PARVO Virus Treatment and Control **Content From Merck Veterinary Manual**

Canine parvovirus infection is a potentially fatal viral disease that most often affects puppies or unvaccinated adult dogs. The virus itself is resistant to several common disinfectants and may survive for several months or possibly years in contaminated areas. Rottweilers, American Pit Bull Terriers, Doberman Pinschers, English Springer Spaniels, and German Shepherds are at increased risk of disease, but any breed can be affected. With appropriate treatment, 68%–92% of affected dogs will survive the virus.

The virus is transmitted by direct contact with infected dogs or feces. Indirect transmission, such as from objects contaminated by feces, is also an important source of infection. The virus is present in the feces for up to 3 weeks after infection. Recovered dogs may serve as carriers.

After entering the body through the mouth or nose, the virus replicates and spreads to the bloodstream. It attacks rapidly dividing cells throughout the body, especially those in the bone marrow, blood cell-producing tissue, and the lining of the small intestine. Production of the virus in the intestinal lining causes severe damage and bloody diarrhea. Normal intestinal bacteria may enter the damaged tissue and the bloodstream, worsening the disease. Affected dogs can also have decreased numbers of white blood cells, which normally protect the body from infections. This allows for further damage by the virus and secondary bacterial infections. In young puppies infection may also rarely involve the heart, leading to signs of heart failure without digestive signs, such as diarrhea.

Infected dogs may not show signs of illness. Clinical disease may be triggered by stress, such as improper nutrition or boarding, and signs may be worsened by other infections of the digestive system. Prolonged contact with a dog shedding high levels of virus increases the likelihood of becoming infected. An infected dog may be contagious before the onset of signs.

Clinical signs of infection generally develop within 5 to 7 days but can range from 2 to 14 days. Initial signs may be nonspecific (eg, dullness, loss of appetite, fever) with progression to vomiting and bloody diarrhea within 1 to 2 days. Abdominal pain may be a sign the intestines have become blocked, which requires emergency treatment. Severely affected animals may be in shock. On the other hand, inapparent infection is also common. Most dogs recover within a few days with appropriate supportive care; others can die within hours of the onset of signs.

Diagnosis is based on the dog's history and signs and is confirmed by a positive fecal or blood test. The tests can also detect the newer strain of the virus known as CPV-2c. The fecal test, which detects viral protein, may be negative despite infection if it is done too early in the disease course. Thus, your veterinarian may need to repeat the test if the history and signs support the likely presence of the virus.

Treatment and Control

There is no specific treatment to eliminate the virus. Most dogs recover with appropriate supportive care, which is focused on replacing lost fluids and electrolytes. Oral electrolyte solutions (used to replace sodium and potassium that is lost through the intestines) may be used in mildly dehydrated dogs without a history of vomiting. More severely affected dogs will need intravenous fluids. Most dogs that survive the first 3 to 4 days of disease recover, usually within 1 week. Persistent vomiting

can be controlled with prescription medication. Antibiotics may be added in cases where secondary bacterial infection is likely to be present.

Follow your veterinarian's instructions for your pet's diet. It was previously thought that food and water should be withheld until vomiting has subsided. However, it is now known that providing nutrition earlier on is associated with earlier improvement, weight gain, and improved gut function. Therefore, veterinarians may place a feeding tube in dogs that will not eat on their own. Once vomiting has stopped for 12–24 hours, frequent, small amounts of a bland diet (such as cottage cheese and rice or a prescription diet) can be slowly introduced. If signs recur after feeding, contact your veterinarian for directions. If food can be tolerated, the bland diet is usually continued for 1 or 2 weeks, after which the dog's regular diet can be gradually reintroduced.

To limit environmental contamination and spread to other susceptible animals, dogs with confirmed or suspected parvovirus infection must be handled with strict isolation routines (separate housing, protective gowns and gloves for handlers, frequent and thorough cleaning of the area, etc). Contaminated areas should be thoroughly cleaned to remove visible dirt, feces, and other organic matter. Household bleach (diluted to 1 part bleach to 30 parts water) or commercial products labeled for use against parvovirus can inactivate the virus by being applied to the area after cleaning. The same solutions may be used as footbaths to disinfect household footwear. Disinfection of hands, clothing, and the dog's food and water bowls and toys is recommended.

Vaccination is critical to prevent canine parvovirus infection. Vaccination of pups should begin at 6 to 8, 10 to 12, and 14 to 16 weeks of age, followed by a booster 1 year later and then every 3 years. Follow your veterinarian's parvovirus vaccination recommendations to protect your pet. In addition, pups should be kept isolated from adult dogs returning from shows or field trials.

As mentioned above, parvovirus can remain viable in the environment for a year or longer. In a kennel, shelter, or veterinary hospital, cages and equipment should be cleaned, disinfected, and dried twice before reuse. The same concepts can be applied to a home situation. Removal of contaminated organic material is important in outdoor areas where complete disinfection is not practical. Disinfectants can be applied outdoors with spray hoses, but they will be less effective than when applied to clean, indoor surfaces. In a home setting, only fully vaccinated puppies or adult dogs should be allowed into a home with a dog recently diagnosed with parvovirus infection.