Kids Do the Darndest Things!

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for
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Objectives

- Epidemiology of pediatric ingestions
- Physiological Differences
- General poisoning treatment strategies
- Salicylates
- Acetaminiphen
- Common Drugs- Lethal prescriptions

Epidemiology

- 1.5 million calls a year for pediatric ingestion
- 79% are for kids less than 6
- 56% are from products around the house

Physiological Differences

- Blood brain barrier more permeable until 4 months
- Higher metabolic demands
- Decreased glycogen stores
- Inability to avoid hazards - they don’t read the signs!

General Management

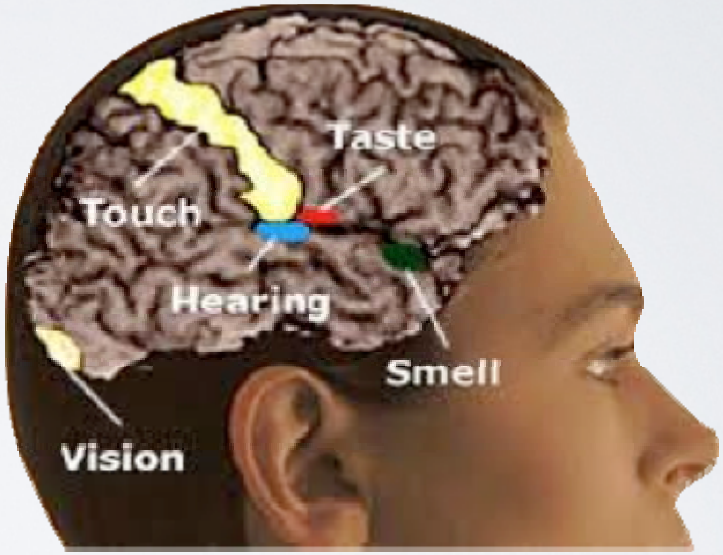
- What is it?
- How much is it?
- When did they take it?
- What else did they take with it?
- Why did they take it?

General Management

- Airway
- Breathing
- Circulation
- Disability
- Basic observations

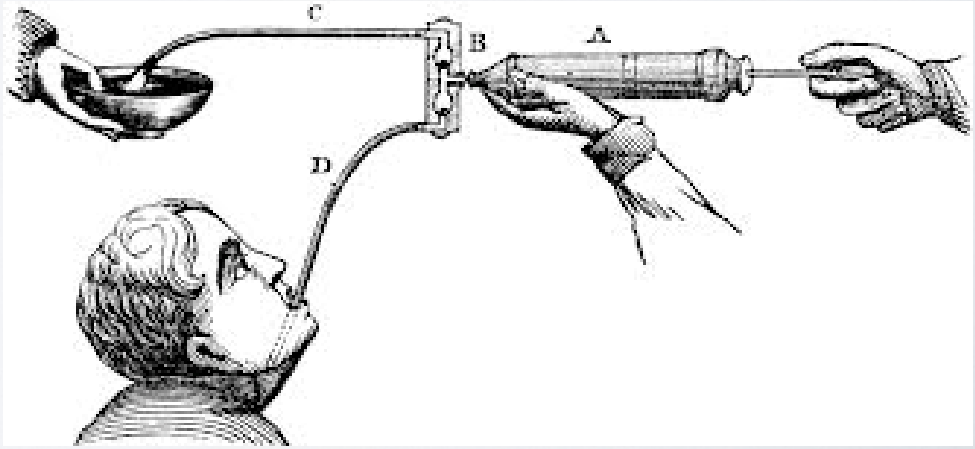
Use your senses

- Look
  - Track marks, pupil size, skin
- Hear
  - Type of breathing
- Feel
  - Temperature
- Smell
  - Ketones
  - Alcohol
- Taste? (OK, not this one)



