

Drugs of Abuse



Annie Duncan

Nurse Manager

RN, BSN, CEN, CSPI

Oregon Poison
Center



Today's Presentation

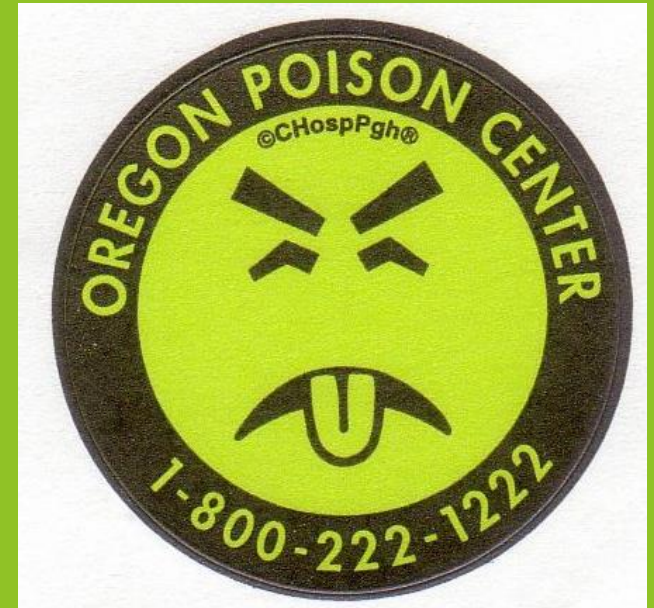


- Oregon Poison Center Services
- Drugs of Abuse
 - Fentanyl
 - Methamphetamines
 - Marijuana
 - Xylazine

Mission of Poison Control Centers

1-800-222-1222

“To promote the reduction of morbidity and mortality from poisonings”

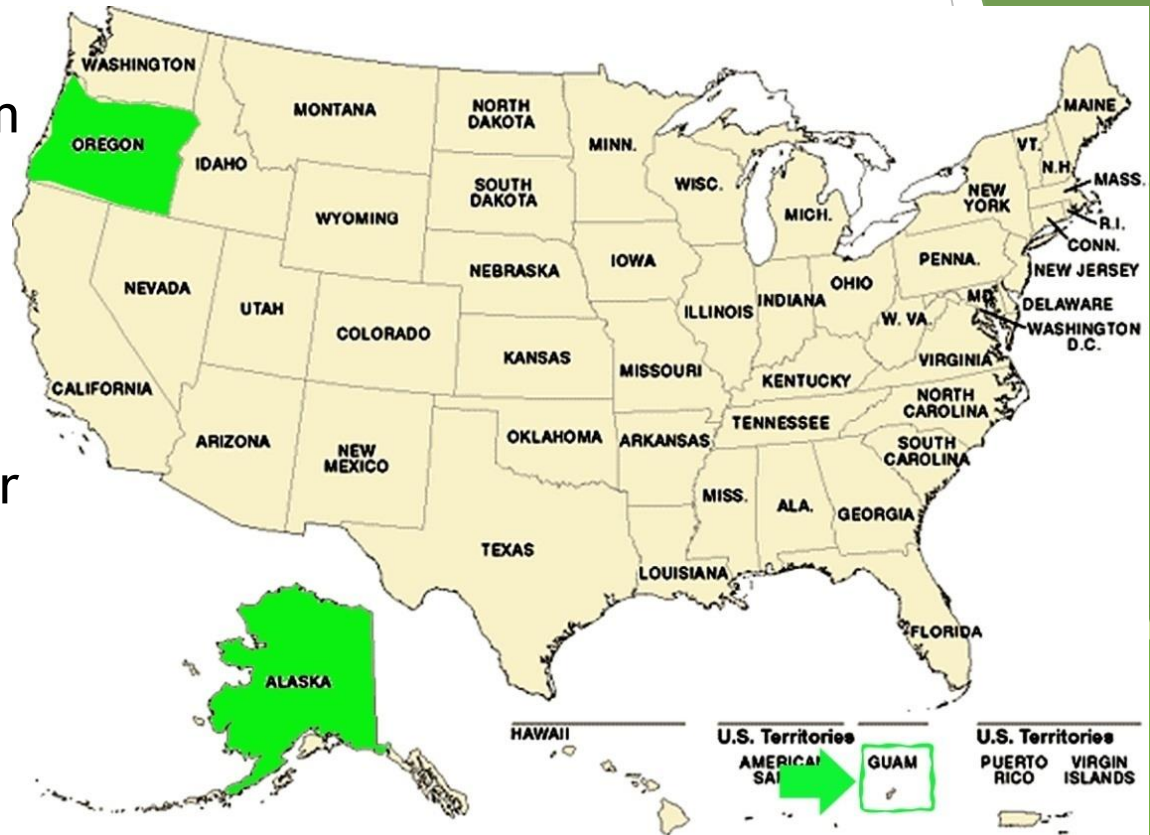


Oregon Poison Center Service Area

Oregon, Alaska, Guam

>5 million people

>48,000 calls per year



America's Poison Centers (formally AAPCC)

- First US PC: Chicago 1953
- 55 poison centers in the US
 - Serve 50 states
 - District of Columbia
 - Puerto Rico
 - American Samoa
 - Micronesia
 - Guam
 - U.S. Virgin Islands
- Oregon Poison Center
 - Established in 1978



Who are we?



Oregon Poison Center @ OHSU

- 28 SPLs & CSPLs
 - Pharmacists and Registered Nurses
- On-Call Toxicologists
 - 24-hour access to board-certified toxicologists with backgrounds in emergency medicine



What do we do?

To provide poison information

To provide immediate treatment advice
and management for poison emergencies

To provide poison prevention information

To educate healthcare professionals and
students

24-hour service, 7 days a week

Who Calls the Poison Center?

Family members

RNs and physicians

Pharmacists

EMT/paramedics

School staff



Confidential Patient Information

- ▶ All information given to the poison center is part of a confidential record
- ▶ Federal law, HIPAA, protects the patient's privacy
- ▶ Our policy is available on request



2022

Top 5 exposure
substances (all
ages):

