

# ANAPHYLAXIS

## BASICS

### OVERVIEW

- “Allergy” is an unusual sensitivity to a substance (such as pollen)—the immune system responds to the presence of the substance leading to signs (such as itchiness); “antigen” is a substance (such as pollen) that induces a sensitivity or immune response; “antibody” is a protein that is produced by the immune system in response to a specific antigen—when the body is exposed to the antigen, the antibody responds, causing the signs of the allergic response
- “Immunoglobulins” are proteins produced by the cells of the immune system; they include the antibodies; they are categorized into classes, including immunoglobulin A (IgA), immunoglobulin G (IgG), and immunoglobulin E (IgE)
- Mast cells are immune-system cells that frequently are located near blood vessels in the skin; mast cells contain histamine; they are involved in allergy and inflammation
- Anaphylaxis is the sudden (acute) allergic reaction following the rapid introduction of an antigen (a substance that induces sensitivity or immune response) into a host having antigen-specific antibodies (proteins produced by the immune system in response to a specific antigen) of the immunoglobulin E (IgE) subclass
- The binding of antigen (a substance that induces sensitivity or immune response) to mast cells sensitized with immunoglobulin E (IgE) results in the release of preformed and newly synthesized chemical mediators (such as histamine)
- Anaphylactic reactions may be localized (atopy) or generalized (systemic), known as “anaphylactic shock”
- “Atopy” is a disease in which the animal is sensitized (or “allergic”) to substances found in the environment (such as pollen) that normally would not cause any health problems
- “Anaphylactic shock” is a severe form of anaphylaxis; it is life-threatening; signs may include difficulty breathing, vomiting, diarrhea, collapse, and death

### GENETICS

- Anaphylaxis may be more common in some families or lines of dogs

### SIGNALMENT/DESCRIPTION OF ANIMAL

#### **Species**

- Dogs and cats

#### **Breed Predispositions**

- Dogs—numerous breeds documented as being susceptible for developing atopy (disease in which the animal is sensitized [or “allergic”] to substances found in the environment [such as pollen] that normally would not cause any health problems)
- Cats—no breeds documented as having a susceptibility for atopy (disease in which the animal is sensitized [or “allergic”] to substances found in the environment [such as pollen] that normally would not cause any health problems)

#### **Mean Age and Range**

- Dogs—age of onset of signs ranges from 3 months to several years of age; most affected animals are 1 to 3 years of age when signs are first identified
- Cats—age of onset of signs ranges from 6 months to 2 years

#### **Predominant Sex**

- Dogs—atopy (disease in which the animal is sensitized [or “allergic”] to substances found in the environment [such as pollen] that normally would not cause any health problems) more common in females
- Cats—no reported differences between males and females

### SIGNS/OBSERVED CHANGES in the ANIMAL

- Initial clinical signs vary depending on the route of exposure (such as airborne, injection) to the antigen (the substance [such as a vaccine] that induces a sensitivity or immune response) that is causing the reaction
- Shock—end result of a severe anaphylactic reaction
- Shock organ—dogs, liver; cats, respiratory and gastrointestinal systems
- May be localized to the site of exposure, but may progress to a generalized (systemic) reaction
- Onset of signs immediate (usually within minutes of exposure to substance that induces the allergic response)
- Dogs—itchiness (known as “pruritus”); hives; vomiting; defecation; and urination
- Cats—intense itchiness (pruritus) about the head; difficulty breathing (known as “dyspnea”); salivation; and vomiting
- Localized fluid build-up in the skin (known as “cutaneous edema”) at the site of exposure (such as at the site of an insect sting or an injection)
- Enlarged liver (known as “hepatomegaly”) in some dogs
- Increased excitement possible in early stages
- Depression and collapse terminally

### CAUSES

- Virtually any substance; those commonly reported include venoms, blood-based products, vaccines, foods, and drugs

#### **RISK FACTORS**

- Previous exposure (sensitization) increases the chance of the animal developing a reaction

### **TREATMENT**

#### **HEALTH CARE**

- In a suddenly affected animal, the reaction is considered a medical emergency requiring hospitalization
- Eliminate the antigen (the substance [such as a vaccine] that induces a sensitivity or immune response) that is causing the reaction, if possible

#### **Generalized (Systemic) Anaphylaxis**

- Goal—emergency life support through the maintenance of an open airway, preventing circulatory collapse, and re-establishing normal body function
- Administer fluids intravenously at shock dosages to counteract low blood pressure (known as “hypotension”)

#### **Localized Anaphylaxis**

- Goal—limit the reaction and prevent progression to a generalized (systemic) reaction

#### **DIET**

- If a food is suspected as the cause of the anaphylaxis (uncommon), avoid foods associated with allergic reaction

### **MEDICATIONS**

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

#### **Generalized (Systemic) Anaphylaxis**

- [Epinephrine](#) for shock ([administered by injection](#))
- Steroids for shock—prednisolone or dexamethasone ([administered by injection](#))
- [Atropine](#) to counteract slow heart rate (known as “bradycardia”) and low blood pressure (hypotension)
- [Aminophylline](#) is a drug that enlarges the bronchi and bronchioles in the lungs (class of drugs known as “bronchodilators”); can be used in patients having severe breathing difficulties

#### **Localized Anaphylaxis**

- [Diphenhydramine](#) ([administered by injection](#)) is an antihistamine
- [Prednisolone](#)
- [Epinephrine](#) ([administered by injection](#), at site of initiation)
- If shock develops, initiate treatment for generalized (systemic) anaphylaxis

### **FOLLOW-UP CARE**

#### **PATIENT MONITORING**

- Closely monitor hospitalized patients for 24 to 48 hours

#### **PREVENTIONS AND AVOIDANCE**

- If antigen (the substance [such as a vaccine] that induces a sensitivity or immune response) that caused anaphylaxis can be identified, eliminate or reduce exposure

#### **POSSIBLE COMPLICATIONS**

- Death

#### **EXPECTED COURSE AND PROGNOSIS**

- If localized reaction is treated early, prognosis is good
- If the animal is in shock on examination, prognosis is guarded to poor

### **KEY POINTS**

- Anaphylaxis is an unpredictable disease
- Recognize that the animal has an allergic condition and may require immediate medical care
- In a suddenly affected animal, the reaction is considered a medical emergency
- Eliminate the antigen (the substance [such as a vaccine] that induces a sensitivity or immune response) that is causing the reaction, if possible

