

Canine Vaccination Decision Making

By Jeff Bowra DVM

Immune System Basics

In order to understand how vaccinations work it is important to have a basic understanding of the immune system. It is made up of 2 major components, the **Cell Mediated and Humoral** immune systems.

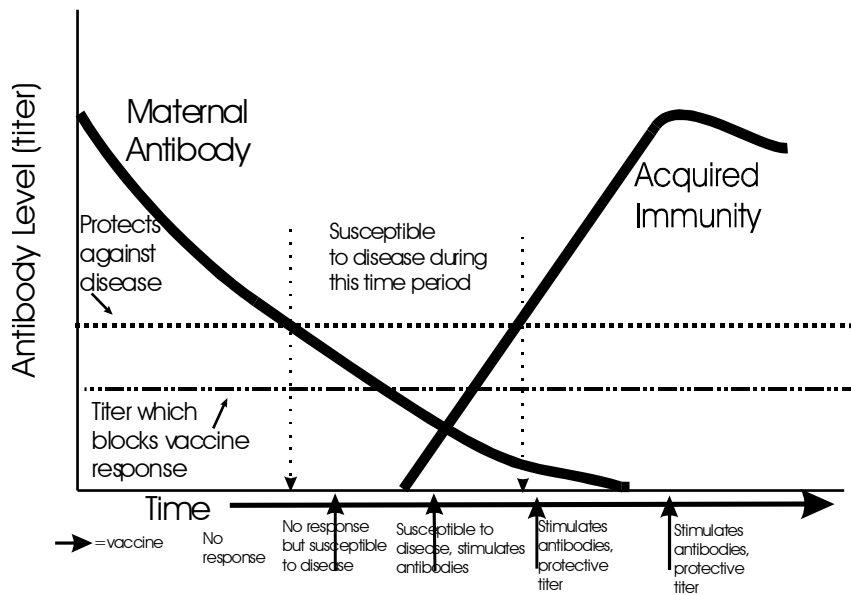
Cell Mediated immune system is made up of special white blood cells called **T lymphocytes**, which destroy viruses, bacteria and other foreign particles.

Humoral immune system is made up of **B-lymphocytes** that produce special proteins called antibodies or immunoglobulins. Antibodies are made by the special cells when stimulated by infection of disease or else vaccination with a modified live or killed virus vaccine. The antibodies produced are specific to the virus or bacteria (antigen) that stimulated their production. Antibodies work by attaching to their specific antigen and then attracting special cells to destroy the disease particle. Antibodies are short lived, lasting only hours to days. B memory lymphocytes can live for several years retaining the ability to produce specific antibodies.

Vaccination Principles

When puppies are born they receive antibodies from their mother through the colostrum for the first 24-48 hours. This is assuming that the mother has been vaccinated in the past. Unvaccinated bitches do not provide immunity for their pups. Antibodies from the mother last for varying amounts of time depending on the disease. Parvovirus antibodies may last up to 16-20 weeks. The presence of maternal antibodies may prevent the puppy from mounting its own immune response upon early vaccinations. This is why we vaccinate puppies multiple times. We do not know how long maternal antibodies last in individual pups.

