



## ***Update on FIV: What Every Shelter Needs to Know*** **Live Webcast Audience Questions and Answers**

**By Dr. Annette Litster**

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- 1) **Q: What commercial diets for FIV cats are okay to eat without making a special diet that can be expensive?**

**A:** There are no particular foods recommended specifically for FIV-infected cats, although if the cat has another condition that could respond to a special diet, such as chronic kidney disease for instance, you should discuss the best diet to use with your veterinarian. Any commercially prepared diet should be labeled as “complete and balanced” for the appropriate life stage. You should seek expert advice through your veterinarian before making a homemade diet so that it is properly balanced and meets the needs of the individual cat it is prepared for.

- 2) **Q: How young can you safely test kittens and get an accurate result?**

**A:** FIV antibody testing should be safe to perform from a very young age, as only a few drops of blood are needed. However, since the tests cannot distinguish between antibodies that an infected mother could have passed on her kittens and those produced in response to a natural infection, accurate results cannot be obtained in kittens younger than 6 months of age.

- 3) **Q: Do you have any first-hand experience with Mega C Plus by Dr. Belfield for the treatment of FIV+ cats?**

**A:** No, I’m sorry but I don’t. My advice to anyone who is seeking information about the effectiveness of a treatment is to only rely on the results of properly conducted controlled trials which have been subjected to peer review. Since many diseases such as FIV can have waxing and waning signs, unless testing includes a control group, it is impossible to know whether any improvements in health or other indicators are merely due to the natural course of disease over a relatively short period. Comparing before and after results on the same cat is not a substitute for a controlled trial.

- 4) **Q: Say a cat comes in with fresh bite wounds and tests negative on that day, if and when would you retest that cat (assuming it is a stray male for the most part)?**

**A:** If the test you are referring to is an antibody test, testing should be repeated a minimum of 60 days after a possible exposure event such as a bite wound. If the cat is

antibody negative, then according to the *2008 AAFP Feline Retrovirus Management Guidelines*, the cat can be considered free of infection and a wellness program can be commenced. In rare cases, some infected cats can take up to 12 months to become antibody-positive after infection, so you might consider retesting 1 year after a bite event if previous tests were negative. It is possible that alternative testing methods such as PCR could detect FIV antigen from FIV-infected cats <60 days after infection, but one published study found marked variability in diagnostic accuracy among commercial laboratories.

**5) Q: Is there a difference in SNAP testing whether you use saliva or blood for the testing?**

**A:** From the IDEXX SNAP Combo package insert, saliva is not one of the specimens that can be used with this test. Serum, plasma or anticoagulated whole blood (e.g. EDTA, heparin), either fresh or stored at 2–8°C for up to one week, can be used. For longer storage, serum or plasma can be frozen (-20°C or colder) and then recentrifuged before use.

**6) Q: What are your thoughts on the accuracy of the snap tests? False positives?**

**A:** Published studies have shown that the SNAP test is highly sensitive and specific for the detection of antibodies against FIV in infected cats. Levy et al. (*J Am Vet Med Assoc* 2004;225:1558-1561) reported sensitivity of 98-100%. Negative FIV antibody results are highly reliable for the detection of uninfected cats. However, false positive results can occur in uninfected vaccinated cats due to antibodies produced in response to vaccination and in kittens younger than 6 months of age due to maternally derived antibodies.

**7) Q: My understanding is that FIV snap tests are not reliable in cats under the age of 6 months of age, but you tested cats as young as 1 month of age. How can you be confident that these cats did not develop FIV by the age of 6 months?**

**A:** Negative FIV antibody results are highly reliable for the detection of uninfected cats, but false positive results can occur in kittens younger than 6 months of age due to maternally derived antibodies. In the FIV transmission study I presented in the webcast, only 1 of the 8 FIV antibody-positive cats was tested for the first time at <6 months old. That cat was 5 months old at the first test and 33 months old at the second test. Both test results were positive. Thirty of the 45 FIV antibody-negative cats in the study were tested for the first time at <6 months old; all remained FIV-antibody negative at the second test.