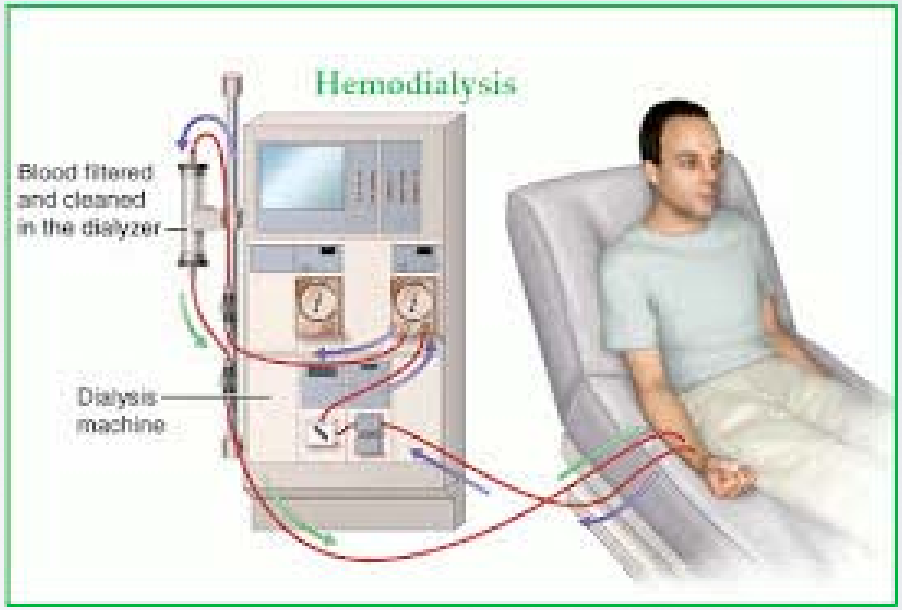
Management

- Decrease drug absorption



Management

- Increase drug elimination



Management

- Antagonize the effects of the poison
  - Naloxone
  - N-acetylcysteine
  - Digibind
  - Flumanzenil
  - Fomepizol

Salicylate's

Where is it found

How does it do what it does?

- Inhibits prostaglandin synthesis.
- Directly inhibits neutrophils to decrease the inflammatory response.

Pathophysiology

- Stimulates the brainstem causing hyperventilation
- Causes renal impairment which leads to the accumulation of acids
- Interferes with the Krebs cycle
- Causes body to generate heat
- Causes fatty acid metabolism which produces ketone bodies.

How much is enough?

- Ingestion of 150 mg/kg causes intoxication
- Level of 50 - 80 mg/dL causes moderate symptoms
- Severe symptoms over 80 mg/dL
- Clinical presentation is more important that numbers!

Manifestations

- Early - non specific signs (i.e. nausea, vomiting)
- Tinnitus, sometimes with hearing loss
- Hyperventilation
- CNS signs
    - Vertigo
    - Hallucinations
    - Stupor

treatment

- ABC’s
- History and Exam
- Activated charcoal should be given
    - 25 to 100 grams
- Sodium Bicarbonate-Call Medical contol

Hemodialysis

- This is for the most severe cases
  - Renal failure
  - CHF
  - Acute lung injury
  - Persistent CNS disturbance
  - Severe acid base imbalance despite treatment
  - Hepatic compromise

Acetaminophen

Where is it found?

How does it do what it does?

- Analgesia is produced by the inhibition of COX-2 and prostaglandin
- Antipyresis at slightly higher blood levels through CNS depression.

How much is enough?

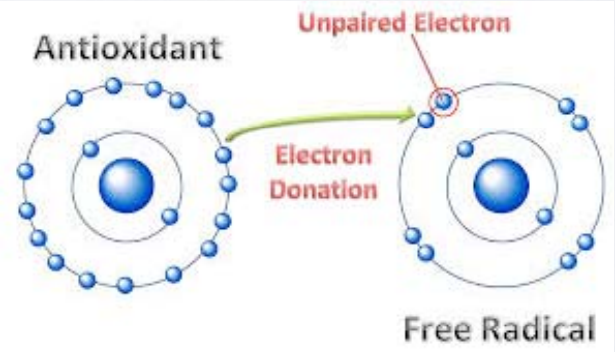
- Adults – 140 mg/kg or greater or 7.5 grams in 24 hours
- Children <10 - >200 mg/kg

What happens in overdose?

- Liver enzymes become saturated
- Glutathione is depleted
- NAPQI accumulates
- Hepatic necrosis ensues

Glutathione

- This is an antioxidant who’s purpose in life is to keep cells running smoothly.
- It is found in every cell



NAPQI

- N - acetyl-p-benzoquinoneimine
- This is a metabolite of acetaminophen

Acetaminophen Poisoning Phases

- Phase I
  - 30 minutes to 4 hours
  - Anorexia
  - Nausea, vomiting
  - Pallor
  - Diaphoresis
  - Malaise

Acetaminophen Poisoning Phases

- Phase II
  - 24 to 48 hours
  - Symptoms lessen and it may seem the patient is getting better.
  - Right upper quadrant pain
  - Liver enzymes become abnormal
  - Clotting times prolonged
  - Renal function deteriorates

Acetaminophen Poisoning Phases

- Phase III
  - 3 to 5 days
  - Symptoms of hepatic necrosis
  - Hepatic encephalopathy
  - Nausea, vomiting
  - Death due to hepatic failure

Acetaminophen Poisoning Phases

- Phase IV
  - Resolution
  - Death

Treatment

- ABC’s
- History and Exam
- Activated Charcoal
- Hemodialysis?

