

Parvovirus (Parvoviral Enteritis or "Parvo," for short) is a virus causing severe infection in puppies and dogs. It invades and destroys rapidly growing cells in the intestine, bone marrow and lymphoid tissue resulting in nausea, vomiting and severe hemorrhagic (bloody) diarrhea. The invasion of the bone marrow cells causes a decrease in the white blood cell count leading to increased susceptibility to bacterial infections and sometimes to a shock-like condition called endotoxemia. The disease can vary from mild to fatal if not properly treated.

Parvovirus is extremely contagious to other dogs. Infection is generally attributed to ingestion of material contaminated by dog feces and can occur when a dog smells or licks the ground. Direct contact with another dog is not necessary for infection. Parvovirus is shed in the feces of infected dogs for approximately two weeks after initial ingestion and can live in the environment for years. The virus is species specific and is not contagious to cat or humans.

Dogs at highest risk for infection are unvaccinated puppies or those who have not yet completed their vaccine series. It is most common in dogs less than 8 months old. Especially susceptible breeds include Doberman pinschers, Rottweilers, German shepherd, Staffordshire terriers, black Labrador retrievers, and dachshunds. Dogs of all ages can be infected, but puppies and younger dogs are most susceptible. Intact male dogs may also be susceptible for unknown reasons.

Unsanitary and/or overcrowded kennels may increase chance of infection and concurrent infection with parasites, other bacteria or viruses may also increase susceptibility to infection. Proper vaccination of your pet can best prevent the disease.

Parvovirus is an acute and serious disease, not a chronic condition. Virtually all cases need proper diagnosis and hospitalization. If your pet is having active symptoms, it is important to see your veterinarian. Parvovirus can be fatal if not properly treated.

What to Watch For

Clinical signs generally are seen 3 to 14 days after exposure to the virus. Signs may include:

- Depression
 - Fever
- Loss of appetite (anorexia)
 - Vomiting
- Diarrhea (often containing foul-smelling blood)

Diagnosis

Diagnosis is usually based on clinical signs. Diagnostic tests are needed to recognize parvovirus, and exclude other diseases. Tests may include:

- Complete medical history and physical examination
 - Testing the feces for the presence of the virus
- Blood tests and abdominal X-rays to determine the severity of the infection or exclude other causes of the symptoms

Treatment

Your veterinarian will probably recommend hospitalization. Therapy is dependent upon the severity of the clinical symptoms and is aimed at treating the dehydration, controlling vomiting and diarrhea and preventing secondary infection. If bacterial infection and dehydration can be prevented, clinical signs will usually resolve in 2 to 5 days.

Therapy may include:

- Intravenous (IV) fluid therapy, antibiotics and/or other drugs used to replace electrolyte and fluid losses and control nausea and vomiting.
- In very severe cases, referral to a 24-hour critical care center may be recommended.

Home Care

At home, allow your pet to rest and regain his strength. Once vomiting and diarrhea have stopped, encourage water intake. Offer your pet a small amount of water and a bland diet. Your veterinarian may recommend a prescription diet.

It takes a few days for stools to normalize. Nevertheless, it is important that you pick up feces and keep the environment clean. It is likely that the feces will contain the virus and other dogs may contract the disease.

If your pet is not eating or drinking, is continually tired, vomiting and/or still has diarrhea, call your veterinarian.

Preventative Care

Prevention is possible by vaccinating your pet regularly to help prevent infection. (NOTE: Immunity to parvovirus develops after infection, but it is necessary to schedule booster immunizations ("shots") with your veterinarian to protect from other viruses).

Keep your dog away from fecal waste of other dogs when walking along neighborhood streets or parks. If your dog leaves his own "deposit" be sure to remove it and dispose of it at home.

You should also minimize contact of unvaccinated puppies with other dogs that may be sick or unvaccinated. This should include avoiding areas where other sick pets may have been (parvo can live in the environment for 2 years). Your pet is most at risk until fully vaccinated (usually 20 to 24 weeks of age).

