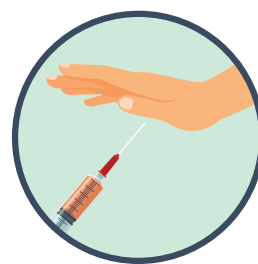




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United Nations Office on Drugs and Crime

Guidelines for the safe handling of synthetic opioids for law enforcement and customs officers



UNITED NATIONS OFFICE ON DRUGS AND CRIME
Vienna

Guidelines for the safe handling of synthetic opioids for law enforcement and customs officers



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Introduction

Background

The emergence of high-potency synthetic drugs represents an ongoing and evolving operational, safety and scientific challenge for law enforcement, customs and forensics officers. This trend is characterized by the emergence of high-potency synthetic opioids which include a wide range of drugs with strong narcotic analgesic properties that act on one or more of the body's opioid receptors. In recent years an increase in the clandestine manufacture, trafficking and supply of synthetic opioids, such as fentanyl and its analogues, as well as a range of other novel synthetic opioids, has contributed to substantial rates of abuse and overdose-related deaths among drug users in many countries and the potential for officers to encounter these substances in the execution of their duties has increased significantly. While this document focuses on synthetic opioids, the principles outlined may be applicable to high-potency synthetic drugs in general.

These guidelines form part of a series of technical guidance and training materials published by the Laboratory and Scientific Service (LSS) of the United Nations Office on Drugs and Crime (UNODC) which have been developed as practical and evidence-based guidance to support law enforcement and customs officers in the safe handling and management of synthetic drugs, with a focus on synthetic opioids.

These guidelines are not intended to replace existing approved operational guidance or search procedures used by law enforcement or customs agencies. Rather, they are intended to provide additional technical information, recommendations and precautions for the safe handling of synthetic opioids. Elements of these guidelines may be incorporated into existing procedures or used to inform the development of new procedures to reduce or prevent the potential for accidental exposure to synthetic opioids or synthetic drugs.

Scope

These guidelines focus on the exposure risks posed by synthetic opioids as a class of substances and recommendations for measures to prevent exposure in a range of operational environments. While fentanyl and its analogues are among the most common synthetic opioids encountered by law enforcement and customs, other emerging synthetic opioids with potentially higher or unknown potency also pose an operational risk, and officers may be unaware of the identity or potency of a substance when encountering it in an operational environment.

The guidelines set out evidence-based exposure control processes to minimize the risk for officers in various operational roles and environments with a focus on high-risk operational activities, evidence handling and laboratory-based roles.

Overview of synthetic opioids

While traditional opiates derived from the opium poppy (*Papaver somniferum L.*) have been used for over 6,000 years, synthetic opioids first emerged in the mid-twentieth century. The pharmaceutical synthesis and patenting of fentanyl itself in 1960 was followed by the development of the analogues sufentanil and carfentanil in 1974, alfentanil in 1976 and remifentanil in 1988 [1]. These substances were developed as analgesic and anaesthetic drugs and a number continue to be widely used in clinical practice in the veterinary and medical professions.

The first significant appearance of synthetic opioids as “designer drugs” occurred in the early to mid-1980s, predominantly in the form of 3-methylfentanyl [2]. While its detection in seized drugs around this time was common, the drug failed to gain a significant user base and the first widespread abuse of synthetic opioids and evidence of clandestine manufacture and trafficking did not emerge until the 2000s when synthetic opioids were identified in several heroin markets in the United States. At the same time, overdose deaths increased to 1,000 per year in these same markets [3].

Initially, the main driver behind the abuse of synthetic opioids from the 2000s onward in the United States was reported to be an oversupply of prescription painkillers such as oxycodone and hydrocodone. This oversupply resulted in a high number of individuals being able to access and abuse such substances leading to dependency and creating a demand which did not exist in the 1980s when the abuse of synthetic opioids was first identified. While the abuse and diversion of licit pharmaceutical synthetic opioids has been widely documented, today the majority of synthetic opioids in illegal drug markets originate from clandestine manufacture [4].

Illicit synthetic opioids are mainly used either as adulterants in heroin or pressed into counterfeit pharmaceutical pills. Occasionally, synthetic opioids are also observed as adulterants in other drugs such as cocaine. In the United States in 2018, the number of opioid-related deaths involving synthetic opioids (predominantly fentanyl), was twice the number of opioid deaths involving heroin or prescription opioids [4]. In some locations, the number of overdose deaths involving synthetic opioids was three times those involving heroin alone, indicating that these markets have transitioned at least temporarily to a dominance of synthetic opioids over heroin.

While fentanyl, fentanyl analogues and other synthetic opioids such as tramadol continue to represent the majority of seizures of synthetic opioids globally, in recent years there has been an increasing emergence of novel synthetic opioids and by January 2021, over 110 individual substances had been reported by 43 countries to the UNODC Early Warning Advisory on New Psychoactive Substances (NPS). In 2020, an additional two synthetic opioids (crotonylofentanyl and valerylofentanyl) were placed under international control bringing to 16 the number of synthetic opioids scheduled internationally in the period 2015-2020.

Trafficking

Domestic and small volume trafficking is commonly conducted via privately owned vehicles, pedestrians, international mail, express consignment carriers, private courier or mail consolidator companies. Synthetic opioids, in finished and raw form, are widely available for sale online through domestic and international vendors on both the Open Web and the Dark Web. Unlike more traditional drug distribution methods, manufacturers of synthetic opioids and other synthetic drugs can distribute substances directly to individual users, dealers or intermediaries using international mail or private courier/mail companies. Such manufacturers often advertise substances on the Internet and seek to conceal shipments through freight forwarding systems, mislabelling or the routing of packages through third countries to hamper efforts to trace the point of origin [5]. Strategies employed by drug manufacturers and traffickers using mail and courier service providers include:

- Shotgun approach, i.e., sending large numbers of packages to multiple addresses and locations within a narrow time period
- Private mailboxes or re-direction service providers
- Using social media to identify properties which are vacant or whose occupiers are absent, and directing consignments to these addresses
- Using online mail and courier tracking systems to trace deliveries and determine if a consignment may have been seized or substituted by law enforcement based on delays in transit and processing

01.

