

# Infectious disease and vaccination



**CATS PROTECTION**  
**VETERINARY GUIDE 17**



Vaccination is a safe and effective way to keep cats safe from the potentially fatal threat of some infectious diseases.

Cats evolved as solitary hunters, rarely coming into contact with other cats. These days, our pet cats live in much higher density than they did in the wild. This puts them at greater risk of sharing and transmitting fatal infectious diseases and they don't even need to have direct contact with other cats to become infected. Sadly, Cats Protection sees cats suffering from preventable diseases on a daily basis. Under the Animal Welfare Act, owners have a legal duty of care to ensure their cat's welfare needs are met, including the need to be protected from pain, suffering, injury and disease. Population control through neutering is important too and alongside vaccination, is an efficient and cost effective way of controlling infectious disease.

## **What are infectious diseases?**

We are surrounded by micro-organisms – bacteria and viruses – most of which are unable to overcome a cat's natural defences. However, there are some micro-organisms – known as pathogens – that can invade the body and cause disease. Whether infection occurs depends on factors such as the amount of pathogen present, its virulence or strength – and the health, stress levels and immunity of the cat. Vaccination harnesses a cat's natural defences against infectious disease.

# How do cats naturally protect against infectious diseases?

Because bacteria and viruses are all around us, mammals have developed a number of different natural defence strategies. These include:

- physical defences – such as the skin, or natural reactions such as coughing or sneezing
- innate immunity – eg inflammation – a process which leads to increased blood flow and delivery of chemicals and cells to destroy pathogens. An inflammatory response is always ready, but it is not always effective and it is not specific to a particular pathogen
- acquired specific immunity – this type of defence takes a few days to develop first time round. Should the cat survive and meet the same pathogen again, it can quickly recognise and destroy it. Acquired immunity involves one or both of the following:
  - production of specific proteins called antibodies, which target specific pathogens
  - production of special cells which recognise and assist in the destruction of infected cells – this is called cell-mediated immunity

This 'memory' for pathogens declines over time, unless they are encountered with some frequency.

## What is immunisation?

Immunisation means the generation of a specific immune response. There are two ways this is achieved:

- passive immunisation – through transfer of antibodies from mother to kittens. When a mother is exposed to a particular pathogen before or during pregnancy, she develops lots of antibodies to it. These are passed on to her kittens in the first milk produced after birth – protecting them during their first few weeks. These antibodies only last for a few weeks before the protection wanes – the kittens will then need to develop their own immunity
- active immunisation – this occurs after a cat has first been exposed to a pathogen and causes the animal to respond with a specific immune response. Each time the pathogen is met again, the cat can make a quicker and more effective response against it. A problem with the natural development of specific immunity is that it requires initial exposure to the pathogen before immunity develops. This exposure may lead to illness, long-term health complications and even death

## How does vaccination work?

Vaccination works in a similar way to active immunisation, but it allows the cat to develop immunity without risking illness from natural exposure to a pathogen. When a cat is vaccinated, it is given a modified, safe version of a pathogen so that the animal develops an immune response. After vaccination, if the cat encounters the same pathogen the body recognises it and has a quicker and more effective response to the disease.

## What is a vaccine?

A vaccine is a suspension of part of a virus or bacteria which triggers an immune response when given to the cat. The micro-organism in the vaccine has been altered in such a way to stop it causing disease. This allows the cat to develop immunity to the disease without suffering from it.

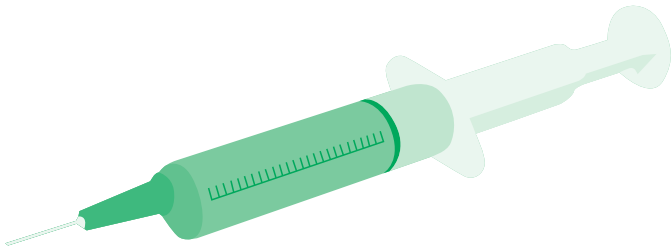
## What types of vaccine are there?

Vaccines are classified as either modified live or killed/ inactivated depending on how the micro-organism has been altered:

- modified live vaccines – infect animal cells and undergo replication to trigger an immune response. They have been modified so that although they are still living, they don't cause disease
- killed or inactivated vaccines – these present a killed version of the micro-organism to the body. As they are not live, they usually require addition of an adjuvant – a substance that increases the response to the vaccine

## How are vaccines given?

Most feline vaccines in the UK are given by injection, although one type of vaccine can be given via the nose.



# Do vaccines protect against all infectious diseases of cats?

Vaccines are usually developed for diseases that are debilitating or life threatening and easily spread. They are not available for all infectious diseases because it can be difficult to produce effective vaccines against some pathogens. Luckily, there are a number of vaccines available to protect your cat from severe infectious diseases that are commonly found in felines.

