

# Revaccination Decisions Made Easy With Antibody Detection

Everyone agrees it's bad medicine to administer a drug unnecessarily, and vaccines are "biological drugs"; they should only be used when they'll benefit the health of the animal.

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An evolution in vaccination programs for cats and dogs is underway. Because the duration of immunity that particular vaccines provide can last many years, the practice of revaccinating cats and dogs annually with all vaccines is being challenged. An increasing number of researchers and experts recommend that vaccines offering long-term immunity can and ought to be administered no more than every three years.

These recommendations, understandably, have caused an upheaval in clinics where the habit of vaccinating every year for everything is considered a medical constant and a revenue staple. Recently, though, a test has been developed that can be performed in the veterinarian's office to assess vaccinal immunity. It is proving to be quite valuable.

When the test shows *positive*, the animal has antibody at a level equal to or greater than the amount needed to prevent disease if it were exposed to the pathogen.

The two most serious canine diseases, based on their severity and the percentage of dogs that die from them, are canine parvovirus type-2 (CPV-2) and canine distemper (CDV). Thus, the two indicator vaccine antigens in the test are CPV-2 and CDV. A *negative* test for one or both viruses indicates that the vaccinated animal may not have effectively responded to the vaccine or has lost its antibody. In this case, revaccination would be beneficial and indicated. A negative test does not mean that the animal would definitely develop disease if exposed.



After revaccination, if the serum remains negative for only one of the two viruses, it is likely that the animal is genetically

unable to develop an antibody response at a level similar to other dogs. This dog would be considered a *low* or *non-responder* and probably has a genetic defect in immunity to that specific pathogen. Some of the *low* or *non-responder* animals have protective immunity, thus when challenged can be resistant to disease, while others are at increased risk to the specific pathogen. *If the test remains negative for both viruses, then revaccination with another product is necessary.*

The titer test is especially useful to ensure that young animals have developed an immune response after the first series of puppy vaccinations has been completed. If the test is negative for one or both viruses two or more weeks after the first series of shots have been given, then the animal has failed to respond to the vaccine and needs to be revaccinated.

In most cases the majority of dogs that do, in fact, develop a response to

CPV-2 and CDV will also develop an immune response to the other important vaccines in a combination product. A response to these two crucial pathogens indicates that there is indeed immunity and the vaccine has provided as much protection as can be expected. A failure, on the other hand, of the animal to respond to both CPV-2 and CDV suggests that the animal is also likely to have failed to respond to the other vaccines in the combination product.

This immune status test, or titer test, can provide assurance that the vaccinated animal has immunity. Annual vaccination, in contrast, does not offer such assurance. What is more, revaccination with vaccines that aren't needed unduly raises the risk that the animal could develop an adverse reaction to the vaccines. The test is an opportunity to know whether or not the vaccine has provided immunity and if revaccination is necessary.

This new diagnostic test for the detection of antibody to vaccine antigens (CPV-2 and CDV) will be very helpful in making a medical decision about when to revaccinate with those vaccines that provide long duration of immunity (three years or more). The canine vaccines that provide a long duration of immunity include CDV, CPV-2, CAV-2, rabies, canine coronavirus and canine parainfluenza virus. The vaccines with short duration of immunity (one year or less) are the leptospira sp. bacterins, Lyme and *Bordetella bronchiseptica*. If these vaccines are considered necessary for the animal, because of known conditions and environment, they should be given annually regardless of the results obtained with the test.

# Antibody Titers And Sterilizing Immunity

A titer test would be very useful to show that a vaccinated animal responded to the vaccine.

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"Sterilizing Immunity" is the ultimate in vaccine induced protection since it not only prevents clinical disease, but also prevents infection. Only antibody can prevent infection. Sterilizing immunity exists for certain canine diseases. Three of those

diseases are the most important diseases. They are canine distemper (CDV), canine parvovirus (CPV-2) and canine infectious hepatitis caused by canine adenovirus-1 (CAV-1).

The test (TiterCHEK™ from Synbiotics) would be very useful to show that a vaccinated animal responded to the vaccine. The test would also show that an animal with a positive test has sterilizing immunity, thus should be protected from infection. If that animal were vaccinated it would not respond with a significant increase in antibody titer, but may develop a hypersensitivity to vaccine components (e.g. fetal bovine serum). Furthermore, the animal doesn't need to be revaccinated and should not be revaccinated since the vaccine could cause an adverse reaction (hypersensitivity disorder). You should avoid vaccinating animals that are already protected. It is often said that the antibody level detected is "only a snap shot in time." That's simply not true; it is more a "motion picture that plays for years"

Many veterinary practitioners do not feel comfortable not vaccinating every year without some way to provide information on the immune status of the dog/cat. TiterCHEK can give them that assurance. Dogs that have a negative result on the test (TiterCHEK) are not protected from infection (no

sterilizing immunity) but they may be protected from clinical disease since an anamnestic (secondary) antibody (humoral) and/or cellular response could protect from disease. Therefore, a negative test does not mean the animal would

develop disease if exposed. A positive test, however, indicates the animal should be protected from infection and disease.

TiterCHEK would be very useful after the puppy vaccination series to ensure the puppy has responded. If it has not responded after vaccination (sample taken 2 weeks after the last dose), then you will want to revaccinate immediately and test again about two weeks later. If the animal is not positive then you need to consider the dog to be a *low* or *non-responder*. A *non-responder* is likely to get sick and die if infected with CPV-2 or CDV, because it is genetically unable to develop a response to the pathogen. If it is a *low-responder* it may not be able to ever develop and/or maintain an antibody response that provides sterilizing immunity. But it may be protected or not from clinical disease through cellular and/or humoral responses.

Interestingly, even for diseases where sterilizing immunity does not exist (e.g. Lepto, Bordetella, rabies) having a titer would show that the vaccine has stimulated an immune response and the animal may be protected from clinical disease by memory T cells and/or B cells that will respond if the animal does get infected. This raises another question often asked, "Why isn't there a titer check test for all the other vaccine components?" My answer would be that for the two most

important diseases CPV-2 and CDV, antibody plays a key role in protection, thus those two diseases should be included in the test. Rabies vaccination is controlled by law and the vaccine is known to give immunity for at least three years and ICH is no longer a disease of any consequence in North America. Furthermore, it is very rare that if a dog responds to CDV and CPV-2 components in the vaccine that it would not respond to canine adenovirus. So you don't have to worry about checking a CAV-2 titer. All other vaccines are non-core canine vaccines that for the most part need to be given annually. They include Lepto, Lyme, and Bordetella/CPI. The CPI doesn't need to be given annually, but Bordetella should be and CPI is part of the combination product. I don't know of any dog that needs to receive a corona vaccine or giardia vaccine, so why would you worry about a titer?

One other important thing to know is if you are using Recombitek® Distemper from Merial, most of the dogs will be negative on the TiterCHEK for CDV. That does not mean they are susceptible to disease, but they do not have sterilizing immunity because the vaccine produces a low antibody titer. However, after challenge infection with CDV they develop a rapid and protective CDV antibody. They will not shed CDV when infected and they do not develop disease, but they do get infected.

So yes, antibody titer is important for certain diseases in every species and yes, this test could be very useful in knowing if the individual animal has responded to initial vaccination or if the animal has sterilizing immunity.