Section: Information In-depth

Parvo virus can have symptoms similar to many other diseases. These diseases may include:

- Dietary indiscretion, which is a common cause of vomiting and diarrhea
- Food-borne bacterial infection. Some foods can give dogs gas or diarrhea, a similar symptom to parvovirus.
- Hemorrhagic gastroenteritis (HGE), which is an inflammatory condition of the gastrointestinal tract causing bloody diarrhea.
- Ileus, a condition in which normal bowel movement is obstructed causing a "functional obstruction" of the intestine
- Inflammatory bowel disease (IBD), a condition in which inflamed cells clog the intestinal wall causing chronic vomiting, diarrhea and weight loss; biopsy of affected intestine is required for diagnosis
- Intussusception. This condition is a prolapse or "telescoping" of one portion of the intestinal tract into another, causing partial or complete obstruction of the bowel, a symptom which can also be a complication of parvovirus; X-rays or an ultrasound may be necessary for diagnosis
 - Mechanical obstruction or foreign body, which may be an object ingested by your pet that is stuck in a part of the intestine like a toy, bone or piece of clothing
 - Other viral infections of the intestines, such as coronavirus and other viruses with similar (though not as serious) symptoms of parvovirus
- Pancreatitis, an inflammation of the pancreas, which is the digestive gland located between the liver, spleen, kidneys, stomach and duodenum

- Parasites, like intestinal worms that feed on an animal host (some also cause bloody diarrhea, vomiting, weakness, weight loss and lethargy) causing similar symptoms of parvovirus
Veterinary care should include diagnostic tests and subsequent treatment recommendations.

Diagnosis In-depth

Diagnostic tests are needed to recognize parvovirus, and exclude other diseases, including:

- Complete medical history and physical examination
 - The ELISA test (CITE-Parvo TEST) The collection and testing of a stool sample is the most practical and thorough method for diagnosis. However, it is possible to get a [false] positive test 5 to 17 days after routine vaccination for parvovirus.
- A complete blood count (CBC). This helps determine the effect of the virus on the bone marrow. In some cases the ELISA test may be negative while the blood test may point to parvovirus (usually a very low white blood count is found). In this case, your veterinarian will choose the appropriate antibiotic therapy.
- Serum biochemistry. These tests are not specific for detection of parvovirus, but they do help your veterinarian determine your pet's hydration status, blood sugar level, kidney function and electrolyte levels. These can help determine the choice of fluid therapy and other medications.
 - Fecal tests. These are performed to exclude the possibility of intestinal parasite infestation (concurrent infection is common).

Additional diagnostic tests may be recommended on an individual pet basis, including:

- Abdominal X-rays to exclude the possibility of other problems such as gastrointestinal ileus (paralysis of the bowel), obstruction of the bowel, a foreign substance in the stomach or intestine or an intussusception
 - A barium contrast study, in which the patient swallows or is administered barium
- An ultrasound, which is an alternate and noninvasive method, may be used to examine your pet's abdominal organs. An ultrasound is not useful in cases where there is build up of abdominal gas

Treatment In-depth

Treatments for parvovirus may include one or more of the following:

- Serious cases require hospitalization during which IV fluid therapy, antibiotics and anti-vomiting drugs may be administered. Severe cases may require referral to a 24-hour hospital.
 - Milder cases may require outpatient treatment consisting of subcutaneous fluid therapy, antibiotics and anti-vomiting drugs.
- Daily physical examination by your veterinarian to assess your pet's progress is vital.
 - Fluid therapy is necessary if your pet is dehydrated, actively vomiting or has diarrhea. Severe cases will most likely require IV fluid therapy consisting of an electrolyte solution supplemented with potassium. If necessary, a bicarbonate supplementation may be required, which is determined after lab testing. In more severe cases where pets have become hypoglycemic (low blood sugar), dextrose (sugar) may be added to the fluid therapy. Milder cases may be treated with subcutaneous fluid therapy, which is administered in the loose skin over the back and more slowly absorbed. Pets with severe cases will almost always require IV therapy for survival.

