



# **CP Feline Coronavirus (FCoV) and Feline Infectious Peritonitis (FIP) Procedures**

## **1 What is Feline Coronavirus (FCoV)?**

It is estimated that the faeces of up to 40 per cent of all household cats contain FCoV (rising to up to 100 per cent of cats in multi-cat households). Most owners are unaware of it as the cats usually remain healthy. The virus is not infectious to humans or other animals.

## **2 How are cats infected with FCoV?**

FCoV is very contagious and cats can acquire it at any time through contact with the faeces of infected cats. Exposure to faeces that contain the virus is the most common form of transmission. The cat may then inadvertently ingest the virus when grooming, or when particles of faeces contaminate their food. In many circumstances, cats go outside to defecate and bury their faeces, in which case the virus lasts only hours to days (it survives slightly longer in freezing conditions). However, FCoV may survive for several days and possibly up to seven weeks in dried faeces in cat litter.

## **3) What happens to a cat infected with FCoV?**

In the vast majority of cats infected with FCoV, it causes no problems, or only short-term mild diarrhoea. However, a small minority of cats infected with FCoV can be severely affected by the virus, developing a disease called Feline Infectious Peritonitis (FIP). This can happen at any time following infection (weeks to years). It is not fully understood why some cats develop FIP, but genetic factors and stress are both thought to play a role. It is possible that cats genetically related to others that have developed FIP may be more at risk of developing the disease. Once infected with FCoV cats can clear the virus and stop shedding it. However, they can be re-infected with the virus again at any time in the future (and this often happens in multi-cat households) as there is no lasting immunity. A small minority of cats develop FIP.

## **4) Which cats are vulnerable to FCoV infection?**

Almost all cats are susceptible to infection with FCoV; a very small minority (<4 per cent) may have natural resistance to infection. Cats which become infected, and are young (under two years of age) or old (over 10 years of age), or are otherwise immunocompromised, may be more at risk of developing FIP.

## **5) What is FIP?**

FIP is an uncommon, fatal viral disease of cats caused by an immune response to infection with feline coronavirus (FCoV). The disease is most common in young cats (six weeks to two years old). Cats living in multi-cat groups are also more likely to develop disease and susceptibility may be partly inherited in some cats. Unfortunately, there are no tests to tell which cats infected with FCoV may develop FIP and which cats won't.

## 6) Why does FIP occur?

There are currently two theories on how a cat develops FIP:

1. The classical theory

FCoV mutates (changes) within individual cats, and this mutated virus causes FIP.

Although the mutation theory has not been fully proven, it is thought that mutation of FCoV to an FIP-causing strain depends on a complex relationship between the strain and amount of virus, and the genetics, age and immune status of the cat. This is the traditional theory of FIP and tends to result in sporadic cases of disease.

2. The hot-strain theory

There are different strains of FCoV circulating in the environment, with some 'hot' strains being more likely to lead to the development of FIP in an infected cat. This theory may help to explain the occasional 'outbreaks' of disease which occur affecting many more cats than would normally be expected <http://www.sheltermedicine.com/node/40>

Research to find out more information about this frustrating disease is ongoing.

## 7) What are the signs of FIP?

There are two forms commonly described – wet FIP (which usually causes a more rapid decline) and dry FIP. All cats with FIP are unwell; most will have a fever, appear lethargic and go off their food. Cats may look bloated or have difficulty breathing. They may show neurological or ocular signs.

## 8) How is FIP diagnosed?

FIP is not easy to diagnose. There is no single test that will always confirm or rule out FIP. The only definitive way to diagnose FIP is through the examination of biopsies taken from the cat's organs and the disease is usually only confirmed at post-mortem.

Antemortem tests (tests in live cats) to suggest a diagnosis of FIP are only useful in sick cats where there is a clinical suspicion of disease.

Healthy cats or cats where the only clinical sign is diarrhoea

- Screening tests such as FCoV antibody tests or faecal PCR tests in healthy cats or cats whose only clinical sign is diarrhoea are not considered useful in the shelter environment and lead to dilemmas in the management of cats with positive results. As FCoV infection is so common, many cats are FCoV antibody positive, including many healthy cats and cats with FIP are occasionally FCoV antibody negative (see section 13)

Sick cats where there is suspicion of FIP

- If the cat has an effusion (fluid, usually in the abdomen or chest), this can be sampled and assessed for colour, viscosity and specific gravity. If this and/or other signs make the vet highly suspicious of FIP (such as pyrexia, uveitis), euthanasia without diagnostic tests may be indicated
- Diagnostic tests: there are many other tests that can be done to try to help to diagnose FIP, but no definitive diagnostic test. If the vet needs to perform further tests, then from a pragmatic perspective, only minimal testing should be done on CP cats and the tests which are most useful include biochemistry (including albumin:globulin ratio) and the  $\alpha$ 1-acid glycoprotein ( $\alpha$ 1-AGP). If the clinical profile and blood tests are strongly suggestive of FIP, then euthanasia is indicated
- Euthanasia or death of a sick cat with a suspicion of FIP should be followed by histopathology and immunohistochemistry on post mortem samples, as ruling out FIP post

mortem can be as useful as diagnosing FIP pre-mortem when considering the management of in-contact cats

### **9) Can a cat with FIP be treated?**

CP cats should not be treated for FIP as no effective treatment exists. Treatment is usually unrewarding and cats deteriorate, eventually succumbing to the disease.

