Rely on TiterCHEK® CDV/CPV to help identify ill dogs during canine distemper virus (CDV) and canine parvovirus (CPV) outbreaks1

Use Zoetis’ TiterCHEK CDV/CPV to:
- Help reduce costs by helping minimize the need for quarantine or additional animal-care days1
- Maintain a healthier dog population by identifying high-risk dogs early and minimizing the need for quarantine or additional animal-care days1
- Allow for faster triage – up to 14 dogs can be tested simultaneously, and results are ready in approximately 20 minutes
- Improve staff morale by euthanizing fewer dogs and by adopting more1

Zoetis’ TiterCHEK CDV/CPV delivers:
- Excellent accuracy to correctly identify high-risk and low-risk dogs for CDV and CPV1,3
- Ease of use
- Excellent value2


Topics include:
- The Current State of Diagnostics Testing in the Shelter Environment – Challenges and Benefits
- Evaluating the Cost Effectiveness of Antibody Titer Testing for Parvovirus and Distemper in the Shelter Setting
- Canine Parvovirus and Canine Distemper in the Shelter Setting: To Test or Not to Test?
- Crisis Care Management: Antibody Titer Testing in Action


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The following is the final segment of a four-part series focusing on diagnostic testing in the shelter environment. This article is from a presentation given by Barbara Hanek, DVM and the director of shelter medicine at PAWS Chicago. PAWS Chicago is the largest adoption-guarantee humane organization in the Midwest. It was founded to end the unnecessary killing of homeless pets by informing and engaging the public and the media to help bring about change. Since opening its doors in 1997, the euthanasia rate of homeless animals in Chicago has been reduced by nearly 70%. During her presentation, Dr. Hanek gave an example of successfully managing an outbreak of canine parvovirus at PAWS Chicago with parvovirus antibody titer testing.

Dr. Hanek:

Approximately two years ago PAWS Chicago had a delivery of 43 puppies and young dogs from a transfer partner, in which some of the dogs had diarrhea within minutes of arrival. A fecal antigen test for canine parvovirus was performed, and it was positive. We had two options: keep the pups and treat or have the transfer partner take them back.

Sending them back was not a good option because we were in a better position to treat than our transfer partner. Professionally, this was a very scary time because we didn’t know how many would succumb to parvovirus, and our concern was that euthanasia might be an option if their health was failing despite treatment. Eventually nineteen of the 43 dogs became ill and confirmed parvovirus positive on a fecal antigen test.

Our game plan included assessing risk and controlling what we could control. We antibody titer tested the ones older than four months of age and sent them to foster for a two-week monitoring period (or to the adoption center if they were older than a year), if they appeared healthy and had antibody titers to parvovirus. Puppies less than four months were kept in isolation and monitored for illness. Ultimately the puppies that were parvovirus positive for fecal antigen showed signs within one week from time of arrival at our shelter.

We tested using TiterCHEK® CDV/CPV. We had a total of 43 puppies, and we only tested those dogs four months and older. We knew we were going to keep the ones younger than four months of age and did not determine their antibody titers because a positive result may be because of maternal antibodies, which may not be protective.

Dr. Krecic:

Why the cut-off of four months of age and how do maternal antibodies affect your decision to test?

Dr. Hanek:

Maternal antibodies, if present in the puppy, are likely waning by four months of age. Antibody titer testing does not differentiate maternal antibodies from the puppies’ antibodies. We believed that the parvovirus antibody titer would be more protective if it wasn’t waning.

We divided the dogs into risk groups: high risk, moderate risk, and low risk. If the dog was older than a year of age and had an antibody titer to parvovirus, then the dog was bathed, spayed/neutered, and sent to the adoption center. That dog would be of low risk. Moderate risk would be a puppy that arrived on the same transport but was housed separately from dogs positive for fecal parvovirus antigens. A high-risk dog was one directly exposed to parvovirus and any dog lacking an antibody titer to parvovirus. Dogs less than four months of age and exposed would also be considered high risk.
Dr. Krecic:
But you did not test those particular dogs for antibodies to parvovirus. And the reason was?

