

Canine Vaccinations: What you need to know...

What is the difference between core and non-core vaccines?

Core vaccines are those which are strongly recommended for all puppies and dogs with an unknown vaccination history. The diseases involved in core vaccines cause significant morbidity (sickness) and mortality (death) and are widely distributed. These vaccines result in relatively good protection from disease. Non-core vaccines are recommended for puppies and dogs that may be more likely to contract these diseases, but are not always necessary. A chat with your veterinarian can assess whether your canine friend needs any of the non-core vaccines, and we strongly urge you to vaccinate with the core vaccines!

What are the core vaccines?

Rabies, DHPP (Distemper virus, Hepatitis: Canine Adenovirus-2, Parvovirus, Parainfluenza)

What are the non-core vaccines?

Bordetella (*Bordetella bronchiseptica*, also known as the Kennel Cough vaccine)

What is MidValley Animal Clinic's vaccine protocol?

Beginning at 8 weeks, puppies receive their first DHPP vaccine, and their Bordetella vaccine if requested.

At 11-12 weeks of age (3 weeks later) they receive their second DHPP.

Finally, at 14-15 weeks of age (an additional 3 weeks after the 2nd round of boosters) they receive their third and final DHPP as well as their rabies vaccine.

A puppy must be at least 12 weeks old to receive its rabies vaccine, and it must be 14 weeks and older to receive its last set of boosters.

Why do I need to vaccinate?

To answer this question, it is important to understand the infectious diseases we are trying to vaccinate against.

Rabies

An acute, progressive virus that attacks the nervous system. It principally affects carnivores (dogs, cats, bats, etc.) but can affect any mammal (including humans).

It is transmitted through saliva, into tissues (usually through the bite of a rabid animal but can also include saliva introduction into fresh wounds). Once inside the body, the virus

spreads through nerves, into the brain. When it reaches the brain, the virus causes the classic clinical signs: abrupt behavioral changes (sudden aggression, staggering, excessive salivation, etc.), and unexplained paralysis (inability to move).

Because this virus is fatal (to both pets and humans), it is extremely important to have your pet vaccinated against it. It is also required by licensing laws. Even if your cat is indoors only, it is strongly encouraged that your pet be protected. You never know when a rabid bat could enter into your home!

Canine Parvovirus

Canine Parvovirus (CPV) is the most widely recognized cause of transmissible viral diarrhea in dogs and one of the most common infectious diseases of dogs world-wide. Transmission of this virus is by the fecal-oral route, meaning dogs are exposed to the virus present in feces or vomit, and more importantly, virus that persists on fomites (any object that can harbor an infection). This virus can be found just about anywhere, and is therefore impossible to shield a puppy from exposure; this makes vaccination against CPV extremely important.

Signs of a possible CPV infection include: vomiting, diarrhea (possibly with blood), and severe dehydration. Dogs will often stop eating, and will act quite lethargic and weak. This occurs due to the virus's affinity for rapidly dividing cells within the body. The virus begins its infection in the lymph nodes, where it replicates to large numbers, and is then released into the bloodstream. From here it travels to the bone marrow and intestinal cells (also rapidly dividing cells). In the bone marrow, the virus knocks out the already fragile immune system by killing white blood cells. Then in the gastrointestinal tract, the virus attacks the normal cells that line the intestines, making it nearly impossible to absorb the essential nutrients and fluids a puppy needs to stay alive. As a result, we see diarrhea and nausea. When the diarrhea becomes bloody, we worry about the bacteria in the guts entering the bloodstream widespread secondary bacterial infection (septicemia) in an already immune-compromised puppy.

