Current Issues in Opioid Use Disorder (OUD): Focus on Fentanyl

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DISCLAIMER

- This session was conducted for members of county-based teams in CA that are working to expand access to **Medications for Addiction Treatment in jails and drug courts**. The project is funded through California's Department of Health Care Services (DHCS) with State Opioid Response funding from SAMHSA. The content is being made available to all interested parties. Please note this content has not been professionally edited and the session was conducted using Zoom.
- In the case of any security issues that may occur, this session will immediately end. A separate email will be sent to all participants with further instruction.
- Any data and information collected through polls and chats will only be used to inform future webinar/learning collaborative topics and to provide DHCS with evaluation results.

AGENDA

Welcome and Introductions

Review of learning objectives

Q & A; wrap up and what's next

LEARNING OBJECTIVES

- Compare and contrast treatment of overdoses related to fentanyl versus heroin
- Distinguish treatment of opioid withdrawal related to fentanyl versus heroin
- Discuss how to manage the patient who is not in withdrawal when evaluated

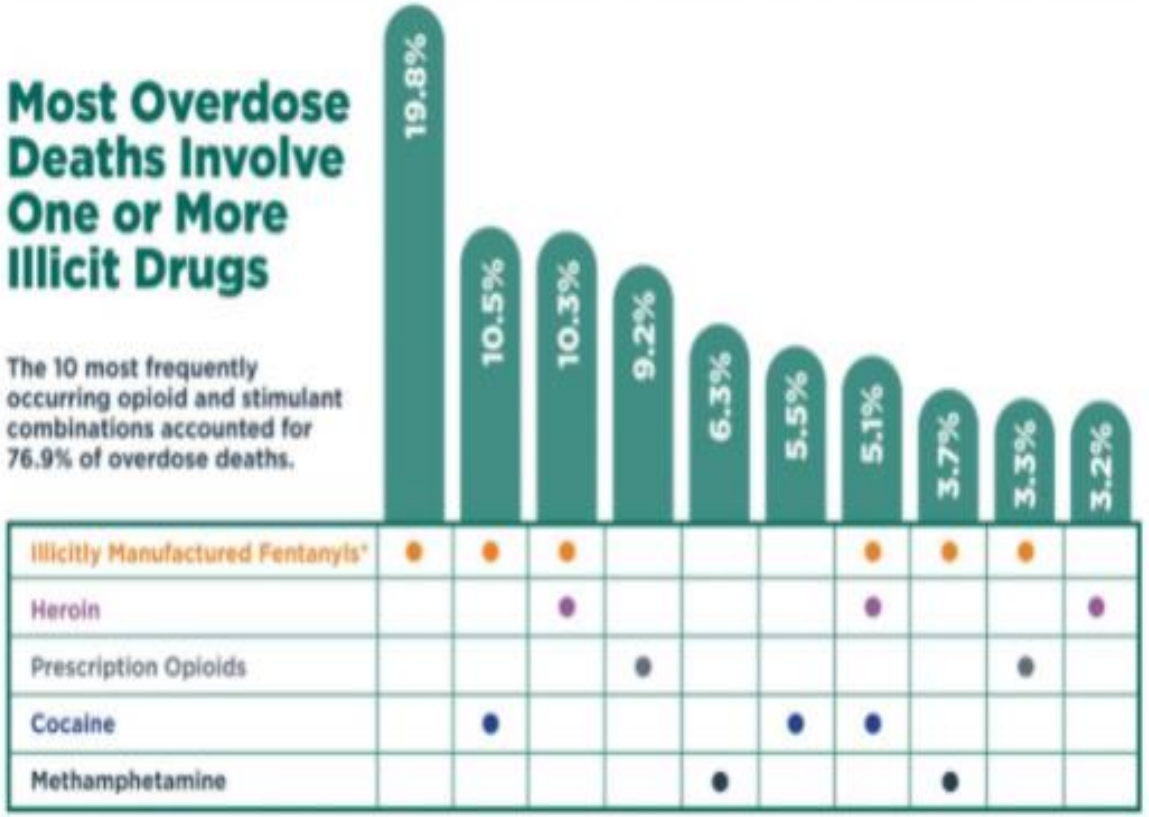
BACKGROUND FENTANYL

- First synthesized in 1960
- Approved in 1968 for analgesia and anesthetic, and later for break through cancer pain
- Fentanyl found in illicit opioids, stimulants, cannabis, vape products
- Fentanyl found in illicitly manufactured stimulants, benzodiazepines and opioid pills
- Fentanyl in liquid form
  - Eye drops, nasal spray, dropped onto paper
- 99% of oxycodone pills submitted to crime lab contained fentanyl
- Pills look identical to legally manufactured pills

Sources:
O'Donnell 2021 MMWR Early Release
https://skylab.cdph.ca.gov/ODdash/
Sacramento County Fentanyl Awareness Virtual Town 1.27.22 Hall
https://drugabusestatistics.org/drug-overdose-deaths/
https://www.cdc.gov/drugoverdose/featured-topics/VS-overdose-deaths-illicit-drugs.html
https://www.cdc.gov/stopoverdose/fentanyl/

BACKGROUND FENTANYL

- Involved in 85% of overdoses
  - 2020 40% of fentanyl deaths also involved stimulants
- Drug OD deaths exceeded homicides by 306.7%
- Drug OD deaths exceed motor vehicle accidents and suicides combined



*IMFs include fentanyl and fentanyl analogs

Source: CDC's State Unintentional Drug Overdose Reporting System (SUDORS) 24 states and the District of Columbia reporting, January-June 2019