### **10) How can FIP be prevented?**

Once a cat is exposed to FCoV there is no way of knowing whether it will develop FIP or not.

In the home environment, owners keeping cats in groups of five or fewer will reduce the amount of virus circulating in the environment and good litter tray hygiene will also help to reduce the likelihood of the disease occurring.

Many cats entering a rescue environment are likely to be shedding FCoV and protocols are designed to try to avoid virus transmission. Cats in rescue care inevitably go through stress resulting from change in routine and environment, from procedures such as vaccination, neutering etc and stress associated with rehoming. Stress is a risk factor that may contribute to the development of FIP in a cat infected with FCoV. Reducing stress may help to protect an infected cat from developing FIP. Housing cats singly and not mixing cats from different sources, while adhering to good hygiene will also help to reduce the likelihood of the disease occurring.

There is a commercial vaccine that has been developed to prevent infection with FCoV. However, the effectiveness of the vaccine is unknown because different studies evaluating it have produced very different results. However, generally it does not appear to be particularly effective and it seems to provide considerably less than 100 per cent protection. It can only be used in kittens over 16 weeks of age, by which time most kittens are already infected with FCoV anyway. For these reasons the vaccine is not recommended. It is currently not available in the UK.

### **11) What action should be taken by CP if FIP is confirmed?**

There is no universally agreed approach to the management of cats and their in-contacts in the rescue situation, following a case of FIP. The following CP guidance has been put together following discussions and consultation with feline specialist vets.

There are four different scenarios related to FIP and each is managed slightly differently (the rationale for each approach is noted in italics after each point).

Scenario:-

- 1. A single case of FIP**
  - a. Single case occurring while in CP care. *FCoV is common and sporadic cases of FIP occur in cats infected with FCoV*
  - b. Single case occurring soon after adoption from CP - see section 14 for guidance when speaking to an adopter reporting this. *FCoV is common and sporadic cases of FIP occur in cats infected with FCoV. Source of infection with FCoV is unknown*
- 2. More than one case of FIP occurring within the same litter or queen/litter combination.** *There may be genetic susceptibility to FIP developing and similar FCoV exposure in cats where littermates have developed FIP.*

3. **More than one case of FIP in different litters or queen/litter combinations of cats but originating from the same source / household.** *Cats from the same household may be genetically related or may have been exposed to a hot strain of FCoV and so all may be more susceptible to developing FIP, when non-litter mates from the same household have developed FIP.*
4. **More than one case of FIP has occurred in different litters or queen/litter combinations of cats originating from different sources or households** i.e. there is suspicion of spread within the centre – **OUTBREAK.** *The hot strain theory may apply*

If further cases arise after one or more cases, move to the appropriate scenario at that point.

### **Guidelines applicable to all scenarios**

- Ensure an accurate diagnosis is made – see sections 8 and 13. (FCoV antibody blood tests and FCoV faecal PCR tests are **not generally helpful** to guide on management of healthy cats in the CP situation). Please speak with the CP Veterinary Department first
- Separate sick suspected cases from healthy in-contacts
- Hygiene: Barrier care for any suspected case and its in-contacts – see section 12, wear PPE (care with fomite transfer on hands, equipment and feet especially), use litter with minimal dust, remove faeces from litter trays as soon as possible and deep clean when the pen is vacated
- Minimise stress: ensure provision for hiding and play enrichment is provided, scent continuity, continuity of carer (particularly until cats have adapted well to life in CP care). Once weaned, keep healthy in-contact littermates in small groups of two or three while in care
- It is not recommended to early wean CP kittens at five-six weeks to prevent potential infection from the queen (a strategy sometimes recommended in breeding colonies). It may lead to behavioural issues and kittens may become infected from another source anyway

### **Additional guidelines applicable to each scenario**

The following table offers guidance, but it is difficult to provide guidelines that will cover every scenario. Please contact the CP Veterinary Department for advice. Information regarding action plans noted can be found after the table of scenarios.

