

PARVO IN DOGS

Canine parvovirus is an acute, highly contagious disease of dogs that was first described in the early 1970s. The virus has a tendency to attack rapidly reproducing cells, such as those lining the gastrointestinal tract.

The virus is shed in large amounts in the stools of acutely infected dogs for up to several weeks following infection. The disease is transmitted by oral contact with infected faeces. Parvo can be carried on the dog's hair and feet, as well as on contaminated crates, shoes, and other objects. When the dog licks the faecal material off hair, feet, or anything that came in contact with infected faeces, he/she acquires the disease.

Canine parvovirus affects dogs of all ages, but most cases occur in puppies less than a year old, while puppies 6 to 20 weeks of age are considered over represented. It has been speculated that certain breeds are at higher risk for Parvo infection than others. In one study Rottweilers, American Pit Bull Terriers, Doberman Pinschers and German Shepherd Dogs (GSDs) were at increased risk and Toy Poodles and Cocker Spaniels were at decreased risk for developing Parvo-induced enteritis, compared with that for mixed-breed dogs. In another study Doberman Pinschers, Rottweilers and English Springer Spaniels had a significantly increased risk of parvo enteritis. It is the opinion of many practitioners that not only are Rottweilers at increased risk of Parvo enteritis but also at increased risk for mortality. In another study evaluating the factors influencing the antibody response of dogs vaccinated against rabies, it was found that animal size, age, and breed strongly influenced results. The latter study also alluded to genetic susceptibility. In studies designed to determine vaccine efficacy, the choice of breed and size may therefore be of significance. The reason(s) for lower resistance in these breeds remains unknown.

The **incubation period** averages seven (7) to fourteen (14) days and the acute illness begins with **clinical signs** indicating depression, vomiting, and diarrhoea. Some dogs do not develop a fever, while others have high fevers (up to 41.1°C). Pups with severe abdominal pain exhibit a tucked-up abdomen and are often very sensitive when the pet owner or veterinarian tries to palpate the belly. The animal may cry and vocalise upon feeling the abdomen, or simply tense up in an effort to protect its painful belly. Diarrhoea is profuse and contains mucous and/or blood. Dehydration can develop very rapidly and make the animal extremely weak, so having your pet examined by a veterinarian as soon as possible is absolutely critical. Survival in dogs with parvo enteritis that are left untreated is 9 % untreated, while 64-90% of treated animals are discharged from hospital and go back home.

Heart muscle involvement in neonatal puppies used to be common, but is now quite rare. This is because routine vaccination of brood bitches two (2) to four (4) weeks before breeding boosts maternal antibody levels and provides better protection for puppies. However, **a word of caution** on the latter use of vaccination in brood bitches expected to whelp: it is known that colostral transfer accounts for approximately 90% of the **maternally-derived antibodies** (MDA) and declines by 50% every 9.7 days but is variable. In the absence of inhibitory colostral MDA, puppies are capable of mounting a protective immune response at a very young age, indicating that the magnitude of MDA is of significance. High levels of maternal antibodies are able to interfere with an active immune response after vaccine administration and may also prevent successful immunization, leaving pups susceptible to infection. This interference accounts for a window of susceptibility of the pups to CPV infections and failure of the vaccine to protect. The message that the author wishes to convey here, is that in brood bitches that are up to date with their vaccination status, do not revaccinate during pregnancy for the sake of providing the future newborn puppies with more maternal antibodies, because we may very well be doing them a disservice.

Suspect parvo in all pups with the abrupt onset of vomiting and diarrhoea. The most efficient way to **diagnose parvo** is to identify either the virus or virus antigens (identifying proteins on the surface of the virus) in stools. An in-house (test done at the clinic, without having to send samples away to a laboratory) test is available for rapid veterinary diagnosis. False negatives do occur and interpretation of these results can be tricky. Virus isolation techniques are more precise, but require an outside laboratory.

Treatment: Dogs with this disease require intensive veterinary management. In all but the mildest of cases, hospitalization is essential to correct dehydration and electrolyte imbalances. Intravenous fluids and medications are used to control vomiting, diarrhoea and pain. More severe cases may require blood plasma transfusions and other intensive care.

Puppies and dogs need to take food in regardless of their condition and if they are too nauseous or weak to feed on their own, they should be either force-fed with liquidized food and a large syringe or have a nasogastric tube placed that allows liquid food to be placed directly into the stomach. Constant fluid support using a drip is almost always necessary. Antibiotics are always utilized to prevent septicaemia and other bacterial complications, which are the usual cause of death.

