

Pediatric Readiness Program Education Session

THIS ACTIVITY HAS BEEN PLANNED AND IMPLEMENTED IN ACCORDANCE WITH THE ACCREDITATION REQUIREMENTS AND POLICIES OF THE ACCREDITATION COUNCIL FOR CONTINUING MEDICAL EDUCATION (ACCME) THROUGH THE JOINT PROVIDERSHIP OF LEGACY HEALTH AND OREGON EMERGENCY MEDICAL SERVICES FOR CHILDREN.

LEGACY HEALTH DESIGNATES THIS LIVE ACTIVITY FOR A MAXIMUM OF 1.0 AMA PRA CATEGORY 1 CREDIT(S)[™]. PHYSICIANS SHOULD CLAIM ONLY THE CREDIT COMMENSURATE WITH THE EXTENT OF THEIR PARTICIPATION IN THE ACTIVITY.



PEDIATRIC READINESS PROGRAM

SERVING OREGON & SW WASHINGTON



Pediatric fentanyl exposures

- Robert G. Hendrickson, MD
 - Medical Director, Oregon Poison Center
 - Professor, Emergency Medicine, OHSU



**OREGON
POISON
CENTER**

I have no financial conflicts of interest to disclose



Objectives

- Poison Center
- Fentanyl exposures in < 6yo
- Fentanyl background
- Clinical effects
- Naloxone
- Poison Prevention



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Oregon Poison Center



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Oregon Poison Center



- Consultation service
 - Public
 - Clinicians
- Free to the user:
 - **1-800-222-1222**
- Federal, state, and OHSU funding



**OREGON
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Oregon Poison Center

- > 50,000 new cases per year
 - ~ 140 new cases per day
 - ~ 30 hospitalized patients per day
- Phone answered by RNs and PharmDs (SPIs)
- 24/7 back up with BC Medical Toxicologists



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Oregon Poison Center

- Purpose
 - Prevent and treat poisonings
 - Public
 - Real-time expert information and recommendations
 - » Goal – avoid ER visit and enhance care
 - HCP
 - Real-time expert information and recommendations
 - Real-time access to BC medical toxicologists
 - Collaborate with public health
 - Syndromic surveillance
 - Public education



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Oregon Poison Center

Age	Percent of total calls
Children <1 to 19 years	56%
Child <= 5 years	41%
Child 6-12 years	6%
Teen 13-19 years	9%
Unknown age child	<1%
Adults >=20 years	44%

Children < 6 years

Children <=5	
Substance	Exposure Count
Cosmetics/personal care products	2,082
Cleaning substances (household)	1,824
Analgesics	1,511
Dietary supplements/herbals/homeopathic	1,373
Foreign bodies/toys/miscellaneous	1,355

- Fatalities: accidental
 - Carbon monoxide
 - Batteries
 - Fentanyl
 - Methamphetamine
 - Rx:
 - Antidepressants
 - Cardiovascular drugs
 - Analgesics

NPDS REPORT 2022;
Clin Toxicol 2023; 61(10): 717–939



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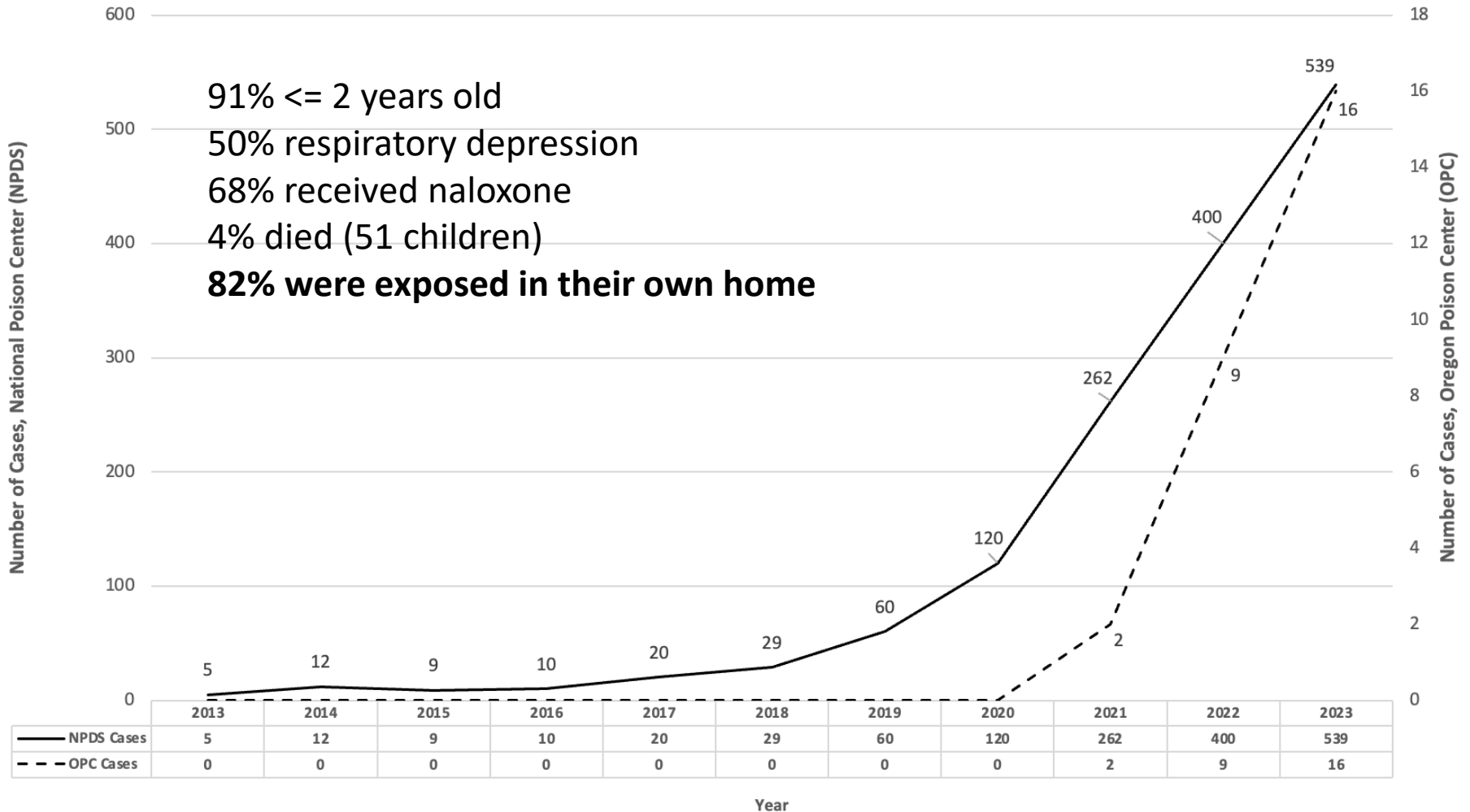
**OREGON
POISON
CENTER**



