

## There's no place like home...

for life-threatening pediatric poisoning

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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



## 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:<sup>9</sup>
  - Poison Control Center managed 2.8 million cases
  - 59% kids 0-19 years old, 47% younger than 6 years old



Table 3(B). Population-Adjusted Exposures by Age Group

Age Group	Exposures/100k population	Number of Exposures <sup>a</sup>	Population <sup>b</sup>
<b>Children (&lt;20)</b>			
<1	2820	113,467	4,024,125
1	8243	330,931	4,014,769
2	7903	317,114	4,012,827
3	3513	141,253	4,020,406
4	1735	70,565	4,066,745
5	1031	41,943	4,066,570
Child 6-12	450	131,406	29,174,948
Teen 13-19	557	165,800	29,776,872
<b>Subgroup</b>	<b>1586</b>	<b>1,319,044</b>	<b>83,157,262</b>
<b>Adults (≥20)</b>			
20-29	410	187,749	45,761,657
30-39	353	150,285	42,555,240
40-49	291	120,856	41,583,375
50-59	265	118,283	44,655,294
60-69	237	84,330	35,581,422
70-79	251	50,015	19,899,746
80-89	293	28,692	9,793,808
90+	270	6626	2,454,291
<b>Subgroup</b>	<b>345</b>	<b>835,269</b>	<b>242,284,833</b>
<b>Overall Total</b>	<b>666</b>	<b>666</b>	<b>325,442,095</b>



From Source 9

## 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



All Ages		% <sup>a</sup>
Analgesics		11.1
Cleaning Substances (Household)		7.6
Cosmetics/Personal Care Products		7.4
Sedative/Hypnotics/Antipsychotics		5.8
Antidepressants		4.6
Antihistamines		4.1
Cardiovascular Drugs		4.0
Foreign Bodies/Toys/Miscellaneous		
Pesticides		
Topical Preparations		

Pediatric Exposures (<6 years)		% <sup>b</sup>
Cosmetics/Personal Care Products		13.6
Cleaning Substances (Household)		11.2
Analgesics		9.1
Foreign Bodies/Toys/Miscellaneous		6.5
Topical Preparations		5.3
Vitamins		4.6
Antihistamines		4.4
Pesticides		3.3
Dietary Supplements/Herbals/Homeopathic		3.0
Plants		2.7

<sup>a</sup> Based on the total number of substances reported in all exposures (N=2,591,955)

<sup>b</sup> Based on the total number of substances reported in pediatric exposures (N=1,059,993)



From Source 9

**Table 17(E). Substance Categories Most Frequently Involved in Pediatric (< 5 years) Deaths\***

Substance (Major Generic Category)	All substances	% <sup>b</sup>	Single substance exposures	% <sup>b</sup>
Analgesics	13	27.08	7	19.44
Batteries	5	10.42	5	13.69
Fumes/Gases/Vapors	5	10.42	4	11.11
Stimulants and Street Drugs	4	8.33	2	5.56
Unknown Drug	4	8.33	4	11.11
Cardiovascular drugs	3	6.25	3	8.33
Chemicals	2	4.17	1	2.78
Electrolytes and Minerals	2	4.17	1	2.78
Anticonvulsants	1	2.08	1	2.78
Antimicrobials	1	2.08	1	2.78
Cold and Cough Preparations	1	2.08	1	2.78
Deodorizers	1	2.08	1	2.78
Essential Oils	1	2.08	1	2.78
Eye/Ear/Nose/Throat Preparations	1	2.08	1	2.78
Industrial Cleaners	1	2.08	1	2.78
Other/Unknown Non-drug Substances	1	2.08	1	2.78
Pesticides	1	2.08	1	2.78
Sedative/Hypnotics/Antipsychotics	1	2.08	0	0.00
<b>Total</b>	<b>48</b>	<b>100.00</b>	<b>36</b>	<b>100.00</b>

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San Francisco

From Source 9

**PREVENTION**

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- 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
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**TIME FOR A LITTLE GAME...**

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### Which is more dangerous?

- Calamine lotion or citronella candle?
  - Citronella!
- 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!