Sources:
O'Donnell 2021 MMWR Early Release
Sacramento County Fentanyl Awareness Virtual Town 1.27.22 Hall
https://drugabusestatistics.org/drug-overdose-deaths/
https://www.cdc.gov/drugoverdose/featured-topics/VS-overdose-deaths-illicit-drugs.html

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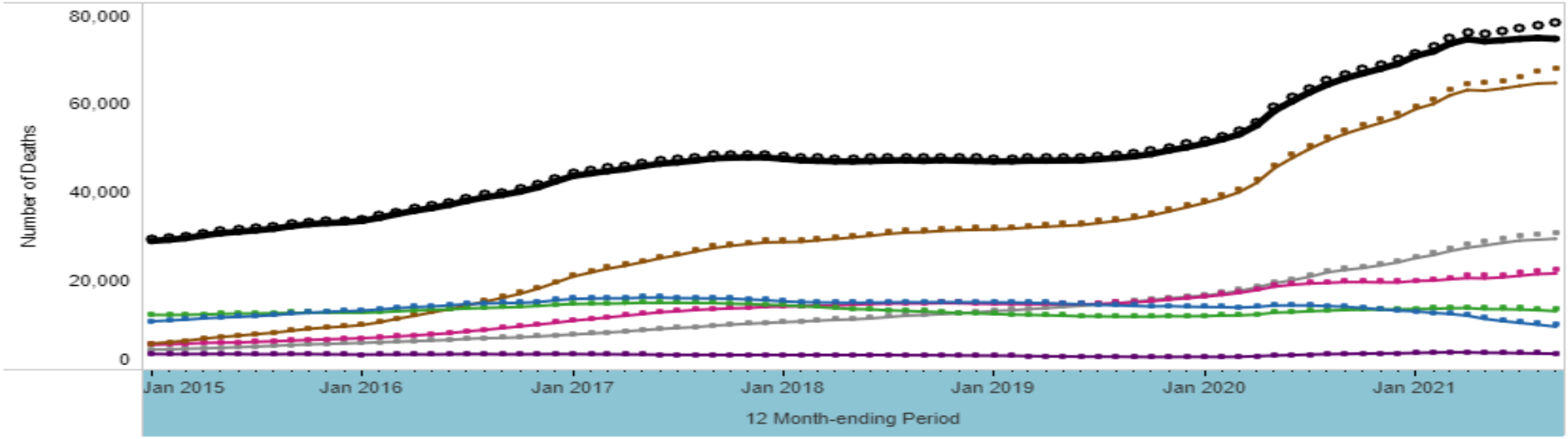
NATIONAL DATA

Based on data available for analysis on: 2/6/2022

Select Jurisdiction: United States

Select specific drugs or drug classes: (Multiple values)

Figure 2. 12 Month-ending Provisional Number of Drug Overdose Deaths by Drug or Drug Class: United States



Legend for Drug or Drug Class

- Opioids (T40.0-T40.4,T40.6)
- Heroin (T40.1)
- Natural & semi-synthetic opioids (T40.2)
- Methadone (T40.3)
- Synthetic opioids, excl. methadone (T40.4)
- Cocaine (T40.5)
- Psychostimulants with abuse potential (T43.6)

---- Reported Value

O Predicted Value

Sources:
https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm

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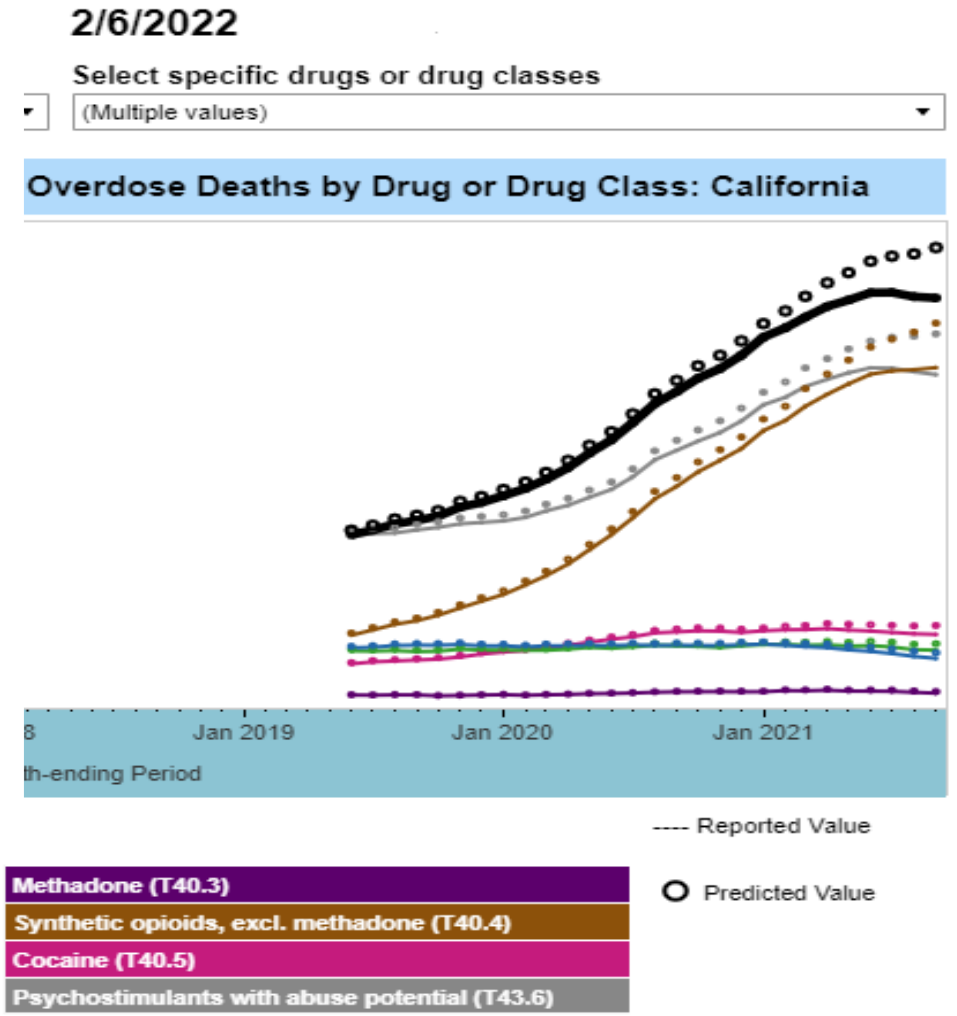
CALIFORNIA DATA