Analgesics

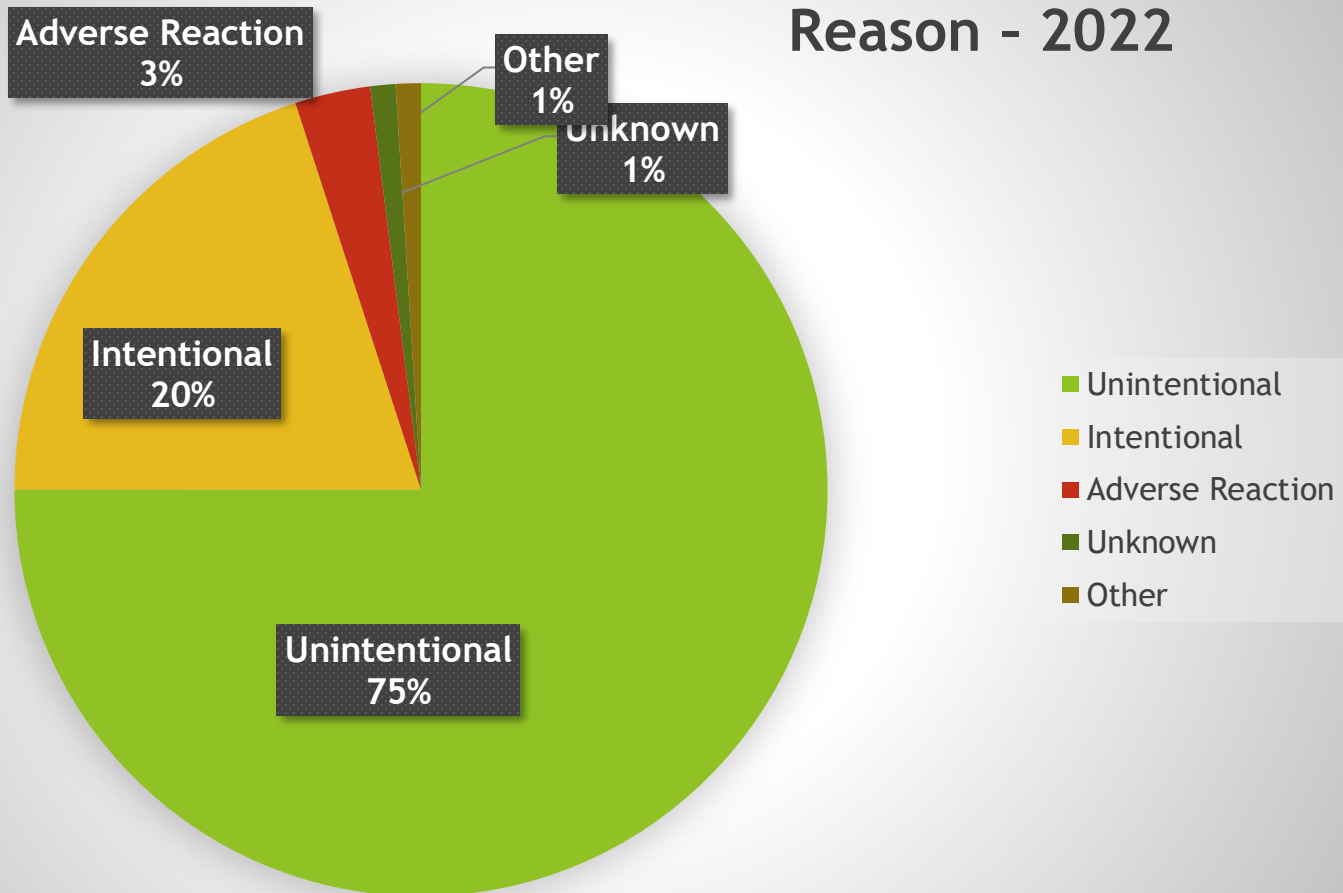
Cleaning
substances
(household)

Antidepressants

Cosmetics/
personal care
products

Cardiovascular
drugs

Reason - 2022



Top 5 substances requiring treatment in HCF



Sedatives/hypnotics/antipsychotics



Analgesics



Antidepressants



Cardiovascular Drugs



Toxic Alcohols

OPC offers *Management Recommendations*



Potential symptoms
that could occur



Measures to
ameliorate the
symptoms



Pharmacokinetics -
time to peak; half life



Fax management
overviews,
treatment fast facts



Medical back-up
available

How Long to Watch?



Peak:

The time it takes to obtain the highest level of drug concentration



Half-life:

The time it takes for $\frac{1}{2}$ the drug to be metabolized, excreted or both

Poison Centers save \$\$



In 2022, 93% of our home exposure cases were managed at home



We saved over \$27 million in health care costs. Every dollar invested in the PC system saves at least \$13.39 in medical cost.



Antidotes

- ▶ Warfarin → Vitamin K
- ▶ Benzodiazepines → Flumazenil
- ▶ Tylenol → NAC
- ▶ Opiates → Narcan
- ▶ Poppers → Methylene Blue
- ▶ Lead → Succimer
- ▶ Botulinum antitoxin → Botulism
- ▶ Rattlesnake bite → Crofab or Anavip antivenom
- ▶ Organophosphates → Atropine and 2PAM



Toxidromes:
Characteristic sets of signs & symptoms
associated with certain poisonings

Cholinergic/Anticholinergic

Sympathomimetics

Serotonin Syndrome

Opioids/CNS depressants



Drugs of Abuse



Fentanyl

Though MAX trains are replete with trace amounts of fentanyl and meth, experts say it's not enough to harm riders

HEALTH

'It's crazy out there': The reasons behind Oregon's deepening drug crisis



By Conrad Wilson (OPB)

May 30, 2023 5 a.m.

Fueled by fentanyl, the number of overdose deaths in Oregon has soared since 2019. And while the surge in overdoses is part of a national problem, the state's underfunded treatment system is struggling to provide local solutions

Oregon sees highest fentanyl overdose death increase in U.S. since 2019

Oregon officials declare state of emergency to address fentanyl crisis in Portland

Synthetic opioid deaths in Multnomah County have risen 533%, say officials.



DEA

CORRESPONDENCE



Increasing Exposure of Young Children to Illicit Fentanyl in the United States

TO THE EDITOR: Fatal overdoses of synthetic opioids, mainly fentanyl, in the United States have increased by a factor of 12 in the past 8 years to 78,207 per year.¹ Although this increase is mostly driven by intentional fentanyl use in adults² and adolescents,³ fatal poisonings in children have also increased.⁴ However, there is a paucity of data describing accidental nonfatal exposures of young children to illicit fentanyl.

The National Poison Data System (NPDS) contains medical records of exposures reported to all U.S. poison centers. The NPDS includes detailed information about exposure, symptoms, and treatment. Individual poison-center medical records include NPDS data with extensively documented case narratives. We queried the NPDS for cases of children younger than 6 years of age with exposures to fentanyl over a period of 11 years from January 1, 2013, to December 31, 2023. We excluded events that were not acute illicit fentanyl exposures specifically, including exposures to pharmaceutical products, adverse drug reactions, withdrawal responses, nonexposures, and cases in which fentanyl was not listed as the primary or secondary substance (see the Supplementary Appendix, available with

the full text of this letter at NEJM.org). We repeated an identical analysis on the Oregon Poison Center medical records. Both authors independently examined the case narratives to determine whether the exposure was confirmed to be illicit fentanyl by history or laboratory, and differences were resolved by discussion and agreement.

In the national database, we identified 1466 cases of illicit fentanyl exposure in children younger than 6 years of age. Annual reported cases increased from 5 in 2013 to 539 in 2023 (Fig. 1). The mean age of exposed children over the 11-year period was 1.6 years, and most children (1238; 84.4%) were 2 years of age or younger. Most had severe effects; 926 (63.2%) had central nervous system depression (were unarousable with stimuli), 916 (62.5%) received naloxone, 727 (49.6%) had respiratory depression or arrest, 142 (9.7%) received cardiopulmonary resuscitation, and 51 died (3.5%). Most children (1202; 82.0%) were exposed to illicit fentanyl in their homes. These data do not reflect the total number of cases in the country, as indicated by a statement from the NPDS (see the Supplementary Appendix).

From the Oregon Poison Center, we identified 27 cases in children younger than 6 years of age over the same period as the NPDS epoch used above. The median age was 1.2 years, and 25 (93%) of the children were exposed in their homes. All had confirmed exposure to illicit fentanyl by history, 21 (78%) had confirmatory fentanyl drug testing, and 8 (30%) were witnessed to handle or ingest fentanyl-containing counterfeit pills.⁴

