

TOXIC METALS

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Several metals, when ingested, are toxic to birds. These include the heavy metals (lead and mercury) and trace minerals (zinc, copper, iron). This paper discusses clinical signs, disease processes, treatment and common sources of lead and zinc, the two most common toxic metals in veterinary medicine today. Diagnosis of metal toxicoses includes a complete history, routine blood tests, x-rays and toxicologic analysis. Sometimes metal pieces will be visible on an x-ray, but not consistently.

Paramount in the creation of a safe home for your pet includes vigilant inspection of all items it may come into contact with. Carefully read all package inserts to see if the product may contain hazardous chemicals. Don't assume that any item is safe, even if it is manufactured for birds or the label says it is free of toxins.

ZINC TOXICOSIS

Zinc is a trace metal that plays an essential role in many biologic processes. It is necessary for the action of many enzymes and normal vitamin A activity. However, increased amounts of zinc may be toxic.

Zinc salts have a direct irritant and corrosive effect on tissues. Severe effects are seen in chronic zinc foreign bodies, which cause stomach ulceration. Aside from the gastrointestinal tract, zinc also directly damages the pancreas, kidney and liver.

Excessive zinc interferes with iron and copper metabolism and inhibits normal red blood cell production and function. In some cases, zinc causes massive red blood cell rupture, known as hemolytic anemia.

Signs of zinc toxicosis are usually non-specific. They may include: a dull appearance, listlessness, and loss of appetite, regurgitation, feather picking, seizures and sudden death. Signs appear similar to lead toxicosis. Diagnosis of zinc toxicosis is often challenging, as birds usually do not become sick until days to weeks after exposure.

Zinc toxicosis is not uncommon in domestic animals. If diagnosed early and treated aggressively, the prognosis is often favorable. Zinc can be removed or chelated by injectable CaEDTA and oral D-penicillamine. Unlike lead toxicosis, DMSA does not effectively chelate zinc. Eliminating environmental exposure is important in preventing recurrence.

Common Sources of Zinc

Galvanized wire (many imported bird cages)
Window screens
Some powder-coated toys & cages
Quick-links
Twist-tie wires
Pennies minted after 1982
Paperclips, staples
Duct tape
Monopoly™ game pieces (98% zinc)
Screws, bolts, washers, chains
Zippers and zipper pulls (some)

LEAD TOXICOSIS

Lead poisoning in humans has been recognized for thousands of years and has been implicated in historic effects such as the decline of ancient Rome. Also known as plumbism (derived from the Latin word for lead, *plumbum*), lead toxicosis most likely caused many of the mental disorders noted in Roman citizens. Contaminated drinking water from lead pipes was found to be the source.

Lead is a heavy metal that has no physiologic benefit in living systems. Today, lead poisoning is common in pet birds, wild birds (especially waterfowl) and human children. It is estimated that up to 2-3% of the wild population of ducks and geese die annually in North America from ingestion of lead shot. Paint from older buildings (built prior to 1970) often contains substantial amounts of lead, a common source in children.

Lead absorbed from the stomach is distributed by red blood cells to soft tissues causing damage to the gastrointestinal tract, nervous system and kidney. Lead causes anemia by increasing fragility and premature destruction of red blood cells and suppressing bone marrow.

Signs of lead toxicosis are usually non-specific. They may include: lethargy, loss of appetite, regurgitation, green or bloody diarrhea, seizures and sudden death. Signs often appear similar to zinc toxicosis.

If diagnosed early and treated aggressively, the prognosis is often favorable. Lead can be removed or chelated by injectable CaEDTA, oral D-penicillamine, oral DMSA or oral dimercaprol. Eliminating environmental

exposure is important in preventing recurrence.

The body ultimately attempts to store lead in the bone, where it is quiescent. However, there have been cases of recurrence in female birds that are reproductively active. This is because these hens are mobilizing calcium to and from the bone (in preparation for egg lay). Lead that has been stored may leached out into the bloodstream along with the calcium at a later date.

Common Sources of Lead

- Batteries
- Costume jewelry
- Weights (curtains, fishing, diving/sailing)
- Galvanized wire (some)
- Hardware cloth
- Linoleum
- Mirror backings
- Paint (varnishes, lacquers), paint tubes
- Pewter (some)
- Plaster & putty
- Solder
- Seams from ornaments, stained glass
- Tiffany lamps
- Champagne and wine bottle foils (some)
- Shotgun & air rifle pellets
- Light bulb bases
- Imported glazed ceramics
- Lubricants (lead naphthalate)



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