PRODUCTS THAT ARE NON-TOXIC WHEN INGESTED IN SMALL AMOUNTS

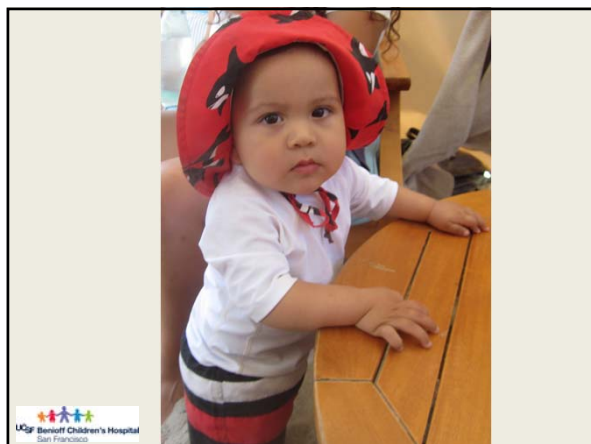
Abrasives	Hand lotions and creams
Adhesives	Hydrogen peroxide (medical 3%)
Antacids	Incense
Antibiotics	Indelible markers
Baby product cosmetics	Ink (black, blue)
Ballpoint pen inks	Laxatives
Bath oil	Lipstick
Barhtub floating toys	Lubricating oils
Bleach (less than 5% sodium hypochlorite)	Magic Markers
Body conditioners	Matches
Bubble bath soaps	Mineral oil
Calamine lotion	Newspaper (black and white pages)
Candles (beeswax or paraffin)	Paint (indoor, latex)
Caps	Pencil (graphite)
Chalk	Perfumes
Cigarettes (less than 3 butts)	Petroleum jelly
Clay (modeling)	Phenolphthalein laxatives (Ex-Lax)
Colognes	Porous-tip marking pens
Contraceptive pills	Putty (less than 2 oz)
Corticosteroids	Rubber cement
Cosmetics	Shampoos (liquid)
Crayons (marked AP, CP)	Shaving creams and lotions
Dehumidifying packets (silica or charcoal)	Soap and soap products
Detergents (phosphate)	Suntan preparations
Deodorants	Sweetening agents (saccharin, cyclamates)
Deodorizers (spray and refrigerator)	Teething rings (water sterility)
Elmer's Glue	Thermometers (mercury)
Eck-A-Sketch	Thyroid tablets
Eye makeup	Toothpaste
Fabric softener	Vitamins (without iron)
Fertilizers (if no insecticides or herbicides added)	Warfarin (rat poison; excludes "superwarfarins")
Glues and pastes	Watercolors
Grease	Zinc oxide (Desitin)
Hair products (dyes, sprays, tonics; excludes "relaxers")	Zincium oxide



From Source 12

### THE KILLERS





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






**SWEET AS SUGAR**



## 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



**TABLE 1** Frequency of Clinical Characteristics in 300 Cases of Pediatric Sulfonylurea Exposure Causing Hypoglycemia


Characteristic	No. (%) of Cases
<b>Age, y</b>	
<1	6 (2.0)
1–2	142 (47)
2–3	110 (37)
3–4 y	38 (13)
≥4	4 (1.3)
<b>Symptoms</b>	
Asymptomatic (other than hypoglycemia)	251 (84)
Altered mental status	41 (14)
Diaphoresis	10 (3.3)
Vomiting	5 (1.7)
Seizure	5 (1.7)

From Source 8



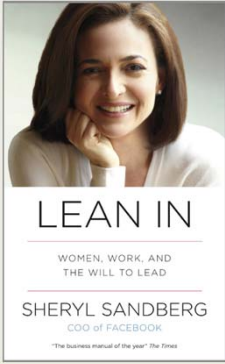
## Sulfonylureas

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





'LINE IN...



The image shows the cover of the book 'Lean In: Women, Work, and the Will to Lead' by Sheryl Sandberg, COO of Facebook. The cover features a portrait of Sandberg and the title in large letters. Below the title, it says 'WOMEN, WORK, AND THE WILL TO LEAD' and 'SHERYL SANDBERG COO of FACEBOOK'. A quote at the bottom reads: 'The business manual of the year' The Times.

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### The 'lines

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

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### 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<sup>10</sup>
- Conclusion:
  - Don't use these medicines in kids!
  - Lock 'em up!

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The image shows a young child sitting at a wooden table, playing with a clear plastic water bottle. The child is holding the bottle and appears to be trying to open it. A full water bottle is also on the table next to the child.

