are made regarding the use of rPEP.

Table. Rabies testing characteristics for dogs and cats by presence of county rabies vaccination ordinances, 2008 to 2011

County Vaccination Ordinance	No. Counties (%)	No. Animals Tested	2010 Census pop	Avg. Annual Testing Rate (per 100,000 pop/year)	Positive Tests	Human Exposures
			Cats			
Yes	16 (29)	256	536,201	11.9	0	222
No	37 (66)	206	409,703	12.6	1	172
Unknown	3 (5)	9	43,511	5.2	0	7
			Dogs			
Yes	20 (36)	351	746,832	11.8	1	332
No	33 (59)	92	199,072	11.6	0	84
Unknown	3 (5)	5	43,511	2.9	0	5

Abstract ID: 1333138 Presentation Type: Breakout Presentation
Title: Assessment of countywide rabies vaccination Laws — Kansas, 2006-2010
Committee: Infectious Diseases Sub-Committee
Topic: Zoonoses
Keywords: Rabies | Law | One Health

Background:
During 2006-2010, rabid cats represented the majority of rabid domestic animals in the U.S. and Kansas. Thirty-eight states had mandatory rabies vaccination laws for dogs but only 31 had a law for cats; Kansas does not have a statewide rabies vaccination law. We assessed countywide rabies vaccination laws and rabies test data to determine the effectiveness of vaccination laws to prevent cases of rabies among dogs and cats.

Methods:
An electronic animal rabies vaccination survey was administered to all 105 local health departments. Rabies test data was obtained from Kansas State University Rabies Laboratory for all dogs and cats submitted during 2006-2010. Counties were grouped into standardized peer groups based on population. County-specific dog and cat population was estimated by number of households.

Results:
There was a 97% (102/105) survey response rate. Only 22 counties had a rabies vaccination law, 22 (100%) for dogs and 12 (55%) for cats. Vaccination law for dogs was present in 83% (5/6) of urban counties, 40% (4/10) semi-urban, 20% (4/20) densely-settled rural, 12% (4/33) rural and 14% (5/36) of frontier counties. For cats, only 50% (3/6) of urban, 40% (4/10) semi-urban, 15% (3/20) densely-settled rural, 6% (2/33) rural, and zero frontier counties had a law. During 2006-2010 a total of 1,636 dogs and 1,987 cats were submitted for testing from 105 counties. The submission rates for dogs and cats were; 3.8 (urban), 5.9 (semi-urban), 5.4 (densely-settled rural), 6.9 (rural), and 7.5 (frontier) per 10,000. There were 45 positive tests; 8 dogs and 37 cats. Counties with a dog law had a test positive rate of 53.3/10,000 tests (95% CI 6.6, 99.9) compared to 29.3/10,000 (95% CI 11.3, 70.0) counties with no law however this was not statistically significant. Counties with a cat law had a test positive rate of 107.1/10,000 tests (95% CI, 40.7, 173.4) compared to 266.5/10,000 (95% CI 157.6, 375.4) among counties with no law; this was statistically significant.

Conclusions:
A higher proportion of the dog population resided in counties with a vaccination law than cats. Densely-settled rural, rural and frontier counties were less likely to have a vaccination law than urban and semi-urban counties. Submission rates were higher in counties with no law. Counties with a cat vaccination law had lower rates of rabies test positive cats than those with no law. A statewide mandatory vaccination law could reduce the number of rabid dogs and cats and potential transmission of the disease to humans.

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ARCTIC OCEAN
Chuckchi Sea
Bering Sea
Beaufort Sea
Baffin Bay
Davis Strait
Labrador Sea
Hudson Bay
Gulf of Alaska
Northwestern Passages
Hudson Strait
Gulf of St Lawrence
PACIFIC OCEAN
Snow Dome
Triple Divide Peak
CONTINENTAL DIVIDES
Great
Laurentian
Arctic
St. Lawrence
Eastern
Great Basin
Gulf of California
Gulf of Mexico
Caribbean Sea
ATLANTIC OCEAN

County Rabies Law Survey-2009

COUNTY	PHONE	DOG RABIES VAX REQ?	CAT RABIES VAX REQ?	2 YEAR?	3 YEAR?	OTHER?	ANY CITY IN COUNTY WITH DIFFERENT LAWS?
BEAVERHEAD	683-4771	NO	NO				DILLON
BIG HORN	665-8724	NO	NO				Hardin-yes both dogs & cats licensed
BLAINE	357-3250	YES	YES - YEARLY		DOGS		
BROADWATER	266-9203	NO	NO				
CARBON	446-1595	NO	NO				
CARTER	775-8749	NO	NO				
CASCADE	454-6810	Yes					
CHOUTEAU	622-3631	YES	YES	YES	Change to 3yr-2010_07	per vet	Great Falls
CUSTER	874-3350	YES	YES	every 2yrs			
DANIELS	487-5561	NO	NO		Per license		
DAWSON	377-3562	YES	YES				
DEERLODGE	463-4771	yes, per vet cert:annual lic	forthcoming	vet says 2			
FALLON	778-7107	NO	NO				
FERGUS	535-5119	NO	NO				
FLATHEAD	758-5503	YES	NO		3 yrs		
GALLATIN	582-3000	Yes	Yes				
GARFIELD	557-2434	Yes	Yes				
GLACIER	873-5063	?	?				
GOLDEN VALLEY	568-2231	NO	NO				
GRANITE	859-7022	NO	NO				
HILL	265-5481 / ext 227	YES	NO		Per license		
JEFFERSON	225-4025	YES	YES			PC	
JUDITH BASIN	566-2277	NO	NO				
LAKE	883-7204	NO	NO				Kalispell licensed w/rabies per compendium dogs only
LEWIS & CLARK	447-8304	Yes	No			PC, label	Helena
LIBERTY	759-5365	NO	NO				
LINCOLN	293-7781 / ext 201						
MADISON	842-4277	Yes	Yes			Label	
MCCONE	485-3500	NO	NO				
MEAGHER	547-3612 / ext 106	NO	NO				
MINERAL	822-3536	NO	NO				
MISSOULA	258-4877	See far right					Missoula Dogs per compendium
MUSSELSHELL	323-1104	NO	NO				
PARK	222-4106	NO	NO				
PETROLEUM	429-5311	NO	NO				
PHILLIPS	654-2429	NO	NO				
PONDERA	271-4010	NO	NO				
POWDER RIVER	436-2657	NO	NO				
POWELL	846-3680/ext 220/221	YES	YES		1st vac/1yr		
PRAIRIE	635-5575	NO	NO				
RAVALLI	375-6500	Yes	No		1or 3 per compendium		
RICHLAND	433-1706	NO	NO				

County Rabies Law Survey-2009

COUNTY	PHONE	DOG RABIES VAX REQ?	CAT RABIES VAX REQ?	2 YEAR?	3 YEAR?	OTHER?	ANY CITY IN COUNTY WITH DIFFERENT LAWS?
ROOSEVELT	653-6246						
ROSEBUD	346-2251	YES	YES				
SANDERS	827-6942	No	NO				
SHERIDAN	765-1660	NO	NO			PC	
SILVERBOW	497-6219	YES	YES	Per license			
STILLWATER	322-8010	NO	NO				
SWEET GRASS	932-5152	NO	NO				
TETON	466-2151	NO	NO				
TOOLE	424-8310	NO	NO				
TREASURE	342-5547	NO	NO				Shelby 2 yr license with current vax
VALLEY	228-6219	NO	NO				
WHEATLAND	632-4891	NO	NO				
WIBAUX	796-2481	YES	YES		Per license		
YELLOWSTONE	256-2701	YES	YES		Per license		Billings

Krayton Kerns, DVM

author of "Ramblings of a Conservative Cow Doctor"
Montana State Representative HD #58

Weekly Posting of the Conservative Cow Doctor

A Rabid Look at Progressivism

If you are infected with the rabies virus to the point of showing clinical signs, you will die. (Sometimes certainty is not reassuring.) Fortunately, rabies also has a unique incubation period of up to a year, so we are able to vaccinate ourselves after exposure, but ignoring the immunization protocol has fatal consequences. For example, a 24-year-old American soldier was bitten by a dog in Afghanistan in January. He did nothing. Upon returning to Fort Drum, NY, in August he began showing clinical signs and he died in May. Apparently, he never considered the significance of a dog bite in a country where rabies is endemic.

Every year several counties across America are placed under rabies quarantine, so the virus is here too. By keeping our dog and cat populations immunized, we lessen the threat, so human rabies is rare. However, more dangerous than the known bite is the exposure to a rabies case where you never considered the disease a possibility. Let me explain the difference.

Being attacked by a skunk in the middle of the day suggests the critter has rabies. (The lab needs intact brain tissue, so do not euthanize the skunk with a 180 grain, hollow-point, between the eyes.) Examining the mouth of a cow bellowing and wandering aimlessly in the pasture, or the horse staring blindly and salivating are the did-not-think-of-rabies cases which will kill you. To be safe, any animal acting odd is considered a possible rabies threat until proven otherwise. Here is how testing looks in real life:

When dealing with very small rabies suspects, such as bats, we typically submit the entire animal to the state diagnostic lab and let the pathologists collect the desired tissues. Such was the case several years back when a client used a broom to snuff a bat in their house and asked us to check it for rabies. They placed the winged perpetrator in a small brown paper sack and handed it to Dr. Moylan. He placed it in a shipping container with an ice pack, filled out the lab forms, and sent it to Bozeman. The following day, the lab personnel read the lab request, opened the brown paper sack, and the very much alive and ticked-off bat zoomed out and clung to a ceiling light fixture. With the diagnostic lab staff armed with mops, they eventually subdued the bat and it was tested as negative for rabies. The pathologist mailed us a nasty-gram stressing the importance of being certain dead animals are truly dead prior to shipment. His logic was flawless.

May 2010
Jan 2011
May 2011
31 1
Jul Aug
14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Aug
Patient in Afghanistan
Patient in Germany
Patient potentially infectious
Patient in New York
Dog bite incident
Serum specimen banked, no rabies virus specific or virus neutralizing antibodies detected later
Chiropractor visits
Emergency department visits
Patient traveled internationally, illness onset
Cerebral hemorrhages first evident
Rabies virus neutralizing antibodies first detected in serum
Rabies laboratory-confirmed, rabies virus-specific antibodies detected in serum and CSF, experimental treatment started
Patient hospitalized
Life support withdrawn, patient died

UNITED STATES
DEPARTMENT OF VETERANS AFFAIRS

PUBLIC HEALTH

Rabies

Veterans of Operations Enduring Freedom, Iraqi Freedom, and New Dawn (OEF/OIF/OND) who were bitten or exposed in some other way to the saliva of a warm-blooded animal while deployed, should be evaluated for the risk of rabies exposure by a health care professional.

Your risk of being exposed to rabies is much higher if you served in parts of the world including Iraq and Afghanistan, where domestic animals are not vaccinated against rabies. Recently a U.S. soldier who had served in Afghanistan died of rabies. Contact your nearest VA health care facility or your health care provider if you think you may be at risk.

OEF/OIF/OND Veterans may have been exposed to rabies

OEF/OIF/OND Veterans who were bitten or had contact with the saliva from a warm-blooded animal such as a dog, cat, bat, fox, skunk, raccoon, mongoose or jackal while deployed in the **previous 18 months** are advised to seek medical care. This includes those Veterans who did not have a complete medical evaluation or post-exposure prophylaxis (rabies vaccine and immunoglobulin) following an exposure incident. Rabies prophylaxis is treatment given after exposure to prevent rabies.

If you are unsure whether you received appropriate care, you must be evaluated. If you were exposed more than 18 months ago, you are at lower risk but still can be evaluated by VA if you are enrolled. Veterans not enrolled in the VA health care system, find out if you qualify for VA health care.

Rabies symptoms

If you were exposed to rabies, you may not have any symptoms. By the time any symptoms appear, rabies often cannot be successfully treated.

As the disease progresses, the person may experience delirium, hallucinations, slight or partial paralysis, anxiety, confusion, increase in saliva, difficulty swallowing, fear of water, and insomnia. Death usually occurs within days of the onset of these symptoms.

What should I do if I was bitten or exposed while deployed?

Get evaluated today. Discuss what happened and what, if any, treatment you received with your health care provider. It is often impossible to know if the animal you had contact with had rabies. Rabies is a very serious disease. VA wants to understand your specific case and discuss treatment options with you. Your health care provider will help you do this.

If you are concerned about your risk for rabies, talk to your health care provider or contact your nearest VA health care facility.

U.S. Department of Veterans Affairs - 810 Vermont Avenue, NW - Washington, DC 20420

Reviewed/Updated Date: February 10, 2012

Billings Gazette
November 12, 2011 12:00 am

Help locate dog that bit writer in Billings

I am writing and hope to locate the owner of the dog that bit me in my yard (we live close to the jail and sugar beet factory) on Oct. 27. The dog had been in my yard two mornings in a row. On the second morning, I tried to catch the dog and it bit my arm. It had red heeler-type coloring with a new black collar with no tags.

If I am unable to locate this dog to verify it has had its rabies vaccines, I will have to endure the rabies series of injections. If anyone has any information, please contact me at 256-0372 and save me from going through this terrible series of injections.

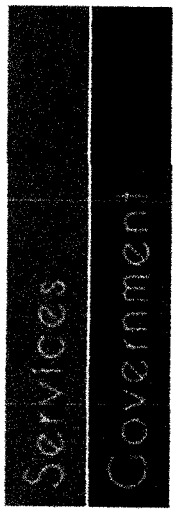
Misty Crawford

Billings

Comments

hairball said on: November 12, 2011, 11:15 am
I hope that the dog owner contacts you. Chances are the dog lives close by. You could go door to door asking but would the owner admit the dog hadn't had the shots.? But I wouldn't wait.
My 4 yr old nephew was bitten and they waited too long before starting the shots and he died as a result.

Pondera County
Montana



20 4th Ave SW, Conrad MT, 59425
(406) 271-4000

Rabies

State Rules (ARM16.28.626A Rabies Exposure) require that when an animal, other than a rabbit, hare, or rodent, who's species can be infected with rabies, bites a human being, it must be reported to the local health officer or representative, the county sanitarian. This gives us the opportunity to verify the animals vaccination and health status. The biting animal is required to complete a ten day observation (quarantine) period. This observation period is applicable for all healthy domestic dogs, cats, and ferrets. There is no approved quarantine for wild animals.

Any possible exposure to humans or animals should be reported to this office as soon as possible. This gives me the chance to address any concerns people may have and refer them to their physician, or in the case of an animal, its veterinarian. The only way to test any animal for the presence of the rabies virus is to have the animal euthanized and the brain sent to the State Diagnostic lab in Bozeman. There are certain guidelines to follow and our local vets are usually willing to assist with this.

Contact Communicable Disease Epidemiology Section for any questions at 444-0273. For more information, click on the following link:

- CDC Rabies Information
- ACIP Recommendations
- Animal Bite Form
- Rabies Exposure Assessment DPHHS

Location
311 South Virginia
Suite 1
Conrad, MT 59425

County Sanitarian
Corrine A. Rose, R.S.
(406) 271-3247
(406) 750-8407 cell
(406) 271-3248 fax
crose@3rivers.net

Hours of Operation:

Teton County Monday-Tuesday **7:30-5:30**

Pondera County Wednesday-Thursday **7:30-5:30**
Teton County
(406) 466-2150
(406) 466-2138 fax
crose@3rivers.net

Sections:
7.16.010 Definitions
7.16.020 Livestock Prohibited in City
7.16.040 Kennel License
7.16.060 Animals Creating Nuisance

7.16.010 Definitions: When used in this chapter the following words and phrases shall have the meanings ascribed to them in this section:

A. "Owner" means any person owning, keeping, or harboring a dog or other animal;

B. "At Large" refers to an animal off the premises of the owner and not under the control of the owner or any other person either by leash, cord, chain, or otherwise;

C. "Impound" means to sequester an animal at a place provided by the city for the impounding of dogs or other animals;

D. "Vaccinate" means the inoculation of a dog or other animal with an antirabies vaccine by any licensed veterinarian;

E. "Kennel" Means any premises or property or any kind or description where more than two female dogs are kept for breeding purposes, or where more than one litter of pups is kept for sale;

F. "Law Enforcement Officer" means, for the purpose of dealing with animals, any police officer, poundmaster, dog warden, or animal control officer.