Toxicity, potency and exposure risk

1.1 Toxicity and potency

Toxicity and potency are key factors in determining and understanding the risk of exposure for law enforcement and customs officers from synthetic opioids.

Toxicity can be defined as the degree to which a toxin can damage an organism or substructure of an organism. In the context of synthetic opioids, toxicity occurs when an individual is exposed to, and accumulates a drug (dose) in their body tissues to the extent that there is an adverse effect on the body. Simply being exposed to a substance will not necessarily result in a toxic effect.

The potency of synthetic opioids is a significant factor in characterizing the risks, both actual and perceived, to drug users and those who may come into contact with the drugs in the course of their work, i.e., occupational exposure. Potency is a measure of the activity of a drug and refers to the amount or concentration (effective dose) of a substance required to produce a cognitive or physiological effect [6]. For example, the usual adult dose of morphine is approximately 10 mg compared to a usual dose of fentanyl of 0.2 mg [7] (or 200 µg). Thus, fentanyl is 50 times more potent than morphine. In comparison, sufentanil has a usual adult dose of 0.05 mg [8] (or 50 µg), indicating that sufentanil is 200 times more potent than morphine.

Both toxicity and potency are dose dependent, i.e., the higher the potency, the lower the exposure dose that results in a clinically observable or toxic effect. In practical terms, this means that when an individual is exposed to a potent synthetic opioid via inhalation, mucous membrane contact or injection (e.g., needlestick), even small quantities can result in an observable effect. However, even under these circumstances, adverse effects can normally be successfully reversed by prompt medical attention and/or administration of an opioid antagonist (antidote) such as naloxone (see annex C, section C.4), with no significant ensuing adverse effects for the exposed individual.

Toxicity and potency are also important to understand the high rates of overdose and mortality associated with the abuse of synthetic opioids. The high potency of many synthetic opioids means that even small errors in weighing, dosing, dilution or manufacture (e.g., tableting) can result in a dose unit containing too much of the synthetic opioid resulting in an increased risk of overdose. However,

the actual and perceived risks associated with drug overdoses involving synthetic opioids should not be transposed to the occupational exposure risk faced by law enforcement and customs officers, as the exposure scenarios are substantially different. However, understanding the toxicity, potency, exposure risk and how to manage or mitigate these risks in an operational environment is important for officers who are likely to encounter these substances in the course of their duties.

1.2 Exposure risk

Given their roles and responsibilities, law enforcement and customs officers are at increased risk of being exposed to synthetic opioids. However, the overall risk of this exposure resulting in a clinically significant exposure or toxic effect (e.g., overdose) is extremely low [9]. Nevertheless, it is important to recognize the potential risks which high-potency synthetic opioids may pose, particularly in combination with high exposure risk operational environments. It is also important to acknowledge that when encountered in an operational environment, officers are unlikely to be aware of the identity of the substance or its potency. For this reason, it is recommended that agencies and officers apply a precautionary principle (see annex A, section A.1), as well as develop procedures for managing exposure risks, ensuring adequate training, use of appropriate protective equipment and decontamination procedures to further assist in managing exposure risk.

A significant amount of misinformation exists in relation to synthetic opioids and their associated exposure risk, especially concerning first responders. This is driven largely by the absence of technical knowledge or training on exposure risk and the objective identification and indicators of opioid intoxication. Many misconceptions arise from widely reported overdoses and mortality rates from the abuse of synthetic opioids. However, the majority of reported overdoses result from the direct administration of a

synthetic opioid (e.g., by intravenous injection), and not from occupational exposure. This is in contrast with the low number of confirmed exposures by law enforcement, customs officers and other first responders which result in an adverse effect following medical examination and/or pathology.

Other factors which can influence both toxicity and exposure risk include:

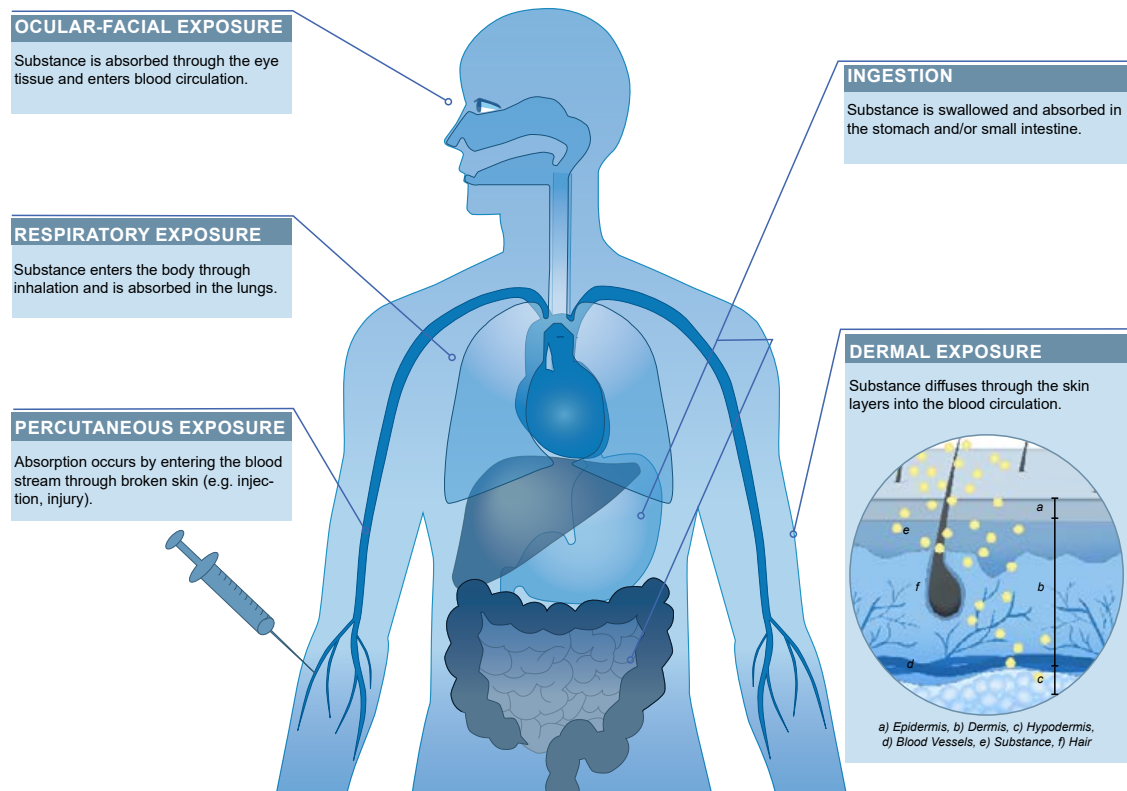
- Exposure route
- Degree and duration of exposure
- Chemical properties of the substance (e.g., molecular weight, solubility, lipophilicity, bioavailability)
- Potency and purity
- Individual characteristics such as body weight [dispersal effect], age, general health and metabolic factors

