

# Vaccines for Cats

Recent advances in veterinary medical science have resulted in an increase in the number and type of vaccines that are available for use in cats, and improvements are continuously being made in their safety and efficacy. Veterinarians routinely recommend certain vaccines for all cats (called 'core' vaccines) whereas others are used more selectively according to circumstances.

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At this time, "core" Vaccines, as recommended by the American Association of Feline Practitioners (AAFP) for all kittens and cats, include:

1. Feline panleukopenia, FPV or FPL (also called feline infectious enteritis or feline distemper) caused by FPL virus or feline parvovirus (FPLV)
2. Feline viral rhinotracheitis, FVR caused by FVR virus, also known as herpes virus type 1, FHV-1
3. Feline caliciviral disease caused by various strains of Feline caliciviruses, FCV
4. Rabies caused by Rabies virus

"Non-core" or discretionary vaccines, as recommended by the AAFP for kittens and cats with a realistic risk of exposure to specific diseases:

1. Feline chlamydiosis caused by *Chlamydomphila felis* infection
2. Feline leukemia disease complex caused by Feline leukemia virus (FeLV)
3. Feline Infectious Peritonitis (FIP) caused by FIP virus or Feline Coronavirus
4. Bordetellosis caused by the bacterium *Bordetella bronchiseptica*
5. Feline Immunodeficiency Virus (FIV)

Vaccines that are not recommended by the AAFP, but that may be appropriate under certain conditions include:

1. Giardiasis caused by the protozoan parasite *Giardia lamblia*

2. Ringworm

## How do vaccines work?



Vaccines work by stimulating the body's immune system to produce antibodies to a particular microorganism such as a virus, bacteria, or other infectious organism. The animal's immune system is then primed, or prepared to react to a future infection with that microorganism.

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This reaction will either prevent infection or lessen the severity of infection and promote rapid recovery. In other words, vaccination mimics or simulates the protection (immunity) that a pet has once it has recovered from natural

infection with a particular infectious agent.

The immune system is complex, involving interaction of various cells and tissues in an animal. The main cells involved in an immune reaction are the white blood cells and the main tissues are the lymphoid tissues such as the lymph nodes.

One of the most important functions of the immune system is the production of specific protein molecules called antibodies. A specific microorganism, such as Feline Panleukopenia Virus, has components called antigens. When a foreign antigen is introduced into the body, the immune system will produce an antibody that specifically binds and neutralizes that specific antigen and no other. The body produces several different types of antibodies.

Other white blood cells such as lymphocytes are able to identify and kill cells that have become infected by the microorganism. This activity of lymphocytes and other immune system cells is called cell-mediated immunity.

After vaccination, just as after recovery from natural infection, the body 'remembers' the specific antigens so that when they are encountered again it can mount a rapid and strong immune response, preventing the cat from developing the disease. The duration of this response varies with the disease, the type of vaccine and other variables. The likely duration will determine the recommended revaccination date.

**"...most vaccines work by preventing your cat from becoming ill during a subsequent exposure to specific disease-causing organisms..."**

It is important to realize that most vaccines work by preventing your cat from becoming ill during a subsequent exposure to specific disease-causing organisms, but vaccination may not prevent the cat from becoming infected. In such cases the cat, while itself protected against disease, may shed the organism for a short time after exposure and be capable of infecting other susceptible animals. This is not a major consideration in the pet cat but may be important in the breeding colony.

## What is the difference between the various types of vaccine?

There are three major types of vaccine:

**1. Modified live vaccines** – these vaccines contain live organisms that are weakened (attenuated) or genetically modified so that they will not produce disease but will multiply in the cat's body. Live vaccines induce a stronger, longer lasting immunity than inactivated vaccines. It is not advisable to use modified live vaccines in pregnant queens or cats whose immune system is not working properly (cats infected by *feline immunodeficiency virus* (FIV), etc.).