DEA

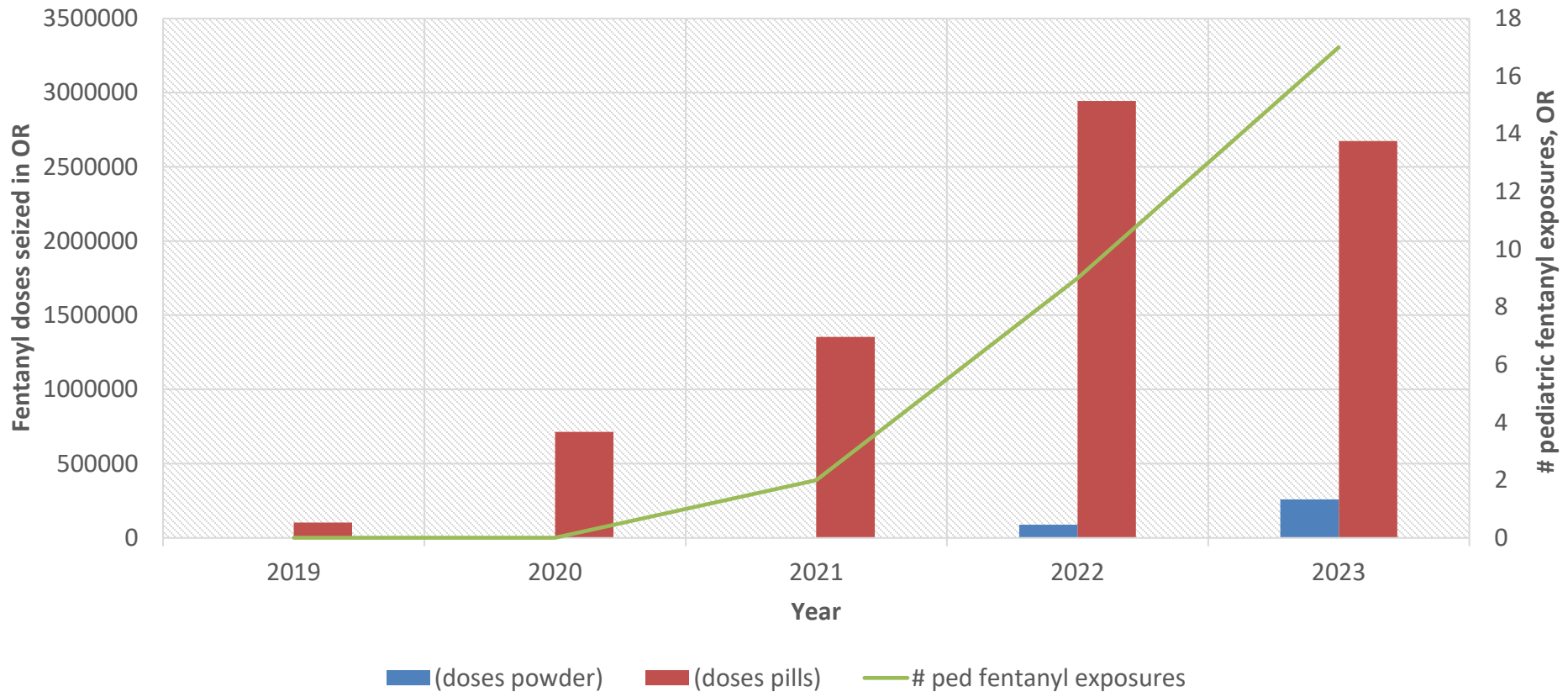
Fentanyl in small children

Illicit fentanyl exposures in children < 6 years by year



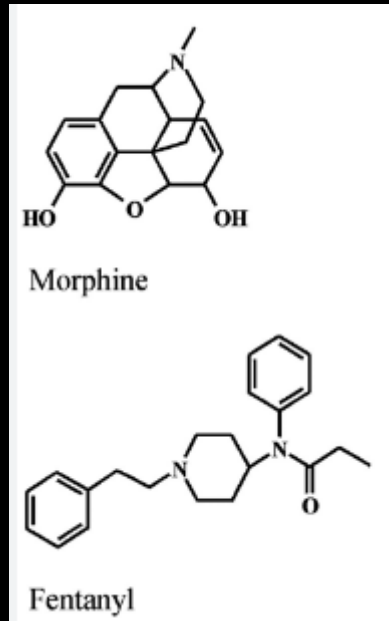
Fentanyl

Pediatric fentanyl exposures compared to fentanyl seizures by the DEA



Fentanyl - background

- Mu agonist
 - Potent mu agonist
 - Pediatric dosing
 - IV 0.5-5 mcg/kg
 - Oral transmucosal 15-20 mcg/kg
 - IN 1-2 mcg/kg
 - PO (not used often) 5-20 mcg/kg

