

# Vaccination Recommendations for Puppies (Puppy Shots)

*Drs. Foster & Smith Educational Staff*

The vaccination of puppies (puppy shots) is one of the crucial steps in assuring the puppy will have a healthy and happy puppyhood. The who, what, why, when, where, and how of vaccinations are complicated, and may vary from puppy to puppy. Always consult with your veterinarian to determine which vaccines are appropriate for your puppy. To better understand vaccines, it is important to understand how the puppy is protected from disease the first few weeks of its life.



Protection from the mother (maternal antibodies)

A newborn puppy is not naturally immune to diseases. However, it does have some antibody protection which is derived from its mother's blood via the placenta. The next level of immunity is from antibodies derived from the first milk. This is the milk produced from the time of birth and continuing for 36-48 hours. This antibody-rich milk is called [colostrum](#). The puppy does not continue to receive antibodies through its mother's milk. It only receives antibodies until it is two days of age. All antibodies derived from the mother, either via her blood or colostrum are called maternal antibodies. It must be noted that the puppy will only receive antibodies against diseases for which the mother had been recently vaccinated against or exposed to. As an example, a mother that had **NOT** been vaccinated against or exposed to parvovirus, would not have any antibodies against parvovirus to pass along to her puppies. The puppies then would be susceptible to developing a parvovirus infection.

Window of susceptibility

The age at which puppies can effectively be immunized (protected) is proportional to the amount of antibodies the puppy received from its mother. High levels of maternal antibodies present in the puppies' bloodstream will block the effectiveness of a vaccine. When the maternal antibodies drop to a low enough level in the puppy, immunization by a commercial vaccine will work.

The antibodies from the mother generally circulate in the newborn's blood for a number of weeks. There is a period of time from several days to several weeks in which the maternal antibodies are too low to provide protection against the disease, but too high to allow a vaccine to work. This period is called the window of susceptibility. This is the time when despite being vaccinated, a puppy or kitten can still contract the disease.

When should puppies be vaccinated?

The length and timing of the window of susceptibility is different in every litter, and even between individuals in a litter. A study of a cross section of different puppies showed that the age at which they were able to respond to a vaccine and develop protection (become immunized) covered a wide period of time. At six weeks of age, 25% of the puppies could be immunized. At 9 weeks of age, 40% of the puppies were able to respond to the vaccine. The number increased to 60% by 16 weeks of age, and by 18 weeks, 95% of the puppies were protected by the vaccine.

Almost all researchers agree that for puppies and kittens, we need to give at least three combination vaccinations and repeat these at one year of age.

Drs. Foster and Smith prefer to vaccinate puppies with a combination vaccine at six weeks of age initially, with boosters given every three weeks until the puppy is about sixteen weeks of age. We feel that this schedule will help protect the widest range of dogs. We realize that with our protocol, we will be vaccinating some dogs that are not capable of responding, and we will be revaccinating some dogs that have already responded and developed a protection. But without doing an individual test on each puppy, it is impossible to determine when the puppy's immune system will be best able to respond. We also realize that in the face of an infection, due to the window of susceptibility, some litters will contract a disease (e.g., parvo) despite being vaccinated. By using quality vaccines and an aggressive vaccination protocol, we can make this window of susceptibility as small as possible. Our vaccination protocol may not be right for every puppy. Some 'high risk' puppies may need a more intense and aggressive vaccination program. It is best to work with your veterinarian on a vaccination protocol that is best for your individual puppy or kennel, taking into consideration your individual situation.

Consult with your veterinarian to determine which vaccinations your puppy should receive, and how often.

Against which diseases should puppies be vaccinated?

The AVMA Council on Biologic and Therapeutic Agents' Report on Cat and Dog Vaccines has recommended that the core vaccines for dogs include [distemper](#), [canine adenovirus-2](#) (hepatitis and respiratory disease), [canine parvovirus-2](#), and [rabies](#).

Noncore vaccines include [leptospirosis](#), [coronavirus](#), canine parainfluenza and *Bordetella bronchiseptica* (both are causes of [kennel cough](#)), and *Borrelia burgdorferi* (causes [Lyme Disease](#)). Consult with your veterinarian to select the proper vaccines for your puppy.

Component	Class	Efficacy	Length of Immunity	Risk/Severity of Adverse Effects	Comments
<a href="#">Canine Distemper (MLV)</a>	Core	High	> 1 year for modified live virus (MLV) vaccines	Low	
Measles	Noncore	High in preventing disease, but not in preventing infection	Long	Infrequent	Use in high risk environments for canine distemper in puppies 4-10 weeks of age. Recombinant canine distemper vaccines are preferred over measles vaccines.
<a href="#">Parvovirus (MLV)</a>	Core	High	> 1 year	Low	
<a href="#">CAV-2 (MLV) for Hepatitis</a>	Core	High	> 1 year	Low	Only use canine adenovirus-2 (CAV-2) vaccines, not CAV-1; also protects against respiratory disease caused by CAV-2
<a href="#">Rabies</a>	Core	High	Dependent upon type of vaccine	Low to moderate	