In cases where treatment is optimal and there is some degree of response we would expect to be able to rehydrate a puppy over the next 24 hours post admission. If things continue to progress optimally the haemorrhagic diarrhoea will resolve over 2-3 days. Faeces may remain soft 7-10 days. Appetite and habitus usually improves soon after the diarrhoea stops. Once puppies start voluntarily taking food they are well on their way to recovery. Animals that are vaccinated often respond very well to treatment and the more vaccines they have received the more likely they are to survive the infection.

Prevention: Thoroughly clean and disinfect the quarters of infected animals. Parvo is an extremely hardy virus that resists most household cleaners and survives on the premises for months. The most effective disinfectant is household bleach in a 1:30 dilution. The bleach must be left on the contaminated surface for 20 minutes before being rinsed. Isolating young puppies as much as possible from other dogs and from potential sources of infection until they complete their parvo vaccination series is advisable.

The author would like to address **the purpose of vaccination**. All vaccines, whether they are developed for use in humans or animals are designed with two major purposes in mind: the first purpose is to reduce the severity of the clinical signs should the person/animal contract the disease, and secondly, to increase the chances of survival by virtue of the less severe clinical signs. The latter, is further supported by the fact that the most reliable way to test any vaccine, is to challenge the vaccinated animals with a far more potent strain of the virus/bacteria/parasite and measure the severity of the clinical studies as well as the survival rates. In addition, the latter also confirms that vaccines are not designed to prevent an animal/person from contracting a disease, but more importantly, designed to offer resistance to the patient should they get the disease. The main reason why vaccines do not prevent an animal from contracting the disease, is simply because there are a lot of environmental factors beyond the pet owner's control, the vaccine manufacturer's control and the vaccine's control that determine whether an animal will contract the disease or not.

The **most important environmental factor** that determines the chances of your animal contracting Parvo enteritis in South Africa is the concept of "high infection pressure". It is currently estimated that >90% of dogs in South Africa are considered either non-vaccinated or inappropriately vaccinated, leaving <10% of animals with some of protection against the diseases we vaccinate for. Should the challenge be greater than the protection acquired through inoculations, the animal will still contract the disease(s) e.g. outbreak situation, immunosuppression in individual animals, etc. That means that "breakthroughs" will happen from time to time and is considered a fact of life. On the positive side, should a vaccinated animal contract the disease for which it was vaccinated and recover asymptotically is not the same as preventing infection - but we will never know will we?

Vaccination of puppies start between 4-8 weeks of age, depending on your veterinarian's vaccination protocol, determined risk and choice of products. It is important to know that only certain products can be used at certain ages of puppies, so it is important to discuss your concerns with your veterinarian and select the products and protocol that will work the best for your puppy and circumstances. In standard practice where control of disease in a small population is the objective, the conventional 6, 9 and 12 week core vaccination protocol should be followed. Furthermore, in only high risk environments and dog breeding colonies, vaccination at 4 weeks of age using specific vaccines designed for that specific purpose may facilitate better control of Parvo enteritis. The World Small Animal Veterinary Association Guidelines of 2010 recommend vaccinations with the three-core canine vaccines (Canine Distemper Virus, Canine Parvovirus-2 and Canine Adenovirus-2) should not begin earlier than 6 weeks of age and if the puppies are to remain with the breeder until they are 8 - 10 weeks or older, it is recommended that vaccination begin at 8 - 10 weeks rather than 6 weeks. Revaccination should be 3 - 4 weeks later with a final vaccination given when the pups are 14 - 16 weeks of age. It is vitally important that the interval between these vaccinations not be lengthened beyond 4 weeks at any stage as it may have a significant detrimental effect on the protection of your puppies against the disease in the field. Furthermore, the brand of vaccine used throughout the puppy's 1st year of life should not be changed at all to ensure that the boosting effects occur on the subsequent vaccines. The literature available at this point in time, does not provide any support for interchangeable brand usage through a puppy's vaccination protocol.

The same virus protein needs to be used repeatedly in order to develop a significant, long-lasting and adequate immunity against these diseases. Although these guidelines may adequately control CPV in some geographic pockets they do not always work in high risk environments.

Currently, recommendations are for a booster a year from the initial vaccine series and then **revaccination** every 1-3 years depending on the level of perceived risk. Given the current situation in South Africa and the high numbers of Parvo enteritis cases we are seeing in the field, the author's recommendation is that all adult dogs are revaccinated on a yearly basis in order to offer the maximum amount of protection we can to our beloved pets and companions.