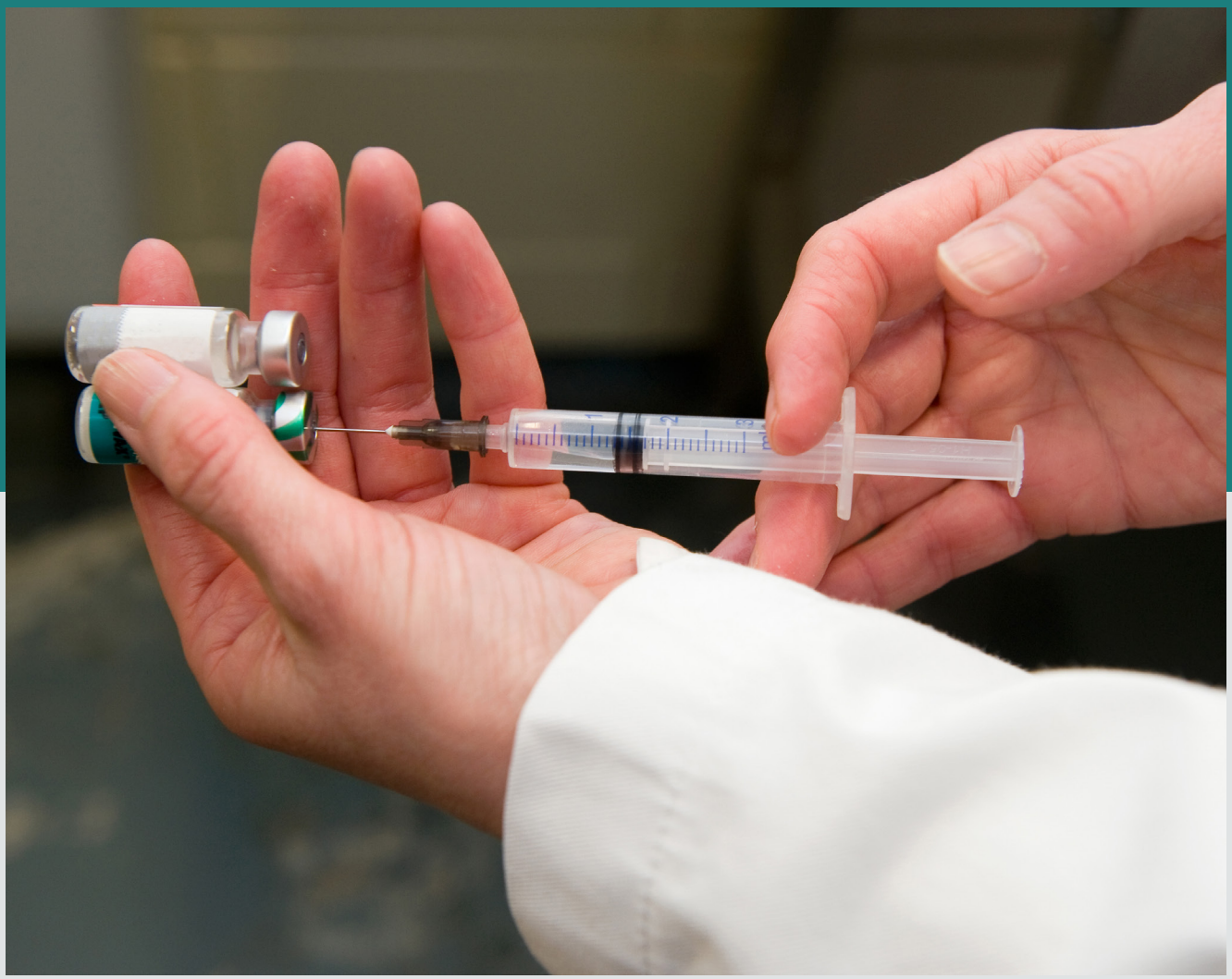
VetTechPrep

Canine and Feline Vaccines: A Guide for Vet Tech Students



If you plan on going into small animal practice, you need to be familiar with vaccines. While they may sound simple and straightforward on the surface, vaccines are an important service that we provide for our patients. Many diseases that once posed a significant threat to the health of our pets can now be prevented through vaccination.

While the decision of which vaccines to recommend for a particular patient is ultimately up to the veterinarian, it's important for you to have an understanding of these vaccines so that you can perform risk assessments and aid in the development of vaccine protocols. Additionally, proper vaccine handling and client education pay a significant role in the health of your patients.