ANOTHER CASE...

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## Hydrocarbons

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



Table 17(E). Substance Categories Most Frequently Involved in Pediatric (< 5 years) Deaths<sup>a</sup>

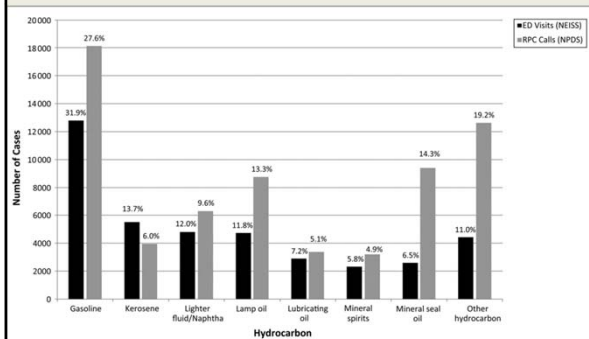
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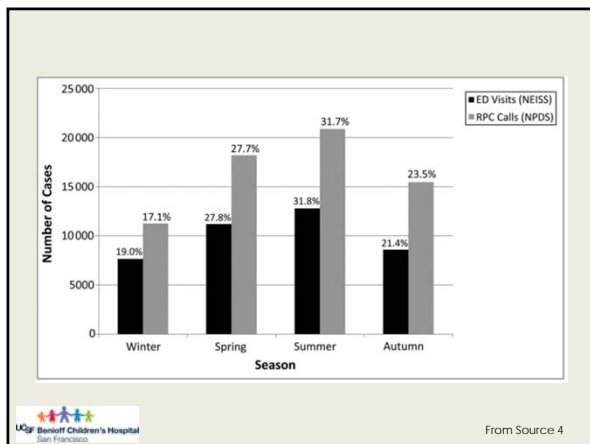
From Source 9

## Hydrocarbons

- 2010: 42,663 hydrocarbon exposures reported<sup>4</sup>
- 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!



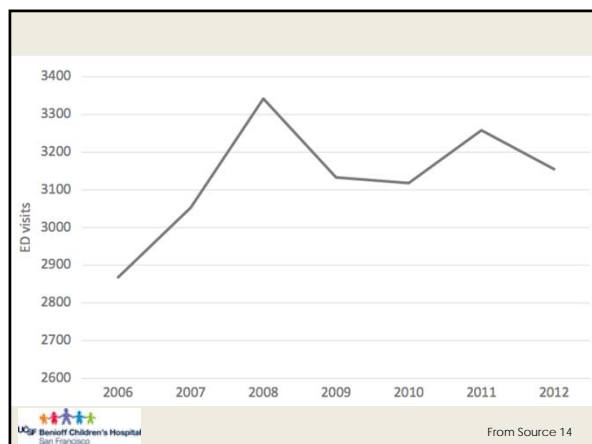
**SWEET DREAMS!**



## 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<sup>14</sup>
  - More than 250,000 Americans have died from opioids in the last 20 years<sup>3</sup>





## Opioids

- Roughly 7,000 people are treated per **day** in the ED for opioid misuse<sup>3</sup>
  - In 2011, 19% of all opioid-related visits were pediatric patients<sup>14</sup>
  - From 2006-2012, 928 ED visits for poisoning by prescription opioids in kids younger than 18, **62% unintentional**
  - Kids whose moms were prescribed an opioid were 2.4 times more likely to overdose<sup>3</sup>
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## 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!
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**PARTY TIME!**

