

## Problem Based Approach to CNS Toxicities

### Excitation or Seizures

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### CNS

#### SEIZURES, EXCITATION

Differential diagnoses:

- Sodium fluoroacetate Compound 1080
- Metaldehyde - slug & snail baits
- Lead (Mixed CNS effects)
- Pyrethrins & Pyrethroids (mixed CNS)
- Ryegrass staggers

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### CNS

#### SEIZURES, EXCITATION

Differential diagnoses:

- Salt poisoning (water deprivation/Na)
- Chocolate (Mixed CNS effects)
- Organochlorine insecticides (DDT)
- Strychnine
- Herbicides: MCPA and 2,4-D

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### CNS Excitation Toxicities

1080 (sodium monofluoroacetate)

Sources of 1080:

Pesticide to control possums and other pests

- Pelleted bait or
- Impregnated carrots
- dyed black or green
- poisoned carcasses



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### CNS Excitation Toxicities

#### 1080 TOXICITY

##### TOXICITY:

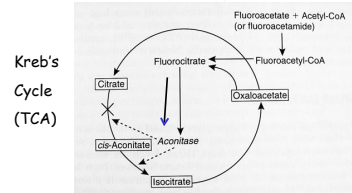
- Extremely toxic
- < 1 mg/kg oral lethal dose for:
  - cats, dogs, rabbits, pigs
  - cattle, sheep, goats
  - horses



### CNS Toxicities

#### COMPOUND 1080

##### Mechanism of Action: (classical theory)



### CNS Excitation Toxicities

#### COMPOUND 1080

##### Toxic effects are variable:

- Primates and herbivores
  - Primarily a Cardiac dysfunction
- Cats, sheep and pigs
  - Cardiac and nervous effects
- Carnivores (e.g. dogs)
  - Primarily nervous signs/effects

### CNS Excitation Toxicities

#### COMPOUND 1080

##### Clinical Signs/effects in the dog:

- Vocalisation, Running
- Tetanic-like seizures
- Frequent defaecation, urination
- Metabolic Acidosis
- Hyperthermia
- ↑ Blood glucose, ↓ Calcium (ionised)

• 1080 poisoning



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**CNS Excitation Toxicities**  
**COMPOUND 1080**  
Clinical Signs/effects in herbivores:

- Stagger, tremble
- Signs of gastrointestinal upset
- May resemble hypocalcaemia in dairy cattle
- Cardiac arrhythmias
- Stress or exercise precipitates death
- Terminal convulsions

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**CNS Excitation Toxicities**  
**1080**  
Clinical Pathology:

- Hyperglycaemia (2 fold or greater)
- Hypocalcaemia (ionised calcium)
- Increased serum citrate
- Metabolic acidosis

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**CNS Excitation Toxicities**  
**1080 TREATMENT:**

- Decontaminate if no clinical signs
- Anticonvulsants (diazepam or barbiturates)
- Metabolic Acidosis
  - Sodium Bicarbonate (fluids)
- Acetamide (fluids) **NOTE!!!**
  - do not use with NaBicarb
- Supportive Care



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**CNS Excitation Toxicities**

1080 Post mortem & Diagnosis:

- Non-specific changes
- Agonal heart changes
- Rapid onset of rigor mortis
- Analysis of stomach contents \*\*
- History of exposure

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**CNS Excitation Toxicities**

1080 Summary:

- Clinical signs for dogs - excitation
- Effects on herbivores - cardiac
- Metabolic acidosis - Sodium Bicarb
- Rapid onset of rigor mortis
- Clin Path changes (glucose, Calcium)
- Symptomatic care & acetamide?

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**CNS Excitation Toxicities**

Metaldehyde

Sources of Metaldehyde:

- Slug or snail bait
- Pelleted mixture
  - dyed blue-green or
  - non-dyed pellets



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**CNS Excitation Toxicities**

Metaldehyde

Toxicity of Metaldehyde:

- Dog: 200 mg/kg (but variable)
- Cattle, sheep: 200-300 mg/kg
- Bittering agent added to deter ingestion. It is not 100% effective in stopping ingestion in dogs



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**CNS Excitation Toxicities**

**Metaldehyde**

**Mechanism of Action:**

- Unknown - only partly understood
- Affects CNS neurotransmitters
- Onset can be minutes after ingestion, but may be after 1-2 hours

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**CNS Excitation Toxicities**

**Metaldehyde**

**Clinical signs - dogs, cats:**

- Anxiety, grimacing, restlessness  
• Dog-grimace
- Depression
- Vomiting and diarrhoea
- Salivation
- Muscle tremors "shake and bake"
- Incoordination

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**CNS Excitation Toxicities**

**Metaldehyde**

**Clinical signs - dogs, cats:**

- Blindness
- Metabolic Acidosis
- Excitation to narcosis
- Tachycardia, Tachypnoea
- Cats-nystagmus, convulsions stimulated
- Surviving animals may develop liver/renal disease

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**CNS Excitation Toxicities**

**Metaldehyde**

**Clinical signs - Herbivores:**

- Ataxia, tremors
- Colic, diarrhoea
- Blindness
- sweating
- hyperthermia
- Tachycardia, Tachypnoea
- Salivation

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**CNS Excitation Toxicities**

**METALDEHYDE**

**Clinical Pathology**

**Metabolic Acidosis - check acid/base\***

Probably not available in most practices.

**In cases of moderate to severe toxicity:**

Liver enzymes may increase

Renal tests (urea nitrogen, creatinine) increase

**Diagnosis:**

Submit frozen stomach contents (or vomit)

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**METALDEHYDE**

**TREATMENT**

- **Decontamination** <http://www.youtube.com/watch?v=lzY59qIUeyI>
- **Metabolic Acidosis**  
(corrects itself when tremors are controlled)
- **Symptomatic and Supportive Care**
- **Anticonvulsants (as needed)**
  - Diazepam
  - Methocarbamol (Robaxin)\*\*
  - Barbiturates

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Monty messes with metaldehyde!



- Monty is a 20 kg Border Collie
- Owner discovers Monty has eaten snail bait
- Bait contains 15 g metaldehyde/kg product
- LD<sub>50</sub> is 200 mg/kg BWt
- How much does Monty have to eat to get a lethal dose?

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