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What is My Puppy Being Vaccinated For?

Canine Distemper

Canine Distemper is a viral disease that affects a wide variety of animal families, including domestic and wild species of dogs, coyotes, foxes, pandas, wolves, ferrets, skunks, raccoons, and large cats, as well as some primates, and a variety of other species. It was long believed that animals in the family Felidae, including many species of large cat as well as domestic cats, were resistant to canine distemper, until some researchers reported the prevalence of CDV infection in large cats. In canines, distemper impacts several body systems, including the gastrointestinal and respiratory tracts and the spinal cord and brain, with common symptoms that include high fever, eye inflammation and eye/nose discharge, labored breathing and coughing, vomiting and diarrhea, loss of appetite and lethargy, and hardening of nose and footpads. The viral infection can be accompanied by secondary bacterial infections and can present eventual serious neurological symptoms. The disease is highly contagious via inhalation and fatal 50% of the time. Despite extensive vaccination in many regions, it remains a major disease of dogs, and is the leading cause of infectious disease death in dogs.

Rabies

Rabies is a viral disease that causes inflammation of the brain in humans and other mammals. Early symptoms can include fever and tingling at the site of exposure. These symptoms are followed by one or more of the following symptoms: violent movements, uncontrolled excitement, fear of water, an inability to move parts of the body, confusion, and loss of consciousness. Once symptoms appear, the result is nearly always death. The time period between contracting the disease and the start of symptoms is usually one to three months; however, this time period can vary from less than one week to more than one year. The time is dependent on the distance the virus must travel to reach the central nervous system. Rabies is spread when an infected animal scratches or bites another animal or human. Saliva from an infected animal can also transmit rabies if the saliva comes into contact with the eyes, mouth, or nose. More than 99% of rabies cases in countries where dogs commonly have the disease are caused by dog bites. Rabies is present in more than 150 countries and on all continents but Antarctica.

Bordetella

Bordetella, also known as 'kennel cough', is an upper respiratory infection affecting dogs. There are multiple causative agents, the most common being the bacterium *Bordetella bronchiseptica* (found in 78.7% of cases in Southern Germany), followed by canine parainfluenza virus (37.7% of cases), and to a lesser extent canine coronavirus (9.8% of cases). It is highly contagious; however adult dogs may display immunity to reinfection even under constant exposure. Kennel cough is so named because the infection can spread quickly among dogs in the close quarters of a kennel or animal shelter. Viral and bacterial causes of canine cough are spread through airborne droplets produced by sneezing and coughing. These agents also spread through contact with contaminated surfaces. Symptoms begin after a several day incubation period post-exposure, and in most cases will clear up on their own. However, in young puppies or immunocompromised animals, mixed or secondary infections can progress to lower respiratory infections such as pneumonia.

Canine Adenovirus / Canine Hepatitis

Infectious canine hepatitis is an acute liver infection in dogs caused by canine adenovirus type-1 (CAV-1). CAV-1 also causes disease in wolves, coyotes, and bears, and encephalitis in foxes. The virus is spread in the faeces, urine, blood, saliva, and nasal discharge of infected dogs. It is contracted through the mouth or nose, where it replicates in the tonsils. The virus then infects the liver and kidneys. The incubation period is 4 to 7 days. Symptoms include fever, depression, loss of appetite, coughing, and a tender abdomen. Corneal edema and signs of liver disease, such as jaundice, vomiting, and hepatic encephalopathy, may also occur. Severe cases will develop bleeding disorders, which can cause hematomas to form in the mouth. Death can occur secondary to this or the liver disease. However, most dogs recover after a brief illness, although chronic corneal edema and kidney lesions may persist. The disease can be confused with canine parvovirus because both will cause a low white blood cell count and bloody diarrhea in

young, unvaccinated dogs. Treatment is symptomatic. Most dogs recover spontaneously without treatment. Prevention is through vaccination. It can also be released in the urine of a recovered dog for up to a year.