Canine Vaccines

Dogs receive two core vaccines: rabies and DAP/DAPP. Additionally, there are a number of non-core vaccines that may be administered depending on the patient's lifestyle. These vaccines can be summarized as follows:

Vaccine	Indications	Puppies (< 16 weeks)	Adults (>16 weeks)	Additional Comments
Distemper, adenovirus, parvovirus, +/- parainfluenza (DAP, DAPP)	Core	Begin as early as 6 weeks of age; repeat q2-4wks until 16 weeks of age; booster in 1 year, then q3yrs	One vaccine is protective, consider repeating in 2-4 weeks if high risk;[1] booster in 1 year, then q3yrs	Parainfluenza vaccine is not core but is included in the DAPP vaccine. If a dog is overdue for vaccination, see label or AAHA guidelines for guidance.[1]
Rabies	Core	Single dose at 12-16 wks of age; booster in 1 year, then q1-3yrs (depending on state/local law)	Single dose; booster in 1 year, then q1-3yrs (depending on state/local law)	Legal requirements dictate frequency of vaccine boosters, as well as protocols for pets that are overdue for vaccination.
Bordetella (+/- parainfluenza)	Dogs with exposure to other dogs (e.g., boarding, grooming, dog parks, etc.)	*Intranasal:* Single dose as early as 3-4 wks of age; booster annually *Oral:* Single dose as early as 8 wks of age; booster annually *Injectable:* Two doses, 2-4 wks apart, starting as early as 8 wks of age; booster annually	*Intranasal/Oral:* Single dose; booster annually *Injectable:* Two doses 2-4 wks apart; booster annually	Boarding and grooming facilities may require boosters q6mos, although evidence supports annual vaccination for all vaccine formulations.[1]
Leptospirosis	Dogs at risk of coming in contact with the urine of wild animals or rodents	Two doses 2-4 wks apart, starting as early as 8-9 wks of age; booster annually	Two doses 2-4 wks apart; booster annually	Recommend 4-serovar vaccine for protection against *canicola, icterohaemorrhagiae, grippotyphosa*, and *pomona*. May be administered as a combination vaccine with DAPP
Lyme	Dogs living or traveling in Lyme-endemic areas	Two doses 2-4 wks apart, starting as early as 8-9 wks of age; booster annually	Two doses 2-4 wks apart; booster annually	Four vaccine types: killed whole cell bacterin (OspA), killed whole cell bacterin (OspA+C), recombinant OspA, chimeric- recombinant OspA+OspC

[1] Ford RB, et al. (2017). 2017 AAHA Canine Vaccination Guidelines. Retrieved from: https://www.aaha.org/globalassets/02-guidelines/canine-vaccination/vaccination_recommendation_for_general_practice_table.pdf

Vaccine	Indications	Puppies (< 16 weeks)	Adults (>16 weeks)	Additional Comments
Canine Influenza (H3N2, H3N8)	Dogs with high-risk exposure (e.g., boarding, grooming, dog parks, etc.)	Two doses 2-4 wks apart, starting as early as 6-8 wks of age; booster annually	Two doses 2-4 wks apart; booster annually	Dogs at risk of canine influenza should be vaccinated against both strains.Vaccinated dogs may still become infected, show clinical signs, and shed the virus.
Crotalus atrax (Western Diamondback Rattlesnake)	Dogs at high risk of rattlesnake exposure	According to label recommendations	According to label recommendations	Dosing and frequency vary based upon weight and exposure risk. Label instructions must be followed.

Feline Vaccines

Cats receive two core vaccines: FVRCP and rabies. Cats that spend time outdoors or may otherwise be exposed to feline leukemia should also receive the FeLV vaccine. These vaccines can be summarized as follows:

Vaccine	Indications	Kittens (< 16 weeks)	Adults (>16 weeks)	Additional Comments
Panleukopenia, herpesvirus, calicivirus (FVRCP)	Core	Begin as early as 6 weeks of age; repeat q3-4wks until 16-20 weeks of age; booster in 1 year, then q3yrs	Two doses 3-4 weeks apart; booster in 1 year, then q3yrs	Most FVRCP vaccines are given subcutaneously, but intranasal vaccines are also available.
Rabies	Core	Single dose at 12-16 wks of age; booster in 1 year, then q1-3yrs (depending on state/local law)	Single dose; booster in 1 year, then q1-3yrs (depending on state/local law)	Legal requirements dictate frequency of vaccine boosters and how to handle pets that are overdue for boosters.
Feline Leukemia (FeLV)	Recommended for all kittens; continue into adulthood if at-risk	Two doses 3-4 wks apart, starting as early as 8 wks of age; booster in 1 year, then q1-2yrs depending on risk	Two doses 3-4 wks apart; booster in 1 year, then q1-2 yrs depending on risk	All kittens should be vaccinated; they are at higher risk[2] and it can be difficult to predict which will eventually go outdoors.[3] Studies indicate that immunity may last for at least 2 yrs and vaccination q2-3yrs is sufficient.[4,5]

