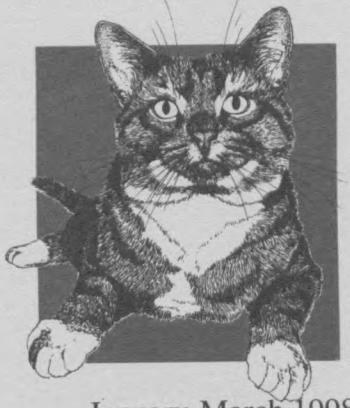

Feline Health Topics

for veterinarians

January-March 1998

Volume 13, Number 1

Feline Vaccination Guidelines

Excerpts from the 1998 Report of the AAFP/AFM Advisory Panel on Feline Vaccines

PREFACE

The American Association of Feline Practitioners (AAFP) and Academy of Feline Medicine (AFM)'s Advisory Panel on Feline Vaccines was established in 1997 to develop recommendations for use of vaccines in cats. Information was incorporated from an extensive literature search and from respected members from a wide spectrum of disciplines within veterinary medicine. Development of these guidelines was necessary to account for new knowledge and new products. They will be updated as additional advances indicate.

OVERVIEW

Vaccines play an important role in the control of infectious diseases and in preventative health care programs for cats. Veterinarians have succeeded in greatly reducing the incidence of various infectious diseases by establishing vaccination protocols and educating clients about the importance of vaccines.

This document is intended to promote understanding and provide guidance for use of currently available feline vaccines. Vaccination programs should be tailored so that each animal has the greatest opportunity to develop protection from the infectious diseases that it will come in contact with while minimizing risk of vaccine-induced complications.

Vaccination protocols should be selected for individual patients on the basis of risk of exposure to specific pathogenic agents. It is impractical to recommend a standard vaccination protocol for all cats, because the risk of acquiring specific infections varies with age and health of the cat, extent of exposure to other cats, and geographic prevalence of disease. A comprehensive physical examination of each patient at least yearly is important to assess health of the cat and address possible lifestyle changes that could affect vaccination recommendations for that year. Because of the ubiquitous nature and seriousness of feline panleukopenia, feline viral rhinotracheitis, feline calicivirus infection, and rabies, all cats should be vaccinated against these diseases. For this report, the panel has defined vaccines against these diseases as core vaccines. Vaccines against chlamydiosis, FeLV infection, feline infectious peritonitis (FIP), and dermatophytosis are defined as noncore vaccines. Noncore vaccines should be administered only to those cats with realistic risk of exposure to the causative organisms of these diseases.

Kittens are generally more susceptible to infection and therefore represent the principle target population for feline vaccine protocols. Neutralization of vaccine antigen by maternal antibody is the most common cause of vaccine failure in cats. For the

Inside this issue ...

Feline Vaccination Guidelines	**page 1**
Behavior Seminar	**page 7**
WWW Study	**page 8**

majority of kittens, vaccination at 8 and 12 weeks of age will allow a protective response to occur. Other factors that affect the immune response to vaccines - such as immunodeficiency, nutritional deficiency, concurrent disease or concurrent drug administration - should be taken into consideration prior to vaccine administration.

Vaccines should be used in accordance with principles of immunology to allow for maximum protection against disease. Factors that affect the immune response to vaccines should be considered prior to vaccine administration. The directions for use provided by the manufacturer are recommended on the basis of experimental evidence the manufacturer collected to support USDA approval of its product. Administration information contained in the product insert does not represent a legal mandate or requirement for administration of the vaccine. Guidelines in this report may differ from recommendations outlined in manufacturer's product inserts and are intended to represent new guidelines for vaccination.

Annual revaccination has been the profession's standard. More recent information suggests that duration of immunity - at least that induced by certain feline vaccines used today - exceeds 1 year. Therefore, the panel recommends booster doses of vaccines against feline panleukopenia, feline viral rhinotracheitis, and feline calicivirus infection be given every 3 years. Veterinarians may elect to vaccinate more frequently on the basis of risk assessments of their patients. Cats at high risk of exposure to infectious agents, such as those entering boarding facilities, may benefit from more frequent revaccination. Duration of immunity studies indicate that 3-year rabies vaccines provide effective immunity.

