

**PARVO PROTECTION**

Puppies are able to begin their canine parvovirus vaccination series at 6 weeks of age.

**MEET THE AUTHOR**

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Canine Parvovirus

The emergence of the dreaded positive dot on a SNAP parvo test can make any veterinary professional's stomach drop. The most disturbing thing about a parvovirus diagnosis is that this infection is preventable. *We have an effective vaccine to protect dogs from infection.* Many of our clients are simply not versed in the necessary precautions or the strict vaccination schedule recommended to avoid this highly contagious virus. This is where we, as veterinary nurses, come in. As advocates for our patients, our responsibility is to stay informed and pass that information on to our clients. Together, we can promote vaccination and protect more dogs from canine parvovirus. This article focuses on the prevention aspects of this vaccine-preventable disease.

Since entering the veterinary field in 2009, Saleema has held a variety of roles and positions. This diverse experience led to the discovery of her true passions for patient care, education, and mentoring. In 2015, she completed the VTNE and became a Registered Veterinary Technician. Saleema is currently part of the Boehringer Ingelheim Tech Champion team and delivers continuing education presentations to veterinary nurses. She strives to be an advocate for veterinary nurses and believes that they are an integral and sometimes underutilized resource in the veterinary hospital. Saleema currently practices in a high-caseload small animal practice. She enjoys trail running, crocheting, and being covered in cat hair.

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WHAT IS CANINE PARVOVIRUS?

Canine parvovirus is a highly contagious and resilient virus that attacks the gastrointestinal tract of dogs. The virus spreads through ingestion of infected fecal matter, either directly or through indirect contact with contaminated surfaces or fomites. Infected dogs show clinical signs of the disease within 2 to 14 days of infection. Clinical signs include inappetence, lethargy, vomiting, diarrhea, and fever. Treatment commonly involves fluid therapy, intravenous antibiotics, antiemetics, careful nursing care, and any other required medical assistance.¹ Patients being treated for parvovirus infection should be hospitalized in an isolation ward, and all staff who come in contact with patients must wear personal protective equipment to avoid contaminating common areas. With appropriate treatment, nearly 90% of patients recover, but without treatment, the survival rate is less than 10%.²

WHICH SPECIES ARE AFFECTED?

Canine parvovirus affects only canids. Some evidence suggests that specific dog breeds are at increased risk for canine parvovirus enteritis (hereafter called parvovirus infection), including German shepherds, Doberman pinschers, Rottweilers, and American pit bull terriers.³ Parvovirus strains genetically similar to canine parvovirus may affect other species, including but not limited to skunks, pumas, and raccoons.⁴ Although younger dogs are most commonly affected, all unvaccinated or incompletely vaccinated dogs are at risk for infection.

VACCINATION

The parvovirus vaccine is considered a core vaccine; however (unlike rabies virus vaccination), parvovirus vaccination is not required by law.⁵ Vaccination is strongly recommended for all healthy dogs regardless of geographic location, lifestyle, or age. This recommendation stems from the highly contagious

nature of the virus and the poor prognosis of those infected by it. Canine parvovirus has been found globally, resulting in the World Small Animal Veterinary Association recommendation to vaccinate all dogs against the virus.⁶

The Vaccine

Although products are available for vaccinating solely against parvovirus, dogs are typically given a combination vaccine. Multivalent vaccines generally protect against both parvovirus and canine distemper virus. Additional components that may be present in this combination vaccine, based on the manufacturer, are adenovirus and parainfluenza virus.⁵

The vaccine contains modified-live (attenuated) virus, meaning that the vaccine contains the virus in a viable but weakened state. The goal is to stimulate the immune system and induce an immune response without actually causing the disease. Proper storage and handling must be executed to ensure vaccine efficacy. Confirm that shipped vaccines are unpacked immediately and stored in a refrigerator at the appropriate temperature (between 36°F and 46°F or as specified on the label). If the product is desiccated, use only the designated diluent for reconstitution. The entire vaccine volume should be administered and should not be mixed with other products.⁵ Many vaccine products must be administered within 1 hour of reconstitution or be discarded. Refer to the product label for specific directions.

Vaccination Schedule

Rather than focusing on the number of booster vaccinations given, emphasis should be put on the patient's age at the conclusion of the initial vaccination series. Puppies can receive their first combination vaccine as early as 6 weeks of age. American Animal Hospital Association Canine Vaccination Guidelines

TABLE 1 Sample Initial Parvovirus Vaccination Schedule for Dogs

VACCINE NUMBER IN SERIES	VERY YOUNG PUPPY	YOUNG PUPPY	OLDER PUPPY/ADULT DOG
Initial	8-10 weeks of age	12-14 weeks of age	16 weeks of age
Second	11-13 weeks of age	15-17 weeks of age	Administered 3 to 4 weeks later
Third	14-16 weeks of age	18-20 weeks of age	
Fourth	17-20 weeks of age*		