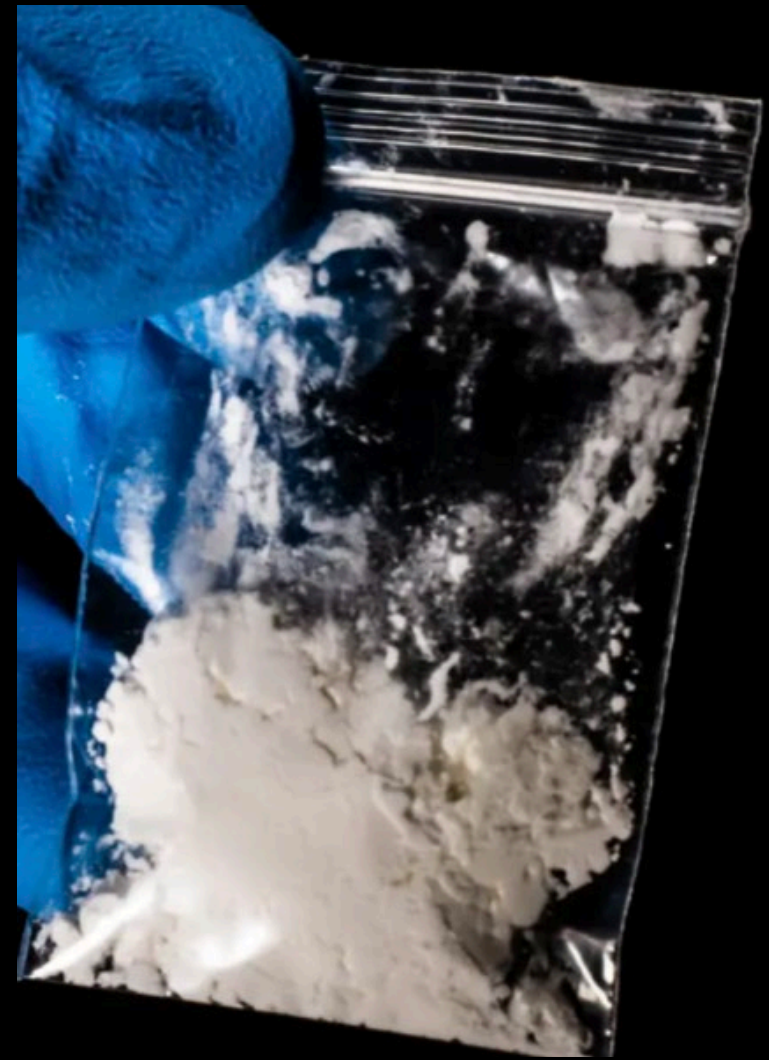


Illicit fentanyl

- Manufactured in Mexico and transported to the US.



Illicit fentanyl



Illicit fentanyl



Photo: Willamette Week

Table 7. Drug Product exhibit #2

Drug Class	Drug	State Found*	Confirmed Levels: mg of drug/gram of drug product (%)	Actual Amount within Drug Product
Exhibit 1: Total Weight – 112.0 mg				
Pain Reliever	Acetaminophen ¹		966 (96.6)	108 mg
Opioid	Fentanyl ²		35 (3.5)	3.9 mg
Precursor	4-ANPP ³	WA	3.2 (0.32)	0.36 mg
Precursor	N-Methyl Norfentanyl ³		0.015 (0.0015)	0.0017mg (1.7 µg)
Opioid	Acetyl Fentanyl ⁴		0.014 (0.0014)	0.0016 mg (1.6 µg)

Figure 3: Drug Product exhibit #2 – Blue “M30” Tablet



Illicit fentanyl

- Fentanyl 3.9 mg = 3900 mcg
- 10kg child:
 - IV dose = 5-50 mcg
 - PO dose = 50-100 mcg
 - IN dose = 10-20 mcg

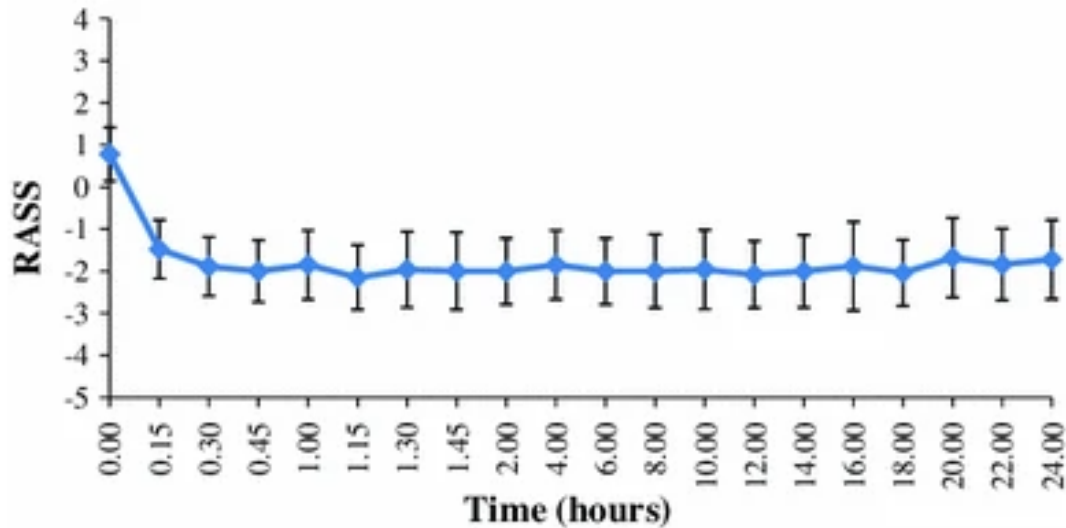
Fentanyl

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



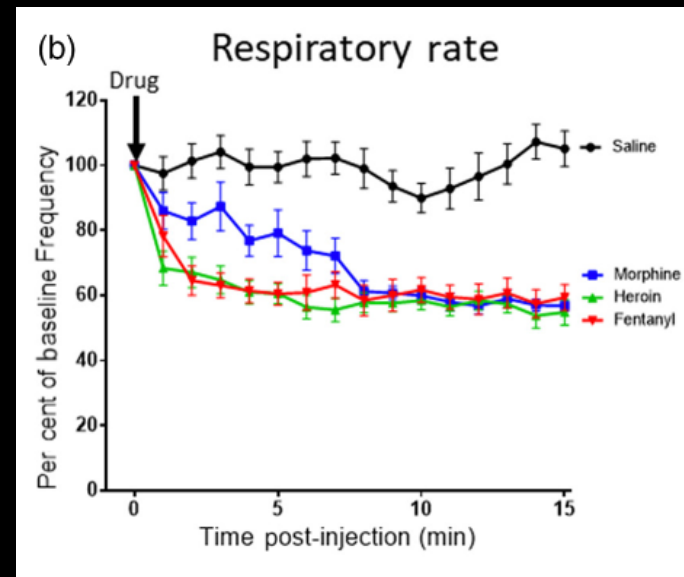
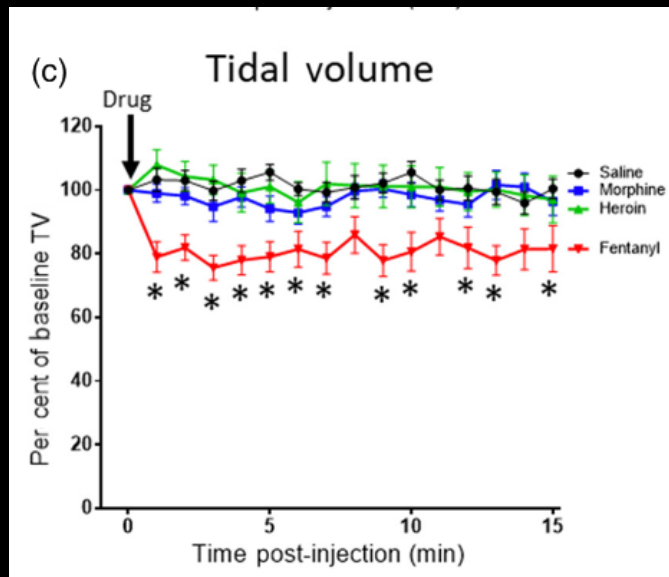
Fentanyl – clinical effects

