



An Unusual Case of Misrepresented Cocaine Powder that Resulted in Fatal and Non-Fatal Intoxications Involving the Novel Synthetic Opioid Etodesnitazene

AAFS 2023 – L46 Platform Presentation – Thursday, February 16, 2023

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DISCLOSURES

- I have no conflicts of interest to disclose.
- I am a scientist and employee of FRFF / CFSRE, a 501(c)(3) non-profit research and educational facility.
- The analysis was supported in part by the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice.
 - Award Number 2020-DQ-BX-0007, “Real-Time Sample-Mining and Data-Mining Approaches for the Discovery of Novel Psychoactive Substances (NPS)”.
 - The opinions, findings, conclusions and/or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect those of the Department of Justice.



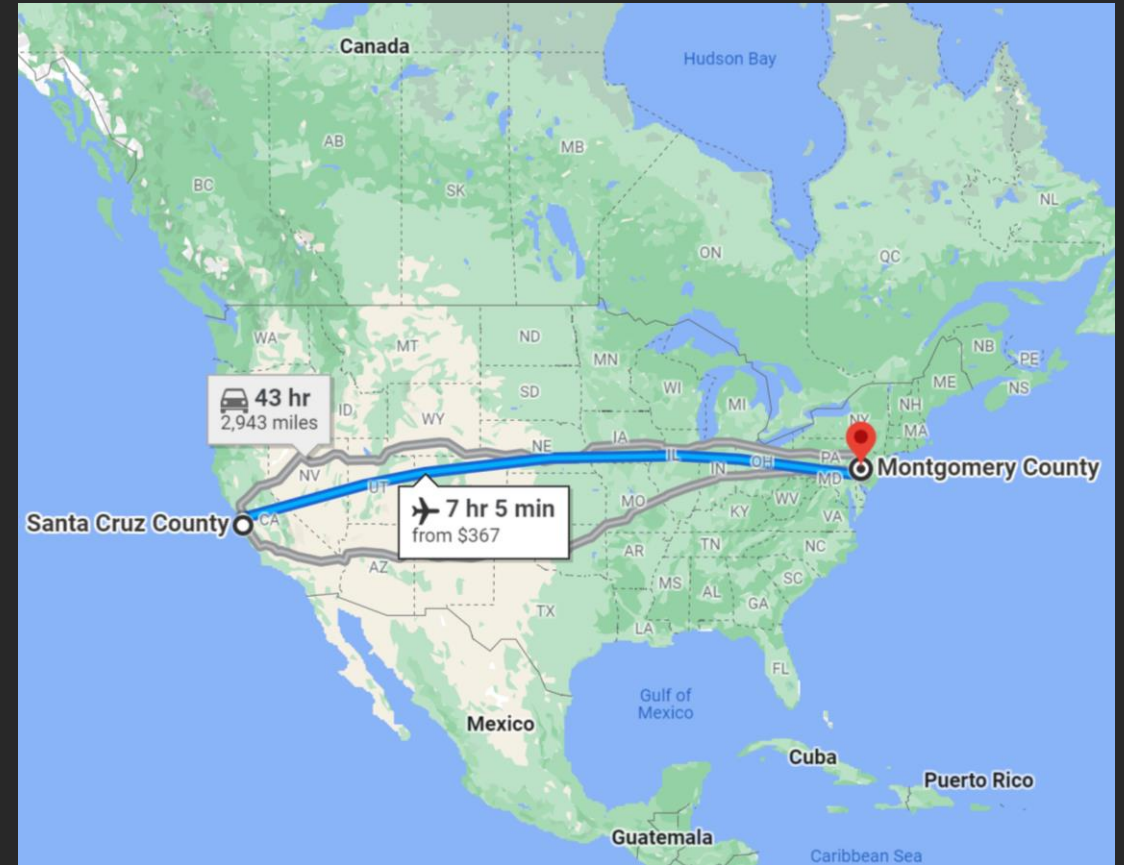
OUR AGENCIES / LABORATORIES

A (LITERAL) CROSS-COUNTRY COLLABORATION

- **Santa Cruz County Sheriff-Coroner's Office**
 - On Pacific coast, south of San Jose, CA
 - Population ~300,000

- **NMS Labs**
 - Reference forensic toxicology laboratory serving clients across the U.S.