Many routes of drug use related to fentanyl deaths:

- Injecting
- Snorting
- Smoking
- Ingesting



Sources:
https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm

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BACKGROUND FENTANYL

- Potency
  - Morphine, heroin, fentanyl, carfentanyl

- Potency within pills and inside pill varies
  - Range from 1mg to 5mg fentanyl in pill
  - Inter pill inconsistencies from different parts of pill
  - DEA's ONE PILL CAN KILL Campaign
    - Harm Reduction
      - Test to see if fentanyl present
      - Use tester doses
      - Never use alone

Comparing the size of lethal doses of heroin, fentanyl, and carfentanil. The vials here contain an artificial sweetener for illustration. (New Hampshire State Police Forensic Laboratory)

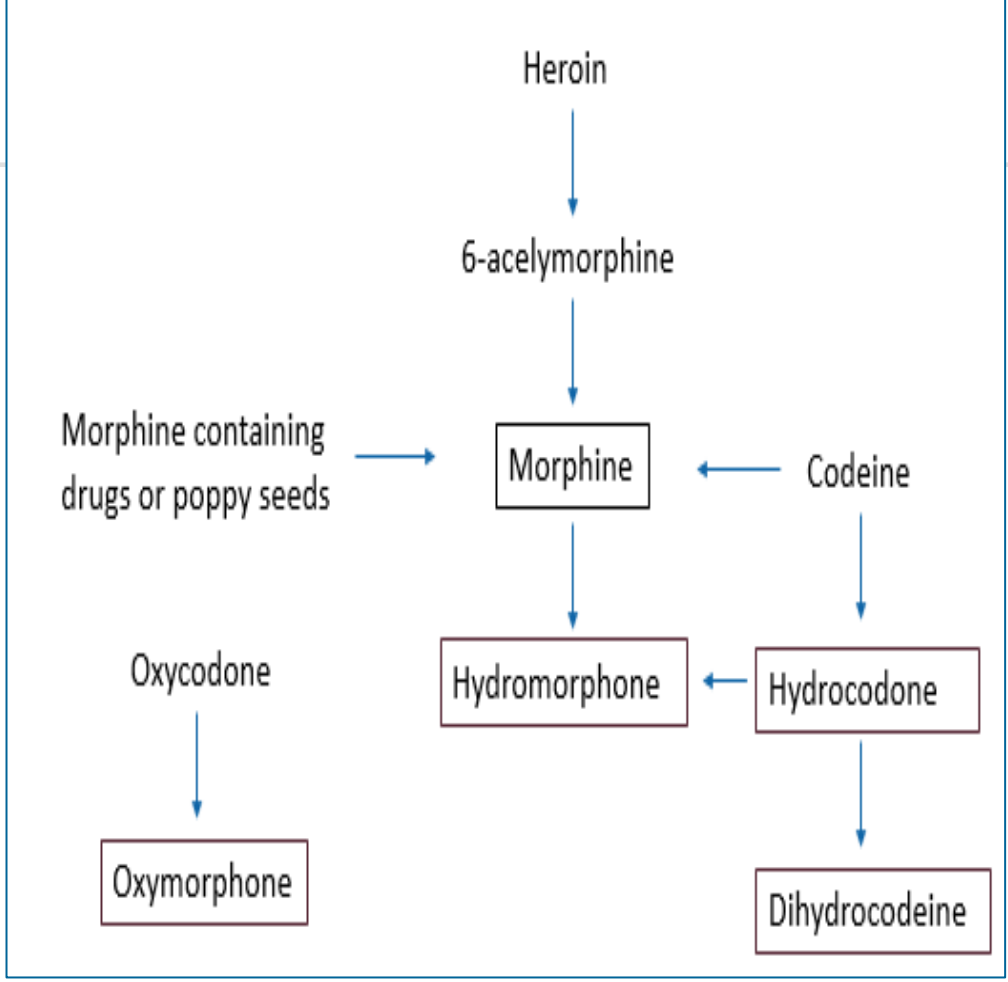
Sources:
Baumann, 2018
Boas, 1985
Hug, 1981
Roy, 1988
Torralva, 2019
https://www.dea.gov/sites/default/files/2021-12/DEA-OPCK_FactSheet_December%202021.pdf

BACKGROUND FENTANYL

- Fentanyl is
  - Highly lipophilic
  - Crosses blood brain barrier quickly
  - Redistributes to adipocytes
  - 1000 times more lipid soluble than morphine
    - Morphine, heroin, fentanyl, buprenorphine

- Lipophilicity influences onset of action
  - The more lipophilic the faster the onset of action
  - Morphine 6 minutes, fentanyl 60 seconds

- Take Home Points: Brain Effects
  - Morphine: slow in slow out
  - Fentanyl: fast in fast out
  - Heroin: fast in slow out



Fentanyl → norfentanyl

Sources:
Fairbairn 2017
Torralva, 2019
https://www.dea.gov/sites/default/files/2021-12/DEA-OPCK_FactSheet_December%202021.pdf

Before we start talking about intervening on overdoses and initiation buprenorphine for persons on fentanyl…

Is your organization testing for fentanyl?