- Clinical effects of oral ingestion:
 - CNS sedation

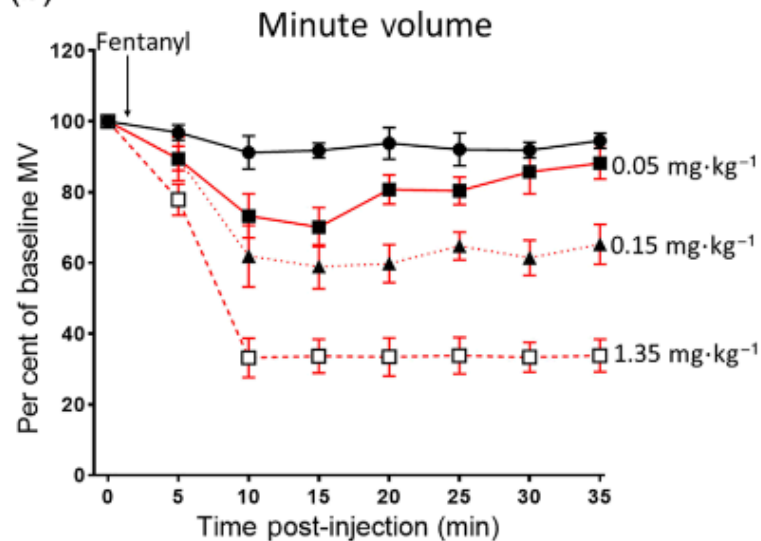


Fentanyl

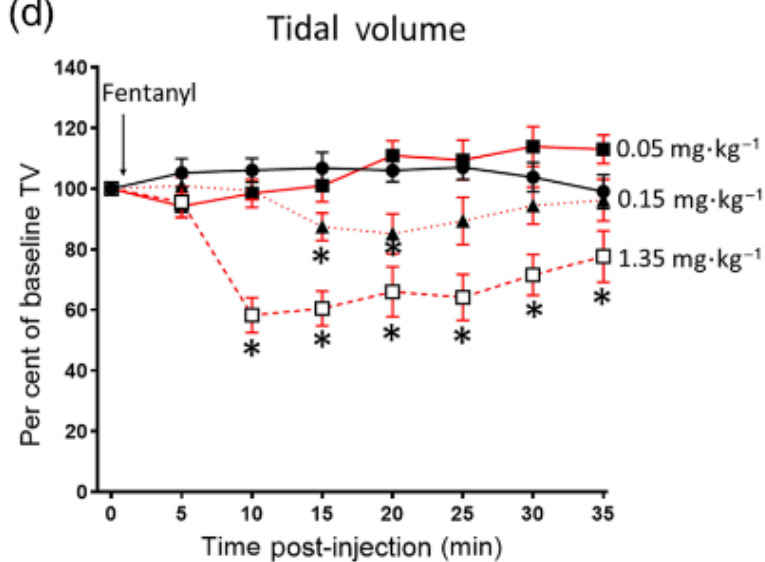
- Clinical effects of oral ingestion:
 - CNS sedation
 - Decreased tidal volume & RR



(b)



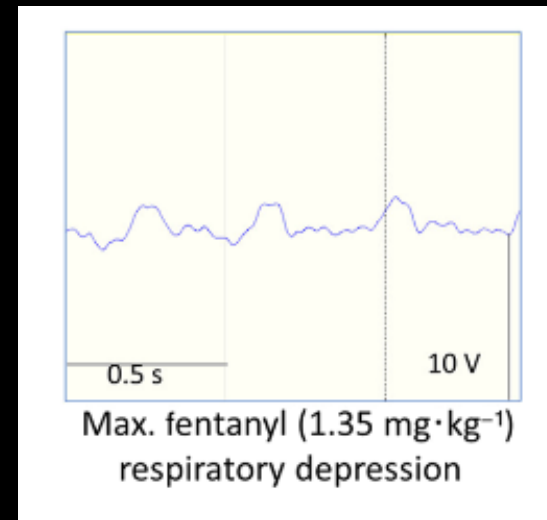
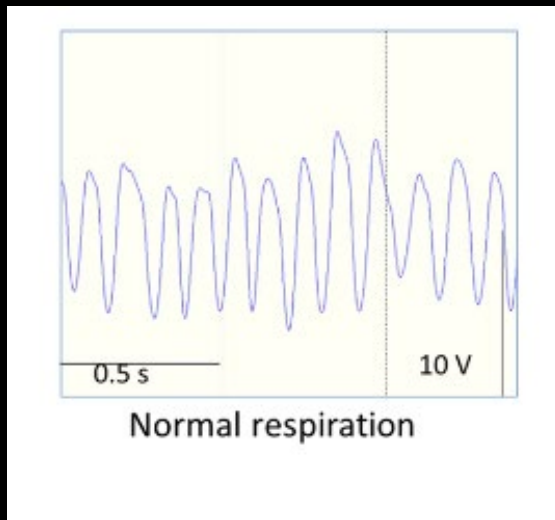
(d)



(f)