- **Center for Forensic Science Research and Education (CFSRE)**
 - Non-profit forensic laboratory specializing in the analysis of newly emerging drugs



CASE HISTORY

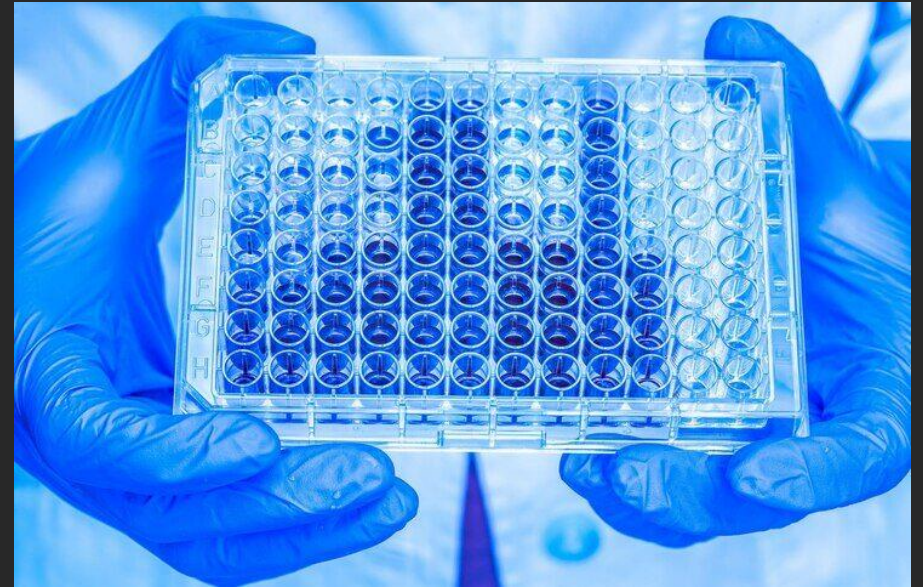
CASE HISTORY

- October 2021 (California)
- **Three individuals unresponsive in park**
 - Snorting suspected cocaine powder
- Two women purchased cocaine from a trusted dealer who sells “untainted” drugs
 - Used drugs the night prior without incident
- Met up with a guy who purchased more cocaine from unfamiliar dealer



CASE HISTORY

- All were transported to the hospital
 - Two were revived with naloxone and survived
 - Third required advanced life support for persistent comatose state (suspected opioid OD)
- Hospital urine drug screen:
 - Positive → Amphetamine, cocaine, benzodiazepines
 - Negative → Opiates
 - **Not performed → Fentanyl**
- Patient died three days later
 - Body transferred to coroner's office
 - Hospital specimens transferred as well



AUTOPSY & ANALYTICAL TESTING

CORONER'S OFFICE

- The body of the decedent was transported to the Santa Cruz County Sheriff-Coroner's Office
- The pathologist performed an external examination
- Hospital admission blood and urine samples were sequestered for toxicological analysis



TOXICOLOGY TESTING

- Specimens sent to NMS Labs (Horsham, PA)
- Analysis performed by LC-TOF-MS, LC-QQQ-MS, and GC-MS

- Results:**

<u>Compound</u>	<u>Result</u>	<u>Units</u>	<u>Matrix Source</u>
Naloxone	Positive	ng/mL	005 - Urine
Nicotine	Positive	ng/mL	005 - Urine
1-Hydroxymidazolam	>5000	ng/mL	005 - Urine
Benzoylecgonine	14000	ng/mL	005 - Urine
Cocaine	780	ng/mL	005 - Urine
Cocaethylene	610	ng/mL	005 - Urine
Amphetamine	300	ng/mL	005 - Urine
Methamphetamine	5400	ng/mL	005 - Urine
Fentanyl	63	ng/mL	005 - Urine
Norfentanyl	17	ng/mL	005 - Urine