1.3 Exposure route

The presence of a synthetic opioid alone does not necessarily mean that there is risk of exposure; a substance must first make contact with and enter the body. This contact point is referred to as the “exposure route”. The exposure route is one of the primary factors which determines the seriousness of an exposure, because toxicity varies depending on the exposure route and some exposure routes allow more rapid or direct entry into the body. Exposure routes with more rapid or direct entry into the blood stream or body tissues represent a higher risk of acute (immediate or rapid onset) effect than other exposure routes.

The three most common exposure routes to the human body are inhalation, dermal (skin) and ingestion. However, in the context of the operational environments encountered by officers, other exposure routes are also relevant. Injection (percutaneous exposure), such as needlestick injuries, and oculofacial exposure via the mucous membranes in the eye, are commonly raised concerns.

FIGURE I. EXPOSURE ROUTES FOR SYNTHETIC OPIOIDS



Considering both the likely physical form of the substances and the operational environments in which synthetic opioids are encountered, the highest risk exposure routes for officers are inhalation (where an airborne particulate is present) and injection. Dermal, ingestion and oculofacial exposure routes are generally lower risk. This section will examine these exposures routes in order of risk for both human and canine officers.

1.3.1 Inhalation exposure

Exposure risk: HIGH [officers and canines]

Environments with increased risk of inhalation exposure:

- ✎ Clandestine drug manufacture and tableting laboratories
- ✎ Confined space searches, e.g., concealed rooms, vessels, truck trailers
- ✎ Handling or processing large volume drug seizures or contaminated exhibits
- ✎ Any operating environment where a free or uncontained powder is visible

Inhalation exposure represents a high risk as the respiratory system, which includes the nasal cavity (upper respiratory tract) as well as the bronchi and lungs (lower respiratory tract), provides a highly efficient, direct and rapid route of entry into the body. As most known synthetic opioids are unlikely to convert into a gaseous state under normal conditions (e.g., at room temperature), the risk of encountering a synthetic opioid in a vapour or as a gas is highly unlikely [10].

For a synthetic opioid to pose an inhalation risk, it must first become airborne or be dispersed within the air. This is most likely to occur where the substance is present as a finely divided powder with a low particle size and weight which allows the particles to become suspended in the air or within a confined atmosphere such as in clandestine tableting laboratories where counterfeit synthetic opioid pills are produced.

Where synthetic opioids are present as respirable particulates in the air, inhalation exposure represents a high risk, primarily due to the high bioavailability of synthetic opioids via inhalation. Bioavailability refers to the amount of an administered dose which reaches the tissues once it has entered the body [11]. Therefore, a substance with high bioavailability is rapidly assimilated or dispersed into body tissues. Fentanyl, as an example, can range from 12 per cent to nearly 100 per cent bioavailable by inhalation [12].

When there is exposure via inhalation to a high atmospheric concentration of a synthetic opioid, particularly if it is of high potency, the individual may rapidly accumulate a concentration of the substance in their body tissues and experience clinically observable symptoms which may progress rapidly. Such exposures in an operational environment may impact the ability to perform essential tasks or actions.

Inhalation exposure in canines

A similar inhalation risk exists for canines where a synthetic opioid is present as a powder or respirable particulate. As with human officers, such exposures may impair or prevent a canine from performing essential tasks or actions. Inhalation exposure in canines occurs in the same manner as in humans, either via mucosal membranes in the nasal cavity or upper airway (e.g., nasal insufflation, particularly for detection dogs) or by inhalation through the mouth and into the lower respiratory tract. Therefore, canine handlers should be alert to the visual presence of any uncontained powders, and not allow canines to directly sniff or otherwise come into direct contact with these substances. Canines should not be deployed in environments where synthetic opioids are known or reasonably suspected to be present in an uncontained state. Further information on canine exposure and response is provided in annex C, section C.5.

1.3.2 Injection exposure

Exposure risk: HIGH [officers and canines]

Environments with increased risk of injection exposure:

- Body (personal), bag, vehicle and other general searches
- Buildings involving drug use or distribution locations

Injection or percutaneous exposure occurs when an object penetrates the skin. For law enforcement, customs officers and first responders, this most commonly occurs in the form of a needlestick injury where the skin is penetrated by a hypodermic needle. In the context of synthetic opioids, injection exposure potentially provides more direct or rapid entry into the bloodstream or body tissues than other exposure routes. Therefore, this represents a high risk of acute (immediate or rapid onset) effect.

