

Dog Vaccinations: A Complete Guide

Adapted from article by Dr. Jennifer Coates

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Vaccinations are a vital part of preventative healthcare, especially for puppies. Not too long ago, the scourges of distemper and rabies, and more recently parvovirus, killed an untold number of dogs. Now, these diseases are almost entirely preventable when dogs receive vaccinations on an appropriate schedule.

As is the case with all medical treatments, there are potential downsides to vaccines. As a conscientious pet parent, it's important to understand the rationale behind when and why we give vaccines as well as the times when some vaccines are not needed. By doing so, you can work closely with your veterinarian to determine the best way to protect your dog against vaccine-preventable diseases.

How Do Vaccines Work?

Vaccines guard against disease by exposing pets to disease-causing microorganisms (in whole or in part) that have been inactivated or otherwise modified so they don't produce the disease in question. By introducing the dog to this controlled stimulus, the immune system can build a defense against future exposure.

What Vaccines Do Dogs Need?

Vaccinations are given to prevent disease, not to treat dogs once they are sick. A list of dog vaccines should be divided into two categories: core and noncore.

You are probably most familiar with core vaccines, the ones recommended for almost every pet. Core vaccines protect dogs from common and/or severe contagious diseases.

Core vaccines for dogs:

- Rabies – considered a core vaccine when required by law or wherever rabies is present
- Canine Distemper Virus (CFV)
- Canine Parvovirus (CPV or parvo)
- Canine Adenovirus-2 (CAV-2) – infectious hepatitis
- Non-core vaccines are not suitable for all pets. When deciding whether to give a dog a non-core vaccine, veterinarians consider the animal's age, environment, lifestyle and overall health.

Common non-core vaccines for dogs:

- Bordetella Bronchiseptica
- Leptospira
- Borrelia Burgdorferi – canine Lyme disease

- Canine Parainfluenza Virus (CPIV)
- Canine Influenza Virus-H3N8 (CIV or dog flu)
- Canine Influenza Virus-H3N2 (CIV or dog flu)
- Ideally, puppies should start receiving core and any necessary non-core vaccinations when they are 6-8 weeks of age. Booster shots usually are given at 3- to 4-week intervals until pups are 16-20 weeks old.

Common Dog Vaccinations

Rabies Vaccine

Rabies is a fatal, viral disease that attacks the central nervous system and usually is transmitted through the bite of an infected animal. Wildlife like coyotes, bats and skunks frequently are carriers of the virus.

Because there is no treatment available for rabies in dogs, prevention is critical. The rabies vaccine is a single dose given when the puppy is at least 12 weeks old in the state of Massachusetts. It is not legally required until the dog is six months old. A booster shot is required after one year. After that the vaccine is given every three years, but may need to be given sooner if the dog is bitten or receives a wound of unknown origin.

DAP Vaccine (Distemper, Adenovirus and Parvovirus)

The DAP combination shot immunizes dogs against canine distemper, canine adenovirus type 2 and canine parvovirus. All three diseases are serious and highly contagious.

- Distemper: This viral disease attacks the respiratory, gastrointestinal and nervous systems as well as the skin. Symptoms include lethargy, runny eyes and nose, loss of appetite, vomiting, diarrhea, thickened skin on the nose and footpads, coughing, difficulty breathing, seizures and paralysis.
- Adenovirus type-2: The canine adenovirus type 2 vaccine defends against a potentially fatal form of liver disease as well as a type of kennel cough.
- Parvovirus: Parvovirus results in vomiting, diarrhea, bone marrow suppression and, in some cases, heart failure. With severe infections, death is likely without aggressive treatment.

The initial DAP vaccine should be given to puppies when they are 6-8 weeks of age. Boosters are given every 2-4 weeks until the puppy is 16-20 weeks old. These boosters are essential or the immunity provided via the mother's milk may render the vaccinations useless. An additional DAP booster at 1 year of age also is needed.

After this point, the immunity provided by the vaccine lasts for at least three years in most cases. Boosters can be given on a three-year schedule, or vaccine titers (a check of distemper, adenovirus and parvovirus antibody levels) can be run and the vaccine given as needed. At this time, most regulatory agencies do not accept a rabies vaccine titer as a substitute for vaccination.