**2. Killed (inactivated) vaccines** – these vaccines are prepared using fully virulent organisms or genetically modified organisms that have been killed by various treatments. Because, on their own, they do not give as high a level of protection as the live, replicating type of vaccine, killed vaccines may have an 'adjuvant' added to enhance immune stimulation.

**3. Subunit vaccines** – these are more commonly called recombinant-DNA vaccines. These are vaccines in which the infectious organism has been broken apart and only certain parts are included in the vaccine. In some cases, this is achieved by using genetic engineering techniques prior to the fragmentation.

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Many vaccines come as combinations, so that protection against more than one disease is achieved in a single injection or administration. Some vaccines are intranasal (or given by drops into the nose) but the majority are given by injection. Your veterinarian will advise you on the most appropriate vaccines for your cat.

## When should my kitten be vaccinated?

Generally, kittens are vaccinated for the first time at between six and eight weeks of age and booster doses are given at ten to twelve weeks and sometimes again at fourteen to sixteen weeks. A kitten will not be fully protected until seven to ten days after the second vaccination. Under specific circumstances, your veterinarian may advise an alternative regime.

## How often should booster vaccinations be given?

In the past, veterinarians recommended booster vaccinations for cats on a yearly basis. However, as research into vaccines progresses, recommendations for frequency of boosters continue to evolve. The appropriate interval for boosters will vary with individual circumstances.

"If your cat is at higher risk for realistic exposure to a disease, the more frequent vaccination may be recommended."

Most adult cats that received the full booster series of vaccines as kittens should be re-vaccinated every one to three years based on lifestyle risk assessment. That is, if your cat is at higher risk for realistic exposure to a disease, the more frequent vaccination may be recommended. It is important to thoroughly discuss your cat's lifestyle with your veterinarian and determine the appropriate vaccinations and vaccination schedule for your cat.

The AAFP vaccination guidelines recommend that low-risk adult cats be vaccinated every three years for the "core" vaccines and then as determined by your veterinarian for any "non-core" vaccinations. Some vaccine manufacturers have developed approved three-year vaccines for many of the core antigens. It is important to note that feline leukemia virus (FeLV) vaccine is recommended by some AAFP members to be a "core" vaccine while other experts classify it as a "non-core" vaccine. Your veterinarian is the ultimate authority on how your cat should be vaccinated

## Will vaccination always protect my cat?

Vaccination will protect the vast majority of cats but under some circumstances, vaccine breakdowns will occur. Reasons for such breakdowns or apparent 'vaccine failure' include:

**Variations between different strains of viruses** – This is particularly a problem for example with feline calicivirus infections, where, like the "common cold" in people, there are a large number of different strains. Available vaccines may only partially cross-protect against some of these strains.

**Maternally derived antibodies** – Kittens acquire a proportion of "maternal antibodies" from the mother (through the uterus before birth and from the milk during nursing). A well-vaccinated queen passes antibodies to the diseases she has been vaccinated against, and any others she has acquired naturally. Such antibodies protect the kitten against those diseases for the first two or three months of life, arguably the most critical period. However, during this same period, the maternally derived antibodies can block the effects of vaccination of the kitten. This blocking effect decreases as the maternal antibodies gradually disappear over those two to three months. A point in time is reached when vaccination can be successfully given. Unfortunately, this point varies between kittens, mainly because the amount of maternal antibodies that each kitten receives is variable. For this reason, vaccinations are usually given two to four weeks apart in the kitten vaccination program.

**The cat was stressed or not completely healthy at the time of vaccination** – Stress can prevent a good response to vaccination. For this reason, it is better to let a kitten settle into its new home for five to seven days before a vaccination is given. Before administering a vaccination, your veterinarian will perform a complete physical examination to help ensure that there are no signs of clinical disease.

**The cat has been exposed to an excessive challenge dose** of virus or bacteria in its environment and this has been sufficient to overwhelm the immunity.

**The immune system of the cat is under-performing or incompetent** because of some other disease, or complications associated with advanced age.

These are not the only reasons for vaccination failure but they are the most common.

