



Top 20 Vet Toxicoses Part 4

For my own personal use only: [Download](#)



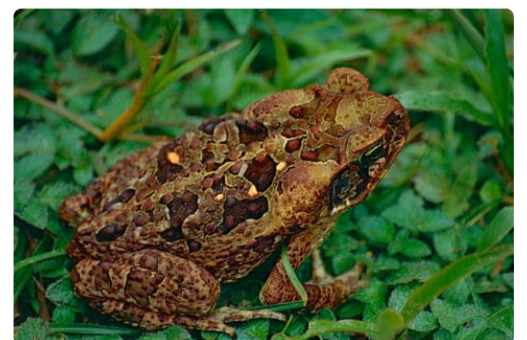
- 🦉 If you see a pet vomiting, call *emetic!*
- 🦉 In 2016, the [Animal Poison Control Center](#) (APCC) fielded over **13,000** calls from pet owners about insecticide poisoning and over **13,000** calls about rodenticides.

16. [Toad poisoning](#)

- **Classic case:** Affects CNS and cardiovascular system
 - Dogs affected most, sometimes cats
 - Variable presentation
 - Oral irritation, frothing and pawing at mouth
 - Retching
 - Vomiting
 - Cyanosis
 - Cardiac arrhythmias
 - Seizures
 - DEATH
- **Dx:** History of exposure
 - Toxic principles:
 - Bufagenins
 - Act like digitalis
 - Bufotoxins
 - Act like local anesthetics, catecholamines, serotonin
 - Block sodium channel in nerves
- **Rx:** Thoroughly rinse mouth and ...
 - Treat any cardiac arrhythmias and give digoxin-specific antibody if refractory
 - Decrease salivation: Atropine if normal cardiac rhythm
 - CNS excitability: Benzodiazepines
 - Cyanosis: Oxygen therapy



CMarine toads are toxic to dogs



Marine toad showing dorsum detail



- **Pearls:**
 - See most often in warm weather
 - *Rhinella marina* (formerly *Bufo marinus*): Giant or marine toad
 - This is most toxic toad in US
 - Found mostly in Florida, Texas, and Hawaii
 - Potency and type of toxin vary with type of toad

17. Insecticides ([organophosphates](#), [carbamates](#), [organochlorines](#), [pyrethrins](#))

- **Classic case:** All species affected
 - Organophosphates and carbamates: Affect all systems, especially gastrointestinal, neuromuscular, CNS
 - Muscarinic: **SLUD**
 - Salivation
 - Lacrimation
 - Urination
 - Diarrhea
 - Nicotinic:
 - Muscle tremors
 - Weakness
 - Central:
 - Anxiety
 - Ataxia
 - Seizures
 - Respiratory failure
 - Organochlorines: Affect CNS
 - Abnormal behavior, posture
 - Vocalization
 - Neuromuscular tremors, convulsions
 - Hyperthermia
 - Pyrethrins/pyrethroids: Affect CNS
 - Tremors, seizures
 - Incoordination
 - Hunched back
 - Salivation
 - Death

- **Dx:** History, clinical signs, and ...

- Organophosphates:
 - Measure acetylcholinesterase concentration in blood and brain (usually a 70% or more decrease)
 - Measure organophosphates in stomach/rumen, blood/serum, urine
- Carbamates:
 - Measure acetylcholinesterase concentration in blood and brain (usually a 50% or more decrease)
 - Measure carbamates in stomach/rumen, blood/serum, urine
- Organochlorines:
 - Measure organochlorines in brain/liver/kidney/fat/stomach
 - Check blood/urine in rest of herd/flock
- Pyrethrins/pyrethroids:
 - Measure pyrethrins/pyrethroids in tissues/fluids

- **Rx:**

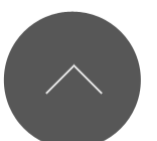
- Organophosphates:
 - Decontamination (gastric emesis/lavage, activated charcoal)



Cattle going through a tick treatment bath



Accidental toxic-level exposure may occur when insecticides are applied to fields using crop dusters



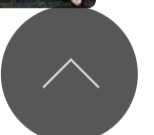
- Atropine (anti-muscarinic)
- 2-pyridine aldoxime methochloride (2-PAM)
- Diazepam for seizures
- Do NOT give phenothiazines as they potentiate organophosphate
- Carbamates:
 - Decontamination
 - Atropine (anti-muscarinic)
 - Do NOT use 2-PAM as it can also reversibly bind and inhibit acetylcholinesterase and therefore may exacerbate the clinical signs
- Organochlorines:
 - Bathe if dermal exposure
 - Decontamination
 - Reduce stress
 - Barbiturates or diazepam
- Pyrethrins/pyrethroids:
 - Bathe if dermal exposure
 - Activated charcoal
 - Do NOT induce emesis because the petroleum solvent may cause aspiration pneumonia
 - Barbiturates or diazepam
- Pearls:
 - Organophosphates:
 - Pathophysiology:
 - Irreversibly inactivates acetylcholinesterase at synapses and in erythrocytes
 - Newer organophosphates are less toxic because they require hepatic activation
 - Frequent toxicosis due to narrow margin of safety
 - Carbamates:
 - Pathophysiology:
 - Reversibly inactivates acetylcholine at synapses and in erythrocytes
 - Considered safer than organophosphates so used more often
 - Organochlorines:
 - Pathophysiology: CNS stimulation
 - Rarely used because of tissue residues and chronic toxicity
 - Pyrethrins/pyrethroids:
 - Pathophysiology:
 - Affect sodium, chloride, and calcium channels
 - Affect nicotinic acetylcholine receptors
 - Pyrethrins are from the plant *C. cinerariaefolium*
 - Pyrethroids are synthetic derivatives of pyrethrins

