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Vaccine Titer Tests for Dogs

These blood tests are the best way to determine whether your puppy or dog is protected against common infectious diseases.

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The truth is, there is no single vaccination protocol that will protect all dogs for all things, without over-vaccinating most of them. Vaccination really ought to be determined on a case-by-case basis, because each dog's risk factors are unique, based on his age, genetic inheritance, current health, geographic location, and lifestyle.

That said, there is a very useful tool that can help an owner gain solid information about whether their dog is likely to be protected against the most common infectious diseases: the vaccine titer test. Positive test results can also give a dog owner some solid ammunition for countering those who blindly promote (or require, in the case of some boarding or training facilities) so-called "current" vaccinations, which can mean many different things to different people.



The use of vaccine titer tests can help you decide whether or not your puppy is completely protected from disease after her "puppy shots," or if your adult dog really needs any more core vaccines.

Core Canine Vaccines

The closest thing that there is to a universal list of recommendations for canine vaccinations in North America is produced by the American Animal Hospital Association (AAHA). The veterinary medical experts who have contributed to the AAHA's recommendations agree that there are a handful of infectious diseases that pose a threat to all dogs and that all dogs should receive vaccinations for those diseases; these are commonly referred to as the "core" vaccines.

Core vaccines include:

Canine distemper virus (CDV, commonly referred to as **distemper**)

Canine parvovirus (CPV, **parvo**)
Canine adenovirus (CAV, better known as **canine hepatitis**)
Rabies

Among healthy dogs, the first three “core” vaccines are expected to induce a protective immune response lasting at *least* five years. However, much longer protection from these vaccines has been demonstrated in dogs and many Immunologists believe that protection may even last as long as the dogs’ lifetime.

Rabies

Rabies is a slightly different case. Because the disease poses a significant risk to human beings, it’s the *only* vaccine that is *required by law* to be administered to dogs. Each state (or province) has its own legal requirements for rabies vaccination. Some require annual rabies vaccinations; the rest require the vaccination be given every two or three years (depending on the state/province). There is ample evidence that rabies vaccines confer protection from rabies for longer than three years, but given the public health risk to humans, there is considerable pushback from public health officials to the idea of extending the legal requirement for rabies vaccines.

Noncore Vaccines

There are also a number of vaccines for infectious diseases that can pose a risk to some dogs, depending on individual risk factors and geographic location. These are called the “noncore” vaccines, and they include:

Bordetella bronchiseptica (Bb, **kennel cough**)
Borrelia burgdorferi (**Lyme disease**)
Canine **coronavirus**
Canine parainfluenza virus (CPiV, **parainfluenza**)
Leptospira spp. (**leptospirosis**)

Most of these vaccines are useful in certain circumstances, but the evidence falls short of proving that they are helpful to all dogs everywhere. Further, there is proof that some of the noncore vaccines can be harmful to certain dogs. For these reasons, the AAHA recommends that the administration of these vaccines should be decided on an individual basis by a veterinarian familiar with the puppy or dog and the local risks.

As just one example, Lyme disease is prevalent in some parts of the country, and quite rare in others, and it is transmitted by tick bites. Also, some dogs can suffer serious side effects from the vaccine. So if a dog lives in a part of the country where Lyme is not common, and/or if you have a dog who has very little exposure to environments where ticks are likely, the risks of vaccinating that dog for Lyme outweigh the potential benefit.

A Test of Protection

Let’s go back to the diseases that every dog should be protected from; these are the ones that are most likely to appear on the reminder postcards sent out by the average, main stream veterinary office – the ones that you will experience the most pressure to repeat in order to keep “current.” Depending on the vet (or the policy of the clinic), “current” may be defined as annually, every three years, every five years, or longer. As little as 20 years ago, it was widely thought that annual vaccinations “couldn’t hurt, and might help,” and most veterinary practitioners recommended that their clients vaccinate every dog annually. But today, we understand that canine vaccines don’t “wear off” or “become due” in any standard amount of time. Also, it’s better understood today that randomly stimulating the immune system can have negative consequences that we don’t fully understand, so we should be more discriminating about vaccinations.

The *core vaccines* are an important and life-saving component of responsible dog care when administered properly – neither too frequently nor inadequately. Which brings us back to the original question: How do you know when your dog is protected – or unprotected – against the core diseases?

The best tool at our disposal today is something called a vaccine titer test, and in our opinion, every dog should be tested at least once, and again every three years or so.

When we vaccinate a dog, we administer disease antigens (in a weakened, modified, or killed form that can't cause disease) in order to stimulate the dog's immune system to produce antibodies; molecules that are produced to recognize and neutralize that specific antigen, should they ever cross paths. A vaccine titer test checks for and quantifies the amount of antibodies to specific diseases that a dog has circulating in his blood.

Meaning that, a positive vaccine titer test for parvo and distemper can put your mind at ease – and should put your veterinarian's mind at ease – that your dog is adequately immunized against the core disease vaccinations he has received.