Fentanyl

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



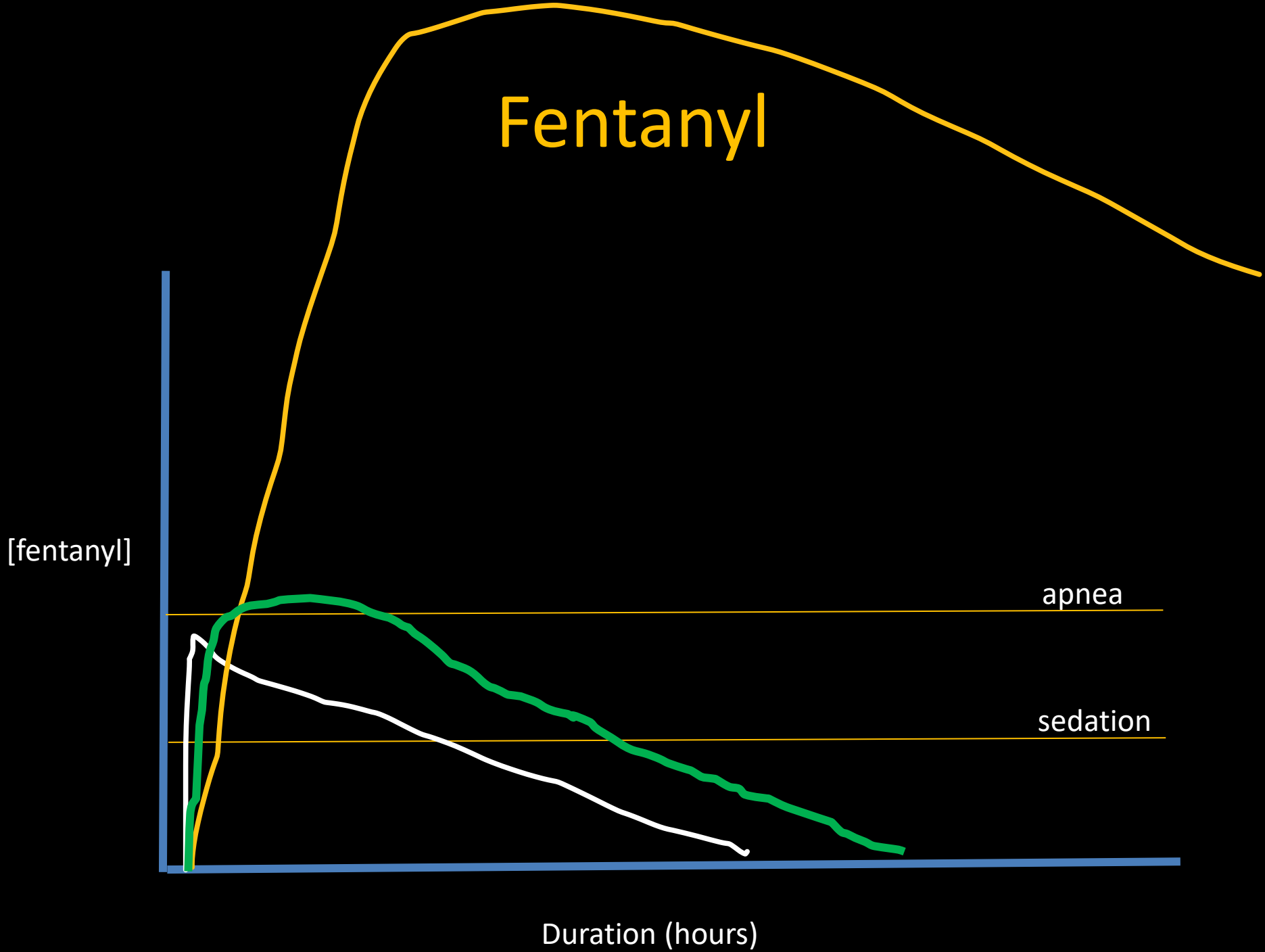
Fentanyl

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



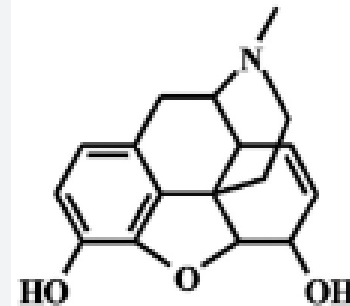
Fentanyl – clinical effects

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

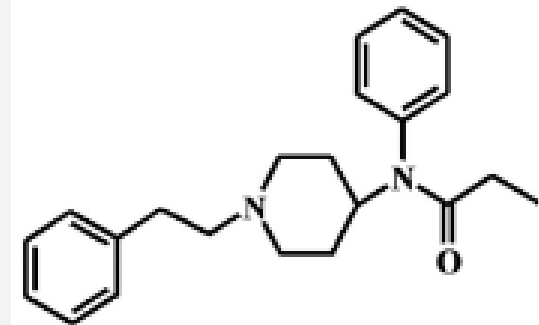


Fentanyl - clinical

- Urine drug screen
 - Opioid/opiate - no
 - Fentanyl – yes
 - False positives?
 - Labetolol
 - Risperidone
 - Trazadone
 - (Methamphetamine)
 - (Diphenhydramine)




Morphine



Fentanyl

Naloxone



1 mL
Sterile / Stérile
Injectable
Naloxone
Hydrochloride

0.4 mg / mL

IV / IM / SC

See package insert

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

- Opioid receptor antagonist
 - Adverse effects minimal in non-tolerant patients
 - IV doses of 70 mg led to slight increase in BP
 - Precipitated withdrawal is a concern in patients with chronic high-dose opioid use
 - Generally not a concern in children < 6 years

Naloxone

- Dose plan:
 - Option to start low: 0.01 mg/kg IV
 - Escalate quickly
 - 0.1 mg/kg IV (max of 10mg IV)

