



(/niosh/index.htm)

Fentanyl

Preventing Occupational Exposure to Healthcare Personnel in Hospital and Clinic Settings

Illicit fentanyl and its analogues (for the purpose of this document, referred to as illicit fentanyl) pose a potential hazard to healthcare personnel who could come into contact with these drugs in the course of their work in hospital and clinic settings. This potential risk, which is related to external sources of fentanyl (i.e., originating in the community), is distinct from the hazards posed by diversion of pharmaceutical fentanyl (which is used in many healthcare settings as part of routine patient care; [see for information](#) (<https://www.cdc.gov/injectionsafety/drugdiversion/index.html>) related to drug diversion).

Healthcare personnel who could potentially be exposed to illicit fentanyl include nurses, nursing assistants, physicians, technicians, therapists, phlebotomists, pharmacists, students, and trainees. Healthcare personnel not directly involved in patient care, but who could be potentially be exposed to illicit fentanyl in the healthcare setting, include clerical, dietary, environmental services, laundry, security, engineering and facilities management, administrative, billing, and volunteer personnel. Possible exposure routes to illicit fentanyl vary based on the source and form of the drug. Healthcare personnel might be exposed when the patient or their personal items are contaminated with illicit fentanyl, which may be present in powder, tablet, or liquid forms. While the clinical findings for a person presenting with fentanyl (or other opioid overdose) may be wide-ranging, respiratory depression or arrest, disorientation or stupor, and pinpoint pupils (miosis) generally suggest severe opioid toxicity.

Potential exposure routes of greatest concern include inhalation of powders or aerosols, mucous membrane contact, ingestion, or exposure secondary to a break in the skin (for example a needlestick). Any of these exposure routes can potentially result in a variety of symptoms that can include the rapid onset of life-threatening respiratory depression. Skin contact is also a potential

exposure route, but is not likely to lead to overdose unless exposures are to liquid or to a powder over an extended period of time. Brief skin contact with illicit fentanyl is not expected to lead to toxic effects if any visible contamination is promptly removed.

The Centers for Disease Control and Prevention (CDC) has no occupational exposure data on illicit fentanyl for workers potentially exposed in the course of their job duties. There are no established federal or consensus occupational exposure limits for illicit fentanyl. These recommendations are based on the reported toxicity and the chemical and physical properties of illicit fentanyl; CDC's National Institute for Occupational Safety and Health (NIOSH) guidance for other similar chemicals (or in the same family); recommendations from previous NIOSH health hazard evaluation reports about law enforcement personnel exposures to other drugs and chemicals; and the basic principles of industrial hygiene. As new research becomes available, these recommendations will be updated.

Work Practices¹

The following work practices should be established and followed when illicit fentanyl is known or potentially present on patients presenting for healthcare with or without symptoms of opioid exposure. These work practices are recommended along with decontamination procedures and use of personal protective equipment (PPE) noted below.

1. Healthcare facilities that receive victims from EMS responses should work with EMS providers to coordinate communication of information about the response. Information including details related to potential contamination of the victims and providers can help the healthcare facility better assess whether decontamination is necessary and coordinate medical evaluation and treatment.
2. When first encountering a patient, the healthcare personnel should assess the risk for hazards, and determine whether the presence of illicit fentanyl is suspected. Gathering relevant information from the patient, emergency medical transport staff, or other persons accompanying the patient is important when possible.
3. Healthcare personnel should follow established work practices as well as these recommendations:
 - Staff should recognize when they are entering and leaving potentially contaminated areas.
 - Do not eat, drink, smoke, or use the bathroom while working in an area with known or suspected illicit fentanyl.
 - Do not touch the eyes, mouth, or nose after touching any surface potentially contaminated with illicit fentanyl.
 - Wash hands (or other unprotected skin) with soap and water immediately after a potential exposure and after leaving an area where illicit fentanyl is known or suspected to be present

to avoid potential exposure and cross contamination. Do not use alcohol-based hand rubs to clean contaminated skin in situations where exposure to illicit fentanyl is suspected. Use of such hand rubs could increase absorption through the skin.