7.16.020 Livestock Prohibited in City: No person owning or having control of any of the following classes of domestic animals: horses, mules, asses, cattle, sheep, goats, chickens, ducks, turkeys, or any other of these species , shall keep the same within or upon his own premises at any time in the city.

7.16.040 Kennel License: Any person maintaining a kennel as defined in Section 7.16.010 shall pay a license fee of twenty – five dollars per year for maintaining such kennel. No license shall be issued until the premises to be used for the kennel has been inspected and approved by the health department of the city.

7.16.060 Animals Creating Nuisance:

A. It is a public nuisance for a dog or other animal to destroy property or other pets,. To bite or chase after persons not trespassing on the property of the animal's owner, or to cause annoyance or disturbance to any person by prolonged howling, yelping or barking.

B. It is unlawful for any owner of an animal to willfully or through willful neglect permit the animal to cause any nuisance specified in this section.

C. Any person aggrieved by a nuisance animal may file a complaint in the police court, charging the owner with the violation of this section.

D. Upon a third conviction under this section, the nuisance animal may be seized and taken up by any law enforcement officer and be put to death.

(Copies of these ordinances in their entirety are available at Lincoln County Animal control)

Chapter 6.08

DOGS

Sections:

6.08.010	Licensing requirements.
6.08.020	License fee.
6.08.030	Rabies vaccination required.
6.08.040	Licenses to be metal.
6.08.050	Dog registry.
6.08.060	Kennel license required.
6.08.070	Leash required.
6.08.080	Violation—Penalty.

6.08.010 Licensing requirements.

A. No person shall keep, own or have in his possession within the city, whether on his premises or running at large, any dog or dogs, either male or female, without first having obtained a license for the same as provided in this chapter.

B. Licenses for dogs shall be issued by the city clerk-treasurer upon application for the same as provided in this chapter and payment of the license fee provided in Section 6.08.020.

C. No license shall be issued unless and until the person or persons applying therefor first sets forth on the application the age, breed, sex, color and other descriptive markings of the dog or dogs to be licensed, and the name and address of the owner or possessor.

D. Dogs shall be licensed on or before December 31st of each year, subject to the exception that owners or possessors of newly acquired dogs or dogs brought into the city shall obtain a license for such dog within thirty days after bringing such dog into the city and the owners or possessors of puppies or young dogs shall license such dogs within the time prescribed by state statute. (Ord. 02-23, 2002; Ord. 97-2 § 4 (part), 1997; prior code § 7.04.030)

6.08.020 License fee.

A. A license fee for each neutered male dog and spayed female dog and a license fee for each unspayed female dog and unneutered male dog shall be established annually by city council resolution after a public hearing.

B. Whenever any dog owner fails or delays to obtain a license prior to April 1st of each year the license fee shall be doubled. (Ord. 06-04 (part), 2006; Ord. 1004, 1991: prior code § 7.04.040)

6.08.030 Rabies vaccination required.

A. No license shall be issued unless and until the application required in this chapter is accompanied with a certificate of a duly qualified person that the dog or dogs have been vaccinated and/or inoculated against rabies, and that the vaccination or inoculation will be reasonably effective for the period of the license to be issued, according to the usual standards of veterinary medicine.

B. All dogs that are within the city limits for a period of twenty-four continuous hours, shall have been vaccinated and/or inoculated against rabies. Any owner of any such animal shall be able to produce upon request by any law enforcement officer a certificate of a duly qualified person that the dog has been vaccinated and/or inoculated against rabies, and that the vaccination or inoculation will be reasonably effective for the period of time the animal will be within the city limits.

C. Failure of any dog owner to produce such certificate as required above, shall subject the animal to be impounded according to the terms of impoundment as set forth in Chapter 6.12. (Ord. 95-3, 1995: prior code § 7.04.050)

North Boundary - from a point located at the west shore of Missouri River at the NE corner of Section 24, T12N, R3W west on the section line between Sections 13 and 24, 14 and 23, 15 and 22, 16 and 21, 17 and 20, 18 and 19, T12N, R3W; the section line between Sections 13 and 24, 14 and 23, 15 and 22, 16 and 21, 17 and 20, 18 and 19, T12N, R4W; the section line between Sections 13 and 24, 14 and 23, 15 and 22, 16 and 21, 17 and 20, 18 and 19, T12N, R5W; the section line between Sections 13 and 24, 14 and 23, 15 and 22, 16 and 21, 17 and 20, 18 and 19, T12N, R6W; the section line between Sections 13 and 24, 14 and 23, 15 and 22, 16 and 21, 17 and 20, 18 and 19, T12N, R7W.

West Boundary - beginning at the NW corner of Section 19, T12N, R7W following the Lewis and Clark and Powell County Line.

South Boundary - the southern boundary of Lewis and Clark County beginning at the SW corner of the County east to the Missouri River. The area inside the city limits of East Helena and Helena is excluded.

G. **"Dog Control Officer" or "DCO"** - any person hired by the County to enforce this Ordinance and under the supervision of Lewis & Clark County Sheriff's Office;

H. **"Kennel"** - a building, enclosure, or portion of any premises in or at which dogs are boarded, are kept for hire or for sale, or are kept or maintained by any person other than the owner thereof; or a building, enclosure, or portion of any premises in or at which five (5) or more dogs over the age of six (6) months are kept or maintained;

I. **"Owner"** - any person who owns or keeps a dog;

J. **"Public Nuisance"** - any dog that threatens people or property, specifically including livestock, other dogs or pets; that damages or destroys property; that is abandoned or deserted by its owner; that is not restrained as required by Section 13; that is not licensed as required by Section 12; that is not vaccinated as required by Section 14; or, that is a barking dog as defined by this section;

K. **"Restraint"** - controlled by a leash, at heel beside a competent physically capable person and obedient to that person's command, in a vehicle with permission of the owner, or within the property limits of the premises controlled by the owner or other person consenting thereto;

L. **"Vaccinated"** - inoculated with an anti-rabies vaccine in accordance with the current "Compendium of Animal Rabies Control, National Association of Public Health Veterinarians, Inc." printed by Centers for Disease Control, Morbidity and Mortality Weekly Report;

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Butte-Silver Bow 6.04.292 Vaccination for rabies.

Upon conviction, the minimum fine for violation of this provision shall be made on a graduated basis respective to the licensed year as follows: first offense, twenty dollars; second offense, fifty dollars; third offense, one hundred dollars. (Ord. 138 4, 1981: Ord. 133 26, 1981)

6.04.275 Animal waste--Removal.

The owner of an animal shall be responsible for the immediate removal of any excreta deposited by his animal on any public walk, recreation area or private property. It shall be unlawful for the owner to fail to dispose of the excreta in a sanitary manner. (Ord. 370 23, 1990)

6.04.280 Failure to have leash--Impoundment.

Any dog not secured by a leash or not securely confined upon privately owned property shall be taken and impounded by the animal warden, any of his assistants, or any law enforcement officer of Butte-Silver Bow and the same shall be impounded for the period otherwise provided in this chapter. Any dog impounded which is not claimed by the owner within the period prescribed in this chapter shall be disposed of by the animal warden as in other cases. (Ord. 138 5, 1981: Ord. 133 27, 1981)

6.04.292 Vaccination for rabies.

A. Dogs or Cats. The owner of every dog or cat kept, harbored or maintained within the city-county which is three months old or older shall, at such owner's expense, cause such dog or cat to be vaccinated for rabies by a licensed veterinarian. Except for the first antirabies vaccine which be administered when the dog or cat is three months of age and has an effective term of twelve months, only vaccines with at least two-year duration of immunity may be used. The owner of any such dog or cat who shall for thirty days wilfully fail to have such dog or cat vaccinated is guilty of a misdemeanor. The veterinarian vaccinating such dog or cat shall give to the owner a rabies vaccination certificate and a metallic vaccination tag. The veterinarian shall retain a copy of the vaccination certificate for such period as the public health officer of the city-county shall prescribe. The owner of such dog when applying for the license as provided in Section 6.04.170 shall present either the vaccination tag or the original vaccination certificate as proof of vaccination.

B. Livestock. It is neither economically feasible nor justified from a public health standpoint to vaccinate all livestock against rabies. However, consideration should be given to the vaccination of livestock located in areas where wildlife rabies is epizootic, especially animals which are valuable and/or may have frequent contact with humans.

C. Wild Animals. Vaccination of wildlife is not recommended since no rabies vaccine is licensed for use in wild animals. Wild animals susceptible to rabies should not be kept as pets. Offspring of wild animals bred with domestic dogs or cats are considered wild animals. (Ord. 370 24, 1990)

6.04.294 Rabies--Post-exposure management--Impoundment procedure--Quarantine.

A. Any animal bitten or scratched by a wild, carnivorous mammal (or a bat) not available for testing should be regarded as having been exposed to rabies.

B. Dogs and Cats.

1. Every dog or cat which has been bitten by, or exposed to, any animal suspected to have been infected with rabies shall be immediately quarantined at a licensed veterinary hospital within the city-county.

2. Unvaccinated dogs or cats bitten by a rabid animal should be euthanized immediately. If the owner is unwilling to have this done, the animal shall be confined in strict isolation at a licensed veterinary hospital for six

8.2 **Dogs Attacking Livestock:** Any dog that harasses injures, or destroys livestock is in violation of Montana state law (MCA 81-7-401), which provides such a dog may be killed immediately by the livestock owner, his agent or employee. The owner of such a dog is guilty of a misdemeanor and upon conviction shall be fined not more than $500. The animal control officer will be responsible for enforcement of MCA 81-7-401. Any fines, fees or penalties from an infraction of this law are subject to State authority.

8.3 **Owner liability:** The dog owner is liable for all damaged caused by said dog harassing, wounding, injuring or killing livestock (MCA 81-7-402). The animal control officer will be responsible for enforcement of this State law. Any fines, fees or penalties from an infraction of this law are subject to State authority.

9. RABIES CONTROL

9.1 It is unlawful for any person to keep, harbor, maintain, sell, adopt out, or give away any dog over four months of age unless such animal has been vaccinated against rabies virus by a licensed veterinarian. Dogs must be re-vaccinated thereafter in accordance with the current edition of the "Compendium of Animal Rabies Control", which requires a booster vaccination one year after the initial vaccination and every three years thereafter. This provision shall not apply to veterinary clinics and grooming parlors. County animal shelters need not vaccinate for rabies while an animal is under their care but they may not sell, adopt out, or give away an unvaccinated animal except as provided below:

A. Animal shelters may sell a rabies vaccination deposit certificate equivalent to the average cost of a rabies vaccination to the adoptive owner of an unvaccinated dog. The adoptive owner shall redeem said certificate with a licensed veterinarian for rabies vaccination within 10 days of adoption or, if the dog is under 4 months of age, by the age of 4 months.

B. The issuing animal shelter must redeem the cost of the face value of the certificate to the veterinarian within 30 days of receiving an invoice form the veterinarian for vaccination services rendered.

9.2 **Record Keeping** Record of rabies vaccinations shall be kept by all licensed veterinarians administering the rabies vaccines and the Health Officer or agent may require the reporting of such records.

9.3 **Dog Bites:** The Animal Control Officer or staff shall determine the rabies vaccination status of any dog involved in a bite incident. A valid complaint may be signed by the bite victim, his/her parent or guardian, and an investigation may be conducted if deemed warranted by the Animal Control Officer.

9.3.1 Healthy, biting dogs without proof of current rabies vaccination shall be impounded and quarantined for a period of ten (10) days from the date of the bite incident. Dogs that remain healthy during this period must be vaccinated within twenty-four (24) hours of release or be subject to impoundment by an Animal Control Officer. Dogs that develop any sign(s) of illness during the quarantine period are subject to an immediate, on-site examination by a licensed veterinarian at the owner's expense. Dogs displaying clinical signs of rabies infection and dogs that die for any reason during the quarantine period shall be tested for rabies by the state veterinary diagnostic laboratory, which requires submission of fresh brain tissue.

9.3.2 Healthy biting dogs with proof of current rabies vaccination are not subject to impoundment for quarantine but shall be confined at home and observed for clinical signs of illness daily for ten (10) days.

9.3.3 No immunizations for rabies can be given during the quarantine period.

9.3.4 Unvaccinated dogs exposed to a rabid animal should be euthanized immediately. If the owner is unwilling to have this done, the animal should be placed in strict isolation for 6 months and

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School Immunization Requirements

	Minimum Number of Doses Required Per Grade		
Vaccine Type	**Kindergarten**	**Grades 1-6**	**Grades 7-12**
DTaP/DTP/DT/Td*	4	4	4
IPV/OPV*	3	3	3
MMR	2	2	2
Td Booster (Tdap is recommended)	0	0	1

*One dose of DTaP and IVP must be given after the child's 4th birthday.

School immunization requirements are detailed in Montana Code Annotated 20-5-403. Administrative Rules of Montana require immunizations to be recorded on the "Certificate of Immunization (HES-101)" as out lined in ARM 37.114.708. The HES-101 must be supported by adequate documentation as defined in ARM 37.114.703. State law requires the HES-101 to follow the pupil from school to school. Within 30 days after a transferring pupil ceases attendance at the school of origin, the school shall retain a certified copy for the permanent record and send the original immunization records for the pupil to the school district to which the pupil transfers.

Pupils less than seven years of age that received DT vaccine *must have a medical exemption* for the pertussis (whooping cough) component of the vaccine. ARM 37.114.705

For catch up of children lacking DTaP, in grades K-12, who are 7 years of age or greater where:

1) The number of doses at age less than 1 year are unknown or zero; a total to equal 3 doses of diphtheria, tetanus containing vaccines must be achieved using Td. A single dose of Tdap vaccine may be used in completion of the series;

2) When the number of doses at age less than 1 year are one or more, a total to equal 4 doses of diphtheria, tetanus containing vaccines must be achieved using Td. A single dose of Tdap vaccine may be used in completion of the series.

One dose of MMR must be given after the first birthday and dose 2 given prior to Kindergarten entry. All new enrolled students must have 2 MMRs prior to attending school, unless the student has a conditional enrollment, religious exemption, or a medical exemption.

Td Booster is required for those students prior to entering 7th grade. If a student has not received a Td/Tdap after 7th grade, the student must receive one dose of Td/Tdap to complete school requirement.

All new enrolled students grades K-12 must meet the age appropriate immunization requirements before attending school unless an exemption or conditional is in place.

Conditional Attendance—ARM 37.114.710

If a child has not completed the minimum vaccination series required by Montana Law, a Conditional Attendance Form (HES 103) should be completed and attached to the Certificate of immunization Form (HES-101). If the pupil has received at least one or more doses of the required vaccine(s), he/she can conditionally attend until the next dose is due. In order to remain in school, the pupil must continue to receive all remaining doses as specified on the conditional form. If the pupil fails to complete the immunization(s) within the time period indicated, he/she must either qualify for and claim an exemption or be excluded immediately from school by the school administrator or that person's designee.

