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Feline Leukemia Virus

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Feline leukemia virus (FeLV) is a retrovirus, a family of viruses which has many members that infect cats and cause disease and death in cats around the world. Another well-known feline retrovirus is the feline immunodeficiency virus (FIV). FeLV and FIV can be found together in the same cat. The prevalence of FeLV in single-cat households is about 3% and can be as high as 11% in stray or high risk cat populations. In large multi-cat households and in households where cats roam freely outdoors, the prevalence can reach as high as 70%. Cats roaming in urban areas are more likely to be exposed to FeLV (40%) than cats roaming in rural areas (6%).

FeLV has been studied for over 30 years, both for its relevance to the cat population and because it serves as an animal model for some human diseases. Research has established key characteristics of FeLV: it is contagious, it directly causes both fatal cancerous and non-cancerous diseases, it can lie dormant in the bone marrow for a long time, and it can be protected against by vaccination. FeLV is not transmissible to humans or animal species other than the cat family.

FeLV is a fragile virus that does not survive in the environment. Ordinary household detergents and bleach effectively kill this virus. There is therefore no danger that cats can be exposed to FeLV in veterinary clinic waiting rooms or exam rooms, or in cages, or at cat shows unless direct contact is made with a positive cat that is shedding virus. Transmission of FeLV requires intimate moist contact. The most common route is contact with infected saliva through grooming, licking, biting and shared dishes and litter pans. FeLV can also be transmitted through a blood transfusion, so all cats that are blood donors are screened for FeLV. Kittens can be infected by their mother before birth or during nursing after birth.

When a cat is exposed to FeLV, there are four possible outcomes. In about 30% of cats, an effective immune response is produced and the infection is resisted. These cats then become naturally immune to FeLV infection for an unknown period of time. In about 40% of cats, the virus is successful and the cat eventually becomes persistently infected and excretes virus in its saliva. Another 30% of cats do not produce immunity but also do not become persistently infected immediately. In these cats, the virus hides in the bone marrow for a period of time. Eventually, these cats either overcome the virus or become persistently infected. Finally, some cats can develop latent or sequestered infection. This probably happens to about 5-10% of cats. These cats, whose virus is hiding in sites such as the bone marrow, will rarely be contagious and are unlikely to develop illness. They will not test positive on routine testing. In general, young cats, especially those under

four months of age, have the least ability to mount an effective immune response and so are most susceptible to FeLV.

FeLV is capable of producing a wide variety of associated diseases and symptoms. Degenerative diseases, such as anemia, liver disease, intestinal disease and reproductive problems can be seen. In other cats, the virus produces cancerous diseases, such as lymphosarcoma and leukemia. Many cats suffer from suppression of the immune system and other illnesses, depending on which organ is involved. Cats whose immune systems are depressed by FeLV are susceptible to a wide variety of infectious diseases and other problems, such as chronic respiratory infections, chronic gingivitis and stomatitis, feline infectious peritonitis, poor healing of wounds and abscesses and chronic generalized infections.

Testing is the basis for diagnosing and managing FeLV infections. The most common screening test for FeLV is the ELISA, while the immunofluorescent antibody test (IFA) is the recommended confirmatory test. Polymerase chain reaction (PCR) tests for FeLV may be offered by some commercial laboratories, but also may not have been independently validated.

In-clinic test kit for FeLV and FIV

Vaccination for FeLV does not affect test results since the tests are for viral antigens, not antibodies. Kittens can be tested at any age because maternal immunity does not interfere with testing. The ELISA is the preferred test for screening cats since it is quick and readily available in vet clinics. It should be performed on a blood sample, since ELISA tests performed on tears or saliva have been shown to be unreliable. Any positive or equivocal ELISA test results should be confirmed using the IFA test, usually done at a commercial laboratory. It is possible to have results on ELISA and IFA which do not agree for a variety of reasons, and there is a testing protocol to follow in order to determine the status of such cats.