Increasing rates of synthetic opioid abuse among intravenous drug users give rise to a corresponding increase in the risk of needlestick injuries, most commonly from used hypodermic needles and syringes. However, it is important to note that any injection exposure, in the absence of a “loaded” dose, where only residual amounts of a synthetic opioid remain present within the needle or syringe, is unlikely to result in any significant adverse effect. In such cases, the primary risk and health care priority is biological and blood-borne diseases.

However, any needlestick injury where an officer is injected with the contents, or portion of contents, from either a primed needle or a loaded syringe, represents a high exposure risk and should be considered a medical emergency. Where inadvertent injection occurs, this most commonly involves the injection of a substance into body tissues such as muscle or fat (subcutaneous injection), rather than directly into a vein

(intravenous). Clinical studies on subcutaneous injection of fentanyl have shown that it is absorbed into the bloodstream with peak effect levels reached in an average of 15 minutes (ranging from 10 to 30 minutes) in non-opioid tolerant individuals [13]. Therefore, absorption by subcutaneous injection is expected to be slower than by direct intravenous injection. This may provide a window of opportunity for officers to deploy a medical countermeasure such as naloxone if objective or clinical symptoms of opioid toxicity appear.

Variables which can impact the degree and severity of exposures involving inadvertent injection include:

- The administered dose (volume and potency)
- The location of administration (tissue type or localized vascular structures)
- The substance or drug present

Where objective symptoms of opioid toxicity occur, the prompt administration of an opioid antagonist (such as naloxone) should prevent the progression of symptoms. However, prompt medical assessment should be obtained, and this requirement included in any organizational procedures. In the case of forensic laboratories, these requirements should be incorporated into the laboratory’s Quality Management System.

1.3.3 Dermal exposure

Exposure risk: LOW [officers and canines]

Environments with increased risk of dermal exposure:

- ✎ Clandestine synthetic opioid manufacture and tableting laboratories
- ✎ Locations where drug distribution or use has occurred
- ✎ Handling or processing drugs or contaminated exhibits
- ✎ Body (personal), vehicle or other manual searches

Dermal exposure occurs when a substance comes into direct contact with the skin. This is the most common type of exposure likely to occur during law enforcement or customs operations. However, available evidence indicates that incidental dermal exposure is unlikely to result in opioid toxicity or overdose [9].

Skin forms a highly effective barrier to environmental contaminants unless it is damaged. In order for a synthetic opioid to be absorbed into the body, it must first penetrate the outer layer of skin and continue through the lower layers to reach the blood vessels. This type of exposure is highly time dependent. The longer a substance is in contact with the skin, the greater the potential for absorption to occur. For this reason, prompt decontamination via washing with soap and water is recommended to remove any residual opioid or drug-related substances (see section 2.7.1).

In most cases, synthetic opioids are encountered in a solid powder form, which represents a relatively low exposure risk through intact skin with no evidence to suggest significant passive absorption.

Synthetic opioids, particularly fentanyl and fentanyl analogues, have the ability to cross the dermal barrier due to physiochemical properties including low molecular weight and high lipophilicity [14]. Fentanyl, for example, is up to 1,000 times more permeable than morphine [15].

Despite the ability of synthetic opioids to cross the dermal barrier, studies on the dermal absorption of fentanyl from transdermal patches, show that 3–13 hours of continuous direct contact is required to reach a therapeutic blood concentration, and up to 35 hours to reach peak blood concentrations [9]. This indicates that although synthetic opioids can be absorbed dermally, this process is unlikely to be rapid.

When a synthetic opioid is present in a liquid, gel or other aqueous form and comes into direct contact with skin, there is an increased risk of more rapid dermal absorption relative to dry powder. However, research suggests that the rate of absorption for aqueous fentanyl applied to the skin, is similar to the rate of absorption observed for patches [15]. This suggests that any effect from an exposure involving an aqueous synthetic opioid is also likely to be delayed. Prompt decontamination remains a priority, particularly where the substance or its potency is unknown.

Therefore, based on current evidence, the absorption of synthetic opioids from small, unintentional skin exposures to tablets, powder or solutions of synthetic opioids is unlikely to result in significant toxicity. However, if toxicity were to occur, it would not develop rapidly, allowing time for decontamination and where necessary, administration of naloxone in case of the appearance of objective symptoms of toxicity.

Dermal exposure in canines

Dermal exposure in canines is also expected to pose a relatively low risk unless the integrity of the skin is compromised (e.g., cuts, abrasion or open wounds). The canine's coat acts as an effective barrier, particularly when exposed to a synthetic opioid in powder form. However, when a canine shakes in response to contamination from an opioid powder, the residual powder may

be dispersed into the air and pose a potential inhalation risk. More significant is the risk of secondary contamination, where the contaminant may be transferred from the canine to people or objects that the canine comes into contact with, including the handler and the handler's vehicle. It is therefore important to decontaminate a canine whenever dermal exposure is known or suspected (see section 2.7.5).

1.3.4 Ingestion

Exposure risk: LOW [officers and canines]

Environments with increased risk of ingestion exposure:

- Clandestine synthetic opioid manufacture and tableting laboratories
- Drug houses or locations where drug distribution or use has occurred
- Handling or processing drugs or contaminated exhibits
- Body (personal), vehicle or other manual searches

For law enforcement and customs officers, the accidental ingestion of a clinically significant quantity of synthetic opioid is unlikely in an operational setting. In addition, oral ingestion of incidental quantities of synthetic opioids are generally considered low risk due to relatively low oral bioavailability [16]. Upon ingestion, synthetic opioids undergo extensive first pass metabolism with as much as 20 per cent of the ingested dose being eliminated through a variety of biological processes. Similarly, transbuccal bioavailability (absorption via the mucosal membranes in the mouth) is estimated at 50–65 per cent [17,18]. Considering the likelihood and degree of oral ingestion, combined with relatively low bioavailability, accidental oral ingestion is considered low risk.

Risk of accidental ingestion, particularly from hand-to-mouth movements, may be further

minimized by appropriate training; the development of relevant procedures, particularly in relation to evidence handling; and decontamination prior to smoking or eating, along with good general hygiene practices.