**8) Q: Do you think that it is reasonable to test mostly non-neutered male cats that are scruffy looking for FIV?**

**A:** Yes, all non-neutered cats are considered high risk and should be tested.

**9) Q: Is there a higher rate of cancer affliction for FIV cats?**

**A:** Cats with FIV are known to be at a higher risk for cancers, especially lymphomas. Reported incidence rates of FIV-associated cancers range between 1 and 21% of FIV-positive cats.

**10) Q: What is difference in cell-mediated vs. antibody-mediated?**

**A:** The immune system is divided in 2 arms - cell-mediated immunity and antibody-mediated immunity. Cell-mediated immunity fights infection with cells designed to recognize and destroy infective agents such as viruses and bacteria. These immune cells also produce chemicals which further stimulate the immune response. Antibody-mediated immunity uses proteins called antibodies to identify and attack infective agents.

**11) Q: What about feral cats? Should FIV positive cats be released back into the colony after spay/neuter or should they be euthanized?**

**A:** This is a decision to be made by the colony caregivers after careful consideration of all aspects of the decision making and disposition process. Some caregivers decide that limited resources are better spent on spay/neuter and vaccination than on FIV testing, especially if the test results will not make a difference to the management options available for individual cats. However, free-roaming outdoor cats are a high risk group, and the *2008 AAFP Feline Retrovirus Management Guidelines* recommend that their FIV status should be determined. It should also be remembered that reduced aggression in spayed/neutered cats makes FIV transmission less likely.

**12) Q: When you say “antibody-mediated immunity can be stimulated”, do you mean that they are naturally stimulated or that we can give the cats drugs that stimulate them?**

**A:** The immune system of an FIV-infected cat is capable of responding with antibodies to infections acquired under normal circumstances.

**13) Q: What does the “match for” or “partner with” mean in the captions of the cat photos?**

**A:** In the Maddie’s Purdue FIV Study, there are 89 matched pairs of cats enrolled. Each pair consists of an FIV-infected cat and an FIV-negative cat, and they are matched on age and sex i.e. the 2 cats in each pair are the same age and sex.

**14) Q: It has been our policy after a positive test to follow our vets recommendations to euthanize...are you saying this is unnecessary, and we have been putting down cats that could have lived almost normal lives?**

**A:** Many FIV-infected cats can live long and healthy lives. The Maddie's Purdue FIV Study aims to find out why some FIV-infected cats develop signs of disease but many do not.

**15) Q: What is your advice when a cat is FIV + and the inflammatory chronic skin disease does not respond to therapy?**

**A:** If possible, the inciting cause of inflammatory skin disease in FIV-infected cats should be determined first, as in any cat with a chronic dermatologic condition. Once the cause has been established, treatment can be tailored to treat that cause. If the skin condition is refractory to treatment, or an inciting cause cannot be determined, the advice of a veterinary dermatologist should be sought.

**16) Q: A cat was SNAP FIV positive, but was Western Blot negative. Do I follow up in 3-4 months with Western Blot or antibody by IFA?**

**A:** Both tests detect antibodies against FIV. Levy et al. (J Am Vet Med Assoc 2004;225:1558-1561) reported that Western Blot tests were not as sensitive or specific as SNAP tests. The *2008 AAFP Feline Retrovirus Management Guidelines* recommend that all positive SNAP test results should be confirmed, so this case should be re-tested with another SNAP test. If the cat is >6 months old and the second test is positive, consider the cat FIV-infected, unless there has been a history of FIV vaccination. If the FIV vaccination history is unknown, you could try a FIV PCR test. If the PCR test is positive, the cat should be considered infected. If the PCR test is negative, it is possible that either the cat is uninfected or that the result is a false negative result.