**CP FIP Scenarios**

Scenario	Littermates and queen of affected cat(s)		Non-litter mates/queen but cats originate from same source as affected cat(s)		Unrelated cats which originate from a different source but where there is suspicion they may have been exposed to the same virus while in CP care (eg breach in biosecurity or presence of a hot strain)		Unrelated cats from a different source which have not been exposed to the same virus
	i) still in CP care or returned to CP care	ii) already adopted from CP care	i) still in CP care or returned to CP care	ii) already adopted from CP care	i) still in CP care or returned to CP care	ii) already adopted from CP care	
Scenario 1a) Single case of FIP occurring while in CP care	Use Action Plan A	Use Action Plan E	no special action required	no special action required	no special action required	no special action required	no special action required
Scenario 1b) Single case of FIP occurring after adoption from CP care	Use Action Plan A	Contact the CP Veterinary Dept for advice (action may depend on age, health, time since adoption, nature of home)	no special action required	no special action required	no special action required	no special action required	no special action required
Scenario 2) More than one case of FIP occurring in same litter	Use Action Plan D	Use Action Plan E	no special action required	no special action required	no special action required	no special action required	no special action required
Scenario 3) More than one case of FIP occurring in different litters of cats originating from the same source/household	Use Action Plan D	Use Action Plan E	Use Action Plan C	no special action required	no special action required	no special action required	no special action required
Scenario 4) Outbreak - more than one case of FIP in different litters of cats originating from different sources/households (ie suspicion of spread within centre) NB Stop intake of the most susceptible cats of less than 12 months of age into CP care, and contact the CP Veterinary Dept for advice	Use Action Plan D	Use Action Plan E	Use Action Plan C	no special action required	Use Action Plan B	no special action required	no special action required

**CP FIP Action plans** (NB Action Plan E is noted separately below)

	<b>Action Plan A</b>	<b>Action Plan B</b>	<b>Action Plan C</b>	<b>Action Plan D</b>
Isolate and barrier care	Yes	Yes	Yes	Yes
Routine vaccination as normal	Yes	Yes	Yes	Yes
Neuter	From first vaccination, prior to adoption			
Hold back in CP care after the last stress* (see below) or last known exposure whichever is the later	four weeks	four weeks	four weeks	eight weeks
Type of home for adoption	Single cat home (or only with existing litter mates)	No special home required	Single cat home (or only with existing litter mates)	Single cat home (or only with existing litter mates)
Owner advice at the point of adoption – For all action Plans A-D at adoption, ensure appropriate advice is given with regard to:- <ul style="list-style-type: none"> <li>• Integration</li> <li>• Stress management</li> <li>• Resource distribution</li> <li>• Particular attention to litter tray provision, distribution and hygiene.</li> <li>• Contacting CP if cat becomes ill</li> </ul>	<b>Specific</b> FIP disclosure on medical summary form **	<b>General</b> FIP disclosure on medical summary form ***	<b>General</b> FIP disclosure on medical summary form ***	<b>Specific</b> FIP disclosure on medical summary form ** In this situation, if costs are discussed, CP may then consider offering costs leading up to a presumptive or confirmed diagnosis of FIP if it develops within six months post-adoption (if insurance excludes it), but speak to the CP Veterinary Department first.

\* Stress – Stress, in this instance, refers to:-

- change in location,
- transportation (long distance or just a trip to the vet),
- surgical procedure,
- course of medical treatment
- vaccination
- separation from (including death of) in-contacts

Stress should be avoided, but unfortunately adoption and change of location are in themselves stressful. There are arguments to delay stressors such as vaccination, neutering and adoption. However, prolonging time in shelter care is also stressful and it is too risky in a shelter environment to delay vaccination. Delaying neutering may result in confinement indoors for many months (and risk of behavioural/welfare consequences), stress of pregnancy or development of unwanted behaviours risking injury, disease or relinquishment. There is no perfect way of managing shelter cats which have been exposed to FCoV and different charities may approach its management in different ways.

**\*\*Specific FIP disclosure:** “One or more of your adopted cat’s kittens/littermates/queen has developed Feline Infectious Peritonitis. It is likely that your adopted cat has been exposed to FCoV and may potentially develop the disease, although only around 1-10 per cent of cats infected by the virus usually go on to develop FIP. Unfortunately there is no test to determine if this will occur. We advise that you read the PRE-ADOPTION FIP HANDOUT (found towards the end of these procedures) provided before adopting this cat. We advise that the cat is adopted with his/her littermates/queen only and not another cat, to a home without resident cats.”

**\*\*\*General FIP disclosure:** “We have lost some kittens to the virus that can cause Feline Infectious Peritonitis (FIP). There is no test to determine which cats infected with FCoV will develop FIP. If your adopted cat shows any signs of ill health, please seek veterinary advice and let us know.”

### **Action Plan E - Informing owners of littermates already adopted**

It is probably best to gently advise by telephone call first, offering guidance on stress management and litter tray hygiene, then send the POST-ADOPTION FIP HANDOUT (found at the end of these procedures).

Owners may be anxious about the health of their newly adopted cat, and/or the risk to any other cats already resident in their home. If cats have mixed at all or shared litter trays, it is likely they will all be infected with FCoV if the newcomer was still shedding FCoV at the point of adoption, but it is rare for resident cats to succumb to FIP when a new FCoV shedding cat is introduced. More commonly, perhaps due to the stress of rehoming, it is the newly introduced cat, if any, that develops FIP. The resident cats may already have been infected with and shedding FCoV (having picked it up from their environment) prior to adopting the CP cat, unbeknown to the owner. Unfortunately, there are no tests that can guide whether a cat will develop FIP and no time-frame exists after exposure during which it is safe to assume a cat won't go on to develop FIP. It is best to direct owners to discuss any concerns they have with their own or CP vet. Faecal RT-PCR and antibody tests can be performed repeatedly over time, as these may show reduced viral load and antibody levels respectively, but interpretation is complex and it will not change the outcome (indeed repeated vet checks may be an unnecessary stress and monitoring by RT-PCR and antibody levels is usually only performed in breeding establishments wishing to reduce/eliminate FCoV infection in their household). It must be noted that FCoV is a common virus. The introduction of a new cat to a household always carries the risk of introduction of FCoV, but fortunately in the majority of cats the FCoV does not cause a problem.

