

Vaccination Station: The Finer Points of Shelter Protocols

BY KATE F. HURLEY, DVM, MPVM



One of the joys of my current job is getting daily reminders of how much I don't know, despite my constant efforts to find out everything in the world. The source of all these sobering reminders is the e-mails I receive from shelter veterinarians and staff asking about every infectious disease control permutation and scenario imaginable. Nowhere is this more true than on the subject of vaccine use in the shelter environment. Fortunately, we now have a set of recommendations designed just for shelter dogs, courtesy of the American Animal Hospital Association (AAHA) and available online. (To find them, visit www.animalsheltering.org/resource_library and click on "Vaccinations, Animals."). A similar set of recommendations for shelter cats from the American Association of Feline Practitioners (AAFP) is scheduled for release this summer.

The AAHA and AAFP guidelines cover all the basic aspects of vaccine use in shelters: what types of vaccines are recommended, which diseases we should generally vaccinate against, how often vaccines should be given, which animals are candidates for vaccination, and more. This is the *first time ever* that shelter-specific guidelines have been included in the recommendations published by these respected organizations. As the AAHA guidelines compellingly state: "The impetus for separate shelter guidelines was the Task Force's recognition that this rapidly developing area of veterinary practice faces unique challenges. What best serves a clinical companion animal practice may not be ideal in an environment housing an ever-changing population." Finally, we are seeing widespread recognition of something many of you have known for years: dogs and cats in shelters need special care!

To celebrate this auspicious development, I'm devoting this column to common vaccine questions I have received over the years. This will allow me to go into a little more detail about the rationale and finer points of the recommendations contained in the AAHA and AAFP guidelines. So here they are, if not ripped from today's headlines, at least plucked from the jumble of my inbox:

Do you have an opinion about whether vaccination upon intake would help or hinder the animals? Our veterinarian believes it is not a good idea, due to both the cost and the risk that it will compromise an already lowered immune system.

Absolutely vaccinate on intake. This is the single most important thing you can do to protect your animals against serious illness and ensure that the cost and effort of vaccination is not wasted. The vaccines for feline panleukopenia, canine distemper, and parvovirus can work very rapidly, often providing significant protection within hours (distemper) to a few days (parvo). However, no vaccine works after an animal has already been infected, as may well be the case if the animal has been in the shelter for even a day or two before you vaccinate.

The question about whether vaccination in the face of stress will be worthless or even harmful comes up a lot. There is *no evidence* that the level of stress experienced by shelter animals on intake is likely to result in a significantly impaired immune response or create a risk of vaccine-induced disease; in fact, there is quite a bit of evidence to the contrary. In various studies, scientists have looked at the effects of moderate doses of steroids (mimicking the body's hormonal stress response), anesthesia, and

surgery on vaccine effectiveness. In none of these scenarios was the effect of stress severe enough to render the vaccine ineffective, and no vaccine-induced disease occurred. Perhaps the most impressive argument for animals' ability to respond to vaccines in the face of stress was a recent study of vaccination in feral cats at the time of surgery at a TNR clinic. A freaked-out feral subjected to transport, surgery, and anesthesia all on one day is arguably one of the more stressed-out creatures in this world, yet the great majority of cats responded favorably to the vaccine.

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But Dr. Hurley, what about the cost issue we mentioned?

Some shelters don't vaccinate on intake because of the "wasted" money for animals who end up euthanized. When well under half the animals actually get adopted, it may seem like spending thousands on vaccines is not the most logical use of resources. On the other hand, those desperately needed adoptions are unlikely to increase if adopted animals regularly suffer through an expensive and scary bout of respiratory disease or die of parvo, panleukopenia, or distemper. Rescue groups will not be able to help nearly as much if every rescued animal takes weeks of treatment or contaminates their foster homes. So the very resources that are most needed—homes for shelter animals—may be compromised because a

vaccine costing less than a few dollars was not given on intake.

There are various ways to make intake vaccination financially viable. A small increase in adoption fees can help offset the costs—I'm guessing most adopters would gladly pay an extra \$5 for an animal who has a better chance of staying healthy. And remember, every extra animal who survives to adoption rather than succumbing to disease results in one extra adoption fee and avoids the cost of euthanasia and disposal, as well as the cost of all the clean-up and negative publicity associated with a serious disease outbreak.

