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Parvovirus: Vaccination and Prevention

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It should not be too surprising that the biggest step in preventing parvovirus is vaccination. As discussed in other sections, the virus exists virtually everywhere. It is hardy in the environment and easily carried on the surfaces of inanimate objects. Every dog will be exposed and every puppy will be vulnerable at least for a time. Prevention is about minimizing exposure to the virus until the vaccination series is completed. We will discussing how to go about achieving immunity for your puppy.

Additional Resources

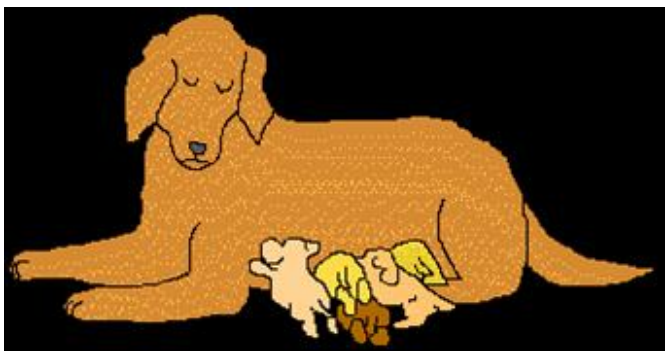
- Parvovirus: What is it?
- Parvovirus: Basic Virology
- Parvovirus: Disinfecting the Environment
- Parvovirus: How it Happens
- Parvovirus Infection: Physical Illness and Treatment
- Parvovirus Infection: Diagnosis
- Parvovirus: Caring for the Recovered Dog

Maternal Antibody: Our Biggest Obstacle in Vaccination

The biggest obstacle in protecting a puppy against this infection ironically stems from its own natural mechanism of protection. As mentioned, puppies obtain their immunity from their mother's first milk, the colostrum, on the first day of life. This special milk contains the mother's antibodies against all the infections she has experienced or been immunized against, parvovirus included, and until these antibodies wane to ineffective levels, they will protect the puppy.

The problem is that they will also inactivate vaccine.

Vaccine is a solution containing a harmless version of the virus, either live and weakened (attenuated or modified live virus vaccine) or killed (inactivated virus vaccine). This virus is injected into the puppy. If there is still adequate maternal antibody present, the vaccine virus will be destroyed just as if it were a real infection. There will be a period of about a week when there is not enough maternal antibody to protect the puppy but too much to allow a vaccine to work. (This period is called the window of vulnerability.) After this period, vaccine can be effective.



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To get around this, we vaccinate puppies in a series, giving a vaccine every 2 to 4 weeks until age 16 weeks. By giving vaccine at intervals we are trying to catch the puppy's immune system after their window of vulnerability has closed. We know that by age 16 weeks, we should be able to get a vaccine to take but we still begin at a younger age in an effort to provide immunization as soon as possible.

If the mother has been well-vaccinated (booster vaccine given at approximately the time of breeding so as to maximize her colostral antibodies), an extra dose at 20 weeks may be a good idea to be sure all the maternal antibodies have waned adequately.

After a puppy is born, maternal antibody levels drop by half approximately every 10 days. Puppies that were born first or were more aggressive at nursing on the first day will get more maternal antibody than their littermates. Mother dogs vaccinated at approximately the time of breeding will have the highest antibody levels to pass on to their puppies. Remember, the more maternal antibody a puppy has, the less likely a vaccine is to work and the longer one must wait for antibody to wane and for vaccination to be effective.

Should Live or Killed Vaccine Be Used?

Killed vaccine is the least effective at penetrating maternal antibody. It is also associated with more vaccine reactions since more stabilizing chemicals are used in a killed vaccine. As a general rule, live parvovirus vaccine is absolutely the way to go.

What is a High Titer Vaccine?

In the mid-1990s, a new innovation in parvo vaccination was developed: the high titer vaccine. The term high titer refers to the amount of virus in the dose of vaccine and means that there is a great deal more virus than in the vaccines that were standard at the time. Nowadays, any vaccine against parvovirus is going to be high titer. When the puppy is vaccinated, maternal antibody binds the virus present. When a high titer vaccine is used, there is still virus left over after all the maternal antibody has been used up. This extra virus can then stimulate the puppy's own immune system. High titer vaccines commonly produce full protection by age 12 weeks (though most experts recommend carrying vaccination out to age 16 weeks to be certain - an especially good idea for predisposed breeds such as the Rottweiler, Doberman pinscher, and American pit bull terrier).