Medical Exemption—ARM 37.114.715

Any student seeking to attend school is not required to have any immunizations which are medically contraindicated. A written and signed statement from a physician that an immunization is medically contraindicated will exempt the students from the immunization requirements that are deemed necessary by the physician. Chiropractors, naturopathic doctors, nurse practitioners, or physician assistants may not sign off on medicals exemptions. Only a physician (MD or DO) licensed to practice medicine in any jurisdiction of the U.S. or Canada.

In August the Immunization Program revised the medical exemption form. On this form the physician will need to check if this is a contraindication or a precaution for immunizations. Then he or she will check the box that has the reasoning for the exemption. A physician may elect to submit a letter in place of the medical exemption form provided the following are included:

1. Which specific immunization(s) are contraindicated.
2. The period of time during which the immunization is contraindicated. (Permanent or Temporary exemption. If, temporary make sure the end date is given.)
3. A medical reasoning to why the immunization(s) are contraindicated. Medical exemptions are routinely reviewed by local and state health officials. Additional documentation supporting exemption may be required.
4. When deemed necessary by a physician, the results of immunity testing can be performed for student's entering K-12. The tests must indicate serological evidence of immunity and must be performed by a CLIA approved lab.

The written medical exemption and immunity testing results must be attached to the HES-101 and placed in student's school record.

Religious Exemption—ARM 37.114.716

In schools K-12 a claim of exemption from immunization requirements on religious grounds must be notarized annually and maintained on the Religious Exemption form (HES-113). The form must be provided to the school prior to each school year by the student's parent/legal guardian, unless the student is 18 years of age or older or emancipated, the student may claim the exemption. The original copy of the religious exemption must be kept by the school as part of the student's school record.

If a student has contracted a disease or is exposed to a disease, the student may be excluded from school by the local health officer or the state department until the excluding authority feels that there is no longer a risk of contracting or transmitting that disease.

Revised 9/18/2012

Centers for Disease Control and Prevention

MMWR

Morbidity and Mortality Weekly Report

Recommendations and Reports / Vol. 60 / No. 6

November 4, 2011

Compendium of Animal Rabies Prevention and Control, 2011

National Association of State Public Health Veterinarians, Inc.

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

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Front cover photo: Raccoons are a primary reservoir of rabies virus in the United States.

The *MMWR* series of publications is published by the Office of Surveillance, Epidemiology, and Laboratory Services, Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, Atlanta, GA 30333.

Suggested Citation: Centers for Disease Control and Prevention. [Title]. MMWR 2011;60(No. RR-#):[inclusive page numbers].

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Compendium of Animal Rabies Prevention and Control, 2011

National Association of State Public Health Veterinarians, Inc. (NASPHV)

Summary

Rabies has one of the highest case-fatality ratios of any infectious disease. This report provides recommendations for public health officials, veterinarians, animal control officials, and other parties engaged in rabies prevention and control activities and should serve as the basis for standardizing procedures among jurisdictions. The recommendations regarding domestic animal vaccination, management of animals exposed to rabies, and management of animals that bite humans are the core elements of animal rabies control and human rabies prevention. These updated 2011 guidelines include the national case definition for animal rabies and clarify the role of the CDC rabies laboratory in providing confirmatory testing of suspect animals. The table of rabies vaccines licensed and marketed in the United States has been updated, and additional references have been included to provide scientific support for information in this report.

Introduction

Rabies is a fatal viral zoonosis and a serious public health problem (*1*). All mammals (referred to as animals in this report) are believed to be susceptible to the disease. Rabies is an acute, progressive encephalitis caused by a lyssavirus. Worldwide, rabies virus is the most important lyssavirus. In the United States, multiple rabies virus variants are maintained in wild mammalian reservoir populations such as raccoons, skunks, foxes, and bats. Although the United States has been declared free of canine rabies virus variant transmission, reintroduction of this variant is always a risk (*2–6*).

Rabies virus usually is transmitted from animal to animal through bites. The incubation period is highly variable. In domestic animals, the incubation period is generally 3–12 weeks but can range from several days to months, rarely exceeding 6 months (*7*). Rabies is communicable during the period of salivary shedding of rabies virus. Experimental and historic evidence indicates that dogs, cats, and ferrets shed virus a few days before clinical onset and during illness. Clinical signs of rabies and include inappetance, dysphagia, cranial nerve deficits, abnormal behavior, ataxia, paralysis, altered vocalization, and seizures. Progression to death is rapid. There are currently no known effective rabies antiviral drugs.

The recommendations in this compendium serve as a basis for animal rabies prevention and control programs throughout the United States and facilitate standardization of procedures among jurisdictions, thereby contributing to an effective national rabies control program.* The most current version replaces all previous versions. These recommendations do not supersede state and local laws or requirements. Principles of rabies prevention and control are detailed in Part I; recommendations for parenteral vaccination procedures are presented in Part II; and all animal rabies vaccines licensed by the U.S. Department of Agriculture and marketed in the United States are listed and described in Part III.

Methods

NASPHV periodically updates the recommendations to prevent and control animal rabies. The revision includes reviewing recent literature, updating licensed vaccine product information as provided by the manufacturers, and soliciting input from NASPHV members and stakeholder groups. During July 15–16, 2010, NASPHV members and external expert consultants met in Atlanta, Georgia. A committee consensus was required to add or modify existing language or recommendations. After the meeting, the updated draft was circulated via e-mail for final review by all voting committee members.

The 2011 guidelines include several updates. First, the national case definition for animal rabies was added to clarify how rabies cases are defined for public health surveillance purposes. Second, the diagnostics section was expanded to 1) clarify that the CDC rabies laboratory is available for confirmatory testing and on an emergency basis to expedite exposure management decisions, 2) include information on

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*This compendium has been endorsed by the American Public Health Association, the American Veterinary Medical Association, the Association of Public Health Laboratories, CDC, the Council of State and Territorial Epidemiologists, and the National Animal Control Association.

testing methodology appropriate for field testing of surveillance specimens, and 3) clarify that no reliable antemortem rabies tests are available for use in animals. Third, the research section was expanded to include additional topics that warrant further study. Finally, the table of rabies vaccines licensed and marketed in the United States was updated, and additional references were included to provide scientific support for information provided in the recommendations.

Part I. Rabies Prevention and Control

A. Principles of Rabies Prevention and Control

1. **Case Definition.** An animal is determined to be rabid after diagnosis by a qualified laboratory as specified in Part I.A.9. The national case definition for animal rabies requires laboratory confirmation by either

   - a positive direct fluorescent antibody (DFA) test (preferably performed on central nervous system tissue); or
   - isolation of rabies virus (in cell culture or in a laboratory animal) (*8*).

2. **Rabies Virus Exposure.** Rabies virus is transmitted when the virus is introduced into bite wounds, into open cuts in skin, or onto mucous membranes from saliva or other potentially infectious material such as neural tissue (*9*). Questions regarding possible exposures should be directed promptly to state or local public health authorities.

3. **Public Health Education.** Essential components of rabies prevention and control include ongoing public education, responsible pet ownership, routine veterinary care and vaccination, and professional continuing education. The majority of animal and human exposures to rabies virus can be prevented by raising awareness concerning rabies virus transmission routes, avoiding contact with wildlife, and following appropriate veterinary care. Prompt recognition of possible exposure and prompt reporting to medical professionals and local public health authorities is critical.

4. **Human Rabies Prevention.** Rabies in humans can be prevented either by eliminating exposures to rabid animals or by providing persons who have been exposed with prompt local treatment of wounds combined with the appropriate administration of human rabies immune globulin and vaccine. Exposure assessment should occur before rabies postexposure prophylaxis (PEP) is initiated and should include discussions between medical providers and public health officials. The rationale for recommending preexposure prophylaxis and details of both preexposure and postexposureprophylaxis administration are available in the current recommendations of the Advisory Committee on Immunization Practices (ACIP) (*9,10*). These recommendations, in addition to information concerning the current local and regional epidemiology of animal rabies and the availability of human rabies biologics, are available from state health departments.

5. **Domestic Animal Vaccination.** Multiple vaccines are licensed for use in domestic animal species. Vaccines available include inactivated or modified live-virus vectored products, products for intramuscular and subcutaneous administration, products with durations of immunity from 1 to 4 years, and products with varying minimum age of vaccination. The recommended vaccination procedures and the licensed animal vaccines are specified in Parts II and III of this compendium, respectively. Local governments should initiate and maintain effective programs to ensure vaccination of all dogs, cats, and ferrets and to remove stray and unwanted animals. Such procedures in the United States have reduced laboratory-confirmed cases of rabies in dogs from 6,949 in 1947 to 93 in 2009 and are responsible for the elimination of the canine rabies virus variant (*2*). Because more rabies cases involving cats are reported annually (274 in 2009) than dogs, vaccination of cats should be required (*2*). Animal shelters and animal control authorities should establish policies to ensure that adopted animals are vaccinated against rabies.

6. **Rabies in Vaccinated Animals.** Rabies is rare in vaccinated animals (*11–13*). If suspected, the case should be reported to public health officials, the vaccine manufacturer, and the USDA Animal and Plant Health Inspection Service, Center for Veterinary Biologics (website: http://www.aphis.usda.gov/animal_health/vet_biologics/vb_adverse_event.shtml; telephone: 800-752-6255). The laboratory diagnosis should be confirmed and the virus variant characterized by the CDC rabies reference laboratory.

A thorough epidemiologic investigation should be conducted, including documentation of the animal's vaccination history and a description of potential rabies exposures.

7. **Rabies in Wildlife.** Controlling rabies in wildlife reservoirs is difficult (*14*). Vaccination of free-ranging wildlife or selective population reduction is useful in some situations (*15*); however, the success of these procedures depends on the circumstances surrounding each rabies outbreak (see Part I. C.). Because of the risk for rabies in wild animals (especially raccoons, skunks, coyotes, foxes, and bats), the American Veterinary Medical Association, the American Public Health Association, the Council of State and Territorial Epidemiologists, the National Animal Control Association, and the National Association of State Public Health Veterinarians (NASPHV) strongly recommend the enactment and enforcement of state laws prohibiting the importation, distribution, translocation, and private ownership of these animals.

8. **Rabies Surveillance.** Enhanced laboratory-based rabies surveillance and variant typing are essential components of rabies prevention and control programs. Accurate and timely information and reporting is necessary to guide human PEP decisions, determine the management of potentially exposed animals, aid in discovery of emerging pathogens, describe the epidemiology of the disease, and assess the need for and effectiveness of vaccination programs for domestic animals and wildlife. Every animal submitted for rabies testing should be reported to CDC to evaluate surveillance trends. Electronic laboratory reporting and notification of animal rabies surveillance data should be implemented (*16*). Optimal information on animals submitted for rabies testing should include species, point location, vaccination history, rabies virus variant (if rabid), and human or domestic animal exposures. A case of rabies in an animal with a history of importation into the United States within 60 days is immediately notifiable by state health departments to CDC; reporting of indigenous cases should follow standard notification protocols (*17*). Integration with standard public health reporting and notification systems should facilitate the transmission of the data discussed in this paragraph.

9. **Rabies Diagnosis**

   a) **DFA.** The DFA test is the gold standard for rabies diagnosis. The test should be performed in accordance with the established national standardized protocol (available at http://www.cdc.gov/rabies/pdf/RabiesDFASPv2.pdf) by a qualified laboratory that has been designated by the local or state health department (*18,19*). Animals submitted for rabies testing should be euthanized (*20,21*) in a way that maintains the integrity of the brain and allows the laboratory to recognize the anatomical parts. Except for very small animals, such as bats, only the head or brain (including the brain stem) should be submitted to the laboratory. To facilitate prompt laboratory testing, submitted specimens should be stored and shipped under refrigeration (rather than frozen) without delay. Thawing frozen specimens will delay testing. Chemical fixation of tissues should be avoided because it can cause substantial testing delays and might preclude reliable testing. Questions about testing fixed tissues should be directed to the local rabies laboratory or public health department.

   b) **Emergency Rabies Testing.** Emergency rabies testing should be available to expedite exposure management decisions (*18*). When state health departments need confirmatory testing (e.g., for inconclusive results, unusual species, or mass exposures), the CDC rabies laboratory can provide results within 24 hours of submission (*22*).

   c) **Direct Rapid Immunohistochemical Test (DRIT).** DRITs are being used by trained field personnel in surveillance programs for specimens not involved in human or domestic animal exposures (*23–26*). All positive DRIT results need to be confirmed by DFA testing at a qualified laboratory.

   d) **Unlicensed Test Kits.** No USDA-licensed rapid test kits are commercially available for rabies diagnosis. Unlicensed tests should not be used for several reasons: the sensitivity and specificity are not known; the tests have not been validated against current standard methods; the excretion of virus in the saliva is intermittent and the amount varies over time; any test result would need to be

confirmed by more reliable methods such as DFA testing on brain tissue; and the interpretation of results might place exposed animals and persons at risk.

10. **Rabies Serology.** Certain jurisdictions require evidence of vaccination and rabies virus antibodies for animal importation. Rabies virus antibody titers are indicative of a response to vaccine or infection. Titers do not directly correlate with protection because other immunologic factors also play a role in preventing rabies, and the ability to measure and interpret those other factors is not well-developed. Therefore, evidence of circulating rabies virus antibodies in animals should not be used as a substitute for current vaccination in managing rabies exposures or determining the need for booster vaccinations (*27–30*).

11. **Rabies Research.** Information derived from well-designed studies is essential for the development of science-based recommendations. Data are needed in several areas, including viral shedding periods for domestic livestock and lagomorphs, potential shedding of virus in milk, earliest age at which rabies vaccination is effective and the protective effects of maternal antibodies, duration of immunity, PEP protocols for domestic animals, models for treatment of clinical rabies, extra label vaccine use in domestic animals and wildlife rabies reservoirs, host-pathogen adaptations and dynamics, and the ecology of wildlife rabies reservoir species, especially in relation to the use of oral rabies vaccines.

B. Prevention and Control Methods in Domestic and Confined Animals

1. **Preexposure Vaccination and Management.** Parenteral animal rabies vaccines should be administered only by or under the direct supervision of a licensed veterinarian on the premises. Rabies vaccinations may also be administered under the supervision of a licensed veterinarian to animals being held in animal control shelters before release. The veterinarian who signs the rabies vaccination certificate must ensure that the person administering vaccine is identified on the certificate and is appropriately trained in vaccine storage, handling, administration, and in the management of adverse events. This practice ensures that a qualified and responsible person is held accountable for properly vaccinating the animal. Within 28 days after initial vaccination, a peak rabies virus antibody titer is reached, and the animal can be considered immunized (*29,31–33*). An animal is currently vaccinated and is considered immunized if the initial vaccination was administered at least 28 days previously or booster vaccinations have been administered in accordance with this compendium.

Regardless of the age of the animal at initial vaccination, a booster vaccination should be administered 1 year later (see Parts II and III for vaccines and procedures). No laboratory or epidemiologic data exist to support the annual or biennial administration of 3- or 4-year vaccines after the initial series. Because a rapid anamnestic response is expected, an animal is considered currently vaccinated immediately after a booster vaccination (*34*).

a) **Dogs, Cats, and Ferrets.** All dogs, cats, and ferrets should be vaccinated against rabies and revaccinated in accordance with Part III of this compendium. If a previously vaccinated animal is overdue for a booster, the animal should be revaccinated. Immediately after the booster, the animal is considered currently vaccinated and should be placed on a booster schedule, depending on the labeled duration of the vaccine used.

b) **Livestock.** All horses should be vaccinated against rabies (*35*). Livestock, including species for which licensed vaccines are not available, that have frequent contact with humans (e.g., in petting zoos, fairs, and other public exhibitions) should be vaccinated against rabies (*36,37*). Consideration also should be given to vaccinating particularly valuable livestock.

c) **Captive Wild Animals and Hybrids**

(1) Wild animals or hybrids (the offspring of wild animals crossbred to domestic animals) should not be kept as pets (*38–40*). No parenteral rabies vaccines are licensed for use in wild animals or hybrids (*41*).

