

Allergies in Dogs

What is an allergy? An *allergy* is a state of over-reactivity or hypersensitivity of the immune system to a particular substance called an *allergen*. Most allergens are *proteins*.

The allergen protein may be of insect, plant or animal origin. Exposure to the allergen, usually on multiple occasions, sensitizes the immune system, and a subsequent exposure to the same or related allergen causes an over-reaction. Normally the immune response protects the dog against infection and disease, but with allergies, the immune response can actually be harmful to the body.

The immune reactions involved in allergies are quite complex. Most reactions involve an antibody in the blood called Immunoglobulin E (IgE). In an allergic reaction the allergen protein molecules combine with IgE antibody molecules and attach to a type of cell called a *mast cell*. Mast cells are found in many tissues throughout the body. When the antigen and antibody react with mast cells, the mast cells break up and release potent chemicals such as *histamines* that cause local inflammation (redness, swelling and itching). This inflammation causes the various signs associated with an allergic reaction.

What are the symptoms of allergies in dogs? In the dog, the most common symptom associated with allergies is itching of the skin, either localized (in one area) or generalized (all over the body). In some cases, the symptoms involve the respiratory system, with coughing, sneezing, and/or wheezing. Sometimes, there may be runny discharge from eyes or nose. In other cases, the allergic symptoms affect the digestive system resulting in vomiting and diarrhea.

How common are allergies in dogs? Unfortunately, allergies are quite common in dogs of all breeds and backgrounds. Most allergies appear after the pet is six months of age with the majority of affected dogs over age two.

Are allergies inherited? Some allergies are inherited. The inherited trait is known as *Atopy* (see **What is Inhalant Allergy or Atopy** below).

What are the common allergy-causing substances (allergens)? A very large number of substances can act as allergens. Most are proteins of insect, plant or animal origin, but small chemical molecules known as *haptens* can also cause allergy. Examples of common allergens are pollens, mold spores, dust mites, shed skin cells (similar to "pet allergies" in humans), insect proteins such as flea saliva, and some medications.

What are the different types of allergy? There are several ways of classifying allergies. Some examples of classifications include:

- Precipitating allergen - Flea Allergy
- Route the allergen takes into the body - Inhalant Allergy, Skin Contact Allergy or Food Allergy
- Time it takes for the immune reaction - Immediate-type Hypersensitivity, also called Anaphylaxis or Shock, and Delayed-type Hypersensitivity
- Type of immune reaction - Types I through IV Hypersensitivity
- Clinical Signs - Allergic Dermatitis or Allergic Bronchitis
- Inherited forms - Atopy or Seasonal Allergies

What is Contact Allergy? Contact allergy is the least common type of allergy in dogs. It results from direct contact to allergens, such as pyrethrins found in flea collars, pesticides used on the lawn, grasses, materials such as wool or synthetics used in carpets or bedding, etc.

If the dog is allergic to these substances, there will be skin irritation and itching at the points of contact, usually the feet and stomach. Removal of the allergen (once it can be identified) often solves the problem.

What is Flea or Insect Bite Allergy and how is it treated? Insect bite allergy is the exaggerated inflammatory response to the bite or sting of an insect. Arachnids such as spiders and ticks, and Insects including fleas, black flies, deerflies, horseflies, mosquitoes, ants, bees, hornets and wasps, and arachnids such as spiders and ticks can cause an allergic reaction in sensitive dogs.

Flea saliva is the most common insect allergen. Most dogs experience minor local irritation from fleabites. The allergic dog will react to a single bite with severe local itching. It will bite and scratch itself and may remove large amounts of hair, especially in the tail-base region. A secondary bacterial infection may develop in the broken skin. The area most commonly involved is over the rump in the tail-base region and extending down the hind limbs.

Because one flea can be a problem for the allergic dog, strict flea control is essential. This is difficult considering the life cycle of fleas, but with modern medications and home treatment options, you should be able to provide a flea free environment for your dog (see the Client Education Handout "*Fleas*" for additional information). Your veterinarian can give you tips on protecting your dog from fleas. When strict flea control is not possible, or in cases of severe itching, your veterinarian may prescribe anti-histamines or corticosteroids (steroids) to block the allergic reaction and give relief. If a secondary bacterial infection is present, an appropriate antibiotic will be prescribed.

