



Parvovirus



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Canine parvovirus disease is currently the most common infectious disorder of dogs in the United States.

'Parvo' is a highly contagious disease characterized by diarrhea that is often bloody and is caused by a pathogen called canine parvovirus, Type 2 (CPV-2). In 1980, the original strain of CPV-2 was replaced by CPV-2A and in 1986, another variation called CPV-2B appeared. Today, CPV-2B has largely replaced the previous strains as the most common isolate. Since all of these strains are similar, we will lump them together and refer to them as CPV-2 (parvo). There is currently some discussion that there may be other strains that are beginning to emerge and have yet to be formally identified. Current vaccinations have helped to control the spread of this disease but despite being vaccinated, some dogs still contract and die from parvo. There is much that we do not know about the virus or the best way to control the disease, but we are learning new information daily. Misinformation about the disease, its spread, and vaccination is widespread in both breeding and veterinary circles. We hope that with a better understanding of the disease, pet owners will be able to make good husbandry decisions that will help prevent and reduce the spread of this disease.

How is parvo spread?

CPV-2 is known to survive on inanimate objects - such as clothing, food pans, and cage floors - for 5 months and longer in the right conditions. Insects and rodents may also serve as vectors playing an important role in the transmission of the disease. All parvoviruses are extremely stable and are resistant to adverse environmental influences such as low pH and high heat. Exposure to ultraviolet light and sodium hypochlorite (a 1:32 dilution of household bleach - ½ cup bleach to 1 gallon of water) can inactivate parvovirus. The bleach solution can be impaired by organic matter and needs to have adequate exposure time and proper concentrations to work effectively. The normal incubation period (time from exposure to the virus to the time when signs of disease appear) is from 7-14 days. Active excretion of the virus in the feces can begin the third day after exposure, often before clinical signs appear, and may last for one to two weeks after the onset of the disease.

Symptoms

There is a broad range in the severity of symptoms shown by dogs that are infected with parvovirus. Many adult dogs exposed to the virus show very few if any symptoms. The majority of cases are seen in dogs less than 6 months of age, with the most severe cases seen in puppies younger than 12 weeks of age. There are also significant differences in response to CPV-2 infections and vaccines among different breeds of dogs, with Rottweilers, Doberman Pinschers, and

Labrador Retrievers being more susceptible than other breeds.

The most common form of the disease is the intestinal form known as [enteritis](#). CPV-2 enteritis is characterized by vomiting (often severe), diarrhea, dehydration, dark or bloody feces, and in severe cases, fever and lowered [white blood cell](#) counts. [Acute](#) CPV-2 enteritis can be seen in dogs of any breed, sex, or age. The disease will progress very rapidly and death can occur as early as two days after the onset of the disease. The presence of [gram negative](#) bacteria, parasites, or other viruses can worsen the severity of the disease and slow recovery.

Diagnosis

Not all cases of bloody diarrhea with or without vomiting are caused by Parvovirus and many sick puppies are misdiagnosed as having 'Parvo.' The only way to know if a dog has Parvovirus is through a positive diagnostic test. In addition to the more time consuming and expensive traditional testing of the blood for [titers](#), a newer and simpler test of the fecal matter with an enzyme-linked immunosorbent assay antigen test (ELISA) are also available through most veterinary clinics. Testing of all suspect cases of Parvo is the only way to correctly diagnose and treat this disease.

Treatment

The treatment of Parvovirus is fairly straightforward and directed at supportive therapy. Replacing fluids lost through vomiting and diarrhea is probably the single most important treatment. [Intravenous](#) administration of a balanced [electrolyte](#) solution is preferred, but in less severe cases, [subcutaneous](#) or oral fluids may be used. Antibiotic therapy is usually given to help control secondary bacterial infections. In cases of severe vomiting, drugs to slow the vomiting may also be used. After the intestinal symptoms begin to subside, a broad spectrum de-worming agent is often used. Restricting the food during periods of vomiting is also necessary. Undertaking the treatment of affected dogs and puppies without professional veterinary care is very difficult. Even with the best available care, the mortality of severely infected animals is high. Without the correct amount of properly balanced intravenous fluids, the chance of recovery in a severely stricken animal is very small.

Immunity and vaccination

If a puppy recovers from CPV-2 infection, it is immune to reinfection for probably at least twenty months and possibly for life. In addition, after recovery, the virus is not shed in the feces. There are many commercially prepared [attenuated](#) (modified) live CPV-2 vaccines available. Although some people have expressed concern about the possibility of attenuated live vaccines reverting to a virulent strain after being given and then causing disease, studies have repeatedly shown that this does not occur. Commercially prepared vaccines are safe and do not cause disease.

The primary cause of failure of canine parvovirus vaccines is an interfering level of maternal antibody against the canine parvovirus. Maternal antibodies are the antibodies present in the mother's milk during the first 24 hours after the puppy's birth.

The age at which puppies can effectively be immunized is proportional to the titer of the mother and the effectiveness of colostral transfer of maternal antibody within those first 24 hours. 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 complicating factor is that there is a period of time from several days to a couple weeks in which the maternal antibodies are too low to provide protection against the disease, but too high to allow the vaccine to work. This period is called the window of susceptibility. This is the time when despite being vaccinated, a puppy can still contract parvovirus. The length and timing of the window of

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susceptibility is different in every litter.

A study done in 1985 in a cross section of different puppies showed, that the age at which they were able to respond to a vaccine and develop protection 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, and by 18 weeks of age, 95% of the puppies could be immunized.

When we examine all of the information about maternal derived antibodies, windows of susceptibility, throw in breed susceptibilities, the possibility of unidentified strains, and the effectiveness of different vaccines, we begin to see why there are so many different vaccination protocols and why some vaccinated animals still develop the disease. Drs. Foster and Smith recommend a protocol that 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 high titer. But without doing an individual test on each puppy, it is impossible to determine where the puppy is in its immune status. We also realize due to the window of susceptibility, some litters will contract parvovirus despite being vaccinated. By using quality vaccines and an aggressive vaccination protocol, we can make this window of susceptibility as small as possible.

Conclusion

In summary, parvovirus is a very common problem that is a huge killer of puppies. Due to its ability to be transmitted through hands, clothes, and most likely rodents and insects, it is virtually impossible to have a kennel that will not eventually be exposed to the disease. [Modified live vaccines](#) are safe and effective, but despite the best vaccination protocol, all puppies will have a window of susceptibility of at least several days where they will be at risk. Using the newer high titer vaccines may shorten the window of susceptibility on many puppies. Prompt treatment by a veterinarian will increase survivability in infected puppies and working with your veterinarian on a vaccination program that is best for your puppy is important. As new information on this disease and vaccines become available, we will continue to update this article in hopes of keeping you as informed on Parvo as possible.

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