

# Pyrethrin and Pyrethroid Toxicosis

Petra A. Volmer, DVM, MS, DABVT, DABT

## BASIC INFORMATION

### Description

The natural pyrethrins are a group of six insecticides derived from the flowers of the *Chrysanthemum* plant. Pyrethroids are synthetic compounds similar to pyrethrins, with a longer duration of action, higher toxicity to insects, and greater stability than their natural counterparts. Pyrethrins and pyrethroids are readily available as flea treatments for dogs and cats and for killing insects in homes. Concentrations and formulations vary and can include sprays, liquids, topical solutions (applied to the fur on the back or neck areas), foggers, and gels.

### Causes and Toxicity

Pyrethroids act on the nervous system of insects, causing hyperexcitability. Toxicity to pets can occur from appropriate or inappropriate use of pyrethrin- or pyrethroid-containing products. Cats tend to be more sensitive to the pyrethrins and pyrethroids than dogs. In cats, flea treatments containing less than 2% pyrethrins are not expected to cause severe clinical signs. Topical treatments labeled for dogs may contain 36-65% pyrethroids, so these formulations can result in severe signs (including death) in cats.

Dogs are generally more tolerant of exposure to these compounds, and clinical signs, if they appear at all, are infrequent and less pronounced.

### Clinical Signs

Dermal exposure of cats to a flea spray containing less than 2% pyrethrins or pyrethroids may cause the animal to twitch the ears and skin, flick the tail, shake the paws, walk abnormally, hide, or exhibit other behavioral abnormalities. These types of signs usually resolve in 24-48 hours. If cats lick these products through grooming, they may develop excessive drooling and an upset stomach. In rare cases, dogs may exhibit similar signs.

Topical flea treatments labeled for dogs often contain concentrated pyrethroids; when applied to a cat, they can result in severe signs requiring immediate treatment. Cats may seem uneasy or restless, cry out, and then develop tremors and seizures within 12-18 hours. Immediate treatment by a veterinarian is required, because death may occur unless aggressive therapy is instituted. In some cases, exposure and clinical signs may occur in cats if they are in close association with recently treated dogs, especially if the cat grooms or licks the dog before the product has dried.

### Diagnostic Tests

A history of exposure and consistent clinical signs are often sufficient to make a diagnosis. Animals exposed to a flea product may have a greasy appearance to the fur at the application site, as well as a chemical odor. Analyses for pyrethrins or pyrethroids can be performed on fur by outside laboratories. Laboratory and other tests may be recommended to rule out other causes of similar clinical signs. Be sure to take any containers associated with these products with you to the veterinary hospital so that the veterinarian can read the ingredient list.

## TREATMENT AND FOLLOW-UP

### Treatment Options

Animals exhibiting signs following application of a flea spray are bathed with a liquid dish detergent to remove the residue from the spray. Animals are then dried thoroughly and kept warm so that they do not become chilled. Signs usually resolve within several hours after bathing. Liquid vitamin E applied to affected areas may help reduce skin irritation. Those animals showing only drooling can be given a tasty treat, such as canned pet food, to remove the bad taste from the mouth.

Contact your veterinarian immediately if your cat is exposed to concentrated pyrethroid products, such as many of the topical solutions. Treatment for these products is done only under the direction of a veterinarian and may consist of bathing to remove the product and administration of intravenous medications to help control tremors and seizures. Supportive care (intravenous fluids, correcting body temperature) may also be warranted. Many cats require hospitalization. Signs usually resolve in 24-72 hours following treatment, if they are not severe.

### Follow-up Care

Cats with severe signs require continuous monitoring while hospitalized. Animals receiving timely and appropriate treatment usually make a full recovery, if they are not severely ill.

### Prognosis

Prognosis is good for many cats receiving prompt, aggressive treatment. If treatment is delayed or signs are severe, prognosis is guarded (uncertain). The concentrated products can be lethal to cats.