

Canine Vaccination Protocols

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HEALTH ISSUES

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The rapid proliferation of companion animal vaccines, advances in diagnostic and vaccine technology, and concerns over vaccine safety are clearly among the most important issues practicing veterinarians face as we enter the 21st Century. While many would argue that these are already issues, the future promises to be especially challenging as the vaccines we currently use and the protocols we recommend undergo unprecedented review.

The following presentation describes changes in canine vaccination guidelines that are the result of changes in the availability and type of vaccines on the market today. For example, the last 10 years alone has seen a rapid proliferation of companion animal vaccines introduced throughout the world. In North America today, there are approximately 25 types of canine vaccine veterinarians must select from. In order to provide the most rational and effective vaccines for the individual patient, revised recommendations for canine vaccination must be anticipated. The material presented in this article serves as a guide for clinicians willing to consider proposed canine vaccination recommendations as they apply to individual patients.

Why change? Is it really necessary to revise vaccination recommendations for dogs? Many would challenge that it is not. After all, vaccination practice over the last 20 years has, in fact, worked well...canine distemper, canine parvovirus, and canine rabies are virtually non-existent among vaccinated dogs. Yet, despite the obvious successes attributable to companion animal vaccination, veterinarians must be willing to at least review, if not revise, vaccination practice stan-

dards as new vaccines are introduced and new vaccine technologies are developed. The objective, quite simply, is to administer the most appropriate vaccine(s) at the most appropriate stage of life and to do so with the best product(s) available. What should not occur is complacency with respect to selection and administration of vaccine.

The demand among veterinarians that vaccines be safe, simple to administer, and timesaving has led to the long-term and widespread use of polyvalent vaccines. Twenty-five years ago, the most commonly used vaccines contained 3 viral antigens (distemper-hepatitis-leptospirosis). Today, vaccines containing 7 or more antigens per dose are routinely administered to dogs. Furthermore, polyvalent vaccines are routinely administered annually with seemingly little regard for the actual risk of infection. This is a disturbing trend. Annual administration of polyvalent vaccine implies that each vaccine antigen, whether of bacterial or viral origin, in each polyvalent product induces the same degree of immunity for the same duration in every patient. Immunologically, this makes no sense whatsoever. Depending on the vaccine antigen, dogs are expected to derive protection that persists for as little as a few months to as long as 7 or more years. Convenience, rather than science, appears to be the driving force behind conventional recommendations listed on vaccine "labels" (product inserts). Depending on the country in which the vaccine is sold, manufacturers may not be required to determine a minimum duration of immunity.

The standard recommendation published on virtually all vaccine labels is

that vaccines be administered annually to adult dogs. The veterinary profession for many years has embraced this recommendation. Interestingly, however, for the majority of vaccines administered to dogs today, there are no scientific studies at all establishing a 12-month duration of immunity (DOI). Vaccine efficacy studies for most vaccines in use today challenged vaccinates just 3 to 4 weeks following the last inoculation. The paradigm that adult dogs and cats require annual boosters for all the commonly administered vaccines is being challenged. We simply cannot continue to arbitrarily administer vaccines without regard for the number and type of vaccine antigens in the product and without realistic consideration of the risk of infection facing the individual animal.

Canine Distemper Virus. Modified live virus (MLV) vaccines have been most effective in protecting dogs against canine distemper. Inactivated whole viral vaccines are not effective. Vaccination in puppies is usually continued until 16 weeks of age. Dogs older than 12 weeks of age at the time they are presented for initial vaccination should receive at least 2 canine distemper virus (CDV) 2 to 3 weeks apart. The duration of immunity, determined by challenge, to attenuated (modified-live) canine distemper virus is 7 years for vaccines using the Rockborn strain of CDV while that for vaccines using the Onderstepoort strain is 5 years.

The latest information on canine distemper relates to the Recombinant Canine Distemper Vaccine (Merial, Ltd.). This product has been shown to prevent infection as well as the conventional modified-live virus (MLV) vaccines...but, the recombinant

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vaccine will immunize puppies in the presence of maternal antibody... something the MLV vaccine can not do.

Infectious Canine Hepatitis.