Ingestion exposure in canines

Ingestion exposure in canines is also considered relatively low risk. Orally administered opioids undergo significant first pass metabolism in canines, significantly limiting systemic absorption. Bioavailability of opioids in canines has also been shown to be low, with only 20–30 per cent of an ingested dose expected to be absorbed into systemic circulation [19]. However, where a canine is contaminated, licking to clean the coat or paws may increase ingestion exposure. Again, decontamination is key to avoiding ingestion exposure (see section 2.7.5).

1.3.5 Oculofacial exposure

Exposure risk: LOW [officers and canines]

Environments with increased risk of oculofacial exposure:

- Clandestine synthetic opioid manufacture and tableting laboratories
- Confined space searches, e.g., concealed rooms, vessels, truck trailers
- Handling or processing large volume drug seizures or contaminated exhibits

Although oculofacial contact with a liquid or powder opioid is unlikely in a normal operational setting, the absorption of synthetic opioids via the mucosal membranes in the eye is a viable exposure pathway, based on clinical studies involving fentanyl [20].

Synthetic opioids can be absorbed across all mucosal membranes, including the eyes, at varying rates and with varying degrees of efficiency. The bioavailability and rate of absorption via mucosal membranes may be up 30 times that of dermal exposure [9]. For this reason, it is recommended that eye protection be used in all circumstances where there is potential for exposure to a synthetic opioid, particularly as an airborne contaminant.

The mucosal membrane of the eye covers the inner surface of the eyelid and the outer surface of the eye and secretes a watery fluid to lubricate the eye. When there is oculofacial exposure to a liquid or powder containing an opioid, it may be dissolved by the ocular fluid, absorbed via the

mucosal membrane and enter the bloodstream. No information is currently available on the rate of absorption of synthetic opioids via ocular tissue. However, the likelihood of receiving a clinically significant dose through ocular exposure resulting in an adverse effect is relatively low. Nevertheless, given the high potency of some synthetic opioids, oculofacial exposure remains an exposure pathway for operational consideration with primary management through the appropriate use of eye protection.

Oculofacial exposure in canines

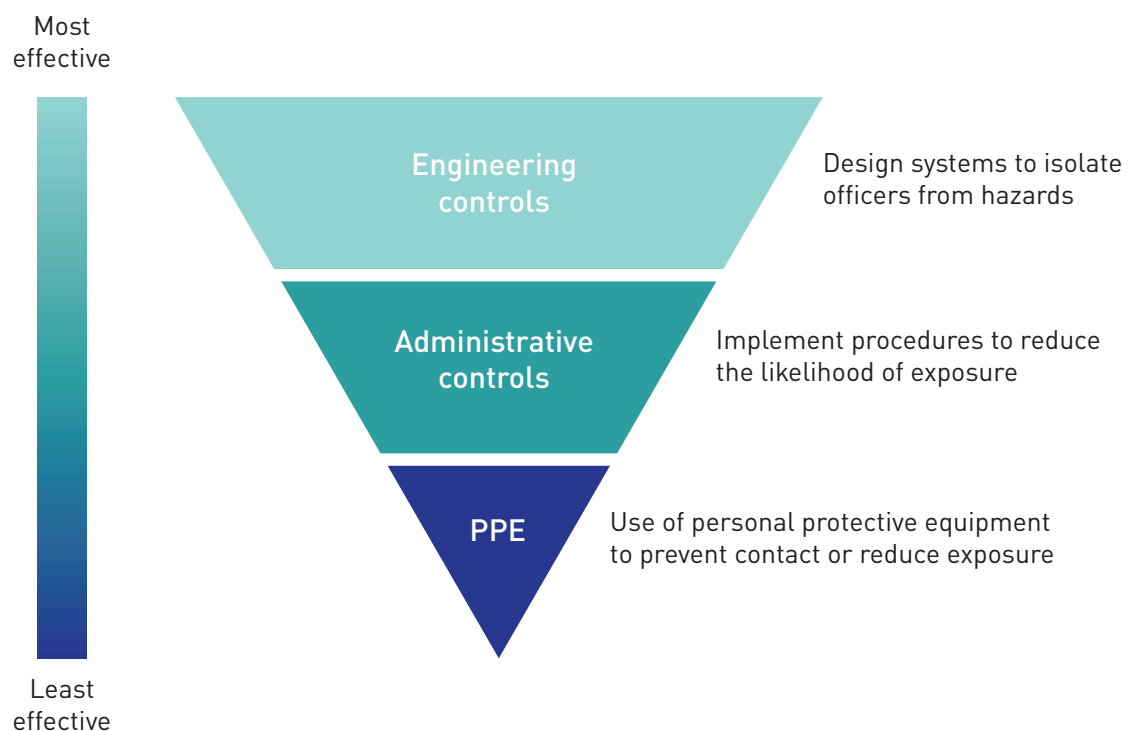
Canines have a slightly increased risk of ocular exposure as during some operations, such as urban search and rescue, their head and eyes are close to the ground where particulates may accumulate. However, the likelihood of receiving a clinically significant dose via this exposure route, in the absence of high-level particulate contamination in the air or the presence of an uncontained powder, is relatively low.

02.

