



PROTECT THE VULNERABLE

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MEET THE AUTHOR

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Feline Panleukopenia Virus

Previously a leading cause of death in cats, feline panleukopenia is now uncommon under normal conditions, thanks to highly effective, widely available, and safe vaccines.¹ The cause, feline panleukopenia virus (FPV), is also referred to as feline parvovirus. A hallmark of FPV infection is decreased white blood cells, or leukopenia. The challenges posed by FPV are infection control and prevention of secondary bacterial infections.

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Veterinary nurses who understand the feline panleukopenia disease process and supportive care that must accompany treatment of FPV-infected cats will be able to provide excellent nursing care for the patient. They will also be able to provide valuable feedback for the veterinarian about the patient's condition, which could help save the patient's life.

THE VIRUS

Parvoviruses are quite distinct because of their marked ability to mutate like RNA viruses.² They have single-stranded DNA and are nonenveloped, making them particularly hardy. The virus can live for months or years in the environment if protected by organic matter.² Newer variants of canine parvovirus can replicate and cause disease in feline populations.² Parvoviruses can be inactivated by carefully cleaning with a detergent to remove organic matter, then disinfecting for 10 minutes at room temperature with products containing 6% sodium hypochlorite (bleach) or potassium peroxymonosulfate.^{2,3} FPV is not adequately inactivated by cleaning with a variety of dilutions of phenolics, organic iodines, 70% alcohol, or quaternary ammonium.^{2,3}

THE DISEASE

FPV infection affects mainly young kittens, causing clinical signs such as fever, anorexia, depression, vomiting, diarrhea, and severe dehydration. By attacking rapidly dividing cells in the gastrointestinal tract, bone marrow, and lymph nodes, FPV can quickly lead to serious disease or sudden death from complications of secondary bacterial infection, dehydration, and disseminated intravascular coagulation.³ FPV can also infect adult cats; although infection can be asymptomatic, infected adults can spread the virus to other cats.

Cats at highest risk for acquiring FPV infection are those housed in groups, especially stressful situations such as in shelters, rescue facilities, and feral colonies; those that are immunocompromised; and those that are pregnant. The disease is highly transmissible when kittens are exposed to infected body secretions (e.g., urine, feces, nasal discharge) or to contaminated surfaces, clothing, and/or hands. Infection control requires isolation of patients suspected to be positive for FPV. Although virus shedding is limited to only a few days, virus can be shed before clinical signs appear and up to 6 weeks after recovery.³

Diagnosis

Diagnosis is commonly based on clinical signs/history, severe leukopenia, and virus detection.² The first hematologic change seen is neutropenia, followed by extreme leukopenia; clinical illness can parallel the severity of the leukopenia.³ Although rarely severe, blood loss in the intestines can also occur, leading to anemia.^{2,4} FPV can be reliably identified by in-clinic use of a fecal enzyme-linked immunosorbent assay.^{2,5}

Treatment

Nursing care and appropriate symptomatic treatment are essential for preventing patient death. Specific supportive care measures include aggressive IV fluid therapy, broad spectrum antibiotics to combat secondary bacterial septicemia, antiemetics, and resumption of enteral nutrition.²

Prognosis

Several days after infection, immune defense mechanisms can help with recovery, leading to lifelong, robust immunity.^{2,4,6} For FPV-infected kittens younger than 8 weeks, the prognosis is poor.¹ For cats that receive in-hospital supportive treatment for FPV, survival rates are only 20% to 51%.⁶ Every effort should be taken to minimize stress for kittens during hospitalization. Stress reduction includes providing a safe, secure cage environment that allows for some degree of hiding, using fear-free handling techniques, and isolating patients from offensive sounds and odors.⁷ Stress can also be reduced by providing synthetic pheromones and familiar items from home, including litter, and then locating the patient's litter box away from food, bedding, and water.⁷

VACCINATION

Similarities and differences exist in vaccines available for FPV. They all contain the same serotype of FPV, but types of vaccine and types of immunity stimulated vary.

