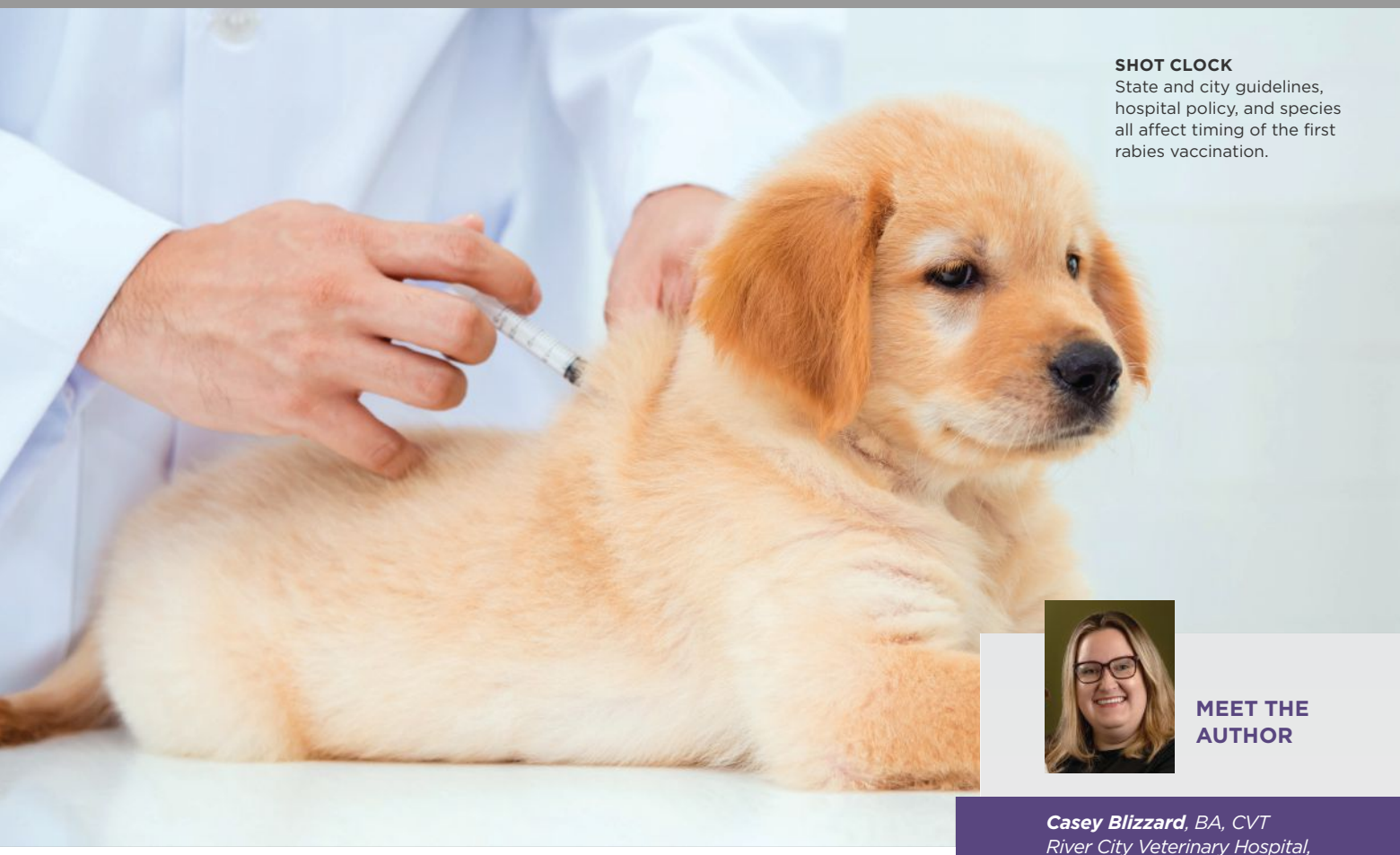

SHOT CLOCK
State and city guidelines, hospital policy, and species all affect timing of the first rabies vaccination.

MEET THE AUTHOR

***Casey Blizzard**, BA, CVT*
River City Veterinary Hospital, Meridian, Idaho

Casey first worked as a kennel attendant and then a veterinary assistant before attending veterinary technician school in 2007. She graduated from Boise State University in 2006 and Colorado Mountain College for Veterinary Technology in 2009. After teaching veterinary technology for 6 years, Casey moved back into private practice and is now the Practice Manager at River City Veterinary Hospital in Meridian, Idaho. She manages a team of around 40 and spends too much money on coffee. She believes that high emotional intelligence among veterinary professionals is the best way to preserve our passion and drive.