- Avoid performing tasks (such as shaking potentially contaminated clothing or bedding) that might aerosolize illicit fentanyl that is present on the patient or in the environment because it might increase risk of exposure to healthcare personnel. Activities that aerosolize illicit fentanyl require the use of higher levels of PPE as recommended below and should be conducted by appropriately trained personnel in accordance with facility policies and procedures.
- Removal or changing of a patient's clothes or bedding might be necessary during the care of a patient that is suspected or confirmed to have used or been exposed to illicit fentanyl. These materials should be handled in a manner which minimizes contact with the materials, dispersion of any illicit fentanyl which may be present, and production of any aerosols from the materials. If powder or dust is identified on clothing, a wet wipe should be used while wearing the PPE as recommended below to remove it. The materials should be carefully placed in labeled durable 6 mil polyethylene bags and segregated from other laundry until they are laundered.
- Notify other healthcare personnel involved with the care of the patient of the potential for illicit fentanyl contamination until the patient, room, work surfaces, and laundry are decontaminated.
- Launder clothes worn by healthcare personnel caring for a patient that is suspected or confirmed to have used or been exposed to illicit fentanyl at the healthcare facility if in-house laundry facilities are available. Clothing should be carefully placed in labeled durable 6 mil polyethylene bags and segregated from other laundry until they are laundered. If a healthcare facility does not have in-house laundry facilities, the potentially contaminated linens or uniforms should be segregated and identified when sent for laundering.
- If collection of unknown substances suspected to be illicit fentanyl is needed in the healthcare setting, develop a specific plan to perform those types of collections in accordance with the policies and procedures of the facility and applicable law enforcement. Personnel specifically trained to perform such collections should do so while using the PPE recommended below. Never handle illicit fentanyl without using the appropriate PPE.

Training

Personnel in healthcare facilities who perform jobs where illicit fentanyl is reasonably anticipated to be present should receive special training in how to conduct a risk assessment and demonstrate an understanding of the following elements. Whether as part of a formal or informal triage process

(<https://www.ahrq.gov/professionals/systems/hospital/esi/index.html>) , healthcare personnel should incorporate the following training elements into the initial part of the patient assessment process to help guide subsequent actions related to minimizing potential exposure to illicit fentanyl:

- Potential exposure routes for illicit fentanyl.
- How to recognize the signs and symptoms of opioid exposure (applicable to patients and other healthcare personnel).
- How to recognize potential illicit fentanyl contamination in patients.
- When to use PPE; what PPE is necessary; how to properly put on, use, take off, dispose of, and maintain PPE; and the limitations of PPE.
- When and how to decontaminate a patient.

Personal Protective Equipment (PPE)

Healthcare personnel may be at increased risk of exposure to illicit fentanyl if small amounts of fentanyl products are visible on the patient, clothing, or possessions. In this case, healthcare personnel would use the following PPE:

- At least an N100, R100, or P100 disposable filtering facepiece respirator² or a respirator that provides a higher level of protection
- Face and eye protection that may include goggles or a faceshield when wearing a filtering facepiece respirator³
- Powder-free nitrile gloves⁴
- Wrist/arm protection, such as sleeve covers, that would cover skin which may not be covered by usual clothing or uniform such as gowns or coveralls

It is important to recognize that the healthcare personnel's potential for exposure may change during the patient encounter or stay in a healthcare facility, and PPE for these purposes should be adjusted accordingly. For situations in which no fentanyl products are visible on the patient, clothing, or possessions, the PPE noted above would not be recommended. Additionally, the PPE noted above would no longer be recommended if decontamination was performed as recommended below.

In all cases, employers should identify hazards to which their personnel might be exposed and provide appropriate PPE to protect them. All PPE should be used in accordance with the Occupational Safety and Health Administration (OSHA) PPE standard ([29 CFR 1910.132](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9777) (https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9777)). When required, respirator use should be in the context of a comprehensive respiratory protection program in accordance with the OSHA Respiratory Protection Standard ([29 CFR 1910.134](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9777)).