(2) Animals that live in exhibits and in zoological parks and are not completely excluded from all contact with rabies vectors can

become infected. Moreover, wild animals might be incubating rabies when initially captured. Therefore, wild-caught animals susceptible to rabies should be quarantined for a minimum of 6 months. Employees who work with animals at such facilities should receive preexposure rabies vaccine. The use of preexposure or postexposure rabies vaccinations for handlers who work with animals at such facilities might reduce the need for euthanasia of captive animals that expose handlers. Carnivores and bats should be housed in a manner that precludes direct contact with the public (*36,37*).

2. **Stray Animals.** Stray dogs, cats, and ferrets should be removed from the community. Local health departments and animal control officials can enforce the removal of strays more effectively if owned animals are required to have identification and are confined or kept on leash. Stray animals should be impounded for at least 3 business days to determine whether human exposure has occurred and to give owners sufficient time to reclaim animals.

3. **Importation and Interstate Movement of Animals**

   a) **International.** CDC regulates the importation of dogs and cats into the United States (*5*). Importers of dogs must comply with rabies vaccination requirements (42 CFR, Part 71.51[c] [http://www.cdc.gov/animalimportation/dogs.html]) and complete CDC form 75.37 (http://www.cdc.gov/animalimportation/pdf/dog-import.pdf). These regulations require dogs imported from rabies-endemic countries to be vaccinated for rabies and confined for varying periods depending on age and prior vaccination status. The appropriate health official of the state of destination should be notified within 72 hours of the arrival of any imported dog required to be placed in confinement under these regulations. Failure of the owner to comply with these confinement requirements should be reported promptly to the CDC Division of Global Migration and Quarantine (telephone: 404-639-4528 or 404-639-4537). For emergencies or after-hours calls, contact the CDC Emergency Operations Center (telephone: 770-488-7100). Federal regulations alone will not prevent the introduction of rabid animals into the United States (*3,4,42,43*). All imported dogs and cats are subject to state and local laws governing rabies and should be currently vaccinated against rabies in accordance with this compendium. Failure of an owner to comply with state or local requirements should be referred to the appropriate state or local official.

   b) **Areas with Dog-to-Dog Rabies Transmission.** Canine rabies virus variants have been eliminated in the United States (*2,6*). Rabid dogs have been introduced into the continental United States from areas with dog-to-dog rabies transmission (*3,4,42,43*). The movement of dogs for the purposes of adoption or sale from areas with dog-to-dog rabies transmission increases the risk for introducing canine-transmitted rabies to areas where the disease does not exist and should be prohibited.

   c) **Interstate.** Before interstate (including commonwealths and territories) movement, dogs, cats, ferrets, and horses should be currently vaccinated against rabies in accordance with the recommendations in this compendium (see Part I.B.1.). Animals in transit should be accompanied by a currently valid NASPHV Form 51 (Rabies Vaccination Certificate) (http://www.nasphv.org/Documents/RabiesVacCert.pdf). When an interstate health certificate or certificate of veterinary inspection is required, the inspection should contain the same rabies vaccination information as Form 51.

4. **Adjunct Procedures.** Methods or procedures that enhance rabies control include the following (http://www.rabiesblueprint.com/spip.php?article119):

   a) **Identification.** Dogs, cats, and ferrets should be identified (e.g., metal or plastic tags or microchips) to allow for verification of rabies vaccination status.

   b) **Licensure.** Registration or licensure of all dogs, cats, and ferrets is an integral component of an effective rabies control program. A fee frequently is charged for such licensure, and revenues collected are used to maintain rabies or animal

control activities. Evidence of current vaccination should be an essential prerequisite to licensure.

c) **Canvassing.** House-to-house canvassing by animal control officials facilitates enforcement of vaccination and licensure requirements.

d) **Citations.** Citations are legal summonses issued to owners for violations, including the failure to vaccinate or license their animals. The authority for officers to issue citations should be an integral part of each animal control program.

e) **Animal Control.** All local jurisdictions should incorporate stray animal control, leash laws, animal-bite prevention, and training of personnel in their programs.

f) **Public Education.** All local jurisdictions should incorporate education covering responsible pet ownership, bite prevention, and appropriate veterinary care in their programs.

5. **Postexposure Management.** This section refers to any animal exposed (see Part I.A.2.) to a confirmed or suspected rabid animal. Wild mammalian carnivores or bats that are not available or suitable for testing should be considered rabid.

a) **Dogs, Cats, and Ferrets.** Any illness in an animal that has been exposed to rabies should be reported immediately to the local health department. If signs suggestive of rabies develop (e.g., paralysis or seizures), the animal should be euthanized and the head shipped for testing as described in Part I.A.9.

(1) Dogs, cats, and ferrets that have never been vaccinated and are exposed to a rabid animal should be euthanized immediately. If the owner is unwilling to euthanize, the animal should be placed in strict isolation for 6 months. Isolation in this context refers to confinement in an enclosure that precludes direct contact with people and other animals. Rabies vaccine should be administered after entry into isolation or up to 28 days before release to comply with preexposure vaccination recommendations (see Part I.B.1.a.). No USDA-licensed biologics for postexposure prophylaxis of previously unvaccinated domestic animals exist, and evidence indicates that the use of vaccine alone does not reliably prevent the disease in these animals (*44*).

(2) Animals overdue for a booster vaccination should be evaluated on a case-by-case basis based on severity of exposure, time elapsed since last vaccination, number of previous vaccinations, current health status, and local rabies epidemiologic factors to determine need for euthanasia or immediate revaccination and observation with isolation.

(3) Dogs, cats, and ferrets that are currently vaccinated should be revaccinated immediately, kept under the owner's control, and observed for 45 days. The rationale for an observation period is based in part on the potential for overwhelming viral challenge, incomplete vaccine efficacy, improper vaccine administration, variable host immunocompetence, and immune-mediated fatality (i.e., early death phenomenon) (*12,45–47*).

b) **Livestock.** All species of livestock are susceptible to rabies; cattle and horses are the most frequently reported infected species (*2*). Any illness in an animal exposed to rabies should be reported immediately to the local health and agriculture officials. If signs suggestive of rabies develop, the animal should be euthanized and the head shipped for testing as described in Part I.A.9.

(1) Unvaccinated livestock should be euthanized immediately. For animals that are not euthanized, on a case-by-case basis, they should be observed and confined for 6 months.

(2) Livestock exposed to a rabid animal and currently vaccinated with a vaccine approved by USDA for that species should be revaccinated immediately and observed for 45 days.

(3) Multiple rabid animals in a herd or herbivore-to-herbivore transmission are uncommon (*48*); therefore, restricting the rest of the herd if a single animal has been exposed to or infected by rabies is usually not necessary.

(4) Handling and consumption of tissues from animals exposed to rabies might carry a risk for rabies virus transmission. Risk factors depend in part on the sites of exposure, the amount of virus present, the severity of the wounds, and whether sufficient contaminated tissue has been excised. If an exposed animal is to be custom- or home-slaughtered for consumption, the slaughter should occur immediately after the exposure, and all tissues should be cooked thoroughly. Persons handling animals, carcasses, and tissues that have been exposed should use barrier precautions (*49,50*). Historically, federal guidelines for meat inspectors required that any animal known to have been exposed to rabies within 8 months be rejected for slaughter (*51*). The USDA Food and Inspection Service (FSIS) and state meat inspectors should be notified when such exposures occur in food animals before slaughter.

Rabies virus is widely distributed in tissues of rabid animals (*52–54*). Tissues and products from a rabid animal should not be used for human or animal consumption (*55,56*) or transplantation (*57*). Pasteurization and cooking inactivate rabies virus (*58*); therefore, inadvertently drinking pasteurized milk or eating thoroughly cooked animal products does not constitute a rabies exposure.

c) **Other Animals.** Other mammals exposed to a rabid animal should be euthanized immediately. Animals maintained in USDA-licensed research facilities or accredited zoological parks should be evaluated on a case-by-case basis in consultation with public health authorities. Options might include isolation, observation, or administration of rabies biologics (i.e., immune globulin or vaccine or both).

6. Management of Animals that Bite Humans

a) **Dogs, Cats, and Ferrets.** Rabies virus is excreted in the saliva of infected dogs, cats, and ferrets during illness and/or for only a few days before illness or death (*59–61*). Regardless of rabies vaccination status, a healthy dog, cat, or ferret that potentially exposes a person through a bite should be confined and observed daily for 10 days from the time of the exposure (*62*); administration of rabies vaccine to the animal is not recommended during the observation period to prevent confusion between signs of rabies and rare adverse reactions (*13*). Any illness in the animal should be reported immediately to the local health department. Animals should be evaluated by a veterinarian at the first sign of illness during confinement. If signs suggestive of rabies develop, the animal should be euthanized and the head submitted for testing as described in Part I.A.9. Any stray or unwanted dog, cat, or ferret that potentially exposes a person to rabies may be euthanized immediately and the head submitted for rabies examination.

b) **Other Animals.** Other animals that might have exposed a person to rabies should be reported immediately to the local health department. Management of animals other than dogs, cats, and ferrets depends on the species, the circumstances of the exposure, the epidemiology of rabies in the area, and the animals' history, current health status, and the potential for exposure to rabies. The shedding period for rabies virus is undetermined for most species. Previous vaccination of these animals might not preclude the necessity for euthanasia and testing.

7. Outbreak Prevention and Control. The emergence of new rabies virus variants or the introduction of nonindigenous viruses poses a significant risk to humans, domestic animals, and wildlife (*63–70*). A rapid and comprehensive response includes the following measures (*71*):

a) **Characterize Virus.** Characterize the virus at the national reference laboratory.

b) **Identify and Control Source.** Identify and control the source of the virus introduction.

c) **Enhance Surveillance.** Enhance laboratory-based surveillance in wild and domestic animals.

d) **Increase Vaccination.** Increase animal rabies vaccination rates.

e) **Restrict Animals.** Restrict the movement of animals.

f) **Evaluate Need to Reduce Vector Population.** Evaluate the need for vector population reduction.

g) **Coordinate Response.** Coordinate a multiagency response.

h) **Provide Outreach.** Provide public and professional outreach and education.

8. **Disaster Response.** Animals might be displaced during and after man-made or natural disasters and need emergency sheltering (http://www.bt.cdc.gov/disasters/petshelters.asp and http://www.avma.org/disaster/default.asp) (*72*). Animal rabies vaccination and exposure histories often are not available for displaced animals. Disaster response creates situations in which animal caretakers might lack appropriate training and preexposure vaccination. In such situations, implementing and coordinating rabies prevention and control measures is critical to reduce the risk for rabies transmission and the need for human PEP. Such measures include the following:

   a) **Coordinate Relief.** Coordinate relief efforts of individuals and organizations with the local emergency operations center before deployment.

   b) **Examine Animals.** Examine each animal at a triage site for possible bite injuries or signs of rabies.

   c) **Isolate Animals.** Isolate animals exhibiting signs of rabies, pending evaluation by a veterinarian.

   d) **Check Animal Identifiers.** Ensure that all animals have a unique identifier.

   e) **Vaccinate.** Administer a rabies vaccination to all dogs, cats, and ferrets unless reliable proof of vaccination exists.

   f) **Adopt Caretaker Standards.** Adopt minimum standards for animal caretakers as feasible, including personal protective equipment, preexposure rabies vaccination, and appropriate training in animal handling (*73*).

   g) **Maintain Documentation.** Maintain documentation of animal disposition and location (e.g., returned to owner, died or euthanized, adopted, relocated to another shelter, and address of new location).

   h) **Provide Facilities for Animals that Have Been Exposed.** Provide facilities to confine and observe animals involved in exposures (see Part I.B.6.).

   i) **Report Human Exposures.** Report human exposures to rabies to appropriate public health authorities (see Part I.A.3.).

C. Prevention and Control Methods Related to Wildlife. The public should be warned not to handle or feed wild animals. Wild animals and hybrids that expose persons, pets, or livestock to rabies should be considered for euthanasia and rabies diagnosis. A person exposed by any wild animal should immediately report the incident to a health-care provider who, in consultation with public health authorities, can evaluate the need for PEP (*9,10*).

Translocation of infected wildlife has contributed to the spread of rabies (*63–68,74*); therefore, the translocation of known terrestrial rabies reservoir species should be prohibited. Whereas state-regulated wildlife rehabilitators and nuisance wildlife control operators might play a role in a comprehensive rabies control program, minimum standards for persons who handle wild animals should include rabies vaccination, appropriate training, and continuing education.

1. **Carnivores.** The use of oral rabies vaccines (ORV) for the mass vaccination of free-ranging wildlife should be considered in selected situations with the approval of the appropriate state agencies (*14,75*). Success has been documented using ORV to control rabies in wildlife in North America (*75–78*). The currently licensed vaccinia-vectored ORV is labeled for use in raccoons and coyotes. The distribution of ORV should be based on scientific assessments of the target species and followed by timely and appropriate analysis of surveillance data; such results should be provided to all stakeholders. In addition, parenteral vaccination (trap–vaccinate–release) of wildlife rabies reservoirs may be integrated into coordinated ORV programs to enhance their effectiveness. Continuous and persistent programs for trapping or poisoning wildlife do not reduce wildlife rabies reservoirs statewide. However, limited population control in high-contact areas (e.g., picnic grounds, camps, and suburban areas) might be indicated for the

removal of selected species of wildlife at high risk for having rabies. State agriculture, public health, and wildlife agencies should be consulted for planning, coordination, and evaluation of vaccination or population reduction programs (*14*).

2. **Bats.** From the 1950s through 2011, indigenous rabid bats have been reported from every state except Hawaii and have caused rabies in at least 43 humans in the United States (*79–92*). Bats should be excluded appropriately from houses, public buildings, and adjacent structures to prevent direct association with humans (*93,94*). Such structures should then be made bat-proof by sealing entrances used by bats. Controlling rabies in bats through programs designed to reduce bat populations is neither feasible nor desirable.

Part II. Recommendations for Parenteral Rabies Vaccination Procedures

A. Vaccine Administration. All animal rabies vaccines should be restricted to use by or under the direct supervision of a veterinarian (*95*), except as recommended in Part I.B.1.

B. Vaccine Selection. Part III lists all vaccines licensed by USDA and marketed in the United States at the time of publication. New vaccine approvals or changes in label specifications made after publication of this report should be considered a part of this list. Any of the listed vaccines can be used for revaccination, even if the product is not the same as previously administered. Vaccines used in state and local rabies control programs should have at least a 3-year duration of immunity. This constitutes the most effective method of increasing the proportion of immunized dogs and cats in any population (*96*). No laboratory or epidemiologic data exist to support the annual or biennial administration of 3- or 4-year vaccines following the initial series.

C. Adverse Events. No epidemiologic association exists between a particular licensed vaccine product and specific adverse events (*13,97–99*); although rare, adverse events including vomiting, swelling at the injection site, lethargy, hypersensitivity, and rabies in a previously vaccinated animal have been reported. Adverse events should be reported to the vaccine manufacturer and to USDA, Animal and Plant Health Inspection Service, Center for Veterinary Biologics (http://www.aphis.usda.gov/animal_health/vet_biologics/vb_adverse_event.shtml; telephone: 800-752-6255). No contraindication to rabies vaccination exists. Animals with a previous history of anaphylaxis can be medically managed and observed after vaccination (*46*).

