There’s no place like home...
for life-threatening pediatric poisoning

Dina Wallin, MD
UCSF Division of Pediatric Emergency Medicine
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Goal

- Become aware of substances and items in your home which may be potentially hazardous to children, and what makes them so dangerous.

Objectives

- After this talk, you’ll be able to:
  1. Name several common medications which are particularly dangerous to children.
  2. Describe the risks of laundry detergent pods and edible marijuana in pediatric patients.
  3. Discuss other risky exposures in the home, and how to prevent life-threatening illness or injury for kids.
Background

• Poisoning = leading cause of injury-related death in the US
• Kids are more vulnerable!
• 60,000 ED visits each year because kids got into household meds
• In 2015,
  – Poison Control Center managed 2.8 million cases
  – 59% kids 0-19 years old, 47% younger than 6 years old

Background

• 80-85% unintentional
• Bimodal distribution: ages 1-5 and adolescents
• Risk factors for ingestion:
  – Age 1-4 years old
  – Male
  – Hyperactive temperament
  – Increased finger-to-mouth activity
Prevention

- **Store** medicines, chemicals, and cleaning products **up and away** out of child’s reach and sight
- **Put medicines away** every time
- **Do not store** chemicals in food containers or same cabinets as food
- Make sure **safety cap** is locked
- **Teach** kids about medication safety
- **Tell** guests about medication safety
- Be careful to understand **dosing** for small kids
Which is more dangerous?

• Calamine lotion or citronella candle?
  – Cintronella!
• Tylenol or shoe polish?
  – Tylenol!
• Aspirin or household bleach?
  – Aspirin!
• Dishwashing liquid or a detergent pod?
  – Detergent pod!

Which is more dangerous?

• Oil of wintergreen or hydrogen peroxide?
  – Wintergreen!
• Latex paint or a hint of vodka?
  – Vodka!
• Visine eye drops or shaving cream?
  – Visine!
LET'S KICK IT OFF WITH A CASE...

Salicylates

- **Salicylates**: Aspirin, other analgesics, cold medicines, Pepto-bismol, topical medications
- **Symptoms**: vomiting, rapid breathing, ringing of the ears, lethargy
- **Can have seizures, coma, brain swelling, severe bleeding**

**Salicylates**

- **Toxic dose**: 
  - Mild intoxication at 150-200 mg/kg, severe 300-500 mg/kg, and death at > 500 mg/kg
  - Jake: symptoms after 4 standard aspirin tablets, and severe symptoms or death after 9-15 tablets
- **Conclusion**: 
  - Aspirin is dangerous!
  - Lock it up, especially when grandparents are around!
Oil of Wintergreen

• Contains 1.4 grams of aspirin per mL, or 7.5 grams per teaspoon
• Jake: sick after 2 mL (less than half a teaspoon), could die after 3.6 mL (well under a teaspoon)
• Conclusion:
  – Just don’t.

WHAT ABOUT THIS ONE...

Acetaminophen

• Acetaminophen = Tylenol, cold medications (DayQuil, NyQuil), Excedrin, Vicodin, Norco
• Early symptoms: nausea and vomiting, no appetite, pallor, confusion
• Late symptoms: jaundice with severe liver failure, progressing to liver transplant or death

Acetaminophen

• Toxic dose:
  – 200 mg/kg
  – Jake: 4 Vicodin or Tylenol tablets, or 60 mL Tylenol elixir
• Conclusion:
  – Tylenol isn’t the benign medication we think it is...
  – Lock it up!
  – Carefully measure out doses to kids
DIZZY MISS LIZZIE

The blockers

- Calcium channel blockers, beta blockers
- Used to treat high blood pressure, atrial fibrillation, even migraines
- Calcium channel blockers: amlodipine, diltiazem, nifedipine, verapamil
- Beta blockers: atenolol, carvedilol, metoprolol, propranolol

The blockers

- Symptoms:
  - Dizziness, confusion, nausea and vomiting → all from low blood pressure and slow heart rate
  - Coma, seizures
  - Can have hypoglycemia or hyperglycemia
  - Wheezing in kids with asthma

The blockers

- Toxic dose:
  - Varies by medication → as little as one pill can kill a toddler or infant
- Conclusion:
  - Lock ‘em up!
  - Ask guests, especially older adults, about their meds
Sulfonylureas

- Medicine for diabetes—glipizide, glimepiride, glyburide
- Cause insulin secretion → hypoglycemia
- Symptoms: agitation, confusion, fast heart rate, sweating, seizures, coma
- 2002-2009: 1943 cases reported to California Poison Control

**SWEET AS SUGAR**

Sulfonylureas

- Toxic dose:
  - One tablet!
- Conclusion:
  - Lock ‘em up!
The ‘lines

- Tetrahydrozoline, oxymetazoline
- Visine, Afrin
- 2011 exposures in 2013 alone!
- Symptoms: low blood pressure, hypothermia, lethargy, stopping breathing, coma

The ‘lines

- Toxic dose:
  - Jake: **1.25-2.5 mL** (about a quarter of a bottle of Visine)
  - Much higher dose if bottle isn’t upright
- Conclusion:
  - Don’t use these medicines in kids!
  - Lock ’em up!
Hydrocarbons

- Solvents, degreasers, fuels, lubricants
  - Gasoline, lighter fluid, kerosene, turpentine, furniture polish
- Poisoning via choking, ingestion, inhalation, skin
- Still in the top 5...