Performing Risk Assessments in Your Veterinary Patients

Vaccines are often divided into two categories: core and non-core. Core vaccines are those vaccines that are recommended for every member of a particular species. Non-core vaccines are vaccines that are only given to pets that are considered to be at risk of a particular illness. For example, a Lyme vaccine would be important for a hunting dog that lives in a Lyme-endemic area, but would not be recommended for an indoor-only dog that lives in an area where Lyme disease is very rare.

When a pet presents for preventive care, it's important to conduct a thorough risk assessment to determine which vaccines the pet needs.

For a canine patient, it's important to discuss:

- Contact with other dogs: does the dog go to a boarding facility, groomer, or dog park?
- Lifestyle: is the dog walked in a well-manicured backyard with pest control or in a wooded area with a high risk of ticks?
- Travel: does the dog remain within your geographic region or travel to other areas?

The only non-core vaccine that is recommended for cats is feline leukemia vaccination. Therefore, you should always ask cat owners whether the cat is an indoor cat or an outdoor cat. Be sure to ask at every visit, because this information can change over time! If an owner tells you that the cat lives indoors, take the time to ask a few more questions. More than one owner has said their cat lives indoors, thinking that's the "right" answer, only to later admit that their cat does sometimes go outside for brief periods of time and may interact with other cats during those brief outdoor forays! Also, even indoor cats should be vaccinated for feline leukemia if there is a leukemia-positive cat in the home or if the owner frequently fosters or takes in cats with unknown medical histories.

[2] Vogt AH, et al. (2010). AAFP–AAHA: Feline life stage guidelines. *J Feline Med Surg*, 12:43–54.
[3] Scherk M, et al. (2013). 2013 AAFP Feline Vaccination Advisory Panel Report. *Journal of Feline Medicine and Surgery*, 15:785–808. Retrieved from: https://journals.sagepub.com/doi/pdf/10.1177/1098612X13500429
[4] Jirjis F, et al. (2010). Protection against feline leukemia virus challenge for at least 2 years after vaccination with an inactivated feline leukemia virus vaccine. *Vet Ther*, 11:E1–6.
[5] Lutz H, et al. (2009). Feline leukaemia ABCD guidelines on prevention and management. *J Feline Med Surg*, 11:565–574.

Proper Vaccine Handling

It's important to handle vaccines carefully, in order to ensure that they maintain their efficacy. When vaccines are shipped to the clinic, they should arrive with ice packs and be cold. Check the temperature of the vaccines upon arrival; if they are not cold, contact the distributor as soon as possible.

Once you determine that the vaccines are at the correct temperature, move them to a refrigerator immediately. Keep in mind that the refrigerator door is often more susceptible to temperature fluctuations, so vaccines should be placed as close to the center of the refrigerator as possible.

Avoid reconstituting vaccines until it is time to administer them. Both the American Animal Hospital Association (AAHA) and the American Association of Feline Practitioners (AAFP) recommend that reconstituted vaccines be used as soon as possible, but no more than one hour after reconstitution.1,3 If you draw up vaccines before the veterinarian has completed an exam, you run the risk that the patient may not be healthy enough for vaccinations and the vaccines may not be administered.

When drawing up vaccines, you should always use a new needle and syringe. The vaccine label should be placed on the syringe, to minimize the risk of inadvertently administering an incorrect vaccine. If possible, change the needle on the syringe between drawing up the vaccine and administering the vaccine. While some practices may avoid this step, in order to control costs, it often makes vaccines significantly more comfortable for the patient! In general, vaccines should be administered using a 22g needle or 25g needle, keeping in mind that a smaller needle may be less painful but will require the patient to remain still for a longer period of time.

In many practices, there is a standard location in which each vaccine is typically given. If a patient returns with a localized vaccine reaction, standardized vaccine locations can make it easier to determine which vaccine was responsible for the reaction.

The AAFP recommends that feline vaccines be administered in the following locations:

- FVRCP vaccine: below the right elbow
- FeLV vaccine: below the left stifle
- Rabies vaccine: below the right stifle

Administering these vaccines distally will facilitate treatment in the rare event that the cat develops a vaccine-associated fibrosarcoma. Vaccine-associated tumors are not observed in dogs; therefore, there are no universal location recommendations for canine vaccines.

