

Pet Vaccines: All you want to know and more!

There is a fairly common saying attributed to Benjamin Franklin: “An ounce of prevention is worth a pound of cure.” The literal meaning of the quote is that it's easier (usually costing less time and money) to stop something bad from happening than to fix the damage after it has happened. Though he originally used this phrase to express the importance of fire prevention in Philadelphia, it rings true for many aspects of our modern lives. It is the philosophy behind most safety regulations, insurance, and especially medical care. The number one tool used in preventative medicine is the modern vaccine.

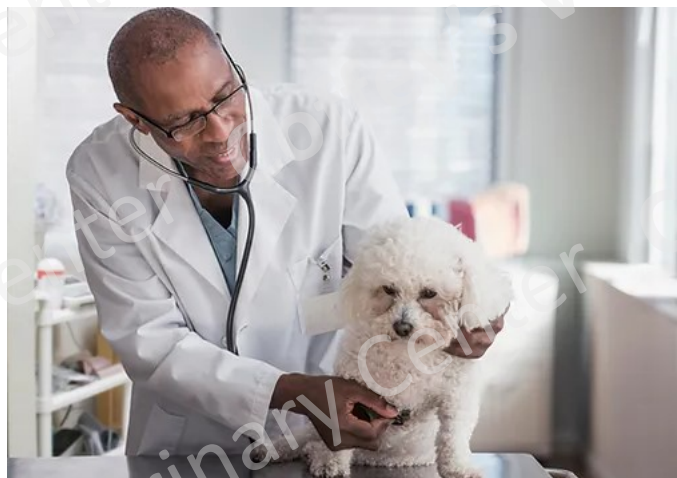


The original concept and framework of modern vaccines was originally called “inoculation” and practiced in the 1700s. Like many modern vaccines, it involved exposure to a small amount of less-deadly virus to build immunity and thereby prepare the body to fight the real threat. People would cut into their skin and rub infected materials into the wound. They would expose themselves to viruses like cowpox, since people who had experienced cowpox often had milder

symptoms if they later encountered smallpox. These crude and dangerous methods paved the way for modern preventative care. It is important to note that inoculation and vaccination were never intended as a “cure” for sick patients. They served as an “ounce of prevention” long before the patient encountered the disease. We have made many advancements since the 1700s – many diseases that were a death sentence can now be prevented and no longer play a role in our lives, and the same can be said for pet vaccines.

What kinds of diseases do pet vaccines prevent?

Since vaccines have made prevention so simple for most pets, many pet owners are not familiar with the diseases that necessitate the vaccines in the first place. Unfortunately, most people become aware of the preventable illnesses only when their pet goes unvaccinated and contracts one of the illnesses – often with devastating results. We hope that by shedding light on these illnesses and de-mystifying pet vaccines, pet owners will feel empowered to take charge of their pet’s preventative care. We will cover canine diseases first, followed by feline.

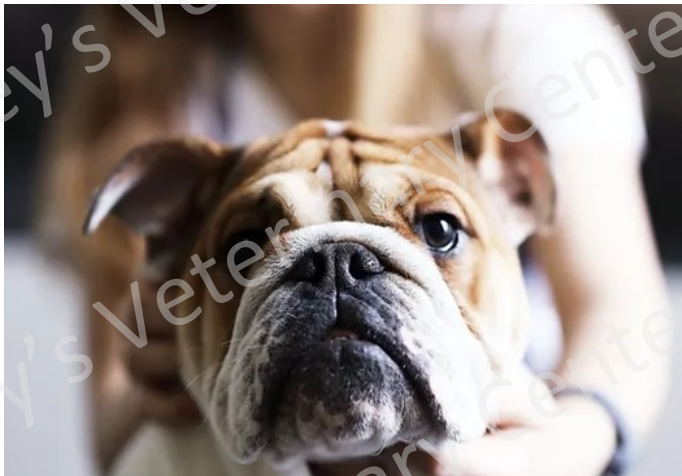


CANINE PARVOVIRUS –

commonly referred to as “parvo,” this disease is the main source of puppy fatality we see in our office. It is a perfect storm of terrible diseases: highly contagious among dogs, difficult to remove from surfaces, deadly complications, and rapid deterioration. It is not uncommon for the virus to claim a puppy’s life within 24 hours of initial symptoms, and has a nearly 100% fatality rate if left untreated. The virus spreads via bodily fluids and feces and can live



on surfaces for over a year unless cleaned with bleach. Once it enters the body, the virus starts destroying the lining of the puppy’s intestines, leading to vomiting and bloody diarrhea. This is very painful for the puppy, quickly drains them of energy, and leads to severe dehydration. Once the puppy is infected, there is no specific “cure” for parvo – treatment involves intense fluid therapy via IV catheter, intestinal rest, and daily medication to combat the diarrhea and vomiting. Usually within a week, if the disease is caught in the early stages and treatment is aggressive, the virus runs its course and the patient recovers. Our office has an isolated hospital room and aggressive protocols for cases of parvo.