## **12 Barrier care**

### **Disinfectants**

- FCoV is shed in faeces and other secretions and can live for up to seven weeks indoors in dried particles
- The disinfectants effective against FCoV include quaternary ammonium compounds, inorganic peroxygen compounds or bleach. It is recommended to use peroxygen compounds or bleach in the event of an outbreak (scenario 4). Please contact Cats Protection Veterinary Department if you need assistance with choice of disinfectant
- Ensure that disinfectant instructions are followed carefully to ensure efficacy, including attention to prior cleaning, disinfectant dilution and contact time
- Bleach should be used at a 1:32 dilution if a cat is housed in the pen. When using bleach, the pen must be cleaned first using detergent. The bleach is then applied and left for a contact time of 15 minutes and then it must be rinsed off with water. A 1:10 dilution of bleach can be used when there is no cat housed in the pen. The bleach solution should be prepared daily

- Inorganic peroxygen compounds (Virkon) should be prepared daily according to the manufacturer's instructions, have appropriate contact time and must be rinsed with water
- Quaternary ammonium compounds should be prepared according to the manufacturer's instructions and used according to the CP guidelines

### **Protective clothing (personal protective equipment, PPE)**

Protective clothing *must* be worn at all times while working with suspect, in-contact or confirmed cats. Protective clothing includes: disposable overalls, disposable apron, gloves, elbow protectors, disposable caps and over shoes. Use new disposable clothing for each pen – change apron, gloves and elbow protectors between each pen. It is important to remember protective clothing should always be worn even while feeding suspect, in-contact or confirmed cats.

### **Bedding and soft materials**

- Bedding used should be disposable – for example, old towels which can be thrown away daily or soaked in quaternary ammonium compounds, bleach or inorganic peroxygen compounds (Virkon) and washed in the washing machine. If re-using bedding, ensure you keep the same bedding for the same cat
- Dispose of all bedding, soiled litter etc. carefully, in infectious waste where available
- Soft toys and scratching posts should be removed from the cat's environment

### **Litter trays**

If possible use disposable litter trays and discard at least once daily. If disposable litter trays are unavailable, ensure that the standard litter trays are soaked separately in appropriate disinfectant.

### **Food and water bowls**

Disposable food bowls should be used and discarded daily. Water bowls should be soaked separately in appropriate disinfectant, thoroughly rinsed and returned to the same cat.

### **Principles of cleaning and handling/barrier nursing**

- Particular attention should be paid to the cleaning and disinfection of litter trays, food/water bowls and bedding
- Sweep all debris into the litter tray and after cleaning and disinfecting, dispose of all items including PPE and cleaning cloths into a suitable disposal bag/bin liner
- Wear disposable overshoes when entering or leaving the pen, changed between each pen
- Mop, bucket, sweeping brush, dustpan and brush, and grooming equipment should all be soaked in bucket of appropriate disinfectant after use
- Ideally each pen should have its own materials and equipment and they should not be used in any another area of the facility

### **13 We don't think this cat has developed FIP, but a vet has already done some diagnostic screening tests which indicate that FCoV is, or has been, present. What does this mean?**

- A blood test for FCoV antibody titres has already been performed:
  - i. A positive result indicates that a cat has previously been exposed to any strain of FCoV. 25-40 per cent of healthy cats will have a positive FCoV antibody titre, rising to 80-100 per cent in multi-cat households
  - ii. A positive titre does not tell you:
    1. whether the cat is still currently infected with FCoV or not
    2. whether the cat is still shedding FCoV or not
    3. which strain of FCoV the cat is/was infected with

4. and regardless of magnitude of titre and change in titre over time, it does not tell you whether a cat will develop FIP or not (some cats which develop FIP actually have no detectable FCoV antibodies and so will have a titre of zero)
- iii. Therefore, caution should be used over the interpretation of FCoV titres, and if detected in a cat in which FIP is not suspected (eg a cat with no clinical signs or with diarrhoea alone) titre results should not be used to influence management. Following titres over time in cats where there is no suspicion of FIP is also not generally considered helpful other than sometimes in breeding establishments
- A faecal RT-PCR test for FCoV has already been performed
  - i. A positive result indicates that a cat is shedding FCoV virus particles in its faeces. Large numbers of healthy cats have a positive faecal PCR test
  - ii. A positive test result does not tell you:
    1. which strain of FCoV the cat has been exposed to
    2. whether those virus particles are infectious, as the test looks for genetic material, rather than live virus
    3. and regardless of quantitative results, it does not tell you whether a cat will develop FIP or not
  - iii. Therefore, caution should be used over the interpretation or significance of coronavirus RT-PCR test results, and if detected in a cat in which FIP is not suspected (eg a cat with no clinical signs or with diarrhoea alone), should not be used to influence management of a cat in CP care. Following RT-PCR results over time in CP cats where there is no suspicion of FIP is also not considered helpful.