"Keep in mind that the refrigerator door is often more susceptible to temperature fluctuations, so vaccines should be placed as close to the center of the refrigerator as possible."

Vaccine Reactions

The overall incidence of vaccine reactions in veterinary patients is unknown, but appears to be low. A 2005 retrospective study, involving over one million vaccinated dogs, determined that the rate of vaccine reactions in dogs is approximately 0.3%.6 A 2007 study involving nearly half a million cats found a similar incidence of adverse reactions, with an estimated incidence of approximately 0.5%.7 In both dogs and cats, the risk of a vaccine reaction increases with the number of vaccines given in a single visit.[6,7]

Many pets experience a brief period of lethargy or malaise after vaccines. While owners often regard this as a vaccine reaction, it is actually an expected effect of an effective immune response. Just like we humans often feel "off" for a day or two after a flu vaccine, our pets often feel lethargic for a day or two after their vaccines. This is normal and not a cause for concern. In these cases, it's important to reassure owners that this is normal and not a contraindication to future vaccination.

True vaccine reactions, however, can be divided into two categories: local and systemic reactions.

1. Local Reactions

Most local reactions involve swelling that develops approximately one day post-vaccination. This swelling may last up to a week, then should begin to resolve.

If swelling persists for over a month, is increasing in size, or is over 2 cm in diameter, a biopsy is recommended, especially in cats. This biopsy can be used to rule out vaccine-associated fibrosarcoma, a feline tumor that is triggered by inflammation. The true incidence of vaccine-associated fibrosarcoma is unknown, but it is estimated to be in the range of 1 in 1,000 to 1 in 20,000 cats.[8]

[6] Moore, GE, et al. (2005). Adverse events diagnosed within three days of vaccine administration in dogs. *Journal of the American Veterinary Medical Association*, 227(7), 1102–1108.
[7] Moore, GE, et al. (2007). Adverse events after vaccine administration in cats: 2,560 cases (2002-2005). *Journal of the American Veterinary Medical Association*, 231(1), 94–100.
[8] Saba C. F. (2017). Vaccine-associated feline sarcoma: current perspectives. Veterinary medicine (Auckland, N.Z.), 8,13–20.

2. Systemic Reactions

The most serious vaccine reactions are Type I hypersensitivity reactions. Dogs with Type I hypersensitivity reactions typically develop facial swelling and urticaria, while cats are more likely to develop gastrointestinal signs. These reactions are treated with a combination of corticosteroids and antihistamines, although epinephrine may be required in severe cases. The doses and routes of administration of these medications will vary, depending on the severity of the reaction. Some pets may also require oxygen or even intubation. If a client calls with concerns that suggest a possible Type I hypersensitivity reaction, this is a true emergency and the pet needs to be seen by a veterinarian as soon as possible.

If a pet has a Type I hypersensitivity reaction to vaccines, this must be fully documented and the pet should be flagged as a "vaccine reactor" in the medical record. These pets will require special care for future vaccines. At a minimum, pets with a history of vaccine reactions should be pretreated and monitored closely in-hospital for all future vaccinations. Vaccine should also be split up, to limit the number of vaccines given at a single visit. Non-core vaccines should be re-evaluated, especially if clients can make lifestyle changes to minimize the risks associated with those diseases.

If a pet has a vaccine reaction that is so severe as to be potentially life-threatening, future vaccinations should be avoided if at all possible. In most states, these pets will still need rabies vaccines, but all other vaccines should be discontinued. Again, this will require owners to take other measures to decrease the risk of infectious disease, but many clients are willing and able to do so in order to avoid a potentially fatal reaction.

Final Reminders

While vaccines may seem like a routine activity that we do almost without thinking, it's important to be conscious of the indications and side effects of vaccinations. At each vaccine visit, perform a patient lifestyle assessment to ensure that you are administering the correct vaccines for the patient's risk factors, and review potential vaccine reaction risks with the pet's owner. Vaccines are an important component of preventive care and it's important to administer them in a way that maximizes benefits while minimizing harm.

About the Author

Cathy Barnette is a practicing small animal veterinarian, freelance writer, and contributor to VetPrep and VetTechPrep. She is passionate about both veterinary medicine and education, working to provide helpful information to veterinary teams and the general public. In her free time, she enjoys spending time in nature with her family and leading a Girl Scout troop.