D. Wildlife and Hybrid Animal Vaccination. The safety and efficacy of parenteral rabies vaccination of wildlife and hybrids have not been established, and no rabies vaccines are licensed for these animals. Zoos or research institutions may establish vaccination programs to attempt to protect valuable animals; however, these programs should not replace appropriate public health activities that protect humans (see Part I.B.1.c.2).

E. Accidental Human Exposure to Vaccine. Human exposure to parenteral animal rabies vaccines listed in Part III does not constitute a risk for rabies virus infection. Human exposure to vaccinia-vectored ORVs should be reported to state health officials (*100,101*).

F. Rabies Certificate. All agencies and veterinarians should use NASPHV Form 51 (revised 2007), Rabies Vaccination Certificate, or an equivalent. This form can be obtained from vaccine manufacturers, NASPHV (available at http://www.nasphv.org/Documents/RabiesVacCert.pdf), or CDC (available at http://www.cdc.gov/rabies/pdf/nasphv_form51.pdf). The form must be completed in full and signed by the administering or supervising veterinarian. Computer-generated forms containing the same information also are acceptable.

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

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

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

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

See table footnotes on page 11.

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

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

Abbreviations: IM = intramuscular; N/A = not applicable; SC = subcutaneous; TF = thimerosal free.
* Minimum age (or older) and revaccinated 1 year later.
† Fort Dodge Animal Health was recently acquired by Boehringer Ingelheim Vetmedica, Inc.
§ One month = 28 days.

TABLE 2. Rabies vaccine manufacturer contact information

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

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U.S. Government Printing Office: 2012-523-043 Region IV ISSN: 1057-5987

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Rule: 37.114.571

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Rule Title: RABIES EXPOSURE

Department: PUBLIC HEALTH AND HUMAN SERVICES, DEPARTMENT OF
Chapter: COMMUNICABLE DISEASE CONTROL
Subchapter: Specific Control Measures

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37.114.571 RABIES EXPOSURE

(1) The following actions must be reported to the local health officer if they are committed by an animal other than a rabbit, hare, or rodent whose species can be infected with rabies:

(a) biting of a human being;

(b) contamination of a mucous membrane, scratch, abrasion, or open wound of a human by the saliva or other potentially infectious material from an animal that exhibits:

(i) paralysis or partial paralysis of the limbs;

(ii) marked excitation, muscle spasms, difficulty swallowing, apprehensiveness, delirium, or convulsions; or

(iii) unusual aggressive or unnatural behavior toward a person, animal, or inanimate object.

(2) The local health officer shall investigate each report of possible rabies exposure and gather, at a minimum, information about the circumstances of the possible rabies exposure; nature of the exposure; name, age, and address of the exposed individual; vaccination status of the animal in question; treatment of the exposed person; and eventual outcome for both animal and person involved.

(3) As soon as possible after investigating a report of possible rabies exposure, the local health officer must inform the exposed person or the individual responsible for the exposed person if that person is a minor whether or not treatment is recommended to prevent rabies and provide a referral to a health care provider.

(4) Whenever the circumstances described in (1) involve a dog, cat, or ferret, the local health officer must either:

(a) arrange for the animal to be observed for signs of illness during a ten day quarantine period at an animal shelter, veterinary facility, or other adequate facility, and ensure that any illness in the animal during the confinement or before release is evaluated by a veterinarian for signs suggestive of rabies; or

(b) if the symptoms described in (1)(b) above exist, order the animal killed and the head sent to the Department of Livestock's diagnostic laboratory at Bozeman for rabies analysis. The local health officer may also order an animal killed subsequent to isolation, and the brain analyzed.

(5) Additional rabies reporting and control requirements are contained in ARM 32.3.1201 through 32.3.1207, rules of the Department of Livestock.

(6) The department hereby adopts and incorporates by reference ARM 32.3.1205, which contains the standards for proper vaccination against rabies. A copy of ARM 32.3.1205 may be obtained from the Department of Livestock, Animal Health Division, Scott Hart Building, Capitol Station, Helena, MT 59620 phone: (406)444-2043.

History: 50-1-202, 50-2-118, MCA; IMP, 50-1-202, 50-2-118, MCA; NEW, 1987 MAR p. 2147, Eff. 11/28/87; AMD, 2000 MAR p. 2528, Eff. 9/22/00; TRANS, from DHES, 2002 MAR p. 913.

Effective rule versions existed in ARM on or after March 31, 2007

MAR Notices	Effective From	Effective To	History Notes
	9/22/2000	Current	History: **50-1-202**, **50-2-118**, MCA; IMP, **50-1-202**, **50-2-118**, MCA; NEW, 1987 MAR p. 2147, Eff. 11/28/87; AMD, 2000 MAR p. 2528, Eff. 9/22/00; TRANS, from

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Rule: 32.3.1205

Rule Title: ANIMAL CONTACTS

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Department: LIVESTOCK, DEPARTMENT OF
Chapter: DISEASE CONTROL
Subchapter: Rabies

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32.3.1205 ANIMAL CONTACTS

(1) Any animal subject to rabies which has been bitten by a known rabid or suspected rabid animal must be quarantined in a place and manner approved by the state veterinarian for a period of 6 months and then if cats or dogs vaccinated as set forth in paragraphs (2) or (3) below, or destroyed.

(2) If a dog or cat has not been vaccinated against rabies within time limits prescribed by, and otherwise in accordance with, a current "compendium of rabies vaccines" issued by the national association of states public health veterinarians, inc. The dog or cat may be quarantined in an approved manner and place for a period of 180 days. The cat or dog must then be vaccinated in accordance with the above mentioned "compendium on rabies vaccines", held in quarantine for an additional 14 days, and then released.

(3) If the dog or cat has been vaccinated against rabies within time limits prescribed by, and otherwise in accordance with, the "compendium on rabies vaccines" described above, the dog or cat may be revaccinated and released.

History: Sec. 81-2-102 MCA; IMP, Sec. 81-2-102 MCA; Eff. 12/31/72; AMD, 1980 MAR p. 583, Eff. 2/15/80.

Effective rule versions existed in ARM on or after March 31, 2007

MAR Notices	Effective From	Effective To	History Notes
	2/15/1980	Current	History: Sec. 81-2-102 MCA; IMP, Sec. 81-2-102 MCA; Eff. 12/31/72; AMD, 1980 MAR p. 583, Eff. 2/15/80.

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Recommendations and Reports | March 19, 2010 / Vol. 59 / No. RR-2

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

Recommendations of the Advisory Committee on Immunization Practices

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

years. Rabies can be prevented by avoidance of viral exposure and initiation of prompt medical intervention when exposure does occur. In the United States, animal rabies is common. In a recent study, approximately 23,000 persons per year were estimated to have been exposed to potentially rabid animals and received rabies postexposure prophylaxis (PEP) (*2*). With the elimination of canine rabies virus variants and enzootic transmission among dogs, human rabies is now rare in the United States, with an average of one or two cases occurring annually since 1960 (*3*).

Prompt wound care and the administration of rabies immune globulin (RIG) and vaccine are highly effective in preventing human rabies following exposure. A variety of empirical schedules and vaccine doses have been recommended over time, based in part on immunogenicity and clinical experience in areas of the world with enzootic canine or wildlife rabies (*4*). As more potent vaccines were developed, the number of vaccine doses recommended for PEP has decreased, and studies aimed at further revision and reduction of PEP schedules and doses in humans have been encouraged. By the latter half of the 20th century, a 4- to 6-dose, intramuscular regimen using human diploid cell vaccine (HDCV) or purified chick embryo cell vaccine (PCECV) was being recommended (*5–8*). In the United States, a 5-dose PEP vaccine regimen was adopted during the 1980s (*9–12*). In 2007, when human rabies vaccine was in limited supply, an ad hoc National Rabies Working Group was formed to reassess the recommendations for rabies prevention and control in humans and other animals. In 2008, a smaller Advisory Committee on Immunization Practices (ACIP) Rabies Workgroup was formed to review rabies vaccine regimen options. This report provides updated ACIP recommendations regarding the use of a 4-dose vaccination regimen, replacing the previously recommended 5-dose regimen, for rabies PEP in previously unvaccinated persons.

Methods

The ACIP Rabies Workgroup* was formed in October 2008 to review 1) previous recommendations; 2) published and unpublished data from both national and global sources regarding rabies PEP; and 3) the immunogenicity, effectiveness, and safety of a 4-dose PEP rabies vaccination regimen. The ACIP Rabies Workgroup used an evidence-based process for consideration of a reduced vaccination regimen in human rabies PEP. This approach consisted of a review of information available from basic and applied studies of rabies prevention. Because rabies is almost always fatal among immunologically naïve persons once clinical symptoms of rabies occur, randomized, placebo-controlled efficacy studies of vaccine in humans cannot be conducted. The ACIP Rabies Workgroup reviewed six areas: 1) rabies virus pathogenesis, 2) experimental animal models, 3) human immunogenicity studies, 4) prophylaxis effectiveness in humans, 5) documented failures of prophylaxis in humans, and 6) vaccine safety. Studies for review were identified by searching the PubMed database and other relevant references and by consulting subject-matter experts. When definitive research evidence was lacking, the recommendations incorporated the expert opinion of the ACIP Rabies Workgroup members. The ACIP Rabies Workgroup also sought advice and comment from representatives of the vaccine industry, the National Association of State Public Health Veterinarians, the Council of State and Territorial Epidemiologists, state and local public health officials, additional national stakeholder groups, and other national and international experts. The proposed revised recommendations and a draft statement from the ACIP Rabies Workgroup were presented to the full ACIP during February 2009. After review and comment by ACIP, a revised draft, recommending a reduced regimen of 4 1-mL doses of rabies vaccine for PEP in previously unvaccinated persons, was prepared for consideration. These recommendations were discussed and accepted by ACIP at the June 2009 meeting (*13*).

Rationale for Reduced Doses of Human Rabies Vaccine

A detailed review of the evidence in support of a reduced, 4-dose schedule for human PEP has been published (*14*). The totality of the evidence, obtained from the available peer-reviewed literature, unpublished data sources, epidemiologic reviews, and expert opinion strongly supports a reduced vaccination schedule (Table 1). Since the 19th century, prophylactic interventions against rabies have recognized the highly neurotropic characteristics of lyssaviruses and have aimed at neutralizing the virus at the site of infection before it can enter the human central nervous system (Figure 1) (*4,15,16*). To accomplish this, immunologic interventions must be prompt and must be directed toward local virus neutralization, such as local infiltration with RIG and vaccination. Modern recommended rabies PEP regimens emphasize early wound care and passive immunization (i.e., infiltration of RIG in and around the wound) combined with active immunization (i.e., serial doses of rabies vaccine). Accumulated scientific evidence indicates that, following rabies virus exposure, successful neutralization and clearance of rabies virus mediated via appropriate PEP generally ensures patient survival (*8*).

*A list of the membership appears on page 9 of this report.

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

Recommendations of the Advisory Committee on Immunization Practices

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Summary

This report summarizes new recommendation and updates previous recommendations of the Advisory Committee on Immunization Practices (ACIP) for postexposure prophylaxis (PEP) to prevent human rabies (CDC. Human rabies prevention—United States, 2008: recommendations of the Advisory Committee on Immunization Practices. MMWR 2008;57[No. RR-3]). Previously, ACIP recommended a 5-dose rabies vaccination regimen with human diploid cell vaccine (HDCV) or purified chick embryo cell vaccine (PCECV). These new recommendations reduce the number of vaccine doses to four. The reduction in doses recommended for PEP was based in part on evidence from rabies virus pathogenesis data, experimental animal work, clinical studies, and epidemiologic surveillance. These studies indicated that 4 vaccine doses in combination with rabies immune globulin (RIG) elicited adequate immune responses and that a fifth dose of vaccine did not contribute to more favorable outcomes. For persons previously unvaccinated with rabies vaccine, the reduced regimen of 4 1-mL doses of HDCV or PCECV should be administered intramuscularly. The first dose of the 4-dose course should be administered as soon as possible after exposure (day 0). Additional doses then should be administered on days 3, 7, and 14 after the first vaccination. ACIP recommendations for the use of RIG remain unchanged. For persons who previously received a complete vaccination series (pre- or postexposure prophylaxis) with a cell-culture vaccine or who previously had a documented adequate rabies virus-neutralizing antibody titer following vaccination with noncell-culture vaccine, the recommendation for a 2-dose PEP vaccination series has not changed. Similarly, the number of doses recommended for persons with altered immunocompetence has not changed; for such persons, PEP should continue to comprise a 5-dose vaccination regimen with 1 dose of RIG. Recommendations for pre-exposure prophylaxis also remain unchanged, with 3 doses of vaccine administered on days 0, 7, and 21 or 28. Prompt rabies PEP combining wound care, infiltration of RIG into and around the wound, and multiple doses of rabies cell-culture vaccine continue to be highly effective in preventing human rabies.

The material in this report originated in the National Center for Emerging and Zoonotic Infectious Diseases (proposed), Lonnie King, DVM, Director.
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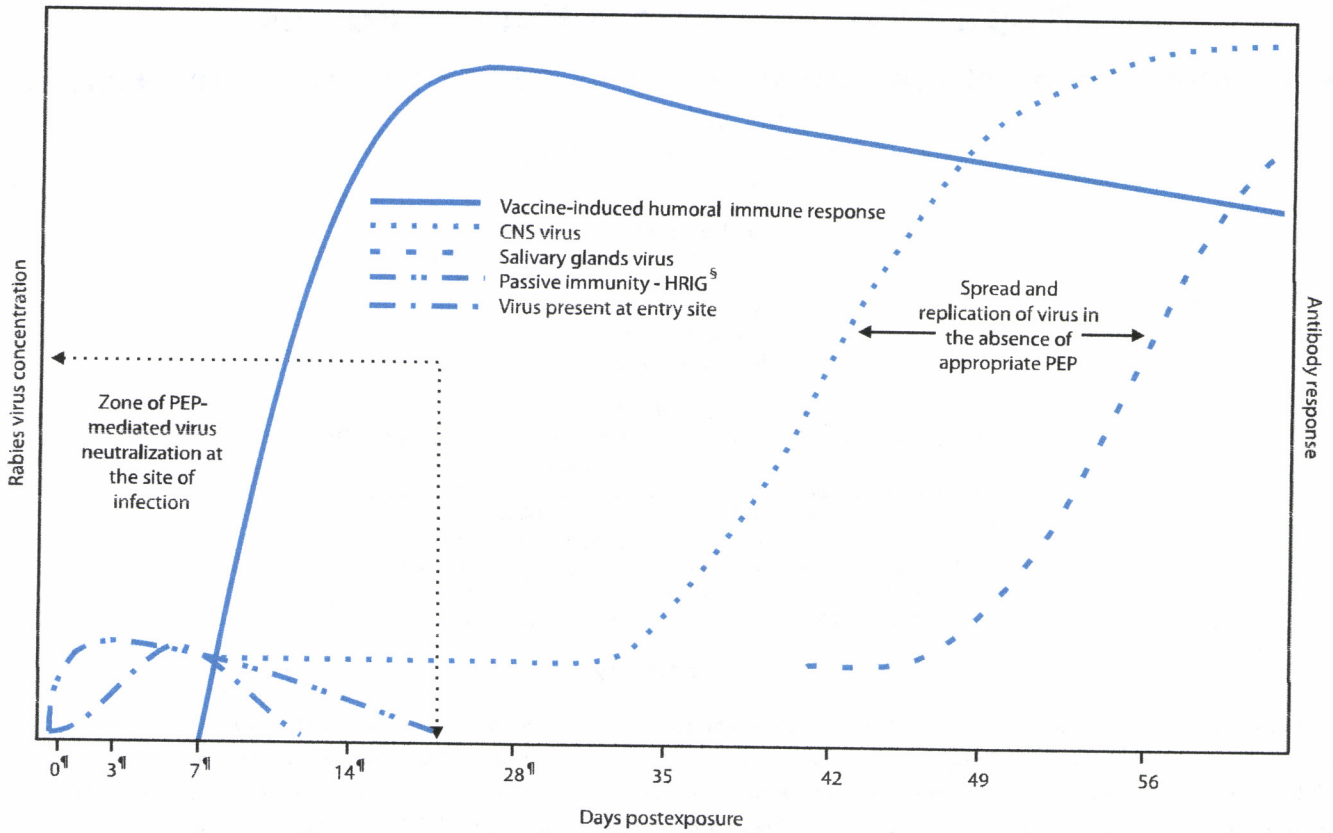
Introduction

Rabies is a zoonotic disease caused by RNA viruses in the family *Rhabdoviridae*, genus *Lyssavirus* (*1*). Virus is transmitted in the saliva of rabid mammals via a bite. After entry to the central nervous system, these viruses cause an acute, progressive encephalomyelitis. The incubation period usually ranges from 1 to 3 months after exposure, but can range from days to

FIGURE 1. Schematic of dynamics of rabies virus pathogenesis* in the presence and absence of postexposure prophylaxis (PEP)–mediated immune responses†



* Rabies can progress through five stages: incubation period (5 days to >2 years: U.S. median ~35 days), prodrome state (0–10 days), acute neurologic period (2–7 days), coma (5–14 days), and death.

