

# IN THE NICK OF TIME

CHALLENGING TOXICOLOGY CASE STUDIES

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## ALONE ON A BUSY ER SHIFT, AND THEN...

- Nick, 8yo CM black Labrador Retriever
- Came from 3 hours away
- Presenting complaint: gave him a bath, he took a nap, now he won't wake up



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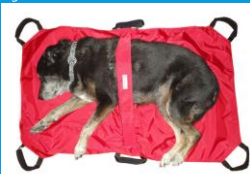
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## NICK

- Comes back for triage on a gurney
- Minimally responsive: stupor progressing to coma
- Laterally recumbent
- Normal PLRs and palpebral response
- No response to painful stimuli



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### MGCS

Modified Glasgow Coma Scale	
	Score
<b>Motor activity</b>	
Normal gait, normal spinal reflexes	6
Hemiparesis, tetraparesis, or decerebrate rigidity	5
Recumbent, intermittent extensor rigidity	4
Recumbent, constant extensor rigidity	3
Recumbent, constant extensor rigidity with opisthotonus	2
Recumbent, hypotonia of muscles, depressed or absent spinal reflexes	1
<b>Brainstem reflexes</b>	
Normal PLR and oculoccephalic reflexes	
Slow PLR and normal to reduced oculoccephalic reflexes	6
Bilateral unresponsive miosis with normal to reduced oculoccephalic reflexes	5
Pinpoint pupils with reduced to absent oculoccephalic reflexes	4
Unilateral, unresponsive mydriasis with reduced to absent oculoccephalic reflexes	3
Bilateral, unresponsive mydriasis with reduced to absent oculoccephalic reflexes	2
Bilateral, unresponsive mydriasis with reduced to absent oculoccephalic reflexes	1
<b>Level of consciousness</b>	
Occasional periods of alertness and responsive to environment	6
Depression or delirium, capable of responding, but response may be inappropriate	5
Semiconscious, responsive to visual stimuli	4
Semiconscious, responsive to auditory stimuli	3
Semiconscious, responsive only to repeated noxious stimuli	2
Comatose, unresponsive to repeated noxious stimuli	1
<b>MGCS Score</b>	
	Score
3-8	Grave
9-14	Guarded
15-18	Good

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### NICK

- T 100.8
- pulse 72
- resp 16
- mm pink, CRT < 25
- Blood pressure 110mmHg systolic




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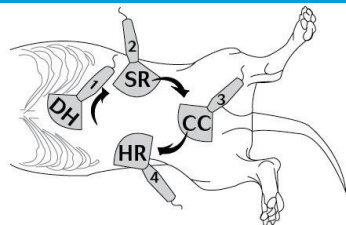
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### NICK: DIAGNOSTICS

- AFAST negative for free fluid
- CBC/Chem/Lytes unremarkable
- PT/PTT within normal limits




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### NICK: WHY ARE YOU SLEEPY?



- Eight hours prior to presentation, earth moving equipment on property
- Equine carcass buried 5 years previously after euthanasia
- Owners didn't know that Nick had ingested
- Confirmed with regurg
- And a Pharmatech Quick Screen At Home drug panel

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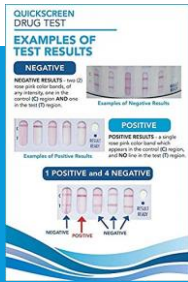
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### DRUG SCREENING




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### PENTOBARBITAL RELAY TOXICOSIS

- Treatment
  - IV maintenance crystalloids
  - Metoclopramide 1mg/kg/day
  - Intralipid – nutritional and myocardial support
  - Intubation
    - Pulse ox WNL on room air
    - Ventilator?
  - Oral care, cuff repositioning
  - Urinary catheter and closed collection system
  - PROM, recumbency rotation




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### ASPIRATION PNEUMONIA

- Serial thoracic radiographs and respiratory rate and effort remained normal



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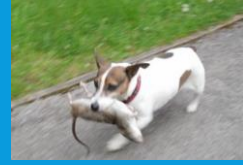
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### RELAY TOXICOSIS

- Secondary poisoning
- Ingestion of a poisoned animal
- Anticoagulant rodenticide toxicity in cats and terriers



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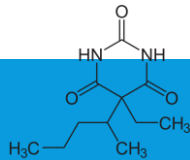
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### PENTOBARBITAL

- Short acting barbiturate
- Nembutal capsules taken off the market in 1999
- Replaced by benzodiazepenes
- Half-life in dogs 8.2 +/- 2.2 hours