The AAHA – and vaccine-savvy veterinarians – recommend that puppies receive a vaccine titer test about two weeks after they have been given their final puppy core vaccinations (which should occur when the puppy is about 14 to 16 weeks old). Again, a positive result for both distemper and parvo antibodies indicates that the puppy is properly immunized. The AAHA's recommendation is that adult dogs are tested about every three years, to ensure that they still possess circulating antibodies for the core diseases.

Understanding Negative Results

What about when vaccine titer tests come back negative for distemper and/or parvo antibodies? The significance of this result depends on a few factors, including the dog's age and vaccination status, and the vaccine used.

If the test was for a puppy who recently completed a series of core vaccines, he should be revaccinated promptly, and then a titer test run again about three weeks later. The most likely explanation is that something called “maternally derived antibodies” (MDA antibodies he received via colostrum from his mother) were still active in his bloodstream when the vaccines were given, and they neutralized the antigens present in the vaccines.

Maternal antibodies don't last forever, however; they “fade” at an unpredictable rate. The maternal antibodies can fade quickly (or may be absent) if a pup's mother was unvaccinated, or he received very little or no colostrum from his mother. If his mother had an unusually high antibody titer herself (the highest levels result from surviving an infection with the disease itself), her pups' MDAs might take longer than usual to fade. This would render all of the puppy's early vaccinations useless; only vaccinations given after the MDA faded would stimulate the puppy's own antibody production.

However, if the puppy was undoubtedly more than 20 weeks old when he was vaccinated the final time, and his vaccine antibody titer test results (from a sample taken three weeks after the last vaccination) were still negative, it could indicate that he was a “non-responder” – a dog who could not be properly immunized.

It's been estimated that 1 in 1,000 dogs are not able to respond to the canine parvovirus vaccine; those dogs will be at a lifetime risk of contracting the disease (though the risk is greater when they are puppies; adults are more likely to pull through with prompt and dedicated care). Far more rare are dogs who cannot respond properly to the distemper vaccine antigen; this is estimated to occur in about 1 in 10,000 dogs.

The third possibility for the dog's failure to produce antibodies in response to vaccination: bad or improperly stored vaccine. In this case, a different vaccine should be used, and the dog re-tested a few weeks later. According to the AAHA guidelines, “if, after one or more attempts at revaccination with a product different than the one

originally used, the dog fails to develop an antibody response to distemper or parvo vaccines, the dog should be considered a non-responder”.

Canine vaccine experts agree that if a dog previously had a positive antibody titer for both distemper and parvo, and upon later titer testing is negative for one or both antibodies, he should be revaccinated with the core vaccines, and another titer test should be ordered about three weeks later.

However, there are professionals who disagree on what to do when antibodies have fallen below protective levels, but are still detectable. The antibodies may no longer be in circulation, but if they had been present earlier in the dog’s life, the dog should have immune memory cells that we can’t detect with lab tests. In theory, these immune memory cells should recognize the old antigen if a dog is exposed to the disease antigen, and re-start production of the appropriate antibodies.

It is important to note the opinion of the most-respected small-animal vaccine expert in the country, Ronald D. Schultz, PhD, of the University of Wisconsin-Madison. Dr. Schultz has studied animal vaccines for decades, and as a consultant and researcher, has helped develop many of the ones on the market. “You have to consider a dog who has no detectable antibodies against disease to be unprotected for that disease,” he says firmly. “I would revaccinate the dog. The risks of contracting the disease are far greater than the risk posed by vaccines – particularly in a very infrequently vaccinated animal.”

Titer Caveats

It can be difficult to be the first in your veterinarian’s practice to ask for a vaccine titer test in lieu of automatic revaccinating. The staff may not understand which test to order, nor may they be able to provide you with accurate costs or answer technical questions you have about the specifics of the titer tests.

There are a variety of veterinary medical laboratories that provide vaccine titer tests for dogs and cats. All offer a combined canine distemper/parvo vaccine titer test that is less than the cost of running two separate tests. The price you pay will vary, depending on which lab is used and any related ancillary costs such as fees for collecting a blood sample for your dog and courier charges for sending it overnight to a lab.

You may encounter pushback on the value of titer testing with arguments such as “There is no way to know what titer numbers are protective,” or that “even dogs with positive titers can contract disease.”

Those statements are both technically true – but it’s very, very rare for a dog who has *any* circulating antibodies to a disease to become infected with that disease upon exposure. Practitioners who make statements like this are unlikely to add the corollary to this – that dogs who do *not* have detectable antibodies to a specific disease *may* be able to fend off a challenge (exposure) to that disease, again, thanks to as-yet immeasurable “cell-mediated immunity.”

Finding a Veterinarian to have a collaborative professional relationship with is key. If you sense you may have conflicting beliefs, be proactive and have an open conversation with your veterinarian to better understand their stance on vaccination protocols. Your veterinarian is a part of your pets’ care team and they will appreciate having a chance to learn about the wellness goals you have for your pet and how you hope to achieve them.

To request information on titer testing options available through our clinic for dogs (and cats too) please contact a member of our team at (519) 503-2000 or via info@mainstreetvetservices.ca. We’re happy to answer any questions you may have.