Rabies Vaccination for Dogs

As **veterinary nurses, taking part** in the everyday routine of vaccine appointments can sometimes seem boring and dull. Working with vaccines rarely involves the critical thinking of anesthesia or surgery, the skill of radiology, or the adrenaline of emergency and critical care.

all_about_people/shutterstock.com

I would argue, however, that preventive medicine is the most important thing that veterinary nurses can contribute to the long-term care of our patients. Pair the ability to educate clients about prophylaxis in a positive and understandable way with the skill to prevent disease with an injection and you will find nothing insignificant about these routine procedures. Do you have a client traveling with a dog overseas or to Hawaii? You can facilitate the process for that client. Educating clients and vaccinating their pets can be fun and can enhance the lives of our patients.

Vaccinating animals against rabies takes on special importance because rabies is a zoonotic disease (i.e., can spread from animals to people) and is almost always fatal.[1] Fortunately, most veterinary nurses will never see a companion animal infected with rabies because the infection rate among domestic animals is low. In the United States in 2018, according to the Centers for Disease Control and Prevention, 63 dogs and 241 cats were reportedly positive for rabies.[2] However, among wild reservoir animals (especially bats, raccoons, skunks, and foxes), levels of the virus remain high. Although rabies continues to be a danger to people around the world, rabies in the United States is controlled through vaccination of pets.

THE DISEASE

Rabies virus causes acute encephalitis that can affect any mammal. The virus causes sudden and progressive brain and spinal cord inflammation.[3] The virus is primarily spread by contact with the saliva or (more rarely) nervous tissue from an infected animal. It is usually transmitted by bites when saliva from the infected animal comes in contact with broken skin or mucous membranes (e.g., eyes, nose, mouth).[2] Infection with rabies virus progresses in 3 phases: prodromal, excitative, and dumb/paralytic.

Prodromal Phase: This initial phase lasts 2 to 3 days and can cause a typically friendly animal to isolate itself and/or become irritable. The animal may or may not become febrile.

Excitative Phase: The excitative phase, also called the furious stage, lasts 3 to 4 days. During this phase, the animal may be hyperreactive and may bite at anything near it. An inability to swallow can cause saliva to foam at the mouth.

Paralytic/Dumb Phase: During this phase, progressive paralysis will limit the animal's ability to move; saliva often drips continually out of the mouth. Eventually, the animal will become completely paralyzed and comatose and will die.

