

antibody titers, determined by use of a validated virus neutralization assay (VN) or enzyme-linked immunosorbent assay (ELISA), can be used to predict resistance to infection and disease.^{8,9,72,73} In 2 published studies,^{9,73} all cats positive for FPV antibody that had been vaccinated within the previous 7 years were protected against the USDA challenge strain of FPV.

Vaccination against FCV and FHV-1 does not prevent infection, but only lessens the severity of clinical disease among cats subsequently exposed to virulent virus. Thus, immunologic tests will never be completely accurate in predicting whether disease will occur following exposure to either of these 2 agents. One study correlated serum FCV and FHV-1 antibody titers (VN and ELISA) with severity of clinical signs after exposure to the USDA challenge strains of FCV and FHV-1 in cats vaccinated between 6 and 36 months previously.⁷³ All cats with detectable FCV antibodies and most cats with detectable FHV-1 antibodies had greater than 50% reduction in severity of clinical signs, compared with control cats.

Virus neutralization antibodies against FeLV can be detected.⁷⁴ However, studies correlating antibody titers in FeLV-vaccinated cats with protection over time are not available. Additionally, humoral immune responses do not always correlate with immunity to this virus.

Studies correlating antibody titers with protection in vaccinated cats have assessed only small numbers of cats to date. Additionally, only a few vaccines have been evaluated, and results with other products may not be equivalent. Accordingly, *the panel recommends the use of set revaccination intervals, as described in this report, for most cats.* However, if serologic testing is being considered in lieu of using set revaccination intervals, the following points should be kept in mind:

- If a vaccination history is unavailable, vaccines should be administered.
- Serologic test results from different laboratories cannot be assumed to be equivalent; practitioners are cautioned to use only laboratories that have validated their test results (ie, they have correlated antibody titers with protection).
- Virus neutralization assays document in vitro inactivation of the specific virus by serum antibodies. ELISA can be designed to measure antibodies against viral antigens, but positive results do not necessarily document that the antibodies detected are protective. Thus, only ELISA for which results have been shown to correlate with protection should be used.
- Because maternal antibodies can be detected by VN assays and ELISA and may not indicate long-term protection, serologic testing for assessment of vaccination needs should be reserved for adult, previously vaccinated cats. If circumstances require measurement of antibody in kittens younger than 16 weeks of age, a sample should be collected on the day of vaccination and a second sample should be collected 2

or more weeks after vaccination. A significant increase in antibody titer indicates that vaccination induced an immune response.

- Serologic testing should not be used to assess vaccination needs in cats with proven or suspected immunosuppressive diseases.
- Detection of serum antibodies against FPV, FCV, and FHV-1 by validated VN assays and ELISA appear to correlate to resistance to infection in most cats, but failure to detect serum antibodies does not correlate to susceptibility. Thus, if serologic testing is used to assess vaccination needs in individual vaccinated cats, some seronegative cats will be vaccinated needlessly.

Practice Management Considerations

For many years, cats and veterinarians have benefited from annual administration of vaccines. By encouraging cat owners to bring their pets in yearly for vaccination, veterinarians have been enabled to recognize and treat disease earlier than might otherwise be the case. The annual visit has provided an opportunity to inform clients of important aspects of feline health care, and annual vaccine administration has bolstered the financial strength of many practices.

Unfortunately, many clients have come to believe that vaccination is the only reason—or at least the most important reason—for the annual visit. Veterinarians are justifiably concerned that a reduction in vaccination frequency will cause clients to forego annual examination of their cats, and that the quality of care they deliver will be degraded. To avoid this consequence, it is vital that veterinarians stress the importance of all aspects of a comprehensive health care program. In addition to vaccination, ways to diminish the impact of infectious disease (eg, reducing overcrowding, improving nutrition, and restricting access to infected animals) should be emphasized. Clients should be informed that cats with serious disease often appear healthy, and that regularly scheduled health evaluations facilitate early detection. The importance of dental care, proper nutrition, appropriate diagnostic testing, control of parasites, and control of zoonotic diseases should be emphasized during each patient evaluation. Behavior concerns should be discussed, as should the necessity for more frequent examination of kittens and older cats. Examination reminder cards (Appendix 5) or calls and on-hold message systems can inform clients that all aspects of preventative health care, not just vaccinations, are important and will be addressed during each appointment.

Each patient's vaccination needs should be assessed at least yearly and, if necessary, vaccination schedules should be modified on the basis of changes in the cat's age or health, the environment in which it resides, and its risk of exposure to infectious agents. As the number of vaccines patients receive is reduced, clients should not be lead to erroneously conclude that vaccination is no longer important. They should be informed that vaccination is a medical procedure