For those shelters that *absolutely can't* afford to vaccinate all animals, at least those animals deemed *likely* to go up for adoption or rescue should be vaccinated on intake. Making this decision right away rather than waiting until an animal is actually selected for adoption gives the vaccination a much greater chance of actually preventing disease. A drawback of this approach is that there is less "herd immunity" when unvaccinated animals remain in the population. For shelters that euthanize unadoptable animals within less than a week, this may not be much of a problem, as the holding period is shorter than the incubation period of most diseases. But holding unvaccinated animals for prolonged periods in the general population will likely lead to higher overall disease levels and should be avoided if at all possible.



We understand that using a modified live FVRCP (herpes-calici-panleukopenia combination) vaccine can result in significant shedding of panleukopenia by kittens. So if our practice is to batch kittens in a single cage, using a modified live vaccine is not appropriate, right?

There is no evidence that any of the currently available feline panleukopenia or FVRCP vaccines are particularly dangerous to use when multiple cats are housed together. In my experience, shelters that use a modified live vaccine, including in

group-housed kittens, are much *less* likely to report outbreaks of panleukopenia than shelters using killed or no vaccines. In fact, modified live vaccines have been specifically recommended for many years in catteries with panleukopenia problems. There are two main reasons that modified live vaccines perform better in a shelter:

1. Modified live vaccines provide *much quicker protection* in animals who have never been vaccinated; they contain live disease-causing organisms that are altered slightly in order to stimulate antibodies in

an animal without making him sick. Killed vaccines, which contain dead organisms as well as special substances designed to enhance the immune-stimulating properties of the vaccine, must be boosted two to three weeks after the initial vaccination—and even then it takes at least another five to seven days for meaningful protection to develop. That means a cat who has received a killed vaccine in the shelter must wait a minimum of three weeks before being protected against a deadly disease! On the other hand, modified live panleukopenia vaccine (administered subcutaneously, or directly under the skin) has been shown to provide meaningful protection within a day, and full protection within a few days of administration when given to healthy kittens (provided there is no interference from antibodies that may have been passed on to the kittens by their mothers).

2. Speaking of maternal antibodies, that's the other reason modified live vaccines are preferred in shelters. As long as their mom was vaccinated or exposed to disease at some point, kittens and puppies "inherit" a certain amount of antibodies in colostrum (milk produced in the first 24 hours or so after birth). These "maternally derived antibodies" provide some measure of protection to infants with developing immune systems; however, they also present some challenges because they can block vaccination for up to 16 weeks after the birth of the kitten. (The exact age can't be determined and varies depending on how many antibodies the mother produced, how well the newborns nursed, and the disease in question). This creates a "window of susceptibility," a period when maternally derived antibodies are strong enough to block the vaccine but have weakened to the point where the animal would be infected if exposed to the real virus.

In a home environment, it is usually easy enough to protect youngsters by minimizing exposure to disease until they are old enough to be reliably vaccinated. In a shelter, this is hard to guarantee! Although not perfect, modified live vaccines can break through maternally derived antibodies at an earlier age than killed vac-

Free Advice

The American Animal Hospital Association recently released its new canine vaccine guidelines, complete with a section for shelters that includes tables of recommended core vaccines and provides advice on the use of vaccines in situations unique to the shelter environment. To download the guidelines, visit www.aahanet.org. Or go to www.animalsheltering.org/resource_library and click on "Vaccinations, Animals."

New guidelines for cat vaccinations will soon be available from the American Association of Feline Practitioners.

cines, minimizing the troublesome window of susceptibility and helping to protect our highly adoptable youngsters.

I was taught that one shouldn't give booster vaccinations less than three weeks apart, but I see that you recommend them as often as every two weeks in high-risk puppies and kittens. If you give boosters two weeks after the initial injection, you are vaccinating just when the kitten is developing a peak antibody response from the previous vaccination. Doesn't that interfere with proper response to the booster vaccination? Why is it okay to vaccinate at two-week intervals?