The American Association of Feline Practitioners (AAFP) has published recommendations for FeLV testing. The guidelines state that the FeLV status of all cats

should be known because FeLV is responsible for the illness and death of more cats than any other disease condition. Testing and identifying positive cats is the mainstay of FeLV control and is not replaced by vaccination. Cats that have had a recent exposure to a known FeLV positive cat should be tested as should any cats that are ill. Any new kitten or cat should be tested before being added to a household with resident cats. Even if the household does not already have resident cats, new pets should be tested because the emotional bond that forms between owners and pets justifies knowing any future threats to the pet's health.

Cats that test positive for FeLV may live for months to years. Euthanasia of positive cats must be addressed on an individual basis in consultation with the veterinarian. In many cases, it is possible and feasible to keep an infected cat and ensure good quality of life through the combined efforts of the owner and the veterinarian. Positive cats are capable of transmitting their infection to other cats, so they should not live with other cats nor should they be allowed to roam outside. This not only protects other cats from FeLV, but protects the positive cat against the many diseases and illnesses they may contract due to their increased susceptibility.

The mainstays of treating FeLV positive cats are protecting them from exposure to other diseases, ensuring good nutrition, giving necessary vaccinations, reducing stress, controlling parasites, and early and aggressive treatment of any signs of illness that appear. There is no specific treatment for FeLV and no known cure. A large number of therapies have been investigated for FeLV positive cats, but most have not shown encouraging results. Anti-viral drugs, such as AZT, show some promise, but are associated with many side effects. A drug that stimulates the immune system, interferon, can be given orally to cats without side effects and may be helpful in many cases. Specific cancers associated with FeLV have their own chemotherapy treatment protocols. However, cats with cancer associated with FeLV have an average survival time of 6 months even with aggressive chemotherapy. Drugs that are being developed to treat AIDS (another retrovirus) in humans are often tested in cats first, so that studies on new drugs for AIDS may produce drugs we can also use to treat FeLV in cats.

The best protection against any infectious disease is eliminating possible exposure. The FeLV test and removal program was developed to remove infected cats from households. Using this program, no new cats are added to the household and all resident cats are tested by IFA every three months. Any cats with positive tests are removed from the household. When every cat tests negative by IFA for two tests in a row, the household is declared free of FeLV. Any new cats are not admitted to the household without a three-month waiting period in which they must have two negative IFA tests. This program has proven to be very effective for multi-cat households and catteries.

There are presently a number of companies who make and sell vaccines against FeLV. Vaccines may be against FeLV only, or they may combine FeLV with other components. Many trials have been conducted to compare the effectiveness of the various vaccines, but unfortunately, the studies remain hard to interpret, largely due to inconsistencies in study designs. However, there are at least two FeLV vaccines on the market that provide excellent protection. All the vaccines are recommended to be given as a two-dose regimen spaced 2-4 weeks apart, staring with kittens 8 to 9 weeks of age. Thereafter, annual boosters are recommended. The newest FeLV vaccine (Purevax® Recombinant

Leukemia Vaccine) is a transdermal, needle-less vaccine that has been shown to provide protection at least equal to injectable vaccines.

The American Association of Feline Practitioners has released feline vaccination guidelines. They divided vaccines into core and non-core groups. Core vaccines are those felt to be necessary for all cats and non-core vaccines are felt to be necessary only for those cats at realistic risk of the disease. FeLV vaccines are designated as non-core vaccines. Vaccination is recommended only for those cats whose lifestyle places them at risk for FeLV. This includes outdoor cats or those that are indoor/outdoor, feral cats, cats in open multi-cat households, cats in FeLV-positive households, and cats in households where the FeLV status of all resident cats is not known. Since young cats are at the greatest risk and their lifestyle is most likely to change in the future, the AAFP panel felt that it may be appropriate to suggest initial FeLV vaccination for all kittens, with subsequent annual vaccinations only for those that continue to be at-risk. In any case, owners should discuss issues of FeLV testing and vaccination with their veterinarian so the best decision can be reached for each individual cat.

For further information:

Recommendations for Feline Retrovirus Testing and Management, American Association of Feline Practitioners, http://www.aafponline.org

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