Risk Assessment in case of Parvovirus Outbreak

Dr. Swartz discusses the proper steps of risk assessment during a Parvovirus (CPV) outbreak and how to minimize risk. As always, vaccination on intake, proper sanitation protocols and population management are the key components in avoiding outbreaks.

Question:

Hi,

I am reviewing/revising our parvovirus and panleukopenia exposure protocol. We currently titer any animals (except those with 2 vaccines or those under 16 weeks of age) exposed (direct or fomite) to a positive animal within the past 7 days and then quarantine any with negative titers or under 16 weeks for 2 weeks. Going back 7 days seems like over kill to me since shedding occurs typically 3 days prior to a positive test. Could we make it 5 days since maybe we don't catch the animal on the first day it is 'sick'?

Thanks for any input!

Answer:

Thank you for the very interesting question about risk assessment in the event of a canine parvovirus (CPV) outbreak. Thinking about and planning for a response protocol to CPV exposure is much easier to do when not actually faced with a case of CPV.

The risk of infection depends on the animal's individual immune and vaccination status and the overall cleanliness of the environment. There is no specific particular distance that is considered "safe" between kennels since environmental considerations are multifactorial and depend on the facility design, housing and handling practices at each individual organization. However, parvovirus is generally not aerosolized (unless you are using pressure washing), and depending on your cleaning and animal handling protocols, even a dog in a neighboring kennel may not actually be exposed. However, if there are weaknesses in how animals are handled/moved, and/or sanitation procedures, exposure could also occur widely.

The good news is that parvovirus is pretty difficult to spread through a

shelter population that is being vaccinated at intake, where the most vulnerable animals are handled carefully (puppies/kittens and animals who were first vaccinated less than 5 days ago), and where proactive population management practices minimize length of stay for animals, allow all animals to have adequate housing, and avoid crowding in the shelter, even during the busiest times of the year.

Vaccination at intake with a parenteral modified-live parvovirus vaccine is probably the most important factor in mitigating the spread of parvovirus through a population. We typically say that healthy adult animals (> five months old) vaccinated at least 5 days prior to exposure (i.e. the day that the dog with CPV had clinical signs) can be considered low risk and titer testing is not usually necessary as this is a very effective vaccine that will reliably protect all mature dogs within 3-5 days of administration.

There is evidence that puppies and kittens may actually have maternal antibody interference beyond 16 weeks, which is why we now make differentiate exposure risk at greater than or less than 5 months (20 weeks) old. So animals in this category who might be exposed never get to be low risk. However, in line with your current protocol, we can do titers to assess their antibody levels at the time of exposure. Puppies or kittens with positive titers are relatively safe to move to adoption or rescue but should leave the shelter quickly if possible and it is prudent to advise adopters or rescues of their recent exposure to CPV. Continue their vaccine schedule as usual.

Animals in the high-risk category would be those of any age who have inadequate titers at the time of likely exposure, and these are the ones you would quarantine for 2 weeks after suspected exposure. In terms of deciding what to consider “likely exposure” (e.g. next two runs versus whole room), two things to consider are likelihood of spread and historical patterns.

First, take a look at cleaning and handling practices on a daily basis. Remember it’s all about dose effect–dogs can withstand some exposure as long as it’s below the infectious threshold. Good and bad cleaning practices add up. Do staff evaluate health before embarking on cleaning, such that they most likely would pick up pretty quickly on a sick animal and not clean it in order with all the other runs, or are they speeding through cleaning and potentially cleaning a big pile of diarrhea and then going on to clean other adjacent runs with no special precautions? Are staff laying down disinfectant after leaving a run or are they often wandering in and out of runs without disinfecting afterward? Is there a lot of contact with staff clothing, shared implements, or other fomites during cleaning? Importantly, are you using a disinfectant with rock solid activity against unenveloped viruses? I think you get the idea–if mostly good

practices are in place coupled with consistent vaccination on intake, an infectious dose of parvo may well not spread even to adjacent runs. On the other hand, if there are quite a few opportunities for spread, then you might need to consider a whole room/ward exposed when one kennel is contaminated.

Then, double check your assumption by looking back at what's happened in the past when an animal breaks with parvo in your care. Have you quarantined over and over with never another case cropping up in "exposed" animals, or do you often see a case or two arise during the quarantine period? If you don't have much history to go on, you can do this moving forward: start with a fairly conservative definition of "exposed" (but that seems reasonable to you given your cleaning practices) and track what happens. If dogs never break even when they are in the risk group as long as they are X kennels away from the index case, you may be able to shrink what you consider your exposed group.

The last part of the question is how far back to consider an animal exposed, as you are currently using 7 days as your criteria for risk assessment. The incubation period of CPV is well defined. In our experience, animals will usually break with signs within seven days of exposure, though technically it can occur up to 14 days after infection. However, they can start shedding at least 3 days before they break with clinical signs (they would test positive for antigen in these days prior to breaking with signs). Thus, when you have a case, it seems prudent to backtrack about 3 days in time–and your point that staff may miss the first day or two of clinical signs is a good one. So 5 days is a reasonable time frame to perform your risk assessment and determine which other animals might have been exposed to that case

I hope this answers your questions. Please let me know if we can be of further assistance to you!

Aleisha Swartz, DVM
Outreach Veterinarian, Shelter Medicine Program
University of Wisconsin – School of Veterinary Medicine
www.uwsheltermedicine.com
www.facebook.com/UWShelterMedicine