Exposure controls

In order for an occupational exposure to a synthetic opioid to result in a toxic effect, the substance must make physical contact, enter the body and accumulate in body tissues at a sufficient level. Preventing physical contact is achieved through the use of a hierarchy of protective measures which are collectively termed “exposure controls”. Traditional models for the hierarchy of controls include “elimination” and “substitution” as first-line options. However, due to the nature of law enforcement and customs operations, it is not possible to eliminate or substitute the hazard of encountering synthetic opioids or other drugs. Therefore, engineering controls, administrative controls (such as development of safe operating procedures and training), and the correct use of personal protective equipment (PPE) are the most viable means to control exposure risk in an operational environment, as shown in the figure below:

Figure II. Hierarchy of controls for synthetic opioid exposure



- Engineering controls include containment systems such as negative pressure rooms in mail examination facilities, air-handling and extraction systems such as fume hoods (including ductless fume hoods) or smaller containment units such as glove boxes in forensic or mobile laboratories.
- Administrative controls commonly include legislation and regulations (including powers and responsibilities), policies, management systems, procedures (both administrative and operational) and training. Management systems and procedures range from high-level electronic, evidence and organizational management systems to operational procedures for searches, evidence collection and the handling and storage of evidence and exhibits. Training is a critical element of administrative controls, which helps ensure that management systems are applied and correct procedures followed. Regular, role-specific training should be implemented to increase awareness of procedures and relevant hazards and to develop the practical skills needed to reduce the likelihood of occupational exposure. Additional information on administrative controls and training is provided in section 2.2.
- PPE is generally considered a “last line of defence” and the least effective means of controlling exposure. However, the reality of law enforcement, customs and forensic operations is that hazards cannot be eliminated and there are generally no engineering controls in the field. Therefore, PPE, along with operational procedures and training, remains critical to managing occupational exposure in operational environments. The appropriate use of PPE removes the exposure route for hazards and thereby controls or minimizes exposure risk in most routine operations.
- The following are a number of exposure control measures, ranging from advanced engineering controls (including containment systems) to simple cost-effective PPE and decontamination measures which can be implemented to control or minimize exposure risk when handling or encountering synthetic opioids.

2.1 Engineering controls



Engineering controls are systems designed and, ideally, built into a building, facility or work environment to control exposure risk by isolating officers from hazards. They should be considered in work environments, such as mail screening facilities, mail examination and deconstruction rooms, evidence handling areas, evidence storage facilities and forensic laboratories where synthetic opioids may be encountered, handled, stored or analysed.

Engineering controls are unlikely to be practical or available in most field environments, other than appropriately equipped mobile forensic laboratories or in some specialist vehicles or mobile units.

There are a range of engineering control systems which may be suitable for different law enforcement, customs or forensic facilities to mitigate or control potential exposure risk. However, some screening, customs or evidence handling and storage facilities may have limited or no engineering controls available or accessible. The following are recommended systems and measures which should be considered where practicable or available. See annex A, section A.7 for examination or deconstruction in facilities with no engineering controls.

TABLE 1. RECOMMENDED ENGINEERING CONTROL SYSTEMS

Facility type	Recommended controls
Major mail screening or customs facilities	<ul style="list-style-type: none"> • Containment systems such as negative pressure rooms should be used for examining high-risk items as they provide a high level of containment for potentially hazardous gases, vapours, particulates, radiological substances or biohazards and assist the decontamination process by restricting any contaminants within the containment area. • Containment systems must provide their own heated and cooled air. • Such systems should not be connected to the facility's centralized heating, ventilation and air-conditioning (HVAC) systems. • Negative pressure rooms should be designed to achieve an appropriate number of air changes per hour [21].
General (or small scale) mail screening or customs facilities	<ul style="list-style-type: none"> • Where negative pressure rooms are not available, it is recommended that a designated, well-identified and enclosed room be used for mail examinations or deconstructions of suspicious items, away from the main screening area or other occupied workspaces. • Access to this room should be controlled or restricted when in use, but still externally accessible in emergencies. • To reduce the potential exposure risk and assist in containing potential hazards, an externally ventilated air extraction system, such as a ducted fume hood or similarly engineered air-handling system, should be used which is not connected to the facility's centralized HVAC system. • Ductless or recirculating fume hoods, which are considerably less expensive than ducted systems, can also be used in mail examination facilities. • Ducted, ductless or recirculating fume hoods must be equipped with appropriate filters for the potential threats or substances being examined. • See annex A, section A.7 for examination or deconstruction in facilities with no engineering controls.
Evidence handling and storage facilities	<ul style="list-style-type: none"> • Engineered air-handling systems should be installed in areas where evidence is handled or stored. This is particularly important for evidence storage facilities used for the storage of bulk drugs or exhibits for extended periods of time. • Engineered air-handling systems should have sufficient air changes per hour to prevent the accumulation of particulates or other volatile substances. • These systems should not be connected to the facility's centralized HVAC system.

TABLE 1. RECOMMENDED ENGINEERING CONTROL SYSTEMS (*continued*)

Facility type	Recommended controls
Mobile laboratories	<ul style="list-style-type: none"> Ducted and ductless or recirculating fume hoods and gloveboxes are recommended to isolate and examine suspicious items or contain any hazardous particulates as well as vapours or other volatile substances. Ducted, ductless or recirculating fume hoods must be equipped with appropriate filters for the potential threats or substances being examined.
Forensic laboratories	<ul style="list-style-type: none"> Fume hoods are essential in all forensic or general laboratories. Fume hoods, either ducted or ductless, should be used for all handling, sampling/subsampling, processing or examination and preparation of samples or exhibits where synthetic opioids are known or suspected.

WARNING

Engineering controls within high-risk facilities such as major (high volume) mail screening or customs facilities are important for managing the risks posed by the potential release of, or contamination by, a synthetic opioid. Similar to risks associated with “white powder” incidents, contamination in these facilities can result, not only in exposure risk to large numbers of personnel, but also in extended “denial of area” and operational disruption.

2.2 Administrative controls and training



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Operating environments, hazards, jurisdictional legislation and powers, including criminal, border control and occupational health and safety, vary between countries and agencies. For this reason, law enforcement and customs agencies, including laboratories, should undertake their own risk assessments to identify any gaps or deficiencies in legislation, policy, management systems or procedures which may limit or affect their ability to safely manage or respond to incidents involving synthetic opioids or any other

high-potency synthetic drugs. Where gaps or deficiencies are identified, agencies should assess available options and implement corrective actions.