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## Ethanol

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



Table 1. Ethanol Content of Common Household Products

Category	Item	Percentage of Ethanol
Medicinal (over the counter)	Tempra syrup and drops	10%
	Tylenol liquid	7%
	Listerine	24%
	Benedryl	14%
	Nyquil	10.0%
	Robussin	3.5%
Cosmetics	Petro Biome	0%
	L'Oréal Féria Hair Colour	<2%
	Cover Girl Lash Blast Luxe Mascara	0.5%-1.5%
	John Frieda Luxious Volume All-Out Hold Hairspray	50%-75%
	Avon Clearskin Targeted Blemish	9.99%
	Avon Sunblock Spray, Continuous	9.50%
	Hugo Boss Cologne Boss No. 6	60%-100%
	Avon Moisture Effective Eye Makeup	60%-98%
	Pantene Pro-V Style Texturize Ultimate	30%-60%
	Listerine Antiseptic Mouthwash, Fresh Burst	20%-30%
Hygiene	Clay Regenerist Daily Cleanser	0.1%-1%
	Lush Speed Sock 347 Antiperspirant and Deodorant Gel, Fresh Fusion	5%-10%
	Old Spice Classic Stick, Original Scent	40%-100%
	Clearexil Soapfree Deep Cleansing Scrub	0.1%-1%
	Noxzema 2 in 1 Pads Extra Strength	40%-45%
	Axe Deodorant Body Spray, Fever (aerosol)	10%-30%
	Scope Mouthwash and Gargle, Original Mint	40%-45%
	Dial Hand Sanitizer	62%
	Softsoap Hand Sanitizer Gel	60%-65%
	Wet Ones Antibacterial Moist Towelettes	9.6%
Cleaning	Static Guard	70%-72%
	Quat Air Sanitizer, Outdoor Scent	60%-70%
	Lysol Neutra Air Sanitizing Aerosol Spray	20%-25%
	Swiffer WetJet Wood Cleaner	1%-4%
	Raid Max Concentrated Deep Reach Fogger	7%-13%
	Dawn with Odor Eraser, Splash of Lime, Liquid Hand Dishwashing Detergent	1%-5%
	Glade Sense and Spray Automatic Spray	1%-2%
	Tide Free Ultra Liquid	55%-60%
	Lysol Brand Disinfectant Spray, Aerosol Country Scent	55%-60%
	Clorox Green Works Natural Dilutable Cleaner	1%-3%

From Source 13



## Ethanol

- 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



## Ethanol

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





**GUESS WHAT- ANOTHER CASE.**




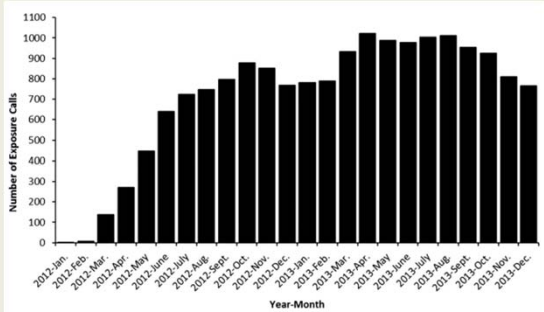

**LAUNDRY DETERGENT PODS**




From <http://www.goodhousekeeping.com/home-products/laundry-detergents/a36470/best-laundry-packets>

### Pods

- Available in Europe since 2001, US since ~2012
- 2012-2013: 17,230 calls (6267 in 2012, 10,963 in 2013) for exposure in kids younger than 6<sup>15</sup>
- Highest among 1 and 2-year-olds
- Two deaths, 4.4% admitted to hospital

Year-Month	Number of Exposure Calls (Approximate)
2012-Jan	0
2012-Feb	0
2012-Mar	150
2012-Apr	280
2012-May	450
2012-June	650
2012-July	720
2012-Aug	750
2012-Sept	800
2012-Oct	850
2012-Nov	880
2012-Dec	850
2013-Jan	800
2013-Feb	800
2013-Mar	900
2013-Apr	1000
2013-May	950
2013-June	950
2013-July	950
2013-Aug	950
2013-Sept	900
2013-Oct	850
2013-Nov	800
2013-Dec	750



From Source 15

## 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.



### Weed Candy Wreaks Havoc on San Francisco Quinceañera

George Donny



The 'C' shaped gummy rings served at the birthday party. (Image: San Francisco Department of Public Health)

San Francisco police are investigating an incident at a quinceañera that sent 19 people, including a six year old, to the hospital after they unknowingly ate marijuana-laced gummies. Sadly, it's not an isolated incident—and it's a problem that's only getting worse.