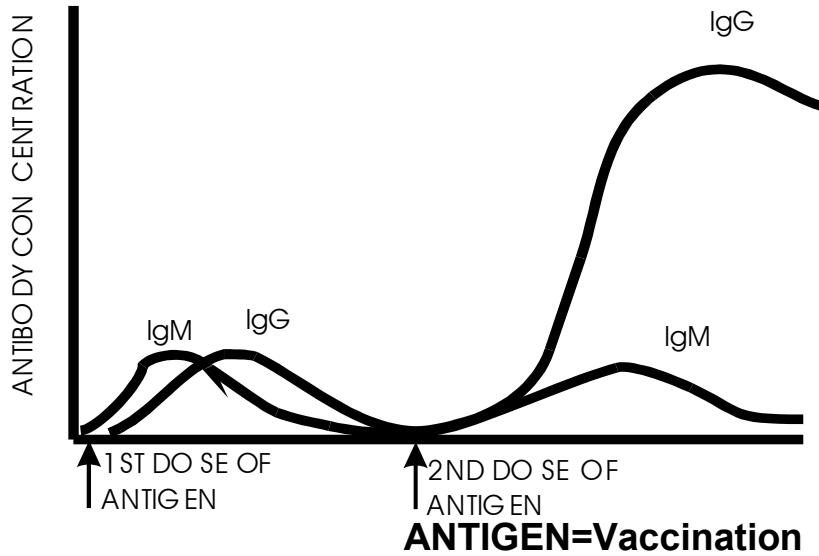
Vaccine response vs. maternal antibody



The most important antibody is called IgG, which is responsible for long-term immunity. Every animal responds differently to vaccination. There are some pups that may be protected after 1 vaccination. Most are protected after 2 vaccinations, but due to maternal antibodies 3 sets of vaccinations are usually given to puppies.

The purpose of vaccination is to produce and expand the population of T and B-lymphocytes sensitive to specific diseases. Vaccination introduces disease particles either in an inactivated (killed) or modified live form that stimulates production of specific antibodies towards this disease. The memory of specific antibody producing cells lasts for differing amounts of time but repeated vaccination increases the level of circulating antibodies

ANTIBODY RESPONSE TO ANTIGENIC STIMULATION



Modified live vaccines, like the name suggests, are actual viruses that have been changed from the disease causing form. They elicit a strong immune response but the concern is present (although very unlikely) that the virus could change to the dangerous form.

There are new types of vaccines on the market that remove the infectious part of the virus and insert it in to another non-dangerous virus, which is then placed in the vaccine.

Killed vaccines are inactivated but require the addition of another chemical called an adjuvant to stimulate immune response. They have to be given more often and adjuvants are more often implicated in allergic reactions. There are many other pros and cons to the use of modified live and killed vaccines.

Vaccination Controversies

There are many questions being raised with respect to traditional vaccination policies. Due to the increased incidence of immune mediated diseases, allergies and even cancer, annual re-vaccination is being questioned. Another area of controversy is what vaccines should be given. Traditionally the sentiment that more is better was often used. This is not true. When considering vaccination options one must look at age and environment. A dog that does not leave its backyard has a different vaccination requirement from a dog that travels to dog shows in different parts of the continent. From immunologists to alternative medicine practitioners many different opinions have emerged. There is very little argument that puppies should have a series of vaccinations when they are young. These should be boosted at least 1-2 times annually then the alternatives can be considered. Due to the lack of information on duration of immunity, antibody titers should be performed annually on diseases of concern, (Canine parvovirus and distemper) if you do not want to vaccinate annually. Most animals are still receiving the traditional frequency of vaccinations and do not have any problems. As far as the content of vaccines, I believe that there are certain vaccines that dogs should and should not receive, no matter how often they are given.

NOSODES are the homeopathic equivalent to vaccinations. There is no evidence that they are effective at preventing disease in an exposed animal. They may lessen the severity of the disease, but responsible alternative practitioners do not recommend nosodes as a complete substitute for vaccination.

Diseases of Concern

Canine Distemper: This viral disease is rarely seen because most dogs are vaccinated. Outbreaks of distemper do occur periodically in places like the SPCA. The virus is shed primarily in nasal secretions and is picked up through the nose. Animals suffer fever, vomiting, diarrhea, and coughing. Many will develop convulsions and go on to die. The virus has an affinity for the cells that produce enamel on the teeth. It is very common to see an older dog that has pits in its enamel--a reflection of damage to the enamel during the growth phase of the teeth. If a dog survives distemper, brain problems can be seen later (encephalitis). Dogs suffer convulsions and nervous problems, hence the name.

Parainfluenza: This virus is part of the "kennel cough complex". Dogs pick up this disease in the pound, grooming parlors, and in other areas where dogs congregate, such as the park.

Infected animals have runny eyes and noses and dry coughs. The disease is tracheobronchitis, usually mild but long lasting. Treatment is simple, antibiotics to prevent secondary bacterial infections and sometimes cough medicine.