## 14 Owner FAQs

### Q I have lost my own cat to FIP. When can I get another?

#### A This will depend on whether there are any other cats in the household:

- If the owner has no other cats remaining in the household, then recommend they disinfect any equipment they are able to and wait six weeks. CP can then rehome a kitten or a cat to them. There is no guarantee that the new kitten/cat is not already infected with FCoV (remember FCoV is a very common virus), and CP is not able to test cats (through FCoV antibody titres on blood tests, or PCR tests on faeces) as it leads to difficulties in interpretation and management of those with positive results, and does not predict whether a cat will go on to develop FIP. It would be a good idea to give the owner CP's *Veterinary Guide: FCoV and FIP*
- If the owner does have other cats remaining in the household, in order to try to protect any new cat acquired it is preferable to wait six months then ideally rehome a healthy cat over the age of two years (dependent on feline numbers in the home), with guidance given on integration, stress management and litter tray provision/ distribution/hygiene. There is no guarantee that the new cat is not already infected with FCoV, nor that the resident cats have cleared FCoV – remember FCoV is a very common virus. It would be a good idea to give the owner CP's *veterinary guide: 'FCoV and FIP'*

### Q I adopted my cat from CP and now we think we have FIP in the household. Help!

There are three potential issues here:

1. Owners may be anxious about the health of the sick cat (and related costs)
2. Owners may be anxious about the risk to other cats resident in their home

3. Owners may be angry that CP rehomed a cat with the virus, and/or that CP hadn't screened for the virus/disease

We will address each issue in turn, but it may be useful to give the CP *Veterinary Guide: FCoV and FIP* and direct owners to the Cat Group policy statement on FIP:

1) Direct the owner to their own vet regarding diagnostic tests in the sick cat. If the cat dies or is euthanased, it is useful for post-mortem samples to be taken to confirm or rule out FIP, but this can inevitably be very sensitive for some owners. Reassure the owner that the cat was homed in good faith, having had a veterinary health check when it was deemed fit to rehome, and that there were no screening tests that could have identified that it would develop FIP. Direct owners to try making a claim with their pet insurance policy (if it has not lapsed). CP is not obliged to pay towards tests/treatments unless this was agreed in advance, though it may use its discretion if the cat was homed knowing it was at greater risk of developing FIP (eg littermates had died of the disease). Once a provisional/confirmed diagnosis has been made, CP should not fund any further treatment.

2) Where there are other cats in the home, it is worth bearing in mind that the source of FCoV infection in this group of cats cannot be certain – it may already have been in the cats in the household and the newly adopted cat has become infected since being placed in the new home, or it may be the newly adopted cat was already infected with FCoV while in CP care and has brought the virus into the home. Regardless, if the cats have mixed at all or shared litter trays, it is likely they will all be infected with FCoV. However it is rare for resident cats to succumb to FIP when a new FCoV shedding cat is introduced – more commonly, if any cat develops FIP, it is more likely to be the newly introduced cat that does, perhaps in view of the stress it experiences through rehoming. Unfortunately, there are no tests that can guide whether a healthy cat exposed to FCoV will develop FIP and no time-frame after exposure when it is safe to assume a cat won't go on to develop FIP. It is best to direct owners to discuss any concerns they have with their own vet. Faecal RT-PCR and antibody blood tests can be performed repeatedly over time, but they are generally not helpful as it is already known that the cat has been exposed to FCoV and there are no tests that will identify whether a cat will develop FIP. Interpretation can be complex and it will not change the outcome (indeed repeated vet checks may be an unnecessary stress).

3) Reassure the owner that FCoV is a very common virus and that there is no test that can be done to identify whether a cat exposed to FCoV will develop FIP. Unfortunately therefore, the introduction of a new cat always carries the risk of the introduction of FCoV, but fortunately, in the vast majority of cats infected with FCoV, it does not cause a problem. Also, if the cat had gone outside, or there are other cats in the home, or if there were no other cats currently, but there had been another feline loss recently in the home, the source of FCoV infection in the sick cat cannot be certain as the virus can survive for up to seven weeks in the environment.

**Further reference:**

The Cat Group Policy Statement, found at [www.thecatgroup.org.uk](http://www.thecatgroup.org.uk) – click on policy statements and select policy statement 5

## **Pre-adoption FIP handout - *Feline Coronavirus: information for owners considering adoption***

Thank you for considering adoption of a cat from Cats Protection (CP).

It is estimated that up to 40 per cent of all household cats carry a virus called Feline Coronavirus (FCoV) and most owners will be unaware of it, as the cats usually remain healthy. Cats can acquire at any time through inadvertent contact with the faeces of infected cats.

