



# Evaluation of a New Hampshire Law Enforcement Officer's Unintentional Occupational Exposure to Illicit Drugs

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August 2018



**Centers for Disease Control  
and Prevention**  
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## Table of Contents

### Main Report

Introduction .....	1
Request.....	1
Background .....	1
Our Approach .....	1
Our Key Findings.....	1
LEO 1 was exposed to fentanyl and other illicit drugs. ....	1
LEO 1 experienced symptoms after the exposure. ....	2
LEO 1 engaged in decontamination procedures after the incident. ....	2
The police department identified areas for improvement after the incident.....	3
Our Recommendations .....	4

### Supporting Technical Information

Section A: Police Department.....	A-1
Section B: Methods, Results, and Discussion .....	B-1
Methods .....	B-1
Results.....	B-1
Discussion .....	B-3
Section C: Tables.....	C-1
Section D: References.....	D-1

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# Introduction

## Request

In May 2018, a police chief requested a health hazard evaluation (HHE) concerning unintentional exposure to illicit drugs experienced by a law enforcement officer (LEO 1). The incident occurred during a traffic stop and law enforcement action in June 2017.

## Background

According to the Centers for Disease Control and Prevention, there has been a 100% increase in the rate of overdose deaths involving synthetic opioids (which includes fentanyl and its analogues) in the United States from 2015–2016. It is becoming more common to find illicit fentanyl and its analogues mixed with other drugs, especially cocaine. This has raised concerns about the potential for exposure to illicit drugs among law enforcement officers (LEOs) and other emergency responders who might be exposed to illicit drugs in the course of their work.

To learn more about the workplace, go to [Section A in the Supporting Technical Information](#)

## Our Approach

In June 2018, we met with LEOs directly involved with the incident and a representative from the state’s Department of Safety to discuss the incident and related “after-action” evaluations. We also reviewed the following records:

- Police department arrest report and photographs from the incident
- Forensic laboratory report of materials (illicit drugs) collected during the incident
- Emergency medical services (EMS) and emergency department (ED) records related to the incident

To learn more about our methods, go to [Section B in the Supporting Technical Information](#)

## Our Key Findings

### LEO 1 was exposed to fentanyl and other illicit drugs.

As part of a vehicle search, LEO 1 opened a container. As a result, LEO 1 was exposed to a powder that was suspected to be heroin and fentanyl at the time of the incident (see Figure 1).

- When the container was opened, LEO 1 reported that a gust of wind blew the powder “all over me and my uniform.”
- LEO 1 was wearing a short-sleeved uniform and was not wearing gloves.
- Multiple exposure routes were possible, including inhalation, mucous membrane (eyes, nose, and mouth) contact, ingestion, or skin absorption.

- The forensic laboratory found fentanyl in the powder on initial testing; the presence of fentanyl was documented with confirmatory testing. The laboratory also found methamphetamine in the powder on initial testing; confirmatory testing was not performed for methamphetamine.



Figure 1. Materials found during the incident. LEO 1 opened the rubber container on the right. Forensic laboratory testing later showed that the power remaining in the container included fentanyl and methamphetamine. The material in the paper wrapper on the left weighed approximately 10 grams and contained fentanyl.

### **LEO 1 experienced symptoms after the exposure.**

LEO 1 began to feel disoriented and lightheaded and had “blurry vision” within several minutes of the exposure. A short time later, LEO 1 also reported feeling “sleepy.”

- LEO 1 did not have respiratory depression, objective signs of central nervous system (CNS) depression, or miosis (small or pinpoint pupils), which are signs consistent with serious (life-threatening) opioid toxicity.
- EMS providers arrived approximately 10 minutes after symptoms began.
- When EMS providers arrived, they found LEO 1 to be alert. Blood pressure was 175/127 mmHg. Respiratory rate was 17 breaths per minute. Note: At rest, normal blood pressure is < 120/80 mmHg and normal respiratory rate is 12–20 breaths per minute. LEO 1’s pupils were normal in size.
- LEO 1 was monitored in the ED for several hours. LEO 1’s vital signs remained stable during this time. The symptoms went away after several hours.
- The ED physician’s assessment was “chemical exposure.”
- Naloxone was not administered to LEO 1.

### **LEO 1 engaged in decontamination procedures after the incident.**

Before going into the ED, LEO 1 was decontaminated by rinsing with water and changing clothes.

- Immediately after the powder release, LEO 1 tried to clean exposed skin with hand sanitizer available in the police vehicle.
- Before the ambulance transported LEO 1 to the ED, the face, arms, and hands were washed with water.

