

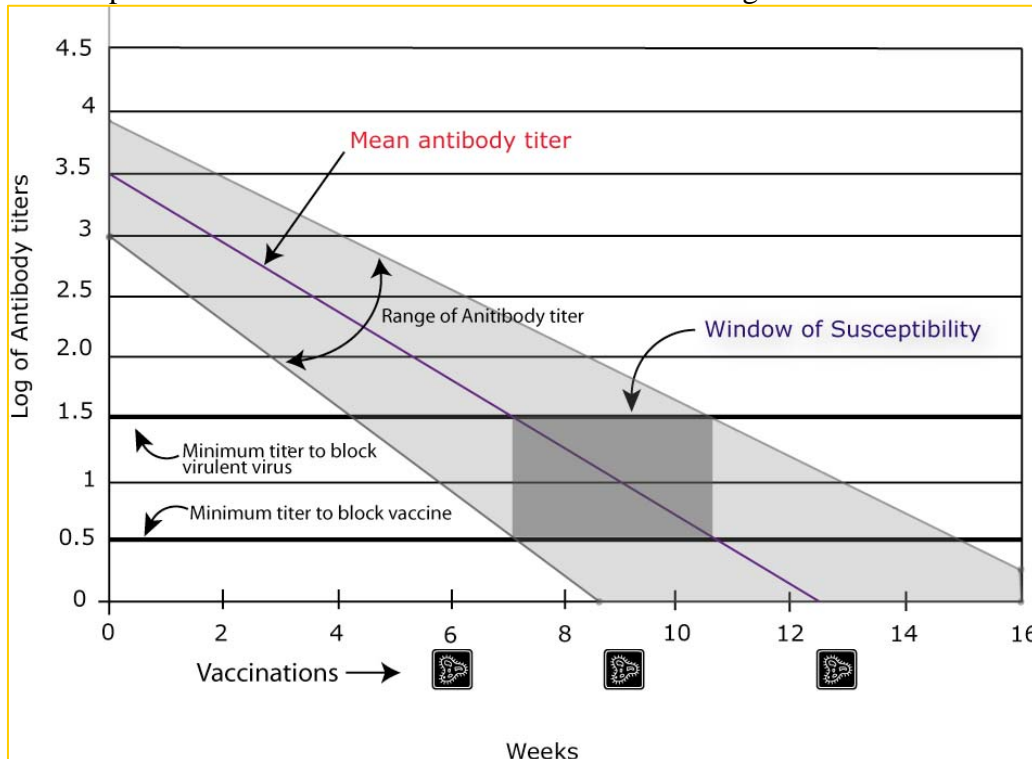
Socialization and Parvovirus Risk
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Parvovirus

Parvovirus is a highly contagious virus which causes vomiting and diarrhea, and often leads to death in susceptible dogs. Parvovirus is a very durable virus, and can remain in the environment for many months (ref). Parvovirus is primarily spread to other dogs by the fecal-oral route, however it can be spread on hands, feet, clothing, tools, rodents and flies traveling from kennel to kennel. Dogs may carry the virus on their fur and feet even if they themselves do not get ill. The virus enters the dog through the nose or mouth and has an incubation period of 3 days to 2 weeks (usually 5-7 days). Because of the incubation period (up to two weeks), it is ideal to quarantine high risk dogs that enter the shelter for two weeks in order to ensure that they will not spread the virus to other at-risk puppies in the shelter.

Vaccination will greatly reduce the risk of dogs becoming ill with parvovirus, however no vaccine will protect 100% of animals. In puppies, maternal antibodies interfere with the ability of the vaccine to provide a long-term effect. If the bitch was vaccinated for parvovirus in the past, she will give antibodies to her puppies, via her milk (colostrum). Maternal antibodies gradually wear off, and become ineffective in most puppies between four and sixteen weeks.

In young puppies, maternal antibodies protect them against disease; however vaccinations will NOT WORK while maternal antibodies are present. The picture below was adapted from Greene's Infectious Diseases of the Dog and Cat.



The picture demonstrates how maternal antibodies ('mean antibody titer') decrease over time, and how vaccinating while maternal antibodies are higher than the 'minimum titer to block vaccine' will not protect puppies. Because of this risk, we recommend vaccinating shelter puppies every two weeks until they are 18 weeks old, in an effort to make the 'window of susceptibility' as small as possible and to increase the likelihood that our vaccine protocol will protect our shelter puppies from parvovirus. Vaccinating more often than every two weeks is not effective. Once maternal antibodies are no longer a factor, the vaccine protects the puppy against parvoviral infection within 2 to 7 days; one vaccine will protect the puppy against disease in this situation. (No "booster" per se is needed with this vaccine.) This may occur at any time from the first vaccine to the last, depending on the amount of maternal antibody the puppy received.