Vaccination can cause minor and, rarely, serious adverse effects. Public awareness and controversy about vaccine safety has increased, especially because of information on vaccine-associated sarcomas. Although development of sarcomas has been associated with use of parenteral vaccines, vaccination of cats at risk for specific preventable diseases should continue. Vaccination sites have been standardized to better understand the cause of sarcomas and to facilitate treatment if sarcomas develop. Use of vaccines that can be administered intranasally should be considered as an alternative to use of parenterally administered vaccines whenever an approved product is available.

Veterinarians have the responsibility to advise clients that vaccines are part of an overall wellness program for cats and to educate clients so they can make informed decisions. Owners should understand that use of vaccines will help protect their cats from most signs of disease, but that vaccine-induced immunity does not always prevent infection or all signs of disease. Discussing risks and benefits of vaccination will allow clients to give informed consent to or refusal of vaccination. For legal reasons, this discussion and the owner's informed decision should be recorded in the patient record.

Although vaccination is not an innocuous procedure, the benefits of vaccination far outweigh the risks for most cats. Veterinarians must continue to vaccinate their patients to prevent recrudescence of infectious diseases we now control. The objective of feline vaccination protocols should be to vaccinate more cats in the population but to vaccinate individual cats less frequently and only for the diseases for which

The ultimate purpose of the Cornell Feline Health Center is to improve the health of cats everywhere by developing methods to prevent or cure feline diseases, and by providing continuing education to veterinarians and cat owners. All contributions are tax-deductible.

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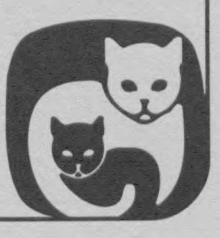

American Association of Feline Practitioners and Academy of Feline Medicine's Advisory Panel on Feline Vaccines recommended guidelines for vaccination of cats

Antigen	Vaccine type	Recommendation for initial vaccination series: <12 weeks old when first examined	Recommendation for initial vaccination series: ≥12 weeks old when first examined	Booster vaccination interval	Comments
Feline parvovirus*	MLV vaccine	Vaccinate at initial visit and every 3 to 4 weeks until ≥12 weeks old†	Vaccinate at initial visit (only 1 dose is needed)	1 year after initial vaccination series, then at 3-year intervals	Highly recommended for all cats; vaccine is not for use in pregnant queens or kittens that are ≤4 weeks old or immunocompromised
	Killed-virus vaccine	Vaccinate at initial visit and every 3 to 4 weeks until ≥12 weeks old	Vaccinate at initial visit and again 3 to 4 weeks later	1 year after initial vaccination series, then at 3-year intervals	Highly recommended for all cats
Feline herpesvirus-1‡ and feline calicivirus	MLV vaccine	Vaccinate at initial visit and every 3 to 4 weeks until ≥12 weeks old	Vaccinate at initial visit (only 1 dose is needed)	1 year after initial vaccination series, then at 3-year intervals§	Highly recommended for all cats
	Killed-virus vaccine	Vaccinate at initial visit and every 3 to 4 weeks until ≥12 weeks old	Vaccinate at initial visit and again 3 to 4 weeks later	1 year after initial vaccination series, then at 3-year intervals§	Highly recommended for all cats
Rabies virus	Killed-virus vaccine	Not eligible for vaccination	Vaccinate at initial visit (only 1 dose needed)	1 year after initial vaccination series, then at 3-year intervals‖	Highly recommended for all cats
Chlamydia psittaci	Avirulent live vaccine	Vaccinate at initial visit (only 1 dose is needed)	Vaccinate at initial visit (only 1 dose is needed)	1 year after initial vaccination series, then annually	Recommended for cats at high risk of exposure
	Killed vaccine	Vaccinate at initial visit and again 3 to 4 weeks later	Vaccinate at initial visit and again 3 to 4 weeks later	1 year after initial vaccination series, then annually	Recommended for cats at high risk of exposure
Feline infectious peritonitis virus	MLV vaccine	Not recommended	Vaccinate at initial visit and again 3 to 4 weeks later (first dose should not be given before 16 weeks of age)	1 year after initial vaccination, then annually	Can be considered for cats at risk of exposure to cats known or suspected to have been exposed to feline coronavirus
FeLV	Killed virus vaccine	Vaccinate at initial visit and again 3 to 4 weeks later (first dose should be given at ≥8 weeks of age, second dose at ≥12 weeks of age)	Vaccinate at initial visit and again 3 to 4 weeks later	1 year after initial vaccination series, then annually	Recommended for use in cats at high risk of exposure¶
Microsporum canis#	Killed vaccine	Not recommended	Prevention: vaccinate at initial visit, second dose 2 weeks later, third dose 3 weeks after second dose Treatment: third dose is at veterinarian's discretion	Guidelines not available	Not recommended for routine use; insufficient data to evaluate efficacy in prevention or treatment of disease