Ah, another good question. This one also has to do with maternally derived antibodies and modified live vaccines. It's true that when you are seeking to elicit a "booster" response, it is best to give the vaccine three to four weeks after the first

injection. However, this is not what we are doing when we repeatedly vaccinate kittens or puppies under 16 weeks with modified live, subcutaneous FVRCP or DHPP (a canine distemper-parvovirus combi-

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nation vaccine). These particular vaccines do not require a booster—the very first one that gets past the maternal antibodies will be effective. But because we never know when the maternal antibodies will be low enough to allow the vaccine to take

effect, we give more than one injection in order to ensure a protective response as soon as possible. For the kitten born to an unvaccinated mom who passed along no maternal antibodies at all, the very first

vaccine given at six weeks of age might work. On the other hand, the greedy puppy who elbowed out his littermates and swigged all the colostrum from his well-vaccinated mom may still have interfering levels of maternal antibodies when

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he's 12 weeks old. The problem is, we never know which kitten or puppy got how many antibodies. That's why we repeat vaccination often in youngsters—we are trying to minimize that window of susceptibility between loss of maternal anti-

body of vaccines required in a puppy or kitten series. In fact, vaccination must be repeated as long as the animal is at risk or until 16 weeks of age, whichever comes sooner. So that kitten who comes in at four weeks old and promptly contracts

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bodies and effective vaccination. Vaccinations given less than a week apart may lead to a reduction in the strength of immune response, so two weeks is recommended as the shortest safe interval.

This reminds me of another common myth—that there is a certain magic num-

ber of vaccines required in a puppy or kitten series. In fact, vaccination must be repeated as long as the animal is at risk or until 16 weeks of age, whichever comes sooner. So that kitten who comes in at four weeks old and promptly contracts ringworm may need to be revaccinated four or five times if she grows up in a high-risk shelter or foster home (one with a reasonably high frequency of panleukopenia). On the other hand, the puppy who walks in at 16 weeks old probably will respond to the very first vaccine you give.

You spoke in one of your talks about the dangers of vaccinating kittens under four to five weeks of age. Could you list those for me?

Glad you asked! Though I'm a big fan of modified live vaccines, there are some risks to using them in a few specific populations, including pregnant, very sick, or very young animals. The vaccines for panleukopenia and parvo are of particular concern. It is thought that modified live parvo and panleukopenia vaccines given to puppies and kittens less than four weeks old may cause problems similar to those seen in animals who have con-

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tracted the actual disease at this age (cardiac problems in puppies, neurological problems in kittens). Although documented cases of this have not been published to my knowledge, prudence suggests we avoid the modified live parvo and panleukopenia vaccines in very young animals. Thus, although animals without maternal antibodies can respond to vaccines at ages as early as two weeks, the suggested age for the first DHPP vaccination for shelter pups and the first FVRCP vaccination for shelter kittens is four to six weeks. Go with the lower end of that age range during an outbreak or in high-risk shelters (those with a moderate to high frequency of respiratory disease and intermittent or more frequent problems with panleukopenia, distemper, or parvo).

Intranasal respiratory vaccines can be given earlier; although the vaccines are not labeled for this use, many shelters report using intranasal *Bordetella* in puppies and the herpes-calici combo in kittens as young as two weeks old. This may be helpful if these vulnerable infants must remain in the shelter. Of course, it is especially critical to house very young animals in clean foster homes or a well-separated area of the shelter. Remember, even once they have a vaccine or two on board, maternal antibody interference may still render them vulnerable.

Every year the same issue comes up, so I want to ask your opinion on this. Do we vaccinate pregnant or nursing cats and dogs for DHPP, FVRCP, rabies?

The general recommendation for pregnant and nursing pet animals is to avoid vaccination during this vulnerable time. That's well and good for a pet who has already received a full series of vaccines *and* who can be protected from disease exposure until her offspring are weaned. Obviously, the situation for a pregnant cat or dog in a shelter is very different. She may never have been vaccinated before, and thus may have no protection for either herself or her young in this high-risk environment. In an ideal world, pregnant animals expected to carry their litters to term would be whisked off into a clean foster