## The police department identified areas for improvement after the incident.

The police department conducted an “after-action” review of the incident with LEOs and EMS personnel in nearby jurisdictions who regularly give mutual aid. They identified some areas for improvement in police department procedures:

- Recognizing: (1) cross-contamination is possible when unknown illicit drugs are present; and (2) the need to prevent further contamination.
- Following current recommendations for first responders potentially exposed to illicit drugs and other unknown substances.
  - They recognized that alcohol-based hand sanitizer should not be used to clean skin after potential exposure to fentanyl or other opioids.
- Periodic review of the police department’s search procedures to minimize potential for LEOs to be exposed to hazardous substances during traffic stops and searches, in accordance with state law.
- Improved access to personal protective equipment (PPE) such as gloves, arm or sleeve protectors, and respirators.

The police department made the following change after the incident:

- Using regular radio checks between LEOs and emergency dispatchers to confirm LEO safety while processing drug evidence.
- Uniforms now have pockets to store gloves, making them more available when needed.

The police department and regional LEO, fire fighter, and EMS organizations are continuing to review standard operating procedures related to potential exposure to illicit drugs. They are working with state health and safety representatives on this review.

To learn more about our findings, go to [Section B in the Supporting Technical Information](#)

## Our Recommendations

NIOSH has issued interim guidance on how to protect emergency responders from exposures to fentanyl and its analogues. We believe that this current NIOSH guidance is applicable to this incident, even though other illicit drugs were present in addition to fentanyl.

### **Recommendation 1: Continue to revise work practices and procedures (“after-action items”) that the police department identified as areas for improvement**

Why? Fentanyl and its analogues pose a potential hazard to responders (including, but not limited to, LEOs, fire fighters, and EMS personnel) who come into contact with these drugs in the course of their work. Possible exposure routes to fentanyl and its analogues can vary based on the source and form of the drug. Responders are most likely to encounter illicit fentanyl and its analogues in powder (including compressed powder), tablet, and/or liquid form. Potential exposure routes of greatest concern include inhalation, mucous membrane contact, ingestion, and percutaneous exposure (e.g., needlestick). Any of these exposure routes can potentially result in toxic effects. Brief skin contact with fentanyl or its analogues is not expected to lead to toxic effects if any visible contamination is promptly removed.

LEO 1 experienced symptoms of lightheadedness, disorientation, and “blurry vision” after being exposed to fentanyl powder during the incident.

### ***How? At your workplace, we recommend these specific actions:***



**Follow guidance related to PPE use, standard safe operating procedures, and decontamination in the NIOSH Topic Page entitled “Fentanyl: Preventing Occupational Exposure to Emergency Responders” (<https://www.cdc.gov/niosh/topics/fentanyl/risk.html>).**

Specific recommendations that are most relevant to this incident include:

- Use gloves in all situations in which fentanyl is suspected to be present but no fentanyl is visible; more protective PPE should be used according to the situation at the scene, as outlined in the current guidance.
- Avoid performing tasks or operations that might aerosolize fentanyl.
- Do not use hand sanitizers to clean potentially contaminated skin.
- Responders who come into contact with fentanyl should immediately use soap and water (or just water if soap is not available) to thoroughly wash and rinse contaminated skin.
- All contaminated clothing should be removed and laundered, being careful not to disturb any areas of contamination.



- When possible, decontamination should be conducted at the scene of potential exposure, and prior to entry into vehicles, buildings, or other areas that are not already potentially contaminated.



**In addition to NIOSH recommendations, the police department should be aware of recommendations and guidance from the state’s Department of Safety and Department of Health and Human Services, available at:**  
<https://www.nh.gov/safety/divisions/fstems/ems/preparedness/documents/syntheticfentanyls.pdf>.



**Provide periodic training to police department employees about how to prevent occupational exposure to illicit drugs**

- Topics for training are outlined in the current NIOSH recommendations.
- Provide training upon hire, periodically (e.g., annually), and on an as-needed basis (e.g., after incidents which may raise issues for review).

**Recommendation 2: To the extent possible, continue joint training and development of uniform standard operating procedures with other nearby local law enforcement agencies, fire departments, and EMS organizations that work together**

Why? The police department frequently takes part in mutual aid operations and joint responses in the region. For best coordination and protection of all workers, it will be important for all groups working together to have similar training and standard operating procedures.

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# Supporting Technical Information

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## **Section A: Police Department**

The police department comprises three LEOs, which includes the police chief, and serves a town of approximately 1,700 year-round residents. The police department routinely collaborates with law enforcement, fire fighting, and EMS organizations in surrounding jurisdictions through mutual aid agreements. Among its duties, the police department conducts approximately 1,200 traffic stops per year.