CANINE DISTEMPER VIRUS –

this disease is another potentially fatal illness that affects dogs. Unlike parvo, which affects the gastrointestinal tract, distemper is a multisystemic disease which affects nearly the whole body. It affects the respiratory system (airways and lungs), gastrointestinal system (stomach and intestines), and the central nervous system (brain and spinal cord). Symptoms include vomiting and diarrhea, yellow discharge of the nose and eyes, coughing sneezing and difficulty breathing, and seizures. The

virus is spread either through direct contact or via the air when the patient is coughing or sneezing. Like parvo, there is no direct “cure,” and treatment involves waiting out the virus while providing intense supportive care via daily medication and IV fluids. However, dogs that recover from distemper can still carry and spread the virus, and can be left with lasting neurological symptoms like tremors or difficulty walking. Thankfully, distemper seems to be less prevalent in the general population than parvo, and we see fewer cases of this disease at our office.

CANINE CORONAVIRUS – this is not the same virus that arose in late 2019 and cannot be spread to humans. This disease existed before Covid19 and only affects canines. It is a milder

virus than either parvo or distemper. It is contracted when a pet consumes infected feces. It affects the stomach and intestines and produces foul-smelling, orange-tinged diarrhea. Other symptoms include severe abdominal pain, reduced appetite, and lethargy. The illness usually only lasts for a few days, but can cause severe complications in puppies if they become dehydrated.

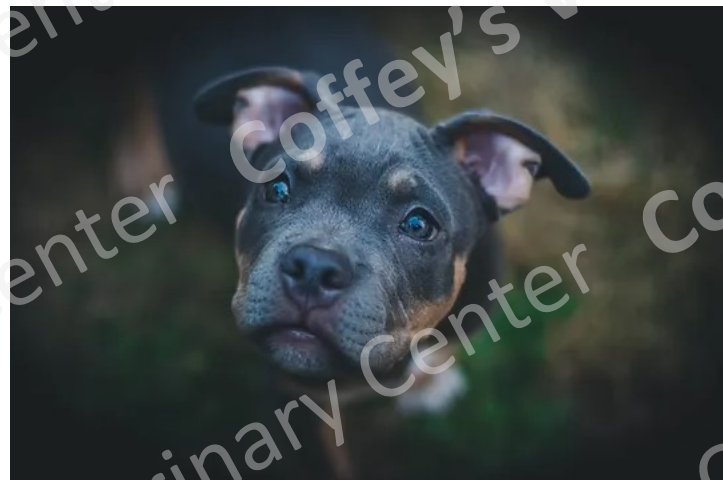


CANINE ADENOVIRUS – this virus is most known for causing hepatitis (inflammation of the liver) in dogs. It is spread between dogs via contact with infected waste (urine/feces), saliva, or discharge of the eyes and nose. Once the dog is infected, the virus multiplies in the tonsils, congregates in the lymph nodes, and spreads via the lymphatic system. It can cause inflammation, bleeding, and necrosis (tissue death) of major bodily organs (liver, lungs, spleen, and kidneys) with varying degrees of severity – which

commonly results in the symptoms: fever, abdominal pain, vomiting, and diarrhea. Like Canine Coronavirus, this virus can be mild, but can also cause severe complications in young puppies. Recovered patients can sometimes develop chronic cloudiness of the corneas of the eyes or chronic damage to various organ systems.

KENNEL COUGH – because several different microbes can produce the exact same symptoms, this label acts as an umbrella term for contagious respiratory illnesses in canines. “Kennel cough” is characterized by a persistent, hacking cough from deep in the chest. The cough often takes on a “honking” quality, and the force of the diaphragm spasms during a coughing fit can be enough to produce a small amount of bile or vomit. While Kennel Cough itself is usually not fatal and is easily treated with medications, there is a potential for complications like pneumonia to develop in young or immunocompromised dogs. The reason the blanket term is “kennel” cough is that it is commonly contracted when dogs from different households congregate in kennels such as in animal shelters or at the groomers. The microbes responsible for this illness spread quickly and easily through the air during coughing fits. Common sources of this disease are the bacteria *Bordetella bronchiseptica* and the parainfluenza virus – both of which can be prevented with routine vaccinations.

