

# Feline Leukemia Virus Infection

## ABOUT THE DIAGNOSIS

Feline leukemia virus (FeLV) is a virus that can infect cats. It was first discovered in cats that had leukemia, which is a cancer of circulating blood cells. Nowadays, we know that this virus does cause leukemia—one of the few known infections that can lead a cat to develop cancer—but most cats with feline leukemia virus are asymptomatic. This asymptomatic state usually lasts for weeks to years until cats begin to show vague symptoms due to anemia, a weakened immune system that allows for other infections, or leukemia.

The virus acts by entering the cells in a cat's tissues throughout the body and "taking control" of the process that cells use for replicating themselves. In this way, the virus guarantees that it will survive in future generations of cells and spreads throughout the body. Some cats exposed to feline leukemia virus infection are able to fight it off and remain healthy for their entire lives. Others bring the virus under control and might never have any health problems as a result, although they do continue to be infected. Other cats can develop very serious, life-threatening diseases as a result of the feline leukemia virus infection; these include some types of cancer, bone marrow suppression, and immune deficiencies (weakened immune system).

Feline leukemia virus can be transmitted among cats in close, prolonged contact with each other through saliva, urine, and other bodily fluids including nasal and eye secretions. Often, it is transmitted from a mother cat to her kittens, and kittens are less able to fight off the virus than are adult cats. It is uncommon for a one-time exposure to lead to infection; rather, repeated exposure such as living together in a household or colony (for instance, barn cats) contribute to the spread of this virus between cats. Unneutered male cats that wander and fight have an increased risk of becoming infected and of transmitting the disease to other cats because of this behavior.

Feline leukemia virus can be transmitted from an infected pregnant cat to her unborn kitten (fetus) or to her newborn kitten in her milk or through maternal grooming of the newborn. Infected fetuses may die in the uterus, such that a cat's owner may never know that the cat was pregnant. The infected fetus may be aborted or the newborn infected kitten may die shortly after birth. Some kittens that are born with feline leukemia virus survive to become adults but have intermittent illness during their lives (persistently infected adults).

Many infected cats do not show signs (asymptomatic) of infection outwardly; however, they can still pass the infection on to other cats. Infected cats that do show signs of illness (clinical signs, symptoms) may have weight loss, weakness, fever, dehydration, inflammation of the lining of the nasal passages (rhinitis) causing nasal congestion and discharge, diarrhea, red eyes (conjunctivitis), sores in the mouth, enlarged lymph nodes, and/or abscesses under the skin. Anemia (decreased number of red blood cells) in cats is commonly caused by FeLV. Because this virus also infects white blood cells, the immune system commonly is weakened. As a result, cats infected with FeLV are susceptible to infections with other organisms (secondary infections) such as bacteria, other viruses, protozoa, and fungi that in turn can lead to other symptoms, including respiratory and intestinal problems. All the symptoms of FeLV infection are vague, and no symptom is truly characteristic of feline leukemia virus infection alone. Therefore, the suspicion of feline leukemia virus infection arises in two contexts: either one or more of these symptoms is/are noted by the veterinarian, or feline leukemia needs to be checked for as part of a routine health screen, such as when adopting a new cat or evaluating a cat's other health

issues. When feline leukemia is suspected by a veterinarian, the next step is to perform a feline leukemia blood test.

There are several blood tests currently used for establishing the diagnosis of feline leukemia virus infection. A screening test (enzyme-linked immunosorbent assay, ELISA) is always used first. For this test, a small blood sample is drawn and screened for the virus. Results can be obtained in a few minutes, and a negative result is highly reliable (true negative; >99% likelihood that the cat does not have feline leukemia virus). If the screening test is positive, a confirmatory test (immunofluorescent antibody, IFA; or polymerase chain reaction, PCR) is necessary because false positives do occur. The confirmatory test is also done on a blood sample, but it must be sent out to a lab and the results take a day or more to be available.

There are many factors to consider when interpreting the results of these tests. For example, early in the disease, the screening test may be negative when, in fact, the cat has the virus but the number of virus particles is too low to be detected in the bloodstream. For this reason, if a cat with symptoms consistent with FeLV has negative test results, some veterinarians will repeat the test one to several months later, or the test may be repeated if a kitten was recently adopted. The cat's lifestyle must be considered when interpreting results of tests. Cats that roam or have been exposed to other cats that are known to have the disease are at a higher risk of testing positive for this virus, and repeated testing is more likely to be necessary in such cases. There are other issues associated with test interpretation, and no test is perfect.

Because there is no medication that will eliminate feline leukemia virus once a cat is infected, prevention of contagion through environmental control (indoor-only lifestyle, avoidance of contact with cats of unknown or positive feline leukemia virus status) and vaccination are extremely important.

This virus is not known to infect people; however, cats with this disease may harbor other infectious agents that can be spread to humans. This is especially worrisome for people with weakened immune systems (such as individuals with HIV/AIDS, people undergoing chemotherapy treatments, etc.). Therefore, cats with feline leukemia infection should be monitored closely for any symptoms of illness and should be brought to a veterinarian to be evaluated promptly if symptoms of any sort of illness become apparent, both for the cat's sake and for the benefit of any individuals in contact with them that might be prone to infections.

