

## BASIC INFORMATION

### Description

Allergic reactions occur when components of the immune system react to substances called *antigens*. Antigens are usually proteins. They may be introduced to the body through the skin, respiratory tract, or gut, or by injection. The systemic allergic reactions discussed here are anaphylaxis, urticaria, angioneurotic edema, and drug allergies. Allergic skin diseases, respiratory diseases, and adverse food reactions are discussed in other handouts.

*Anaphylaxis* is a severe, life-threatening hypersensitivity reaction. It is rare in both dogs and cats. *Urticaria*, or hives, are acute, focal swellings of the skin that are very itchy. *Angioneurotic edema* is sudden, soft swelling of tissues beneath the skin, especially the pinnae of the ears, lips, eyelids, and tissues of the face. Angioneurotic edema is not itchy or painful, but the skin overlying the swollen tissue may be red in color. *Drug allergies* are immune-mediated hypersensitivity reactions that are produced by antibodies formed by the immune system against some component of the drug.

### Causes

Many different allergens can cause anaphylaxis, urticaria, and angioneurotic edema, including venoms from insects, drugs (usually injectable), vaccines, and blood or plasma transfusions. Urticaria and angioneurotic edema may occur after exposure to certain foods, and they can rarely arise with events that release histamine in the body, such as exposure to heat, cold, or pressure.

Drugs that can cause reactions include antibiotics and antibacterials (sulfonamides, penicillins, cephalosporins, tetracyclines), chemotherapeutic agents (asparaginase, doxorubicin), vaccines, and other medications (propylthiouracil, levamisole, aurothioglucose, methimazole, others). The drug dose, duration, formulation, and route of administration may all affect drug reactions. In some cases, genetics may influence the likelihood of a reaction; for example, the Doberman pinscher is more sensitive than other breeds to sulfonamide reactions.

### Clinical Signs

In the dog, the target organ of anaphylaxis is the liver, so vomiting, diarrhea, respiratory distress, collapse, shock, and death can occur. In the cat, the target organs are the respiratory and gastrointestinal tracts, so facial itchiness, salivation, difficulty breathing, vomiting, diarrhea, shock, and collapse may be seen. Anaphylaxis may occur the first time an allergen is encountered.

Hives are localized or generalized red swellings or wheals in the skin. Dramatic sudden, soft, nonpainful swellings of the ears, eyelids, and face are typical findings with angioneurotic edema. If the edema affects the voice box area, the animal may have trouble breathing.

Drug allergies usually arise after the animal has been exposed to the drug for 5 or more days. A wide variety of signs may develop, including skin rashes, ulcerations, and scabby lesions; fever; joint swelling; pain in the muscles; weakness or wobbliness; kidney disease; hemolytic anemia; and decreased platelets.

### Diagnostic Tests

Diagnosis is based primarily on the clinical signs. It is often difficult to identify the offending allergen in cases of urticaria or angioneurotic edema. Administration of a drug immediately before the onset of anaphylaxis is very suspicious. Diagnosis of drug reactions is often made by eliminating other conditions that could cause similar clinical signs and by improvement of the signs after the drug is withdrawn. Although drug reactions can be confirmed by a return of signs when the drug is reintroduced, this is not usually recommended for fear of a severe reaction.

## TREATMENT AND FOLLOW-UP

### Treatment Options

Anaphylaxis and severe drug reactions require immediate emergency treatment in the hospital, with intravenous fluids, supplemental oxygen, and administration of injectable steroids, epinephrine (adrenalin), and other drugs for shock. Urticaria, angioneurotic edema, and mild drug reactions are treated with injectable and oral antihistamines and steroids. For all allergic reactions, it is also important to withdraw or remove the antigen, if it is known.

### Follow-up Care

Animals with severe allergic reactions are usually hospitalized for close monitoring for at least 24 hours. Monitoring may include measurements of heart and respiratory rates, blood pressure, and blood oxygen levels. Laboratory tests may be repeated to assess the effect of the reaction on liver and kidney function, blood sugar, blood cell counts, and blood clotting functions.

Most mild reactions are treated on an outpatient basis, but the animal may be rechecked daily if the signs do not respond quickly to treatment. Notify our veterinarians if the signs worsen or do not show steady improvement over the first 24 hours of therapy.

### Prognosis

Anaphylaxis is a potentially life-threatening reaction that can be fatal if therapy is not started quickly and aggressively. Prognosis for urticaria, angioneurotic edema, and drug reactions are good to excellent. To prevent recurrences, exposure to the antigen should be avoided in the future.