- Blood: Negative for fentanyl*

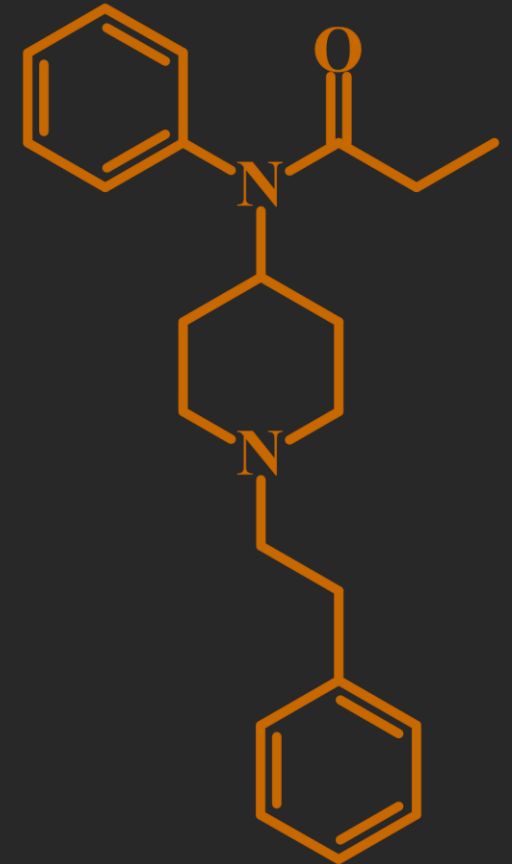
TOXICOLOGY TESTING

- Specimens sent to NMS Labs (Horsham, PA)
- Analysis performed by LC-TOF-MS, LC-QQQ-MS, and GC-MS
- **Results:** Fentanyl, methamphetamine, and cocaine (urine)
- Review of medical records → Fentanyl administered by medical staff
 - Was the cocaine laced with fentanyl??
- Other toxicology results are insufficient to explain the death
 - What's the next step??



IS FENTANYL ALWAYS THE ANSWER?

- Fentanyl can be administered in the hospital for various reasons
 - Examples: Intubation or post-intubation sedation
- Handful of cases to date with this type of scenario
- Are there ways to distinguish hospital fentanyl vs. illicit fentanyl?
- *Was fentanyl really the culprit in this case?*



DRUG MATERIAL TESTING

- **Three white powders** sent to the CFSRE (Willow Grove, PA)
 - Sample preparation → Methanol dilution
 - Qualitative Analysis → GC-MS and LC-QTOF-MS

- **Results:**
 - Powder #1 – Cocaine (ziplock)
 - Powder #2 – Cocaine (ziplock)
 - Powder #3 – **Etodesnitazene** (cellophane)



(Examples of the drug evidence)

TOXICOLOGY TESTING

- Secondary toxicological analysis at the CFSRE for **etodesnitazene**
- Blood and urine samples were submitted
 - Sample preparation → Basic liquid-liquid extraction
 - Analysis → LC-QTOF-MS and LC-QQQ-MS
 - Quantitation → Standard addition (ISTD: fentanyl-D5).

- **Results:**

Results and Conclusions:		
Exhibit #	Analyte	Concentration
1 (Blood)	Etodesnitazene	72 ng/mL
2 (Urine)	Etodesnitazene	68 ng/mL

TOXICOLOGY TESTING

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- Blood and urine samples were submitted
 - Sample preparation → Basic liquid-liquid extraction
 - Analysis → LC-QTOF-MS and LC-QQQ-MS
 - Quantitation → Standard addition (ISTD: fentanyl-D5).
- **Results:** Blood = 72 ng/mL, Urine = 68 ng/mL
- **Reference Blood Concentrations:**
 - Eleven MDI cases / **Mean = 33 ng/mL**, Median = 11 ng/mL, **Range = 0.53 to 120 ng/mL**

NITAZENE ANALOGUES IDENTIFIED IN THE U.S.



Date	Class	Compound	Structure	Formula	MW	[M+]	[M+H] ⁺
12/19/2022	Opioid	N-Desethyl Isotonitazene		C21H26N4O3	382.5	382	383.2078
11/22/2021	Opioid	N-Piperidiny Etonitazene		C23H28N4O3	408.5	408	409.2234
09/22/2021	Opioid	Metodesnitazene		C21H27N3O	337.5	337	338.2227
05/26/2021	Opioid	Protonitazene		C23H30N4O3	410.5	410	411.2391
05/13/2021	Opioid	N-Pyrrolidino Etonitazene		C22H26N4O3	394.5	394	395.2078
03/26/2021	Opioid	Flunitazene		C20H23FN4O2	370.4	370	371.1878
02/23/2021	Opioid	Etodesnitazene		C22H29N3O	351.5	351	352.2383
01/15/2021	Opioid	Butonitazene		C24H32N4O3	424.5	424	425.2547
07/30/2020	Opioid	Metonitazene		C21H26N4O3	382.5	382	383.2078
11/19/2019	Opioid	Isotonitazene		C23H30N4O3	410.5	410	411.2391

REVIEW OF CASE FINDINGS

- **Case History:**
 - Three individuals ingested misrepresented “cocaine”
 - Two non-fatal overdoses, one fatal overdose
- **Drug Material Testing:**
 - Powder #3 → Etodesnitazene
- **Toxicology Testing:**
 - Blood & Urine → Etodesnitazene
- **Death Certification:**
 - Manner of Death – Accident
 - Cause of Death – Acute Etodesnitazene Intoxication





DISCUSSION & CONCLUSIONS

DISCUSSION

- **Why** did this happen?
 - California cocaine supply contaminated with opioids?
 - Mistaken white powder? Deliberate?
- Recreational drug supply in the U.S. remains **dynamic, volatile**, and (overall) increasingly **toxic**
- Fentanyl is the primary driver of drug related deaths in the U.S., but its not always the answer
- **MAC-D** → Misrepresentation, Adulteration, Cutting, and/or Dilution of drug materials
 - Why? → Increase profits, produce better effects or highs, reduce potential unwanted side effects, etc.