If the cat is >6 months old and the second test is negative, consider the cat FIV-free. If the cat was <6 months old at the first test, retest with SNAP when the cat is 6 months old.

**17) Q: How effective is the FIV vaccine?**

**A:** The vaccine is a killed vaccine against FIV subtypes A and D. Subtypes A, B, D and F have been identified in US cats infected with FIV. Challenge studies have shown 0-82-100% 'preventable fraction' (proportion protected by vaccination in excess of proportion that is naturally resistant).

**18) Q: So you are saying that new studies show that SNAP is more accurate than Western Blot**

**A:** Yes. Levy et al. (J Am Vet Med Assoc 2004;225:1558-1561) reported that Western Blot tests were not as sensitive or specific as SNAP tests.

**19) Q: Can one kitten contract FIV from its FIV+ mother while others do not?**

**A:** That has been known to occur. It is thought that the health of the queen is during pregnancy and her viral load are important factors affecting the proportion of kittens in the litter that are infected.

**20) Q: What are the differences in the seven strains of FIV?**

**A:** There are molecular differences between the proteins which make up the FIV virus in each of the subtypes. The clinical significance of these subtype differences has yet to be established.

**21) Q: What kind of test is the IFA (Immunofluorescence Assay)? Is it worth doing if a snap test is positive?**

**A:** Firstly, I should point out that FIV IFA testing is no longer commercially available in the USA. In the UK, the test is offered by the University of Glasgow Retrovirus Research Laboratory. The IFA test detects FIV antibodies in a plasma sample by using FIV-infected cells that have been fixed to a microscope slide. In the presence of anti-FIV antibodies in the test plasma sample, the infected cells fluoresce when stimulated by light of a particular wavelength. Levy et al. (J Am Vet Med Assoc 2004;225:1558-1561) reported that IFA tests were not specific as SNAP tests in FIV-uninfected unvaccinated cats (i.e. IFA tests were more likely to give false-positive results in FIV-uninfected unvaccinated cats). The *2008 AAFP Feline Retrovirus Management Guidelines* recommend that all positive SNAP test results should be confirmed, and since SNAP testing is highly sensitive and specific, re-testing in a SNAP-positive cat can be performed by repeating the SNAP test. If the cat is >6 months old and the second test is positive, consider the cat FIV-infected, unless there has been a history of FIV vaccination. If the FIV vaccination history is unknown, you could try a FIV PCR test. If the PCR test is positive, the cat should be considered infected. If the PCR test is negative, it is possible that either the cat is uninfected or that the result is a false negative result.

**22) Q: Would kittens testing positive on a snap test (due to their mother's antibodies and not because they actually are infected) test negative on the FIV RealPCR test done at the same time?**

**A:** In this case, if only antibodies and not infection has been transferred to the kitten from the FIV-infected mother, the FIV PCR test should be negative, as the kitten is not infected with FIV. Antibody testing should become negative by the time the kitten is 6 months old.

**23) Q: What is the incidence of pancreatitis in the FIV positive cats? Could something else be a confounding factor? I have two FVI positive cat that have developed pancreatitis**

**A:** Pancreatitis is a relatively common disease in cats and is often associated with inflammatory liver disease and/or inflammatory intestinal disease. To my knowledge, there have not been any published studies that have proven a link between FIV and pancreatitis, although since FIV-infected cats sometimes have chronic inflammatory disease, it is possible that there is a link. None of the 89 FIV-infected cats in the Maddie's<sup>®</sup> Purdue FIV Study have been diagnosed with pancreatitis over the last 3.5 years.

**24) Q: Do you have recommendations for housing of FIV-positive cats in a shelter? For instance, should they be housed separately?**

**A:** This question has been answered in the slide titled 'Shelter considerations - Management'. Briefly, FIV-positive cats should be housed separately from FIV-negative cats, and especially should be housed away from FIV-negative kittens and sick FIV-negative cats.

