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Vaccination protocols:

The considerations for designing vaccination protocols in a shelter, foster home or rescue group are different from those for a privately owned pet. The likelihood of exposure to infectious disease is higher, and the consequences of an infection can be potentially severe for both the affected animal and the rest of the animals in the population. On the flip side: a well designed vaccine program can be a life saving tool to keep these animals healthy and be candidates for adoption programs.

Types of vaccines:

\Modified live vaccine (MLV):

Advantages:

- Provides **rapid onset of immunity**
- A **single dose** of MLV vaccine can offer protection in healthy animals
- Better ability to **overcome maternal antibody** interference in puppies and kittens
- Prevents shedding as well as disease from some agents (e.g. parvo)
- Produces local mucosal immunity when given by appropriate route

Disadvantages:

- Can produce mild signs of disease indistinguishable from natural infection
- Can cause shedding that may interfere with diagnostic tests
- Some MLV (feline panleukopenia, parvovirus) may damage fetuses and neonates
- Sensitive to incorrect storage or handling, may inactivate the vaccine
- May produce significant disease when given by the incorrect route

Killed Vaccine:

Advantages:

- No shedding of the vaccine virus
- No risk of disease, even in pregnant or very young animals
- Much more tolerant of variations in storage and handling.

The major disadvantage of killed vaccines is that it takes much longer for a killed vaccine to provide protection. The killed vaccine has to be boostered 2-3 weeks, even after giving the booster it takes 1-2 weeks until any significant protection is acquired. This means that naïve animals will not be protected for 3-5 weeks after their first vaccination! In a shelter the animal has almost certainly been exposed to disease long before the vaccine can provide protection

Recombinant vaccine:

Purified or recombinant products often require the same booster schedule and time to onset as a killed vaccine, they are also generally more costly than traditional MLV or killed vaccines. The recombinant vaccine for canine distemper has been shown to provide rapid protection similar to the MLV vaccines, and works well in young puppies as well.

What pathogens should we vaccinate against?

All shelters should use the core vaccines, these include vaccines against those agents which are very likely to be a threat and for which vaccines are at least somewhat protective. Limiting vaccines to core components reduces cost and incidence of adverse reactions.

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Core Vaccines for dogs in shelters

- Distemper (CDV)
- Adenovirus-2 (CAV-2/hepatitis)
- Parvovirus (CPV)
- Parainfluenza (CPiV)
- *Bordetella bronchiseptica*

The first 4 are usually grouped into one vaccination (DA2PP or DHPP) that can be administered by a single injection given under the dog's skin (subcutaneously/ SQ).

Bordetella bronchiseptica vaccines are available with or without canine parainfluenza and canine adenovirus-2, as in intranasal or SQ vaccine. We recommend using the intranasal vaccine as it has been demonstrated to result in rapid onset of local and systemic protection. Another benefit is that this vaccine can be used in puppies as young as 2-3 weeks of age.

Quasi-core vaccine:

- ***Rabies***: the best time to vaccinate dogs and cats against rabies is regularly discussed within the shelter community. Some shelters vaccinate at the time of adoption or instruct the adopter's to get the animal vaccinated by their veterinarian, others vaccinate earlier in the animal's shelter stay. The chosen protocol for rabies should be based on local legal requirements, shelter philosophy and resources.

Vaccines not generally recommended:

- Canine coronavirus.
- Giardia
- Lyme

Core Vaccines for cats in shelters

- Feline herpesvirus-1 (feline viral rhinotracheitis/FHV-1)
- Feline calicivirus (FCV)
- Feline panleukopenia (FPV)

These are usually grouped into one vaccination (FVRCP).

Cat vaccines occasionally recommended:

These vaccines are generally only recommended for shelters in which an infection has been confirmed by laboratory diagnostics:

- ***Chlamydophila felis* (*C. psittici***.
- ***Bordetella bronchiseptica***

Vaccines not generally recommended:

- Feline coronavirus ("FIP vaccine")
- FeLV
- FIV
- Giardia

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Who to vaccinate:

To keep it simple: all animals over 4 weeks of age regardless of health status should be vaccinated upon shelter entry provided they can be safely handled.
Some special considerations:

- **Animals with medical conditions:**

In private practice veterinarians will generally shy away from vaccinating injured animals and those with medical conditions, in a shelter however even these animals should be vaccinated. Although they may not mount an optimal immune response, the risk of exposure to the full strength natural infection is too great in most shelters to risk delaying the vaccination. In these animals the vaccine can be repeated after recovery (no less than two weeks later.) There is nothing more frustrating than treating an animal for an injury only to have it succumb to infectious disease.
Some vaccines can produce significant disease in ***severely*** immunosuppressed animals. This does not include "everyday" immunosuppression associated with stress, poor nutrition, or surgery . Genetic immune deficiency, chemotherapy, or parvo infection are more significant risk factors
Animals with severe immunosuppression (such as cats symptomatic for FIV or animals being treated with some chemotherapeutics) should be carefully isolated and given killed or recombinant vaccines if available. Remember, if an animal is too immune-suppressed to be safely vaccinated, it is unlikely to survive exposure to all the many pathogens present in a typical shelter environment.

