Metz Petz Veterinary Clinic - Ada

180 State Route 309, Ada, OH, 45810

Phone: 419-634-9663

Fax: 4196349665

Email: metzpetz@hotmail.com

Website: www.metzpetz.net

Parvovirus in Dogs

What is parvovirus?

Canine parvovirus (CPV) infection, or parvo, is a relatively new disease that first appeared in dogs in 1978. Because of the severity of the disease and its rapid spread through the canine population, CPV has aroused a great deal of public interest. The virus that causes this disease is similar to feline panleukopenia (feline distemper); the two diseases are almost identical. It has been speculated that the canine virus is a mutation of the feline virus. However, that has never been scientifically proven.

The most significant canine parvovirus strains are CPV-2, CPV-2a, CPV-2b, and CPV-2c; they all cause the same disease, and vaccines protect against all strains. CPV-2 and CPV-2c are associated with the most severe disease. Fortunately, diagnostic tests for parvovirus will detect all strains of the virus.

How does a dog become infected with parvovirus?

The primary source of the virus is the feces of infected dogs. The virus begins to be shed in the feces just before clinical signs develop, and shedding continues for about fourteen days after clinical signs resolve. Susceptible dogs become infected by ingesting the virus. After ingestion, the virus enters the tonsils or lymph nodes, where it invades lymphocytes (a type of white blood cell) that then carry it in the bloodstream to many areas of the body, most notably the bone marrow and the lining of the intestine. Unlike most other viruses, CPV is stable in the environment and is resistant to heat, detergents, alcohol, and many disinfectants. A 1:30 bleach solution will destroy the infective virus. Infective CPV has been recovered from surfaces contaminated with dog feces even after three months at room temperature.

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Due to its environmental stability, the virus is easily transmitted via the hair or feet of infected dogs or on shoes, clothes, and other objects contaminated by infected feces. Direct contact between dogs is not required to spread the virus. Dogs infected with the virus who show clinical signs will usually become ill within three to seven days after exposure.

What are the clinical signs of parvovirus?

The clinical signs of CPV disease can vary but generally include severe vomiting and diarrhea. The diarrhea often has a powerful smell, may contain lots of mucus, and may or may not contain blood. Additionally, affected dogs often exhibit a lack of appetite, marked listlessness and depression, and fever. It is important to note that many dogs may not show every clinical sign, but vomiting and diarrhea are the most common and consistent signs; vomiting usually begins first.

Parvo may affect dogs of all ages but is most common in unvaccinated dogs less than one year of age. Young puppies under five months of age are usually the most severely affected and difficult to treat. Any unvaccinated puppy showing severe vomiting or diarrhea should be tested for CPV.

How is parvovirus diagnosed?

The clinical signs of CPV infection can mimic many other diseases that cause vomiting and diarrhea; consequently, diagnosing CPV is often challenging for the veterinarian. The positive confirmation of CPV infection requires the demonstration of the virus or virus antigen in the stool or detecting anti-CPV antibodies in the blood serum.

There is a simple in-clinic test for CPV that will screen for this disease. Occasionally, a dog will have parvovirus but test negative for virus in the stool. Fortunately, this is an uncommon occurrence. A tentative diagnosis is often based on a reduced white blood cell count (leukopenia) and clinical signs. If further confirmation is needed, stool or blood can be submitted to a veterinary laboratory for additional tests. The absence of leukopenia does not mean that the dog does not have CPV infection. Some clinically ill dogs may not have a low white blood cell count.

How is parvovirus treated?

There is no treatment to kill the virus once it infects the dog. However, the virus does not directly cause death; instead, it causes loss of the lining of the intestinal tract and weakens the immune system by affecting the white blood cell numbers. The intestinal damage results in severe dehydration (water loss), electrolyte (sodium and potassium) imbalances, and infection in the bloodstream (septicemia). Septicemia occurs when the bacteria that normally live in the intestinal tract can enter the bloodstream; if septicemia develops, the dog is more likely to die.

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The first step in treatment is to correct dehydration and electrolyte imbalances. This requires the administration of intravenous fluids containing electrolytes. In severe cases, plasma transfusions may be given. Antibiotics and anti-inflammatory drugs are given to prevent or control septicemia. Antinausea drugs are used to inhibit the vomiting that perpetuates the problems. Newer treatments currently being investigated include anti-viral drugs, such as Tamiflu®, and fecal transplantation from healthy dogs.

What is the prognosis?

Most dogs with CPV infection recover if aggressive treatment is used and if therapy is started before severe septicemia and dehydration occur. For reasons not fully understood, some breeds, notably the Rottweiler, Doberman Pinscher, Labrador retriever, American Staffordshire terrier, and Arctic sled breeds, have a much higher fatality rate than other breeds. In most cases, puppies that have not improved by the third or fourth day of treatment have a poor prognosis.

Can parvovirus be prevented?

Vaccination is the best method of protecting your dog against CPV infection. Puppies receive a parvovirus vaccination as part of their multiple-agent vaccine series. It is recommended to be given at 8, 12, and 16 weeks of age. In some high-risk situations, veterinarians will give the vaccine at two-week intervals, with an additional booster administered at 18 to 22 weeks of age. After the initial series of vaccinations, boosters will be required regularly. If an approved three-year parvovirus vaccine is used, the next booster vaccine will be routinely administered in three years.

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Dogs in high exposure situations (e.g., kennels, dog shows, field trials, etc.) may be better protected with a booster every year. Breeding dogs should be up to date on their parvo vaccination before breeding; however, pregnant females may be able to be vaccinated with a parvovirus vaccine one week before whelping to transfer higher levels of protective antibodies to the puppies. You and your veterinarian should decide about the vaccination schedule that best fits your pet's lifestyle.

Is there a way to kill the virus in the environment?

The stability of the CPV in the environment makes it necessary to disinfect contaminated areas properly. A solution of 3/4 cup of chlorine bleach in one gallon of water (133 ml: 4 liters) will disinfect food and water bowls and other contaminated items. Chlorine bleach must be used because most disinfectants, even those claiming to be effective against viruses, will not kill the canine parvovirus.

Does parvovirus pose a health risk to my cats or me?

Currently, no evidence indicates that CPV is transmissible to cats or humans.