- Nutrition. There are different thoughts on feeding dogs with parvovirus. Many veterinarians recommend giving no food or water until vomiting or diarrhea has stopped completely for 12 to 24 hours. Only then will water be offered in small amounts along with small frequent feedings of a bland diet, including such foods as Hill's Prescription Diet i/d®, Iams Recovery Diet®, Purina EN Diet® or Waltham Low Fat Diet®. Your pet may also be given a bland homemade meal of carbohydrates (boiled rice or potatoes) and protein (lean hamburger, skinless chicken or low-fat cottage cheese) in small amounts. The return to regular dog food must be gradual over a 3 to 4 day period. Other veterinarians recommend feeding despite vomiting. High-protein and high calorie foods such as Hills Science Diet A/D or Eukanuba Max Calorie may be offered as soon as possible.

- Antibiotic therapy is often used to control secondary bacterial infection. Antibiotics (such as gentamicin or amikacin) must only be given after dehydration is corrected with the proper fluid therapy. Commonly used antibiotics are: cefazolin or ampicillin combined with enrofloxacin, gentamicin or amikacin. Gentamicin and amikacin are administered to your pet especially when there is indication of a very low white blood cell count (neutropenia).

- Antiemetic drugs may be administered to your pet to control vomiting. Common drugs include: metoclopramide (Reglan®) given SQ or as continuous IV; chlorpromazine (Thorazine®); prochlorperazine (Compazine®), or ondansetron (Zofran®) by injection.

- Gastrointestinal protectants are sometimes prescribed. Common drugs include: famotidine (Pepcid®), cimetidine (Tagament®) and sucralfate (Carafate®), prescribed only after vomiting is controlled.

- Parenteral nutrition (such as PPN) may be suggested in very weak puppies with persistent vomiting and diarrhea. This is a special food

that is placed in an IV type catheter; parenteral nutrition requires hospitalization.

- Anti-diarrheal drugs, which help reduce bowel movements, are only prescribed for unresponsive diarrhea. These include: loperamide, oral opioids and diphenoxylate.
- Pepto-Bismol® (Bismuth subsalicylate) is sometimes administered when vomiting has stopped.
- Pain medications may also be indicated. Commonly used pain medications include Buprenorphine (Bupernex) and Butorphanol (Torbugesic).
 - Blood products (packed red blood cells or plasma) may be administered with severe blood loss, protein loss, or anemia.
- Isolating your dog from other dogs is very important throughout treatment of parvovirus.
- Nursing and caring for your pet is vital throughout treatment. Your pet must be kept clean and dry, and debilitated dogs must be turned frequently. Rectal temperature must be monitored frequently.
- Worm infestation is treated once your pet is able to eat and drink. The common drug administered is fenbendazole (Panacur®), given orally for three consecutive days or Ivermectin by injection.

Prognosis

- Approximately 80 to 90 percent of affected dogs will survive and lead normal lives if disease is detected early and proper treatment and hospitalization is sought and administered. Prognosis is worse for high-risk breeds.

Following recovery from parvo, allow your pet to rest and regain his strength. Feces should be picked up and kept from other dogs, because it most likely contains the virus. The virus is extremely resistant to many disinfectants. The recommendation for cleaning areas possibly contaminated with parvovirus include diluted bleach (diluted to 1 part bleach to 20 parts water) and quaternary ammonium disinfectants (such as Roccal-D, Parvosol, and others).

Once vomiting and diarrhea have stopped, encourage water intake. Offer your pet a small amount of water and a bland diet. Your veterinarian may recommend a prescription diet.

If your pet is not eating or drinking, is continually tired, vomiting and/or still has diarrhea, call your veterinarian. It takes a few days for stools to normalize.

<http://www.petplace.com/dogs/parvoviral-enteritis/page1.aspx>