*Cause of feline panleukopenia. †Vaccination of kittens between 4 and 6 weeks old that are in environments where they are at high risk of exposure (eg, catteries and shelters) and orphan kittens may be indicated. ‡Cause of feline viral rhinotracheitis. §Booster vaccination interval may be decreased depending on risk of exposure. Cats at high risk of exposure, such as those entering boarding facilities, may benefit from more frequent vaccination. Duration of immunity beyond 1 year has been evaluated by determining antibody titers, not results of challenge. ‖Vaccination interval must comply with local statutes. ¶Outdoor cats, indoor-outdoor cats, stray cats, feral cats, cats in open, multiple-cat households, cats in FeLV-positive households, and cats in households with unknown FeLV status. #Cause of dermatophytosis (ringworm).
MLV = modified-live virus.

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there is a risk of exposure and disease.

CORE VS NONCORE VACCINES

When designing a vaccination protocol for individual cats, decisions must be made as to how often to administer core vaccines and which noncore vaccines may be appropriate. The panel determines the following to be core vaccine antigens; feline panleukopenia virus, feline herpesvirus 1, feline calicivirus, and rabies. All other feline vaccines are noncore. The panel recommends that vaccines designated as core vaccines be administered to all cats on the basis of the following criteria: the consequences of infection are particularly severe (e.g. feline panleukopenia virus), infection in cats poses a substantial zoonotic potential (e.g. rabies), prevalence of the disease is high and the disease is easily transmitted so that it poses a substantial risk to the population of cats at large (e.g. feline herpesvirus 1 and feline calicivirus infections), and vaccines that are selected are safe and efficacious. The decision to vaccinate a cat with a noncore vaccine should be made on the basis of a realistic evaluation of all risk factors as well as vaccine efficacy and safety.

VACCINE SELECTION AND ADMINISTRATION

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Veterinarians can determine which type of vaccine should be used for a particular patient by understanding the different characteristics of available products. Current choices are modified-live virus (MLV), killed-virus and subunit vaccines. Vaccines also differ on the basis of route by which they are administrated (parenteral or intranasal) and number of antigens they contain (single or multiple-antigen).

Veterinarians should understand the strengths and limitations of the different types of vaccines available to help in their selection of vaccines. Modified live virus (MLV) vaccines provide quicker protection in the face of an outbreak; protective immunity after one dose of MLV vaccines; and decreased risk of serious adverse reaction since there is no need for adjuvant or large antigenic mass. They are also thought to have increased efficacy with better stimulation of cell-mediated immunity than killed and subunit vaccines. The major advantages of killed vaccines is that they do not cause infectious disease.

Vaccine site recommendations should be followed in accordance with those established by the AAFP/AFM and accepted by the Vaccine-Associated Feline Sarcoma Task Force. It is important to standardize vaccine sites to help identify causes of local adverse reactions, and to aid in the treatment of vaccine-associated sarcomas (see Feline Health Topics, Vol. 11, No. 4). Parenteral FVRCP vaccines should be administered over the right shoulder, FeLV in the left rear, and rabies in the right rear, all administered as distally as practical.