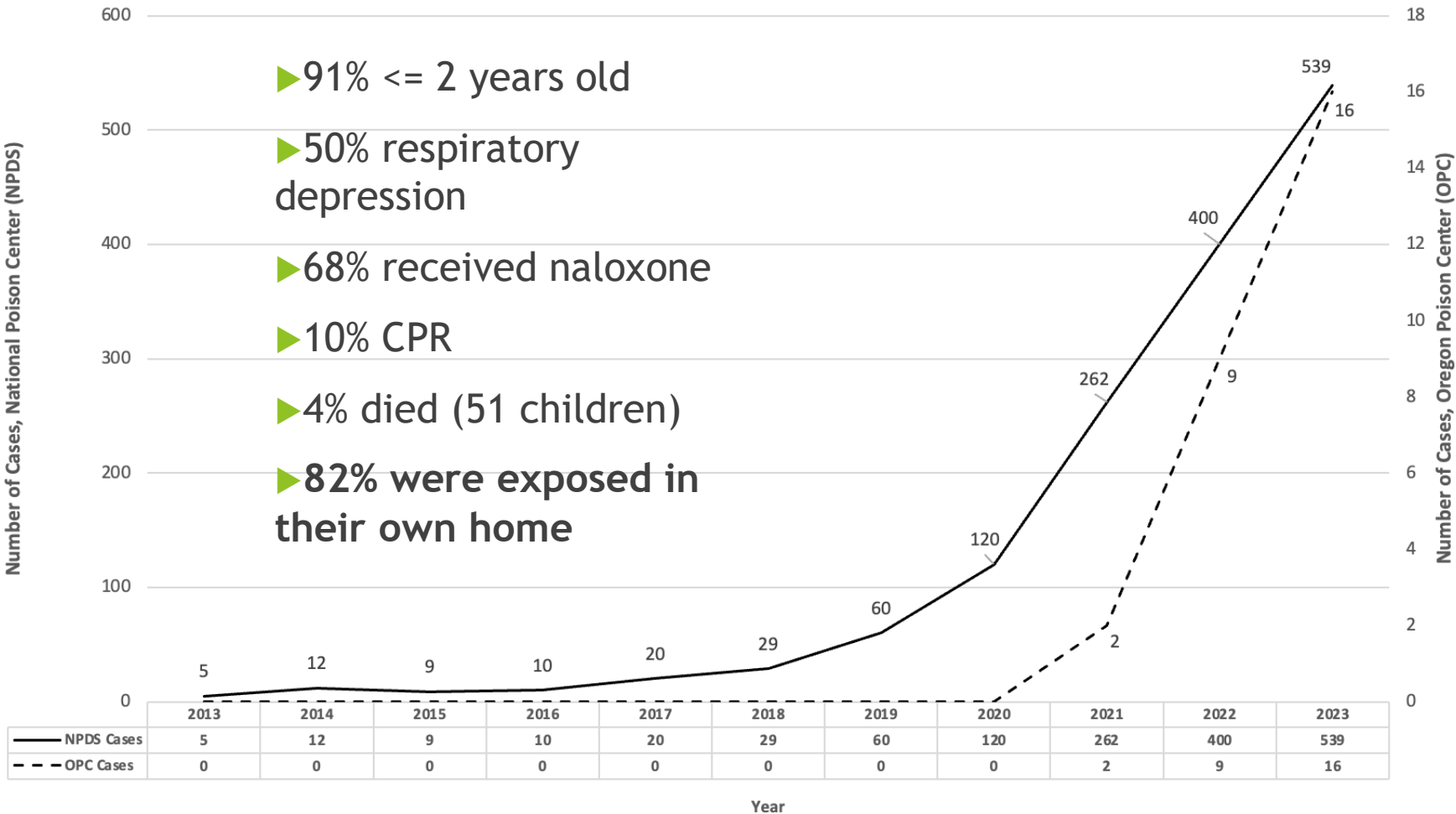
We found a substantial increase in reported exposures to illicit fentanyl in children younger

THIS WEEK'S LETTERS

- 956 Increasing Exposure of Young Children to Illicit Fentanyl in the United States
- 957 Actionable Genotypes and Life Span in Iceland
- 960 Transfusion Strategy in Myocardial Infarction and Anemia
- 962 Digital Technology for Diabetes

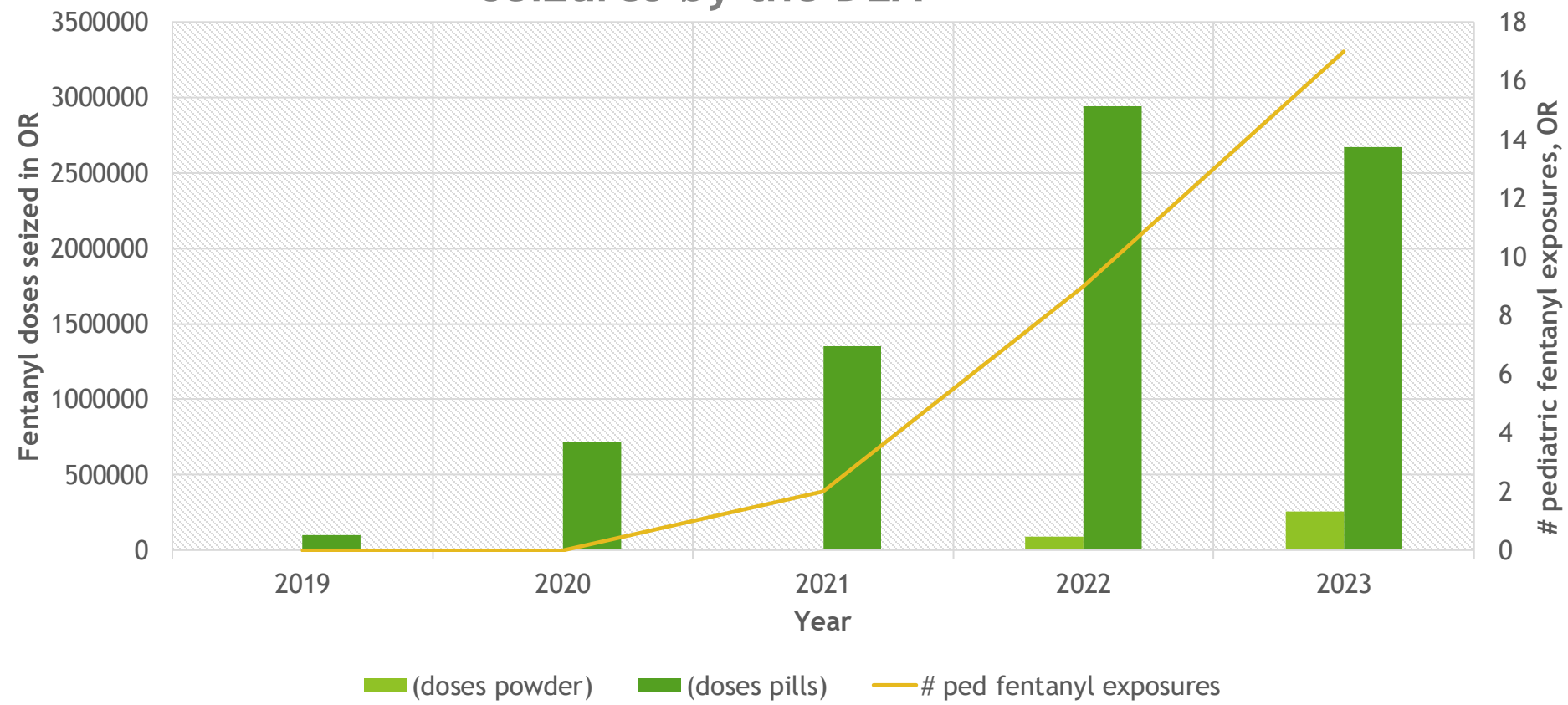
Fentanyl in small children

Illicit fentanyl exposures in children < 6 years by year



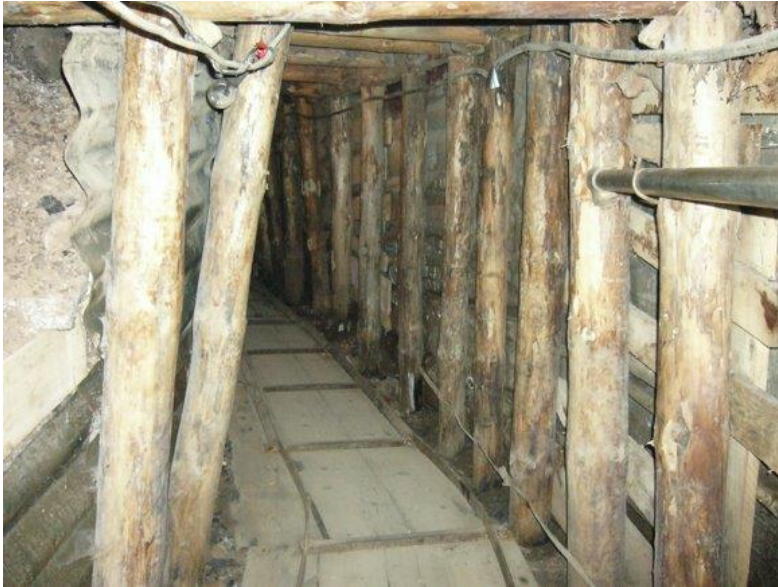
Fentanyl

Pediatric fentanyl exposures compared to fentanyl seizures by the DEA



Illicit fentanyl

- Manufactured in Mexico and transported to the US.