If you feel your cat has contracted an infection for which it has been vaccinated then let your veterinarian know so tests can be undertaken to try to establish why vaccination has failed to be protective.



## What are the risks of vaccination?

There are very few risks to vaccination. Your veterinarian will be able to advise you on specific details concerning your pet. You may notice your cat has a temporary loss of appetite or is less lively a day or two after a vaccination, but this should resolve within twenty-four to forty-eight hours. A very few cats may be allergic to one or more components of the vaccine and have more serious side effects such as difficulty in breathing, vomiting or diarrhea. If these signs occur, let your veterinarian know immediately. A rare form of soft tissue sarcoma known as "vaccine-associated" or "injection-site" fibrosarcoma has been associated with a reaction to vaccine components or medication in a very small number of genetically susceptible cats. This association is controversial, and studies are in progress to investigate whether the association is real. The benefits of vaccination greatly outweigh these small risks in most situations (for further information, see the handout Post-vaccination Sarcoma).

## Which are the most important vaccinations to have?

The answer to this difficult question depends on individual circumstances, including the area you live in and the lifestyle of your cat.

"Certain vaccines are more routinely given and are regarded as "core" vaccines."

As mentioned before, certain vaccines are more routinely given and are regarded as "core" vaccines. Others may or may not be advised, depending on the particular situation of your cat. Your veterinarian will be able to advise you of the most appropriate vaccination schedule for your cat.

### **Feline panleukopenia infection – FPV or FPV**

This is an uncommon disease today because of widespread vaccination, but the risk remains widespread. When disease occurs, it is a severe and often fatal gastroenteritis (stomach and intestinal infection), with profound depression, dehydration and collapse. It is very contagious to other cats. Vaccination provides a high level of long lasting protection.

### **Feline respiratory virus infection**

Disease is caused by FVR virus (FHV-1) or the caliciviruses (FCV) – sometimes simultaneously. The syndrome is commonly termed Upper Respiratory Infection (URI) or sometimes, erroneously, "Cat Flu". While not usually very serious, except in young kittens, it is a very common infection in unvaccinated cats and can cause long-term problems. Vaccination is only moderately effective as solid immunity to these viruses is not long term, and may be overcome by a high dose of virus in the immediate environment. Vaccination significantly reduces the severity and duration of URI.

### **Feline chlamydiosis**

This tends to be a particular problem in colony cats or in certain geographical locations. Chlamydiosis is a bacterial infection due to the organism *Chlamydomphila felis*, which causes a painful inflammation and swelling of the conjunctiva or the membrane around the eye as well as upper respiratory infections. It has also been associated with infertility in queens. Infection in colonies of cats can last for long periods because protection against re-infection (immunity) is relatively short lived. Vaccination can help to prevent infection becoming established in a colony and can be used in conjunction with treatment where infection is already present.

### **Feline leukemia virus (FeLV) infection**

This virus is widespread and infection of outdoor cats or cats in infected catteries is common. The vast majority of persistently infected cats will die either from tumors or because of the immunosuppression caused by the viral infection. Current vaccines provide a good level of protection and do not interfere with routine testing for the virus in breeding

colonies. Because the virus tends to take many months before it causes disease, infected cats can appear completely normal and healthy. For this reason, your veterinarian may suggest your cat have a blood test to make sure it is not infected before vaccination. Despite vaccination, a few cats will still become infected with the virus.

### **Feline Infectious Peritonitis (FIP)**

FIP is caused by a coronavirus. Infection with the causative or related viruses is common, but the disease is uncommon, although cases occur from time to time almost everywhere. We do not understand why some infections lead to fatal disease whereas the majority of infections cause only minor illness. Vaccines may be advised in some high-risk situations.

### **Rabies**

This is such an important disease because of the almost 100% fatality rate of cases once symptoms occur, and because of its potential transmission to people by bites from infected animals. Rabies vaccination is an essential part of the vaccination program for all cats.

*This client information sheet is based on material written by: Ernest Ward, DVM*

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