LYME DISEASE – this illness is caused by microscopic parasites that infect red blood cells: *Borrelia burgdorferi*. They are transmitted via ticks once the tick attaches for feeding. Common symptoms of Lyme disease



are joint swelling and pain leading to lameness, swollen lymph nodes, and general fatigue. Severe kidney issues, including acute kidney failure, can also be caused by *Borrelia burgdorferi* infection, but is less common. This disease can be treated at home with medication, though treatment requires a time commitment of a month or more. This disease cannot be transmitted directly between pets and requires being bitten by an infectious tick, reducing the risk of contraction for most pets. Since most pets are on some form of monthly flea and tick preventative, vaccination against *Borrelia burgdorferi* is not usually included in routine vaccinations, but is available upon request.



LEPTOSPIROSIS – this disease is usually contracted through direct contact with contaminated water. It is caused by the *Leptospira* bacteria, which can enter the body via mucous membranes or directly through the skin. It spreads through the urine of infected animals and concentrates in stagnant water where animals gather to drink. There are different strains of *Leptospira* bacteria which cause differing symptoms; it can cause spontaneous bleeding throughout the body and affect the kidneys, liver,

lungs, or gastrointestinal tract. Effects of the disease can be mild or severe depending on which strain is causing the infection and the strength of each patient's immune system. If caught early and treated aggressively with antibiotics, even patients with severe cases have a good chance of recovery, but may be left with a permanent impairment of affected organs. Because most pets have a low risk of encountering water contaminated with *Leptospira*, the leptospirosis vaccine is not included in routine vaccinations in most veterinary offices. It is available upon request.

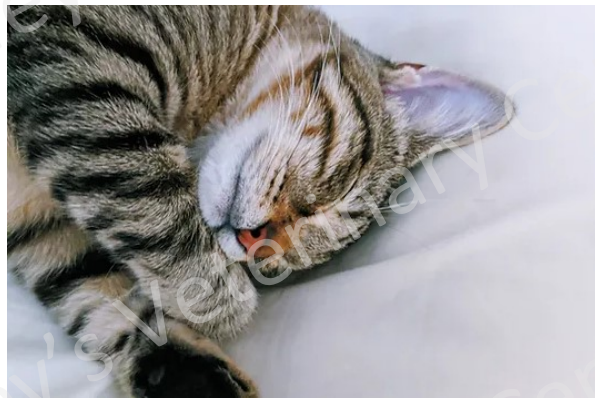
RABIES – by far, the worst virus pets can encounter is rabies. Rabies can be spread between most mammals and therefore can affect dogs, cats, and humans. Once infected with rabies, mortality rate is 100%. It is a devastating disease that attacks the central nervous system (brain and spinal cord) and is spread primarily via the saliva through biting. Rabies is the only disease on this list that is spread directly from pet to pet-owner, which makes it even more dangerous. Due to the danger to humans presented by this virus, the rabies vaccine comes with a certificate indicating that your pet is safe in case of a biting incident. Without an in-date certificate from a veterinary clinic, there can be additional legal ramifications if your pet bites someone (even in play). Without proof of



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vaccination, you could be legally required to euthanize your pet so that it can be tested for rabies. Testing for rabies requires intact brain tissue, and so cannot be done on living patients.

FELINE LEUKEMIA – the FeLV virus is highly contagious to cats, with estimates indicating that 2-3% of all domestic cats in the United States are infected. The virus can be spread directly from cat to cat during close contact, passed on from mothers to their offspring, and indirectly through exposure to waste products, bodily fluids, and contaminated surfaces. Not only is this illness highly contagious and prevalent in the population, FeLV is the leading cause of virus-related deaths in cats. FeLV is insidious and infects the lymph nodes and



bone marrow, allowing it to remain present in the cat's body for the rest of its life – even if the patient's symptoms can be kept in check with medication. While replicating in these tissues, the virus attacks different cell types that are vital to the immune and circulatory systems. Cells can be destroyed or altered, allowing cancer to form. There are multiple strains of FeLV, but the main effect of the most common strain is the suppression of the cat's immune system (FeLV can also cause tumors and anemia in less common

strains). When its immune system is suppressed, the cat cannot fight against infection – leading to it being overwhelmed with illnesses its body would have originally been able to handle with little difficulty, similar to the effects of HIV/AIDS in humans. The majority of cats infected with FeLV pass away within four years of showing symptoms. However, for many cats, with proper early and maintained care, infection with FeLV does not have to be a death sentence; though they will continue to be a source of infection and steps will need to be taken to prevent further spread.