Make no mistake, this virus can lead to death. This is because the diarrhea and vomiting lead to extreme fluid loss, and thus dehydration, which can eventually cause shock and ultimately death. As mentioned, the virus leads to a loss of a barrier in the intestine can cause bacteria to enter the bloodstream and septic toxins from these bacteria results in death. If your puppy is diagnosed with parvovirus (through a simple in-house fecal test), the mainstay of treatment is supportive care, which includes correcting the severe

dehydration with IV fluid therapy, antibiotics, anti-nausea medication and consistent monitoring. An owner with a parvo-positive puppy should expect five to seven days in the hospital for intensive care. Unfortunately, we do not have the isolation facilities here at MVAC, so we would have to refer any positive cases to Cottonwood Animal Hospital. The best treatment you can provide your puppy is protection, with a vaccination!

Canine Distemper Virus

Canine distemper virus (CDV) is an important disease of domestic dogs and wild animals worldwide. Interestingly, it is closely related to the human measles virus (but don't worry you cannot get distemper from your dog, and you cannot give measles to your dog)! Fortunately, like measles, vaccination has greatly reduced the incidence of the disease, but CDV remains an important virus, especially where large numbers of young dogs with inadequate immunity are housed together (such as kennels, breeding facilities, and shelters). Unlike parvovirus, distemper is susceptible when it is in the environment and can readily be inactivated with heat, drying and disinfectants. Therefore, contact between dogs is the most important method of transmission for this virus, and oro-asal contact (mouth and nose) with the virus is the main way your dog can become infected.

Once the virus enters the body, it initially infects white blood cells and can cause transient fever and a drop in the body's ability to fight off infection. Secondly, the virus travels to cells of the respiratory, gastrointestinal, and central nervous system (brain and spinal cord), urinary tract, and skin, while also attacking red and white blood cells. Because this virus attacks so many parts of the body, its clinical signs can vary greatly. Some dogs can even experience a subclinical infection (where there are no clinical signs, but they still spread the virus), while others become extremely ill and can die. Clinical signs include: ocular and nasal discharge, fever (may go unnoticed), poor appetite, coughing and development of pneumonia. It can also go on to cause vomiting and diarrhea (which can be confused for parvovirus), and calluses of the nose and foot pads. Neurologic signs can include seizures (which may begin as snapping or tremors of the jaw), imbalance, and limb weakness. Signs may progress to death, or may be non-progressive and permanent; recovery is also possible.

Unlike parvovirus, CDV is very difficult to confirm with bloodwork and other laboratory diagnostics. Usually a diagnosis is made on clinical signs and history with supportive labwork. Treatment is also based on supportive care and antibiotics for secondary infections, but again, prevention via vaccination is the key to eliminating this virus.

Infectious Canine Hepatitis

Infectious canine hepatitis (ICH) is an uncommonly recognized disease caused by canine adenovirus-1 (CAV-1). Disease most commonly occurs in dogs that are less than 1 year of age, but was reported in older dogs before vaccinations were introduced. It is important to note that there is a related virus to CAV-1, and that is canine adenovirus-2 (CAV-2) which is used in our vaccinations. This is because vaccines with CAV-1 caused unwanted side-effects in small percentage of vaccinated dogs. CAV-2 offers protection for infectious canine hepatitis without the side-effects.

CAV-1 is shed in the saliva, feces and urine, and thus spread of the virus occurs through direct dog-to-dog contact or contact with contaminated fomites (such as hands, utensils and clothing). Notably, ectoparasites such as fleas and ticks are potential mechanical vectors (meaning they too can spread the virus). The virus first replicates in tonsils where it then spreads to lymph nodes and the bloodstream. Subsequent infection of hepatocytes (liver cells) and other organs occurs, including lungs, kidneys, spleen, and the eyes. Here the virus can cause hemorrhage (bleeding), necrosis (cell death), and inflammation. Clinical signs usually occur after a few days, although many dogs probably show no signs of illness initially. There are three overlapping disease syndromes described with ICH. First, a peracute phase can occur which involves circulatory collapse, coma and death after a brief illness that lasts 24-48 hours. The second, most common syndrome is acute disease, which is associated with a high morbidity (illness), and possible mortality (death). To put it simply, dogs with acute disease either recover or die within a two-week period. The third syndrome is more chronic and occurs in dogs with a partial immunity, with death due to liver failure weeks or months after initial infection.