Injectable modified live vaccines stimulate cell-mediated immunity after a single dose; partial immunity is effective within hours.⁸ This vaccine type is associated with virus shedding in the feces for 2 weeks after vaccination, which can affect results of fecal testing for parvoviruses.⁹ Because these vaccines carry a potential for neurologic dysfunction or clinical panleukopenia, they are not safe to administer to kittens younger than 4 weeks or to pregnant queens.^{4,9}



Inactivated, or killed, FPV vaccines stimulate humoral immunity and are safe for young kittens and pregnant queens. They should be used when vaccination of kittens younger than 4 weeks or pregnant queens is crucial.⁹ For development of full immunity, cats given these vaccines must receive a booster. Killed vaccines may also be used in cats with retroviral infections because the virus will not replicate when administered.⁸

Intranasal FPV vaccines are all modified live. When intranasal vaccines are used to provide local immunity, it may be advisable to also administer an injectable FPV vaccine to enhance immunity.⁸ Revaccination with intranasal FPV vaccines can also minimize and sometimes eliminate rhinitis clinical signs in chronic carrier cats.¹⁰

Vaccination Plans

Vaccination plans for each patient should be individualized. Choosing which vaccines and when to administer them is only part of the picture. When evaluating immune response capability, consider the patient's environment and immune system, vaccine features, and the pathogen itself.⁸ The ability of a

patient's immune system to appropriately respond to vaccination can be decreased by congenital or acquired immunodeficiency, other disease processes, persistence or interference of maternally derived antibodies (MDA), poor nutrition, chronic stress, and very young or old age.⁸ Vaccines from different manufacturers differ considerably in their capacity to immunize in the presence of MDA.⁹

The 2020 American Animal Hospital Association/American Association of Feline Practitioners (AAHA/AAFP) Vaccination Guidelines provide recommendations for vaccination of cats at any life stage, of any lifestyle, or from any place of origin.⁸ Because studies have shown that up to one-third of kittens are unable to mount a proper immune response to the last core vaccine at 16 weeks and possibly possess MDA at 20 weeks, the guidelines state that kittens should be vaccinated starting at 6 to 8 weeks of age and receive boosters every 3 to 4 weeks until 16 to 20 weeks of age.⁸ To ensure protection against MDA, a final booster should be given when the patient is 6 months of age. Vaccination every 3 years thereafter is recommended except for intranasal vaccines, which require yearly vaccination.⁸ Vaccine manufacturers will