Adenovirus type 2: This vaccine actually protects against 2 diseases. One is the respiratory disease caused by adenovirus type 2, which causes irritation in the larynx (cough) and sometimes pneumonia. It is normally a mild disease. The second disease is hepatitis, a liver disorder that usually results in death. The liver infection is caused by adenovirus type 1. The adenovirus type 2 vaccine cross-protects against both diseases. Adenovirus hepatitis is exceedingly rare in vaccinated populations.

Parvovirus: This is a severe disease that causes vomiting, diarrhea, and loss of blood. Most die without treatment and although treatment is often successful it is expensive. Treatment consists of intravenous fluids and antibiotics. Some dogs lose so much blood that transfusions are necessary. The virus is shed in the feces and picked up when other dogs sniff the area or munch on contaminated grass. The virus is very hardy and can live in the soil for a year or more.

Kennel Cough: This vaccine protects against the bacterium *Bordetella bronchiseptica*. *Bordetella* is transmitted from dog to dog through respiratory secretions and causes a long-term cough. Treatment includes antibiotics and sometimes cough medicine. Like the human flu vaccine, this vaccine may not completely protect against all strains of *Bordetella*. It is possible to see mild disease even in vaccinated dogs.

Rabies: This is a deadly disease for cats, dogs, people, and most warm-blooded animals. The virus, which affects the nervous system, is carried in saliva. Thus, it is transmitted by a bite. In our area, bats are the primary carrier animals. They migrate through BC between May and October and about 10% of them carry the rabies virus. How do animals contact these rabid bats? Most people will tell you that they have never seen bats. Bats that are sick however will do strange things. They often go inside houses or apartments. They may even go down chimneys. Cats are at the greatest risk for contact because they like to play with bats and can be bitten.

Vaccination Protocol

Core Vaccines

Distemper (D)

Parvovirus (Pv)

Adenovirus (A2)

Parainfluenza (P) Unfortunately this is found in both the combination injection and with the bordetella intranasal drops so it often given more than necessary.

Rabies (R)

These are all given by injection usually in combination. The most common combinations that we use are (D, Pv) and (D, Pv, A, P)

Optional Vaccines

Bordetella/Parainfluenza Intranasal drops (B)

What are high-risk situations for kennel cough? SPCA, dog shows, puppy/obedience classes, kennels, groomers, parks with other dogs, and veterinary hospitals. Dogs in ongoing high-risk situations should be vaccinated every 6 months.

I recommend bordetella vaccine for all puppies because I recommend puppy classes for all puppies.

Unnecessary Vaccines

Lyme Disease: although Lyme disease has been seen in BC it is rare (1 in every 50 ticks) and since ticks carry it, prevention of ticks can prevent this disease. Travel to heavily affected areas is the only reason I might consider it. But again tick control is a better option.

Corona virus: It causes mild gastrointestinal signs and is self-limiting, so not recommended.

Leptospirosis: A rare disease with many different strains, that is not protective against each other. It is probably most often linked with vaccine reaction.

Giardia: Although this is a common disease that can be transmitted to humans, it is easily treated. It is contracted from stagnant water and causes mild diarrhea. It is a very new vaccine and I do not recommend it.

Puppies

8 weeks	D Pv (Combo)
10-12 weeks	B can be given at 12 week with combo but best spaced.
11-12 weeks	D Pv A2 P (Combo)
15-16 weeks	D Pv A2 P (Combo)
18-20 weeks	R can be given at 16 week with combo but best spaced.
1 year later	D Pv A2 P R can be given with combo but best spaced by several weeks B only given if at high risk. (See above)

Dogs first vaccinated at older than 4 months

D Pv A P should be given and boosted once 3-4 weeks later and then annually for 1-2 years
Rabies given once then boosted 1 year later then every 3 years.

Adults

Annually?	D Pv A P B only in animals at high risk
Every 3 Years	R
Titers?	

ANNUAL PHYSICAL EXAMINATIONS

Reduced vaccination frequency does not replace the need for regular physical examinations. Early detection and treatment of disease goes along with prevention of disease. Just like people, dogs should have an annual check up. Upon reaching 8 years of age they should be examined at least every 6 months. At 7-8 they are considered seniors and more prone to many diseases and problems.