*If in high-risk environment



Titers against parvovirus indicate whether the dog's immune system has generated appropriate antibodies (from prior vaccination) to fight off infection if later exposed to the virus.⁵



recommend revaccination every 2 to 4 weeks until the pet is at least 16 weeks of age. An older puppy first vaccinated after the age of 16 weeks should receive 1 or 2 boosters of the vaccine, given 2 to 4 weeks apart. In general, most practices recommend a total of 3 to 4 vaccinations given until the age of 16 weeks, or 2 vaccinations (administered at 2- to 4-week intervals) for dogs beginning their initial vaccination series after the age of 16 weeks (TABLE 1).⁵

Any young dog exposed to high-risk conditions should receive a final dose between 18 and 20 weeks of age. High-risk environments/regions are those in which prevalence of canine parvovirus is significant and include areas with the potential for high contamination (e.g., animal shelters, dog parks, boarding facilities, and pet stores).

Dogs should receive a parvovirus booster vaccination 1 year after the final dose in the initial vaccination series. Subsequent vaccination boosters should be administered every 3 years thereafter for the lifetime of the dog.⁵

Vaccine Administration

Canine parvovirus vaccine is administered subcutaneously.⁵ A credentialed veterinary nurse can administer the vaccine under the direct supervision of a licensed veterinarian, meaning that the veterinarian may or may not be on the premises but has given written or oral instructions to administer the vaccine. In some states, veterinary assistants may be authorized to administer vaccines under the supervision of a credentialed veterinary nurse or veterinarian, defined as the overseeing veterinary nurse or veterinarian being on the premises and having provided written or oral

instructions. Note that these regulations vary according to the state of residence.⁷

Although there are no specific recommendations for where on the dog to administer parvovirus vaccines (in contrast with vaccination site mapping for cats), it is prudent to record the injection location and the manufacturer's lot number, which is valuable information in the event of a reaction.

Adverse Reactions

Any injection has the potential to cause unfavorable side effects (adverse reactions). Reactions to vaccines are categorized as localized or systemic.

- **Local reactions** include localized swelling, pruritus, granuloma, seroma, abscess, or pain at the injection site. These reactions are generally temporary.⁵ Particularly small or sensitive dogs can even exhibit lameness (if the injection was given in a limb) secondary to injection-related pain. Many patients benefit from short-term administration of nonsteroidal anti-inflammatory drugs and cold compress therapy.
- **Systemic reactions** are infrequent but can be serious. Systemic reactions range in severity from mild to life-threatening. Mild reactions can cause nonspecific transient signs such as lethargy, fever, or inappetence. Acute anaphylactic reactions may appear as sudden gastrointestinal upset (vomiting and diarrhea), facial swelling, urticaria, or dyspnea. Patients who exhibit any concerning signs after vaccination should be returned to the hospital for evaluation. Based on severity of the reaction, a veterinarian may recommend an injection of diphenhydramine, an anti-inflammatory dose of a corticosteroid, or hospitalization.⁵

Patients who have experienced a confirmed or suspected systemic reaction in the past should be identified as such on their medical record. Those who have experienced mild reactions can be pretreated with diphenhydramine.⁵ Close monitoring for several hours after vaccination is recommended. Practices are encouraged to report all vaccine reactions to the manufacturer.

The benefits of vaccinating dogs against parvovirus outweigh the risk for mild adverse reactions. However, a veterinarian may decide to forego parvovirus booster vaccination of dogs that have experienced severe reactions. A valuable



tool for determining the need versus the risk for revaccinating patients who may experience reactions to the vaccine is antibody titer testing.

ANTIBODY TITER TESTING

Antibody titers can be an effective diagnostic tool for determining a patient's immunity to a particular virus. Titers against parvovirus indicate whether the dog's immune system has generated appropriate antibodies (from prior vaccination) to fight off infection if later exposed to the virus.⁵ Titer testing can be used to determine if routine tri-annual revaccination is needed, if continuation of the puppy series is recommended after completing the initial vaccination series, or if boosters are necessary for a dog that has previously reacted to the vaccine. It can also be used to establish if a dog of unknown vaccine history has immunity against the virus.⁸

A blood serum sample (collected in a tube free of additives or in a serum-separating tube) can be sent to the reference laboratory for evaluation. Kits are also available for rapid in-hospital parvovirus antibody testing and require whole blood, plasma, or serum, depending on the manufacturer.

