

Parvovirus Vaccine

Modified Live Virus

For use in dogs only

Vanguard® Plus CPV

PRODUCT DESCRIPTION: Vanguard Plus CPV is for vaccination of healthy dogs 6 weeks of age or older for the prevention of canine parvoviral enteritis caused by canine parvovirus (CPV). Vanguard Plus CPV contains a strain of CPV attenuated by low passage on an established canine cell line. The vaccine is high titer ($>10^{7.0}$ TCID₅₀/dose) and was attenuated by low passage (35 passes from the canine isolate with a maximum of 2 additional passes allowed for production) on the canine cell line which gives it the immunogenic properties capable of overriding maternal antibody interference at the levels indicated in Table 2. Some puppies in the field may have higher levels of maternal antibodies than those evaluated in our pivotal efficacy study. Vanguard Plus CPV is packaged in liquid form.

DISEASE DESCRIPTION: CPV is generally transmitted through direct contact with infectious feces. The virus also can be carried on dogs' hair and feet or other contaminated objects and can remain infective for more than 6 months at room temperature.¹ With an incubation period of 4–14 days, CPV infection results in enteric disease characterized by sudden onset of vomiting and diarrhea, often hemorrhagic.^{2,3} Leukopenia commonly accompanies clinical signs.² Course of CPV disease may be aggravated by concurrent parasitism or infection with other enteric pathogens.^{1,3} Susceptible dogs of any age can be affected, but mortality is greatest in puppies. In puppies 4–12 weeks of age CPV may occasionally cause myocarditis that can result in acute heart failure after a brief and inconspicuous illness. Following infection many dogs are refractory to the disease for a year or more. Similarly, seropositive bitches may transfer to their puppies CPV antibodies which can interfere with active immunization of the puppies through 16 weeks of age.

SAFETY AND EFFICACY: Vanguard Plus CPV was subjected to comprehensive safety and efficacy testing at Pfizer Animal Health. Extensive field safety trials conducted by Pfizer showed it to be safe and reaction-free in dogs as young as 6 weeks of age under normal usage conditions.

Product safety was further demonstrated by a backpassage study which included oral administration of multiple doses of the vaccine strain to susceptible dogs, all of whom remained normal. Vanguard Plus CPV vaccine virus shares a characteristic with other live CPV vaccine strains in that the vaccine virus may be present in the feces following administration. Although this CPV vaccine virus was found occasionally and in low titers in the feces of vaccinated dogs, testing demonstrated that the vaccine master seed did not revert to virulence following 6 consecutive backpassages in susceptible dogs.

Research at Pfizer demonstrated that 3 doses of the vaccine with increased CPV virus titer can overcome serum neutralization (SN) titers associated with maternal antibody. Serum neutralization titers as low as 1:4 have been shown by others to interfere with active immunization using conventional modified live vaccines.^{4,5} A clinical trial was conducted with fifty 6-week-old puppies [25 vaccinates (SN titer range <2 –256) and 25 nonvaccinated controls (SN titer range 4–1024)] (Table 1). The group of vaccinates received 3 doses, with vaccinations administered 3 weeks apart beginning at 6 weeks of age. After 1 vaccination, 13/25 puppies exhibited a 4-fold or greater increase in CPV SN titer (seroconversion) (Table 2). Twelve of these

13 puppies had maternal SN titers $\leq 1:16$ at the time of the first vaccination with the remaining puppy having an SN titer of 1:64. Another 9 puppies with initial SN titers between 1:16 and 1:256 seroconverted after the second vaccination. Their maternal antibody SN titers had declined to $\leq 1:64$ at the time of the second vaccination. Similarly, the last 3 vaccinates, with initial SN titers of 1:128, seroconverted after the third vaccination, after their maternal antibody CPV titer dropped $\leq 1:64$. Therefore, in this study, when 3 doses of vaccine were given beginning at 6 weeks of age, all 25 vaccinates, even those with the highest maternal antibody levels, became actively immunized (GM = 1:1176; range of SN titers 128–4096). All 50 dogs were challenged 3 weeks after the third vaccination with a heterologous CPV challenge virus. Fourteen of 25 nonvaccinated control dogs died or showed illness severe enough to warrant euthanasia, while all 25 vaccinates remained essentially healthy. The high-titer, low-passage vaccine virus in Vanguard Plus CPV is therefore highly immunogenic and capable of stimulating active immunity in the presence of maternal antibodies.

Table 1. Initial Serum Neutralization (SN) Titers of Vaccinates and Controls

SN Titers	# Vaccinates Included	# Controls Included
<1:2	3	0
1:4	4	3
1:8	1	3
1:16	4	1
1:32	2	5
1:64	3	1
1:128	6	3
1:256	2	3
1:512	0	5
1:1024	0	1

Table 2. Postvaccination Serum Neutralization (SN) Titers Geometric Mean (Range)^a

Groups	N	Pre-	Postvaccination		
		vaccination	1	2	3 ^b
All Vaccinated Dogs	25	1:24 (<2–256)	1:108 (8–1024)	1:605 (8–4096)	1:1176 (128–>4096)
Responders	13	1:6 (<2–64)	1:460 (64–1024)	1:1745 (256–4096)	1:1410 (256–4096)
Post 1st Vac. Responders	9	1:87 (16–256)	1:20 (8–64)	1:376 (256–1024)	1:1625 (256–4096)
Post 2nd Vac. Responders	3	1:128 (128)	1:32 (16–64)	1:25 (8–64)	1:203 (128–256)
Post 3rd Vac. Nonvaccinated Control Dogs	25	1:64 (4–1024)	1:9 (<2–64)	1:3 (<2–64)	<1:2 (<2–4)

^a Dogs were vaccinated at 6, 9, and 12 weeks of age.

^b Pre-challenge SN titers

DIRECTIONS:

1. *General Directions:* Vaccination of healthy dogs is recommended. Shake well. Aseptically administer 1 mL subcutaneously or intramuscularly.

2. *Primary Vaccination:* Healthy dogs 6 weeks of age or older should receive 3 doses, each administered 3 weeks apart.

3. *Revaccination:* Annual revaccination with a single dose is recommended.

PRECAUTIONS:

1. Store at 2°–7°C. Prolonged exposure to higher temperatures and/or direct sunlight may adversely affect potency. Do not freeze.
2. Use entire contents when first opened.
3. Sterilized syringes and needles should be used to administer this vaccine. Do not sterilize with chemicals because traces of disinfectant may inactivate the vaccine.
4. Burn containers and all unused contents.
5. Contains penicillin, streptomycin, and amphotericin B as preservatives.
6. Vaccination of pregnant bitches should be avoided.
7. As with many vaccines, anaphylaxis may occur after use. Initial antidote of epinephrine is recommended and should be followed with appropriate supportive therapy.
8. This product has been shown to be efficacious in healthy animals. A protective immune response may not be elicited if animals are incubating an infectious disease, are malnourished or parasitized, are stressed due to shipment or environmental conditions, are otherwise immunocompromised, or the vaccine is not administered in accordance with label directions.

REFERENCES:

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4. O'Brien SE, Roth JA, Hill BL: Response of pups to modified-live canine parvovirus component in a combination vaccine. *JAVMA* 188:699–701, 1986.
5. O'Brien SE: Serologic response of pups to the low-passage modified-live canine parvovirus-2 component in a combination vaccine. *JAVMA* 204:1207–1209, 1994.

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