

Feline Immunodeficiency Virus (FIV) in Cats

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What is feline immunodeficiency virus?

Feline immunodeficiency virus (FIV) is a type of virus called a retrovirus. It is in the same family as [feline leukemia virus \(FeLV\)](#) and human immunodeficiency virus (HIV, the virus that causes AIDS). It attacks the immune system, and as a result, the cat is unable to fight off various infections and cancers. Approximately 2.5% of cats in the United States are infected with FIV.

Retroviruses are species-specific. This means a feline retrovirus like FIV will only infect cats; a human retrovirus such as HIV will only infect humans.

Retroviruses are made up of RNA. In the host, the RNA is transcribed into DNA and incorporated into the DNA of the host's cells.

Retroviruses are fragile, being easily inactivated by ultraviolet light, heat, detergents, and drying.

How is FIV transmitted?

FIV is NOT transmitted by prolonged close contact, as is the case for FeLV. FIV is shed in the saliva and is usually transmitted by bite wounds.

FIV transmission *in utero* or through the mother's milk is very rare. It could possibly occur if the queen is infected during pregnancy or while nursing the kittens. Queens infected with FIV prior to the pregnancy usually have noninfected kittens.

How common is FIV?

FIV is found worldwide in domestic cats, and also infects wild felines including snow leopards, lions, tigers, jaguars, Florida panthers, and bobcats. Although the virus was first isolated in 1987, we know the virus has existed for many years. It is most common in outdoor, free-roaming cats. In the United States, 1-2 percent of apparently healthy cats are infected with FIV.

Male cats are at least twice as likely to become infected with FIV as female cats. Free-roaming cats are also more likely to be infected since they too are more susceptible to bite wounds. Unlike FeLV, FIV infection is rare in catteries since few bite wounds would be expected in a cattery situation.

How does the virus cause disease?

FIV infection in cats has three stages, just like HIV infection in humans. The initial or acute stage of FIV infection is often characterized by fever, swollen lymph nodes, and a susceptibility to skin or intestinal infections. This stage generally occurs 4-6 weeks after being exposed to the virus.

The second stage is a latent or subclinical stage in which we see no signs of disease. This stage can last for many years. During this stage, the immune system may slowly be destroyed. When the immunodeficiency becomes severe, the third stage of infection occurs.

The third stage is the final or AIDS-like stage, and occurs most commonly in cats 5-12 years of age. (FeLV is seen most often in cats 1-5 years of age.) During this final, clinical stage, the cat's immune system is not functioning correctly since the virus kills essential cells in the system. Because of this, the cat is very prone to infections. These infections, which are usually chronic, may be bacterial, fungal, or parasitic. Often, they are caused by organisms which normally do not cause severe disease in cats. But since the immune system cannot keep them in check, they multiply rapidly and cause disease. These are called opportunistic infections.

We can see chronic upper respiratory tract infections, intestinal infections, and skin/ear diseases. Certain cancers may develop in some cats; researchers are determining how FIV is involved. Other cats may show neurologic signs although FIV generally has less effect on the nervous system of cats when compared to the effect of HIV in humans. Anemia can occur and may be a result of a parasitic infection. Once a cat is in the late stages of disease, life expectancy is 1 year or less.

What are the clinical signs of disease?

FIV-infected cats may show nonspecific signs such as lethargy, loss of appetite, fever, swollen lymph nodes (lymphadenopathy), and weight loss. The signs of FIV infection and FeLV infection are very similar.

Oral Infections: Chronic oral infections occur in approximately 50% of cats with FIV-related disease. Cats may show pain when touched on the face, have difficulty eating

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Chronic oral

or refuse to eat, and may have a bad odor around the mouth. These infections can be difficult to control. Oral infections are more common in cats with FIV infection than those infected with FeLV.

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Respiratory Disease: Approximately 30% of FIV-infected cats have chronic upper respiratory disease with sneezing and nasal discharge. These symptoms may be due to chronic infections with feline herpes (rhinotracheitis) or calicivirus. In some cats, pneumonia can develop and cause coughing and difficulty breathing.

Eye Disease: Along with signs of upper respiratory disease, cats may also show ocular signs such as redness of the eyes, discharge, and cloudiness of the cornea. Glaucoma is sometimes seen, as well.

Gastrointestinal Disease: Chronic diarrhea is seen in 10-20% of FIV-infected cats. It may be due to cancer, bacterial infection, parasitic infestation, or FIV itself.

Skin and Ear Infections: Recurrent or chronic infections of the skin and ears may be the first sign of an FIV infection. Because of the immunodeficiency, parasites, yeast and bacteria overgrow and cause symptoms such as hair loss, itching, and pustules. [Demodectic](#) and [notoedric mange](#), which are unusual in healthy cats may be seen. Chronic [ear mite](#) infections and aggressive [ringworm](#) lesions have also been reported. Chronic abscesses can also occur.

Neurologic Disease: Changes in behavior, loss of house-training, and dementia can be seen in FIV-infected cats. These symptoms may be caused directly by FIV or by parasitic ([Toxoplasmosis](#)) and fungal ([Cryptococcosis](#)) infections, which occur more often in immunosuppressed animals.

Lymphadenopathy: Lymph nodes in the abdomen and other parts of the body are often enlarged.