## LIVING WITH THE DIAGNOSIS

While it is ideal to prevent infection, cats that have already been infected can still make good pets but require some special care. Firstly, cats that are diagnosed with feline leukemia virus must be confined indoors to prevent spreading this disease to other cats in the neighborhood. This confinement also prevents the cat from contracting diseases from other cats and the environment, because of the reduced immune function caused by feline leukemia virus. Cats that have feline leukemia virus infection should be examined by their veterinarians at least every 6 months so that subtle symptoms of secondary infections, anemia, or cancer can be detected by physical examination and routine blood tests. Asymptomatic (that is, apparently healthy) cats that have the feline leukemia virus should still receive at least some routine (annual to triennial) vaccinations. Routine vaccinations help to reduce the risk of other common, serious infections, and the need for these is determined on a case-by-case basis according to exposure risk. You should discuss the advantages and drawbacks of vaccination for your feline leukemia-positive cat with

your veterinarian to determine the best approach. There is a vaccine that protects against feline leukemia virus, but it should not be given to feline leukemia-positive cats because once a cat has the virus it is too late for the vaccine to help. Rather, it is appropriate to give it to feline leukemia-negative cats. It is best if infected cats can live in a one-cat household. If that is not possible, the next best thing would be to keep the infected and noninfected cats separate (separate litter box, bowls, etc.). If this is impossible, any cats that are not infected with feline leukemia virus should be vaccinated against infection. All household cats should be treated with flea and tick preventatives, and a good program of internal parasite control should be followed as well. Finally, it is very likely that even a seemingly healthy cat infected with feline leukemia virus will at some point become ill. These cats should be taken for veterinary care immediately, without waiting a few days as you might for an uninfected cat. With early treatment, many of the complications that make these cats ill can be treated. However, it is very likely that feline leukemia virus-infected cats will live a shorter life than an uninfected cat.

## TREATMENT

**Pet:** There is no antiviral drug that can eliminate feline leukemia virus to cure the infection. Instead, the focus is to keep asymptomatic cats healthy for as long as possible, and to quickly intervene when they do eventually become ill. This might include blood transfusions for cats that have low red blood cell counts, antibiotics for cats with bacterial infections, or chemotherapeutic drugs for cats that develop cancer. Other supportive measures may be necessary, including forced nutritional support of fluid therapy in the case of dehydration. Sometimes, treatment also includes immune modulators to try to help to strengthen a cat's immune system – these seem to have minimal efficacy. Antiviral agents directly impair the virus to prevent it from replicating. These kinds of drugs can be both expensive and toxic in cats, and they do not cure infection. None of these treatments can completely rid your cat of the virus, but your veterinarian can tailor a treatment regimen for your pet. At some point, perhaps years down the line, the viral infection can lead to difficult to treat complications and humane euthanasia (putting to death via lethal injection) might be considered.

**Environment:** Fortunately, the feline leukemia virus is relatively fragile and easily destroyed by most detergents and disinfectants (for example, diluted household bleach 1 part bleach to 30 parts water). It survives for only several hours outside a cat's body on objects such as food bowls, water bowls, and litter boxes. If you are bringing a new cat into the household after having housed a cat with feline leukemia infection, no special precautions are required if the infected cat has not been in the house for more than several days.

## DOs

- Have any new kitten or cat tested for feline leukemia virus, and if negative, vaccinated against the infection.
- Know the feline leukemia virus status of all cats in your household. This is a cornerstone of knowing the health status of a cat. Even if your cat is kept strictly indoors, your veterinarian should recheck the status if any new illness occurs. This is because infection can be hidden for many years, and your cat might have been infected even as a young kitten.
- Keep all feline leukemia virus-positive cats strictly isolated indoors. **AT ALL TIMES** to avoid contagion to other cats.
- Understand that having feline leukemia virus does not mean a cat is suffering; some cats naturally keep the virus in check for

years and have a normal quality of life, while others can become very ill soon after infection.

- Realize that the seriousness of a cat's feline leukemia virus infection is highly variable and that the most reliable information comes from the evaluation of your specific cat (rather than generalizations in brochures, textbook chapters, or internet sources).
- Establish a schedule of regular visits to your veterinarian if your cat has feline leukemia virus.
- Give medication(s) prescribed for your pet exactly as directed.
- Contact your veterinarian immediately if you feel your cat shows negative reactions to the medication(s) or new symptoms appear that might be linked to FeLV-induced secondary disease.

## DON'Ts

- Do not introduce new cats to cats that you already have until you are sure that the new cat has tested negative for feline leukemia virus (and you know the status of your current cats).
- Do not assume that a cat vaccinated against feline leukemia virus cannot acquire the disease. No vaccine offers a 100% guarantee, and testing a cat is always appropriate when the cat is about to first enter the household, or when signs of illness occur that a veterinarian suspects may be due to immune deficiency, anemia, or cancer.
- Do not allow a cat that has feline leukemia virus to roam freely outdoors.
- Do not allow a cat that has feline leukemia virus to eat uncooked meat (risk of toxoplasmosis).
- Do not neglect preventive care for a feline leukemia-infected cat.
- Do not ignore any sign of illness in a feline leukemia-infected cat; instead, seek prompt veterinary evaluation.

## WHEN TO CALL YOUR VETERINARIAN

With your cat that has had a feline leukemia virus-positive test:

- If your cat shows negative reactions to the medication(s).
- If you cannot return for a scheduled visit.
- If your cat has lost weight, decreased appetite, weakness, been bitten by another cat, diarrhea, sores in the mouth, or abscesses (lumps under the skin), or any other sign of illness.

With any cat:

- If your cat has been exposed to a cat with an unknown or positive FeLV status.

## SIGNS TO WATCH FOR

- When giving medication, watch for sluggishness, weakness, decreased appetite, hives (bumps under the skin), vomiting, diarrhea, or any abnormal behavior as general signs of either intolerance to the medication or worsening of the disease; a recheck visit to the veterinarian may be needed to tell the difference between the two.

Also available in Spanish.

Practice Stamp or Name & Address