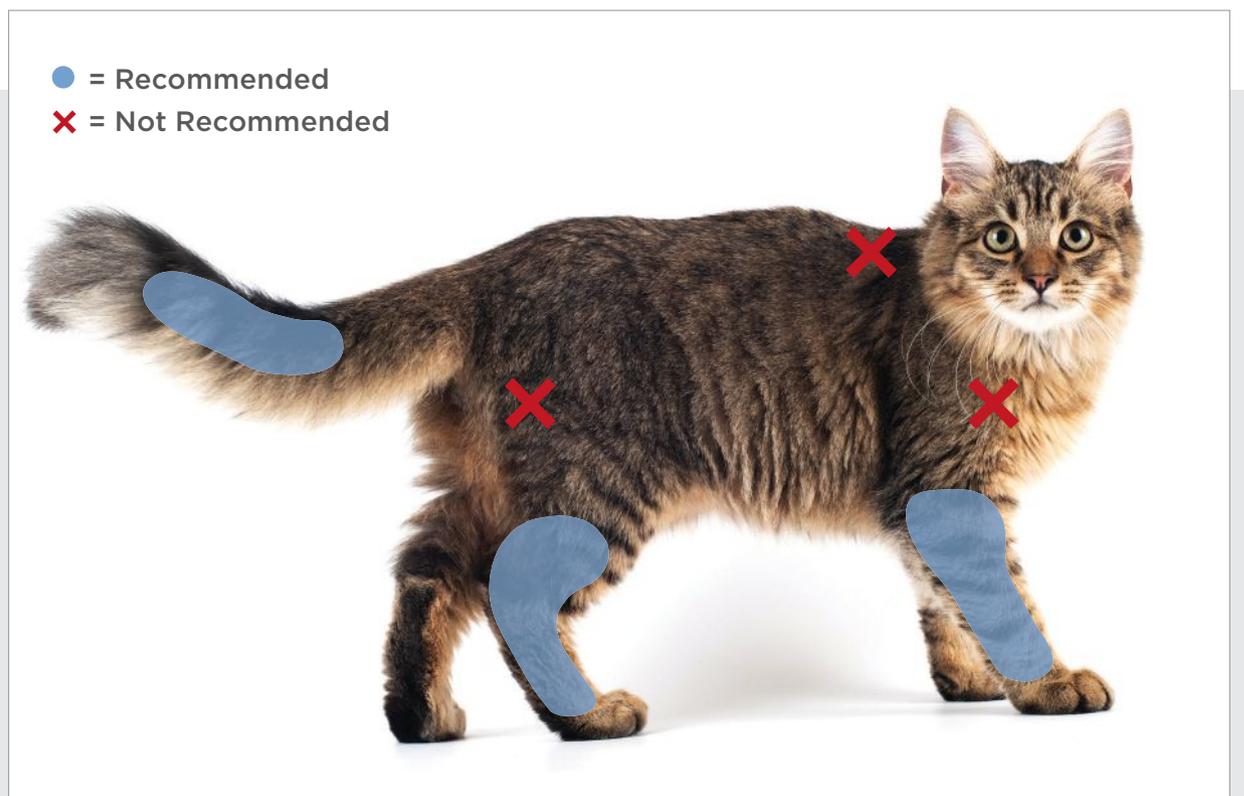


FIGURE 1. Feline vaccination sites from the 2020 AAHA/AAFP Feline Vaccination Guidelines.⁸



support the veterinarian's decision on how to use injectable combination vaccines such as the feline viral rhinotracheitis, calicivirus, panleukopenia virus (FVRCP) vaccine. For example, not all injectable FVRCP vaccines are licensed for 3 years, but they can be used on a 3-year protocol 1 year after the initial series of vaccinations has been completed.¹¹

Adverse Reactions

Postvaccination adverse events in cats are relatively rare.⁸ Vaccine side effects that can be expected include anorexia, low-grade fever, inflammation at the injection site, and lethargy.⁸ Even more rarely are anaphylaxis or a type 1 hypersensitivity reaction, exhibited by vomiting, diarrhea, generalized pruritus, facial pruritus, facial swelling, respiratory distress, and collapse.⁸

With regard to feline injection-site sarcomas, not enough research exists to recommend one vaccine type over another.⁸ However, in terms of injection sites (**FIGURE 1**), the AAHA/AAFP guidelines recommend vaccinating feline patients in a distal limb so that if a sarcoma does develop, it would be in a location that could be amputated, if necessary, with adequate margins.⁸ Vaccination in the tail of the cat seems well tolerated by patients and reportedly leads to acceptable immunity.¹² To enable tail sarcoma excision with 5-cm margins, the vaccine should be administered in the distal tail. The Task Force also recommends using the entire volume of the vaccine, rather than decreasing the volume injected.⁸ When educating clients about postvaccination swelling, use the 3-2-1 rule: if the swelling or a lump persists *3 months* after vaccination, biopsy is warranted. If it grows to over *2 cm* in diameter and is still growing *1 month* after vaccination, the patient should be evaluated by a veterinarian.⁸

Antibody Titers

Some clients may elect to have their cat tested for presence of antibodies. Antibody titer testing for FPV is useful for determining immunity and guiding decisions whether to revaccinate.⁸ The presence of antibodies against FPV corresponds with protection, and the absence of these antibodies indicates need for vaccination.⁸

CLIENT COMMUNICATION

Client education should emphasize the importance of core vaccines, how the immune system works, and the

role of vaccination in disease control. Some of the following communication tips will help increase client compliance with vaccination.

- Because FPV is a hardy virus and can be found everywhere in the environment, proper vaccination of all cats is essential.
- Vaccination is important even for indoor-only cats, which may lack immunity provided by natural exposure.⁸
- Because immunity gained through vaccination decreases over time and at different rates between cats, vaccination continues to be important throughout the cat's lifetime.
- Following recommended vaccination protocols will help prevent disease and increase the cat's long-term health.
- The vaccination site should be examined for swelling according to the 3-2-1 rule. **TVN**

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