† Once in tissues at the entry site, rabies virus can be neutralized by passively administered rabies immune globulin (RIG). Active immunization (vaccine) stimulates the host immune system, and, as a result, virus-neutralizing antibodies (VNA) are produced approximately 7–10 days after initiation of vaccination. By approximately day 14–28 (after administration of 4 vaccine doses), VNAs peak. In the absence of early and adequate PEP, virus enters host neurons, spreads to the central nervous system (CNS), and causes disease, with inevitably fatal consequence.

§ Human rabies immune globulin.

¶ Day vaccine administered.

nervous system occurs before the due date (i.e., day 28) of the fifth vaccine dose, the utility of that dose must be nil. In the United States, of the 27 human rabies cases reported during 2000–2008, none of the patients had a history of receiving any PEP before illness, and this is the most common situation for human rabies deaths in both developed and developing countries (*3,8*). In India, an analysis from two animal bite centers during 2001–2002 demonstrated that in 192 human rabies cases, all deaths could be attributed to failure to seek timely and appropriate PEP, and none of them could be attributed to a failure to receive the fifth (day 28) vaccine dose (*18*). Even when PEP is administered imperfectly or not according to established scheduled dose recommendations, it might be generally effective. Several studies have reported cases involving persons who were exposed to potentially rabid animals and who received less than 5, 4, or even 3 doses of rabies vaccine but who nevertheless did not acquire rabies (Table 2). For example, in one series from New York, 147 (13%) of 1,132 patients had no report of receiving the complete 5-dose vaccine regimen. Of these patients, 26 (18%) received only 4 doses of vaccine, and two of these patients were exposed to animals with laboratory-confirmed rabies. However, no documented cases of human rabies occurred (CDC, unpublished data, 2003). The ACIP Rabies Working Group estimates that >1,000 persons in the United States receive rabies prophylaxis annually of only 3 or 4 doses, with no resulting documented cases of human rabies, even though >30% of these persons likely have exposure to confirmed rabid animals (*14*). In addition, no case of human rabies in the United States has been reported in which failure of PEP was attributable to receiving less than the 5-dose vaccine course. Worldwide, although human PEP failures have been reported very rarely, even in cases in which intervention

TABLE 1. Summary of evidence in support of a 4-dose postexposure prophylaxis regimen — United States, 2010

Evidence	Conclusion	Sources
Rabies virus pathogenesis	High neurotropism of rabies virus requires immediate immunization (local infiltration with human rabies immune globulin [HRIG] and vaccination) to neutralize virus at the site of infection and prevent viral entry into the central nervous system.	Published literature,* expert national and international opinion, and historic observations
Experimental animal models	Protection in animal models was elicited without regard to the absolute number of vaccine doses used.	Published literature,† expert national and international opinion, and unpublished data
Human clinical studies	All patients develop adequate levels of virus-neutralizing antibodies by day 14, without any additive value of a 5th dose of vaccine administered at day 28 (in regards to any substantive increase in measured virus-neutralizing antibody levels).	Published literature,§ expert national and international opinion, and unpublished data
Epidemiologic surveillance	No human rabies cases were identified in patients who received appropriate wound care, HRIG, and 4 doses of vaccine.	Published literature,¶ expert national and international opinion, and unpublished data
Health economics	Expected positive national benefits are related to omission of a 5th dose (e.g., minimized travel expenses, reduced time out of work, health-care workers have more time for other patients, and fewer adverse reactions).	Published literature** and expert national opinion

* **SOURCES:** Lyles DS, Rupprecht CE. *Rhabdoviridae*. In: Knipe D, Howley P, eds. Fields virology. 5th ed. Philadelphia, PA: Lippincott, Williams, & Wilkins; 2007:1363–408. Plotkin SA, Koprowski H, Rupprecht CE. Rabies vaccines. In: Plotkin SA, Orenstein WA, Offit PA, eds. Vaccines. 5th ed. Philadelphia, PA: Saunders; 2008:687–714. World Health Organization. WHO Expert Consultation on Rabies. 1st report. WHO Technical Report Series, No. 931. Geneva, Switzerland: World Health Organization; 2005. Rupprecht CE, Briggs D, Brown C, et al. Evidence for a 4-dose vaccine schedule for human rabies post-exposure prophylaxis in previously non-vaccinated individuals. Vaccine 2009;27:7141–8. Charlton KM, Nadin-Davis S, Casey GA, Wandeler AI. The long incubation period in rabies: delayed progression of infection in muscle at the site of exposure. Acta Neuropathol 1997;94:73–7. Dietzschold B, Schnell M, Koprowski H. Pathogenesis of rabies. Curr Top Microbiol Immunol 2005;292:45–56.

† **SOURCES:** Lyles DS, Rupprecht CE. *Rhabdoviridae*. In: Knipe D, Howley P, eds. Fields Virology. 5th Ed. Philadelphia, PA: Lippincott, Williams, & Wilkins; 2007:1363–408. World Health Organization. WHO Expert Consultation on Rabies. 1st Report. WHO Technical Report Series, No. 931. Geneva, Switzerland: World Health Organization; 2005. Rupprecht CE, Briggs D, Brown C, et al. Evidence for a 4-dose vaccine schedule for human rabies post-exposure prophylaxis in previously non-vaccinated individuals. Vaccine 2009;27:7141–8. Baer GM. Animal models in the pathogenesis and treatment of rabies. Rev Infect Dis 1988;10(Suppl 4):S739–50. Franka R, Wu X, Jackson RF, et al. Rabies virus pathogenesis in relationship to intervention with inactivated and attenuated rabies vaccines. Vaccine 2009;27:7149–55. Sikes RK, Cleary WF, Koprowski H, Wiktor TJ, Kaplan MM. Effective protection of monkeys against death from street virus by post-exposure administration of tissue-culture rabies vaccine. Bull World Health Organ 1971;45:1–11. Manickama R, Basheer MD, Jayakumar R. Post-exposure prophylaxis (PEP) of rabies-infected Indian street dogs. Vaccine 2008;26:6564–8.

§ **SOURCES:** Plotkin SA, Koprowski H, Rupprecht CE. Rabies vaccines. In: Plotkin SA, Orenstein WA, Offit PA, eds. Vaccines. 5th ed. Philadelphia, PA: Saunders; 2008:687–714. World Health Organization. WHO Expert Consultation on Rabies. 1st Report. WHO Technical Report Series, No. 931. Geneva, Switzerland: World Health Organization; 2005. Rupprecht CE, Briggs D, Brown C, et al. Evidence for a 4-dose vaccine schedule for human rabies post-exposure prophylaxis in previously non-vaccinated individuals. Vaccine 2009;27:7141–8.

¶ **SOURCES:** Plotkin SA, Koprowski H, Rupprecht CE. Rabies vaccines. In: Plotkin SA, Orenstein WA, Offit PA, eds. Vaccines. 5th ed. Philadelphia, PA: Saunders; 2008:687–714. Rupprecht CE, Briggs D, Brown C, et al. Evidence for a 4-dose vaccine schedule for human rabies post-exposure prophylaxis in previously non-vaccinated individuals. Vaccine 2009; 27:7141–8. Wilde H. Failures of post-exposure rabies prophylaxis. Vaccine 2007;25:7605–9.

** **SOURCES:** Meltzer MI, Rupprecht CE. A review of the economics of the prevention and control of rabies: I: global impact and rabies in humans. PharmacoEconomics 1998:14:365–83. Dhankhar P, Vaidya SA, Fishbien DB, Meltzer MI. Cost effectiveness of rabies post exposure prophylaxis in the United States. Vaccine 2008;26:4251–5.

The induction of a rabies virus-specific antibody response is one important immunologic component of response to vaccination (*4*). Development of detectable rabies virus-specific neutralizing antibodies is a surrogate for an adequate immune response to vaccination. Clinical trials of human rabies vaccination indicate that all healthy persons develop detectable rabies virus-neutralizing antibody titer rapidly after initiation of PEP. For example, in a literature review conducted by the ACIP Rabies Workgroup of at least 12 published rabies vaccination studies during 1976–2008 representing approximately1,000 human subjects, all subjects developed rabies virus-neutralizing antibodies by day 14 (*14*).

Observational studies indicate that PEP is universally effective in preventing human rabies when administered promptly and appropriately. Of the >55,000 persons who die annually of rabies worldwide, the majority either did not receive any PEP, received some form of PEP (usually without RIG) after substantial delays, or were administered PEP according to schedules that deviated substantially from current ACIP or World Health Organization recommendations (*17*). For example, a review of a series of 21 fatal human cases in which patients received some form of PEP indicated that 20 patients developed signs of illness, and most died before day 28 (Figure 2). In such cases, in which widespread infection of the central

TABLE 3. Rabies postexposure prophylaxis (PEP) schedule — United States, 2010

Vaccination status	Intervention	Regimen*
Not previously vaccinated	Wound cleansing	All PEP should begin with immediate thorough cleansing of all wounds with soap and water. If available, a virucidal agent (e.g., povidine-iodine solution) should be used to irrigate the wounds.
	Human rabies immune globulin (HRIG)	Administer 20 IU/kg body weight. If anatomically feasible, the full dose should be infiltrated around and into the wound(s), and any remaining volume should be administered at an anatomical site (intramuscular [IM]) distant from vaccine administration. Also, HRIG should not be administered in the same syringe as vaccine. Because RIG might partially suppress active production of rabies virus antibody, no more than the recommended dose should be administered.
	Vaccine	Human diploid cell vaccine (HDCV) or purified chick embryo cell vaccine (PCECV) 1.0 mL, IM (deltoid area†), 1 each on days 0,§ 3, 7 and 14.¶
Previously vaccinated**	Wound cleansing	All PEP should begin with immediate thorough cleansing of all wounds with soap and water. If available, a virucidal agent such as povidine-iodine solution should be used to irrigate the wounds.
	HRIG	HRIG should not be administered.
	Vaccine	HDCV or PCECV 1.0 mL, IM (deltoid area†), 1 each on days 0§ and 3.

* These regimens are applicable for persons in all age groups, including children.
† 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.
§ Day 0 is the day dose 1 of vaccine is administered.
¶ For persons with immunosuppression, rabies PEP should be administered using all 5 doses of vaccine on days 0, 3, 7, 14, and 28.
** Any person with a history of pre-exposure vaccination with HDCV, PCECV, or rabies vaccine adsorbed (RVA); prior PEP with HDCV, PCECV or RVA; or previous vaccination with any other type of rabies vaccine and a documented history of antibody response to the prior vaccination.

of PEP. If PEP has been initiated and appropriate laboratory diagnostic testing (i.e., the direct fluorescent antibody test) indicates that the animal that caused the exposure was not rabid, PEP may be discontinued.

Vaccine Use

A regimen of 4 1-mL vaccine doses of HDCV or PCECV should be administered intramuscularly to previously unvaccinated persons (Table 3). The first dose of the 4-dose regimen should be administered as soon as possible after exposure. The date of the first dose is considered to be day 0 of the PEP series. Additional doses then should be administered on days 3, 7, and 14 after the first vaccination. Recommendations for the site of the intramuscular vaccination remain unchanged (e.g., for adults, the deltoid area; for children, the anterolateral aspect of the thigh also is acceptable). The gluteal area should not be used because administration of vaccine in this area might result in a diminished immunologic response. Children should receive the same vaccine dose (i.e., vaccine volume) as recommended for adults.

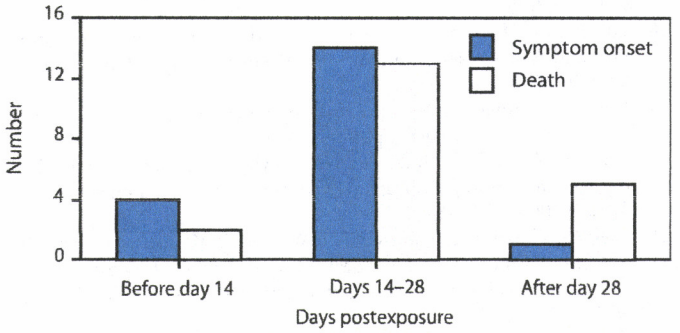
HRIG Use

The recommendations for use of immune globulin in rabies prophylaxis remain unchanged by the revised recommendation of a reduced rabies vaccine schedule. HRIG is administered once to previously unvaccinated persons to provide rabies virus-neutralizing antibody coverage until the patient responds to vaccination by actively producing virus-neutralizing antibodies. HRIG is administered once on day 0 at the time PEP is initiated, in conjunction with human rabies vaccines available for use in the United States. If HRIG was not administered when vaccination was begun on day 0, it can be administered up to and including day 7 of the PEP series (*12,25*). If anatomically feasible, the full dose of HRIG is infiltrated around and into any wounds. Any remaining volume is injected intramuscularly at a site distant from vaccine administration. HRIG is not administered in the same syringe or at the same anatomic site as the first vaccine dose. However, subsequent doses (i.e., on days 3, 7, and 14) of vaccine in the 4-dose vaccine series can be administered in the same anatomic location in which HRIG was administered.

Postexposure Prophylaxis for Previously Vaccinated Persons

Recommendations for PEP have not changed for persons who were vaccinated previously. Previously vaccinated persons are those who have received one of the ACIP-recommended pre- or postexposure prophylaxis regimens (with cell-culture vaccines) or those who received another vaccine regimen (or vaccines other than cell-culture vaccine) and had a documented adequate rabies virus-neutralizing antibody response. Previously vaccinated persons, as defined above, should receive 2 vaccine doses (1.0 mL each in the deltoid), the first dose

FIGURE 2. Number of documented rabies postexposure prophylaxis (PEP) failures — Burma, India, the Philippines, South Africa, Sri Lanka, and Thailand, 1984–2007*



SOURCES: Wilde H. Failures of post-exposure rabies prophylaxis. Vaccine 2007;25:7605–9; Wilde H, Sirikawin S, Sabcharoen A, et al. Failure of postexposure treatment of rabies in children. Clin Infect Dis 1996;22:228–32; Matha IS, Salunke SR. Immunogenicity of purified vero cell rabies vaccine used in the treatment of fox-bite victims in India. Clin Infect Dis 2005;40:611–3.