**25) Q: When is the best time to test after an unknown FIV status bite?**

**A:** If the test you are referring to is an antibody test (SNAP), testing should be performed a minimum of 60 days after a possible exposure event such as a bite wound. If the cat is antibody negative, then according to the *2008 AAFP Feline Retrovirus Management Guidelines*, the cat can be considered free of infection and a wellness program can be commenced. In rare cases, some infected cats can take up to 12 months to become antibody-positive after infection, so you might consider retesting 1 year after a bite event if previous tests were negative. It is possible that alternative testing methods such as PCR could detect FIV antigen from FIV-infected cats in <60 days after infection, but one published study found marked variability in diagnostic accuracy among commercial laboratories.

**26) Q: Do FIV + cats have a higher risk of developing FIP?**

**A:** To my knowledge, there have not been any published studies that have proven a link between FIV and FIP, but since cellular immunity is known to be important in fighting FIP, and cellular immunity can be reduced in FIV-infected cats, it is possible that FIV-infected cats are at higher risk of developing FIP if they are exposed to feline enteric coronavirus.

**27) Q: We have an eight year old FIV cat with chronic URI. What treatment/antibiotics do you recommend to help get it under control?**

**A:** The key to successful treatment is to identify the underlying cause if possible and then treat appropriately. My advice is to work with your veterinarian and start with a full microbiological investigation of the URI, perhaps using PCR testing of swabs collected

from the eyes, nose and oral cavity. Your veterinarian should then be able to recommend appropriate therapy.

**28) Q: In the oral human interferon therapy, if there was no change in the CD4:CD8 why the longer survival rate?**

**A:** We can only speculate on the reasons for this. It is probable that factors other than CD4:CD8 were responsible for the longer survival. It is also possible that there was in fact a difference in CD4:CD8 between the treatment and control groups, but that the statistical methods used were unable to demonstrate this.

**29) Q: Is AZT readily available to general public or just vets? How expensive is it?**

**A:** AZT is available by prescription only. You should check with your veterinarian about current prices.

**30) Q: How likely would you say in a mixed household of non-aggressive cats is it to pass FIV to non-FIV cats?**

**A:** The FIV transmission study I presented in the webcast showed that in a stable multi-cat household where 45 FIV-negative cats cohabited with 8 FIV-positive cats, FIV transmission did not occur. In this study, each FIV-negative cat had an average of 11.98 years' exposure to FIV-positive cats, leading us to believe that 'casual' transmission is very unlikely with FIV. However, if aggression with bite wounds occurs, FIV transmission will most likely occur.

**31) Q: In the closed household study, do you think the coronavirus impacted on the transmission of FIV since it appears to be a much higher rate of transmission than in the other studies?**

**A:** There is no evidence from the scientific literature that infection with feline coronavirus facilitates the transmission of FIV. I think it is much more likely that there was a relatively high rate of inter-cat aggression in that particular household and that bite wounds were the source of the FIV transmission.

**32) Q: Why are pooled specimen tests unreliable if the result is negative?**

**A:** Since the tests were designed to be performed on specimens from individual animals, and all quality control was performed by the manufacturer on individual specimens, there is insufficient data available about the diagnostic accuracy of the tests when used with pooled specimens for this method to be recommended.

**33) Q: How do you label FIV+ cats as FIV+ without creating a barrier to adoption before the adopter has had a chance to connect with the cat?**

**A:** Education is the key here. Prospective adopters need to be given as much accurate information as possible about FIV, its prognosis and recommended care for FIV-positive cats. Further information on prognosis is provided in the webcast on the slide titled ‘Published evidence on survival in naturally infected cats’ and detailed information on care of FIV-infected cats can be found on page 12-13 of the *2008 AAFP Feline Retrovirus Management Guidelines* (<http://jfm.sagepub.com/content/10/3/300.full.pdf+html>) and on page 579-581 of *Feline immunodeficiency ABCD Guidelines on Prevention and Management* (use link on right of page at – <http://www.sheltermedicine.com/node/42>).