(https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=12716) and other requirements. Healthcare personnel who need to wear respirators should be medically cleared, trained, and fit-tested for respirator use. Detailed information on respiratory protection programs, including fit-testing procedures, can be accessed in OSHA's Respiratory Protection eTool (<http://www.osha.gov/SLTC/etools/respiratory>).

Decontamination

Patients who may be contaminated⁵ and healthcare personnel who come into contact with illicit fentanyl should immediately remove clothing and use soap and water to thoroughly wash and rinse potentially contaminated skin. They should avoid breaking the skin during the decontamination process and they should cover all open wounds. Do not use alcohol-based hand rubs or bleach solutions to clean contaminated skin. All contaminated clothing should be removed, segregated from other laundry, and laundered at the healthcare facility when possible, being careful not to disturb any areas of contamination. Employers should establish policies and staffing to ensure that healthcare personnel shower and change clothing immediately after a potential exposure.

Decontamination of reusable PPE and equipment should be done according to the manufacturer's recommendations. Contaminated single use PPE should be placed in labeled durable 6 mil polyethylene bags and disposed of appropriately.

Laundering (laundry may include bed sheets and blankets, towels, personal clothing, patient apparel, uniforms, scrubs, and gowns) should be done in a manner that minimizes disturbance of any areas of contamination and segregates contaminated laundry, allowing it to be handled safely. Laundering in a healthcare facility should be done in accordance with the Laundry and Bedding section in the CDC Guidelines for Environmental Infection Control in Health-Care Facilities (<https://www.cdc.gov/infectioncontrol/guidelines/environmental/index.html>).

Routine cleaning of work surfaces and rooms in healthcare facilities should be done in accordance with the Principles of Cleaning and Disinfecting Environmental Surfaces section of the CDC Guidelines for Environmental Infection Control in Health-Care Facilities (<https://www.cdc.gov/infectioncontrol/guidelines/environmental/index.html>). Surfaces suspected or know to be contaminated with illicit fentanyl that are able to be cleaned (such as hard, non-porous surfaces) should first be washed with soap and water as outlined in the Cleaning Housekeeping Surfaces section before using a disinfectant (such as bleach). Any activity which could result in making an unknown contaminant airborne (such as dry sweeping or vacuuming with a standard vacuum) should not be performed. A high-efficiency particulate air (HEPA) filter vacuum should be used when sweeping or vacuuming is required.

References

[1] Standard precautions are used for all patient care

(<https://www.cdc.gov/infectioncontrol/basics/standard-precautions.html>

(<https://www.cdc.gov/infectioncontrol/basics/standard-precautions.html>)). Standard precautions are intended to protect healthcare personnel from infection and prevent the spread of infection from patient to patient.

[2] N: not resistant to oil, P: oil proof, R: resistant to oil.

[3] Faceshields are recommended when additional protection is needed to protect against possible body fluid splashes when wearing filtering facemasks.

[4] Powder-free nitrile gloves should be worn with a minimum thickness of 5 +/- 2 mil (i.e. 0.127 +/- 0.051 millimeters; 1 mil=0.0254 millimeters), unless manufacturer provides performance breakthrough data for thinner gloves.

[5] If patient is incapacitated, this should be done for the patient by the healthcare personnel.

Follow NIOSH

Facebook (<http://www.facebook.com/NIOSH>)

Flickr (<http://www.flickr.com/photos/NIOSH>)

Pinterest (<http://www.pinterest.com/cdcgov/workplace-safety-and-health/>)

Twitter (<http://twitter.com/NIOSH>)

YouTube (<http://www.youtube.com/user/NIOSHSafetyVideos>)

NIOSH Homepage

NIOSH A-Z

Workplace Safety & Health Topics

Publications and Products

Programs

Contact NIOSH

Page last reviewed: April 23, 2018

Page last updated: April 25, 2018

Content source: National Institute for Occupational Safety and Health (<https://www.cdc.gov/NIOSH/>) Emergency Preparedness and Response Office (EPRO)