A. Yes
B. No
C. I don't know

FOLLOW-UP QUESTION

If you are not testing for fentanyl currently, what are barriers to doing this?

Please respond in chat.

Compare and contrast treatment of overdoses related to fentanyl versus heroin

Near 100% success with reversal of overdoses with naloxone pre-fentanyl era

NEED FOR NALOXONE & FATALITY WITH FENTANYL

- **Cook County Illinois (4/2005 – 12/2006)**
  - Cook County Medical Examiner Officers Fentanyl Fatality Database: 342 fentanyl related deaths
  - University of Illinois Chicago Emergency Department (ED): Naloxone .4mg to 12mg
    - Incomplete drug testing in ED; can't confirm higher doses of naloxone related to fentanyl

- **California (3/2016)**
  - 18 patients tested positive for fentanyl presented to University California Davis ED
    - 4 required naloxone infusion for 26-39 hours

- **Kentucky (10/2015-9/2016)**
  - Correlated with law enforcement data with toxicology from ED
  - More fentanyl related ODs were reported than fentanyl related ED visits
  - >10 to 1 heroin related ED visits compared to overdoses
  - < 40% of heroin OD ED discharges listed procedure code for drug testing

Sources:
Schuman 2008
Sutter 2017
Slavova 2017

NEED FOR NALOXONE & FATALITY WITH FENTANYL

- **Massachusetts (2014-2016)**
  - Interviewed 64 people who had witnessed or experienced overdose (OD) over 12 months
    - 75% witnessed naloxone administration
    - 83% of those reported >2 doses of naloxone were required
    - Incomplete drug testing in ED; can't confirm higher doses of naloxone related to fentanyl
    - However, 3 counties in Massachusetts 125 of 196 opioid overdoses were fentanyl related

- **Allegheny County Pennsylvania (1/2013-12/2016)**
  - No statistical difference on average number of naloxone doses to reverse OD
    - 2013 89%, 2014, 2015 and 2016 93-95% of overdose reversed with ≤2 doses of naloxone
    - Despite Medical Examiner documented increase in fentanyl contributed opioid overdose deaths from 3.5% to 68.7%

- **Vancouver, Canada (12/2016-4/2017)**
  - Observation of safe injection sites (witnessed overdose rescues) and interviews
    - 4-6 ampoules of naloxone required for fentanyl ODs

Sources:
Somerville 2017
Bell 2019
Mayer 2018

- **Atlanta, Georgia (1/2017-6/15/2018)**
  - No statistical difference on average number of naloxone doses to reverse OD between fentanyl only, opiate only and opiate + fentanyl

OVERDOSE FENTANYL – NOT JUST RESPIRATORY DEPRESSION

- Wooden chest syndrome (WCS)
  - Rigidity of the diaphragm & chest wall and upper airway closure (laryngospasm)
  - Narrow therapeutic window; doses as low as 50 micrograms
  - Onset within 2 minutes and duration of 15 minutes
  - Associated with cardiovascular system and decreased perfusion
    - Heart, liver and brain
    - So rapid that many fentanyl ODs don't have norfentanyl present because the blood hasn't circulated through the liver to be metabolized
  - Almost always fatal without expert airway management
  - Mediated via alpha adrenergic and cholinergic
  - Difficult to perform chest compression or ventilation
  - Increased death associated with fentanyl OD compared to other opioids

Sources:
Grell, 1970
Somerville, 2017
Mayer, 2018
Torralva, 2019

OVERDOSE TREATMENT HEROIN VERSUS FENTANYL

Receptor	Physiological Effect	Morphine	Heroin	Fentanyl	Reversed by	Prevented by
Mu opioid	Respiratory depression	+	+	+	naloxone	naltrexone buprenorphine
Alpha 1 adrenergic	Muscle rigidity & laryngospasm	-	-	+	succinylcholine	prazosin succinylcholine
Muscarinic Cholinergic	Cardiovascular system	-	-	+		

Sources:
Baumann 2018
Fairbairn 2017;
Grell, 1970
Hill, 2019
Jansen Pharmaceuticals, 2017 package insert
Rzasa, 2018
Schuman, 2008
Slavova, 2017
Torralva, 2019