* Of 21 reported PEP failures described, 20 patients had symptoms and 15 died before day 28.

appeared both prompt and appropriate (*8*), no cases have been attributed to the lack of receipt of the fifth human rabies vaccine dose on day 28 (*4,17*).

In vivo laboratory animal studies using multiple animal models from rodents to nonhuman primates have underscored the importance of timely PEP using RIG and vaccine, regardless of the absolute number of vaccine doses used or the schedule (*14,19*). For example, in a study in which 1, 2, 3, 4, or 5 doses of rabies vaccine were used in a Syrian hamster model in combination with human rabies immune globulin (HRIG), no statistically significant differences in elicited protection and consequent survivorship were observed among groups receiving different doses (*20*). In the same study, using a murine model, no differences were detected in immunogenicity and efficacy of PEP with 2, 3, or 4 vaccine doses. In another study using a nonhuman primate model, 1 dose of cell-culture vaccine, in combination with RIG administered 6 hours postexposure, provided substantial protection (*21*). In another study, a 3-dose regime was evaluated in a canine model and determined to be effective in preventing rabies (*22*).

Compared with older, nerve tissue-based products, adverse reactions associated with modern human rabies vaccination are uncommon (*4*). A review by the Workgroup of published and unpublished human rabies vaccine clinical trials and Vaccine Adverse Event Reporting System data identified no adverse events that were correlated to a failure to receive the fifth vaccine dose. As some adverse reactions might be independent clinical events with each vaccine administration, the omission of the vaccine dose on day 28 might have some positive health benefits. Otherwise, the overall safety of human rabies PEP is expected to be unchanged from the evidence provided in the 2008 ACIP report (*12*).

Preliminary economic assessments support the cost savings associated with a reduced schedule of vaccination (*23,24*). The ACIP Rabies Workgroup has estimated that, assuming 100% compliance with a recommended vaccine regimen, a change in recommendation from a 5-dose schedule to a 4-dose schedule would save approximately $16.6 million in costs to the U.S. health-care system. Persons who receive rabies vaccination might see some savings related to deletion of the fifth recommended dose of vaccine, measured in both the cost of the vaccine and the costs associated with the additional medical visit.

Revised Rabies Postexposure Prophylaxis Recommendations

This report presents revised recommendations for human rabies PEP (Table 3). Rabies PEP includes wound care and administration of both RIG and vaccine.

Postexposure Prophylaxis for Unvaccinated Persons

For unvaccinated persons, the combination of RIG and vaccine is recommended for both bite and nonbite exposures, regardless of the time interval between exposure and initiation

TABLE 2. Number and percentage of patients with suspected rabies exposures who received <5 doses of vaccine — India, 2003; New York, 1998–2000; and Puerto Rico, 2008*

Location (year)	No. of persons exposed	Persons who received <5 doses of vaccine		No. of documented rabies deaths
		No.	(%)	
New York (1998–2000)†	1,132	147	(13)	0
India (2003)§	439	261	(59)	0
Puerto Rico (2008)¶	191	30	(16)	0

* No cases of human rabies were recorded that were attributable to receipt of only 4 doses of vaccine.

† **SOURCE:** CDC, unpublished data, 2003.

§ **SOURCE:** Association for the Prevention and Control of Rabies (APCRI) in India. Assessing the burden of rabies in India: WHO sponsored national multicentric rabies survey 2003. Final report May 2004. Available at http://rabies.org.in. Accessed March 8, 2010. Sudarshan MK, Madhusudana SN, Mahendra BJ, et al. Assessing the burden of human rabies in India: results of a national multi-center epidemiological survey. Intl J Infect Dis 2007;11:29–35.

¶ **SOURCE:** CDC, unpublished data, 2008.

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immediately and the second dose 3 days later. Administration of HRIG is unnecessary, and HRIG should not be administered to previously vaccinated persons to avoid possible inhibition of the relative strength or rapidity of an expected anamnestic response (*26*). Local wound care remains an important part of rabies PEP for any previously vaccinated persons.

Vaccination and Serologic Testing

Postvaccination Serologic Testing

All healthy persons tested in accordance with ACIP guidelines after completion of at least a 4-dose regimen of rabies PEP should demonstrate an adequate antibody response against rabies virus (*14*). Therefore, no routine testing of healthy patients completing PEP is necessary to document seroconversion (*12*). When titers are obtained, serum specimens collected 1–2 weeks after prophylaxis (after last dose of vaccine) should completely neutralize challenge virus at least at a 1:5 serum dilution by the rapid fluorescent focus inhibition test (RFFIT). The rabies virus-neutralizing antibody titers will decline gradually since the last vaccination. Minimal differences (i.e., within one dilution of sera) in the reported values of rabies virus-neutralizing antibody results might occur between laboratories that provide antibody determination using the recommended RFFIT. Commercial rabies virus antibody titer determination kits that are not approved by the Food and Drug Administration are not appropriate for use as a substitute for the RFFIT. Discrepant results might occur after the use of such tests, and actual virus-neutralizing activity in clinical specimens cannot be measured.

Management of Adverse Reactions, Precautions, and Contraindications

Management of Adverse Reactions

Recommendations for management and reporting of vaccine adverse events have not changed. These recommendations have been described in detail previously (*12*).

Immunosuppression

Recommendations for rabies pre- and postexposure prophylaxis for persons with immunosuppression have not changed. General recommendations for active and passive immunization in persons with altered immunocompetence have been summarized previously (*27,28*). This updated report discusses specific recommendations for patients with altered immunocompetence who require rabies pre- and postexposure prophylaxis. All rabies vaccines licensed in the United States are inactivated cell-culture vaccines that can be administered safely to persons with altered immunocompetence. Because corticosteroids, other immunosuppressive agents, antimalarials, and immunosuppressive illnesses might reduce immune responses to rabies vaccines substantially, for persons with immunosuppression, rabies PEP should be administered using a 5-dose vaccine regimen (i.e., 1 dose of vaccine on days 0, 3, 7, 14, and 28), with the understanding that the immune response still might be inadequate. Immunosuppressive agents should not be administered during rabies PEP unless essential for the treatment of other conditions. If possible, immunosuppressed patients should postpone rabies preexposure prophylaxis until the immunocompromising condition is resolved. When postponement is not possible, immunosuppressed persons who are at risk for rabies should have their virus-neutralizing antibody responses checked after completing the preexposure series. Postvaccination rabies virus-neutralizing antibody values might be less than adequate among immunosuppressed persons with HIV or other infections (*29,30*). When rabies pre- or postexposure prophylaxis is administered to an immunosuppressed person, one or more serum samples should be tested for rabies virus-neutralizing antibody by the RFFIT to ensure that an acceptable antibody response has developed after completing the series. If no acceptable antibody response is detected after the final dose in the pre- or postexposure prophylaxis series, the patient should be managed in consultation with their physician and appropriate public health officials.

Variation from Human Rabies Vaccine Package Inserts

These new ACIP recommendations differ from current rabies vaccine label instructions, which still list the 5-dose series for PEP. Historically, ACIP review and subsequent public health recommendations for the use of various biologics has occurred after vaccine licensure and generally are in agreement with product labels. However, differences between ACIP recommendations and product labels are not unprecedented. For example, during the early 1980s, ACIP review and recommendations concerning the intradermal use of rabies vaccines occurred well in advance of actual label claims and licensing (*9*). On the basis of discussions with industry representatives, alterations of current product labels for HDCV and PCEC are not anticipated by the producers of human rabies vaccines licensed for use in the United States.

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☆U.S. Government Printing Office: 2010-623-026/41232 Region IV ISSN: 1057-5987

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The *MMWR* series of publications is published by Surveillance, Epidemiology, and Laboratory Services, Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, Atlanta, GA 30333.

Suggested Citation: Centers for Disease Control and Prevention. [Title]. MMWR 2010;59(No. RR-#):[inclusive page numbers].

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Rule: 32.3.2301

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Rule Title: CONTROL OF BIOLOGICS

Department: LIVESTOCK, DEPARTMENT OF
Chapter: DISEASE CONTROL
Subchapter: Control of Biologics

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Latest version of the adopted rule presented in Administrative Rules of Montana (ARM):

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32.3.2301 CONTROL OF BIOLOGICS

(1) In this sub-chapter "biologic" means a medicinal preparation made from living organisms and their products. It includes but is not limited to serums, vaccines, antigens, and antitoxins.

(2) No biologic may be brought into the state without a permit from the department of livestock as required by 81-2-703 , MCA. A long term permit may be granted upon request.

(3) No person may manufacture for sale, or sell, or offer for sale for use in the state of Montana, any biological product intended for diagnostic, immunizing or therapeutic purposes in animals unless such product is approved by and manufactured under a license issued by the U.S. department of agriculture, or unless upon specific permission in writing by the Montana department of livestock, animal health division.

(4) The distribution, sale or use of viable anthrax vaccines is prohibited except by permit from the state veterinarian of Montana.

(5) The sale of any rabies biologic except to a licensed veterinarian or public health agency is prohibited.

(6) All serums, viruses and vaccines sold or offered for sale in the state of Montana for use in domestic animals shall be kept in a dark place at a temperature of not more than 45°F, and not less than 35°F, until such time as they are sold, and shall not be sold after their expiration date. They must be sold in their original container.

History: Sec. 81-2-102, 81-20-101, MCA; IMP, Sec. 81-2-102, 81-20-101, MCA; Eff. 12/31/72; AMD, Eff. 11/4/75; AMD, 1980 MAR p. 1083, Eff. 3/28/80; AMD, 1984 MAR p. 267, Eff. 1/27/84; AMD, 1996 MAR p. 2300, Eff. 8/23/96.

Effective rule versions existed in ARM on or after March 31, 2007

MAR Notices	Effective From	Effective To	History Notes
	8/23/1996	Current	History: Sec. **81-2-102**, **81-20-101**, MCA; IMP, Sec. **81-2-102**, **81-20-101**, MCA; Eff. 12/31/72; AMD, Eff. 11/4/75; AMD, 1980 MAR p. 1083, Eff. 3/28/80; AMD, 1984 MAR p. 267, Eff. 1/27/84; AMD, 1996 MAR p. 2300, Eff. 8/23/96.

For questions regarding the content, interpretation, or application of a specific rule, please contact the agency that issued the rule. A directory of state agencies is available online at http://www.mt.gov/govt/agencylisting.asp.

For questions about the organization of the ARM or this web site, contact sosarm@mt.gov.

Montana Code Annotated 2011

37-18-102. Veterinary medicine defined. (1) A person is considered practicing veterinary medicine when the person does any of the following:

(a) represents to the public that the person is a veterinarian or is engaged in the practice of veterinary medicine in any of its branches, either directly or indirectly;

(b) uses words, titles, or letters in this connection or on a display or advertisement or under circumstances so as to induce the belief the person using them is engaged in the practice of veterinary medicine. This use is prima facie evidence of the intention to represent oneself as engaged in the practice of veterinary medicine in any of its branches.

(c) diagnoses, prescribes, or administers a drug, medicine, appliance, application, or treatment of whatever nature or performs a surgical operation or manipulation for the prevention, cure, or relief of a pain, deformity, wound, fracture, bodily injury, physical condition, or disease of animals;

(d) instructs, demonstrates, or solicits by a notice, sign, or other indication, with contract either express or implied, or otherwise, with or without the necessary instruments, for the administration of biologics or medicines or animal disease cures for the prevention and treatment of disease of animals and remedies for the treatment of internal parasites in animals;

(e) performs a manual or laboratory procedure on livestock for the diagnosis of pregnancy, sterility, or infertility for remuneration or hire;

(f) performs acupuncture, ova or embryo transfer, or dentistry on animals;

(g) instructs others, except those covered under the provisions of 37-18-104(4), for compensation, in any manner how to perform any acts that constitute the practice of veterinary medicine.

(2) Subsection (1)(e) may not in any way be construed to prohibit the pregnancy testing by any person of the person's own farm animals or by the person's employees regularly employed in the conduct of the person's business or by other persons whose services are rendered gratuitously.

(3) This section may not be construed as modifying, amending, altering, or repealing any part of 37-18-104.

History: (1)En. Sec. 9, Ch. 82, L. 1913; re-en. Sec. 3225, R.C.M. 1921; re-en. Sec. 3225, R.C.M. 1935; amd. Sec. 7, Ch. 90, L. 1955; amd. Sec. 1, Ch. 191, L. 1965; amd. Sec. 211, Ch. 350, L. 1974; amd. Sec. 7, Ch. 135, L. 1975; Sec. 66-2209, R.C.M. 1947; (2)En. Sec. 2, Ch. 191, L. 1965; Sec. 66-2209.1, R.C.M. 1947; (3)En. Sec. 3, Ch. 191, L. 1965; Sec. 66-2209.2, R.C.M. 1947; R.C.M. 1947, 66-2209(1), 66-2209.1, 66-2209.2; amd. Sec. 3, Ch. 43, L. 1985; amd. Sec. 1, Ch. 650, L. 1989; amd. Sec. 1382, Ch. 56, L. 2009.

State	Citation	Who May Administer the Vaccination	Specified Exemptions	Frequency of Vaccinations
Alabama	Code of Ala. § 3-7A-2 Alabama Administrative Code 420-4-4-.08	Rabies officer, his authorized representative, or any duly licensed veterinarian	With consent of owner a veterinarian may exempt an animal if medically necessary	Dogs, cats and ferrets at the age of three months and subsequently in accordance with the label of the vaccine used
Alaska	7 Alaska Admin. Code 27.022	By or under the direct supervision of a licensed veterinarian; Lay vaccinator qualified to administer the vaccine and approved by the Department		Dogs, cats and ferrets in accordance with the Compendium of Animal Rabies Prevention and Control
Arizona	A.A.C. § R3-2-409	Not specified		In accordance with the Compendium of Animal Rabies Prevention and Control
Arkansas	Arkansas Code Title 20 Public Health and Welfare §20-19-302 Code of Arkansas Rules and Regulations 007 00 CARR 025	Licensed veterinarian or agent of the Department of Health		Initial vaccination for dogs and cats at 4 months and older. Revaccinations during the twelfth (12) month after initial vaccination. Thereafter, the interval between revaccinations should conform to the Compendium of Animal Rabies

				and Control
California	17 CCR 2606.4 Cal Health & Safety Code § 121690 Cal Food & Agr Code § 30801 California Compendium Of Rabies Control And Prevention, 2004	Licensed veterinarians	A rabies immunization exemption may be issued for a dog whose life would be endangered due to disease or other considerations if the dog received the vaccine, as determined by a licensed veterinarian, on an annual basis.	Dogs must be vaccinated at four months and revaccinated one year later and then at least once every three years in accordance with the type of vaccine used
Colorado	C.R.S. 25-4-607 6 CCR 1009-1, Regulation 8	Licensed veterinarians	A veterinarian with owner consent may exempt an animal from a rabies vaccination if the rabies inoculation is contraindicated due to the animal's medical condition	Dogs, cats and ferrets in accordance with the Compendium of Animal Rabies Prevention and Control
Connecticut	Conn. Gen. Stat. § 22-339b	Licensed veterinarians	When a licensed veterinarian has examined the animal and determined that a rabies vaccination would endanger the animal's life due to disease or other medical considerations	Dogs and cats 3 months of age or older. Animals vaccinated prior to one year of age must receive a booster vaccination one year after the initial vaccination. Animals shall then be vaccinated every 3 years thereafter

