

# CLEANING PRODUCTS — Exposures in Birds

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**M**ary has owned her cockatiel, Marty, for years. She has several grandchildren that love to visit and help her around the house. Her young grandson is especially eager to help. Late one afternoon, Mary saw that Marty appeared to be soaked. She noticed her grandson holding a bottle of window cleaner in his hands; he had apparently just given the bird a bath. Mary panicked and immediately called the clinic. If you received this client's call, what instructions would you give to her?

Many cleaning products that are used daily in homes can be harmful to pet birds. Because of their physiologic makeup (e.g., air sacs), birds can be more sensitive than mammals to various chemicals, especially through inhalation. By understanding the unique sensitivity of birds, technicians can help educate pet owners about the risks associated with these products.

## TYPES OF HOUSEHOLD CLEANERS

Household cleaning products essentially fall into six main categories: acids, alkalis, alcohols, bleach, detergents, and essential oils. The concentration of the chemicals, the amount of the product, and the route of exposure (i.e., inhalation, ingestion, dermal

contact) determine the severity of clinical signs and the extent of treatment needed.<sup>1</sup> Although treatment may be somewhat similar among the six household product categories, there are some important differences.

### Acids

Acid-based cleaning products are available in a variety of concentrations and formulations. Acids are generally found in toilet bowl cleaners, lime removers, drain openers, and antirust compounds.

Acids cause severe burns on contact. A coagulation-type necrosis (coagulation of proteins) occurs in the affected tissues. If the acid is inhaled, severe respiratory distress may occur. Dermal

Cleaning products, especially in the hands of well-meaning children, can pose a hazard to birds.



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contact with acids may result in the formation of skin lesions and burns. Oral exposure can cause burns and ulceration along the alimentary tract. Burns to the tongue, mouth, throat, and esophagus may also occur. Ocular exposure may lead to corneal injury.<sup>1</sup>

### Alkalis

Alkali-based cleaners are available in various forms and concentrations. Drain and oven cleaners, electric dishwasher soaps, and homemade soaps containing high amounts of alkali (e.g., lye) are some examples of alkali-based cleaning products.

Alkalis cause liquefaction necrosis (disolution of the cellular membrane), which can penetrate deeply into the tissue. There is little immediate pain, and the burns may take hours to form. Signs may include central nervous system depression, oral and dermal ulcers, and anorexia.<sup>1</sup>

### Alcohol

Cleaning products, including many solvents and disinfectants, are alcohol-based. Because birds are small and have a thinner skin than some mammals, they may be at a higher risk of

harm from oral or dermal exposures to products containing alcohol; however, feathers offer some protection against dermal exposure.<sup>1</sup>

Alcohol is rapidly absorbed when ingested and can also be absorbed through the skin and mucous membranes. Central nervous system depression, inflammation of the mucosal lining of the alimentary tract, hypotensive shock, hypothermia, hypoglycemia, acidosis, tremors, dyspnea, and ataxia may be seen. Clinical signs often occur within 30 to 60 minutes.<sup>2</sup>

### Bleach

Bleach is another common household cleaner that can be harmful to pet birds. Most bleaches contain sodium hypochlorite. The concentration and form of the hypochlorite may vary by brand. Household bleach products that contain concentrations of hypochlorite that are greater than 5% may be problematic to birds.<sup>3,4</sup>

The most common signs following oral ingestion are inflammation of the mucosal lining of the alimentary tract, oral lesions, and depression. Fumes from the bleach may irritate the bird's respiratory tract and cause dyspnea and open-beak breathing. Ocular and dermal irritation may also occur.<sup>4</sup>

### Detergents

There are three main types of detergents:

- Anionic (e.g., sodium lauryl sulfates, alkyl sodium sulfates)<sup>5</sup>
- Nonionic (e.g., polyethylene glycol stearates, alkyl phenoxy polyethoxy ethanol)<sup>5</sup>
- Cationic (e.g., benzalkonium chloride, cetyl pyridinium chloride)<sup>5</sup>

Because of the similar mechanism of action and treatment protocols, peroxides may also be discussed along with nonionic and anionic detergents. In general, nonionic and anionic detergents have a relatively neutral pH and are unlikely to cause serious corrosive

injury. However, peroxides in concentrations greater than 10% may be corrosive. Anionic, nonionic, and peroxides are not considered to be as caustic as cationic detergents, but they may cause significant irritation in birds.<sup>6</sup>

Clinical signs of exposure to anionics, nonionics, and peroxides may include mild to moderate local oral, ocular, and/or dermal irritation and inflammation of the mucosal lining of the alimentary tract. Onset of signs may be 4 to 6 hours after ingestion.