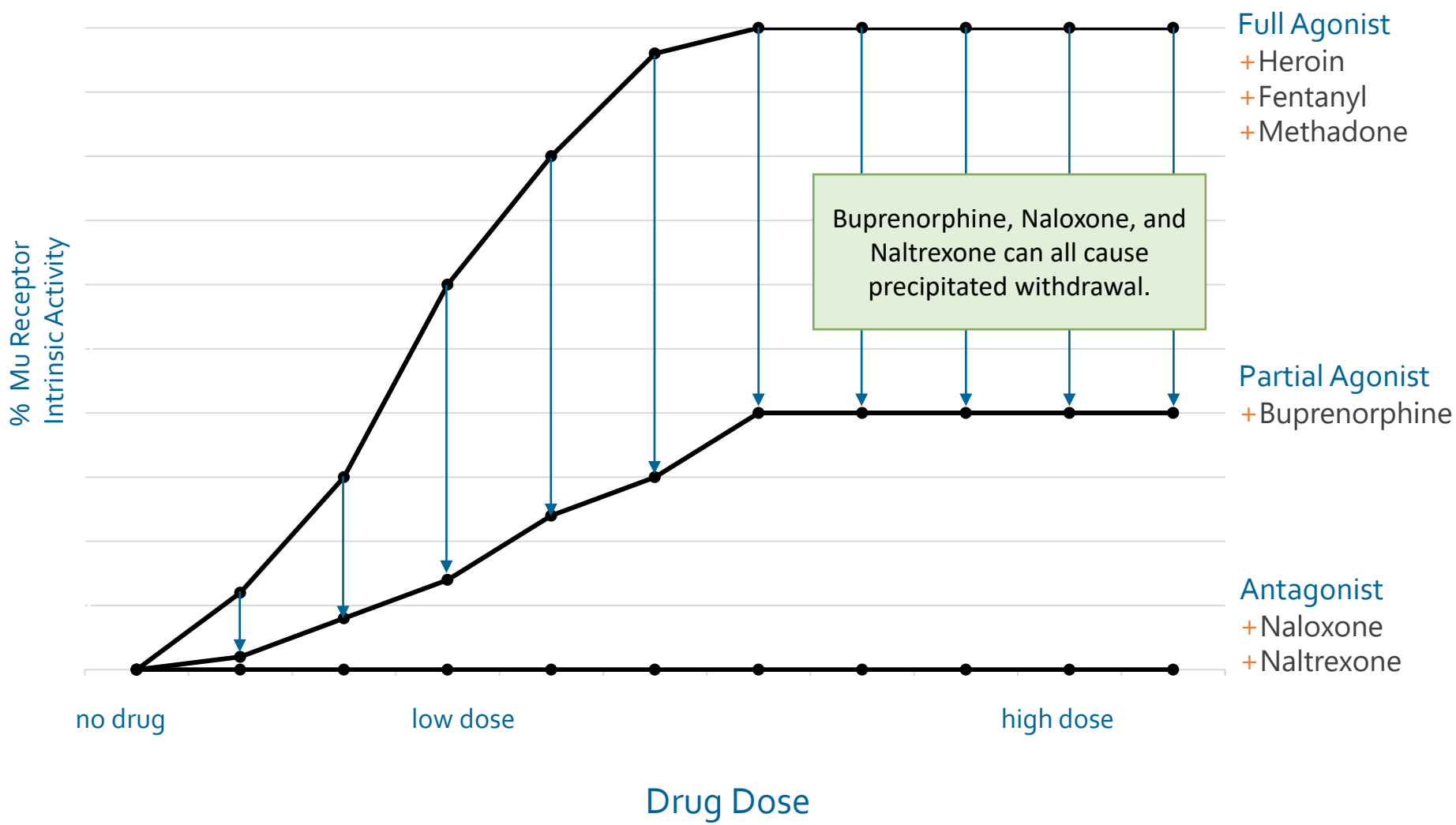
Some of our California counties and organizations have great data tracking abilities.

Do you have data in your community/emergency department, EMS system comparing number of doses of naloxone required for heroin ODs vs fentanyl ODs?

A. Yes
B. No
C. I don't know

Distinguish treatment of opioid withdrawal related to fentanyl vs. heroin

MECHANISM OF ACTION: MU OPIOID RECEPTOR BINDING



BUPRENORPHINE INITIATION FOR FENTANYL

- Precipitated withdrawal described when trying to initiate buprenorphine after having withdrawal symptoms associated with fentanyl cessation
- Why might this occur?
  - Possible explanation: delayed clearance from body related to fentanyl in the adipose tissue
    - Heroin excretion 2-4 d; fentanyl 7 d and norfentanyl 13 days

- Precipitated withdrawal in 2 patients using their normal protocol
  - Protocol was
    - 24 h after last use; COWS >9
    - 4mg buprenorphine/naloxone; Additional dose optional at 3 h later
  - Withdrawal protocol modified and successful in next 2 patients
    - 48 hours since last use; COWS >13
    - 2mg buprenorphine/naloxone; additional 2mg doses at 60-90 min intervals
    - Patients will benefit from alpha agonist and other symptomatic treatments prior to initiating buprenorphine- see next slide
  - Multi-site trial of ED initiated buprenorphine
    - 1% precipitated withdrawal despite 76% positive being positive for fentanyl

Sources:
Silverstein, 2019
Huhn, 2020
Antoine, 2022
D'Onofrio 2022

MICRO DOSING – 18 PAPERS DESCRIBING 63 PATIENTS

- Various schedules associated with giving small doses of buprenorphine and other opioid
  - Most used 4-8 days
  - Some used much longer transitions
  - Some outpatients and some hospitalized patients
  - .2 to 4mg starting dose of SL buprenorphine or transdermal patch 5 micrograms to 35 micrograms
    - FDA has NOT approved transdermal buprenorphine for OUD
  - Cases describe transitions from hydrocodone, hydromorphone, oxycodone, morphine, heroin, methadone
  - Generally, without generating withdrawal symptoms
  - No randomized controlled trials; no quasi experimental or case control or cohort studies

  - NO CONSENSUS REGARDING A SINGLE MICRODOSING APPROACH
  - May be considered in those who have failed buprenorphine initiation
  - Those with chronic pain; exacerbation of pain during withdrawal may now be unnecessary
  - High dose methadone where the standard taper to 30 mg per day is time consuming
  - Fentanyl use as precipitated withdrawal is more likely with buprenorphine than when transitioning from other short acting opioids

Sources:
Ahmed, 2021

BUPRENORPHINE FOR FENTANYL POST OVERDOSE

- 2 patients successfully initiated on buprenorphine within 30-120minutes **post naloxone** for fentanyl overdose
  - First dose 4-8mg; total 16-24mg given