N-acetylcysteine

- Glutathione substitute
- Administered orally or IV
  - They need this as soon as possible as it prevents liver damage


ONE
SHOT
KILL

Calcium Channel Blockers

- Used to treat hypertension, migraines, Raynauds.
- Include:
  - Norvasc
  - Cardizem
  - Procardia
  - Verapamil

Calcium Channel Blockers

- Can cause:
  - Hypotension
  - Bradycardia
  - Arrhythmia's

Treatment

- ABC’s
- History and Exam
- Fluids
- Will need:
    - Calcium
    - Glucagon
    - Insulin
    - Atropine

TCA

Tricyclic Antidepressants

What Does it cause?

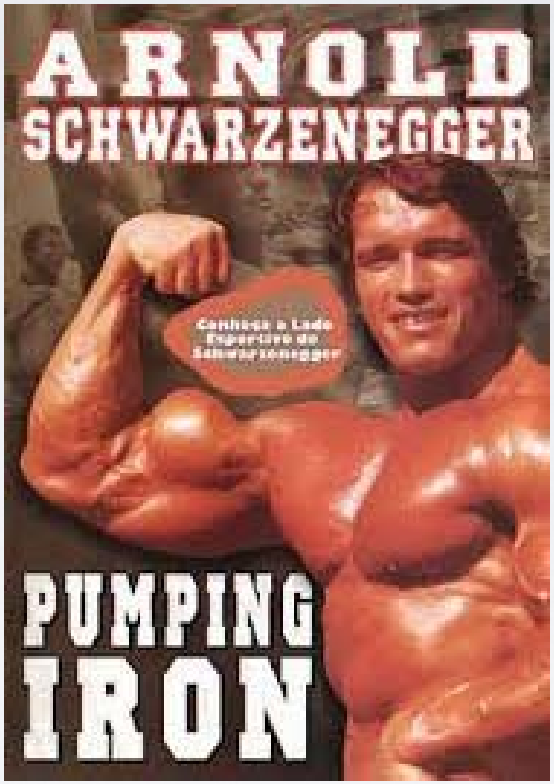
- Anticholinergic Effects
  - Dry mouth
  - Dry eyes
  - Dilated pupils
  - Urinary retention
  - Blurred vision
  - Dizziness
  - Palpitations

What does it cause?

- CNS effects
  - Confusion
  - Delirium
  - Coma
  - Convulsions
  - Respiratory depression

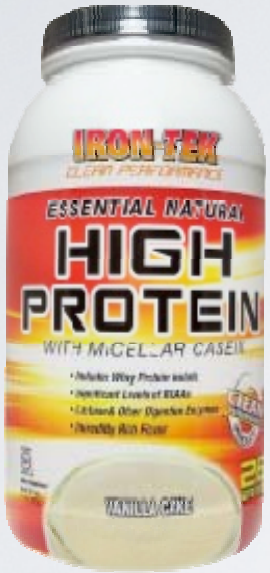
Treatment

- Initial management is supportive
- Control seizures
- Activated charcoal if they have received more than 4 mg/kg in one hour
- Treat hypoxia with oxygen
- Correct acidosis with sodium bicarbonate
- Correct arrhythmia's



Iron

Where is it found



How much is a bad thing?

- Toxicity occurs at as low as 10 mg/kg
  - Prenatal vitamins typically contain 65 mg
  - Children’s vitamins contain 10-18 mg

How bad does it get?

- Phase I
  - Nausea, vomiting, abdominal pain, diarrhea
- Phase II
  - 6 - 24 hours
  - GI symptoms will resolve

How bad does it get?

- Phase III
  - Shock stage occurs
  - Poor cardiac output
  - Hypovolemia
  - Lethargy
  - Seizures

How bad does it get?

- Phase IV
  - Liver failure continues
- Phase V
  - Gastric outlet obstruction occurs

Treatment

- ABC’s
- History and Exam
- Very aggressive fluid resuscitation
- Patients will need whole bowel irrigation
- Patient may need blood products
- Deferoxamine can combat this

Summary

- Remember the basic strategy of poisoning treatment
- Pre-hospital providers mainly provide supportive care
- Pre-hospital providers are the first line in assessment and diagnosis