The decision to use multiple- or single-antigen vaccines is not simple. Use of multiple-antigen products can be convenient for owners and veterinarians, because fewer injections are required. For a multiple-antigen vaccine to be approved, its manufacturer must demonstrate that each component of the vaccine induces the same level of immunity as does the single-antigen product. Therefore, the effectiveness of multiple-antigen vaccines should be clinically indistinguishable from that of single-antigen products. Nevertheless, controversy remains about advantages and disadvantages of multiple-antigen products. Simultaneous use of several single-antigen products tends to expose patients to higher amounts of proteins and, in certain instances, adjuvants, compared with use of a multiple-antigen vaccine. Therefore, it is speculated that there may be a safety advantage with the use of multiple-antigen products. The rate of adverse responses appears to increase as the number of antigens increases, regardless of whether these antigens are administered as concurrent single-antigen vaccines or as a multiple antigen vaccine.

The use of routes of vaccine administration other than parenteral should be considered if a vaccine approved for use by an alternative route is available. Intranasal administration of vaccines may be more effective for diseases for which the primary site of replication of the organism is the respiratory tract (e.g., feline herpesvirus 1 and feline calicivirus infection). Intranasal administration has the advantage of inducing humoral and cell-mediated immune responses in the respiratory tract, in addition to inducing systemic immunity. Another advantage of alternative methods of vaccine administration is the expectation that such methods would not be associated with sarcoma development. In the absence of any experimental data, this advantage is speculative. In addition, vaccines that are administered intranasally tend to be associated with a higher rate of adverse postvaccination effects, such as conjunctivitis, sneezing, and shedding of vaccine virus. Therefore, potential advantages of intranasal administration must be balanced against potential disadvantages.

Strict attention should be paid to the recommendations of the vaccine manufacturer for vaccine storage, handling, administration and dosing to maximize efficacy and safety. The directions for vaccine use provided by the manufacturer are recommendations based on experimental evidence that the manufacturer collected to support its products' USDA approval. These directions, while important, should not be adhered to without consideration of informa-

tion from other sources. Therefore, the AAFP/AFM guidelines contain recommendations for the use of vaccines that may differ from the directions outlined in the package insert.

DURATION OF IMMUNITY

The veterinary profession has for years recommended annual administration of booster doses of most vaccines. By tradition, manufacturers of veterinary biologics have recommended annual revaccination, and veterinarians have usually judiciously followed this recommendation. Until recently, only manufacturers of rabies vaccines were routinely required by the USDA to evaluate duration of immunity after vaccination. Most other vaccines are evaluated for duration of efficacy for only a few weeks or months but not necessarily the full vaccine interval listed on the vaccine label. Manufacturers are not required to establish maximum duration of immunity provided by the vaccine.

In recent years, many investigators and practitioners have expressed concerns that cats are routinely overvaccinated. On the basis of human medicine and our understanding of how the immune system functions, we would expect that the duration of immunity associated with currently available vaccines is longer than 1 year yet scientific information to substantiate this conviction has not been available for vaccines other than rabies vaccine.

In a recent study, vaccination of kittens with an inactivated, parenterally administered, adjuvanted vaccine again feline panleukopenia, feline viral rhinotracheitis, and feline calicivirus infection was shown to induce long-lasting antibody titers against the 3 causative viruses. The authors have not yet completed challenge-exposure trials. However, results of this study, as well as results of rabies vaccine studies, information from human medicine, and knowledge of how the immune system functions, are the basis for the panel's recommendation that a revaccination interval of 3 years be used for vaccines against feline panleukopenia virus, feline herpesvirus 1, and feline calicivirus infection.

Some practitioners have begun to measure VN antibody titers against the organisms that cause feline panleukopenia, feline viral rhinotracheitis, and feline calicivirus infection in cats in lieu of routine booster vaccination. This procedure may be especially appropriate for cats that have previously had adverse responses to vaccination. However, the correlation between VN titer and protection against challenge exposure has not been thoroughly established for these agents. A low titer does not necessarily correlate with a lack of protection to subsequent exposure.

