Parvo and Panleukopenia a Shelter Perspective

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Canine parvo and feline panleukopenia are closely related viruses that replicate in rapidly dividing cells. The most obvious symptoms of infection are gastrointestinal but the bone marrow is also affected. The virus is transmitted primarily by the fecal-oral route (including indirectly via objects/clothing/hands contaminated with virus from feces). These viruses are unenveloped making them very durable persisting in the environment for months or even years. The incubation period is generally less than 14 days, on average 5-7 days. It tends to be shorter in cats. Control in shelters is dependent on effective vaccination, accurate and efficient diagnosis, effective isolation, and careful cleaning and disinfection. This lecture will focus on these four key outbreak control tools.

Effective shelter vaccination

Vaccination for parvo viruses is highly effective if performed correctly. Shelter vaccination protocols can substantially reduce spread of infection as they are more intensive than those used in private practice. This fact has been recently recognized by both the American Association of Feline Practitioners (AAFP) and the American Animal Hospital Association (AHAA) published vaccine guidelines. Modified live subcutaneous vaccination will provide considerably more rapid protection than killed vaccines. All cats and dogs 4-5 weeks of age and older should receive a modified live parvo/panleukopenia vaccine immediately upon shelter entry. Studies have shown that parvo vaccines can illicit protective immunity within 3-5 days of vaccination in susceptible dogs. Panleukopenia vaccines have been shown to protect against disease within 72 hrs of exposure. Even injured, pregnant and mildly ill animals should be vaccinated, unless they are certain to be euthanized within a few days.

The emergence of a new canine parvo strain (CPV-2c) has elicited concern about the efficacy of current parvo vaccines that use either CPV-2 or CPV-2b strains. The research and conclusions remain controversial to date but most evidence suggests that all currently available parvo vaccines do protect against CPV-2c

Vaccination recommendations

- Vaccinate all dogs and cats > 4-5 weeks old immediately upon intake with a modified live subcutaneous CPV or FPV vaccine respectively.
- Revaccinate all puppies and kittens every two weeks up to *at least* 18-20 weeks of age while in shelter
- All animals older than 6 months of age should receive two ML vaccines 2-3 weeks apart.
- Vaccinate fostered animals at least one week prior to shelter return

Recognition/diagnosis

Diagnosis may include

- Symptoms and exposure history
- Positive results on a Parvo test
    - weak positive ELISA tests may be caused by recent (within 3 weeks) MLV vaccine) especially in kittens depending on the test used
    - in spite of rare false positive results it is prudent for shelters to consider positive snap tests in symptomatic animals as real infection.
- Low white blood cell count on CBC or blood smear
- Segmental enteritis observed on necropsy

Risk assessment and quarantine

It is important to determine all animals that were in contact, either directly or indirectly, with the infected animal.

- Low risk: dogs and cats > 4 months old that are either:
    - vaccinated with an MLV SC vaccine at least one week prior to exposure
    - documented history of appropriate vaccination as an adult (>4-5 months of age) prior to exposure.
- Moderate to high risk: kittens and puppies under 4 months old regardless of number of vaccines given (due to maternal antibody interference)
- High risk: closely exposed, unvaccinated animals of any age.

Serology

This may be a useful tool to identify dogs at low risk and limit the number of animals requiring quarantine. Blood titers can be analyzed by outside labs that uses validated tests or by using an in-house test kit (Synbiotics TiterCHEK® http://www.synbiotics.com/Products/CompanionAnimals/Canine/CRF.html Another in-house option for both cats and dogs has become available in the US, the VacciCheck ImmunoCombTM test by Biogal (http://biogal.co.il/kits-for-canine-feline-avian/). These

kits provide semi-quantitative antibody titer levels for CPV and CDV (as well as Canine Adenovirus), FPV, FHV and FCV. There is a video on YouTube that demonstrates how to run this test: http://www.youtube.com/watch?v=wQ4o6gFzqiw

Titers can be considered protective rather than due to infection in animals with NO clinical signs. This includes vague signs such as lethargy or decreased appetite. Basically, any exposed dog or cat that has clinical signs must be considered high risk. This test is probably more accurate in dogs and has not been validated in cats. However, anecdotal reports have suggested that it is also useful in cats in conjunction with clinical assessments.

Any dog (or cat) older than 4 months of age with no clinical signs and a positive titer may be considered low risk and doesn't need to be isolated or held back from moving through the shelter system.

Adult animals with negative titers should be considered high risk and either quarantined for two weeks, if space and resources for appropriate care allow and exposure can be limited, or removed from the population.

Healthy puppies and kittens with positive titers may either have active or passive immunity. Both will protect the animal from current infection but if the titer is due to maternal antibodies then these will wane resulting in future susceptibility. These puppies and kittens need to be removed from the shelter as quickly as possible.

Be advised that the washing step is crucial for good results when using the TiterCHEK® kits so it is important to have qualified and trained staff running these tests.

Quarantine

At risk/exposed animals must be strictly isolated from incoming animals to prevent continued spread of disease. Depending on resources, this can be done either by a 14 day quarantine or, as a last resort, euthanasia. Quarantined animals should be removed to a separate isolation ward, separate building, or foster care. Any area where animals are quarantined must be able to be thoroughly cleaned and disinfected – no carpet, furniture, wood, grass, etc.

Precautions for quarantine

- Minimize handling of animals during quarantine.
- Wear protective clothing (lab coats or smocks, boots or shoe covers, and gloves)
    - Shoe covers or dedicated boots for quarantine are preferable to foot baths.
- Use supplies (brooms, feeding carts, scrub brushes, etc.) dedicated to quarantine and used only in that room.
- Handle quarantine animals last
- Quarantine precautions should be maintained for 14 days.

Cleaning and disinfection

- Parvo viruses are reliably inactivated only by bleach*, potassium peroxymonosulfate**or accelerated hydrogen peroxide ***
- Most quaternary ammonium disinfectants (e.g. Triple Two, Parvosol, Roccal) do not reliably kill parvo and panleukopenia viruses
- Clean and disinfect ALL areas of the shelters including animal transport vehicles, carriers and other equipment
- Known heavily contaminated areas should be cleaned, then disinfected, and left to dry without rinsing.
- For more in depth information on cleaning and disinfection protocols see: http://www.sheltermedicine.com/portal/is_cleaning.shtml#top3

* Notes on bleach: Bleach must be applied to a clean surface to be effective. 5% household bleach should be freshly diluted at 1:32 (1/2 cup per gallon). Correct dilution is very important: too weak is ineffective, too strong is overly corrosive and irritating. Spray bottles should be non-see-through plastic, as bleach is inactivated by light. Diluted bleach does not lose potency if kept in dark, sealed bottles. Products in the same family as bleach that have also been found effective include calcium hypochlorite (e.g. Wysiwash®) and sodium dichloroisocyanurate (e.g. Bruclean®). Like bleach, these have no detergent properties and must be applied to a pre-cleaned surface.

** Potassium peroxymonosulfate is marketed as Trifectant or Virkon-S and can be obtained from many animal supply outlets

*** E.g. Virox®, Accel®

References

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