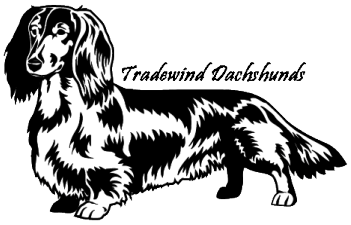

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Vaccines and how they work

For modified live vaccines like distemper and parvovirus we inject a few attenuated (weakened) viruses into the patient. These viruses are taken up by the host DNA where they replicate. For every virus injected we get thousands. They are then presented to the immune system. This programs plasma cells to produce antibodies. It also programs memory cells which persist for the life of the patient.

These memory cells, B &T lymphocytes, can at a moment's notice, respond with sufficient antibodies to prevent infection, even in the absence of an antibody titer. Cell mediated immunity is also stimulated, which can attack and destroy any cells which become infected, before the virus can replicate.

If the patient had antibodies from the mother's colostrum or from a previous vaccination, antibodies from colostrum or from the first vaccine would prevent the viruses in the new vaccine from replicating. Cell mediated immunity would also prevent replication. The immune system would not be stimulated.

Since antibody titers have been shown to last for 7 to 15 years and memory cells persist for life there is no benefit from repeat administration of MLV vaccines like distemper and parvovirus. Maternal antibodies or antibodies from a previous vaccination can block a rabies vaccine from having any effect in the same way.

Because modified live vaccines replicate within the host's cells they stimulate good cell mediated immunity. For a killed vaccine to stimulate cell mediated immunity (depending on the antigen), an adjuvant must be added to make the virus in the vaccine a sustained release type product. Adjuvant also stimulates the immune system by increasing inflammation at the site of the vaccine.

The average person may believe that this is why we give a series of vaccines initially, to boost the immunity. This is not what happens at all. Remember we just said that antibodies from the first

vaccine will block any subsequent vaccines form having an effect. There is no such thing as a booster for a modified live vaccine.

Different puppies may receive more antibodies depending on the mother's antibody levels and depending on how much they nurse. These maternal antibodies block a vaccine from having any effect. They antibody levels will decline at different rates in different puppies. They will decline to a low enough level that the vaccine virus can replicate and stimulate the immune system beginning at 6 weeks in some puppies and sometimes last as late as 16 weeks in other puppies.
We give a series of vaccines every three to four weeks so we can break through the maternal antibodies at the earliest possible time. It is not important how many vaccines the patients get. What is important is how old they are when they get the last vaccine. The older they are, the better an immunity they can get due to the lack of maternal antibodies interfering with the vaccine, and also due to age related immunity.

At 6 weeks of age only 37% of puppies and kittens will have low enough maternal antibody levels that the vaccine can work.
At 8-9 weeks 79% of puppies will have low enough maternal antibody levels that the vaccine can work.
At 12 weeks 95% will have low enough maternal antibody levels that the vaccine can work.
This study was done on Rottweiler's which seem to be harder to seroconvert.
This study does not take into effect cell mediated immunity

106 dogs, divided into three groups, and vaccinated one, two or three years previously were re-vaccinated. The antibody titer only rose slightly in one dog. This proves that antibodies from a previous vaccine will block any subsequent vaccine from having an effect. The virus in the vaccine must replicate to stimulate an immune response. Antibodies from a previous vaccine block this replication. This is what Dr Schultz meant when he said "the client is paying for something with no effect." Annual administration of rabies, distemper and parvovirus vaccine does not elevate antibody titers or expand the number of memory cells. The immunity of the patient is not enhanced.

Those puppies that were successfully immunized at 6 weeks of age will not get any stimulation out of this next vaccine because the antibodies they developed from the first vaccine will block the next vaccine from having any effect. We give another round of vaccines because we do not know which puppies were protected and it is cheaper to re-vaccinate than to test their titers. The vaccine at 12 weeks will protect some new puppies that were not previously protected, but those that were already protected will not be stimulated further because the antibodies from the previous vaccine will block any subsequent vaccine. This is the reason we give a series of vaccines. The immune system does not mature completely until 6 months of age. Any vaccine given after 6 months of age will provide a better immunity. That is why we give another vaccine at

one year later. The one year interval was a completely arbitrary number chosen simply because that was a convenient time for the owner to return.

From Dr Ian Tizard, author of the text book on immunology used by most Veterinary Schools.
An important thing to note for dog breeders, vaccinating the bitch before breeding in a previously immunized dog does not increase antibody levels in the colostrum.