Anemia: Anemia is observed in approximately 1/3 of FIV-infected cats. [Mycoplasma haemofelis](#), formerly known as [Haemobartonella felis](#), is a parasite of red blood cells that may be responsible for many of these cases.

Neoplasia: FIV-infected cats are 5 times more likely to develop [lymphoma](#) and leukemia than uninfected cats. The exact mechanism for this is unknown.

What are the laboratory findings in cats with FIV-related disease?

Most chemistry tests are normal in cats with FIV. We may see anemia and decreased numbers of white blood cells in ill cats. A certain protein, called globulin, may be elevated in FIV-infected cats.

How is FIV infection diagnosed?

FIV infection is diagnosed through tests which detect the cat's antibodies against FIV. The screening test is called an ELISA and the confirmatory test is called a Western Blot. A test to detect antigens (proteins from the virus) is called a PCR test, and it can also be used to determine if a cat is infected with FIV, but it is more expensive. In 2008, The American Association of Feline Practitioners (AAFP) revised their guidelines for FeLV testing. They recommend that all cats be tested for FIV. In addition, cats should be (re)tested:

- During sickness: Regardless of previous negative results. While many signs (such as fever, stomatitis - inflammation of the mouth, vomiting, and diarrhea) are obvious indicators of illness, other signs are subtle and may include changes in behavior, grooming, and eating habits.
- When being adopted/entering new home: Regardless of age and whether or not they will be entering a household with other cats. They should be tested prior to being introduced into the household.
- When living in multi-cat households in which another cat is infected with FIV, or are otherwise at high risk (e.g., cats that go outdoors unsupervised).
- After potential exposures: When cats have had known or possible exposure to other cats who are infected or are of unknown infection status. If a negative test is obtained, the test should be repeated after a minimum of 60 days.

In addition, it is important to note that:

- FIV tests detect antibodies (FeLV tests detect antigens). All positive screening tests (the "ELISA" is preferred) should be confirmed through a test called the Western blot. Remember though, no test is 100% accurate.
- It takes at least 8 to 12 weeks after infection for detectable levels of antibody to appear. Therefore, cats should be retested about 8 to 12 weeks after their most recent exposure in order to allow adequate time for development of antibodies. Cats with an unknown infection status should be tested once, then have the test repeated in 8 to 12 weeks.
- Young kittens may have positive test results for 12 to 16 weeks after birth because of the passive transfer of FIV antibodies from the mother through the colostrum. Only a small percentage of these kittens who test positive are actually infected. A positive test result in an uninfected kitten is called a 'false positive.' Conversely, an infected kitten may have a falsely negative test if it has not yet had time to develop antibodies. Kittens tested at less than 6 months of age, regardless of the test result, should be retested after 6 months of age.
- Vaccinated cats develop antibodies that are not distinguishable from those resulting from an actual infection using

currently available tests. A newer test is being analyzed for its ability to distinguish between vaccine-associated antibodies and those from a natural infection.

- Remember that FIV-infected cats can live for many years before they develop symptoms.

To assist your veterinarian in determining the risk of your cat being exposed to FIV, the AAFP has developed a history form you can fill out and give to your veterinarian at your cat's next exam. Click [here](#) to see a sample form.

How is FIV infection treated?

Although FIV-positive cats can live for many years, your veterinarian needs to know if your cat is FIV-infected to provide the best care, e.g., proper vaccinations and often more intensive treatment of infections. Stress and exposure to ill animals should be avoided. FIV-positive cats should be kept indoors both to protect them from exposure to disease and also to prevent them from spreading FIV to other cats.

To provide the best care, your veterinarian needs to know if your cat is FIV-infected.

There are many antiviral medications for people with HIV infection, but currently there are none which are routinely and effectively used in FIV-infected cats. The antiviral drug AZT, which is used in human retrovirus infections has had some success in cats, although it can cause toxic side effects. Certain agents that have used to modify the immune response in FeLV-infected cats include staphylococcal protein (SPA), *Propionibacterium acnes* (ImmunoRegulin), low doses of oral human alpha interferon, and an aloe derivative called Acemannan. Well-controlled clinic trials of these agents have not been performed.

Cats with FIV-related disease will need to be treated according to the signs of disease they are showing. Infections which occur as a result of the immunodeficiency should be treated aggressively. FIV-infected cats with cancer can receive chemotherapy, radiation therapy, or immunotherapy. Supportive care such as fluids, good nutrition, and antibiotics for secondary infections are essential.

How is FIV infection prevented and controlled?

Testing and identifying positive cats is the only means by which FIV infection can be controlled. Although FIV is less transmissible than FeLV, any FIV-positive cat should be separated from non-infected cats. Cats in the terminal stages of the disease can shed large amounts of the virus in their saliva and can pose a greater threat to uninfected cats.

Since cats who roam are more likely to sustain cat bites, cats should be kept inside, or supervised when outside and not be allowed to roam.

A vaccine against FIV, produced by Fort Dodge, was approved for use in Spring 2002. It does not provide 100% protection, and vaccinated cats will test positive on the antibody test. The American Association of Feline Practitioners does not currently recommend use of the vaccine.

Are there human health risks associated with FIV-infected cats?

The retroviruses are species-specific. There is no evidence FIV can be transmitted to mammals other than cats. A potential human health risk can occur from exposure to some of the secondary infections FIV-infected cats may acquire, such as toxoplasmosis.