**Feline parvovirus (FPV)** – for further information, see Cats Protection's *Veterinary Guide: Feline Parvovirus*

- FPV is also known as feline panleukopenia virus and feline infectious enteritis
- it causes severe disease in cats and especially kittens and is frequently fatal
- initial signs include vomiting, diarrhoea and a high temperature. This progresses to a low temperature, watery diarrhoea with or without blood, dehydration or sudden death
- FPV is extremely hardy, surviving in the environment for months or years. Cats are at risk through contact with other cats or the environment. The virus can also be spread on an owner's shoes from the ground outside, so even cats kept indoors are at risk. Disease in cats can also be caused by infection with canine parvovirus (CPV) shed by infected dogs

**Feline herpes virus (FHV)** – for further information, see Cats Protection's *Veterinary Guide: Cat Flu*

- FHV is one of the causes of cat flu and is a very common virus
- it often causes a severe and potentially life-threatening illness
- cats which survive may develop ulcers on the surface of the eyes and develop long-term painful eye conditions. Others may suffer from repeated infections of the nose and sinuses
- once a cat has been infected with FHV, the virus stays within the cat and can cause disease and virus shedding to occur at times of stress

**Feline calicivirus (FCV)** – for further information, see Cats Protection's *Veterinary Guide: Cat Flu*

- FCV is another common cause of cat flu. FCV changes frequently when it replicates, meaning there are a number of different strains of FCV – each type has a different ability to cause disease
- FCV infection usually causes a slightly milder form of cat flu than FHV. Signs include sneezing, runny nose and eyes, a high temperature and loss of appetite. In kittens it can cause lameness and a high temperature. In both adults and kittens, sometimes the only sign is painful ulcers found on the tongue, roof of the mouth or the nose – leading to dehydration and anorexia. It may be associated with feline chronic gingivostomatitis in some cats – for further information, see Cats Protection's *Veterinary Guide: Teeth and oral health*. In some cases, FCV can cause severe outbreaks of disease with high death rates

**Feline leukaemia virus (FeLV)** – for further information, see Cats Protection’s *Veterinary Guide: Feline Immunodeficiency Virus (FIV) and Feline Leukaemia Virus (FeLV)*

- FeLV is a virus that causes a fatal disease – it affects the immune system and can also cause vulnerability to other infections, anaemia or tumours
- signs of persistent FeLV infection include recurrent infections with respiratory disease, sore gums or digestive problems. Infected cats can also suffer from a fluctuating high temperature and enlarged lymph nodes
- 80 per cent of cats diagnosed with FeLV die within three and a half years

**Chlamydophila felis** – for further information, see Cats Protection’s *Veterinary Guide: Cat flu*

- Chlamydophila felis is a bacterium that often causes painful conjunctivitis with discharge and redness of the eyes, but it can also be a cause of cat flu
- kittens are most commonly affected and it is often seen in unvaccinated cats in multi-cat households, breeding establishments or catteries



***Bordetella bronchiseptica*** – for further information, see Cats Protection’s [Veterinary Guide: Cat flu](#)

- *Bordetella bronchiseptica* is a bacterium that causes flu-like signs such as sneezing, runny nose and eyes, high temperature and a cough. It may progress to the chest, causing a serious infection and has a relatively high death rate in kittens where pneumonia may develop and sudden death can occur. The same bacteria cause kennel cough in dogs
- those most at risk include unvaccinated cats in multi-cat households, breeding establishments or catteries and those sharing an environment with dogs

### **Rabies**

- Rabies is a lethal virus which is not currently a problem in the UK
- cats travelling abroad under the Pet Travel Scheme must have vaccinations against rabies – for further information, see Cats Protection’s [Essential Guide: Moving house](#)

## **What are combined vaccines?**

Combined vaccines contain more than one micro-organism to induce immunity against more than one disease. FPV, FHV and FCV vaccines are usually combined – commonly referred to as a ‘flu and enteritis’ vaccine. A combined vaccine may also have a FeLV component and/or a *Chlamydomphila felis* component.

## What are core vaccines?

Core vaccines are generally considered to be essential for all cats to protect them against a number of serious diseases that are commonly encountered – these include FPV, FHV and FCV. Non-core vaccines are generally used once the cat's risk of getting the disease is assessed to decide whether vaccination is essential – these include FeLV, *Bordetella bronchiseptica*, *Chlamydophila felis* and rabies.

## When should vaccinations start?

The primary vaccination course should be given to kittens from around eight to nine weeks of age. Timing is important – too early and the antibodies they receive from their mother will interfere with the immune response to the vaccine, preventing it from working properly – too late and kittens will be left susceptible to infection. Unfortunately, the timing of when the antibodies from the mother deplete varies from kitten to kitten. Two vaccines are usually needed – three to four weeks apart – to ensure kittens are not left susceptible to infection. Giving vaccines twice ensures a satisfactory level of immunity. A booster vaccine should also be given one year later to keep immunity levels high.

NB Vaccination against rabies cannot start until 12 weeks of age.