Delaware	3 Del. C. § 8204	Veterinarians		Dogs, cats and ferrets at 6 months of age and subsequently according to the label on the vaccine used
District of Columbia	CDCR 24-901 D.C. Code § 8-1803	Licensed veterinarians		Dogs at 3 months of age. Cats at 4 months of age. Dogs must be revaccinated annually
Florida	Fla. Stat. § 828.30	Licensed veterinarians	If a licensed veterinarian has determined that vaccination would endanger the animal's health because of its age, infirmity, disability, illness or other medical consideration, the animal may be exempt from vaccination requirements	Dogs, cats and ferrets at 4 months of age with a booster shot 12 months later. Thereafter the intervals between vaccinations must comply with the label of the vaccine used
Georgia	Ga. Comp. R. & Regs. r. 40-13-2-.18 O.C.G.A. § 43-50-3 O.C.G.A. § 31-19-5	Licensed veterinarians		It is up to the county boards of health to promulgate rules regarding rabies vaccinations. For dogs, cats and ferrets being imported into the state, they must be vaccinated at 12 weeks in accordance with the Compendium of Animal Rabies Prevention and

				Control
Hawaii	Code of Hawaii Rules § 4-29-8	No specific provision found		All dogs and cats 90 days or older entering the state must be vaccinated
Idaho	Idaho Code Annotated §25-2801 & §25-2803	Under the direct supervision of a veterinarian according to Idaho Rabies Control Protocol and subject to county license requirements		Dogs, cats and ferrets older than 3 months with booster one year later and then according to the Compendium of Animal Rabies Prevention and Control
Illinois	Illinois Statutes Chapter 510/8 8 Illinois Administrative Code §30.90	Licensed veterinarians	An animal is exempt from vaccination requirements if a licensed veterinarian determines in writing that a rabies inoculation would compromise the animal's health	Dogs at 4 months with a booster shot 12 months later. Subsequent vaccine administration and duration of immunity must be in compliance with USDA licenses of vaccines used
Indiana	Indiana Administrative Code 345 IAC 1-5-1	Licensed veterinarians		Dogs, cats and ferrets at 3 months of age. Ferrets must be revaccinated annually and dogs and cats must be revaccinated in accordance with the label on the vaccine used
Iowa	Iowa Annotated Statutes §351.33	Licensed veterinarians		Dogs at 6 months of age. Revaccination according to the

	§351.35 and Iowa Administrative Code §21-64.25			Compendium of Animal Rabies Prevention and Control
Kansas	Kansas Statutes §21-1213	Licensed veterinarians and those acting under the direct supervision of a licensed veterinarian		Not found
Kentucky	Kentucky Statutes Title XXI §258.015 and Kentucky Administrative Regulations 902 KAR 2:070	Licensed veterinarians in accordance with the manufacturers instructions		Dogs, cats and ferrets at 4 months and revaccinated 1 year after the initial vaccination. Thereafter dependent upon the type of vaccine administered. as certified by the veterinarian
Louisiana	Louisiana Administrative Code Title 51 Part III §103	Licensed veterinarians		Dogs, cats and ferrets at 3 months. Revaccination 12 months later and subsequently in accordance with the vaccination used
Maine	Maine Statutes Title 7 §3916 and Code of Maine Rules 1-144-260	Licensed veterinarian or under the direct supervision of a licensed veterinarian	Dogs and cats may be exempt from vaccination requirements if a medical reason exists and an owner has a written statement signed	Cats at 3 months, dogs at 6 months. Cats must be revaccinated one year after the initial vaccination and then according to the type of vaccine used.

			by a licensed veterinarian.	Dogs must be revaccinated according to the type of vaccine used
Maryland	Code of Maryland §18-318, §18-319	Licensed veterinarians or under the direct supervision of a licensed veterinarian		Dogs, cats and ferrets at 4 months. They must be revaccinated according to the label on the vaccine used
Massachusetts	Annotated Laws of Mass. Ch. 140, § 145B Code of Mass. Regs. 330 CMR 10.02 & 105 CMR 330.100	Licensed veterinarians or under the direct supervision of a licensed veterinarian		Dogs and cats at 6 months. Revaccination between 9 and 12 months from the initial vaccination and then subsequently according to the vaccine used
Michigan	Mich. Compiled Laws §287.266 and §287.892	No specific law found		First vaccination for dogs by 4 months of age. Ferrets at 12 weeks of age
Minnesota	Minnesota Administrative Code 1705.1145	Licensed veterinarians or under the supervision of a veterinarian		Revaccination in accordance with the vaccine used
Mississippi	Mississippi Code §41-53-1,5	Licensed veterinarians or other competent person granted a permit to administer vaccine by the state board of health		Dogs and cats at 3 months and thereafter as required by the State Board of Health
Missouri	Missouri	Licensed		No specific law

	Statutes §322.090 Missouri Code 20 CSR 2270-4.031	veterinarians		found
Montana	Administrative Rules of Montana §32.3.213	Licensed veterinarians		Dogs and cats entering the state must be vaccinated by 3 months
Nebraska	Nebraska Statues §71-4402 Nebraska Administrative Code 180-004.04	Licensed veterinarians		Dogs and cats at 3 months of age with a booster shot one year later and then revaccinated every three years
Nevada	Nevada Revised Statutes § 441A.410 Nevada Administrative Code §441A.435, §441A.430	Not specified	A licensed veterinarian may exempt a dog, cat or ferret from vaccination for health reasons	Dogs and cats every 3 years, ferrets annually
New Hampshire	New Hampshire Statutes §436:99, §436:100 New Hampshire Admin Rules §2112.02	Licensed veterinarian	A rabies immunization exemption may be issued, where illness or a veterinary medical condition warrants, by the local rabies control authority upon the written recommendation of a licensed veterinarian	Dogs, cats, and ferrets at 3 months of age with a booster shot between 9 and 12 months after the initial vaccination. Subsequent boosters as outlined in the Compendium of Animal Rabies Prevention and Control
New Jersey	New Jersey Statutes §4:19-	Licensed veterinarians	Municipal dog licensing	Dogs and cats 3 months of age or

	15.2a Administrative Code §8:23A-4.1		officials shall grant an exemption for any dog that a veterinarian certifies in writing to be incapable of being inoculated because of infirmity, other physical condition, or regimen of therapy	older receiving their first known immunization have a 1 year duration of immunity. Animals between 3 and 6 months of age receiving a second or subsequent booster have a 1 year duration of immunity. Animals 6 months or older receiving 2nd booster – 1 or 3 years immunity depending on the vaccine used
New Mexico	New Mexico Statutes §77-1-3 Administrative Code § 7.4.2.8	By or under the supervision of a licensed veterinarian		Dogs and cats over 3 months and booster within 1 year of first vaccination. Annually or triennially thereafter depending upon vaccine used
New York	New York Consolidated Laws Public Health §2141, §2146* and Agr & M §109 *excludes New York City	Not specified	Vaccination requirements do not apply to dogs, cats and ferrets for which vaccination against rabies would adversely affect the animal's health, as determined by a licensed veterinarian	Dogs, cats and ferrets at 4 months of age with a second vaccination within one year of the first. Subsequent vaccination in accordance with the vaccine used
North	North Carolina	Licensed		Dogs, cats and

Carolina	General Statutes §130A-185 North Carolina Administrative Code §41G.0101	veterinarian Registered veterinary technician under the direct supervision of a licensed veterinarian Certified rabies vaccinator		ferrets at 4 months of age. Revaccination for dogs and cats one year later and then annually or triennially depending on the type of vaccine used When rabies vaccine is administered by a certified rabies vaccinator to a dog or cat, the dog or cat shall be re-vaccinated annually
North Dakota	North Dakota Century Code §23-36-01	No specific law found		In accordance with the Compendium of Animal Rabies Prevention and Control
Oklahoma	Oklahoma Statutes §1-508 Oklahoma Administrative Code §310:599-3-9.1, and §775:10-7-9.1	Licensed veterinarian Registered veterinary technician under the general supervision of a licensed veterinarian		Dogs, cats and ferrets at 4 months and at regular intervals thereafter according to the vaccine used
Oregon	Oregon Revised Statutes §433.365 Oregon Administrative Rules	Licensed veterinarian Veterinary technician under the direct supervision of	Exemptions are provided for dogs brought temporarily into the state for periods of less than 30 days and kept under	Dogs at least three months old shall be immunized against rabies by the age of six months in accordance with

	§333-019-0017	a licensed veterinarian In the case of a need to vaccinate and the lack of an available veterinarian, by another person approved for this purpose by the State Public Health Veterinarian.	strict supervision by their owners; dogs for which rabies immunization is contraindicated for health reasons, as determined by a licensed veterinarian; and dogs owned by dealers, breeders, or exhibitors exclusively for sale or exhibition purposes and confined to kennels except for transportation to and from dog shows or fairs	the Compendium of Animal Rabies Prevention and Control
Pennsylvania	Pennsylvania Statutes Title 3 Chapter 7A §455.8 Pennsylvania Rules Title 7 §16.41, §16.42, §16.43	Licensed veterinarian or under the supervision of a licensed veterinarian. Owners of State-licensed private or breeding kennels and operators of State-licensed nonprofit kennels who have been examined and certified by the department		Dog and cats at 3 months of age. Animals vaccinated under 1 year of age shall be revaccinated 1 year later on the anniversary of the original vaccination and then every 3 years if using a 3 year vaccine. Animals vaccinated over 1 year of age must be revaccinated every 3 years if using a 3 year

		may administer rabies vaccine to animals which are either owned by the private or breeding kennel or which are in the possession of the nonprofit kennel		vaccine
Rhode Island	General Laws of Rhode Island § 4-13-31 Code of Rhode Island Rules 12.020.036 §4.00 - §6.00	Licensed veterinarians or by or under the direct supervision of a licensed veterinarian		Dogs, cats and ferrets between 3 and 4 months of age with a one year booster shot. Subsequent vaccinations in accordance with the Compendium of Animal Rabies Prevention and Control
South Carolina	South Carolina Code of Laws Rabies Control Act §47-5-10 through §47-5-210 Vaccination Requirements: §47-5-60	Not specified		At a frequency to provide continuous protection of the pet from rabies using a vaccine approved by the South Carolina Dept. of Health & Environmental Control and licensed by the United States Department of Agriculture
Tennessee	Tennessee Code Annotated § 68-8-103. Tennessee	Licensed veterinarians or under the supervision of a licensed veterinarian		Dogs by 3 months and cats by 6 months of age with a one year booster vaccination.

	Rules & Regulations §1200-14-01-.32, §1200-14-01-.33			Subsequent vaccinations in one or three year intervals in accordance with the specific vaccine used
Texas	Texas Statutes Title 10 §826.021, §826.023 Texas Administrative Code § 169.29	Licensed veterinarians or under the direct supervision of a licensed veterinarian		Dogs and cats at 4 months. The veterinarian has discretion on subsequent vaccinations as long as the due date does not exceed recommended intervals for booster vaccination as established by manufacturers or any local ordinance requirements
Utah	Utah Administrative Code § R386-702-6	Licensed veterinarian or under the direction of a licensed veterinarian		In accordance with the Compendium of Animal Rabies Prevention and Control
Vermont	Vermont Statutes Title 20 Part 8 §3581 Code of Vermont Rules §20-022-018	Licensed veterinarian or under the direct supervision of a licensed veterinarian	An animal may be exempt from vaccination requirements if in the judgment of the veterinarian the animal's medical condition would prevent the development of adequate immunity to rabies. Animals so exempted	Dogs, cats, and ferrets prior to 4 months. Thereafter in accord with manufacturers recommendations

			must be inoculated against rabies as soon as their medical condition permits	
Virginia	Code of Virginia § 3.2-6521 §3.2-6525	Licensed veterinarian Veterinary technician under the immediate and direct supervision of a licensed veterinarian	The Board of Health may grant an exemption from vaccination requirements if the animal suffers from an underlying medical conditions likely to result in a life-threatening result	Initial vaccination for dogs & cats 4 months of age & older. Then subject to local ordinance
Washington	Washington Administrative Code §246-935-050	Licensed veterinarian Veterinary technician under indirect supervision Unregistered assistants under direct supervision of a veterinarian or licensed veterinary technician.		Not specified
West Virginia	Code of West Virginia §19-20A-2	Licensed veterinarian or his or her assistant. If there is no licensed veterinarian practicing in the county, a		Dogs and cats by six months with a booster shot after one year. Subsequent vaccinations every 3 years

		qualified person may be appointed by the county health department to administer vaccinations		
Wisconsin	Wisconsin Statutes §95.21	Licensed veterinarian Veterinary technician if a veterinarian is physically present at the location the vaccine is administered	A city, village, or town may exempt the owner of a dog from the requirement to have the dog vaccinated against rabies for a year based on a letter from a veterinarian stating that vaccination is inadvisable because of a reaction to a previous vaccination, a physical condition, or a regimen of therapy that the dog is undergoing	Dogs at 5 months of age with a one year booster vaccination and then triennially thereafter

Source: Staff research, AVMA State Legislative and Regulatory Department
Contact: Tara Southwell, State Policy Analyst, AVMA State Legislative and Regulatory Department, 847-285-6779

Alabama,	Dog, Cat, Ferret - 3 months old
Alaska,	Compendium of Animal Rabies Prevention and Control
Arizona,	Local enforcement
Arkansas,	Dog, Cat - 4 months old - in accordance with Compendium
California,	Dog - 4 months old - Compendium
Colorado,	Local enforcement - Compendium
Connecticut,	Dog, Cat - 3 months old
Delaware,	Dog, Cat, Ferret - 6 months old - Compendium
Florida,	Dog, Cat, Ferret - 4 months old - Compendium
Georgia,	Local enforcement - Compendium
Hawaii,	Rabies free - strict rabies vaccination regulations
Idaho,	Dog, Cat - 3 months old - Compendium
Illinois,	Dog - 4 months old
Indiana,	Dog, Cat, Ferret - 3 months old
Iowa,	Dog - 6 months old
Kansas,	Local enforcement
Kentucky,	Dog, Cat, Ferret - 4 months old - Compendium
Louisiana,	Dog, Cat, Ferret - 3 months old - Compendium
Maine,	Dog - 6 months, Cat - 3 months
Maryland,	Dog, Cat, Ferret - 4 months old
Massachusetts,	Dog, Cat - 6 months old
Michigan,	Dog - 4 months old
Minnesota,	Local enforcement - Compendium

Mississippi, Dog, Cat - 3 months old

Missouri, Local enforcement

Montana, Local enforcement

Nebraska, Domestic animals age as required in compendium, Local enforcement

Nevada, Dog, Cat - 3 months old, Ferret - annually, - Compendium

New Hampshire, Dog, Cat, Ferret - 3 months old - Compendium

New Jersey, Dog - 7 months old

New Mexico, Dog, Cat - 3 months old - Compendium

New York, Dog, Cat, Ferret - 4 months old

North Carolina, Dog, Cat, Ferret - 4 months old - Compendium

North Dakota, Local enforcement - Compendium

Ohio, Local enforcement

Oklahoma, Dog, Cat - 4 months old

Oregon, Dog - 3 to 6 months old - Compendium

Pennsylvania, Dog, Cat - 3 months old

Rhode Island, Dog, Cat, Ferret - 3 months old - Compendium

South Carolina, Dog, Cat, Ferret - age as required in compendium

South Dakota, Local enforcement

Tennessee, Dog, Cat - 6 months old

Texas, Dog, Cat - 4 months old

Utah, Local enforcement

Vermont, Dog - 6 months old

Virginia, Dog, Cat - 4 months old

Washington, Dog, Cat, Ferret - age as required in compendium

West Virginia, Dog, Cat - 3 to 6 months old

Wisconsin, Dog - 5 months old

Wyoming, Local enforcement

District of Columbia, Dog, Cat - 4 months old

Guam, Dog, Cat - 3 months old

Code of Federal Regulations - Importing Dogs Dog 3 - months