Illicit fentanyl



Illicit fentanyl



UCSF Mt Zion Cancer
Research Building
2340 Sutter St.
Room S-271
San Francisco, CA 94115
Tel #: (415) 502-1446

Date: 04/01/2024
Date Samples Submitted: 03/07/2024
DEA Sample ID: DEA-2024-1697
Contract: Samples Analyzed for the Drug Enforcement Administration (DEA)
(contract #: 15DDHQ19F0000086)
Sample Origin: Oregon Health & Science University Hospital, Portland, OR
Testing Requested: Comprehensive Drug Analysis
Analytical Platform: LC-Quadrupole Time-of-Flight Mass Spectrometer (Agilent
LC1260- QTOF/MS 6550)

Findings: Drug Product:
Drug Product ID: DEA-2024-1697-240214-OR-97229-002-DP1
Description: Blue Pill with "M30" markings.
TOTAL WEIGHT EXHIBIT: 105.0mg



Analytical Results:

| Confirmed Drug | Percentage within Drug Product | Actual Amount within Drug Product | Total Weight of Sample |
|-----------------|--------------------------------|-----------------------------------|------------------------|
| Acetaminophen | 69.5% | 73.0mg | 105.0mg |
| Fentanyl | 1.8% | 1.8mg | |
| Methamphetamine | 0.15% | 0.15mg | |

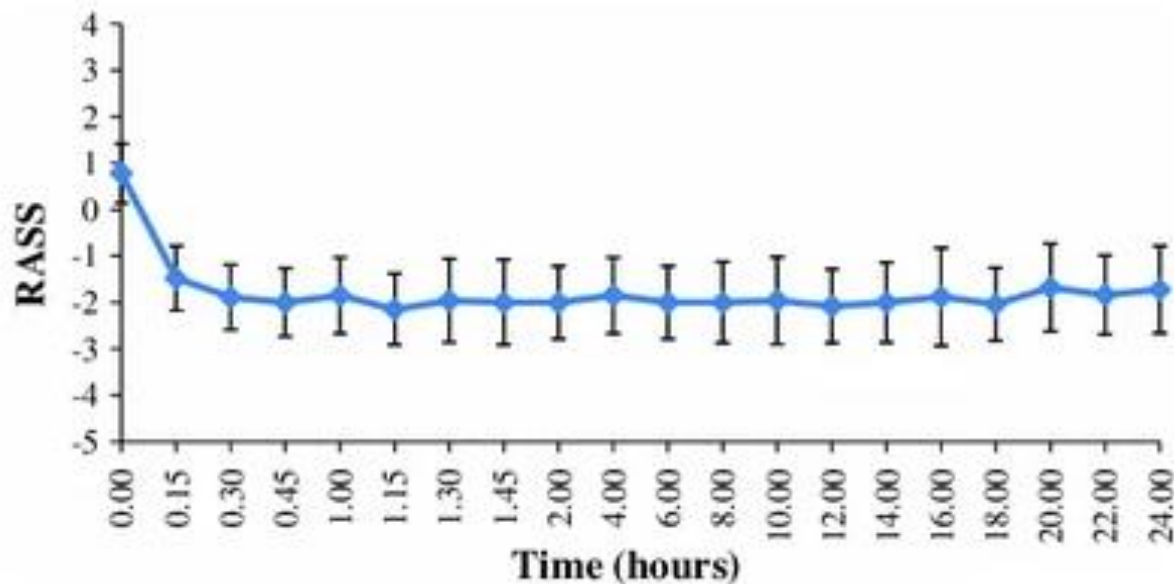
Fentanyl

- ▶ How do children get exposed?
 - ▶ Ingestion of pill
 - ▶ Ingestion of powder
- ▶ Our NPDS/OPC study:
 - ▶ 80% exposed at home
 - ▶ 91% < 2 years old



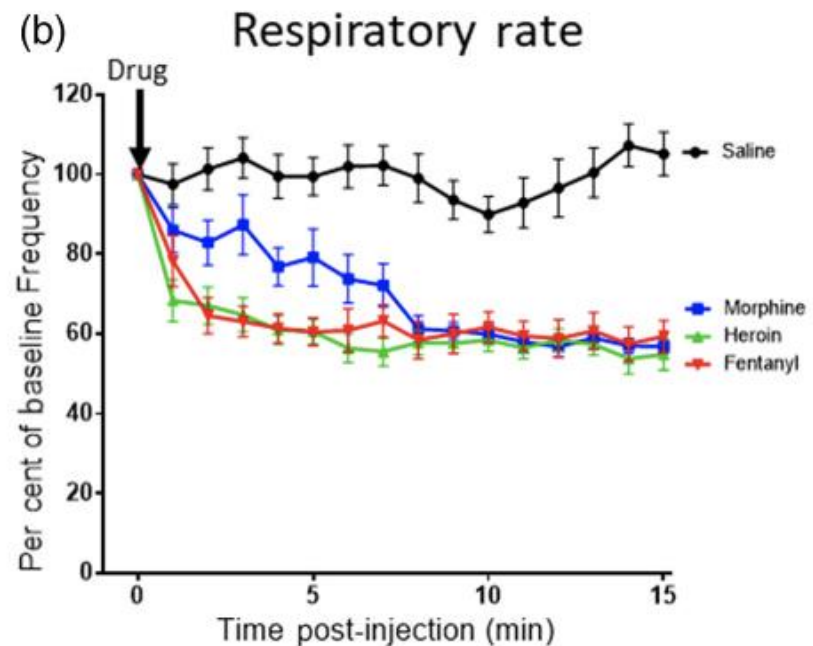
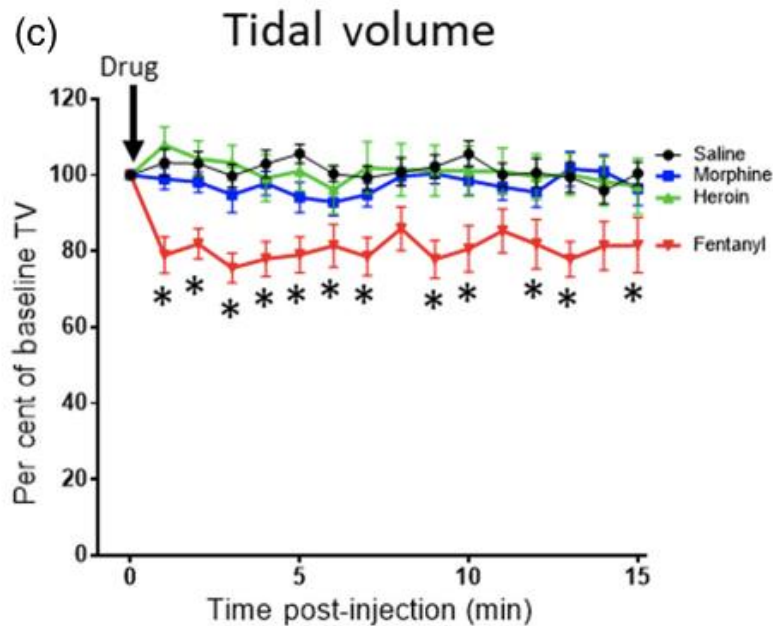
Fentanyl - clinical effects