Behavior/Socialization

The primary socialization period of puppies is between 3 and 13 weeks. This period is critical for development of primary social relationships with humans and other animals. Puppies that are confined during this period are significantly more likely to develop behavioral problems (primarily fear and aggression) than puppies that are provided a socialization program. Puppies isolated from conspecifics (other puppies) until 16 weeks of age, were significantly more likely to display fearful behavior and be aggressed upon by other pups. They were unable to develop a positive relationship with other dogs. Puppies raised in isolation until 16 weeks lose the capacity to exhibit playful behavior toward strangers. Previous research demonstrates that socialization is a critical step in the development of behaviorally healthy dogs.

Puppies with parvovirus die within a few weeks of contacting the virus; puppies with behavior problems die within a few years. Because of the temporal disconnect between acquiring the disease (behavior or parvovirus) and mortality, the need to develop comprehensive socialization programs in puppies is often underestimated. Dogs surrendered to a shelter are most likely to have been initially acquired from a shelter. This data does not reveal whether the relinquishers valued the dog less because they obtained it from a shelter, whether they returned it because of behavior problems which started before they obtained the dog (in the shelter or before entry to the shelter), or some other factor. A recent study demonstrated that puppies who attended socialization classes were more likely to be retained in their homes than those that did not.

Behavioral problems are the primary cause of relinquishment of dogs to shelters. Thus, they are also the leading primary cause of mortality of dogs in animal shelters. Because the signs of behavior problems are not as blatant as parvovirus, behavior problem prevention in puppies is not a primary focus of many animal shelters. Shelters can and should develop socialization programs for puppies which maximize socialization AND protect them from infectious diseases.

Recommendations:

1. All puppies should be vaccinated for parvovirus upon intake to the shelter, and every two weeks until they are eighteen weeks (or until they are adopted into a home, at which point they can follow the vaccine schedule for a pet puppy). The majority of dogs will be protected by 18 weeks.
2. Kennels and exercised area should be cleaned with a detergent and disinfectant that is effective against parvovirus, such as potassium peroxymonosulfate (Trifectant® or Virkon-S®). If using bleach, remember that bleach is inactivated by organic matter and sunlight and, unless used properly, will be less effective than potassium peroxymonosulfate.
3. To ensure prevention of parvovirus, dogs under six months of age and dogs without a vaccination history could be placed in a quarantine area upon arrival, and not placed into the adoption area for two weeks. This is recommended for puppies from a very high risk background such as shelter transfers from a shelter that has frequent outbreaks of parvo.
4. Because a two week quarantine period lengthens shelter stay (and increases length of potential exposure to parvovirus), is inconvenient, and may contribute to euthanasia due to behavior problems; an alternative protocol should be considered for most shelters. This could include making puppies available for adoption without a two week quarantine but keeping them in an area separate from adult dogs; cleaning and caring for puppies using separate staff or at least prior to caring for adult and sick dogs; using separate supplies for puppy cleaning and care; exercising puppies only in areas that can be routinely disinfected.

Recommendations for puppy socialization:

1. The shelter should have two exercise yards, one for puppies present in the shelter less than two weeks (quarantine), and another for puppies/dogs that have been at the shelter more than two weeks (post-quarantine).
 - a. The quarantine exercise yard must be easily disinfectable.
2. Post-quarantine puppies should not spend time or visit areas for quarantine puppies.
3. Kennel staff should clean cages of post-quarantine puppies before quarantine puppies.
4. Post-quarantine puppies should be placed in socialization groups earlier in the day than quarantine puppies. Potentially infectious puppies should be handled last.
5. Shelter staff and volunteers who handle quarantine puppies/dogs must walk through a disinfectant foot bath and wash hands or spray hands and arms with trifactant before handling other dogs. This does not prevent transmission of parvovirus (pants and shirts still potentially carry disease), but may reduce the risk.
6. Exercise yards should be cleaned with disinfectant after every play group. Trifactant® or Virkon® are good choices, because they are non-irritating to tissues. A new group of puppies can enter the exercise area after allowing the disinfectant to sit for 10 minutes.
7. Ideally, puppies should play with the same group of dogs every day, so that if a parvovirus outbreak occurs, a smaller proportion of puppies will be at high risk. It is preferable to allow puppies to play with slightly older dogs (> 4 months old) rather than other puppies from diverse sources.
8. The shelter should have a 'parvovirus quarantine protocol' in place. If a puppy is diagnosed with parvovirus, play groups should be discontinued for a two week quarantine period.
9. Keep data regarding who gets parvovirus and their relationship to play groups (who they played with and whether they became infected).
10. Keep data regarding post-adoption follow-up and the development of behavior problems with vs. without the socialization program.

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