Signs of CIH include a fever, which may occur twice during the infection. Other signs are depression, decreased appetite, an elevated heart rate and respiratory rate, vomiting and diarrhea. Respiratory distress can occur due to enlarged tonsils, tracheitis and occasionally pneumonia. Your veterinarian may also feel an enlarged liver with abdominal palpation, and hemorrhage can manifest as epistaxis (bloody nose), congestion, or bleeding from the mucous membranes. Ocular complications can occur in some cases, usually as bilateral corneal edema ("blue eye"). Like the other viruses discussed, the mainstay of treatment involves supportive care with IV fluid therapy (plus a possible , blood transfusion), vitamin supplementation, antibiotics and antioxidants to name a few. Again, vaccination is very safe and prevention is key!

Canine Parainfluenza

Canine Parainfluenza (CPI) virus is one of the viral causes of infectious tracheobronchitis (otherwise known as Canine Infectious Respiratory Disease or Kennel Cough) in dogs. This virus is spread via inhalation of excretions from the respiratory tract of infected dogs. It then replicates in the nose, pharynx, trachea, large bronchi (within the lungs) and lymph nodes. A sole CPI infection usually only causes mild rhinitis (infection and inflammation of the inside of a dog's nose), conjunctivitis (think "pink-eye") and tracheobronchitis (leading to a cough), and is usually in young dogs or those of a recent history of exposure to a kennel or shelter environment. A persistent cough is often the main complaint in these patients. But it is possible for bronchopneumonia to develop with patients also infected with *Bordetella bronchiseptica*, *Mycoplasma*, and/or other viruses. A generalized infection does not usually occur unless the patient is suffering from a weakened immune system.

What are those diseases which are not considered to be core vaccines?

Bordetella bronchiseptica

Unlike our other vaccines thus far, *Bordetella bronchiseptica* is a bacteria which has adapted to colonize in the respiratory tract of dogs (and cats)! It is one of the principle agents that causes Canine Infectious Respiratory Disease (CIRD, or kennel cough). "Kennel Cough" is often a mixed-bag infection. Infection of *B. bronchiseptica* usually occurs from direct contact with infectious airborne respiratory secretions or through contaminated fomites, with an incubation period of roughly 6 days. It colonizes in the respiratory tract, and there it produces toxins that destroy cellular components necessary for clearing infections. It also suppresses (or reduces) the body's immune responses, and can even enter into cells and act as a persistent infection, making dogs long-time carriers. The main clinical sign you will see is a dry, honking cough (sometimes described as a "goose-honk cough"). Dogs are otherwise healthy, unless they have a co-infection with another infectious agent (such as CPI discussed above). Younger patients and those already with a compromised immune system may go on to develop pneumonia if left untreated. The majority of cases of *B. bronchiseptica* are self-limiting (meaning they go away after a few annoying days of coughing), but a short course of antibiotics are often issued to help prevent other infections and to reduce the chance of bacterial pneumonia. Treatment can also include anti-tussive therapy to reduce the frequency of the cough (but remember, a cough can be a good thing as the body attempts to expel pathogens). It is important to note that just because your dog is vaccinated against

“Kennel Cough” does not mean it is completely safe from some of the other pathogens that can lead to this syndrome (such as *Mycoplasma*). Regardless, it is a good idea to have your dog vaccinated with Bordetella, especially if they are being boarded at a kennel, get groomed frequently, or come into contact with a high number of dogs in any other situation!

There are other vaccinations we encourage you to investigate including those against Lyme disease and Leptospirosis that have not been covered here.

We discourage advice from Dr. Google, but would instead prefer you to check out www.VeterinaryPartner.com for more information.

To set up an exam or if you have further questions, please call us at

801-269-1213

Midvalley Animal Clinic