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### NICK

- Extubated 16 hours after presentation
- Eating, wagging, sternal 33 hours after presentation
- Initial visual defects resolved
- Discharged, walking, at 60 hours post-presentation




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### PENTOBARBITAL RELAY TOXICOSIS

- 6yo CM Border Collie, hypoadrenocorticism
- Ataxia and acute collapse
- Suspected Addisonian crisis
- Didn't get better with saline and dexamethasone
- Housemate dog seen with goat head from euthanasia 47 days previously
- Urine screen positive
- Recovered with supportive care




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### PENTOBARBITAL RELAY TOXICOSIS

- 2yo spayed female Australian Shepherd
- Comatose after walking on a beach
- Went home 3 days later after supportive care
- Urine sample positive for pentobarbital and phenytoin
- Juvenile humpback whale stranded 3 weeks earlier and euthanized




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### PENTOBARBITAL RELAY TOXICOSIS

- 1390 SF and 790 CM dogs with pentobarbital toxicity
- Female died on the way to the vet; male survived with supportive care
- Horse carcass euthanized 2 years previously
- Partially buried in a ravine
- Responsible for the death of 3, possibly 2, other dogs
- Gas chromatography-mass spec showed high ppm concentrations of pentobarb in carcass meat and skin. Median lethal oral dose is 85mg/kg; a full meal of this carcass could provide over 100mg/kg



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### PENTOBARBITAL-CONTAMINATED FOOD

- 2017 Evanger's and Big Heart Brands
- 2018 Gravy Train – Smucker's
  - 90 million cans



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### CARCASS DISPOSAL

- Composting does not eliminate pentobarb, and the drug leached through the compost pad into the soil, with no clear trend at reduction in drug concentration
- Horse slaughter in the USA
  - No funds for horsemeat inspection allocated to the USDA Food Safety Inspection Service
    - Effectively bans horse slaughter in the USA
      - Canada, Mexico
      - Long travel times
- Incineration?



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### 5-FU



- 5-fluorouracil
- Topical medication for basal cell carcinoma and solar keratosis
- Cream is toxic to dogs and cats when ingested; IV injection can be used
- Efudex




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### 5-FU

- Inhibits thymidylate synthase
  - Normally converts deoxyuridine to thymidine
  - 5-FU causes strand breaks and cell death
- Exposure methods:
  - Bite or chew the container
  - Groom the person who applied it
  - Groom themselves or another animal
    - Actinic keratitis in cats and ocular neoplasms in dogs
    - Sarcoids in horses
- About 30% of exposed dogs and cats die or are euthanized




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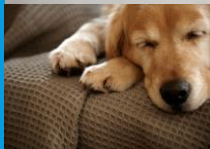
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### 5-FU

- Charlie: 10 year old CM golden retriever
- Chewed up container in a bag
- Clinically normal, normal vitals
- Admitted for activated charcoal and seizure watch
- Had a seizure 6h post-admit and acutely died




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## 5-FU SEIZURES

- May be refractory to traditional treatment methods
  - Benzos, phenobarb, levetiracetam, propofol
  - May require general anesthesia
- Treat for elevated ICP
- Reduce ammonia
- Give thiamine
- Uridine triacetate for people
  - Not proven to be effective in dogs and cats
  - Hard to source when needed




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## 5-FU



- Rosie, 4yo spayed female hound
- Also chewed into a tube
- No seizures, but developed severe GI signs (hematemesis and hematochezia)
  - No metronidazole – delays clearance
- Day 5: developed leukopenia and thrombocytopenia
  - Consumptive or bone marrow suppression?
- Owners elected to take home AMA on day 6 due to finances
  - Lost to follow up
  - Concerned for bone marrow suppression, bleeding, and sepsis

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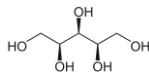
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## XYLITOL



- Sugar alcohol
- Chewing gum, peanut butter, some liquid medications (gabapentin)
- Hypoglycemia
- Acute hepatic necrosis
- Other sugar alcohols are nontoxic




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### XYLITOL

- Decontamination
  - Rapidly absorbed
  - No activated charcoal
- Treatment
  - Dextrose supplementation
  - More than 7.5%: central line
- Monitor hepatic enzymes and coags
  - Multiple FFP transfusions




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### XYLITOL

- Hepatic support
  - SamE
  - N-acetylcysteine
  - filter




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### NOT TOXIC

- Silica packets
- Ant and roach bait




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