In the vast majority of cats infected with FCoV, it causes no problems, or only short-term mild diarrhoea. However, a small minority of cats can be severely affected by the virus, developing a disease called Feline Infectious Peritonitis (FIP). It is not fully understood why some cats develop FIP, but genetic factors and stress are both thought to play a role.

This handout is aimed at providing more information for owners interested in adopting a cat that may potentially be at a slightly higher risk of developing FIP, as it is related to one or more cats or kittens that have developed FIP. Although this cat is highly likely to have been infected with FCoV, as it has been in direct contact with its relative, this does **not** mean that it will develop FIP – the majority of cats don't and it may well live a long and healthy life. Unfortunately, there are no tests to tell which cats may develop FIP and which cats won't.

### **What is FCoV?**

Feline coronavirus (FCoV) is a virus carried in the faeces of many healthy cats, and most owners will be unaware of it. FCoV is very contagious and nearly every cat that encounters the virus will become infected. The virus is not infectious to humans or other animals.

Exposure to faeces in the litter tray is the most common mode of transmission, where the cat may then inadvertently swallow the virus when grooming, or when particles of faeces contaminate their food. In natural circumstances, cats go outside to defecate and bury their faeces, in which case the virus lasts only hours to days (it survives slightly longer in freezing conditions). However, in domesticating the cat we have introduced litter trays, and FCoV may survive for several days (and possibly up to seven weeks) in dried faeces in cat litter.

Most cats will clear the virus themselves, although they can be reinfected with the virus again at any time. However, in a small percentage of cats infected with FCoV, the virus is thought to mutate (change), and this mutated form causes FIP; this can be at any after infection time, from weeks to years.

### **What is FIP?**

FIP is an uncommon, fatal viral disease of cats caused by an infection with a mutated feline coronavirus (FCoV). The disease is most common in young cats (six weeks to two years old).

### **Why does the FCoV mutate?**

Although the mutation theory has not been fully proven, it is thought that mutation from FCoV to an FIP-causing strain depends on a complex relationship between the strain and amount of virus, and the age and immune status of the cat. FIP is most common in young cats. Cats living in multi-cat groups are also more likely to develop disease and susceptibility may be partly inherited in some cats. Research to find out more information about this disease is ongoing.

### **What are the signs of FIP?**

All cats with FIP are unwell; most will have a fever, appear lethargic and go off their food. Cats may look bloated or they may have difficulty breathing. They may develop disorders of the eyes and/or the nervous system.

### **How is FIP diagnosed?**

FIP is not easy to diagnose. There is no single test we can perform on sick cats that will always confirm or rule out FIP. The only definitive way to diagnose FIP is through the examination of biopsies taken from the cat's organs, and sadly the disease is often only confirmed at post-mortem.

### **Can a cat with FIP be treated?**

Unfortunately, there is still no reliable cure for FIP.

### **Can I prevent FIP?**

Once a cat is infected with FCoV there is no way of knowing whether it will develop FIP or not. Reducing stress may help to protect a FCoV-infected cat from developing FIP.

There is a commercial vaccine that has been developed to prevent infection with FCoV and is used in the USA. However, the efficacy of the vaccine is unknown because different studies evaluating it have produced very different results. However, generally it does not appear to be particularly effective and it seems to provide considerably less than 100 per cent protection. It can also only be used in kittens over 16 weeks of age, by which time most kittens are already infected with FCoV anyway. For these reasons, the vaccine is not recommended. It is not currently available in the UK.

### **Management of a cat infected with FCoV**

It is thought that stress is involved in the development of FIP so it is important to try to minimise stress in cats infected with FCoV.

When taking a cat suspected of having been infected with FCoV home, follow the integration programme below which will help to ensure the move is as stress free as possible:

- Take a blanket or item of clothing that smells of the cat's new home to the CP pen a week or so before taking it home so that the cat gets a chance to become comfortable with the new scent. Cats rely heavily on scent to tell them whether an environment is safe so bring the item back home with the cat too so it has access to something that smells familiar
- Dedicate a 'safe room' for the cat at home. Make sure the room has space for a litter tray, scratching post, water and food bowls, somewhere to sleep and some places to hide. Hiding can help a cat to cope with stressful situations. Upright cardboard boxes with a hole cut in the side, an open wardrobe door or under the bed are all good hiding options
- Allow the cat some time alone in its 'safe room' to become accustomed to its new surroundings
- See the *CP Essential Guide: Welcome Home* for further information on bringing your cat home – it is always good practice to make the transition as stress-free as possible for all cats

Cats can find activities such as adoption, vaccination, moving house, cattery stays and overcrowding stressful. To further reduce stress, avoid moving house or putting the cat in a cattery soon after adoption and delay any non-urgent trips to the vet. However, if your cat shows any sign of ill health, you must seek veterinary advice and mention the history of FCoV infection and recommend that your vet contacts the adoption centre or branch to discuss further. Tests in a healthy cat exposed to FCoV are not helpful in this situation, but being aware of this history early on may help to avoid extensive tests and expensive veterinary bills should your cat become unwell.