- ▶ Clinical effects of oral ingestion:
 - ▶ CNS sedation



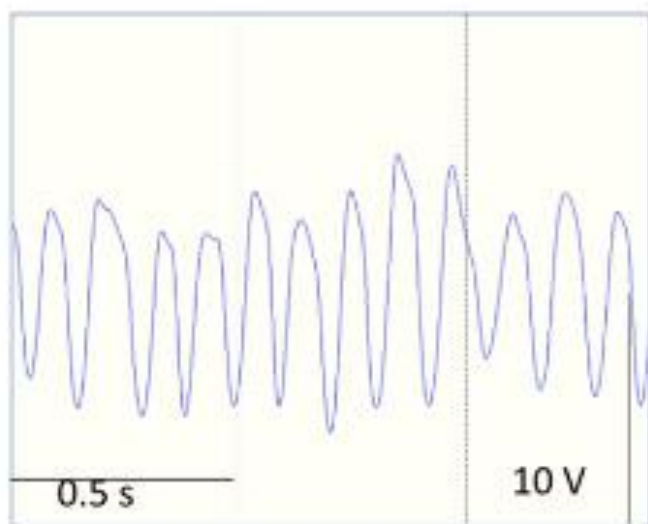
Fentanyl

- Clinical effects of oral ingestion:
 - CNS sedation
 - Decreased tidal volume & RR

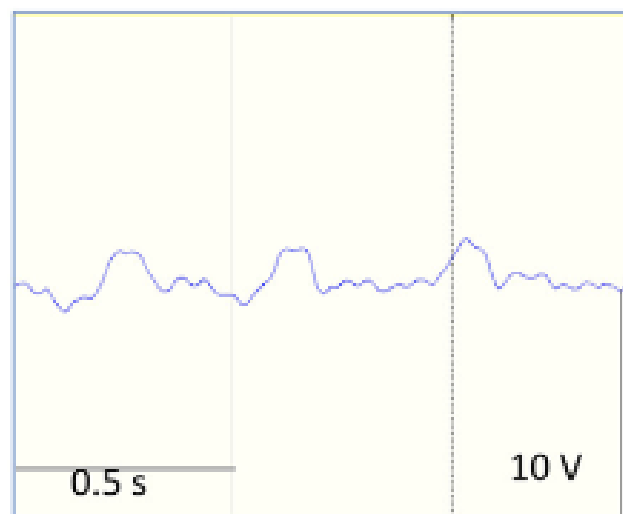


Fentanyl

- Clinical effects of oral ingestion:
 - CNS sedation
 - Decreased tidal volume & RR



Normal respiration

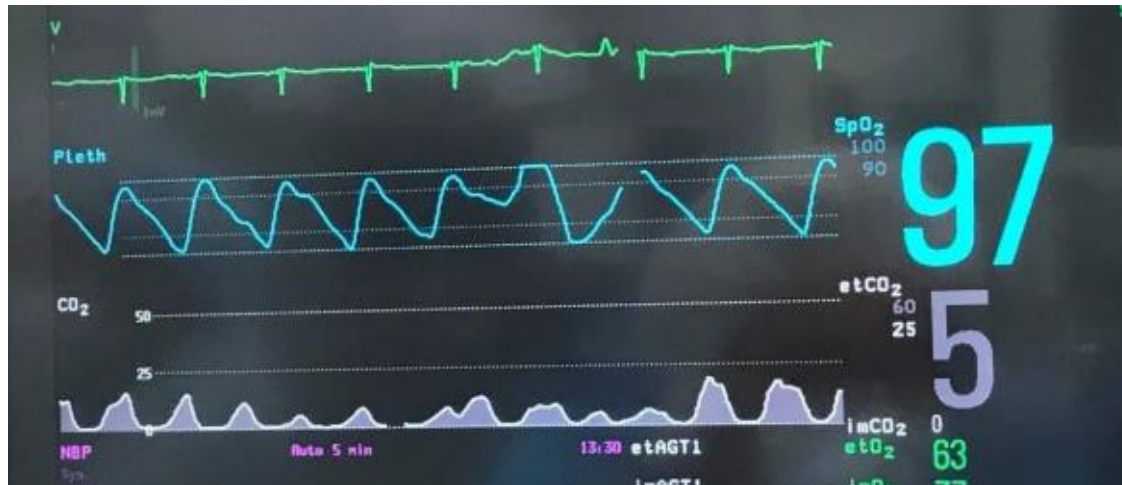


Max. fentanyl ($1.35 \text{ mg} \cdot \text{kg}^{-1}$)
respiratory depression



Fentanyl

- Clinical effects of oral ingestion:
 - CNS sedation
 - Decreased tidal volume & RR
 - Hypoventilation and apnea
 - Capnography
 - O₂ saturation



Fentanyl - clinical effects

- ▶ Prolonged toxicity
- ▶ May have repeated apnea and respiratory depression for days
 - Half-life = 3-7h
 - Metabolized by enzyme CYP3A4
 - May be prolonged (toxicokinetics)
 - Dose is large



Naloxone



Serving Oregon, Alaska & Guam

Naloxone

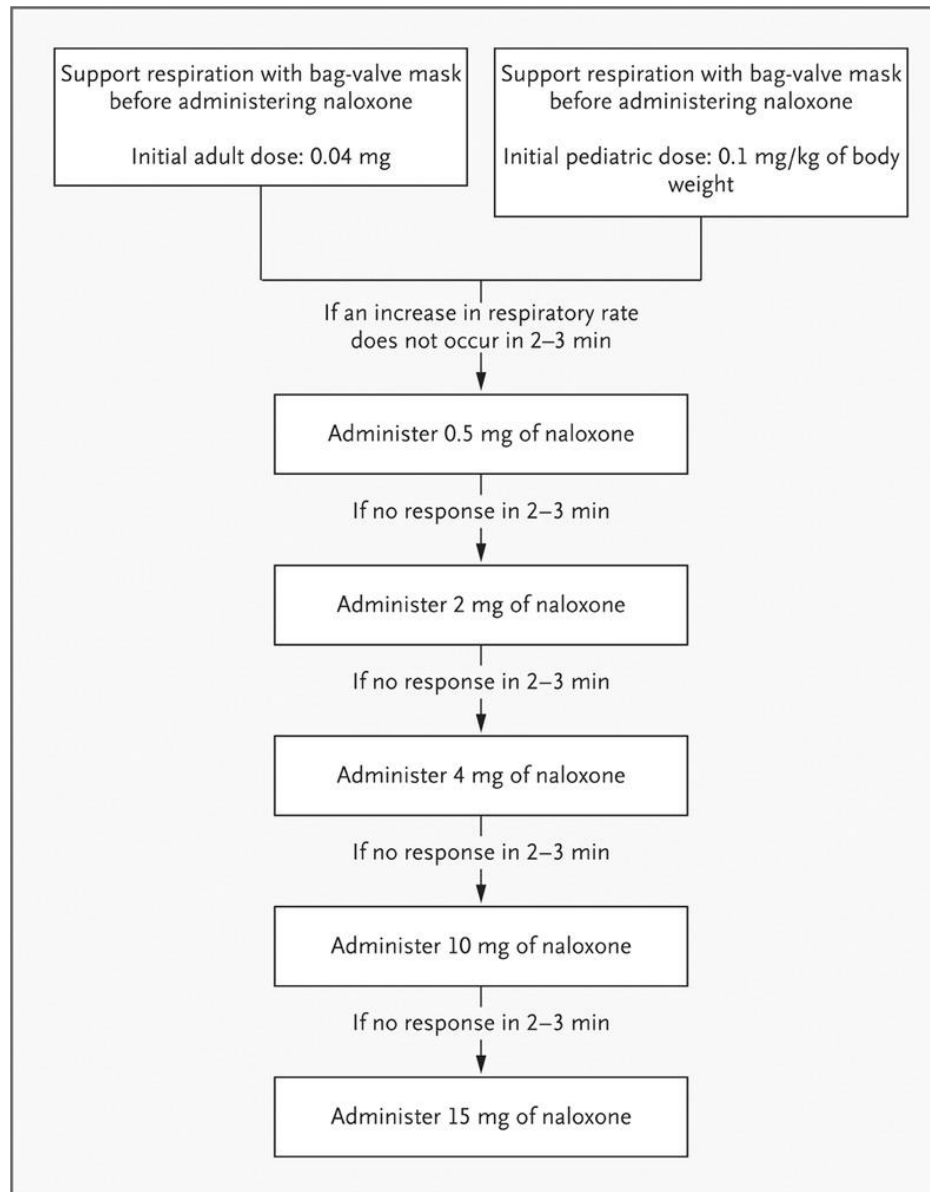
- ▶ Opioid receptor antagonist
 - Competitive
 - Titrated to [opioid]
 - Reverses the respiratory depression and CNS depression
 - Fentanyl does not require high doses of naloxone, but large overdoses do