**34) Q: I've read that the false positive rate of snap tests for FIV is as high as 32% (source: [www.fivtherapy.com/fiv\\_testing.htm](http://www.fivtherapy.com/fiv_testing.htm)). What do you think of this statistic?**

**A:** This statistic is likely to include use of the test in kittens <6 months that have maternally-derived immunity from their FIV-infected mothers and FIV-uninfected cats that have been vaccinated against FIV. Published studies have shown that the SNAP test is highly sensitive and specific for the detection of antibodies against FIV in infected cats. Levy et al. (J Am Vet Med Assoc 2004;225:1558-1561) reported sensitivity of 98-100%. Negative FIV antibody results are highly reliable for the detection of uninfected cats. However, false positive results can occur in uninfected vaccinated cats due to antibodies produced in response to vaccination and in kittens younger than 6 months of age due to maternally derived antibodies.

**35) Q: What supplements, etc., should I give my non-symptomatic FIV cat to help her combat the illness?**

**A:** Unfortunately, there are no published studies of properly conducted, long-term clinical trials of supplements which aim to prolong the life of healthy FIV-positive cats, so at this stage there are no recommendations that I can give. However, detailed information on care of FIV-infected cats can be found on page 12 of the *2008 AAFP Feline Retrovirus Management Guidelines* (<http://jfm.sagepub.com/content/10/3/300.full.pdf+html>) and on page 579 of *Feline immunodeficiency ABCD Guidelines on Prevention and Management* (use link on right of page at – <http://www.sheltermedicine.com/node/42>).

**36) Q: How is viral load measured? Is it something that would be useful for me to determine the risk of letting my FIV positive cat mingle unsupervised with the others?**

**A:** Viral load is measured using PCR testing, and IDEXX offers this service with their FIV RealPCR test. Viral load could well be important in the risk of viral transmission, but the association between viral load and risk of transmission is likely to be affected by many other factors such as viral strain and the clinical condition of the FIV-infected and



in-contact cats. Also, one study showed that high viral loads were associated with clinical stage, survival time, and disease progression in naturally FIV-infected cats (Goto et al., 2002 J Virol;76:10079).

**37) Are cats ever infected with more than one FIV strain at a time?**

**A:** This is possible, but currently available molecular techniques struggle to identify >1 FIV subtype in an individual cat.

**38) Are FIV cats also susceptible to *Pneumocystis carinii* pneumonia like humans?**

**A:** Pneumonia caused by *Pneumocystis carinii* has been reported in experimentally infected cats, but to my knowledge, natural infections in cats, including FIV-infected cats, have not been identified.

**41) Do you see different outcomes in treatment for lymphoma in FIV+ and FIV- cats?**

**A:** To my knowledge, clinical trials to address this question have not been reported in the veterinary literature. However, important factors affecting the prognosis for cats treated for lymphoma include tumor grade, stage of disease, health at the time that therapy is initiated and initial response to therapy.

**42) In addition to lymphoma what are the other common opportunistic infections?**

**A:** Lymphoma is a kind of cancer rather than an infection. While many common viral, bacterial, fungal and protozoal infections have been reported in FIV-infected cats, there are not any ‘AIDS-defining’ infections for FIV as there are for HIV.

**43) Have you encountered any FIV+ with LPGS - have you treated it successfully other than whole mouth extraction?**

**A:** Lymphocytic plasmacytic gingivitis stomatitis (LPGS) is quite common in FIV-positive cats. The most consistently successful treatment for this condition is full mouth extraction. Since it is a painful condition, my advice is to treat it promptly using the therapeutic modality that is likely to be most effective. Once the immediate post-operative period is over, most cats do very well after full mouth extraction and can eat a wide variety of foods.