18. Petroleum products

- **Classic case:** Affect respiratory, GI, central nervous, and dermal systems
 - Usually dogs, cats, or ruminants, but all species are vulnerable
 - All species:
 - Excitability, incoordination
 - Shivering
 - Dyspnea
 - Aspiration pneumonia
 - DEATH
 - Small animals:
 - Salivation, cough, choking



Diesel spill



- Vomiting
- Ruminants: Bloat
- **Dx:**
 - Toxic principle: Volatile hydrocarbons
 - Odor of hydrocarbons from lungs/rumen contents/feces
 - Measure hydrocarbons in lung/liver/kidney/GI contents
- **Rx:**
 - Small animals:
 - Activated charcoal
 - Do NOT induce emesis because of aspiration risk
 - +/- Antibiotics for pneumonia
 - Ruminants: Relieve bloat with stomach tube
- **Pearls:**
 - Pathophysiology:
 - CNS dysfunction
 - Chemical aspiration pneumonia: Low viscosity and high volatility (e.g., gasoline, kerosene) increase aspiration risk
 - Prognosis for aspiration pneumonia is poor
 - Dogs and cats may ingest petroleum products when grooming
 - Cows may ingest because curious or thirsty

19. Smoke inhalation

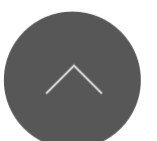
- **Classic case:** Affects respiratory system
 - All species can be affected, but worse in smaller animals and birds
 - 12-48 h after inhalation (compromise peaks at 12-24 h post-inhalation):
 - Coughing
 - Stridor, tachypnea, dyspnea
 - Voice change, lower respiratory noise
 - If inhaled toxicants:
 - Depression, weakness
 - Obtundation, coma
- **Dx:**
 - Several toxic principles (examples):
 - Carbon monoxide
 - Cyanide gas
 - Methane
 - Sulfur trioxide
 - Pyrolysis products (cause polymer fume fever)
 - Laryngoscopy/bronchoscopy (gold standard): See edema, ulceration, subglottic injury
 - Pulse oximetry: Carboxyhemoglobin and methemoglobin will cause false high readings
 - Pulse co-oximetry is usually more accurate than pulse oximetry
 - Arterial blood gases (PaO₂ is not affected by carbon monoxide poisoning)
 - Elevated carboxyhemoglobin concentration (although may be falsely decreased if recent oxygen treatment)
 - Elevated lactate concentration (especially with cyanide gas poisoning)
 - CBC: Decreased PCV and hemoglobin after 1 wk
 - Thoracic imaging: See changes (atelectasis, pulmonary edema, hyperinflation) at 24-36 h
 - ECG: Compatible with cardiac ischemia (S-T segment elevation or depression, T-wave inversion)
- **Rx:**
 - Intubation or tracheostomy and administer oxygen



Cat getting oxygen treatment after rescue from a fire



Fire in sage approaching a barn.



- Specific Rx:
 - Methemoglobinemia: Methylene blue
 - Polymer fume fever: Acetylcysteine
- Bronchodilators
- +/- Antibiotics, corticosteroids
- Pearls:
 - Pathophysiology due to thermal injury and inhaled toxicants
 - Steam produces severe lung injury

20. Strychnine

- **Classic case:** Affects CNS
 - All species vulnerable, but most often in western USA in young, large-breed, intact male dogs
 - Initially:
 - Nervous
 - Stiff
 - Very rapid progression
 - Generalized rigidity
 - Tetanic spasms
 - Tonic-clonic seizures
 - Hyperthermia
 - DEATH
- **Dx:**
 - Toxic principle: Indole alkaloid
 - Measure strychnine in stomach contents, liver, kidney, urine
- **Rx:**
 - Decontamination
 - Control seizures: Pentobarbital, methocarbamol
 - Prevent asphyxiation: +/- Intubation and artificial respiration
- **Pearls:**
 - Strychnine comes from the seeds of the Indian tree *Strychnos nux-vomica*
 - Pathophysiology:
 - Competitive and reversible inhibition of the inhibitory neurotransmitter glycine at postsynaptic sites in spinal cord and medulla
 - Striated muscle rigidity
 - Used in gopher bait
 - Restricted use pesticide because so highly toxic



Strychnine is mostly used as gopher bait



Strychnos nux-vomica plant that produces the toxic seeds



Strychnos nux-vomica seeds

Images courtesy of [Sam Fraser-Smith](#) (top marine toad), [Bernard DUPONT](#) (bottom marine toad), [Wutsje](#) (vomiting cat), [Scott Bauer](#) (dipping cows), [Airman 1st Class Kenneth Norman](#) (cropdusters), [John](#) (diesel spill), [Dragonfire1024](#) (cat receiving oxygen), [National Park Service](#) (sage fire), [Davefoc](#) (gopher), [H. Zell](#) (strychnine seeds), [Franz Eugen Köhler](#) (strychnine plant), and [Hisashi](#) (cat licking paw).

Cross-species