Naloxone

- ▶ Dose for fentanyl:
 - Recreational adolescent/adult overdoses
 - Lowest naloxone dose needed to reverse apnea
 - Accidental pediatric overdoses
 - Still lowest dose needed
 - High likelihood of needing large naloxone dose
 - Little risk of precipitated withdrawal





Naloxone

- ▶ Things that interfere with my perfect naloxone plan:
 - Aspiration
 - Co-ingestions

Fentanyl in small children

- ▶ Treat the adult who used fentanyl
- ▶ Risk reduction:
 - ▶ Expand poison prevention teaching to adults with opioid use disorder who have contact with children
 - Up and away

Up and Away



Up and Away

Safe Medicine Storage for: Parents

Put your medicines
up^{and}away
and out of sight



Medicines and vitamins help families feel well and stay well, but children are curious; to keep them safe, parents and caregivers must practice safe medicine storage. Always put every medicine, vitamin, and supplement—especially those in gummy form—up and away every time you use it, including those you use every day, even between doses.

<https://upandaway.org/en/>

Fentanyl in small children

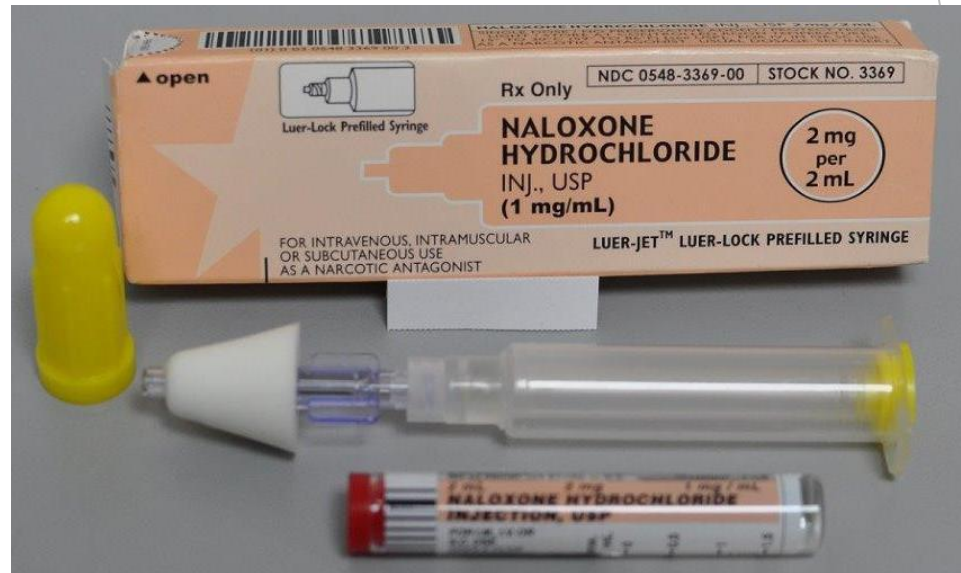
- ▶ Treat the adult who used fentanyl
- ▶ Risk reduction:
 - ▶ Expand poison prevention teaching to adults with opioid use disorder who have contact with children
 - Up and away
 - ▶ Lock-box
 - ▶ Lockable bags

Fentanyl in small children



Fentanyl in small children

- ▶ Naloxone in the home
 - ▶ For anyone with opioid use disorder
 - ▶ Provide information on how to use (or have the pharmacist do so) to the other members of the family
 - ▶ Use adult naloxone on children



Drugs of Abuse

Methamphetamines

Methamphetamine



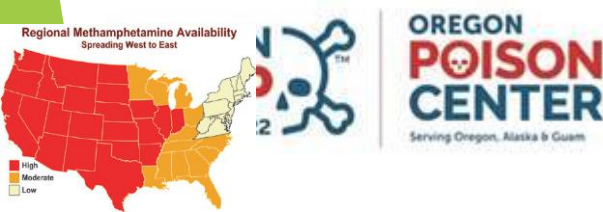
Methamphetamine Crystals

Photo by Slut, © 2001 Erowid.org



Methamphetamine history

- ▶ Pre-2000s: Methamphetamine was locally produced throughout the country by small labs
- ▶ Operated by independent dealers/users or by motorcycle gangs
- ▶ These are now very rare



Methamphetamine history

- ▶ Late 1990s / early 2000s
- ▶ “Superlabs”
- ▶ Run by Mexican criminal organizations



**POISON
HELP**
1-800-222-1222



**OREGON
POISON
CENTER**
Serving Oregon, Alaska & Guam



Meth distribution

- ▶ Almost all methamphetamine is produced in Mexico and trafficked over the border.