**44) Would you recommend Lymphocyte T-Cell Immunomodulator for FIV cats with anemia?**

**A:** My advice to anyone who is seeking information about the effectiveness of a treatment is to only rely on the results of properly conducted controlled trials which have been subjected to peer review. Since many diseases such as FIV can have waxing and

waning signs, unless testing includes a control group, it is impossible to know whether any improvements in health or other indicators are merely due to the natural course of disease over a relatively short period. Comparing before and after results on the same cat is not a substitute for a controlled trial. Unfortunately, the company that makes Lymphocyte T-Cell Immunomodulator has not released the results of any clinical trials, if they have been conducted.

- 45) Some shelters seem to be moving to FeLV-only SNAP testing. We don't agree and will continue to test for both FIV and FeLV. Can we pass along a firm recommendation for continuing to test for both?**

**A:** The *2008 AAFP Feline Retrovirus Management Guidelines* recommend that the retroviral status (both FIV and FeLV) status of all cats should be known. This is a firm recommendation that both FIV and FeLV testing should be performed in all cats.

- 46) We retest for FeLV and FIV following six months of quarantine for wounds of unknown origin. Should this be sufficient?**

**A:** If the test you are referring to is an antibody test (SNAP), testing should be performed a minimum of 60 days after a possible exposure event such as a bite wound. If the cat is antibody negative, then according to the *2008 AAFP Feline Retrovirus Management Guidelines*, the cat can be considered free of infection and a wellness program can be commenced. In rare cases, some infected cats can take up to 12 months to become antibody-positive after infection, so you might consider retesting 1 year after a bite event if previous tests were negative.

- 47) Can we conclude that a cat vaccinated with FIV vaccine will Snap test + close to 100% of the time? With that said, do we know how many cats have been vaccinated with that vaccine? We'd like to establish reasonable doubt when we do FIV tests on intake.**

**A:** It is reasonable to assume that an FIV-vaccinated cat will test antibody-positive after vaccination and that the vaccine-induced antibodies will remain detectable by the SNAP test for years. I know of one FIV-uninfected vaccinated cat that is still testing SNAP FIV-positive 8 years after the last FIV vaccine was administered. The prevalence of FIV vaccination is likely to vary widely between localities and information on this topic has not been published. The *2008 AAFP Feline Retrovirus Management Guidelines* recommend that all positive SNAP test results should be confirmed, so cats that test SNAP FIV-positive should be re-tested with another SNAP test. If the cat is >6 months old and the second test is positive, consider the cat FIV-infected, unless there has been a history of FIV vaccination. If the FIV vaccination history is unknown, you could try a FIV PCR test. If the PCR test is positive, the cat should be considered infected. If the PCR test is negative, it is possible that either the cat is uninfected or that the result is a

false negative result. If the cat is >6 months old and the second test is negative, consider the cat FIV-free. If the cat was <6 months old at the first test, retest with SNAP when the cat is 6 months old.

- 48) Does the age of the cat when infected change much in regard to health and life expectancy? Would a kitten who got infected from its mother live a shorter life than one infected as an adult?**

**A:** From *Feline immunodeficiency ABCD Guidelines on Prevention and Management* (use link on right of page at – <http://www.sheltermedicine.com/node/42>) - The duration of the asymptomatic stage varies according to the infecting variant. When cats are infected at a younger age, they are more likely to progress to an immunodeficient state.

- 49) Would a household be considered stable even if the cats/kittens are young and play fight? Will play fighting spread FIV?**

**A:** Play fighting, where the skin is not broken, often occurs in stable multi-cat households. This has not been shown to be a source of FIV transmission.

- 50) Do you still recommend yearly FIV testing for a FIV negative cat living w/ a FIV positive cat, both being non-aggressive?**

**A:** FIV-negative cats cohabiting with FIV-positive cats are considered at increased risk of infection, so it would be prudent to test the FIV-negative cat annually.