



Vaccine Allergic Reactions in Dogs and Cats

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With vaccination commonly recommended annually, most pet owners are accustomed to taking their pets to the vet for "yearly shots." It seems such a commonplace part of routine pet care that many people do not think about what is actually occurring within their pet's body. In fact, immunization represents stimulation of the immune system, an inherently inflammatory process.

What is Considered Normal?

After vaccination, it is usual for pets to return home and re-engage in normal activity; however, since vaccination is inflammatory by nature, sometimes there are symptoms for a couple of days:

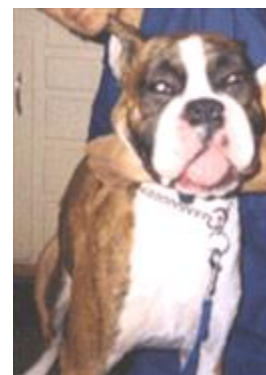
- Pain at the vaccine site
- Mild Fever
- Lethargy
- Reluctance to play or exercise
- Reduced appetite
- Sneezing after a nasal vaccine

These symptoms are considered normal for the vaccination process. Treatment is generally unnecessary, though sometimes an appropriate anti-inflammatory medication is needed for comfort. The patient can be expected to be back to normal in a couple of days. Again, if these reactions are seen, there is no reason to alter vaccination recommendations or plans for the patient's future as these symptoms are inherent to the vaccination process and are considered normal.

What is not Normal and When is Treatment Required?

Occasionally, a reaction is extreme and potentially dangerous. As vaccine technology has advanced, these reactions are more and more rare but it is important to know when to take action. The following symptoms are more serious and your veterinarian should be notified at once, especially if they occur within hours of receiving the vaccine:

- Vomiting or diarrhea
- Facial swelling
- Hives
- Collapse
- Difficulty breathing



Pepper's facial swelling is actually from an insect

These symptoms can be part of an anaphylactic reaction, which is more extreme and potentially life-threatening in its most severe form. Any symptoms from this list should be taken seriously and future vaccination plans should be altered to avoid more severe problems. These types of vaccination reactions tend to get worse with subsequent exposure to the offending protein. The reaction can be directed against the infectious organism, vaccine stabilizers, preservatives, or residue from the vaccine organism's laboratory tissue culture.

bite, but looks identical to the facial swelling of a vaccination reaction. Photo courtesy of Dr. Wendy Brooks.



Which Pets are Likely to Have Vaccination Reactions?

In October 2005, a study by Moore et al was published in the *Journal of the American Veterinary Medical Association* in which over 1 million canine medical records in over 350 separate animal hospitals were reviewed. In this study, approximately one in 250 dogs had some sort of vaccination reaction, which translated to 13 reactions for every 10,000 doses of vaccine given.

The group at greatest risk for reaction were small breed young adult (age 1-3 years) neutered male dogs. As a dog's size increased, the risk of vaccination reaction dropped. Not surprisingly, the more vaccines that were given at one time, the higher the risk of reaction. Most reactions occur the same day as the vaccine is given.

Multivalent Vaccines vs. Multiple Vaccines

Some vaccine doses include protection against multiple organisms. These are called multivalent vaccines and include the basic [distemper-parvo](#) vaccine for dogs and some [Bordetella](#) vaccines. Since giving more vaccines at once is associated with an increased risk of reaction, you might expect that using multivalent vaccines would also increase the risk of reaction, but surprisingly this was not found to be the case.

What to do During the Reaction

If your pet is having a reaction more severe than just some general malaise or soreness, you should let your veterinarian know right away. If it is after hours, it is prudent to consult the local emergency clinic. Anti-inflammatory injections can be used to halt the inflammatory cascade before it gets dangerously out of hand. Be sure you know who to call in case of problems after your pet is vaccinated.

Vomiting may be a sign of an on-coming serious reaction or could represent something as mild as car sickness. If vomiting is observed, let your veterinarian know right away.

Preventing Future Vaccine Reactions

After a pet has had a vaccine reaction, what do you do the next time vaccinations are due? There are several steps that can be used as prevention.

Be Sure your Veterinarian is Aware of your Pet's History of Vaccine Reaction

Obviously, if you know your pet has had vaccination reactions in the past, be sure to inform the staff so that proper premedication can be given. Do not wait until after vaccines have been given and THEN inform the staff that there is a history of reaction. It is also extremely helpful to know what the reaction consisted of; a little lethargy, local soreness or mild fever is considered normal for the vaccination process and does not constitute a significant reaction. If you know what vaccines preceded the reaction, the staff will also need to know that.

Be Prepared to Pay for Extra Pre-Medications and/or Observation

Medications such as antihistamines or corticosteroids can be used to head off allergic reactions before they happen, and with the use of these medications a reacting pet can be

vaccinated normally. To be safe, it is frequently recommended that the pet be observed for the rest of the day following vaccination, despite the medication. Allow extra time for the pre-medications to be in effect before vaccinations are given. Consult your veterinarian for a recommendation.

Avoid Giving Several Vaccinations at Once

Keep in mind that vaccines given within two weeks of each other can interfere with each other so you do not want to separate vaccines by less than a two-week period but separating vaccines can mean your pet has less stimulation to deal with at one time. Breaking up vaccination also helps determine which vaccine is the culprit. If multiple vaccines are due, consider spreading them out by at least 3-4 weeks if possible. It may be tempting to request giving half doses to reduce immune stimulation, but this will not result in complete vaccination and is not a valid alternative.