Top seven things you can do to maximize vaccine benefit in a shelter

- 1** Vaccinate against important diseases only. (See the "Free Advice" on page 48 to find out how to access a list of core vaccines.)
- 2** Vaccinate immediately upon intake.
- 3** Vaccinate everybody (with the exception of kittens and puppies less than four weeks old, very sick animals, and possibly pregnant animals expected to carry litters to term).
- 4** Repeat frequently in youngsters, especially during outbreaks or in shelters with lots of infectious disease.
- 5** Give vaccines time to work: prevent exposure prior to or immediately after vaccination.
 - a. Transport animal in a clean carrier and clean vehicle.
 - b. Place on a clean surface.
 - c. Handle with clean hands and clean clothes.
 - d. Place in a clean cage.
- 6** Store, administer, and document vaccination correctly.
- 7** Remember that puppies and kittens under 16 weeks can never be guaranteed protection, and take special care to isolate youngsters and prevent exposure to infection.

home with no other animals trooping in and out. In the real world, if a pregnant animal must remain in a shelter for even a day or two, the potential benefits of vaccination must be weighed against its risks.

So just what are the risks of vaccination during pregnancy? We have very little data on this, as there is no compelling reason for vaccine manufacturers to spend the resources (and lose animal lives) to establish safety of a vaccine in a population in which it would rarely be used. However, it is thought that *in a mother who has never been vaccinated or exposed*, modified live parvo and panleukopenia vaccines may cause abortion or fetal damage, similar to the effects of an infection acquired through normal exposure. In mothers who have been previously immunized, on the other hand, there is likely no risk to the litter. In one study, abortions were no more common in queens vaccinated with a modified live

FVRCP vaccine during pregnancy, and their kittens were considerably *less* likely to suffer from upper respiratory infection than kittens born to queens not vaccinated during pregnancy. (We can chalk that benefit up to the increased maternal antibody received by the litter.)

The bottom line is this: There is likely some risk of causing fetal damage when we vaccinate pregnant animals who have never been vaccinated before. On the other hand, there is also some risk in *not* vaccinating: if the mother contracts a fatal illness, both she and at least some of her kittens will be lost; surviving kittens may be at higher risk of contracting a URI due to low maternal antibodies.

It all comes down to weighing the risk of exposure versus the risk to the litter. If you almost never see serious disease in your shelter or you can reliably prevent exposure, the risk of vaccinating pregnant animals may outweigh the benefit.

For example, the risk of contracting rabies in a shelter is very, very low, and it is rarely worth giving this vaccine during pregnancy provided exposure to wildlife can be prevented. If risk of exposure is reasonably high, on the other hand, then the benefit of vaccination likely outweighs the chance for complications. If URI is a frequent problem in foster litters, that provides further reason to vaccinate during pregnancy. Keep in mind the special considerations for animals involved in legal cases: there are many causes of abortion besides vaccination, but a vaccine may be blamed if given to an animal at the center of a contentious legal battle. In that situation, make every effort to find out the

cinics should be limited to those indicated by the immediate circumstances: that would usually include DHPP and kennel cough for dogs, FVRCP for cats. Administration of other vaccines, such as rabies, can wait until the litter is weaned.

After a dog has survived parvo, how long before s/he should be vaccinated or boosted? And do the same guidelines apply for the other common diseases of cats and dogs?

I will break this down into two categories: serious systemic disease such as parvo, distemper and panleukopenia, and not-so-serious disease such as kennel cough, URI, injuries, skin conditions, etc.

For less serious conditions: Vaccinate animals immediately on intake even if they are mildly to moderately ill or injured. *Do not wait until they have recovered from their infection.* This will not harm the animal, and may well provide protection against serious infection. I can't tell you how often I hear about outbreaks of fatal disease in animals being treated for another illness because they were not vaccinated. It happened to me in my first year as a shelter vet—my only outbreak of panleukopenia struck our feline URI ward. After all they had been through and all the care we had put into those cats, some died of a vaccine-preventable disease. This is heartbreaking and avoidable. (But let me tell you how I *really* feel ...)

Remember: the real disease is always stronger than the vaccine. If an animal is so immune-compromised that she is unable to respond to a vaccine or would even become ill from vaccination, exposure to the many infections lurking in a typical shelter will very likely have far worse effects. If you can't vaccinate, it's imperative to isolate these animals from the general population *and* from other sick animals who may be carrying more serious illness!