Adequate training for officers in role-specific hazards related to synthetic opioids is an essential part of effectively managing occupational exposure risk. Training should seek to develop a heightened awareness of synthetic opioids including an understanding of exposure routes

and the correct use of PPE to prevent or minimize occupational exposure and should also include decontamination procedures. In addition, procedures and training on evidence collection and the handling of synthetic opioids or opioid-contaminated exhibits are also important for managing exposure risk. These can include modified evidence handling procedures to minimize the manipulation of drugs and contaminated exhibits as well as safe and secure storage and transport.

Occupational training related to synthetic opioids should include the following:

- Awareness of high-risk operational environments (see definition in section 2.3), such as tableting or milling operations, and how to recognize these activities or equipment



- How to recognize forms of synthetic opioids (and illegal drugs generally) and apply a precautionary principle when encountering or handling synthetic drugs



- How to make an initial risk assessment and what factors to consider, such as any immediate hazards, exposure risks, the nature of the substance (e.g., form, contained/uncontained) and environmental factors (e.g., wind or other factors which may disturb the substance)

- How to manage exposure risk through containment, scene control and correct procedures for evidence collection, handling and transport as well as the correct use of PPE and decontamination procedures



- How to recognize objective indicators of exposure to a synthetic opioid (opioid toxicity), including in canines
- How to administer an opioid antagonist such as naloxone
- How to manage personal safety when administering first aid or primary medical care (e.g., assisted breathing/rescue breathing) in cases of acute opioid exposure and overdose

Ongoing regular training in relation to illegal drugs, including new and emerging synthetic drugs, as well as synthetic opioids, is important for ensuring that officers remain familiar with evolving drug trends and any associated safety or exposure risks.

2.3 Personal protective equipment



A wide range of personal protective equipment (PPE) is commonly used by law enforcement, customs, forensic and laboratory officers. The type of PPE used is determined largely by the threat or hazards that are likely to be encountered, the role being performed or the environment in which the officers are working. One of the key considerations is that it must provide the required protection but also be functional and not restrict officers from performing the required activities. Additionally, the use of PPE should not itself represent a hazard under the intended operating conditions (e.g., heat stress).

Many PPE items have multiple uses such as gloves that are used for a wide variety of activities to reduce or prevent dermal exposure, or particulate masks that are used to prevent exposure to aerosols including biological, dust, smoke or other particulate hazards. This section will focus on the PPE recommended for managing exposure risks posed by synthetic opioids or other synthetic drugs for routine operations as well as for high-risk operations and environments. For the purposes of these guidelines, routine operations and high-risk operations are defined as follows:

Routine operations

Definition: General law enforcement, customs or related operations with low to moderate likelihood of officers encountering a synthetic opioid, other than as small volume drug product in a contained or uncontained form, including residue on drug use paraphernalia, exhibits or other evidence.

Example 1: Recovery of small volumes of bagged drug product from suspects as a result of a personal, bag, vehicle or other routine search or arrest activity.

Example 2: Responding to a drug overdose involving a suspected synthetic opioid where residual drug product may be present, including as a small volume dose unit or multiple units (such as in deal bags or caps), or residue on drug use paraphernalia or other items.

Example 3: Identification of moderate to large volumes of contained (packaged) drugs during the execution of a routine search or arrest activity.

Example 4: Identification of low, moderate or large volumes of concealed contained (packaged) drugs during a mail examination or border control search, including searches of persons, vehicles or vessels (other than in a confined space).

High-risk operations

Definition: Any operation in which moderate to large volumes of known or suspected synthetic opioids in any form are likely to be encountered, including, but not limited to, large volumes of contained or uncontained drug product, aerosols or other fine particulates present in an atmosphere or confined space or as a visible powder residue on surfaces or equipment in a contaminated environment.

Example 1: Entering or processing a clandestine laboratory with known or suspected synthetic opioid manufacture, milling or tableting activities.

Examples 2: Manual handling of large volumes of synthetic opioids in an uncontained form or where containment/packaging is significantly compromised.

Example 3: Entering or processing locations used for large volume drug distribution where synthetic opioids are known or suspected to be present.

Example 4: Search of a confined space where a synthetic opioid is known or suspected to be present including large concealments in shipping containers, confined spaces in vessels (such as bulk heads or deep voids), aircraft or truck-trailer units.

This section provides guidance for selecting the correct type of PPE or level of protection required for a particular activity or operational environment based on an assessment of the situation

and the threats or hazards. See section 2.6 for a summary of the minimum recommended PPE by activity type where the presence of synthetic opioids is known or suspected.

WARNING

- It is recommended that a higher rather than lower level of PPE be used to manage a threat or hazard unless there is sufficient evidence that the lower level is suitable.
- PPE is a “last line of defence” against a threat or hazard and should not be relied upon as the primary means of managing exposure risk. PPE alone is not sufficient to guarantee protection from synthetic opioids.
- Final decisions on the appropriate level of PPE should be made based on the totality of circumstances.

2.4 Personal protective equipment for routine operations

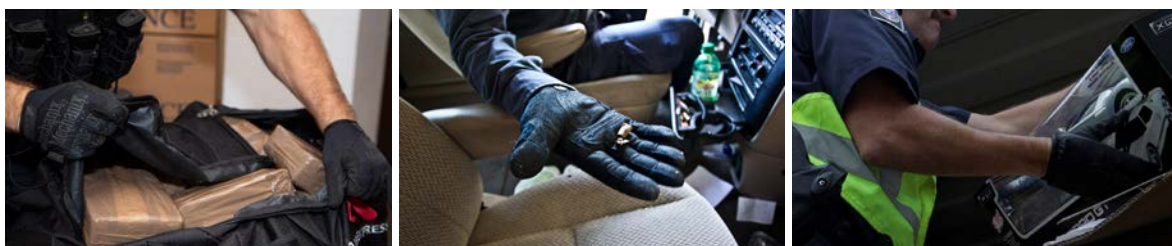


Synthetic opioids may potentially be encountered during a wide range of routine operations such as calls for service requiring entry into residential or commercial properties, vehicle stops, personal or bag searches, service of routine search or arrest warrants as well as baggage, parcel or mailroom examinations. In most routine operations, the risk of exposure to synthetic opioids can be reduced or prevented through appropriate training and the correct use of PPE,

such as the use of search or nitrile rubber gloves depending on the application, eye protection and respiratory protection in the form of an N95 or P2 certified particulate mask.