## Section B: Methods, Results, and Discussion

### Methods

The objectives of our evaluation were to:

- Review work activities during the June 2017 traffic stop to characterize potential exposure to illicit drugs.
- Review and discuss information concerning health effects related to the June 2017 incident, including information from available police, EMS, and medical records.
- Review and discuss any changes made by the police department in response to the incident (“after-action changes”).
- Make recommendations on how to prevent exposures to illicit drugs among LEOs.

We conducted open discussions with three of the LEOs who were on the scene of the June 2017 incident, including the LEO who became symptomatic (LEO 1). A representative of the state’s Department of Safety, Division of Fire Standards and Training and Emergency Medical Services was also present. Our discussion primarily included:

- Details about the incident, PPE used, work duties during the incident, exposure to what were suspected to be illicit drugs at the time, and health effects experienced by LEO 1.
- Actions taken after the June 2017 incident to address areas for improvement in standard law enforcement procedures (“after-action changes”) identified by the police department.
- General information concerning topics such as training and typical work duties and practices in the police department.
- The opioid epidemic and health and safety issues among emergency responders in the state, including guidance documents prepared by the state.

We reviewed the following records:

- Police department arrest record.
- Two EMS pre-hospital incident reports.
- ED records for LEO 1.
- Testing results for materials from the incident performed by the state’s forensic laboratory.

### Results

LEO 1 and LEO 2 performed a traffic stop. LEO 1 searched the vehicle with the driver’s consent while LEO 2 remained at the back of the vehicle with the driver and passenger. The search was conducted following usual police department protocols in accordance with state law. State law allows consent for the search to be withdrawn at any time. Materials consistent with illicit drugs were found in a small purse, which contained a package of powder consistent with heroin and fentanyl, an unlabeled rubber

container, and buprenorphine and naloxone (Suboxone) strips (Figure 1). When LEO 1 opened the rubber container outside of the vehicle, a gust of wind blew powder inside the rubber container onto LEO 1. LEO 1 reported the powder was “all over me and my uniform.” During the incident, LEO 1 was wearing a short-sleeved uniform and no gloves. Since it was a hot and humid day, LEO 1 sat in the police vehicle when attempting to brush the powder off. LEO 1 also used hand sanitizer available in the police vehicle to clean hands and arms.

Within minutes, LEO 1 began to feel disoriented and lightheaded and to have “blurry vision.” LEO 2 called for an ambulance several minutes later. Other regional law enforcement personnel also responded to the scene of the incident.

The ambulance arrived approximately 10 minutes after symptom onset noted above, which was approximately 8 minutes after EMS providers were dispatched. EMS providers assisted LEO 1 with further decontamination by washing exposed skin with water. EMS providers noted that LEO 1 was alert upon their arrival. Initially, LEO 1’s vital signs were:

- Blood pressure: 175/127 mmHg
- Respiratory rate: 17 breaths per minute
- Heart rate: 105 beats per minute

Note: At rest normal blood pressure is < 120/80 mmHg, normal heart rate is 60–100 beats per minute, and normal respiratory rate is 12–20 breaths per minute.

Heart rate and blood pressure measurements were documented several other times in the EMS and ED reports. Other documented measurements included heart rate ranging between 80–85 beats per minute and blood pressure ranging from 149/77–159/104 mmHg. EMS providers noted that LEO 1’s pupils were 4 mm (normal) and reactive. During the ambulance ride to the hospital, blood pressure decreased but was still elevated, respiratory rate was normal to elevated, and heart rate decreased to within the normal range. During transport to the ED, LEO 1 noted intermittent symptoms of “trouble thinking and staying awake.”

LEO 1 arrived at the ED approximately 42 minutes after symptom onset. According to the ED record, the only symptom experienced in the ED was “mild blurry vision.” Physical examination in the ED noted that LEO 1 was alert and had pupils that were equal, round, and reactive to light with no miosis. LEO 1 remained alert, and vital signs remained stable during several hours of observation and monitoring in the ED before LEO 1 was discharged. LEO 1’s symptoms resolved after several hours. No naloxone was administered to LEO 1. The ED physician’s assessment was “chemical exposure.” LEO 1 returned to work on the same day.

The materials found in the vehicle search conducted by LEO 1 underwent expedited testing at the state forensic laboratory. Results are shown in Table C1. The forensic laboratory identified fentanyl and methamphetamine in the powder remaining in the rubber container.