Quality control issues make interpreting VN titers complicated. Only a few diagnostic laboratories measure feline parvovirus, feline herpesvirus, and feline calicivirus antibody titers routinely, and practitioners need to be aware that there are no quality control procedures to ensure that private laboratories measure antibody titers accurately. Interlaboratory results can be inconsistent. Practitioners are cautioned to assess reliability of serologic results prior to using titers to determine vaccination protocols that deviate from established recommendations.

ADVERSE RESPONSES TO VACCINES

Vaccines licensed for use in cats are considered safe and effective; however, adverse responses reportedly have been associated with every licensed vaccine. These responses range from minor local reactions and stinging to severe and sometimes fatal anaphylaxis or development of neoplasia. Intranasal administration of vaccines has been associated with local adverse responses including sneezing, coughing, conjunctivitis and shedding of vaccine virus. Vaccines can also induce systemic responses that are not allergy-mediated, including fever, lethargy, and reluctance to move. These signs are expected, to some degree, in a sizable proportion of any vaccinated population. Severity can range from mild to severe. Avirulent live Chlamydia psittaci vaccines may cause atypical reactions in about 3% of vaccinated cats.

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These reactions are often poorly recognized by practitioners. Severity of the reaction may vary from cat to cat. The cause of these reactions is not known. Reactions to the live Chlamydia psittaci component of the vaccine include lethargy,anorexia, lameness, and fever 7 to 21 days after vaccination. Cats with this reaction usually respond well to treatment with corticosteroids or aspirin. When observed, suspected adverse vaccine reactions should be reported to the US Pharmacopeia (1-800-4USP-PRN) and the vaccine manufacturer.

Preventing infectious diseases in cats with previous adverse responses to vaccines requires serious consideration. A cat that has experienced a potentially life-threatening reaction, such as anaphylaxis or tumor formation at the site of administration, should not, unless at high risk of exposure to infectious agents, receive additional parenterally administered vaccines for the remainder of its life. Because further vaccination is discouraged, every attempt should be made to prevent exposure to pathogenic organisms by keeping such a cat indoors and away from other cats that could be harboring infectious diseases. If a cat has previously had an adverse reaction to rabies vaccines and does not have any risk of exposure to bats or other animals that could harbor the disease, local regulatory agencies can be petitioned to waive the rabies vaccination requirement for that animal. If the cat is at high risk of infection, vaccinations should be separated so that fewer antigens are given at one time. If an anaphylactic reaction has occurred previously, the patient should be pretreated with antihistamines and/or steroids, and monitored closely for several hours post-vaccination.

MEDICAL RECORD DOCUMENTATION

Medical records serve as a basis for planning patient care, promoting communication, and reviewing, studying, and evaluating treatment. Such records should include documentary evidence of a patient's care and treatment. Currently, no prescribed system of record keeping exists, but record keeping should be done meticulously and methodically. Individuals administering vaccines should record the following information in the permanent medical record of the patient: date the vaccine was administered, name of the person administering the vaccine, vaccine lot or serial number, expiration date of the vaccine, name of the vaccine, vaccine manufacturer, and site of vaccine administration. Use of peel-off vaccine labels facilitates this type of record keeping, and the panel encourages all vaccine manufacturers to use peel-off labels. Results of serologic tests, as well as episodes of adverse responses, should also be recorded in the permanent medical record of the patient.

OBTAINING INFORMED CONSENT

Veterinarians are expected to provide their clients with sufficient information so that a reasonable person, in the client's position, could make an intelligent decision about whether to accept or reject vaccination of their animal. Legal advisors suggest that information presented to the client should include a brief discussion of the nature of the disease being vaccinated against and the animal's risk of exposure to the causative organism. In addition, a short explanation on any substantial short- and long-term adverse effects reasonably expected to result from vaccination should be given; however, veterinarians are not required to inform clients of every possible adverse effect that could occur. The required information can be given to the client orally or in the form of a prepared handout. The Cornell Feline Health Center's brochure, "Feline vaccines: benefits and risks", or the brochure, "Vaccines and sarcomas: a concern for cat owners," or others with similar content would be appropriate. Although not required, a separate consent form may be used. In all cases, a notation should be made in the patient's record as to what information was provided, by what method it was provided, and what the owner's decision was.