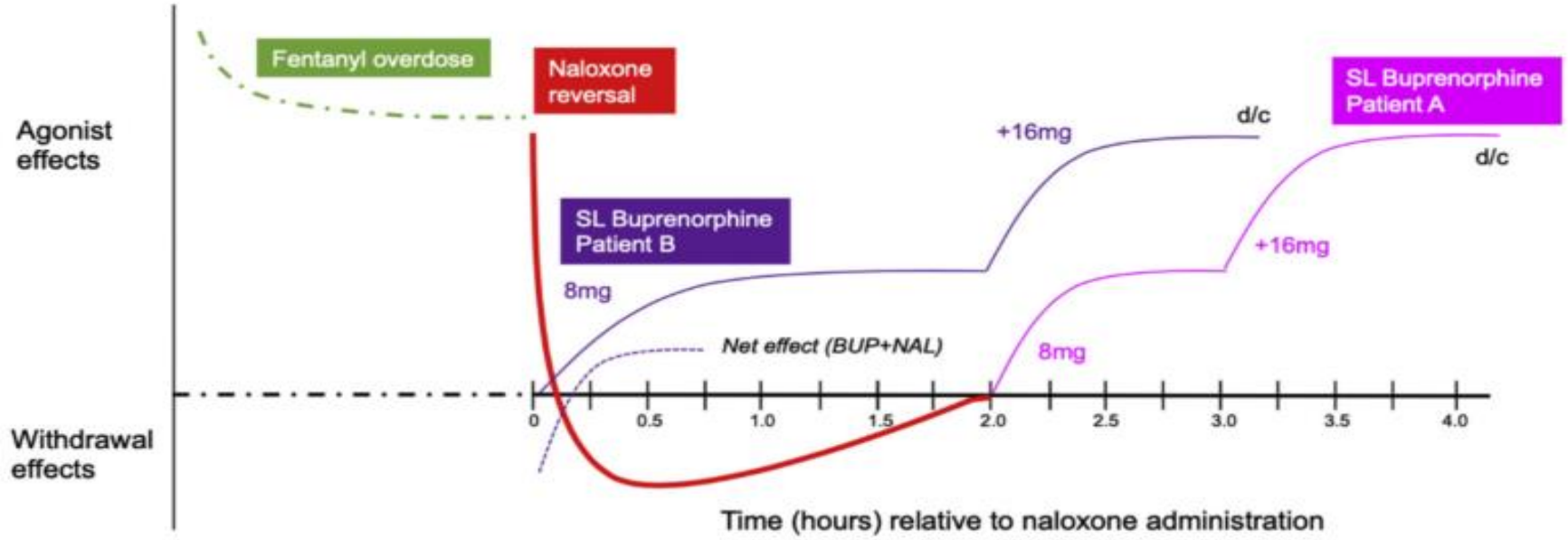


Fig. 3. Hypothesized opioid agonist/withdrawal outcome of ED-based naloxone reversal and buprenorphine administration for patients A and B following fentanyl overdose.

Sources:
Herring , 2019

I believe you all have more experience than the peer reviewed case literature discussed here.

Are you having more trouble with precipitated withdrawal as the incidence of fentanyl use has increased in California?

A. Yes
B. No
C. I don't know

FOLLOW UP

If yes, please describe your experience with this in chat.

TREATMENT RETENTION RATES

- 6-month treatment retention rates for persons on buprenorphine
  - Fentanyl positive groups, “other” opioid positive group and those who tested negative at baseline did not differ
- 6-month opioid abstinence rates
  - Fentanyl positive groups and other opioid positive group did not differ
  - Fentanyl positive group had lower abstinence rate than those who tested negative
- Doses did not differ between groups

- Current trials underway
- Buprenorphine SL vs XR in ED 04225598, includes people presenting with fentanyl use
- Fentanyl to Buprenorphine in person presenting to OTP NCT04794790; enroll 30 patients
  - Standard intervention 4mg buprenorphine if COWS>8
  - Macro Dose
  - Micro Dose

Sources:
Wakeman, 2019
ClinicalTrials.gov

How to manage a patient who is not in withdrawal when evaluated

HISTORICAL TREATMENT OF OPIOID WITHDRAWAL: "COMFORT MEDICATIONS" WHILE AWAITING BUPRENORPHINE INITIATION FOR FENTANYL

1. Clonidine: start 0.1 mg bid for bone pain & arousal; may increase dose, but watch for hypotension
2. Imodium (loperamide) 4mg 1-2 tabs q1 hr for diarrhea, NTE 16 mg/day
3. Motrin (ibuprofen) 600 mg q 6hr for bone pain or NSAID of your choice
4. Tylenol (acetaminophen) 975 mg up to qid for pain not relieved by NSAIDs
   - Can use both Tylenol and NSAIDS at the same time
5. Benadryl (diphenhydramine) 25 to 50 mg q6hr for nasal congestion, insomnia or anxiety
6. Compazine (prochlorperazine) 10mg qid for nausea/vomiting; give by any route available
7. Bentyl (dicyclomine) 10 mg qid for abdominal cramping, not relieved by controlling diarrhea
8. Valium (diazepam):10-15 mg for muscle spasms and insomnia

REEVALUATION

- Do you have procedures in place to re evaluate patients who are not yet in withdrawal?
- Do you have procedures for reevaluating someone who has been using fentanyl?
- Do you have procedures in place to reevaluate someone you started on buprenorphine?
  - Who reevaluates patients? Or what combination of people reevaluates patients?
    - Custody
    - Nursing
    - BH provider
    - SUD provider
    - Medical provider
  - How frequently are patients reevaluated?
  - Coming soon: Bureau of Justice AHP NCCHC Jail Withdrawal Guidelines

