

## VACCINATION STUDIES

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*[Every effort has been made to ensure accuracy of information. However, this is not a substitute for prompt veterinary care. Any similarity to other publications is unintentional. Published online at Sealyhealthguard.org, 12/7/10]*

There are three vaccination studies underway which could help us decide what is best for our dogs. The first two are sponsored by the Canine Health Foundation and are being conducted at Auburn University by Associate Professor Saralyn Smith-Carr.

The purpose of the first study is to determine the minimal number of doses necessary to immunize puppies and maintain protection in adulthood. The vaccine studied here is the combination protecting against distemper, hepatitis and parvo. Blood for assay of antibody levels will be collected from 180 healthy dogs (61 puppies, 12 weeks old or less and 120 adult dogs.) Antibody levels (or 'titer') will be measured in puppies prior to the first vaccination and two weeks following a second vaccination. Puppies with antibody levels sufficient to protect them against these viruses will require no additional vaccines in the initial series. All dogs will be tested annually for three consecutive years. Additional vaccines will be administered as necessary to sustain immunity. Immunity levels will be measured by a standard assay and the data will be statistically analyzed. Antibody values that are essential for protection against these viruses have been reported. That information will be used to determine the criterion for acceptable antibody levels.

The second study will determine the minimal doses of vaccine necessary to immunize and maintain acceptable antibody titer levels during adulthood in puppies exposed to different environmental conditions. There will be 90 healthy puppies 12 weeks old or less. One group will be 30 client-owned dogs that are presented for routine immunization to Auburn University's veterinary teaching hospital; the second 30 puppies will be healthy adoptable puppies from Lee County Humane Shelter, the last 30 puppies will be from the Canine Detection and Research Center in Anniston, AL who are fostered in private homes. Blood samples for antibody titer assay will be collected from each puppy and tested using a standard virus neutralization assay. Antibody titers of 1:40 or greater against distemper, hepatitis and parvo are accepted as indicators of immunity. The difference in titer levels between the groups will be statistically compared.

Another study recently completed by George Moore, DVM, PhD, at Purdue University used the electronic database of a large general veterinary practice to estimate the incidence rate and potential risk factors for vaccine-associated adverse events (or VAAE) occurring within three days of vaccination in dogs. Dr. Moore says: "Essentially, as we improve the quality of our vaccines, we also improve the number of vaccines."

There are many more animal vaccines and accompanying implications now than there were 20 or 30 years ago. When vaccines are successful in decreasing infections, then it is time to decrease VAAE. As the number of adverse events rises, people stop vaccinating, the disease recurs and people increase vaccination again to control the disease. For example, a recent outbreak of canine distemper in Chicago occurred because people had stopped vaccinating their dogs against the disease.

## SAFETY TRIALS MAY NOT BE EFFECTIVE

There are safety trials required for licensing of all animal vaccines, but it only involves giving two doses of a vaccine to 500 to 1500 animals, with a follow-up in less than 30 days. Not looking at repeat vaccinations, having only one follow-up and having that follow-up within a relatively short time limits the ability of these vaccine trials to recognize adverse events..

With human vaccines, by law, doctors must report adverse events to the FDA or CDC. That kind of reporting is not required for animal vaccines. The USDA gets about 500 to 600 reports on V AAE a year, mostly on dogs and cats, although more livestock than small animals are vaccinated.

Veterinarians are more likely to report V AAE to the vaccine manufacturers than to regulators. Government surveillance on animal vaccines is more passive than active.

## LONGER-TERM STUDIES NEEDED

VAAE studies must follow a large population over a long period. Dr. Moore and his research team looked at the vaccination records of dog patients at Banfield, The Pet Hospital, from January 1, 2002 to December 31, 2003. They considered the breed, age, sex and neuter status. Vaccines administered included bordetella, borrelia, coronavirus, giardia, rabies, parvovirus, and a multivalent distemper-adenovirus-parainfluenza-parvovirus-leptospirosis. All vaccines were from one manufacturer.

## RESULTS

The team searched the animals' records for ailments occurring up to three days post-vaccination and checked records for the nature of the reaction. This two-year study, examining 3.5 million doses of vaccine and 1.2 million dogs, found 4,678 adverse events. In 65 percent of those, the veterinarians called the adverse event a "vaccine reaction" and in 32 percent an "allergic reaction".

The most common reactions involved swelling around the face or eyes, wheals (small bumps), general itching or vomiting. The incidence of allergic reaction was greater in smaller dogs and higher in one-year-old dogs than in dogs two to nine months old, and greatest in two-year-old dogs. Neutered dogs had higher rates of adverse events than intact dogs. Of the 42 breeds included in the study, Dachshund, Pug, Boston Terrier, Miniature Pinscher and Chihuahua showed the highest rate of adverse effects. [The study summary does not address rates of other reactions, such as immune-mediated hemolytic anemia.]

Rates increased by almost 25 percent for each additional vaccine given on the same occasion, with a greater increase in small dogs. Three dogs died in the study; all received four or more vaccines on one occasion. Many dogs that had vaccine reactions did not have a reaction the next time they were vaccinated.

## LEPTO

Dr. Moore is also currently involved in a study on leptospirosis. It appears to be established in the wildlife population and now is seen in dogs who never leave their yards. As cities spread into formerly wild areas, dogs get the disease from wild animal contamination. Although the vaccine has side effects, the hazards of the disease – 15

percent to 20 percent mortality rate from acute renal failure - outweigh the dangers of the side effects. The lepto vaccine appears to offer long-term protection. Even with undetectable titers, immunity appears to continue. We will have to stay tuned for the formal results of this study. As we obtain more information from this research, we can make more informed decisions about subsequent vaccination of our dogs.

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