Support respiration with bag-valve mask
before administering naloxone

Initial adult dose: 0.04 mg

Support respiration with bag-valve mask
before administering naloxone

Initial pediatric dose: 0.1 mg/kg of body
weight

If an increase in respiratory rate
does not occur in 2–3 min

Administer 0.5 mg of naloxone

If no response in 2–3 min

Administer 2 mg of naloxone

If no response in 2–3 min

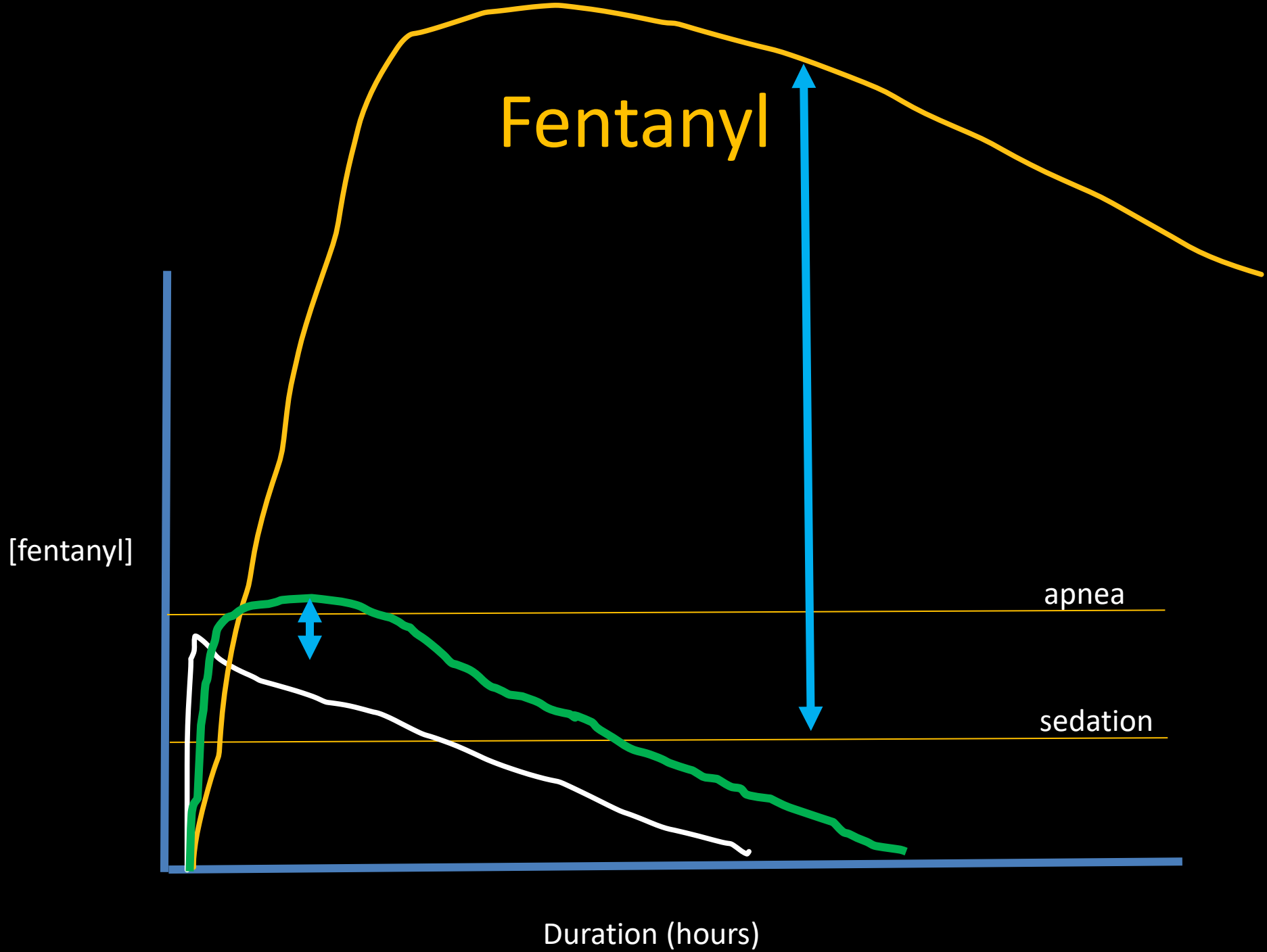
Administer 4 mg of naloxone

If no response in 2–3 min

Administer 10 mg of naloxone

If no response in 2–3 min

Administer 15 mg of naloxone



Naloxone

- Dose plan:
 - May (likely) will need **multiple doses of naloxone**
 - Naloxone half-life ~ 1 hour
 - Fentanyl half-life ~ 5 hours
 - Be prepared to monitor
 - Ventilation – ETCO₂, RR, chest excursion
 - Oxygenation – O₂ sat
 - **Naloxone infusion:**
 - 2/3 "response dose"/ hour

Naloxone

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

Co-ingestions

- Co-ingestions
 - Benzodiazepines
 - Xylazine



Drug
Weight – 112.0 mg
Acetaminophen ¹
Fentanyl ²
4-ANPP ³
N-Methyl Norfentanyl ³
Acetyl Fentanyl ⁴
Product exhibit #2
Front

Fentanyl - review

- Tablets are LARGE doses
- Expect:
 - Severe CNS effects/apnea
 - Large doses of naloxone
 - Repeated doses of naloxone (or infusion)
 - Prolonged fentanyl effects

POISON PREVENTION

WEEK



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 **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