We would also suggest implementing the following measures to help reduce any potential stress:

- Provide high vantage points for cats to sit on such as empty shelves or stools. Cats tend to feel more comfortable if they have the opportunity to get up high
- Provide plenty of safe hiding places such as upturned cardboard boxes and igloo beds, preferably in several different places. This will allow cats to have 'time out'. Cats shouldn't be disturbed while using their hiding places

To help a cat clear FCoV infection, ensure good hygiene procedures are in place. The litter tray should be cleaned regularly (faeces should be removed as soon as possible and the tray should be fully cleaned with detergent twice a week and disinfected once weekly). Dust free litter is recommended and cats should be fed a long way away from the litter tray to lower the chances of re-infection.

### **Will my existing cat be at risk?**

When acquiring any new cat, there is always a chance that it will be infected with FCoV (around 40 per cent or more of cats may be infected with FCoV).

If your existing cat goes outside, it is already at risk of contracting FCoV from encountering infected cat faeces, or it may already have the virus. Cats that are over two years of age are less likely to develop FIP.

Because of the history of this cat having had direct contact, with and being genetically related to, a cat which has died of FIP, we would recommend it is not homed to a home with existing cats, and if with other cats, only with an existing litter mate. While it is rare for resident cats to be affected by FIP after introducing a new cat, it can happen. Also, the cat you are considering adopting may be less stressed by going into a house where there are no other unrelated cats, and so it may reduce its risk of developing FIP.

### **In summary**

We are pointing this out to ensure you understand there is a potential risk of FIP disease developing in the future, but we hope that you may be able to offer a home to this beautiful cat which deserves a loving home, away from the stresses of a rehoming facility.

Please consider that:-

- FCoV infection is very common
- FCoV only leads to FIP in a very small percentage of cats
- Cats can acquire FCoV from any other infected cat
- FCoV could be passed on to other cats, but likewise, any other cat could acquire the virus from other infected cat's excretions
- Taking measures to minimise stress is important
- Good hygiene measures can help reduce the FCoV burden
- Any new cat that you rehome could potentially be infected with FCoV, the only difference with this cat is that we know it is related to a cat which has developed FIP
- It is extremely rare following a case of FIP, for all related cats to themselves develop FIP, for example in a litter of affected kittens, only a small minority develop FIP

You may wish to have a discussion with a vet to help you decide whether you are happy to adopt this cat

### **Further information**

Cats Protection produces a leaflet which provides information on FCoV and FIP which can be accessed on our website at [www.cats.org.uk](http://www.cats.org.uk) or by calling us on 03000 12 12 12.

Cats Protection is part of The Cat Group, a collection of professional organisations dedicated to feline welfare through the development and promotion of policies and recommendations on the

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care and keeping of all cats. The Cat Group have produced a policy statement on FIP which is available here: <http://www.thecatgroup.org.uk/>

Further information is also available from International Cat Care [www.icatcare.org.uk](http://www.icatcare.org.uk).

## **Post-adoption FIP handout - *Feline Coronavirus: further information following adoption***

Thank you for adopting a cat from Cats Protection (CP).

It is estimated that up to 40 per cent of all household cats carry a virus called Feline Coronavirus (FCoV) and most owners will be unaware of it, as the cats usually remain healthy. Cats can acquire it at any time through inadvertent contact with the faeces of infected cats.

In the vast majority of cats infected with FCoV, it causes no problem, or only mild short-term diarrhoea. However, a small minority of cats can be severely affected by the virus, developing a disease called Feline Infectious Peritonitis (FIP). It is not fully understood why some cats develop FIP, but genetic factors and stress are both thought to play a role.

Since you adopted your cat, we have found out that one or more of the cats/kittens to which it is genetically related have sadly since developed FIP. It is possible that your recently adopted cat may potentially be at a slightly higher risk of developing FIP than an average cat, as it is genetically related to one or more cats or kittens that have developed FIP. Although your cat is likely to have been infected with FCoV, as it was in direct contact with its relative, this does not mean that it will develop FIP – the majority of cats don't and it may well live a long and healthy life. Unfortunately, there are no tests to tell which cats may develop FIP and which cats won't.

### **What is FCoV?**

Feline coronavirus (FCoV) is a virus carried in the faeces of many healthy cats, and most owners will be unaware of it. FCoV is very contagious and nearly every cat that encounters the virus will become infected. The virus is not infectious to humans or other animals.

Exposure to faeces in the litter tray is the most common mode of transmission, where the cat may then inadvertently swallow the virus when grooming, or when particles of faeces contaminate their food. In natural circumstances, cats go outside to defaecate and bury their faeces, in which case the virus lasts only hours to days (it survives slightly longer in freezing conditions). However, in domesticating the cat we have introduced litter trays. FCoV may survive for several days and possibly up to seven weeks in dried up faeces in cat litter.

Most cats will clear the virus themselves, although they can be reinfected with the virus again at any time. However, in a small percentage of the cats infected with FCoV, the virus is thought to mutate (change), and this mutated form causes FIP; this can be at any time from weeks to years after infection.