Misrepresentation

Adulteration



Cutting

Dilution



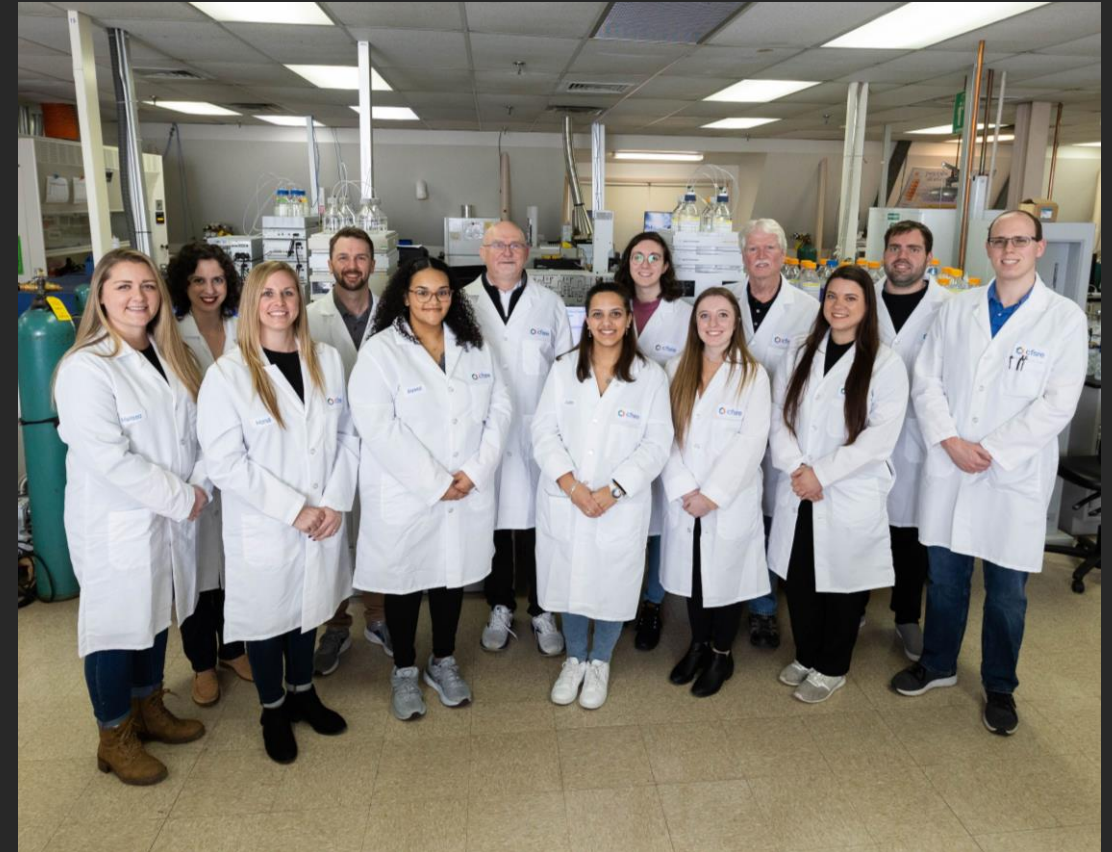
CONCLUSIONS

- **New drugs continue to appear in fatal overdose** scenarios, albeit at lower occurrence than fentanyl
 - New synthetic opioids (e.g., nitazene analogues) are causing increased mortality across the country
- This cases stresses the **importance of thorough medicolegal death investigation**
 - Forensic pathologists, forensic toxicologists, forensic chemists and others working together
- **Comprehensive toxicology testing** is preferred in cases of suspected overdose
 - Especially in the absence of fentanyl



ACKNOWLEDGEMENTS

- **Santa Cruz County Sheriff-Coroner's Office**
 - Stephany Fiore
 - Staff
- **CFSRE / NPS Discovery**
 - Sara Walton
 - Josh DeBord
 - Barry Logan
 - Staff
- **NMS Labs**
 - Dan Anderson
 - Brianna Peterson
 - Donna Papsun
 - Staff
- **National Institute of Justice (NIJ)**



NIJ *National Institute of Justice*

STRENGTHEN SCIENCE. ADVANCE JUSTICE.



Thank you!

Questions?

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