Kennel Cough and Flu Vaccinations (Bordetella Bronchiseptica, Canine Parainfluenza Virus, Canine Influenza Virus-H3N8 and Canine Influenza Virus-H3N2)

Kennel cough can have a variety of causes, including Bordetella bronchiseptica bacteria, parainfluenza virus, and/or adenovirus type-2. Canine flu, on the other hand, is only caused by influenza viruses, the two most common of which in dogs are influenza virus-H3N8 and influenza virus-H3N2. Infection with all of these microorganisms results in similar symptoms, including coughing, labored breathing, fever, decreased appetite, fever and nasal discharge.

Dogs who are stressed or regularly visit dog parks, daycares or boarding facilities especially are vulnerable to kennel cough and canine flu.

Vaccination schedules depend on the type of vaccine given and patient-specific parameters. For example, intranasal Bordetella vaccines can be given to puppies as young as 3-4 weeks of age and are effective after a single dose, while two doses of canine influenza vaccines are given 2-4 weeks apart in dogs 6-8 weeks of age or older. Boosters are generally given every 6-12 months depending on patient lifestyle.

Leptospirosis Vaccine

Leptospirosis is a disease caused by infection with Leptospira bacteria. Dogs generally come into contact with Leptospira when engaging in water-related activities near where infected animals have urinated. This includes swimming, but can also be transmitted by drinking from puddles and spending time near standing bodies of water. Leptospirosis is also a zoonotic disease, meaning that it can be spread from animals to humans.

Once in the body, Leptospira bacteria can cause poor appetite, digestive upset, fever, conjunctivitis and kidney and/or liver failure. It can be fatal, especially if not treated in a timely and aggressive manner.

Because of the serious and zoonotic nature of leptospirosis, it is recommended that most dogs that spend any time outdoors receive a leptospirosis vaccine. Your veterinarian will administer two initial vaccines 2-4 weeks apart once your dog is at least eight weeks old, plus annual boosters.

Lyme Disease Vaccine (Borrelia Burgdorferi)

Lyme disease is a tick-transmitted illness that can result in swollen lymph nodes, arthritis and sometimes kidney disease. In order for ticks to transmit Lyme disease, they must be attached to the dog for generally 36 to 48 hours. Not all dogs develop observable symptoms when infected.

Geography is a major consideration with this vaccine, as Lyme disease is most common in the Northeast, upper Midwest, Mid-Atlantic and along the Pacific coast. Tick prevention is the best defense against Lyme disease and other tick-borne illnesses. Lyme disease is endemic in our area, so is recommended in all dogs spending any time outdoors. Your veterinarian will give two initial vaccines 2-4 weeks apart once your dog is at least eight weeks old, plus annual boosters.

Q: What are the common side effects of vaccines for dogs?

A: Many dogs have no observable vaccine side effects. For those who do, it's rarely anything too serious. As with people, dogs might feel a little "off" after a vaccination. You may notice swelling or tenderness around the injection site. As long as you don't see any worsening symptoms and everything returns to normal in a few days, there's no need for alarm.

With intranasal injections, it's normal for dogs to experience a day or two of sneezing or a little coughing and a runny nose.

Allergic reactions to vaccines are rare but potentially serious. If you notice hives, itchiness, facial swelling, vomiting, diarrhea and/or difficulty breathing, call your veterinarian immediately.

Q: How effective are vaccines for dogs?

A: Vaccines cannot guarantee 100 percent protection to every animal, yet they play a vital role in disease prevention. Some dogs simply don't react to a particular vaccine as expected. This becomes more likely if they are sick or immunosuppressed. As previously noted, maternal antibodies can prevent a puppy's vaccine from taking full effect. Vaccines also can be damaged through improper storage or transport.

At the end of the day, vaccines offer huge benefits with few downsides. Potential side effects pale in comparison to the risks posed by the diseases they prevent. While vaccines aren't perfect, they are the best way to provide our dogs with the protection they deserve. So if your dog isn't up to date, call your veterinarian—and find out the best questions to ask when you're there.

Sample Vaccine/Heartworm Testing Schedule:

Age						
7-9 weeks	DHPP #1	KC 1y (oral)				
10-12 weeks	DHPP #2		Lepto #1			
13-16 weeks	DHPP 1y		Lepto 1y	Lyme #1		
18-20 weeks				Lyme 1y	Rabies 1y	
1 year	DHPP 3y	KC 1y (oral)	Lepto 1y	Lyme 1y	Rabies 3y	HWT
2 years		KC 1y (oral)	Lepto 1y	Lyme 1y		HWT
3 years		KC 1y (oral)	Lepto 1y	Lyme 1y		HWT
4 years	DHPP 3y	KC 1y (oral)	Lepto 1y	Lyme 1y	Rabies 3y	HWT