Dr. Hanek:
When you get a positive antibody titer test result in a puppy less than four months, you don’t necessarily know if it’s due to maternal antibody or if it’s truly a protective response to parvovirus, as seen with vaccination or prior exposure.

Dr. Krecic:
The rationale is that in any puppy older than four months of age, the maternal antibodies have waned to non-protective concentrations and therefore a protective antibody titer test result is likely due to antibodies that have been actively produced in response to vaccine or previous natural infection.

Dr. Hanek:
Correct. In regards to the movement of animals for normal intake, we have a slow track and a fast track. Normally (i.e., no outbreak) dogs less than seven months are put on a slow track, meaning that they need two vaccinations at least two weeks apart in order to proceed to surgery (spay or neuter) and then to the adoption center. For this parvovirus outbreak, we fast-tracked the eight dogs older than a year of age and that had antibody titers to parvovirus.

Dr. DiGangi:
Some veterinarians automatically place puppies less than four months into the high-risk category regardless of their antibody titer test result. They’re not yet immunocompetent. They’re just at high risk by nature. And so, that goes back to the reasons for diagnostic testing: Will knowledge of the test result affect the treatment plan? Here, the test result is not going to change the plan.

Dr. Krecic:
So generally, veterinarians are not testing puppies less than four months of age given the likely presence of maternal antibodies that would make interpretation of the results of antibody titer testing impossible.

Dr. Hanek:
Even in a non-outbreak of parvovirus or distemper, we will antibody titer test dogs that are between four and seven months of age because then we don’t have to automatically slow-track them.

Dr. Krecic:
What do other people think about that age range? Is this another application of using an antibody titer to slow-track versus fast-track a dog to the adoption floor?

Dr. DiGangi:
I think it’s another option. There are pros and cons to everything we do, and it’s all risk management. So, I think it is certainly one feasible way of using the test to make decisions.

Dr. Litster:
I’m sure if you stack up the dollars and compare the costs of conducting a TiterCHEK CDV/CPV test versus putting the dog in the slow track, testing would be less expensive.

Dr. Hanek:
We have a saying at PAWS: “Three paws down and you’re out the door.” We don’t even like the fourth paw to land. That’s how much we want to keep these dogs moving through the system. Obviously, we don’t want to send them out if they’re sick, but we would rather have them in an adopted home.

Dr. O’Quin:
It always comes down to a risk assessment. Ideally, your adoption center is going to have dogs at low risk of exposure to disease. If you have the resources, antibody titer testing puppies at four to seven months of age, even if there aren’t a parvovirus (or distemper virus) outbreak, is great. But, if your resources are limited, shelters might prioritize other uses for those funds, depending on how the relative costs and adoption opportunities play out in each shelter.

Dr. Hanek:
As for the 43 puppies, we considered 13 (between the ages of 4-12 months) to be at low risk. Those were ones that had at least two vaccinations and positive antibody titers for parvovirus. These puppies were sent to foster. We didn’t feel comfortable sending them to the adoption center, but we had some comfort knowing they had at least two vaccinations. We had seven puppies that were due for vaccinations the day after they arrived, so likely they were vaccinated 13 days prior to arrival. We considered these puppies to be medium-high risk, and they also were sent to foster.

Properly educating fosters on the importance of isolation and disease recognition was critical. Trained, experienced fosters would notify us at the first sign of lethargy, poor appetite, vomiting, and/or diarrhea and return the puppy to us so treatment could start immediately.

We had 20 puppies about two months of age, and they received their first vaccination eight days before entering our shelter. Those were considered high risk, and four of those became symptomatic within 24 hours of arrival. Due to their high risk, those 20 puppies were kept in the shelter for close monitoring.

“\textit{We have a saying at PAWS: ‘Three paws down and you’re out the door.’ We don’t even like the fourth paw to land. That’s how much we want to keep these dogs moving through the system. Obviously, we don’t want to send them out if they’re sick, but we would rather have them in an adopted home. The more that go to the adoption center, the more we can save from the municipal shelter.}”\textsuperscript{\cite{Hanek}}
Regarding daily assessments and treatment, it was very helpful to have the same technician for the puppies to ensure continuity of care. Having one technician to focus on the puppies also decreased the possibility of cross-contamination.