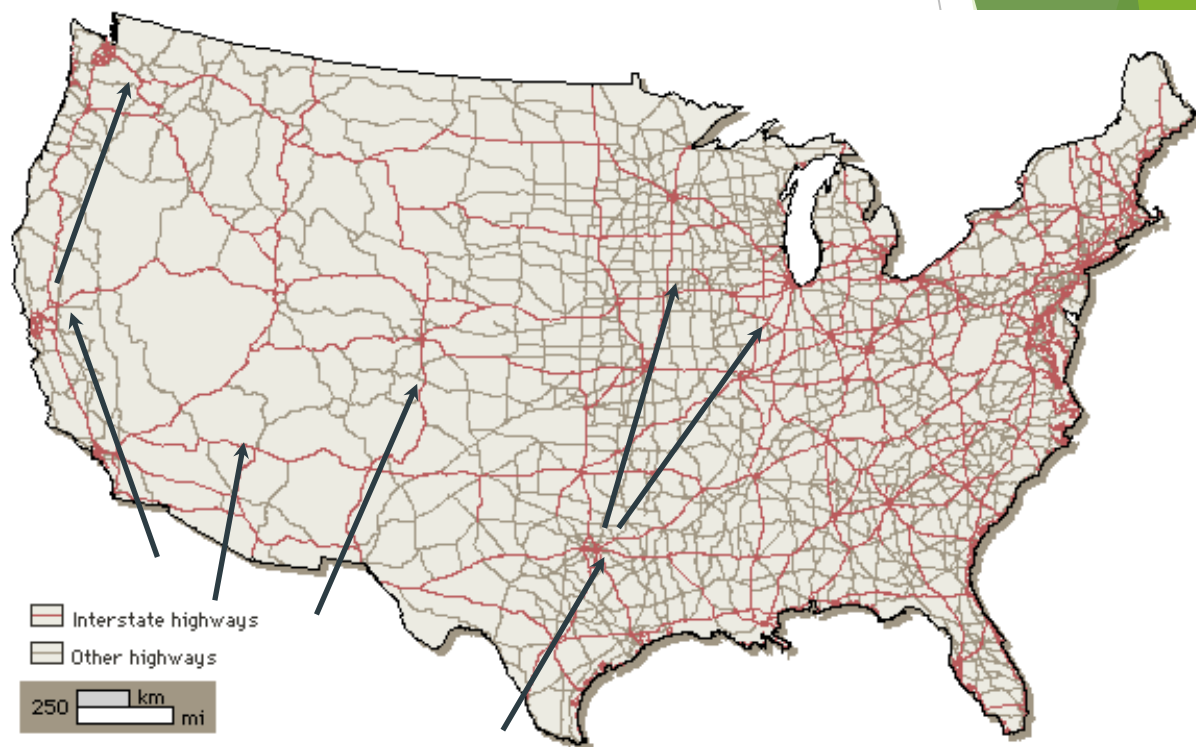


Image: Encarta / Microsoft corp

Crystal Meth

- ▶ AKA “Crystal” or “Ice”
- ▶ Crystal meth is NOT the free base form
- ▶ “Ice” is somewhat purer methamphetamine which allows it to crystallize and is easier to smoke

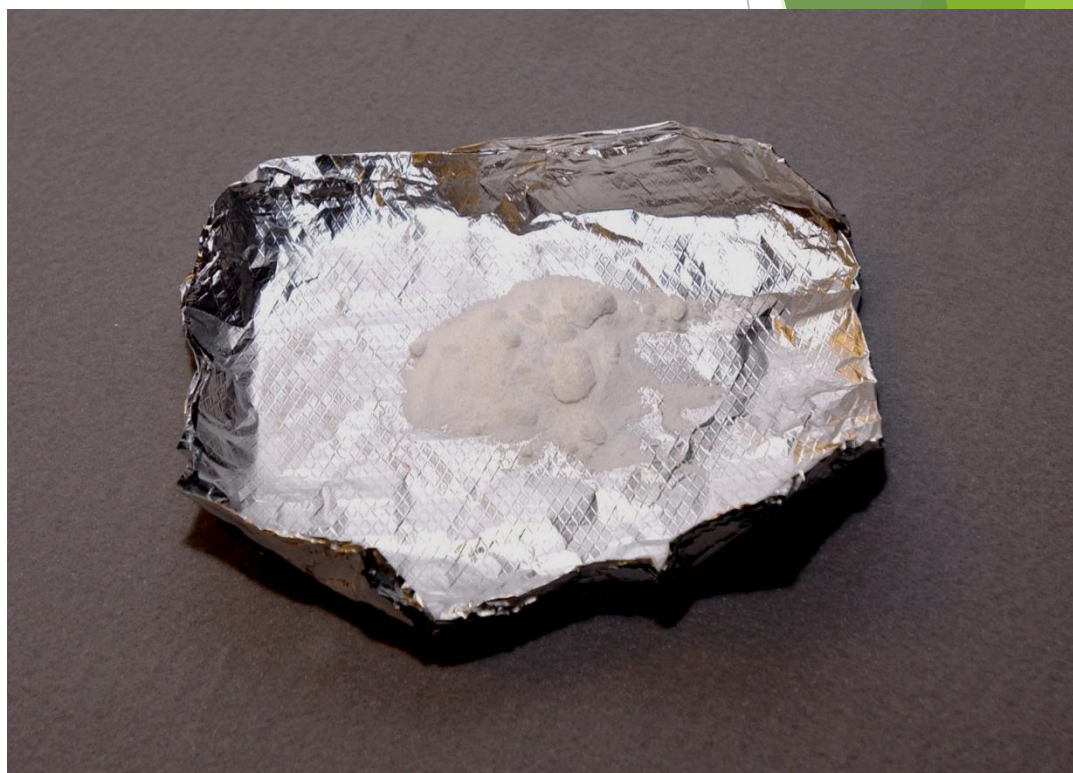


Methamphetamine crystals
Photo by Payin2Much, © 2002 Erowid.org



Methamphetamine

- ▶ Insufflated (snorted)
- ▶ **Smoked** / Vaporized
- ▶ Ingested (PO tablets)
- ▶ **Injected** (IV or SC)



Acute presentations

- ▶ Symptoms related to acute methamphetamine / stimulant use:
 - ▶ Palpitations
 - ▶ Anxiety
 - ▶ Hypertension
 - ▶ Headaches
 - ▶ Psychosis
 - ▶ CVA
 - ▶ Chest pain/MI



ED presentations

- ▶ **Tweaking:**
 - ▶ Paranoia
 - ▶ Psychosis
 - ▶ Aggressive behavior



Photo: The Oregonian

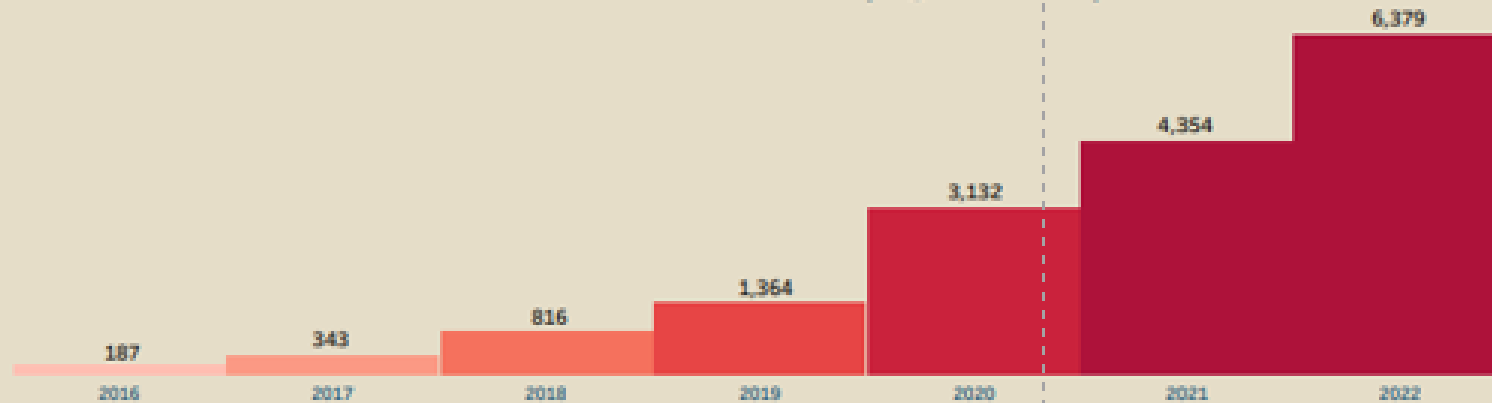


Drugs of Abuse

Marijuana

Cannabis Edibles

Recent Category Profile
CANNABIS EDIBLES (Ages 0-12)



Drugs of Abuse

Xylazine

Xylazine

- ▶ Xylazine is an **animal** tranquilizer with sedative, analgesic, and muscle relaxant properties.
- ▶ **ADULTERANT:** In recent years, xylazine has emerged as an adulterant in drugs of abuse, such as heroin or speedball (a cocaine and heroin mixture).
- ▶ Deaths have been reported.



Xylazine

► OVERDOSE

- Not used in humans due to marked hypotension
- The primary toxic effects seen after acute overdose with xylazine are hypotension, bradycardia, and respiratory depression.