From <http://gizmodo.com/weed-candy-wreaks-havoc-on-san-francisco-quinceanera-1785041304>



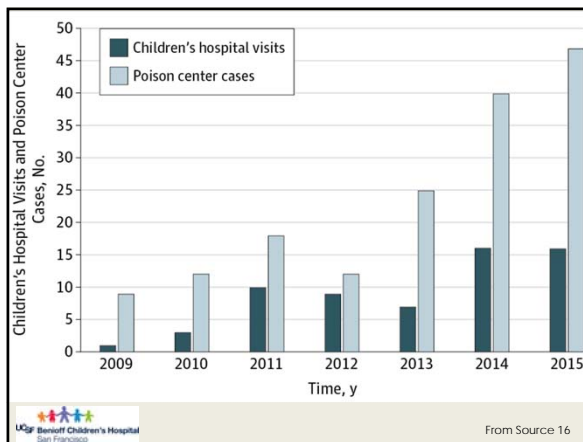
## EDIBLE MARIJUANA



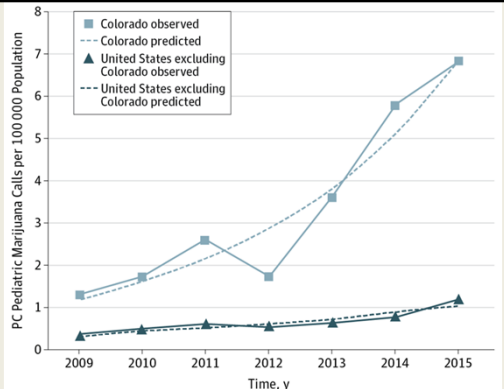
From <https://commons.wikimedia.org/wiki/File:Amsterdam-420-cannabis-products-window.jpg>

## Edible marijuana

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



From Source 16



From Source 14

## 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

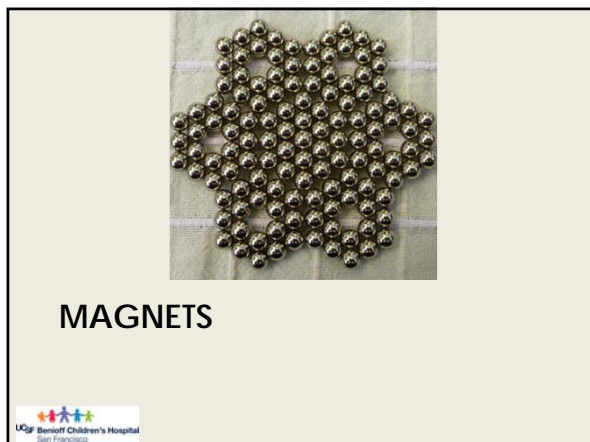
- Child-resistant packaging is an option...
- Conclusion:
  - Lock it up!
  - If you have kids around, reconsider buying edibles that look at all appealing.



**YEP, ANOTHER CASE**



From Source 2



## Magnets

- Single magnet? No problem.
- Multiple magnets that travel together? No problem.
- Multiple magnets flying solo? Big problem.
- 2003-2006: 20 cases resulting in serious complications<sup>12</sup>
  - 19 kids needed surgery and 1 died

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## Magnets

- Survey of pediatric surgeons<sup>17</sup>
  - 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!

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**BUTTON BATTERIES**

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From  
[https://commons.wikimedia.org/wiki/File:C-46\\_cells.jpg](https://commons.wikimedia.org/wiki/File:C-46_cells.jpg)

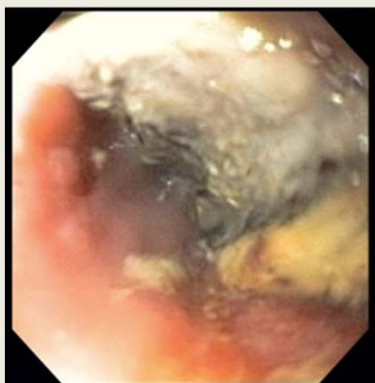
## Button batteries

- 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

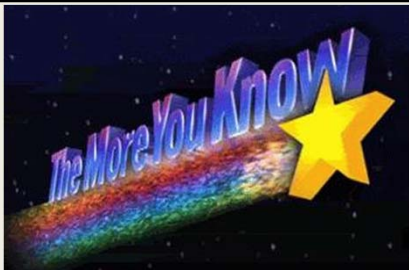


From Source 6


## Button batteries

- 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...**





Up & Away is an initiative of PROTECT in partnership with the Centers for Disease Control and Prevention (CDC).

**UpAndAway.org**





**Safety first**

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



**SUMMARY**



## 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, sulfonyleureas, 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.



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**QUESTIONS?**



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