

Feline Infectious Peritonitis (FIP)

- FIP is a rare but fatal disease caused by a mutation of a common virus inside *individual* cats.
- Cats cannot catch it from other cats.
- Testing is difficult for prediction of FIP or determining if a cat has FIP.
- Vaccination is generally not recommended.
- Good nutrition, good litter-box maintenance, and reducing stress will help prevent the disease.

What it is: Feline infectious peritonitis (FIP) is a viral disease that is generally fatal. FIP is caused by a mutation in a very common virus, the feline enteric coronavirus (FECV), which is one of the many feline coronaviruses (FCoV).

How cats get FCoV/FECV: These viruses occur in almost any cattery in Western Europe and America. FCoV/FECV are transmitted primarily by fecal-oral contact, and less so by direct contact between cats or environmental contact. The virus may persist in the environment (cat litter, for example) up to two months. FECV is found in the gut. FCoV infections are generally associated with acute, self-limiting enteric (intestinal) or respiratory diseases, with signs ranging from mild diarrhea or sneezing to none at all.

How cats get FIP: FECV can mutate inside *an individual cat* to yield the form of virus responsible for FIP. The FIP virus (FIPV) is a particularly virulent mutation of FECV. The immune response of the cat to FIPV is responsible for the clinical signs and illness. It is thought that some cats may be genetically predisposed to acquiring the disease. Stress may also facilitate the mutation of FECV to FIPV and subsequent disease. It is unknown how FIP develops, but cats do not get FIP from other cats.

Occurrence of FIP: It has been estimated that after FECV has been introduced into a multi-cat environment, 80-90% of cats will be infected with FECV. But, fewer than 10% of cattery cats develop FIP. Another estimate is that 75-100% of purebred cats in catteries have FCoV antibodies while only 30% of cats in family pet households develop these antibodies. The antibodies indicate the cat has been *exposed* to the virus at some time in its life and produced antibodies to it. There is some recent evidence of a relationship between cat breed and FCoV antibody titer (concentration) in both healthy cats and those with clinical signs of FIP, as well as between cat breed and FIP; however these relationships have been inconsistent across studies.

Clinical signs: FIP has two forms, the wet form and the dry form, though specific disease signs may exist on a continuum between them. The signs are non-specific, including lethargy, decreased appetite, undulating fever, and weight loss. If the wet form of FIP is present, the abdomen may be swollen with fluid, and may cause difficulty in breathing. This form of FIP has a short disease course. With the dry form, signs include seizures, vomiting, depression, and cloudy eyes, and the cat may have only subtle signs for months.

Testing and Diagnosis: Usually, a combination of testing methods must be used for a diagnosis to be made. Clinical signs and abnormalities in blood work or body fluid may suggest FIP, but a definitive or certain diagnosis is possible only if the virus is found in tissue biopsy. There are a few blood tests available but none is specific for FIP. The popular serum antibody test is for antibodies to FCoV only and there is **no** correlation between FCoV antibody titers and FIP or the potential for FIP to develop. This test only measures a cat's immune response to FCoV. In fact, a cat with FIP may have a low or no titer. Thus, the FIP blood test is not particularly helpful in predicting or diagnosing which cats may develop or have FIP.

Another test, PCR, has been used with mixed results because it may not detect the specific mutations involved with a given cat's form of FIP. DNA analysis of fluid from the abdomen or lungs of a *sick* cat can be used for a tentative diagnosis of FIP, if the FIPV is found.

Vaccination: The FIP vaccine protects against FCoV, not against FIPV. Because most cats are exposed to FCoV as kittens, younger than the vaccine is practical to use and earlier than it is licensed for use, many veterinarians do not advocate its use. The vaccine can also stimulate production of FCoV antibodies, which may result in a measurable titer. Again, this is not indicative of FIP.

Prevention: Because stress suppresses the immune system and can facilitate the mutation of FECV, reducing stress is very important. This includes providing good nutrition as well as excellent sanitation, and keeping cat groups small (under 5 cats is recommended) rather than large. There are management techniques for breeders but they are not necessary for households or small rescue situations.

In summary: FIP happens. It is tragic when it occurs, but other cats will not catch the disease. Maintain good sanitation and keep stress to a minimum for your cats, and the incidence of FIP should be very low. Research is ongoing.

References: Here are some websites that may be helpful:

UC Davis School of Veterinary Medicine's Center for Companion Animal Health, Maddie's Shelter Medicine Program, *FIP - Frequently Asked Questions:*

http://www.vetmed.ucdavis.edu/CAAH/Prog-ShelterMed/fip_faq.htm

The Winn Foundation Health Article on Feline Infectious Peritonitis:

<http://www.winnfelinehealth.org/health/FIP.html>

Dr. Addie's FIP and Coronavirus website:

<http://www.dr-addie.com/index.htm>

Other questions? Always consult your veterinarian for specific information for your cat!