Cationic detergents have caused clinical effects at concentrations of less than 1%.<sup>7</sup> Signs of oral exposure may include diarrhea and regurgitation (possibly with blood). In addition to corrosive injury, which may result in oral ulcers, cationic detergents may also cause systemic effects such as muscular weakness, fasciculation, respiratory and central nervous system depression, seizure, collapse, coma, hypotension, and metabolic acidosis. Ocular exposure may cause corneal ulcers. Dermal exposures may result in dermatitis, edema, dermal necrosis, and pain. Hyperthermia has been noted following exposure.<sup>8</sup>

### Essential Oils

Another category of cleaning products that birds may be exposed to is essential oils. Citrus oil and pine oil are examples of essential oils that may be present in many products. These oils can be rapidly absorbed through the skin and mucous membranes.<sup>9</sup>

If ingested, inflammation of the mucosal lining of the alimentary tract and central nervous system depression may be noted. If the oil is on the skin and feathers, ataxia, muscle weakness, depression, and behavior changes may occur. Respiratory effects can include tachypnea, cyanosis, and dyspnea. With large exposures (either absorbed through the skin or ingested), seizures and hepatic injury have been reported in mammals. There is reason to assume, because of mechanism of action, that birds may be as sensitive as mammals and are at risk of showing similar signs.<sup>9,10</sup>

### DECONTAMINATION

Immediate decontamination is important in managing exposures to cleaning products. Dilution with nonacidic juice or water is indicated in oral exposures. Lavage and activated charcoal are not recommended because they may aggravate the alimentary tract irritation or ulceration. In addition, activated charcoal does not absorb most cleaning products. When ocular exposure occurs, the patient's eyes should be flushed with sterile saline for 5 to 10 minutes. A dermal exposure to cleaning products is treated by a thorough bath in mild hand liquid dishwashing soap followed by thorough rinsing in clear water.<sup>10,11</sup>

### TREATMENT

Treatment is symptomatic and supportive. More aggressive treatment may be necessary for birds exposed to essential oils or cationic detergents than to other types of cleaning products. Birds showing severe central nervous system signs should be stabilized before initiating other therapies. If seizures occur, use of anticonvulsants, such as diazepam or barbiturates, may be indicated. Fluids (intravenous or intraosseous) may be used to help control hypotension; refractory cases may necessitate the use of pressor agents. Respiratory function can be assisted



▲ The unique respiratory system of birds makes them extremely sensitive to fumes from various cleaning products.

with ventilation and/or oxygen as needed. Sucralfate slurries and other gastrointestinal protectants may be used for oral ulcers. Analgesics, antibiotics, and antiinflammatory agents may be necessary. Corneal and dermal ulcers may need to be treated topically. Thermoregulation is important.

If cationic detergents or essential oils are involved, birds that are asymptomatic should be monitored closely for 8 to 12 hours after exposure for the development of oral lesions. Monitoring electrolytes, heart rate, and blood pressure is important. Also, with essential oil exposures, the risk to the liver must be evaluated with blood chemistries and treated accordingly. Other cleaners are not as caustic and may require that the patient be monitored for 4 to 6 hours for signs that are not expected to be as severe.<sup>1,3,4,9-12</sup>

## CONCLUSION

Cleaning products come in a variety of forms and concentrations. The severity of the signs is determined by the extent of the exposure. Because birds have delicate respiratory tracts and thin skin, they may be more sensitive to many of these products. Proper decontamination and close monitoring can make all the difference for these patients.

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*In regard to Marty, who had been bathed with an ammonia-based window cleaner, it was determined that the risks included dermal, ocular, and, possibly, respiratory exposure. Mary was instructed to rinse Marty's body in clean water and rinse his eyes with sterile saline. For several hours, she was instructed to watch the bird very closely at home for signs of respiratory distress. When Marty remained asymptomatic 6 hours later, it was determined that he should be fine. Being provided with detailed instructions on how to proceed, the owner was able to properly handle the situation.*

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