► CHRONIC EXPOSURE

- Xylazine-associated skin injury and infection, including necrotic skin ulcerations and osteomyelitis, have been reported after chronic use. These wounds may occur at or remote from injection sites and irrespective of the route of exposure.

Xylazine


- ▶ Treatment is symptomatic and supportive
- ▶ Warning – the next slide shows a graphic picture of a xylazine wound



Resources

← → ↺ 🏠 🔍 https://www.ohsu.edu/oregon-poison-center ☆ 📄 📁 👤 ⋮

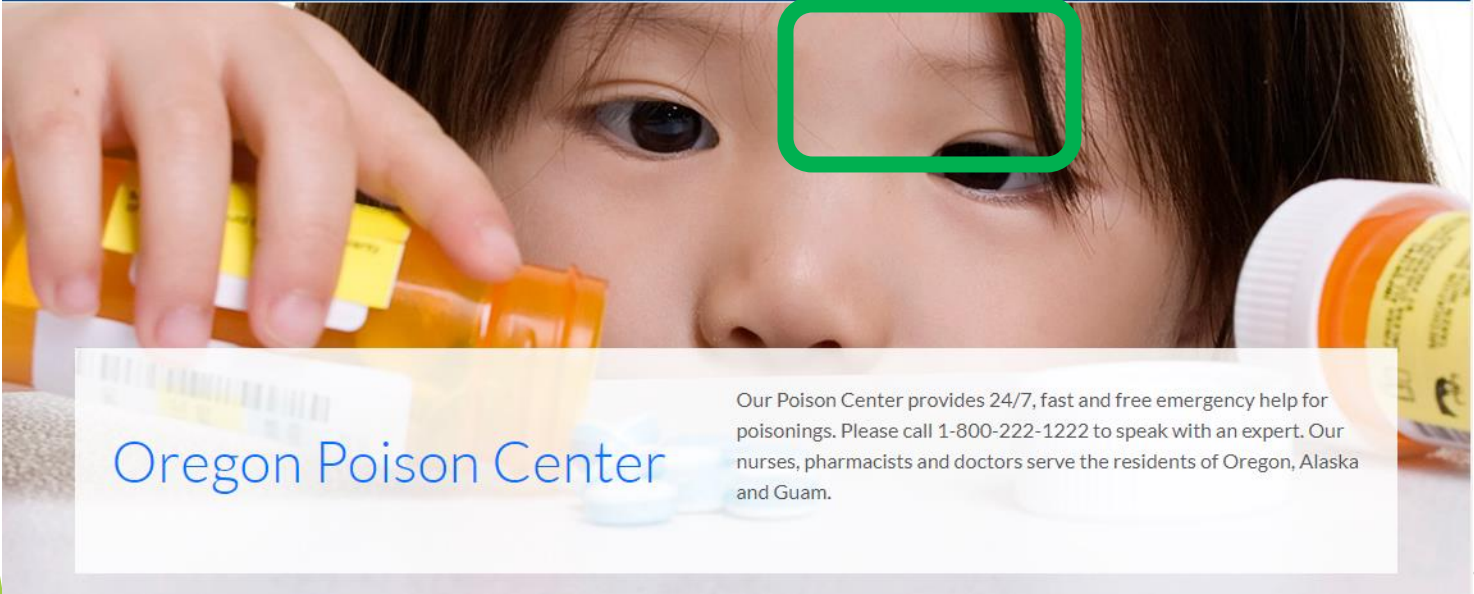
📧 OHSUTox (@OhsUt... 📄 AAPCC NPDS 📄 Box | Login 🔑 Password Reset Res... 🖨 Home - MICROMED... 🌐 Cisco Webex 📄 OHSU DEM conf att... >> 📁 All Bookmarks



Oregon Poison Center

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Oregon Poison Center

Our Poison Center provides 24/7, fast and free emergency help for poisonings. Please call 1-800-222-1222 to speak with an expert. Our nurses, pharmacists and doctors serve the residents of Oregon, Alaska and Guam.

[Oregon Poison Center](#)[Donate to the Poison Center](#)[About Us](#)[Common Exposures](#)[Poison Prevention Education](#)[First-Aid](#)[Materials Order Form](#)[Poison Prevention Online Training](#)[Download Handouts](#)[Health Care Professionals](#)[Poisoning Data](#)

Poison Prevention Education

Oregon Poison Center Education Department

Public education is an important function of the poison center. Our goal is to decrease the incidence and severity of poisonings through poison prevention education, outreach and promotion of the Poison Help® line.

Our public education program is managed by a full-time health educator with a background in public health and injury prevention. Our educator participates in a national network of poison center educators who share information, best practices and resources as member centers of [America's Poison Centers](#). Our educator works with community partners across the poison center's service area to conduct outreach in the community, act as a poison prevention subject matter expert and leverage available resources to maximize impact in communities. Additionally, our educator provides poison prevention resources to the public and partner agencies, classes for children and adults, participates in community events and health fairs, maintains a free online [poison prevention training](#) program and manages external communications for department in conjunction with OHSU Media Relations.

The education program uses Mr. Yuk™ stickers and Poison Help® magnets, brochures, videos, and posters to promote the Poison Help® line and support poison prevention messages throughout the community. [Order materials](#) or [download handouts](#), puzzles,



Resources
















The following are all the Oregon Poison Center materials available for order. Please indicate the number you need in the order form.

| Brochure – English | Sticker (2 per sheet) – English | Magnet – English | Mr. Yuk Sticker Sheet – English |
|--|---|---|---|
|  |  |  |  |
| Brochure – Spanish | Sticker (2 per sheet) – Spanish | Magnet – Spanish | |
|  | <p>OUT OF STOCK</p> |  | <p>(Mr. Yuk sticker sheet not currently available in Spanish)</p> |

Is it Candy or Medicine

When you have questions about poisonings, call the NY State Poison Control Centers. Information is provided free of charge.

Translators are available.
1-800-222-1222

| | | | | | |
|---|---|---|---|---|---|
|  |  |  |  |  |  |
| Dolobid® | Good N' Fruity® | Ferrous Sulfate | Red Hots® | Tegretol® | Smarties® |
|  |  |  |  |  |  |
| Children's Vitamins | Tangy Bunnies | Depakene | Good N' Fruity® | Pseudoephedrine | Cinnamon Candy |
|  |  |  |  |  |  |
| Ferrous Gluconate | M&M® | Amantadine | Good N' Fruity® | Bethanechol | Sweetarts® |
|  |  |  |  |  |  |
| Aspirin | Skittles® | Mesoridazine | M&M® (small) | Simethicone Chewable | Altoid® Mint |
|  |  |  |  |  |  |
| Tylenol® | Tic Tac® | Ephedrine | Good N' Plenty® | Phenelzine | Skittles® |
|  |  |  |  |  | |
| Valproic Acid | Good N' Plenty® | Ibuprofen | Good N' Plenty® | | |

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¿Podría estar cargando un **veneno**?

Mantenga su bolso fuera del alcance para proteger a los niños.



Casi cualquier cosa puede ser venenosa si se usa de manera incorrecta, en la cantidad incorrecta o por la persona equivocada.

Si sospecha un envenenamiento,
no tome riesgo.
Llame a 1-800-222-1222.



Rápido. Gratis. Experto.
24/7, ayuda confidencial.

Summary

- ▶ OPC is here to help
- ▶ Call us anytime
- ▶ Questions? Comments? Concerns?
 - ▶ duncaann@ohsu.edu
 - ▶ 503-494-6077
- ▶ www.oregonpoison.org



References/Resources

“Toxicologic
Emergencies”
Goldfrank, et.
al.

Poisindex

Oregon Poison
Center’s Policies
and Procedures

Zane Horowitz,
MD

Rob
Hendrickson, MD



Feedback