At this point, virtually all commercially available live vaccines are of the high titer type.

It should be noted that giving vaccine more frequently than every 2 weeks will cause interference between the two vaccines and neither can be expected to be as effective as they normally would. This includes giving vaccines for different infections. Vaccines should be spaced 2 to 4 weeks apart.

It is commonly held that puppies need a certain number of vaccines for protection to be achieved (usually either three or four is the magic number). The number of vaccines given has nothing to do with protection. In order for protection to be achieved, vaccine must be given when it can penetrate maternal antibody.

A vaccine FAQ can answer common vaccination questions.

Vaccinating Adult Dogs

Traditionally, parvovirus vaccine has been administered annually to all dogs. Vaccine against canine parvovirus has been included in the distemper combination vaccine (the DHLPP, "6 in one," etc.)

There has also been some thought that annual vaccination is not necessary, especially for a disease where adult dogs are considered low risk. Many university teaching hospitals have switched to a 3-year schedule for adult dogs, plus the American Animal Hospital Association recommends that parvo vaccination be given to adult dogs on a 3-year schedule. There is still controversy regarding this practice and many hospitals continue to use the annual guideline as that is usually as far as formal vaccine challenge testing has gone. Do not be surprised if your veterinarian has chosen to follow the university and begins recommending a 3-year vaccination protocol for this virus.

Read the AAHA vaccination guidelines.

What is the Meaning of a Vaccine Titer?

A vaccine titer is a blood test that measures the antibody level a dog is carrying against a certain virus. There are two methods of measuring parvovirus antibody titer: hemagglutination inhibition and serum neutralization. The result obtained, expressed as a ratio, refers to how diluted the dog's serum (blood) must be for antibody to still be detectable. Based on work at Cornell University, the following titer levels are generally considered protective:

- Hemagglutination inhibition titer of 1:80 or more
- Virus neutralization titer of 1:20 or more

The virus neutralization titer is felt to be the most accurate representation of protection.

There is a great deal of controversy regarding whether or not a certain level of antibody can be considered tantamount to protection. Many veterinarians do not feel it is useful to run titers until this issue is resolved (i.e., there is more to protection than an antibody level; there is an entire immune system involved and there is no simple way to assess the entire immune system). Other veterinarians find it cost ineffective to recommend titers prior to vaccination; it costs a great deal more to run the titer than to simply give the vaccination. If the titer is adequate, the worst possible outcome is that the vaccine will be ineffective. Other veterinarians question whether or not it is harmless to annually give vaccinations when there is already adequate immunity. At this time there is no single answer to this issue and we recommend trusting your veterinarian's educated opinions regarding these issues.

Protection after Infection

A puppy that has recovered from a parvovirus infection can be expected to have strong immunity. This has been tested out to 20 months after infection and immunity is believed to be lifelong; because this is unproven, continued vaccination is commonly recommended.

Prevention by Environmental Control

Because of parvovirus, puppies should not be allowed out in the public world until their vaccine series has been completed. This means not going for walks or to the park and not socializing with other puppies. There is some controversy regarding socialization of young puppies if they are kept isolated in this way until age 16 weeks; however, from an infectious disease standpoint, this is the safest way to go. If the home has previously housed a parvo infected dog or puppy, disinfection (especially removing fecal matter) is paramount. By getting an older puppy whose vaccination series is already complete, you can avoid this entire issue.

Related resources

- Parvovirus: Basic Virology - *November 15, 2022*
- Parvovirus Infection: Physical Illness and Treatment - *May 4, 2022*
- Parvovirus in Dogs - *April 29, 2022*
- Parvovirus Infection: Diagnosis - *November 10, 2021*
- Parvovirus: How it Happens - *October 6, 2021*
- Parvovirus: Caring for the Recovered Dog - *May 5, 2021*
- Parvovirus: Disinfecting the Environment - You are being redirected to updated information on this topic - *September 30, 2015*