I was wondering about your opinion on intranasal vaccines and their efficacy. We are considering using both subcutaneous and intranasal vaccines upon impound for cats.

I like the way you think, especially that part about giving the vaccine upon impound. Every shelter cat (with the few exceptions described above) should receive a subcutaneous modified live panleukopenia vaccine immediately on intake for optimum protection against this deadly disease. This is usually given as part of a three-way vaccine (FVRCP) that also contains the two respiratory viruses, feline herpes and calicivirus. If you can afford two vaccines per cat, you might consider also giving an intranasal vaccine for the respiratory viruses (FVRC). There is no harm in vaccinating two ways for these same viruses at the same time, and there may be some benefit. In one small study, shelter cats

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animal's vaccine status from the owner, and gain consent from the owner for any necessary vaccinations. If the owner's approval cannot be documented in this situation, carefully protect the animal from exposure to illness rather than risking a vaccine without consent.

Finally, any time a spay-abortion is planned, immediate vaccination of the pregnant animal is indicated.

The situation with nursing moms is less troublesome. Although vaccination is generally avoided in low-risk situations so as not to disrupt mom or compromise lactation because of possible vaccine reactions, there is no risk of transmitting vaccine-induced disease to puppies or kittens. Puppies and kittens will not derive any immunity through milk after the first 24 hours of life, but simply protecting mom from infection goes a long way towards protecting the litter. However, vac-

For serious conditions: It is okay to vaccinate *as soon as the animal has completely recovered from clinical signs.* If the animal's immune system has managed to kick the disease, it is ready to respond to a vaccine. Once an animal has recovered from parvo, distemper or panleukopenia, it is likely protected against that particular infection for several years if not for life. The reason to vaccinate is to protect against the other infections contained in the vaccine. It will not harm animals to vaccinate against a disease they just got over. For animals with severe, immunosuppressive conditions from which they will not recover—and here I'm talking about cats clinically ill with feline leukemia or feline immunodeficiency virus, not the puppy with demodex—only killed vaccines should be used, and care should be taken to prevent infectious disease exposure.

showed a modest increase in protection from URI after being given both a subcutaneous vaccine and an intranasal vaccine upon intake. In practice, this strategy seems to draw mixed reviews. Some shelters report it makes all the difference, some say there is no change, and a few report an impression that sneezing actually increases with the intranasal vaccine. If you decide to try it, I would love to hear what you think!

If you choose to go this route, I would also like to provide a couple of caveats:

1. The intranasal modified live vaccines are more likely than others to cause mild, transient sneezing. There is no way to distinguish benign vaccine-induced sneezing from a mildly infected cat just by looking at it. The problem is, cats who are showing only mild signs may be carrying an infection that is serious for other cats—the infected cat might just have a particularly

good immune system. Therefore, all sneezy cats should be isolated as usual, whether that means in-cage isolation or transfer to a treatment area.

2. Although the three-way FVRCP intranasal vaccine containing panleukopenia as well as the respiratory viruses appears to offer fine protection for pet cats in private homes, this vaccine does not seem to work as well to protect shelter cats against panleukopenia. *Many of my colleagues share my impression that shelters using only the intranasal vaccine for panleukopenia experience more frequent and widespread panleukopenia outbreaks than shelters using the subcutaneous modified live vaccine.* Whether this is due to more rapid onset of protection (which has been demonstrated for the subcutaneous modified live vaccine but not for the intranasal one) or some other factor, we don't know. However, given the

severity of panleukopenia infection and the increasing frequency with which it is recognized in shelters, it seems like a good idea to make sure we are giving cats the best available protection based on our current understanding and experience. And that means we should be using subcutaneous modified live panleukopenia vaccination for most cats in most shelters.

Well, thanks for reading this far. I hope you've found this sufficiently epic, edifying, and enjoyable. For yet more information on vaccinations, be sure and check out the new canine and feline vaccine guidelines at the website of the UC Davis shelter medicine program, www.sheltermedicine.com. (The guidelines are under the "shelter health portal" in the "information sheets" section.) And if I've missed anything, be sure and let me know. I'm always looking for new questions so I can hunt down some new answers. 🌟

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