Vaccination for canine adenovirus infection, the cause of infectious canine hepatitis (ICH), is usually done in combination with that for distemper and other diseases, beginning at 6 to 8 weeks of age.† Attenuated (MLV) adenovirus-2 vaccines are generally used in the United States because of their ability to produce a superior immune response but inactivated products are marketed in many countries.† The half-life of maternal antibody to ICH is similar to that for canine distemper virus: approximately 8.5 days. By the time a puppy reaches 14 to 16 weeks of age, maternal antibody is not usually detectable. Vaccination, therefore is typically combined with canine-distemper virus. The initial vaccines can be administered at 6 to 8 weeks of age and every 3 to 4 weeks until reaching 16 weeks of age. Although booster inoculation is recommended annually in adults, challenge studies have demonstrated the duration of immunity is at least 7 years when attenuated canine adenovirus-2 is used as the vaccine antigen.

Canine Infectious Tracheobronchitis.

Infectious tracheobronchitis, or kennel cough, is a complex clinical infection caused by a number of respiratory pathogens that can infect dogs alone or in combination. Causative viruses include distemper (CDV), adenovirus (CAV-2), parainfluenza virus (CPIV), herpesvirus (CHV), and reoviruses. *Bordetella bronchiseptica* is a recognized bacterial pathogen. The performance of parenterally administered ITB vaccines is quite different from that of intranasally (topically) administered vaccine. Parenterally administered vaccine for ITB provides duration of immunity of up to 7 months or longer depending on the antigen. It is not known whether parenteral administration of ITB antigens culminates in the development of an effective local (upper

respiratory tract) immune response. Maternal antibody will, however, interfere with parenterally administered vaccine. On the other hand, vaccine labeled for intranasal (topical) administration can be administered as early as 3 weeks of age (depending on the product), appears to induce a local immune response that is not interfered with by maternal antibody, and has a relatively rapid onset (3 to 5 days).

Canine Parvovirus. Canine parvovirus-2 (CPV-2) vaccines are available as inactivated or MLV products. MLV products offer better protection against shedding of virulent virus following challenge than inactivated vaccines.† For this reason, older dogs that will be housed with younger susceptible animals should be vaccinated with MLV vaccines.† In case of an outbreak, MLV vaccines should always be used. MLV CPV-2 products are consistently shed in the feces of vaccinated dogs and will infect contact animals and may cause weak positive reactions on fecal parvovirus ELISA tests. Duration of immunity of MLV CPV-2 vaccines is at least 7 years based on challenge studies; over-vaccination with this product occurs regularly. The duration of immunity subsequent to administration of inactivated (killed) CPV products has been shown to protect puppies from challenge for at least 16 months post-vaccination.

Canine Coronavirus. Most vaccines licensed for canine coronavirus are inactivated canine coronaviral or feline coronaviral strains. One attenuated (MLV) canine coronaviral product is available in some countries. In the absence of reliable commercial or in-hospital diagnostic assays for canine coronavirus, the prevalence of clinical disease associated with CCV infection in dogs is unknown but is considered to be extremely low, even in high density shelter environments. CCV vaccine is considered to be among the least important vaccines given to dogs today and has been identified by several authors as a vaccine that, quite

simply, is not needed. A minimum duration of immunity has not been established for CCV vaccines; during challenge studies, control dogs do not become ill.

Leptospirosis. Inactivated Leptospiral vaccines against 4 serovars inactivated serovars (*L. canicola*, *L. ictero-haemorrhagiae*, *L. grippityphosa*, and *L. pomona*) are available for dogs. However, the absence of global and regional incidence data for canine leptospirosis greatly complicates the decision regarding whether or not vaccination is necessary and which vaccines should be used.

Lyme borreliosis. Commercial inactivated (killed) whole cell bacterins and one recombinant subunit outer surface protein A (OspA) exist in the United States. In Europe, the vaccines are whole cell bacterin. Vaccines have been shown by challenge studies conducted by the manufacturer of the recombinant OspA vaccine to provide a duration of immunity for up to 1 year. Immunization should be given early in life to high risk dogs living in endemic regions.

Giardiasis An inactivated adjuvanted vaccine is available for vaccination of puppies and kittens. The first dose can be given as early as 8 weeks of age. Routine annual revaccination is not indicated with this product except in the unusual situation where recurrent exposure and infection are documented and can not be controlled using conventional hygienic methods. This vaccine does not prevent infection, but has been shown to diminish fecal shedding of the infectious cysts for up to one year.



Additional Reading:
Ford RB (guest editor):
The Veterinary Clinics
of North America:

Small Animal Practice.
Vaccines and Vaccination.
WB Saunders,
Philadelphia. May 2001..