From Source 9

Hydrocarbons

- 2010: 42,663 hydrocarbon exposures reported
- Majority in boys
- 1/3 younger than 5 years old

From Source 4
Hydrocarbons

- Symptoms:
  - Choking/coughing, trouble breathing, vomiting
- Toxic dose:
  - A few milliliters!
- Conclusion:
  - Kids will try to drink gross things.
  - Be especially careful in the summer, as kids are playing.
  - Lock ‘em up!

Opioids

- Opium, heroin, morphine, hydromorphone (Dilaudid), fentanyl, codeine, oxycodone (Percocet), hydrocodone (Vicodin, Norco), methadone
- Huge problem:
  - Death rate rose from 6.1/100,000 in 2009 to 13.8/100,000 in 2014\(^4\)
  - More than 250,000 Americans have died from opioids in the last 20 years\(^3\)
Opioids

- Symptoms:
  - Decreased respiratory rate, confusion, coma
  - Death because you stop breathing
- Toxic dose:
  - As little as one pill
- Conclusion:
  - Think twice about filling the prescription
  - Dispose of unused medicines properly
  - Lock’em up!

PARENT TIME!
Ethanol

- Alcoholic beverages, cologne, aftershave, mouthwash, perfume, hand sanitizers, medication elixirs

Symptoms:
- Nausea and vomiting, confusion, bad balance, coma, hypoglycemia
- Toddlers: hypothermia, hypoglycemia, coma at low levels

Toxic dose:
- 10-15 mL/kg beer, 4-6 mL/kg wine, 1-2 mL/kg hard liquor
- Jake: 40-60 mL wine or 10-20 mL hard liquor

Conclusion:
- Be careful with alcoholic beverages!
- Also be careful with other household products...
- Lock 'em up!
Pods

- Available in Europe since 2001, US since ~2012
- 2012-2013: 17,230 calls (6,267 in 2012, 10,963 in 2013) for exposure in kids younger than 6
- Highest among 1 and 2-year-olds
- Two deaths, 4.4% admitted to hospital
Pods

- Poisoning by ingestion, eye, skin
- Easily dissolves when exposed to saliva
- Most commonly ingested household product
- Symptoms:
  - Vomiting, coughing, rash, drowsiness, hole in esophagus

Pods

- Toxic dose: 1 pod!
- Packaging has been changed...
- Conclusion:
  - Lock ‘em up...
  - But just don’t use them if you have kids younger than 5.


EDIBLE MARIJUANA

From https://commons.wikimedia.org/wiki/File:Amsterdam-420-cannabis-products-window.jpg
Edible marijuana

- Incidence increasing!
- Colorado:
  - 2000: medical marijuana legalized
  - 2009: DOJ stopped prosecuting merchants
  - 2014: legal for recreational use

From Source 16

Edible marijuana

- Median age 2.4 yr
- 48% of known marijuana exposures were edibles
- 36% admitted to hospital
  - 21% to general pediatric ward
  - 15% to ICU
- AAP opposes legalization of marijuana
Edible marijuana

- **THC**: stimulant, sedative, or hallucinogenic effects
- Symptoms: pallor, bloodshot eyes, fine tremor, imbalance, confusion (lethargy or agitation)
- Onset 30 min to 1 hour, with peak at 2-3 hours
- Toxic dose:
  - Depends!

Edible marijuana

- Child-resistant packaging is an option...
- Conclusion:
  - Lock it up!
  - If you have kids around, reconsider buying edibles that look at all appealing.

YEP, ANOTHER CASE
Magnets

- Multiple magnets that travel together? No problem.
- Multiple magnets flying solo? Big problem.
- 2003-2006: 20 cases resulting in serious complications\(^\text{12}\) – 19 kids needed surgery and 1 died

Magnets

- Survey of pediatric surgeons\(^\text{17}\)
  - 99 reported cases
  - 32% of kids got endoscopy, 65% of which were successful
  - 72% ultimately needed surgery
  - 9% needed long term care and 1 child died
- Conclusion:
  - Don’t buy magnets for kids, even tweens.
  - More dangerous than they seem!

BUTTON BATTERIES

\(^{12}\) From https://commons.wikimedia.org/wiki/File:Coin-cells.jpg
Button batteries

- More frequent in ages 4-8
- Kids with hearing aids at increased risk
- Number of cases has remained constant, but injury and death have increased sevenfold!

Button batteries

- Toxic when in contact with a mucosal surface—mouth, esophagus, ear, nose
- Mucosa bridges positive and negative ends of the battery → current flows
- Current generates free radicals, which kill the tissue

- If swallowed, most will pass within 72 hours without issue
- If stuck in esophagus, need emergent removal
- National Battery Ingestion Hotline: 202-625-3333
- Conclusion:
  - Button batteries are dangerous!
  - A button battery stuck anywhere needs immediate removal.
A BRIEF PSA...

Safety first

- Call the Poison Control Center – 1-800-222-1222
- Helmets!
- Close the windows.
Summary

- Now that you’ve endured this talk, you can:
  1. Name several common medications which are particularly dangerous to children.
     - Aspirin, acetaminophen, the blockers, the ‘lines, sulfonylureas, hydrocarbons, opioids, ethanol
  2. Describe the risks of laundry detergent pods and edible marijuana in pediatric patients.
  3. Discuss other risky exposures in the home, and how to prevent life-threatening illness or injury for kids.

Summary

- Hopefully, now you’ve become aware of substances and items in your home which may be potentially hazardous to children, and what makes them so dangerous.

QUESTIONS?

dina.wallin@ucsf.edu

References