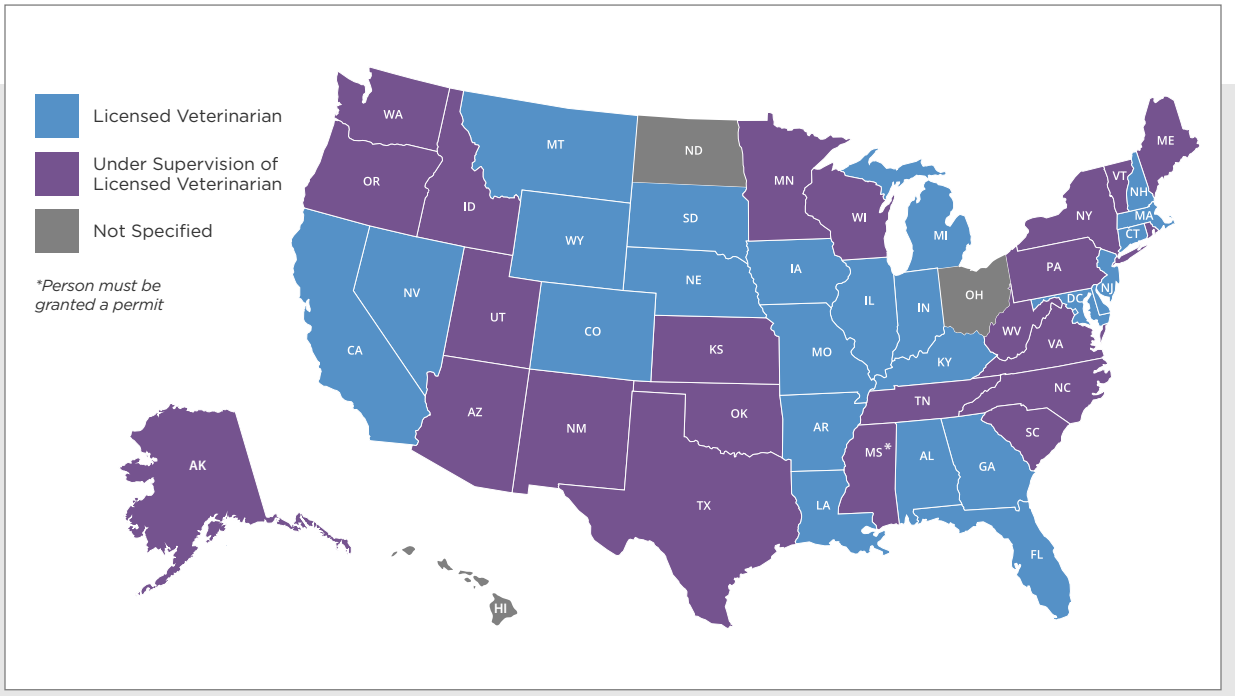

FIGURE 1. Who can administer rabies vaccine, by U.S. state.

For animals exposed to the rabies virus, there is no treatment for clinical disease; the death rate approaches 100%.

- If an unvaccinated animal has been exposed to the virus, the recommended action is immediate euthanasia. Another option is strict quarantine and isolation for 6 months (180 days). If healthy, the animal should be vaccinated 1 month before release from quarantine.
- If a vaccinated animal has been exposed, it should be revaccinated immediately and quarantined and observed for 45 days.[3]

RABIES VACCINE FOR DOGS

How It Works

Rabies vaccines are killed vaccines, which means that the strain of rabies virus used in the vaccine has been inactivated and cannot cause disease. The body's immune response to the vaccine is antibody production. Should the animal later be exposed to the virus, these antibodies will quickly recognize and bind to the virus before it can replicate enough to cause clinical signs.

Who Can Administer

Whether a veterinary nurse can administer rabies vaccine to animals depends on individual state regulations. The Veterinary Practice Act in your state will indicate which member of the veterinary team is allowed to administer the vaccine. For example, the author's home state of Idaho allows a credentialed veterinary technician to legally administer rabies vaccines under the direct supervision of a veterinarian. Direct supervision is defined as having the veterinary supervisor on the premises and easily available. Some states, however, require that only a licensed veterinarian can perform the vaccination. **FIGURE 1** shows state requirements on a map, and **avma.org/sites/default/files/2020-09/rabies_chart.pdf** shows them in chart form with additional information.

How to Administer

The rabies vaccine can be given subcutaneously or intramuscularly, depending on the species. Although this article focuses on dogs, it is worth mentioning that the vaccination site for cats is important because rabies vaccination can lead to sarcoma formation. Per American Veterinary Medical Association vaccine guidelines, the injection should be given as distally as possible in the right rear leg of cats,[4] so that should a tumor form, it can be removed by limb amputation.

When to Administer

Timing of the first rabies vaccination depends on state and city guidelines, hospital policy, and species. For dogs, it is typically first administered to puppies 12 to 16 weeks of age and then repeated in 1 year. Some vaccines are approved for subsequent 1-year use and some for 3-year use. However, regardless of the age of the patient or labeled vaccine duration, the first 2 vaccinations must be 1 year apart. Check your individual hospital protocol, local ordinances, and vaccine manufacturer to determine an appropriate rabies vaccine schedule for dogs in your practice.

Adverse Reactions

Allergic reactions to rabies vaccines fall into 2 categories, local and systemic, and can range from mild to severe.

Local site reactions cause redness, swelling, pain, and inflammation in the area of injection. These reactions are managed with rest, antihistamines, pain medication, ice packs, monitoring, and possibly benign neglect.

Systemic reactions, less common than local reactions, can be life-threatening. Patients may experience facial swelling, vomiting, diarrhea, and/or lethargy, and the reaction may escalate to full anaphylaxis. Treatment includes antihistamines, steroids, fluid therapy, pain management, and monitoring. The attending veterinarian will decide if this animal is able to receive a vaccine again in the future. To prevent additional reactions, the veterinarian may choose to administer antihistamines as pretreatment to patients that have previously experienced systemic reaction. All vaccine reactions should be reported to the vaccine manufacturer and to your state veterinary board. Vaccine reaction tracking is crucial for identifying possible contamination, bad batches and lot numbers, and for protecting future patients.