These guidelines are published in their entirety in the Journal of the American Veterinary Medical Association, Vol. 212, No. 2, pp. 227-241, Jan. 15, 1998.

CORNELL UNIVERSITY WEEKEND SHORT COURSE

Solving Feline Behavior Problems
June 13–14, 1998 Ithaca, New York

Program

This intensive course is designed for veterinary practice staff members, cat breeders, boarding facility owners, and other people with a serious interest in cats.

Topics to be covered include:

- **Behavioral History**
- **The Cat Brain and Drug Therapy**
- **Feline Communication and Spraying**
- **Housesoiling**
- **Feline Social Structure**
- **Aggression**
- **Feeding and Pica**
- **Sleep, Sex, and Maternal Behavior**
- **Development and Temperament Testing**

Faculty

Program instructors are faculty and staff members of the College of Veterinary Medicine, Cornell University:
Dr. Katherine A. Houpt, Director of the Animal Behavior Clinic and Professor of Veterinary Physiology;
Dr. Diane Frank, veterinary medicine practitioner and Visiting Resident in the Veterinary Medical Teaching Hospital;
Dr. Ellen Lindell, veterinary behavior consultant and Visiting Resident in the Veterinary Medical Teaching Hospital.

Accommodations

Rooms have been reserved at the following locations: Best Western University Inn, (607) 272-6100, $69 single/double (shuttle service provided on request); Super 8 Motel, (607) 273-8088, $41 single, $50 double. The above reduced rates are available if, when you make your reservations, you mention the program by name. Please make your reservations early; room availability and discount rates cannot be guaranteed after May 22.

Program Charge

The program charge is $300 and includes tuition; course materials; a certificate of completion; continental breakfasts and lunch on Saturday and Sunday; and refreshment breaks. Persons whose cancellations are received in writing by May 29 will receive a full refund. Cancellations received after May 29 are subject to a $100 cancellation fee. Substitutions may be made prior to June 10. Program costs may be tax deductible.

Travel Planning

Participants should arrive by 8:30 a.m., Saturday, June 13. The program will conclude by 4:00 p.m. on Sunday, June 14.

Further Information

Solving Feline Behavior Problems, Cornell University, B20 Day Hall, Ithaca, NY 14853-2801; telephone: (607) 255-7259; fax: (607) 255-9697; e-mail: cusp@cornell.edu

Registration Form

Please print or type:

_____
Name (as you want it to appear on certificate)

_____
Nickname (as you want it to appear on name badge)

_____
Mailing address (to appear on participant list)

_____

(____) _____ (____) _____
Day telephone Evening telephone

Please indicate your payment preference:

☐ Enclosed is my check for $ _____ made payable to Cornell University in U.S. dollars and drawn on a bank located in the United States.

☐ Charge my Visa or MasterCard for $ _____

_____
Account number Expiration date
(specify: ☐ Visa ☐ MasterCard)

_____
Cardholder's signature

_____
Cardholder's name (please print)

Registration should be submitted as soon as possible since enrollment will be limited. Send this form, along with payment or charge authorization, to: ***Solving Feline Behavior Problems,*** *Cornell University, PO Box 717, Ithaca, NY 14851-0717; Fax (607) 255-9697.*

Veterinarians Sought for World Wide Web Study of Feline Vaccine-Associated Sarcomas

Veterinarians who routinely administer vaccines to cats and have access to the World Wide Web are requested to participate in an internet-based study of the incidence of post-vaccinal reactions and sarcomas. The purpose of this research is to develop accurate national figures for disease incidence, and to determine how often localized reactions following vaccination develop into malignant tumors. Veterinarians who enroll will be confidentially asked on a regular basis over the next year about their vaccine use (frequency and brand) and any adverse health effects that occur.

The web site address is http://sarcoma.ucdavis.edu.

For further information, contact Dr. Philip Kass (phkass@ucdavis.edu) or Dr. Glenna Gobar (gmgobar@ucdavis.edu).

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