## Discussion

### Background

From 2015 to 2016, there has been a 100% increase in the rate of overdose deaths involving synthetic opioids (which includes fentanyl and its analogues) in the United States [Centers for Disease Control and Prevention 2018a]. Illicit fentanyl and its analogues are increasingly being mixed with other drugs, particularly cocaine [Centers for Disease Control and Prevention 2018b]. This has raised concerns about the potential for exposure to opioids among emergency responders (e.g., law enforcement officers, fire fighters, and emergency medical service workers), who might come into contact with opioids in the course of their work [Howard and Hornsby-Myers 2018]. Continual introduction of novel synthetic opioids presents continuing challenges during the current opioid epidemic [Armenian et al. 2017].

### Issues related to health effects

Classic signs and symptoms of severe opioid toxicity include lethargy or other indications of CNS depression, shallow or slow breathing, miosis, slow heart rate, and low body temperature [Boyer 2012; Ropper et al. 2014]. However, not all patients experiencing opioid intoxication consistently experience all of these components [Boyer 2012]. Symptoms of mild opioid toxicity (compared to severe toxicity that includes respiratory depression) may include effects such as lightheadedness and drowsiness [Lynch et al. 2018; Suzuki and El-Haddad 2017].

Analysis of the remaining powder in the rubber container indicated the presence of methamphetamine in addition to fentanyl. Methamphetamine, a type of amphetamine, can cause CNS stimulatory effects such as increased alertness and agitation. Other signs and symptoms associated with methamphetamine include chest pain, palpitations (sensation of rapid or irregular heartbeat), increased blood pressure, and difficulty breathing [Albertson et al. 1999].

The work-related health effects experienced by LEO 1 were not consistent with severe opioid toxicity described above. The non-specific symptoms experienced by LEO 1 associated with this incident are consistent with a milder form of toxicity related to drug exposure; however, in our evaluation it is not possible to determine if other clinical factors may have impacted the observed health effects. LEO 1's symptoms had mostly resolved by the time of arrival in the ED. Care provided by the ED consisted primarily of evaluation and monitoring; LEO 1 was discharged within several hours. In summary, LEO 1 experienced work-related health effects that were debilitating and the health effects resolved within several hours.

### Issues related to potential exposure

While it is clear that LEO 1 was exposed to the powder from the opened container, there are a number of issues that make characterization of the exposure difficult. As with other similar incidents that have occurred among emergency responders, this incident: (1) was evaluated in a retrospective manner one year later; (2) occurred quickly, in a work setting where advance planning is difficult; and (3) involved highly toxic materials, which are not fully characterized from an occupational safety and health perspective.

In this incident, potential routes of exposure could include inhalation, mucous membrane absorption, ingestion, absorption through the skin, or a combination. An unknown amount of powder was blown from the rubber container onto LEO 1; approximately 1.6 g of powder remained in the container after the incident. While brief contact of powder with intact skin is not expected to lead to toxic effects, use of alcohol-based hand sanitizer might have increased absorption of the powder in this incident [Lynch et al. 2018, Moss et al. 2018].

The police department has reviewed standard operating procedures for work duties (including training activities covering work practices and PPE use) and decontamination procedures. Based on the reviews, several modifications have occurred with the goal of minimizing future exposures. Ongoing coordination of implementing these “after-action items” with other LEO agencies and responder organizations in the region will be important because mutual aid activities are common.



## Section C: Tables

Table C1. Summary of forensic laboratory testing results from the incident

Description of item	Weight (grams)	Substance present
Paper wrapper containing compressed tan powder	9.98	Fentanyl
Rubber container* containing tan powder and chunks	1.56	Fentanyl Methamphetamine†
Plastic bag containing crystals	0.006	Methamphetamine
Sealed packages‡ labeled "Suboxone sublingual film" containing orange strips	0.28	Buprenorphine

\*Opened by LEO 1, which resulted in release of powder.

†Analysis indicated the presence of methamphetamine, but the laboratory report stated "this drug was not confirmed." In this laboratory, ultraviolet and visible spectrophotometry are used as an initial laboratory technique to identify the presence of specific chemical agents in a sample. Gas chromatography-mass spectrometry and infrared spectrophotometry (with attenuated total reflectance) are used as confirmatory techniques to document ("confirm") the presence of a specific agent in a sample – those latter techniques were not used for the methamphetamine detected by the initial techniques.

‡One of the packages was randomly tested. The orange strips were visually consistent with Suboxone, a pharmaceutical product containing 2 milligrams of naloxone and 8 milligrams of buprenorphine.

## Section D: References

### Opioids

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### Methamphetamine

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## Additional Resources

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