

## **Parvovirus Infection in Dogs**

Canine parvovirus (CPV) infection (sometimes called “parvo”) is a disease that struck the canine population in 1978. The classic signs are vomiting and bloody diarrhea. The virus has a selective effect on the most rapidly dividing cells of the body. For this reason, the lining of the small intestine and the cells of the bone marrow are most severely affected.

### **Contributing Factors**

Several factors contribute to the clinical course of parvovirus infection in dogs. These include stress, vaccination history, age of the dog, concurrent infection with other diseases or parasites, and breed of the dog. It is thought that breeds such as Rottweilers, Doberman pinschers, Pit Bulls, and German Shepherds may be the most susceptible. However any breed, including mixed breeds, can be infected with the virus. Dogs and puppies that have come from animal shelters, puppy mills and uninformed back yard breeders are commonly infected, regardless of the breed.

Parvoviral enteritis (intestinal inflammation) may affect dogs of all ages, but is most common in dogs less than one year of age. Young puppies less than five months of age are often the most severely affected and the most difficult to treat.

### **Prevalence**

Canine parvovirus has been reported to exist in approximately 50 different countries.

### **Causes/Transmission**

The causative agent of CPV disease is a very hearty virus. Unlike most other viruses, CPV is stable in the environment and is resistant to the effects of heat, detergents, and alcohol. CPV has been recovered from dog feces even after three months at room temperature. Since the virus is so resistant to decay, it can survive for long periods and be transmitted to any dog by simple contact with a contaminated object (called a “fomite”). Examples of fomites include shoes, clothing, play toys, insects, and feet of the infected dog.

Feces of the infected dog contain millions of viral particles. Susceptible dogs become infected by ingesting (swallowing) the virus. There does not have to be direct contact between the two dogs. Dogs that become infected with the virus and show clinical signs will usually become ill within 7-10 days of the initial infection.

### **Clinical Signs**

In a large percentage of dogs, there may be no signs at all; this is called an inapparent infection. These dogs are capable of shedding the virus in the feces. The dogs are most commonly unvaccinated older pups or adult dogs.

When signs are present, they may be variable, but generally take the form of severe vomiting and bloody diarrhea. Nausea and vomiting are usually the first sign to develop after infection. Diarrhea usually begins about 24 hours later and may or may not contain blood. Some dogs exhibit anorexia, depression, and fever.

Because the virus affects the rapidly dividing cells of the intestines, once it has killed all these cells, the virus no longer lives in the dog. It takes approximately 5-7 days for the cells to heal themselves after the virus has done its damage. The entire course of the disease usually lasts 5-7 days after signs are seen; however it is not uncommon for the puppy to remain sick from the effects of virus for up to 2 weeks.

### **Diagnosis**

The clinical signs of CPV infection can mimic other diseases causing vomiting and diarrhea. The positive confirmation of CPV infection requires the demonstration of the virus in the stool. The detection of virus in the stool is easily done and takes just a few minutes. This test can be performed in the veterinarian’s office. Occasionally, a dog will have parvovirus but test negative for virus in the stool. This usually happens early in the stage of the disease when the virus is affecting only the upper part of the stomach and intestine and has not reached the rectum to be shed in the feces. These dogs usually do not yet have diarrhea but are vomiting. They may or may not be “sick” yet. The classically bloody diarrhea will usually develop a few days later.

A presumptive diagnosis may be based on the presence of a reduced white blood cell count (leukopenia). The lack of white blood cells contributes to the chance of severe bacterial infections developing. Other blood tests may be abnormal too. They have low blood sugar (hypoglycemia), low blood albumin (the major protein in blood), and may be anemic. Anemia is common in dogs that also have intestinal parasites such as hook worms. Because these puppies have not received adequate vaccinations and puppy care, they are frequently infected with intestinal parasites in addition to parvo virus. They may also show signs of distemper, especially if they have been in an animal shelter.

## **Treatment**

Unfortunately, there is no specific antiviral therapy that will kill the virus once it infects a dog. Therapy focuses on treating the damage done by the virus. Since the lining of the intestine is compromised, diarrhea results. This leads to severe dehydration, loss of sodium and potassium, and may provide intestinal bacteria with access to the blood stream (septicemia). Dehydration and septicemia are the leading causes of death from the virus. Therefore, treatment involves aggressive intravenous fluid replacement, attention to electrolytes, and prevention of septicemia with injectable antibiotics.

Additional therapies can include administration glucose (sugar) to keep their energy levels up to help fight the infection and a plasma transfusion to replace their albumin and to provide them with antibodies to help fight the virus. Anti-vomiting medicines are frequently administered to help with the vomiting. Because anti-diarrheal medicines must be given orally, they are usually ineffective if the puppy is vomiting.

After the diarrhea and vomiting have stopped, food is offered. The puppy/dog is released from the hospital once it can eat without vomiting. Because the puppy has not been able to eat for 5-7 days and most of its energy has been put toward fighting the virus, the puppy frequently loses weight while in the hospital. Once it is eating again, weight is gained quickly.

## **Prognosis**

Most dogs with CPV infection recover if aggressive treatment is used and if therapy is begun before severe septicemia and dehydration occur. Dogs that recover from naturally occurring parvo virus infection are thought to be immune to it for life.

## **Transmission to Humans**

There is no documented evidence to suggest that humans may become infected with CPV.

## **Prevention**

Proper vaccination offers the best protection against CPV. Puppies should receive a parvo vaccination as part of their multiple-agent vaccine as recommended by your veterinarian. Pregnant bitches should be boosted within two weeks of whelping in order to transfer protective antibodies to the puppies. The final decision about a proper vaccination schedule should be made by your veterinarian.

The stability of the CPV in the environment makes it important to properly disinfect contaminated areas. This is best accomplished by cleaning food bowls, water bowls, and other contaminated items with a solution of one cup of chlorine bleach in a gallon of water. It is important that chlorine bleach be used because most "virucidal" disinfectants will not kill the canine parvovirus. While it is unlikely the puppy will become re-infected once it goes home, thorough cleaning and disinfecting is necessary to prevent the virus from infecting other dogs that may come into the puppy's environment later.

Because puppies are very susceptible to the virus until they have gone through their vaccination series (one vaccine is not enough to protect the puppy against the virus), it is important to be careful about where you take the puppy and where you go. Avoid situations where other puppies are or have been. Remember that the virus is shed in the feces of recovering dogs and even apparently healthy dogs. Following recovery from the disease, the virus is continued to be passed in the feces for an additional 7-10 d days. Because fomites are an important source of infection, you can bring the virus home on your clothes or shoes if you have been somewhere infected dogs or feces are. Practice good hygiene regarding your puppy until it has been through its complete vaccination series. See a veterinarian at the first signs of any nausea, vomiting or diarrhea.