SUMMARY

- Fentanyl has rapid onset of action and death due to
  - Lipophilic (goes into brain quickly)
  - Wooden Chest Syndrome which is more than respiratory depression
- Treatment of fentanyl overdose
  - Currently unclear if we need higher doses of naloxone
  - May need additional interventions in different pharmaceutical classes
  - Start buprenorphine after naloxone reversal of fentanyl overdose
- Treatment of OUD related to fentanyl use
  - More difficult to initiate buprenorphine for fentanyl vs heroin
  - Current recommendations: wait until person is in moderate withdrawal (not just objective evidence of withdrawal) before starting buprenorphine; this may take over 24 hours
  - Start with low dose of buprenorphine
  - If no precipitated withdrawal, then proceed as usual*
  - Some patients may require micro-dosing approaches*
- To manage a patient who is not yet in withdrawal and has recently used fentanyl
  - Comfort medication
  - Reevaluation

*Clinical trials underway

REFERENCES/ RESOURCES

- https://cabridge.org/resource/fentanyl-frequently-asked-questions/
- Ahmed S, Bhivandkar S, Lonergan BB, Suzuki J. Microinduction of Buprenorphine/Naloxone: A Review of the Literature. Am J Addict. 2021 Jul;30(4):305-315. doi: 10.1111/ajad.13135. Epub 2020 Dec 30. PMID: 33378137
- Armenian P, Vo KT, Barr-Walker J, Lynch KL. Fentanyl, fentanyl analogs and novel synthetic opioids: A comprehensive review. Neuropharmacology. 2018 May 15;134(Pt A):121-132. doi: 10.1016/j.neuropharm.2017.10.016. Epub 2017 Oct 14. PMID: 29042317.
- Antoine D, Huhn AS, Strain EC, Turner G, Jardot J, Hammond AS, Dunn KE. Method for Successfully Inducting Individuals Who Use Illicit Fentanyl Onto Buprenorphine/Naloxone. Am J Addict. 2021 Jan;30(1):83-87. doi: 10.1111/ajad.13069. Epub 2020 Jun 23. PMID: 32572978; PMCID: PMC7755703.
- Baumann MH, Kopajtic TA, Madras BK. Pharmacological Research as a Key Component in Mitigating the Opioid Overdose Crisis. Trends Pharmacol Sci. 2018 Dec;39(12):995-998. doi: 10.1016/j.tips.2018.09.006. PMID: 30454770.
- Boas RA, Villiger JW. Clinical actions of fentanyl and buprenorphine. The significance of receptor binding. Br J Anaesth. 1985 Feb;57(2):192-6. doi: 10.1093/bja/57.2.192. PMID: 2982388.
- Bell A, Bennett AS, Jones TS, Doe-Simkins M, Williams LD. Amount of naloxone used to reverse opioid overdoses outside of medical practice in a city with increasing illicitly manufactured fentanyl in illicit drug supply. Subst Abus. 2019;40(1):52-55. doi: 10.1080/08897077.2018.1449053. Epub 2018 Jun 25. PMID: 29558283.
- Carroll GG, Wasserman DD, Shah AA, Salzman MS, Baston KE, Rohrbach RA, Jones IL, Haroz R. Buprenorphine Field Initiation of ReScue Treatment by Emergency Medical Services (Bupe FIRST EMS): A Case Series. Prehosp Emerg Care. 2021 Mar-Apr;25(2):289-293. doi: 10.1080/10903127.2020.1747579. Epub 2020 May 4. PMID: 32208945.
- Clark AK, Wilder CM, Winstanley EL. A systematic review of community opioid overdose prevention and naloxone distribution programs. J Addict Med. 2014 May-Jun;8(3):153-63. doi: 10.1097/ADM.0000000000000034. PMID: 24874759.
- Cook RR, Torralva R, King C, Lum PJ, Tookes H, Foot C, Vergara-Rodriguez P, Rodriguez A, Fanucchi L, Lucas GM, Waddell EN, Korthuis PT. Associations between fentanyl use and initiation, persistence, and retention on medications for opioid use disorder among people living with uncontrolled HIV disease. Drug Alcohol Depend. 2021 Nov 1;228:109077. doi: 10.1016/j.drugalcdep.2021.109077. Epub 2021 Sep 20. PMID: 34600253; PMCID: PMC8595584.
- Carpenter J, Murray BP, Atti S, Moran TP, Yancey A, Morgan B. Naloxone Dosing After Opioid Overdose in the Era of Illicitly Manufactured Fentanyl. J Med Toxicol. 2020 Jan;16(1):41-48. doi: 10.1007/s13181-019-00735-w. Epub 2019 Aug 30. PMID: 31471760; PMCID: PMC6942078.
- D"onofrio, G 2022 personal communication with Shannon Robinson
- Fairbairn N, Coffin PO, Walley AY. Naloxone for heroin, prescription opioid, and illicitly made fentanyl overdoses: Challenges and innovations responding to a dynamic epidemic. Int J Drug Policy. 2017 Aug;46:172-179. doi: 10.1016/j.drugpo.2017.06.005. Epub 2017 Jul 4. PMID: 28687187; PMCID: PMC5783633.
- Herring AA. Postoverdose Initiation of Buprenorphine After Naloxone-Precipitated Withdrawal Is Encouraged as a Standard Practice in the California Bridge Network of Hospitals. Ann Emerg Med. 2020 Apr;75(4):552-553. doi: 10.1016/j.annemergmed.2019.12.015. PMID: 32216889.
- Herring AA, Schultz CW, Yang E, Greenwald MK. Rapid induction onto sublingual buprenorphine after opioid overdose and successful linkage to treatment for opioid use disorder. Am J Emerg Med. 2019 Dec;37(12):2259-2262. doi: 10.1016/j.ajem.2019.05.053. Epub 2019 May 29. PMID: 31239086.
- Hill R, Santhakumar R, Dewey W, Kelly E, Henderson G. Fentanyl depression of respiration: Comparison with heroin and morphine. Br J Pharmacol. 2020 Jan;177(2):254-266. doi: 10.1111/bph.14860. Epub 2019 Dec 23. PMID: 31499594; PMCID: PMC6989952