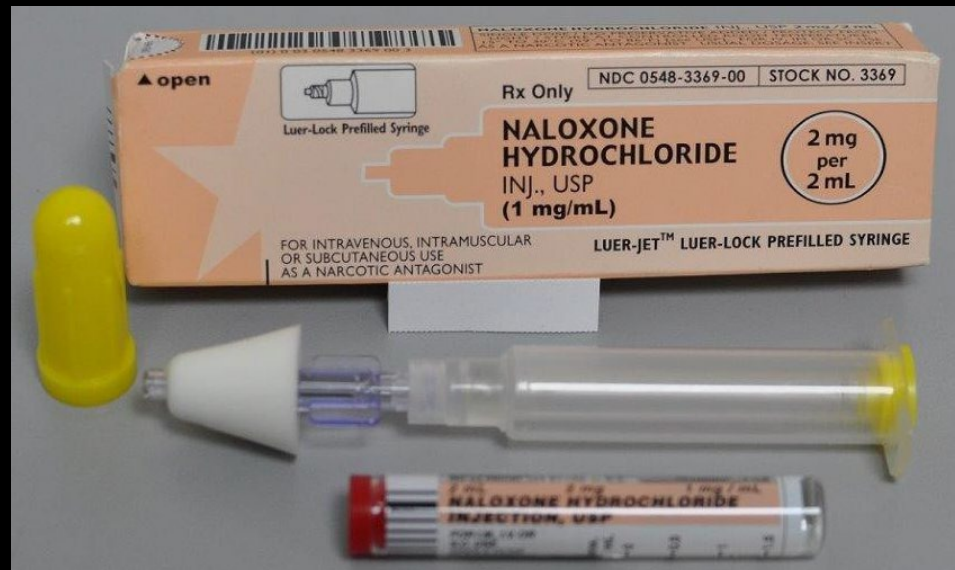


Fentanyl in small children



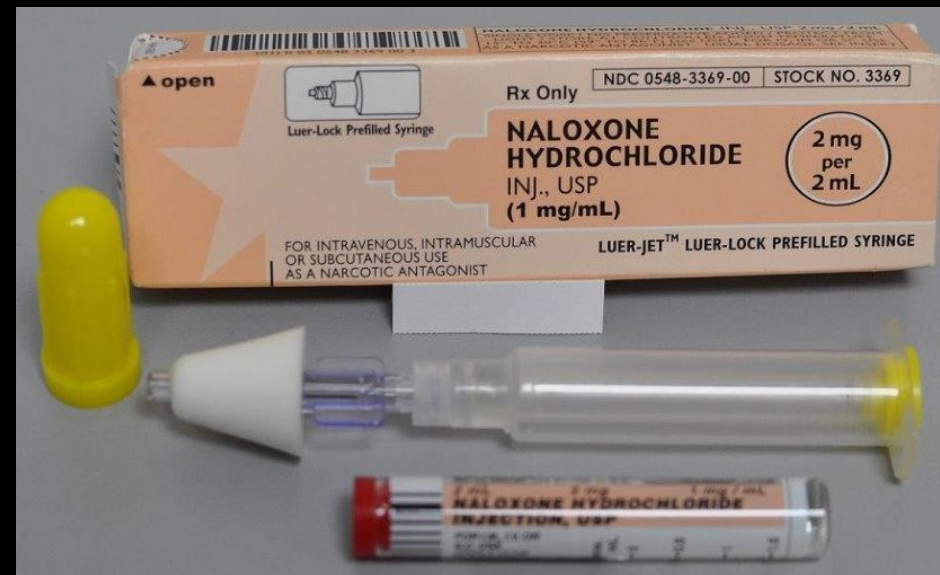
Fentanyl in small children

- 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



Fentanyl in small children

- Naloxone in the home
 - Use adult naloxone on children
 - Over the counter (or prescription)
 - Covered by OHP
 - \$45 for 2-pack





Resources

The image is a screenshot of a web browser displaying the Oregon Poison Center website. The browser's address bar shows the URL <https://www.ohsu.edu/oregon-poison-center>. The website header includes the OHSU logo on the left and navigation links for OHSU Home, Find a Doctor, MyChart, Donate, Jobs, Directions, and Contact on the right. A search bar labeled "Search OHSU" is also present. Below the header is a dark blue navigation bar with white text links: "Donate to the Poison Center", "About Us", "Common Exposures", "Poison Prevention Education" (which is highlighted with a green rectangular box), "Health Care Professionals", and "Poisoning Data". The main content area features a large photograph of a young child's face, looking intently at several orange pill bottles. A white text box is overlaid on the bottom left of the image, containing the text "Oregon Poison Center" in blue. To the right of this box, a paragraph of text reads: "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

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 style="color: red; text-align: center;">OUT OF STOCK</p>	<p style="text-align: center;">“Dile a una amiga”</p> <p style="text-align: center;">Ayuda para envenenamientos... está al alcance con sólo una llamada 24 horas al día todos los días. Servicio gratuito y confidencial.</p> <p style="text-align: center;"> 1-800-222-1222</p>	<p style="text-align: center;">(Mr. Yuk sticker sheet not currently available in Spanish)</p>

Poison center brochure, by language:

Poison center brochure in [English](#)

Additional languages:

- Poison center brochure in [Acholi](#)
- Poison center brochure in [Arabic](#)
- Poison center brochure in [Burmese](#)
- Poison center brochure in [Chinese](#)
- Poison center brochure in [Croatian](#)
- Poison center brochure in [Farsi](#)
- Poison center brochure in [French](#)
- Poison center brochure in [Hmong](#)
- Poison center brochure in [Korean](#)
- Poison center brochure in [Khmer](#)
- Poison center brochure in [Kinyarwanda](#)
- Poison center brochure in [Kirundi](#)
- Poison center brochure in [Nepali](#)
- Poison center brochure in [Nuer](#)
- Poison center brochure in [Polish](#)
- Poison center brochure in [Portugese](#)
- Poison center brochure in [Russian](#)
- Poison center brochure in [Somali](#)
- Poison center brochure in [Spanish](#)
- Poison center brochure in [Swahili](#)
- Poison center brochure in [Thai](#)
- Poison center brochure in [Vietnamese](#)

YOUR POISON CENTER



Every 8 seconds someone
needs a poison center...

Could you be next?

**POISON
Help**
1-800-222-1222

**Free, Fast,
Expert Help.
24 hours a day,
7 days a week**

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



Resources

[Donate to the Poison Center](#)

[About Us](#)

[Common Exposures](#)

[Poison Prevention Education](#)

[Health Care Professionals](#)

[Poisoning Data](#)

[Home](#) > [Oregon Poison Center](#) > [Poison Prevention Education](#) > [Download Handouts](#)

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[Download Handouts](#)

Download handouts

[Activity sheets for children](#)



[Poison center brochure](#)



[Factsheets and infographics](#)



[Poison prevention posters](#)



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

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

Activity sheets for children, by age

[Connect the dots](#)  - Ages 4-8

[Draw a line](#)  - Ages 4-8

[Raccoons \(English\)](#)  - Ages 4-8

[Raccoons \(Spanish\)](#)  - Ages 4-8


[Color Mr Yuk](#)  - Ages 4-10


[Circle maze \(English\)](#)  - Ages 5-10

[Circle maze \(Spanish\)](#)  - Ages 5-10

[Color or draw \(English\)](#)  - Ages 5-10


[Color or draw \(Spanish\)](#)  - Ages 5-10

[Picture these products](#)  - Ages 5-10

[Poison word search](#)  - Ages 7-12


[Fill in the blanks](#)  - Ages 7-12

[Unscramble the poisons](#)  - Ages 7-12

[What's wrong with this picture](#)  - Ages 7-12

[Halloween word jumble and answer sheet](#) 

