



Vaccinations in 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. Some vaccines are more or less routinely advocated for all cats ('core' vaccines) whereas others are used more selectively according to circumstances. However, in all cases the selection of the correct vaccination program for each individual cat, including the frequency of repeat, or booster, vaccinations, requires professional advice.

Currently cats can be vaccinated against several different diseases:

"Core" Vaccines, as recommended by the American Association of Feline Practitioners (AAFP) for all kittens and cats:

1. Feline panleukopenia, FPV or FPL (also called feline infectious enteritis) caused by FPL virus or feline parvovirus
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, recommended for kittens and cats with realistic risk of exposure to specific diseases:

1. Feline chlamydial 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. Giardiasis caused by the protozoal parasite *Giardia*
5. Bordetellosis caused by the bacterium *Bordetella bronchiseptica*
6. Ringworm
7. Feline Immunodeficiency Virus (FIV)

How do vaccines work?

Vaccines work by stimulating the body's defense mechanisms or immune system to produce antibodies to a particular microorganism or microorganisms such as a virus, bacteria, or other infectious organism. The animal's immune system is then prepared to react to a future infection with that microorganism(s). The reaction will either prevent infection or lessen the severity of infection and promote rapid recovery. Thus, vaccination mimics or simulates the protection or

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 and organs 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 that induce the immune system to produce antibody that specifically binds and neutralizes that organism and no other.

Antibodies work together with other white blood cells such as lymphocytes that are able to identify and kill cells that have become infected by the microorganism. The 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 particular 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.

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 period of 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?

Three major types of vaccine are produced for use in cats.

- 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 are generally considered to cause 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 most commonly what are 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.

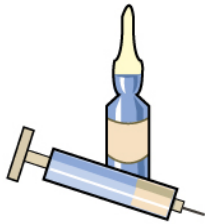
Also vaccines come in various combinations, so that protection against more than one disease is achieved in a single injection or administration. Some vaccines are given by drops into the nose rather than by injection. Your veterinarian will advise you on the most appropriate vaccines for your cat.

When should my kitten be vaccinated?

Generally kittens are vaccinated for the first time at between six and eight weeks of age and a second dose is given at ten to twelve 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?

Booster vaccination has generally been carried out yearly, but as vaccines and knowledge change, recommendations for frequency of boosters evolve. The appropriate interval for boosters will vary with individual circumstances. Your veterinarian will discuss this with you. All cats should be examined and appropriate vaccines administered regularly. Senior cats are particularly susceptible to these infections as they grow old and their immune system becomes less efficient.



Many adult cats that have been vaccinated as kittens will be 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 frequency of vaccination may be increased. 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. 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 is vaccinated

Will vaccination always protect my cat?

Vaccination will protect the vast majority of cats but under some circumstance 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 FCV 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 – When a kitten is born and after it suckles its mother, it is acquires a proportion of antibodies from the mother. A well vaccinated queen cat will pass on some 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. This is part of the reason that 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. A physical examination is always given before vaccinating to help ensure the cat is healthy at that time.

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 and establish why vaccination has failed to be protective.



situations.

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 has been associated with a reaction to vaccine or vaccine components in a very small number of 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

Which are the most important vaccinations to have?

This is a difficult question and will depend on individual circumstances, including the area you live in and the lifestyle of your cat. 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, 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 does significantly reduce the severity and duration of URI.

Feline chlamydial infection

This tends to be a particular problem in colony cats or in certain geographical locations. Chlamydiosis is a bacterial infection causing 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 as a consequence 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 are advised in some high-risk cases. Discuss usage with your veterinarian.

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. Your veterinarian will discuss the frequency of booster vaccinations needed for your cat.