<a href="#">Parainfluenza</a>	Noncore	Intranasal MLV - Moderate Injectable MLV - Low	Moderate	Low	Only recommended for dogs in kennels, shelters, shows, or those exposed to large numbers of other dogs.
<a href="#">Bordetella</a>	Noncore	Intranasal MLV - Moderate Injectable MLV - Low	Short	Low	Vaccinate within 6 months of exposure to large numbers of dogs (boarding, shows, etc.)
<a href="#">Leptospirosis</a>	Noncore	Variable	Short	High	Up to 30% of dogs may not respond to vaccine
<a href="#">Lyme</a>	Noncore	Appears to be limited to previously unexposed dogs; variable	Revaccinate annually just prior to tick season	Moderate	
<a href="#">Coronavirus</a>	Noncore	Low	Short	Low	Generally not recommended
<a href="#">Giardia</a>	Noncore	Low	Unknown	Low	Does not prevent infection but may reduce risk of transmission to others

MLV= modified live vaccine

A possible vaccination schedule for the 'average' dog is shown below.

<b>Dog Vaccination Schedule</b>	
<b>Age</b>	<b>Vaccination</b>
5 weeks	<b>Parvovirus:</b> for puppies at high risk of exposure to parvo, some veterinarians recommend vaccinating at 5 weeks. Check with your veterinarian.
6 & 9 weeks	<b>Combination vaccine*</b> without leptospirosis.
12 weeks or older	<b>Rabies:</b> Given by your local veterinarian (age at vaccination may vary according to local law).
12 & 15 weeks**	<p><b>Combination vaccine</b>  <b>Leptospirosis:</b> include leptospirosis in the combination vaccine where leptospirosis is a concern, or if traveling to an area where it occurs.</p> <p><b>Lyme:</b> where Lyme disease is a concern or if traveling to an area where it occurs.</p>
Adult (boosters)§	<p><b>Combination vaccine</b>  <b>Leptospirosis:</b> include leptospirosis in the combination vaccine where leptospirosis is a concern, or if traveling to an area where it occurs.</p> <p><b>Lyme:</b> where Lyme disease is a concern or if traveling to an area where it occurs.</p> <p><b>Rabies:</b> Given by your local veterinarian (time interval between vaccinations may vary according to local law).</p>

\*A combination vaccine, often called a 5-way vaccine, usually includes adenovirus cough and hepatitis, distemper, parainfluenza, and parvovirus. Some combination vaccines may also include leptospirosis (7-way vaccines) and/or coronavirus. The inclusion of either canine adenovirus-1 or adenovirus-2 in a vaccine will protect against both adenovirus cough and hepatitis; adenovirus-2 is highly preferred.

\*\*Some puppies may need additional vaccinations against parvovirus after 15 weeks of age. Consult with your local veterinarian.

§ According to the AVMA and AAHA, dogs at low risk of disease exposure may not need to be boosted yearly for most diseases. Consult with your local veterinarian to determine the appropriate vaccination schedule for your dog. Remember, recommendations vary depending on the age, breed, and health status of the dog, the potential of the dog to be exposed to the disease, the type of vaccine, whether the dog is used for breeding, and the geographical area where the dog lives or may visit.

**Bordetella and parainfluenza:** For complete canine cough protection, we recommend Intra-Trac II ADT. For dogs that are shown, in field trials, or are boarded, we recommend vaccination every six months with Intra-Trac II ADT.

#### Vaccine dose



It is NOT true that a small breed of puppy should receive a smaller vaccine dose than puppies of larger breeds. All puppies regardless of age, body weight, breed, and gender are given the same vaccine dose. Vaccines are generally administered in one milliliter (cc) doses. Simply follow the manufacturer's recommendations. To administer a lesser vaccine amount than recommended will likely result in insufficient immunity.

#### Time to produce protection

Vaccines do not stimulate immunity immediately after they are administered. Once a vaccine is administered, the antigens must be recognized, responded to, and remembered by the immune system. In most puppies, disease protection does not begin until five days post vaccination. Full protection from a vaccine usually takes up to fourteen days. In some instances, two or more vaccinations several weeks apart must be given to achieve protection. In general, modified live vaccines and those vaccines administered intranasally provide the fastest protection.

#### Why do some vaccinated animals still get the disease?

It is a fact that in the USA today, literally hundreds and perhaps thousands of vaccinated dogs and cats are still contracting the diseases they were vaccinated against. Some term this ' [vaccine failure](#),' although it is more likely a failure of the immune system to respond than a problem with the vaccine itself.

Parvovirus is a serious case in point. How can a puppy get the disease and possibly die if it was vaccinated? Unfortunately, for some reason the vaccine did not stimulate the immune system enough to protect the puppy from disease. The reason may be interfering maternal antibodies, the vaccines themselves, the dog's own immune system, or genetics. By far, the most common reason in puppies is interfering maternal antibodies.