

# 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, and eventually 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 with feline leukemia virus infection remain completely asymptomatic for their entire lives and never have any health problems as a result, although they do continue to spread the virus (contagion). Other cats can develop very serious diseases as a result of the feline leukemia virus infection, and these include some types of cancer, bone marrow suppression, and immune deficiencies (weakened immune system).

This virus has been diagnosed in cats throughout the world and is not known to infect people; however, cats with this disease may harbor other infectious agents that can be spread to humans 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.

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. It is extremely uncommon for a one-time exposure to lead to infection; rather, repeated exposure such as sharing food/water dishes and using common litter areas 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 also 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 feline leukemia virus 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. Therefore, a positive result on the screening test and a negative result on the confirmatory test mean that the cat does not have feline leukemia virus.

There are many factors to consider when interpreting the results of these tests. For example, early in the disease, the 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. 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.

Because there is no medication that will completely 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.

## LIVING WITH THE DIAGNOSIS

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. Asymptomatic cats that have the feline leukemia virus should still receive their routine (annual to triennial) vaccinations if exposure to other cats is inevitable. 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. A vaccine exists 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.

In multi-cat households, the cat(s) with feline leukemia virus should be isolated from all other cats and their environment (separate litter box, bowls, etc.). For this reason, cats with feline leukemia virus are sometimes adopted out to other homes with no cats. All other cats in the household should be tested for feline leukemia virus as described above. Those cats that test positive should likewise be isolated or removed. Cats that test negative should be vaccinated against the virus if they are considered “high risk” by you and your veterinarian as described above; for example, vaccination is recommended if an FeLV-negative cat roams outdoors, or lives with an FeLV-positive cat.

## TREATMENT

**PET:** Feline leukemia virus infections can be very difficult to control because no medication can eliminate the virus entirely. Many factors influence the effectiveness of a treatment plan, including the cat’s age, concurrent illnesses, and the strength of the immune system. There are different strains of virus, some more difficult to treat than others. Two general types of medicine are available. Immune modulators help to strengthen a cat’s immune system. Antiviral agents directly impair the virus to prevent it from replicating. Treatment may require several weeks of injections or giving medications orally at home. Supportive care, including fluids to prevent dehydration, may necessitate occasional visits to the veterinarian. Proper nutrition is essential. Secondary infections and other concurrent diseases must be treated. For example, anemic cats may require blood transfusions. Cats with cancer may require chemotherapy. Even for cats that respond to treatment, the disease may recur. None of these treatments can completely rid your cat of the virus. Your veterinarian can tailor a treatment regimen for your pet.

**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 several hours outside a cat’s body on objects such as food bowls, water bowls, and litter boxes. Litter box liners may be helpful in preventing transmission of this disease because the liner can be discarded; be aware to look for inappropriate elimination, which can occur when some cats refuse to use litter boxes that have liners.

## DOs

- Know the feline leukemia virus status of all cats in your household. This is a cornerstone of knowing the health status of a cat.
- 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 and life expectancy, while others can become very ill.
- 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.
- 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).

## 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).

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.

Practice Stamp or Name & Address