Dr. Krecic: That is an extremely important point, isn’t it?

Dr. Hanek: Yes, 19 of the 43 puppies ended up parvovirus positive and displayed severe gastroenteritis. Being that our facility houses approximately 100 dogs on average, it was extremely important that we contain the disease. Every morning for about two weeks, we cared for 19 critically ill puppies—it was an extreme challenge to give individual critical care at a herd level. Daily we would make up 19 bags of IV fluids and prepare all the injectable medications. Fortunately most of the puppies weighed approximately 15 pounds, so individual calculations of dosages were decreased. Once the puppies were eating and no longer showing gastroenteritis, they were sent to foster for two weeks to improve their body score.

Dr. Krecic: What was the outcome here with these guys?

Dr. Hanek: We had 100% survival. At the end of this two to three week medical marathon, the puppies looked much better than the staff. Professionally it was the most difficult and most rewarding event I have experienced. I’ll never forget when we took them from their individual cages (many of them had multiple legs shaved from ongoing IV catheters), bathed them, and put them in a room with another survivor and watched them play! To have the puppies go from near death to enjoying life will always be a treasured memory.

Dr. Krecic: You have a smile on your face as you’re talking about this. So, how did this positive outcome affect the staff, and especially the certified veterinary technician that was taking care of these puppies?

Dr. Hanek: We take pride in the puppies’ survival and appreciate the opportunity to show how amazingly challenging and rewarding shelter medicine can be. All of our other outbreaks pale in comparison, and we believe there is nothing we can’t accomplish if we work hard and work as a team. As difficult as it was to treat 19 parvovirus puppies, not treating would have been much more difficult.

Dr. Krecic: So, for you and your staff, treatment and seeing the success outweighed euthanasia, even if the cost disparity of treatments used and staff time was significant.

Dr. Hanek: Euthanizing them would have broken us. We have a very “can-do” attitude at PAWS Chicago. Ultimately I see “problems” as opportunities for solutions. An incredible amount of energy and time goes into building our foster program and also fundraising. The public sees that animals are suffering and wants to help, and they believe in what we are doing. I know most shelters probably have to euthanize animals in this situation and are not in the position to treat. Euthanizing exposed yet healthy animals is difficult for me to imagine because I have seen them survive. I understand it may have to be done because of a lack of space or the risk to other animals. Often I see animals that are exposed to infectious diseases, like canine parvovirus, that don’t become clinically ill.

Dr. Krecic: How did antibody titer testing, specifically determining the presence or absence of protective antibodies to parvovirus, positively affect the outcome here?

Dr. Hanek: During an outbreak there is fear of the unknown...the fear of who, when, and how many will be affected. Antibody titer testing decreased uncertainty by providing information to allow knowledgeable decisions. Informed decisions were made on which animals would go to surgery and then the adoption center, who was going to foster, and who needed to stay in the shelter for close monitoring. This knowledge provided structure for a game plan—a game plan that allowed us to best use our resources and increase the probability of success.

With more information, we had the ability to make better decisions. Antibody titer testing decreased fear, guessing, and risk. For this parvovirus outbreak, dogs that were greater than a year of age and had antibodies to parvovirus were cleared for surgery and adoption. If they had antibody titers and they were less than a year, then they were sent to foster for two-week monitoring. If they were less than four months of age, they were high risk and needed to be isolated and closely monitored for two weeks.

Dr. Litster: You had two major tools at the beginning of the outbreak. You had your clinical judgment and experience and you had the parvovirus antibody titer test results. From these you were able to stratify low, medium, and high risk. Looking back on that, did you pick right, as it played out? Did your low-risk dogs end up not breaking? Did your high-risk ones end up being the ones that did break? With those two tools were you able to stratify correctly?

“This decision is not as straightforward and depends on the specific shelter. Maybe you’ve got room to hold a few more animals, so you keep them in quarantine within the shelter. But maybe you don’t—so you have to either quarantine them within foster homes or fast-track them to adoption. Both of these options rely on your clinical judgment along with the antibody titer test results.”

Dr. Brian DiGangi
Dr. Hanek: Yes, having the puppies’ (vaccination) history and antibody titer results allowed for a more predictable outcome. The older ones with an antibody titer did not develop parvovirus. Some of the ones that became clinical received their first vaccination eight days prior to arrival at our shelter.