Antibody titers are quantitative and reported as a dilution value. For canine parvovirus, a minimum concentration of 1:8 is required for appropriate protection. A titer greater than 1:8 is considered positive, confirming that the patient has appropriate protective antibody levels and therefore immunity. A titer less than 1:8 is considered negative, signaling that the antibody levels have not met the reference threshold. However, a negative titer does not necessarily mean that the dog is susceptible to infection. A previously vaccinated adult dog may have antibody levels less than 1:8 because of decreased detectable levels, yet the patient still possesses immune memory, which means that if exposed to the parvovirus, the body can initiate a protective response.⁸ To measure titer in a puppy, you must wait at least 2 weeks after completion of the initial vaccination series; if the result is negative, an additional vaccination is recommended to ensure full immunity.⁵

DIAGNOSTIC TESTING

Tests to diagnose parvovirus infection in a dog include fecal viral antigen testing and polymerase chain reaction (PCR). Fecal antigen testing is an effective

diagnostic tool and is most commonly performed in the clinic. The Canine Parvovirus Antigen Test (SNAP Parvo Test; IDEXX, idexx.com) requires only a small amount of fecal matter, and results are available after 8 minutes (idexx.com/files/snap-parvo-pkg-insert-en.pdf).

If the positive sample dot is visible, the patient is infected with parvovirus.¹ Note, however, that fecal antigen tests can produce false results.

- **False-negative:** Because dogs begin shedding the virus in their feces within 4 to 5 days of exposure,¹ the antigen test can produce a false-negative result if performed before shedding begins.
- **False-positive:** Because the parvovirus vaccine contains a modified-live virus, recent vaccination can affect testing. Antigen testing of dogs vaccinated within 10 days can potentially produce a false-positive result.

PANDEMIC-RELATED CASE INCREASES

The current coronavirus pandemic affecting humans has influenced the risk for parvovirus infection in dogs. Due to stay-at-home orders and social distancing, many people have sought connections with new canine companions. Increased adoption rates are excellent for emptying out shelters, but it is no secret that veterinary hospitals have been overwhelmed with patients. Some dog owners have delayed vaccination appointments because of pandemic-related schedule changes or new protocols, whereas others, especially new dog owners, are unaware of the importance of vaccination and limiting exposure until the dog is fully vaccinated. In addition, many owners have spent considerably more time outside with their dogs, increasing the dogs' environmental exposure to parvovirus.

News of recent pandemic-related spikes in parvovirus infection cases has been reported across the country. In July 2020, BluePearl noted a 70% increase in cases compared with the past 5 years.⁹ A shelter in Ohio even reported a shocking 450% increase in parvovirus patients.¹⁰ This alarming increase confirms the value of educating clients about this life-threatening virus.

CLIENT COMMUNICATION

Client education plays a critical role in protecting canine patients from parvovirus infection. Ideally, this education should begin before the person brings a



Offering a prepaid “puppy vaccine package” can positively influence compliance because clients are more likely to return for future visits if they have already paid for them.



puppy home. But if not, it should begin at the first veterinary visit. Veterinary nurses should emphasize the following key points.

- **Significance of disease.** Make it clear to clients that parvovirus infection is life-threatening. Highlight the physical and emotional toll that fighting parvovirus can take on both the dog and client and that even with treatment, some patients do not survive. Most clients are willing to comply if they understand the severity of the disease. If these consequences still don't resonate with clients, the financial toll may. Comparing the price of the vaccination series (usually less than \$100 for 3 vaccines, depending on the hospital) with the price of hospitalization for treatment (\$1200 or more, depending on the severity of the case and duration of hospital stay) can motivate clients to comply with vaccination.
- **Value of vaccination.** Emphasize the need to complete all vaccinations in the series. Complete protection is not ensured until at least 2 weeks after the final vaccination. Assist clients by creating a vaccination schedule and identify when they should return. If possible, schedule all future appointments during the first visit. Offering a prepaid “puppy vaccine package” can positively influence compliance because clients are more likely to return for future visits if they have already paid for them.
- **Monitor for adverse reactions.** Advise clients of concerning symptoms so they can identify them and act quickly should their dog experience an adverse reaction. For example, you could say, “You can expect Spot to be a little sleepy and possibly sore for the rest of the day. If he becomes very lethargic, vomits, has difficulty breathing, or if you notice facial swelling, please bring him back immediately.” Ensure that it is part of your hospital protocol to immediately triage a patient who returns to the hospital after vaccination.

- **Limit contact until the dog is fully vaccinated.** Even if a client complies with the vaccination schedule, the intention is futile if the dog is not quarantined. Clients must protect vulnerable (unvaccinated or incompletely vaccinated) dogs from potentially contaminated areas.⁴ This does not mean merely avoiding the dog park; susceptible dogs must stay away from all playgrounds, hiking trails, sidewalks, and the veterinary hospital parking lot. I always tell clients, “If there's a chance another dog has walked somewhere, avoid it.” A backyard is safe if the client knows that no sick dogs have accessed the area within the past year. Encourage clients to begin leash training and socializing inside the house. Clients should wait at least 2 weeks after the final vaccination before introducing their puppy to the world.

Information is power. By keeping your clients informed, you can help them feel confident that they are protecting their dog from the risks of parvovirus infection. **TVN**

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