Do Not Have Your Pet Vaccinated at a Vaccine Clinic

Vaccination clinics are designed to provide streamlined service for healthy pets in need of their regular immunizations. These clinics are generally not prepared for the individual attention required by a pet who has a history of vaccination reaction. Many clinics are mobile and have moved to the next site by the time a pet has started showing reaction symptoms. A pet with a vaccine reaction history should receive some observation in the hospital and/or pre-treatment with anti-inflammatory medication as described above. It is probably best to utilize your primary care veterinarian if your pet has special vaccination needs.

Avoid Vaccination Altogether?

Vaccination reactions severe enough to produce shock are **extremely** rare and are a function of an individual pet's immune response. If a pet has suffered a severe or life-threatening reaction in the past, it is not worth continuing to expose the pet to the same allergen again.

Every hospital has its own policy regarding what vaccines are recommended for dogs and cats in general and what vaccines are required for boarding or grooming. Most communities have legal requirements for rabies vaccination and may or may not allow exemptions. Vaccine recommendations differ regionally and according to the pet's lifestyle as well as according to the philosophy of the veterinarian in charge of defining a particular hospital's policies.

An alternative may involve having a "vaccine titer" checked. This involves a blood test to check for a minimum antibody level. If the patient has an antibody level believed to correlate with protection, vaccination may not be needed at that time. There is some controversy regarding titering as it is not available for all the infectious diseases that one might vaccinate for. Further, there is a great deal more to immunologic protection than an antibody level. To determine if titering is right for you, discuss this option with your veterinarian.

Avoid Leptospirosis Vaccine?

The [leptospirosis](#) portion of the DHLPP (distemper) vaccine for dogs has a reputation for being the most likely portion to cause vaccine reactions. This is largely because of the huge size of the inactivated organism that is included in the vaccine and partly related to the bovine serum albumin (a cow blood protein) used in its production. (Extraneous proteins create unnecessary immune stimulation and predispose to reaction.) A traditional technique in avoiding vaccination reactions is to avoid leptospirosis vaccine, giving the rest of the distemper combination vaccine without it.

That said, vaccine technology has improved over the years, and many vaccines only use portions of the leptospirosis organism to avoid excess inflammation. Newer production methods have substantially reduced the amount of bovine serum albumin used in manufacture.



Whether or not an individual dog should be vaccinated against leptospirosis is not a foregone conclusion. The infection is indeed serious and is transmissible to humans. Rural dogs are classically infected via water puddles contaminated with rat or wildlife urine, while urban dogs are typically exposed in boarding facilities, parks, or similar areas where dogs are crowded and exposed to other dogs' urine. Discuss your dog's lifestyle with your veterinarian to determine if leptospirosis should be included in your vaccine regimen.



How important vaccination for leptospirosis is has become a matter of some controversy. The infection is serious and contagious to humans, and exposure generally involves urine contamination of outdoor puddles of water by wildlife or other dogs. Most dogs that become infected, however, are exposed in their own backyards. Some hospitals include leptospirosis in their protocol, while others omit it. Consider what infections your pet is actually going to be at risk for in your geographic area to avoid unnecessary vaccination, and discuss concerns with your veterinarian. See more on [leptospirosis](#).

Vaccination is an important part of responsible pet ownership and should not be omitted without specific veterinary guidance. Every hospital has its own policy regarding what vaccines are recommended for dogs and cats in general and what vaccines are required for boarding or grooming. Vaccine recommendations differ regionally and according to the pet's lifestyle as well as according to the philosophy of the veterinarian in charge of defining a particular hospital's policies.

Lumps that Develop at the Injection Sites

The makeup of a vaccine includes an infectious organism rendered harmless but still capable of stimulating the immune system. In some instances, the organism is live but weakened in some way. In other instances, the organism is killed. Some vaccines are made from killed bacterial organisms rather than viral organisms, and other vaccines (such as for rattlesnake bites) are made against proteins, and no infectious organism is involved. The larger the organism and the more complicated the proteins, the more local inflammation results after the injection, and this sometimes translates into a firm knot or bump at the injection site. These growths are typically noted a few weeks following vaccination and generally resolve on their own. These are not allergic reactions but are inflammatory reactions caused by the immune stimulation. If a lump persists longer than three months from the time of vaccination or is larger than 2 cm in diameter any time after vaccination, it should be removed and biopsied. This removal is particularly true for cats as they have the potential to develop injection site tumors.

Reporting a Vaccination Reaction

The United States Department of Agriculture (USDA) is responsible for licensing animal vaccines. The agency within the USDA that is immediately responsible is the Center for Veterinary Biologics. This agency is responsible for reviewing vaccine reaction reports and considers whether or not the manufacturer must perform additional investigation. The CVB is also responsible for unannounced testing of vaccine-producing facilities. Vaccination reactions may be reported to the CVB directly or to the manufacturer, though the manufacturer is not required to pass vaccine reaction reports along to the CVB. The advantage of reporting reactions to the manufacturer instead of the CVB is that often the manufacturer will cover the costs of treatment as long as the reaction extends beyond the mild malaise that is a natural result of the vaccination process. Different manufacturers have different policies regarding reimbursement but if you find yourself with a significant expense from a vaccine reaction, it may be worthwhile to have your veterinarian look into reimbursement from the manufacturer. [Report a vaccine reaction](#) to the Center for Veterinary Biologics.

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