Dr. O’Quin: Were there any other cases associated with this outbreak that occurred in the shelter where they were contained? If not, that’s a fantastic win-win.

Dr. Hanek: No, we were very fortunate. Because we needed individual cages to treat the puppies on IV fluids, we had to use a room that was solely used for our cat intake. Normally puppies are kept in small rooms, but critical care could not be accomplished in a free-roaming room. This bank of cat cages is located adjacent to where foster animals are given to their fosters. During this outbreak, we continued our normal daily intake of puppies and dogs from the city’s Animal Control Department. To prevent the spread of parvovirus, we temporarily moved our foster pickups to a different floor of our shelter. Extra effort was made to get any new puppy coming in from the city’s facility immediately out to foster.

Dr. Krecic: What about others’ experiences with an outbreak situation of parvovirus similar or dissimilar to what Dr. Hanek described?

Dr. DiGangi: I don’t have a specific case example, but those are basically our options when we get calls from shelters that think they’re dealing with an outbreak. We split the animals up into risk categories using antibody titers and clinical judgment and make a plan based on those factors. The outbreaks that I’ve heard about and been involved in have had favorable outcomes, though I don’t know if they’ve all had 100% success rates. The ones that don’t evaluate antibody titers, the ones that haven’t reached out for help, have often already decided that they’re going to de-populate or take some other course of action.

Dr. Krecic: Dr. Hanek, how can you best summarize what you did successfully at PAWS Chicago with that result, based on this scenario that you have? For example, what if one dog breaks with vomiting and diarrhea and is confirmed to have parvovirus based on a fecal antigen test?

Dr. Hanek: I don’t antibody titer test a dog that shows clinical signs and tests parvovirus positive on a fecal antigen test. The antibody titer results would not change how I treated the illness or where the animal is housed, etc. The results would not matter to me. I would keep it isolated and treat the clinical symptoms.

Dr. Krecic: What about the asymptomatic yet exposed dogs? We’re not antibody titer testing the symptomatic ones because instead we rightly use a fecal antigen test there.

Dr. Hanek: Typically if the puppy is less than four months of age, I do not antibody titer test. We antibody titer test dogs older than four months that are asymptomatic. If older than a year of age and have antibody titers, then they can go to the adoption center or have surgery (spay or neuter). In an ideal world they would all go to foster to be monitored for two weeks, but sometimes there are not enough fosters, especially ones that are willing to take animals who might be exposed to parvovirus. In shelter medicine we are constantly weighing risk. All dogs with negative antibody titers and puppies less than four months of age (not tested because of possible measurement of maternal antibodies) are not cleared for surgery/adoption and are on “parvovirus watch” for two weeks.

Dr. Krecic: What do others think of dogs greater than a year of age going to foster or to the adoption floor, as Dr. Hanek said, for fast track?

Dr. DiGangi: You can put confidence in that protective antibody titer test result in the absence of clinical signs. It just depends on your comfort level with risk and the space you have available. I think a lot of shelters would go ahead and try to get them adopted as fast as they could.

Dr. Krecic: And if exposed dogs are going to quarantine within the shelter or within a foster home, circling back to what Dr. Hanek said earlier, we’re looking at a 14-day quarantine. Is that fair to say? And then, if we have an outbreak of canine distemper, if we’re looking at a similar scenario, then we would have a 28-day quarantine?

Dr. DiGangi: It could be up to 3 months.

Dr. O’Quin: This is because the incubation period is much longer with distemper virus. The majority of dogs are likely to break in the first few weeks, but it could be longer. So, again, it’s a risk assessment.

Dr. Krecic: Dr. Hanek, the other option you suggested was fast-tracking the dogs if they’re a year of age, so they could go immediately to the adoption floor versus going into a foster home for that quarantine period.

Dr. Hanek: Yes, if they are healthy and have antibody titers, then they can go to the adoption center after a bath if they were potentially exposed to parvovirus. The adoption center and the adopters are informed of the potential exposure and informed about what signs to watch for. If the dog is older than a year and does not have antibody titers, then the dog is sent to foster for two-week monitoring.