- **Neonatal animals:**

MLV vaccines against parvo and panleukopenia should not be given to puppies or kittens less than 4 weeks of age. Intranasal vaccines for upper respiratory infection may be used in puppies and kittens as young as 2-4 weeks old.

- **Pregnant animals:**

Unfortunately we have very little data when it comes to vaccinating pregnant animal. It is thought that *in a mother who has never been vaccinated or exposed,* MLV parvo and panleukopenia vaccines may cause abortion or fetal damage. In animals which have been vaccinated or infected at some point; there is likely no risk to the litter. One study found that abortions were no more common in queens vaccinated with an MLV FVRCP vaccine during pregnancy than in invaccinated queens, *and* their kittens were considerably *less* likely to suffer from URI than kittens born to queens not vaccinated during pregnancy. The bottom line is, there may be some risk of causing fetal damage when we vaccinate pregnant animals who have never been vaccinated before, but there is definite risk in *not* vaccinating: if the mother contracts a fatal illness, both mother and litter will be lost.

When to vaccinate:

In almost all cases animals should be vaccinated immediately upon intake to the shelter, if not sooner. A delay of even a half a day or two will interfere with the vaccine's ability to provide protection (in some cases, the chance of the vaccine preventing disease may be 90% or better if given the day before exposure, but will drop to less than 1% if given the day after exposure).
Unfortunately some shelter still end up euthanizing a majority of their population and for these shelters vaccinating all animals upon intake may be impractical. In these instances resources may be better spent on improving adoption opportunities. Good adoption candidates should still be identified and

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vaccinated upon intake and kept segregated from the unvaccinated population. This will facilitate work with rescue groups as well as improving the animal's chance of surviving its shelter stay.

- **Adult animals:**

In healthy animals over 4 months of age, booster vaccines per se are not required when MLV vaccines are used. Animals in shelters may not always be able to mount an optimal immune reaction initial vaccine, especially if they were mildly ill at the time of initial vaccination. In these cases a second vaccine after recovery may be helpful (at least two weeks later), or a recommendation could be made to adopters to discuss revaccination along with additional other indicated preventive health measures with their new veterinarian.

- **Puppies, kittens and MDA:**

Maternally derived antibodies (MDA) are passed from the mother to nursing puppies and kittens in the first 24-72 hours after birth. The level of protection the MDA can provide depends on both the mother and the neonate; low levels of antibody may exist if the mother was neither immunized nor naturally exposed, or if the puppies or kittens did not nurse well due to illness, stress or separation from mom. MDA are a mixed blessing in the shelter environment. They provide much needed protection in the first few weeks, but can also prevent effective vaccination for up to 16 weeks. At 4-6 weeks of age the MDA levels start to decrease, and are usually gone by the age of 16 weeks. Since the time period and rate over which the level of maternal antibodies wanes differs, we do not know exactly when the levels will be low enough to no longer protect the animals from infection and to allow an effective vaccination. Complicating the picture even further is what we call the "window of susceptibility": this is the period when the antibody level is no longer sufficient to protect from natural infection, but still high enough to interfere with the vaccination. The time at which this window occurs depends on the disease agent and the amount of antibodies initially present, and for most diseases occurs somewhere between 6-16 weeks old. In order to minimize the window of susceptibility and ensure that infections are prevented in as many puppies and kittens as possible, we recommend vaccinating shelter puppies and kittens every 2-3 weeks until 16 weeks of age. Vaccination less than 2 weeks apart runs the risk of interference by the immune response to the previous vaccine and should be avoided.

Vaccine reactions

Vaccines can have a range of adverse effects, including:

1. Local inflammation, swelling or hair loss (most common)
2. Mild symptoms such as sneezing or lethargy.
3. Systemic reactions (including anaphylactic shock)

Severe vaccine reactions are very uncommon, and the benefits of vaccinating shelter animals greatly outweigh the risks. Reported reactions in one study were estimated at 0.004%. All adverse vaccine reactions, including mild reactions, should be documented on the animal's permanent record so that adopters can be made aware of this history.

Anaphylactic shock requires immediate recognition and treatment, clear written directions should be posted regarding recognition and treatment of anaphylactic shock , and a crash kit for treatment of anaphylactic shock should be available at all times.

Adverse effects of vaccines given by the incorrect route

Some modified live vaccines can produce significant disease when given by the wrong route.

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- **Bordetella bronchiseptica vaccine**

Intranasal *Bordetella* vaccine inadvertently given subcutaneously can cause a local inflammatory reaction, abscessation and in rare cases severe complications including liver failure and death.

- **Feline respiratory virus vaccines (FVRC)**

When a MLV vaccine produced for SQ injection is accidentally given by the oronasal route, severe upper respiratory infection can develop. This is most likely due to the calicivirus component, and most commonly occurs when vaccine is spilled on the cats fur.

References:

UC Davis Koret Shelter Medicine program: **www.sheltermedicine.com**
Vaccination information sheet: **http://sheltermedicine.com/portal/is_vaccination.shtml#top3**
The 2006 American Association of Feline Practitioners Feline Vaccine Advisory Panel Report:
www.aafponline.org/resources/guidelines/2006_Vaccination_Guidelines_JAVMA_%20PDF_Plus.pdf
The 2006 AAHA Canine Vaccine Guidelines:
http://www.aahanet.org/PublicDocuments/VaccineGuidelines06Revised.pdf