Canine Parvovirus

Canine Parvovirus is a contagious virus mainly affecting dogs, and thought to originate in cats. Parvo is highly contagious and is spread from dog to dog by direct or indirect contact with their feces. Vaccines can prevent this infection, but mortality can reach 91% in untreated cases. Treatment often involves veterinary hospitalization. Canine parvovirus may infect other mammals; however, it will not infect humans. Dogs that develop the disease show signs of the illness within 3 to 7 days. The signs may include lethargy, vomiting, fever, and diarrhea (usually bloody). Generally, the first sign of CPV is lethargy. Secondary signs are a loss of appetite or diarrhea followed by vomiting. Diarrhea and vomiting result in dehydration that upsets the electrolyte balance and this may affect the dog critically. Secondary infections occur as a result of the weakened immune system. Because the normal intestinal lining is also compromised, blood and protein leak into the intestines leading to anemia and loss of protein, and endotoxins escaping into the bloodstream, causing endotoxemia. Dogs have a distinctive odor in the later stages of the infection. The white blood cell level falls, further weakening the dog. Any or all of these factors can lead to shock and death. Survival rate depends on how quickly CPV is diagnosed, the age of the dog and how aggressive the treatment is. Treatment usually involves extensive hospitalization, due to the severe dehydration and damage to the intestines and bone marrow. A CPV test should be given as early as possible if CPV is suspected in order to begin early treatment and increase survival rate if the disease is found.

Leptospirosis

Leptospirosis is an infection caused by corkscrew-shaped bacteria called *Leptospira*. Signs and symptoms can range from none to mild such as headaches, muscle pains, and fevers; to severe with bleeding from the lungs or meningitis. Up to 13 different genetic types of *Leptospira* may cause disease in humans. It is transmitted by both wild and domestic animals. The most common animals that spread the disease are rodents. It is often transmitted by animal urine or by water or soil containing animal urine coming into contact with breaks in the skin, eyes, mouth, or nose. In the developed world it most commonly occurs in those involved in outdoor activities in warm and wet areas of the world. Vaccines for animals exist for certain type of *Leptospira* which may decrease the risk of spread to humans. Treatment if infected is with antibiotics such as: doxycycline, penicillin, or ceftriaxone. Animals which are infected may have no symptoms, mild symptoms, or severe symptoms. Symptoms may vary by the type of animal which often makes the disease difficult to diagnose at first. Leptospirosis is a biphasic disease that begins suddenly with fever accompanied by chills, intense headache, severe myalgia (muscle ache), abdominal pain, conjunctival suffusion (red eye), and occasionally a skin rash. Ninety percent of cases of the disease are mild leptospirosis. The rest experience severe disease, which develops during the second stage or occurs as a single progressive illness. The classic form of severe leptospirosis is known as Weil's disease, which is characterized by liver damage (causing jaundice), kidney failure, and bleeding. Additionally, the heart and brain can be affected, meningitis of the outer layer of the brain, encephalitis of brain tissue with same signs and symptoms; and lung affected as the most serious and life-threatening of all leptospirosis complications. The infection is often incorrectly diagnosed due to the nonspecific symptoms. Other severe manifestations include extreme fatigue, hearing loss, respiratory distress, and azotemia.

Canine Coronavirus

Canine coronavirus is a virus of the family Coronaviridae that causes a highly contagious intestinal disease worldwide in dogs. The virus invades and replicates in the villi of the small intestine. Canine coronavirus was originally thought to cause serious gastrointestinal disease, but now most cases are considered to be very mild or without symptoms. A more serious complication of canine coronavirus occurs when the dog is also infected with canine parvovirus. Coronavirus infection of the intestinal villi makes the cells more susceptible to parvovirus infection. This causes a much more severe disease than either virus can separately. However, fatal intestinal disease associated with canine coronavirus without the presence of canine parvovirus is still occasionally reported. The disease is highly contagious and is spread through the feces of infected dogs, who usually shed the virus for six to nine days, but sometimes for six months following infection. Symptoms include diarrhea, vomiting, and anorexia. Diagnosis is through detection of virus particles in the feces. Treatment usually only requires medication for diarrhea, but more severely affected dogs may require intravenous fluids for dehydration. Fatalities are rare.

Parainfluenza

HPIVs are a group of four distinct single-stranded RNA viruses belonging to the Paramyxoviridae family. These viruses are closely associated with both human and veterinary disease. Mortality caused by HPIVs in developed regions of the world remains rare. Where mortality has occurred, it is principally in the three core risk groups (very young, elderly and immuno-compromised). HPIVs are spread person to person by contact with infected secretions through respiratory droplets or contaminated surfaces or objects. Infection can occur when infectious material contacts mucous membranes of the eyes, mouth, or nose, and possibly through the inhalation of droplets generated by a sneeze or cough. HPIVs can remain infectious in airborne droplets for over an hour. Overall, HPIVs remain best known for its effects on the respiratory system and this appears to be where the majority of the focus has been upon. The inflammation of the airway is a common attribute of HPIV infection.