What is Inhalant Allergy (Atopy) and how is it treated?

The term "Inhalant Allergy" in the dog is used as a synonym for Atopy. The main inhalant allergens are tree pollens (cedar, ash, oak, etc.), grass pollens, weed pollens (ragweed), molds, mildew, and house dust mites. Many of these allergies occur seasonally, such as ragweed, cedar, and grass pollens. However, others such as molds, mildew, and house dust mites occur year-round. When humans inhale these allergens, the allergy manifests mainly with respiratory signs - runny eyes, runny nose, and sneezing ("hay fever"). Although sometimes the symptoms of allergies include allergic rhinitis or bronchitis, in most dogs the allergy manifests mainly with itchy skin (pruritus). Due to these clinical signs, the condition is also called "Inhalant Allergic Dermatitis". The dog may rub its face, lick its feet and scratch the axillae (underarms).

Most dogs that have inhalant allergy start showing signs between one and three years of age. Affected dogs will often react to several allergens. If the offending allergens can be identified by intradermal skin tests (skin testing) or IgE allergy tests (blood tests), the dog should be protected from exposure to them as much as possible. Because most of these allergens are environmental, this is difficult and recurrent bouts are likely. Symptoms of atopy can be controlled but a permanent cure is not usually possible.

Treatment depends largely on the length of the specific allergy season. It may involve one or more of the following three therapies:

Anti-inflammatory therapy. Treatment with anti-inflammatory drugs such as corticosteroids, or with antihistamines, will quickly block the allergic reaction in most cases. Fatty acid supplementation of the diet can improve the response to steroids and antihistamines in some cases. Recently-approved drugs such as oral cyclosporine hold promise for severely atopic dogs.

Shampoo therapy. Frequent bathing with a hypoallergenic shampoo can be soothing. The bathing may also rinse out allergens in the coat that could be absorbed through the skin. Some therapeutic shampoos contain anti-inflammatory ingredients that may further benefit your pet.

Hyposensitization therapy. If the specific offending antigens are identified by allergy testing, an allergy injection serum or "allergy shots" can be given to the patient. With this treatment, very small amounts of the antigen are injected weekly. This repeated dosing has the objective of reprogramming or

desensitizing the immune system. Success rates vary with this treatment. Approximately fifty-percent of treated dogs will see significant improvement in their clinical signs while approximately twenty-five percent more will see a decrease in the amount or frequency of corticosteroid usage.

What is Food Allergy and how is it treated?

Food allergy or *food hypersensitivity* can develop to almost any protein or carbohydrate component of food. It most commonly develops in response to protein of the food of a particular food origin; dairy products, beef, wheat gluten, chicken, chicken eggs, lamb, and soy are commonly associated with food allergies in

dogs. Food allergy can develop at almost any age. Food allergy may produce any of the clinical signs previously discussed including itching, digestive disorders, and respiratory distress. A dog may have multiple types of allergy, such as both food allergy and atopy.

Food allergy does not respond well to corticosteroids or other medical treatments. Treatment requires identifying the offending component(s) of the diet and eliminating them. The most accurate way of testing for food allergies is with an elimination diet trial using a hypoallergenic diet. Because it takes at least eight weeks for all other food products to be eliminated from the body, the dog must eat the special diet exclusively for eight to twelve weeks. If a positive response and improvement of your pet's clinical signs occurs, your veterinarian will advise you on how to proceed.

It must be emphasized that *if the diet is not fed exclusively, it will not be a valid test*. All table food, treats or flavored vitamins must be discontinued during the testing period. There may be problems with certain types of chewable tablets such as heartworm preventative. Blood tests called serum IgE tests may give an indication of whether the dog is allergic to specific foods. Your veterinarian will discuss the specific tests and restrictions that are recommended for your dog.

Caution:

The symptoms of allergies can be confused with other disorders, or occur concurrently with them.

Therefore, do not attempt to diagnose your dog without veterinary professional assistance. Be prepared for your pet to receive a full diagnostic evaluation to rule out other causes. If an allergy is diagnosed, your whole family must follow your veterinarian's advice very closely in order to successfully relieve your pet's discomfort.

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