PANLEUKOPENIA – This virus was once one of the main causes of cat fatalities before vaccination was possible. This virus causes very similar effects in cats as the canine parvovirus listed above does for dogs, though they are separate viruses and cannot be passed between species. The virus responsible for panleukopenia attacks cells in the cat's bone marrow and intestines. This causes very high fever, lethargy and fatigue, a lack of appetite, and extreme dehydration. Diarrhea and





vomiting and colored discharge from the eyes can also be present, but are not necessarily indicators for the disease. Kittens infected with panleukopenia rarely survive even with aggressive treatment. The vast majority of cats infected with panleukopenia die within days if left untreated, and may die even with treatment. Just like with canine parvo, treatment is limited to supportive care and involves aggressive fluid therapy and daily medication to reduce symptoms – and just like canine parvo, panleukopenia can be contracted from waste-contaminated surfaces even after a year.

FELINE HERPESVIRUS – this virus causes symptoms in the nose, throat, and eyes that can vary in severity. Common symptoms are sneezing, congestion, discharge of the nose and eyes, and inflammation of the eyes that can develop into corneal ulcers. Individuals with severe cases may also experience lethargy, stop grooming themselves, experience reduced appetite and become dehydrated. This disease is not usually fatal, but causes chronic symptoms that must be medically controlled for the remainder of the cat's life. Much like human cold sores, feline herpesvirus can go into a latent phase with occasional flare-ups of viral activity in response to stress or immunosuppression. Medications will be required to control these flare ups off and on for the rest of the cat's life. With proper care, infected cats can live relatively normal and full lives.



In contrast with canines, the feline genome presents unique challenges for researchers in the veterinary biomedical field. Researchers are still working on vaccine technology for other feline viruses such as FIV and Feline Coronavirus – both of which can be deadly for infected cats and are currently without a means of prevention.

When do pets need vaccines?



It is crucial that puppies and kittens receive a full set of vaccines during their early lives, as that is when they are most vulnerable to these diseases. We recommend the first vaccine at 6 weeks of age and follow-up vaccines and boosters at 9 weeks, 12 weeks, and 16 weeks of age. These four rounds of vaccines are so important for the health of your pet that our office waives the usual exam fee for each visit. After the final round of juvenile vaccines at 16 weeks, your pet is not due for vaccines for a year. Vaccine boosters to maintain their protection are once a year for the rest of your pet's life during their yearly health exams.

It is important to note that puppies and kittens are not fully protected from these diseases until two weeks after their final round of juvenile vaccines, and should be kept in a safe environment until then. These diseases can be spread by contact with other individuals, so contact with other dogs/cats should be limited to fully vaccinated adults. Diseases like parvo can also linger in the dirt or on surfaces after an infected animal passes waste – making it possible for your pet to contract a disease from a stray without ever encountering the infected animal. For this reason, it is recommended not to let young pets explore and keep them in known clean areas until they are fully vaccinated.

Are there side effects to pet vaccines?

Side effects of vaccines tend to be mild if present at all. The most common side effects include pain around the region of injection, mild swelling or bleeding of the site, slight fever or reduced activity level for 24-72 hours after the injection, or a slight increase in anxiety that diminishes with time. One rare side effect a pet can exhibit is an allergic reaction to the vaccine which can vary in severity: itching, hives, swelling of the face or throat, vomiting/diarrhea, trouble breathing, etc. Another very rare side effect of some vaccines is an injection-site sarcoma: a tumor that can form in response to an injection. This is due to an intense inflammatory reaction due to a genetic overly-sensitive immune system. It is important to note that all of the previously listed side effects are also possible for injections of any kind and are not just associated with vaccination. All veterinary medicine involves at least a small amount of risk since all bodies are unique – meaning that a patient may respond to medication in a unique and unpredictable way. The likelihood is incredibly low – but never zero. Routine vaccines are the safest and arguably most important medical service our office provides.



How do I get my pet vaccinated?

You can call and schedule a vaccine visit with our office or contact your veterinary office of choice. Even if your pet has missed vaccines in the past, or if you don't know your pet's medical history, it is never too late to start the vaccine regimen.