Use of Rabies Titers

Titer testing measures the body's level of antibodies against a specific pathogen; in this case, the rabies virus. Titer testing is useful for animals that can no longer receive the vaccine because of a reaction, for those whose owners request it, and for those traveling

to other states or countries that require it. Titers can also be used to determine which animals may not need boosters as well as those that may need boosters more often than every 3 years. However, substitution of titers for boosters is not included in most state/municipality laws. In addition, the rabies titer that is considered protective has not been definitively established. For a disease with as much public health importance as rabies, using an accredited laboratory (e.g., Kansas State Veterinary Diagnostic Laboratory, ksvdl.org/rabies-laboratory) for titer testing is crucial.[5]

RABIES VACCINE FOR HUMANS

Rabies protection for humans is administered under 2 circumstances: before exposure (pre-exposure prophylaxis) and after exposure (postexposure prophylaxis).[1]

Pre-exposure Prophylaxis. Some veterinarians receive the rabies vaccine as pre-exposure prophylaxis while in veterinary school; however, veterinary nurses are often vaccinated only if they work in a rabies-endemic area, in animal control, in wildlife rehabilitation/medicine, or with rabies virus in a laboratory.[6] Also, if you are traveling to a country where rabies is widespread, you should consult your doctor about possibly receiving pre-exposure rabies vaccination.

Postexposure Prophylaxis. Postexposure prophylaxis for those who have never been vaccinated consists of a dose of human rabies immune globulin and a rabies vaccine administered on the day of exposure, followed by vaccine doses on days 3, 7, and 14.[7] Those who have been vaccinated or are currently receiving pre-exposure vaccine for rabies should receive only vaccine.[6]

CLIENT COMMUNICATION

Because rabies can affect people as well as animals and is often fatal for both, client education is crucial. However, many clients bring their pets for rabies vaccination only because it is mandated. Just because clients do not ask questions or voice concerns about the disease and its vaccine is not reason to avoid offering information. Here are some conversation starters.

Q: Who in your area is at risk for the virus?
A: All mammals.

Q: What is the wild animal reservoir for rabies and why should you care?
A: Wild animals may be infected with rabies, especially raccoons, foxes, skunks, and bats. These animals not only do not stay in natural areas, they are also often found close to human populations.

Q: What should you do if you find a dead wild animal?
A: Any wild animal found sick or dead from an unknown cause should be considered a potential hazard for rabies; local wildlife officials should be contacted for help with containment and testing.

Q: How do we control the spread of rabies to people and animals?
A: Through vaccination of companion animals and at-risk humans.

Be sure to ask clients if they have any questions or concerns. If their pet has just been vaccinated, be sure to advise them to watch for postvaccination site and systemic reactions; if suspected, call the clinic/hospital and come back or go to a local emergency veterinarian as needed.

Veterinary nurses contribute greatly to the success of rabies prevention. Often, the first time we see a new patient is for vaccination. Disease prevention through vaccination is a substantial part of patient health and wellness, as well as the One Health initiative. Your knowledge, working alongside veterinarians, will provide clients with the appropriate information required to protect your patients and the public against this preventable disease. TVN

References

1. Brown CM, Slavinski S, Ettestad P, et al. Compendium of animal rabies prevention and control, 2016. avmajournals.avma.org/doi/pdf/10.2460/javma.248.5.505. Accessed September 2020.
2. Centers for Disease Control and Prevention. Domestic animals. cdc.gov/rabies/location/usa/surveillance/domestic_animals.html. Accessed September 2020.
3. Rupprecht CE. Rabies in dogs. merckvetmanual.com/dog-owners/brain,-spinal-cord,-and-nerve-disorders-of-dogs/rabies-in-dogs. Accessed September 2020.
4. American Veterinary Medical Association. VAFSTF vaccine site recommendations. avma.org/vafstf-vaccine-site-recommendations. Accessed October 2020.
5. Gonzalez SE. Decoding vaccine titers: a literature-based review of vaccine titers in companion animal practice. *Today's Vet Prac* 2020;10(6):58-64.
6. Centers for Disease Control and Prevention. Preexposure vaccinations. cdc.gov/rabies/specific_groups/travelers/pre-exposure_vaccinations.html. Accessed October 2020.
7. Centers for Disease Control and Prevention. Rabies postexposure prophylaxis. cdc.gov/rabies/medical_care/index.html. Accessed October 2020.