## How long does the protection given by vaccination last?

The immune system's 'memory' for micro-organisms declines over time, unless they are encountered with some frequency. The amount of time before immunity fades depends on factors including:

- the individual cat
- whether the cat is being regularly exposed to the micro-organism in its environment
- the specific micro-organism

## What are booster vaccinations?

Regular booster vaccinations – boosters – are very important. The primary course of vaccination that a cat receives will kick start protective immunity, but booster vaccinations are needed to ensure that it remains at an adequate level. Boosters remind the immune system to react, enabling it to work effectively in the face of infection. If booster vaccinations are not given, the cat will become susceptible to infection because the immune system will gradually 'forget' the threat.

## How often should booster vaccinations be given?

Your vet can guide you on the vaccination needed for your cat and how often boosters should be given to maintain protection.

Remember, the immune system's memory for micro-organisms declines over time. It's useful to understand how feline infectious diseases are transmitted and what may pose a risk to your cat. Some infectious diseases are spread through direct contact with other infected cats. If your cat has outdoor access and you live in an area with a high feline population, they may be at greater risk. Indoor cats may appear to be at less risk, but they are not getting natural exposure to bacteria and viruses which act as natural booster reminders to their immune system. If vaccinations are not kept up to date, immunity may wane and indoor cats will not have protection if they do become exposed.

Boarding catteries may have strict vaccination history requirements before they allow your cat to board – check in advance.

There is currently no way of checking if immunity has run out – the only tests available measure antibody levels but cannot anticipate whether there is enough 'memory' to kick off an immune response when needed. However, they may be useful to determine immunity to feline parvovirus.

## Vaccination risks and adverse reactions

A mild reaction following vaccination is normal as it shows the cat is having an immune response. Your cat may lack energy, have a poor appetite and feel tenderness at the injection site for around 24-48 hours after vaccination. Other side effects that can occur include: a high temperature, vomiting and diarrhoea, lameness or flu-like signs. Often these reactions are due to an infection already in progress at the time of vaccination – the additional challenge of the vaccine on the immune system has allowed the infection to develop. Occasionally, a lump may occur at the site of injection and in very rare cases, cancers may develop in the same spot.

Vaccination of pregnant animals is not generally recommended. A reaction such as a fever may harm the developing foetuses and if using a live vaccine, the pathogen may infect the foetus.

It is unusual for a vaccination to fail but it can sometimes happen. This may result from:

- vaccine failures – eg from poor storage, or the vaccine not being administered properly
- failure to respond – some cats cannot harness an effective immune response to vaccination, especially those with a major illness or under significant stress
- the infection already incubating prior to vaccination
- subsequent infection occurring from a strain of micro-organism that was not included in the vaccine

Vaccination failures and severe reactions to vaccines are very rare and the benefits of vaccinating far outweigh the risks involved. The Veterinary Medicines Directorate (VMD) run a surveillance scheme where members of the public and veterinary surgeons in the UK can voluntarily report any suspected adverse reactions (SARs) to veterinary licensed drugs, including vaccines. The number of SARs reported after vaccination are very low in comparison with the thousands of cats suffering from infectious disease.

## Should all cats be vaccinated?

Vaccination has greatly reduced the outbreak of life-threatening infectious diseases within the cat population. However, the population has increased and if cats are not vaccinated, widespread outbreaks of disease may occur.

Whether or not a cat is vaccinated against various diseases will depend on their lifestyle and their risk of infection. It is best to discuss your cat's individual vaccination needs with your vet. Remember, cats entering boarding catteries will usually need to have vaccines up to date.

Cats infected with feline immunodeficiency virus (FIV) have a disrupted immune system and may be at greater risk of developing infectious diseases if they are exposed to them. FIV positive cats can be vaccinated to offer some protection, so speak to your vet for advice. For further information, see Cats Protection's [\*Veterinary Guide: Feline Immunodeficiency Virus \(FIV\) and Feline Leukaemia Virus \(FeLV\)\*](#)

In cases where health problems prevent the cat from being vaccinated, the owner should discuss the options with their vet.

If a large number of cats continue to be vaccinated, there will be low levels of disease leading to 'herd immunity.' Herd immunity is the resistance of a group of animals to a disease because a large proportion of them are immune. It reduces the chances of a cat coming into contact with an infected animal or its secretions, so that the spread of disease is slowed or stopped.

## How can I get my cat vaccinated?

Book an appointment with your vet to discuss and organise vaccination for your cat.

## Summary

Cats Protection advocates the judicious use of feline vaccination as the most effective way of controlling infectious diseases. All cats and kittens homed from Cats Protection have been vaccinated before adoption – we recommend that their new owners continue to give them regular vaccinations on their vet's advice, to keep them protected through their lives.

## Further information

The Cat Group policy statement on vaccination  
[www.thecatgroup.org.uk](http://www.thecatgroup.org.uk)

### Learn more about your cat online!

Take a look at our free interactive tool to help you understand cats' origins and their behaviour within our homes. <http://learnonline.cats.org.uk/content/ufo>

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For more information about Cats Protection or to make a donation, please visit [www.cats.org.uk](http://www.cats.org.uk) or phone our Helpline on 03000 12 12 12.

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