### **What is FIP?**

FIP is an uncommon, fatal viral disease of cats caused by an infection with a mutated feline coronavirus (FCoV). The disease is most common in young cats (six weeks to two years old).

### **Why does the FCoV mutate?**

Although the mutation theory has not been fully proven, it is thought that mutation from FCoV to an FIP-causing strain depends on a complex relationship between the strain and amount of virus, and the age and immune status of the cat. FIP is most common in young cats. Cats living in multi-cat groups are also more likely to develop disease and susceptibility may be partly inherited in some cats. Research to find out more information about this disease is ongoing.

### **What are the signs of FIP?**

All cats with FIP are unwell; most will have a fever, appear lethargic and go off their food. Cats may look bloated or they may have difficulty breathing. They may develop disorders of the eyes and/or the nervous system.

### **How is FIP diagnosed?**

FIP is not easy to diagnose. There is no single test we can perform on sick cats that will always confirm or rule out FIP. The only definitive way to diagnose FIP is through biopsies taken and sadly the disease is often only confirmed at post-mortem.

### **Can a cat with FIP be treated?**

Unfortunately, there is still no reliable cure for FIP.

### **Can I prevent FIP?**

Once a cat is infected with FCoV there is no way of knowing whether it will develop FIP or not. Reducing stress may help to protect an FCoV-infected cat from developing FIP.

There is a commercial vaccine that has been developed to prevent infection with FCoV and is used in the USA. However, the effectiveness of the vaccine is unknown because different studies evaluating it have produced very different results. However it generally does not appear to be particularly effective and it seems to provide considerably less than 100 per cent protection. It can also only be used in kittens over 16 weeks of age, by which time most kittens are already infected with coronavirus anyway. For these reasons, the vaccine is not recommended. It is not currently available in the UK.

### **Management of a cat infected with FCoV**

It is thought that stress is involved in the development of FIP so it is important to try to minimise stress in cats infected with FCoV.

Cats can find activities such as adoption, vaccination, moving house, cattery stays and overcrowding stressful. To further reduce stress, avoid moving house or putting the cat in a cattery soon after adoption and delay any non-urgent trips to the vet. However, if your cat shows any sign of ill health, you should seek veterinary advice and mention the history of FCoV infection and recommend that your vet contacts the adoption centre/branch to discuss further. Tests in a healthy cat exposed to FCoV are not helpful in this situation, but being aware of this history early on may help to avoid extensive tests and expensive veterinary bills should your cat become unwell.

We would also suggest implementing the following measures to help reduce any potential stress:

- Provide high vantage points for cats to sit on such as empty shelves or stools. Cats tend to feel more comfortable if they have the opportunity to get up high
- Provide plenty of safe hiding places such as upturned cardboard boxes and igloo beds, preferably in several different places. This will allow cats to have 'time out'. Cats shouldn't be disturbed whilst using their hiding places

To help a cat clear FCoV infection, ensure good hygiene procedures are in place. The litter tray should be cleaned regularly (faeces should be removed as soon as possible and the tray should be fully cleaned with detergent twice a week and disinfectant once weekly). Dust free litter is recommended and cats should be fed a long way away from the litter tray to lower the chances of re-infection.

### **Will my existing cat be at risk?**

When acquiring any new cat, there is always a chance that it will be infected with FCoV (around 40 per cent or more of cats may be infected with FCoV).

If your existing cat goes outside, it is already at risk of contracting FCoV from encountering infected cat faeces, or it may already have the virus. Cats that are over two years of age are less likely to develop FIP.

Fortunately, it is rare for resident cats to be affected by FIP after the introduction of a new cat which has FCoV. It may be helpful to minimise stress, ensure each cat has its own separate resources, such as resting areas, food, water and litter trays that they can each reach easily, and ensure good litter tray hygiene.

### **In summary**

Please consider that:-

- FCoV infection is very common
- FCoV only leads to FIP in a very small percentage of cats
- Cats can acquire FCoV from any other infected cats
- FCoV could be passed on to other cats, but likewise, any other cats could acquire the virus from other infected cat's excretions
- Taking measures to minimise stress is important
- Good hygiene measures can help to reduce the FCoV burden
- Any new cat that you acquire could potentially be infected with FCoV, the only difference with this cat is that we know it is related to a cat which has developed FIP
- It is extremely rare following a case of FIP, for all related cats to themselves develop FIP, for example in a litter of affected kittens, only a small minority develop FIP

### **Further information**

Cats Protection produces a leaflet which provides information on FCoV and FIP which can be accessed on our website at [www.cats.org.uk](http://www.cats.org.uk) or by calling us on 03000 12 12 12.

Cats Protection is part of The Cat Group, a collection of professional organisations dedicated to feline welfare through the development and promotion of policies and recommendations on the care and keeping of all cats. The Cat Group have produced a policy statement on FIP which is available here: <http://www.thecatgroup.org.uk/>

Further information is also available from International Cat Care. See [www.icatcare.org](http://www.icatcare.org).