

# Canine Parvovirus

**Agent:** Canine Parvovirus is a nonenveloped single-strand DNA virus of canine.

**Brief Description:** Canine Parvovirus is a highly contagious viral disease of canine that causes vomiting, diarrhea, anorexia, and rapid dehydration. Clinical disease is higher in young puppies and may result in death. Infected dogs may also be asymptomatic. Mortality rates range from 16 - 48 % of those infected. Feces typically appear yellow-grey and may contain blood or mucus. Fever of 104° F - 105° F and leukopenia may be present with death occurring as little as 2 days after onset. Sepsis, electrolyte disturbances, hypoglycemia, and central nervous system hemorrhage from Disseminated Intravascular Coagulation (DIC) may cause neurological disease. Myocarditis may develop due to in utero exposure or in puppies under 8 weeks of age. Asymptomatic urinary tract infection develops in 25 % of puppies following Parvovirus enteritis. Canine Parvovirus can occur in dogs of any age, sex, or breed; however, puppies between 6 weeks and 6 months of age, Rottweilers, Doberman Pinschers, Labrador Retrievers, American Staffordshire Terriers, German Shepherds, and Alaskan Sled Dogs appear to have an increased risk of disease.

## **Differential Diagnoses:**

- Canine Coronavirus
- Canine Distemper
- Canine Rotaviruses
- Campylobacteriosis
- Salmonellosis
- Coccidiosis
- Giardiasis
- Listeriosis
- Infectious Canine Hepatitis
- Ancylostomiasis
- Intussusception
- Acute Renal Failure
- Acute Hepatic Failure
- Ingestion of a Foreign Body or Toxin
- Diarrhea from *Clostridium sp.*

**Reservoir/Host Species:** domestic dogs, coyotes, and wolves are affected.

**Mode of Transmission:** Oronasal exposure to contaminated feces, hair coat, and fomites including instruments, insects, and rodents are responsible for the spread of the disease. Canine Parvovirus can survive in the environment for months to years.

**Incubation Period:** The incubation period ranges from 4-14 days.

**Diagnosis:** In clinic testing utilizing Enzyme-linked Immunosorbent Assay (ELISA) antigen tests on feces is most useful in the first 5-7 days of clinical disease as fecal viral shedding is

brief. All specimens except those fixed in formalin should be submitted on ice packs and via courier (ex. FedEx, UPS) within 24 hours of collection, neither frozen nor chemically fixed. In Georgia, Polymerase Chain Reaction (PCR) testing is conducted at the Athens Diagnostic Laboratory only and requires a small amount of feces (1 teaspoon) in a capped tube. Results will be reported within 1-2 days of receipt. A false positive is possible with some ELISA and all PCR tests when conducted within 5-12 days after vaccination with a modified live vaccine. Electron microscopy on fecal material is also reported within a day of receipt.

At necropsy, PCR of samples of jejunum, ileum, heart, spleen, dorsal tongue, and mesenteric lymph nodes will detect the virus. Submit samples in capped containers. Histopathologic examination and fluorescent antibody (FA) testing are conducted at both the Athens and Tifton Diagnostic Laboratories. For histopathologic examination, the same samples should be sent in formalin. Intestinal lesions are characterized by necrosis of the crypt epithelium in the small intestine. Early lesions are usually more pronounced in the distal duodenum; however, the jejunum is more severely affected later. Necrosis of the Peyer's patches, mesenteric lymph nodes, thymus, and spleen are present. Parvoviral myocarditis is characterized grossly as pale streaks in the myocardium. FA testing is conducted on tissues of the dorsal tongue, spleen, and small intestinal mucosa. For more information on testing and sample collection, please contact the UGA Athens Veterinary Diagnostic Laboratory (706) 542-5568 or The UGA Tifton Veterinary Diagnostic Laboratory (229) 386-3340.

**Prevention Measures/Control:** Clean and disinfect all surfaces with known exposure to feces from infected canine. Before cleaning the area where infected canine are/were located, first spray a fine mist of water all over surfaces to decrease aerosolizing fecal matter. It should then be thoroughly cleaned with a detergent to remove all fecal material, rinsed, disinfected with an appropriate agent with 10 minutes of contact time, and then rerinsed to remove the disinfectant. Allowing the disinfectant to dry on the surface is preferred. Bleach at a 1:30 dilution is an effective disinfectant on surfaces that have been cleaned of organic matter. Quaternary ammonium compounds are not effective against Canine Parvovirus. Footbaths, hand washing, and cleaning of all instruments and cages exposed to infected canine are necessary. Puppies should be isolated from other canine especially those that have been exposed to other dogs at shows or field trails. Puppies should not be exposed to areas where other dogs may have defecated such as yards, pet stores, and parks. Vaccination is also indicated in all canine. Adequate immunity requires a 2-4 week period from the last vaccination in a series before exposure to other dogs is recommended.

**Vaccine:** It is recommended that pups be vaccinated with a high titer-attenuated vaccine at 6, 9, and 12 weeks of age, and then annually. A serum antibody level to determine the need for a fourth vaccination at 15-16 weeks of age may also be useful, particularly in those breeds that are at an increased risk of infection. A fourth vaccination at 15-16 weeks is recommended if a killed vaccine is utilized. Maternal antibody may interfere with the puppy's ability to mount an immune response; therefore, multiple doses of vaccine are recommended to ensure an adequate immune response.

**Zoonotic Risk:** None

**Reporting Requirements:** Any person who makes a clinical diagnosis or laboratory confirmation of Canine Parvovirus in animals residing in or recently purchased from a Georgia Department of Agriculture licensed facility such as an animal shelter, kennel or pet dealer shall report it by the close of the next business day to the State Veterinarian's office at 404 656-3667 in Atlanta or 1-800-282-5852 outside of Atlanta.

**Electronic References:**

The Merck Veterinary Manual, 50th anniversary edition.

<http://www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/23301.htm&word=parvovirus>

**Other References:**

Greene, Craig E.; Infectious Diseases of the Dog and Cat, Saunders, third edition, 2006.