Factsheets and infographics, by topic

[Autumn hazards](#)  factsheet

[Back to school poison safety](#)  factsheet


[Carbon monoxide poisoning](#)  fact sheet

[Harmful blue green algae](#)  factsheet

[Halloween safety](#)  infographic for parents

[Halloween safety and poison hazards](#)  factsheet

[Home Safety](#)  infosheet

[Pesticide Prevention](#)  Infographic for farmworkers in English


[Pesticide Prevention](#)  Infographic for farmworkers in Spanish

[Snakebite Prevention](#)  toolkit

[Spring hazards](#)  factsheet

[Summer hazards](#)  factsheet

[Teen drug use prevention](#)  tipsheet for parents

[Winter](#)  hazards factsheet

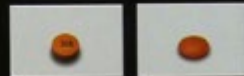
Is it Candy or Medicine

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



Multivitamin

Good N' Fruity®



Amitriptyline

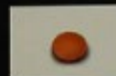
Cinnamon Candy



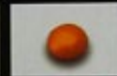
Dolobid®



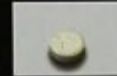
Good N' Fruity®



Ferrous Sulfate



Red Hots®



Tegretol®



Smarties®



Children's Vitamins



Tangy Bunnies



Depakene



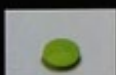
Good N' Fruity®



Pseudoephedrine



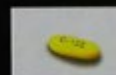
Cinnamon Candy



Ferrous Gluconate



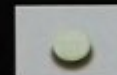
M&M®



Amantadine



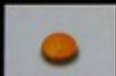
Good N' Fruity®



Bethanechol



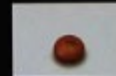
Sweetarts®



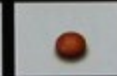
Aspirin



Skittles®



Mesoridazine



M&M® (small)



Simethicone Chewable



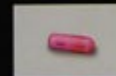
Altoid® Mint



Tylenol®



Tic Tac®



Ephedrine



Good N' Plenty®



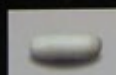
Phenelzine



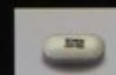
Skittles®



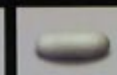
Valproic Acid



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.



BE PREPARED

For a poison emergency

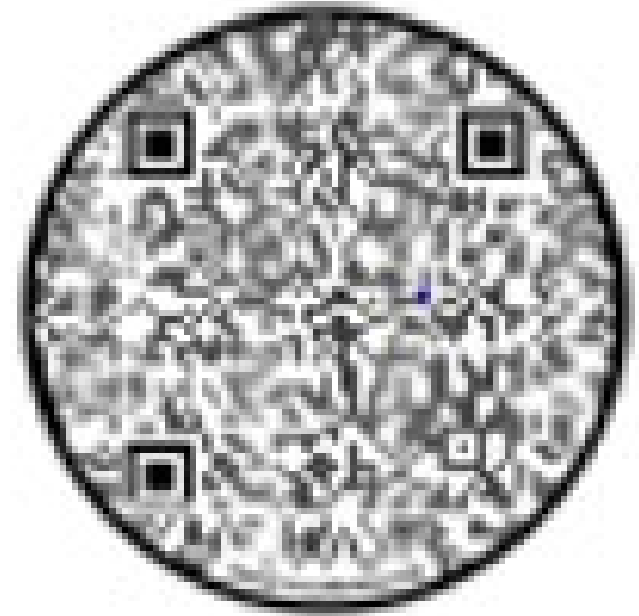
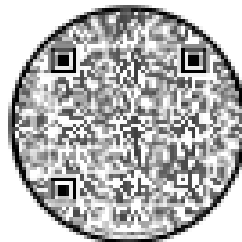
**USE IT. SAVE IT.
SHARE IT.**

The best resource
for poison emergencies.



Add the
Poison Help
hotline as a
contact in
your phone

SCAN HERE



Resources

Featured poison prevention campaigns,
resources

[Up & Away safe medicine storage campaign](#)

[SCHOLASTIC® Over The Counter MEDICINE SAFETY](#)

[Safe Kids Worldwide's pediatric injury prevention campaigns](#)

[CDC Rx Awareness prescription opioid campaign](#)

[HERO Kids Registry](#)

Education department contacts

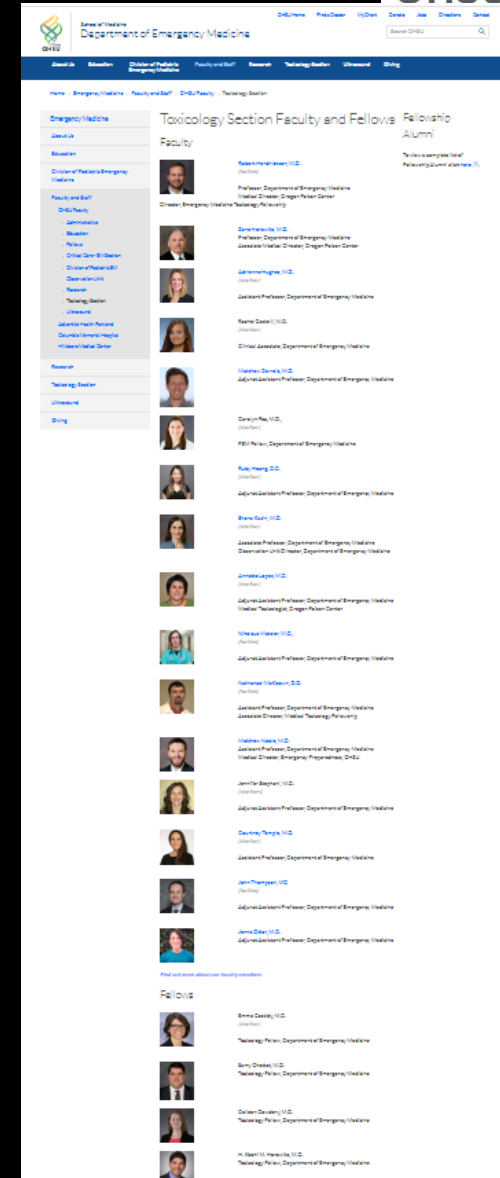
To order materials complete the online [order form](#) or call 503-494-7799 and leave a detailed message for our team.

To speak with our administrator about general questions call [503-494-8600](tel:503-494-8600) [↗](#).

Resources



- Medical toxicologists as a resource
 - Poison Center: 1 800 222 1222
 - 2700/yr HCP-toxicologist consults
 - Can always ask to speak with the toxicologist
 - 16 faculty
 - 4 fellows



Resources

- Rob Hendrickson
 - Medical Director
 - hendriro@ohsu.edu
 - 503-494-9495
- Jennifer Eskridge
 - Community Outreach Educator
 - Eskridge@ohsu.edu
 - 503-494-2196

Questions?



Rob Hendrickson - hendriro@ohsu.edu; Jennifer Eskridge – Eskridge@ohsu.edu



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