Dr. O’Quin: This is an area where some more data would be valuable in helping guide decisions. It’s not just a matter of how much of a gambler you are. It’s more about having evidence to make the best decision.
Dr. Krecic:
The decision-making process was a good one.

Dr. DiGangi:
What Dr. Hanek alluded to earlier about having data to refer to—using the clinical signs to say whether or not that predicted protection—is something I have written about. If there’s a group of animals whose level of risk you are unsure about, you could evaluate other factors that have been associated with protection, for example, neuter status. In my study, neuter status of cats at intake to the shelter predicted protection against panleukopenia.

You could combine clinical risk factors and antibody titers to help make your decision. We lack data on exactly what those factors are for each disease in each species, but we have a couple of them, so maybe you could combine that information and build a case.

Dr. Krecic:
We’ve defined what potentially would be a low-risk situation with the antibody test result. So, asymptomatic dogs greater than a year of age with protective antibody titers for canine parvovirus in an outbreak of parvovirus (and similarly for canine distemper virus in an outbreak of distemper) are sent to foster or to the adoption floor for fast-tracking. Likewise, asymptomatic dogs four months to 12 months of age that test positive for protective antibody titers against parvovirus or distemper virus in respective outbreaks of disease may also be sent to foster or to the adoption floor for fast-tracking.

Dr. DiGangi:
This decision is not as straightforward and depends on the specific shelter. Maybe you’ve got room to hold a few more animals so you keep them in quarantine within the shelter. But maybe you don’t—so you have to decide either to quarantine them within foster homes or fast-track them to adoption. Both of these options rely on your clinical judgment along with the antibody titer test results.

Dr. Krecic:
Alternatively, if I have the dog that is older than four months of age and has a negative antibody titer test result, that dog would be classified as a high-risk dog.

Dr. DiGangi:
Yes, probably, in most cases.

“Using an antibody titer test can make a difference. Regardless of what type of shelter, antibody titer testing is a valuable tool and can increase the capacity for saving lives.”

Dr. Barbara Hanek

Dr. Krecic:
What do we do with the high-risk dog? What are the actions after classifying this dog as high-risk? Quarantine within the shelter or a foster home?

Dr. O’Quin:
Foster is an option as long as you educate the foster parents to monitor for signs of illness.

Dr. Krecic:
And for some, unfortunately, it’s euthanasia. Dr. Hanek, your PAWS Chicago shelter is an adoption-guarantee shelter, and it seems like those are becoming more common. Although euthanasia is a less-costly option, it is detrimental to the staff morale and it potentially leaves a negative perception in the community. How does that affect disease testing for something like parvovirus?

Dr. Hanek:
Many who work in shelters want to help animals. Antibody titer testing is a tool which assists us in being part of the solution, and that is to save animals. If a shelter normally euthanizes parvovirus-exposed, healthy dogs, maybe euthanasia would no longer be considered if these healthy dogs had antibody titers (i.e., of low risk). I believe the trend is to treat the treatables. We know we can successfully treat very serious diseases, especially if we use the resources that can be made available. Treating is not easy, but neither is euthanasia.

Managing disease, especially with limited information (e.g., no availability to antibody titer testing), is extremely challenging. Many factors also create possible limitations, such as few to no isolation areas and inadequate staffing. Building a knowledgeable foster network can be a solution. I’ve seen both dogs and cats of littermates of known parvovirus-infected animals continue to remain healthy.

Dr. DiGangi:
That kind of “shelter and euthanize” model is also very reactive. It’s not going to be effective in the long run to save animals and prevent the overpopulation issues that we have. Some of the other techniques we discussed are proactive. They’re going to have positive outcomes in the long run and you’re going to shift the whole paradigm of animal sheltering.

Dr. O’Quin:
Testing gives us a tool to make better decisions. I think that’s what it comes down to.

Dr. Litster:
We need as many tools as we can get in order to wisely choose which animals we take in to help the current sheltered population and therefore save the most lives.

Dr. Hanek:
Using an antibody titer test can make a difference. Regardless of what type of shelter, antibody titer testing is a valuable tool and can increase the capacity for saving lives.