REFERENCES

- Hug CC Jr, Murphy MR. Tissue redistribution of fentanyl and termination of its effects in rats. Anesthesiology. 1981 Oct;55(4):369-75. doi: 10.1097/00000542-198110000-00006. PMID: 7294371.
- Huhn AS, Hobelmann JG, Oyler GA, Strain EC. Protracted renal clearance of fentanyl in persons with opioid use disorder. Drug Alcohol Depend. 2020 Sep 1;214:108147. doi: 10.1016/j.drugalcdep.2020.108147. Epub 2020 Jul 2. PMID: 32650192; PMCID: PMC7594258.
- Klebacher R, Harris MI, Ariyaprakai N, Tagore A, Robbins V, Dudley LS, Bauter R, Koneru S, Hill RD, Wasserman E, Shanes A, Merlin MA. Incidence of Naloxone Redosing in the Age of the New Opioid Epidemic. Prehosp Emerg Care. 2017 Nov-Dec;21(6):682-687. doi: 10.1080/10903127.2017.1335818. Epub 2017 Jul 7. PMID: 28686547.
- Mayer, S., Boyd, J., Collins, A., Kennedy, M. C., Fairbairn, N., & McNeil, R. (2018). Characterizing fentanyl-related overdoses and implications for overdose response: Findings from a rapid ethnographic study in Vancouver, Canada. Drug and alcohol dependence, 193, 69–74. https://doi.org/10.1016/j.drugalcdep.2018.09.006.
- Moss RB, Carlo DJ. Higher doses of naloxone are needed in the synthetic opioid era. Subst Abuse Treat Prev Policy. 2019;14(1):6. Published 2019 Feb 18. doi:10.1186/s13011-019-0195-4
- Roy SD, Flynn GL. Solubility and related physicochemical properties of narcotic analgesics. Pharm Res. 1988 Sep;5(9):580-6. doi: 10.1023/a:1015994030251. PMID: 2907788.
- Schumann H, Erickson T, Thompson TM, Zautcke JL, Denton JS. Fentanyl epidemic in Chicago, Illinois and surrounding Cook County. Clin Toxicol (Phila). 2008 Jul;46(6):501-6. doi: 10.1080/15563650701877374. PMID: 18584361.
- Silverstein SM, Daniulaityte R, Martins SS, Miller SC, Carlson RG. "Everything is not right anymore": Buprenorphine experiences in an era of illicit fentanyl. Int J Drug Policy. 2019 Dec;74:76-83. doi: 10.1016/j.drugpo.2019.09.003. Epub 2019 Sep 25. PMID: 31563098; PMCID: PMC6914257.
- Slavova S, Costich JF, Bunn TL, Luu H, Singleton M, Hargrove SL, Triplett JS, Quesinberry D, Ralston W, Ingram V. Heroin and fentanyl overdoses in Kentucky: Epidemiology and surveillance. Int J Drug Policy. 2017 Aug;46:120-129. doi: 10.1016/j.drugpo.2017.05.051. Epub 2017 Jul 18. Erratum in: Int J Drug Policy. 2018 Aug;58:92. PMID: 28735777.
- Somerville NJ, O'Donnell J, Gladden RM, Zibbell JE, Green TC, Younkin M, Ruiz S, Babakhanlou-Chase H, Chan M, Callis BP, Kuramoto-Crawford J, Nields HM, Walley AY. Characteristics of Fentanyl Overdose - Massachusetts, 2014-2016. MMWR Morb Mortal Wkly Rep. 2017 Apr 14;66(14):382-386. doi: 10.15585/mmwr.mm6614a2. PMID: 28406883; PMCID: PMC5657806.
- Sutter ME, Gerona RR, Davis MT, Roche BM, Colby DK, Chenoweth JA, Adams AJ, Owen KP, Ford JB, Black HB, Albertson TE. Fatal Fentanyl: One Pill Can Kill. Acad Emerg Med. 2017 Jan;24(1):106-113. doi: 10.1111/acem.13034. Epub 2016 Oct 31. PMID: 27322591.
- Torralva R, Janowsky A. Noradrenergic Mechanisms in Fentanyl-Mediated Rapid Death Explain Failure of Naloxone in the Opioid Crisis. J Pharmacol Exp Ther. 2019 Nov;371(2):453-475. doi: 10.1124/jpet.119.258566. Epub 2019 Sep 6. PMID: 31492824; PMCID: PMC6863461.
- Wakeman SE, Chang Y, Regan S, Yu L, Flood J, Metlay J, Rigotti N. Impact of Fentanyl Use on Buprenorphine Treatment Retention and Opioid Abstinence. J Addict Med. 2019 Jul/Aug;13(4):253-257. doi: 10.1097/ADM.0000000000000486. PMID: 30550392.

1. Overall, today's webinar was:
   A. Very useful
   B. Somewhat useful
   C. Not very useful
   D. Not useful at all

2. The material presented today was:
   A. At the right level
   B. Too basic
   C. Too detailed

CONTACT US

FOR ANY QUESTIONS OR COMMENTS

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News Release 4.7.21

"Federal funds (CDC and SAMHSA) may now used to purchase fentanyl test strips"

https://www.cdc.gov/media/releases/2021/p0407-Fentanyl-Test-Strips.html

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DHCS