The following section will provide information about recommended PPE types and their correct use to reduce or prevent occupational exposure risk as well as to prevent secondary exposure or cross-contamination.

2.4.1 Search gloves



Designed for law enforcement and tactical applications, search gloves (also known as frisking gloves) provide increased protection against abrasion, cuts and punctures such as from hypodermic needles. While search gloves provide adequate dermal protection against synthetic opioids in a solid form, they are not single use and require decontamination if exposed to a

synthetic opioid, or other contaminant, and may not provide adequate protection against gels or liquids. Gloves which have been contaminated by a liquid or gel should be removed to prevent increased exposure through prolonged dermal contact. Contaminated gloves should not be returned to a duty bag until they have been decontaminated.

Search gloves should meet relevant jurisdictional industrial standards for abrasion, cut and puncture resistance such as ANSI/ISEA 105-2000, OSHA 1910.138 [US]; EN388: 2016 (EU); ISO 13997: 1999); or other comparable current standards.

2.4.2 Nitrile rubber gloves



Nitrile gloves are a highly cost-effective means of mitigating routine dermal exposure and are recommended in place of latex gloves for the safe handling of synthetic opioids due to their greater durability and chemical resistance. Additionally, nitrile gloves are manufactured in several thicknesses up to 0.16mm at the fingertips, providing greater protection when undertaking manual tasks such as searches or evidence handling.

While dermal exposure is generally considered a lower risk than other exposure routes, the

correct use of nitrile gloves plays a critical role in preventing occupational exposure as well as secondary exposure and cross-contamination. This is particularly important when handling synthetic opioids in any form or environment as well as handling or processing contaminated exhibits.

While putting on nitrile gloves is straightforward, their removal requires adherence to strict procedures to prevent secondary exposure or cross-contamination, as shown in the following slides.

Procedure for putting on nitrile gloves:

➤ STEP 1

Select the appropriate size; gloves should be neither too loose nor too tight. Inspect the gloves for any defects or damage.



➤ STEP 2

Insert one hand into the first glove and pull the cuff of the glove up to the wrist, making sure the cuff is fully extended and the wrist is covered.



STEP 3

Repeat step 2 for the second hand.



STEP 4

Make sure the cuff of the second glove is also fully extended and the wrist covered.



Procedure for removing nitrile gloves:

STEP 1

Pinch and hold the **outside** of one glove at the cuff and pull away from the wrist.



STEP 2

Curl your fingers under the cuff and peel downwards, turning the glove **inside out** as it is pulled down.



STEP 3

Continue to pull the glove slowly downward; the glove should turn **inside out** as it is rolled down.



STEP 4

As the glove is removed, bunch the now **inside out** glove in the palm of your gloved hand.



➤ STEP 5

Once removed, bunch the glove securely in the palm of your remaining gloved hand.

**➤ STEP 6**

Slide your fingers **under** the cuff of the remaining glove at the top of the wrist without touching the outside of the glove.

**➤ STEP 7**

Keeping the first glove bunched securely in your palm, peel the remaining glove slowly down toward the fingers making sure you **do not touch** the outside of glove.

**➤ STEP 8**

Continue to pull the glove down, enveloping the first glove in the palm of your hand as you remove the glove.

**➤ STEP 9**

Making sure to **touch only the inside** of the glove, immediately place the gloves into a bag or bin for contaminated waste for disposal.

**➤ STEP 10**

Once gloves have been removed, it is good hygiene practice to wash your hands and any exposed skin for 30–60 seconds with soap and water.



Wearing two pairs of nitrile gloves (double-gloving)

Double-gloving is commonly used in both routine and high-risk environments where an activity requires the regular removal and changing of gloves to avoid cross-contamination of evidence or samples, for example, when collecting DNA or other trace evidence in a crime scene or when handling, processing or analysing samples in a forensic laboratory. Besides preventing cross-contamination, double-gloving ensures that when outer gloves are removed, broken or punctured, an inner glove maintains dermal protection.

Double-gloving is also used in high-risk environments such as clandestine drug laboratories,

including opioid manufacture, milling and tableting laboratories, where higher levels of protection are required. In these circumstances, gloves are often worn in combination with an outer pair of heavy-duty chemical-resistant gloves.

When wearing double gloves, attention should be paid to the fit and sizing. If the gloves are too loose, the inner glove can easily come off when the outer glove is removed. While it is not always possible to have different coloured gloves, using two colours can help visually identify if the outer glove is damaged.

Procedure for putting on double nitrile gloves:

➤ STEP 1

Follow the procedure for putting on a single pair of nitrile gloves



➤ STEP 2

Inspect the second pair of gloves for any defects or damage.



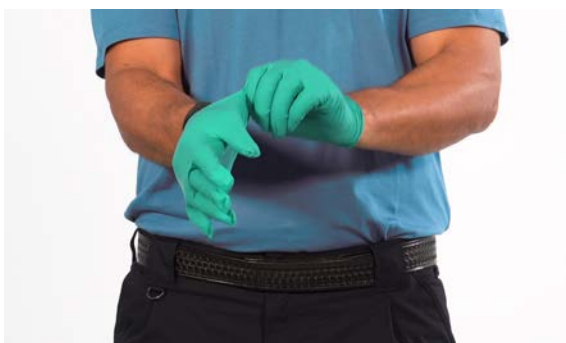
➤ STEP 3

Put on the second pair of gloves.



➤ STEP 4

Ensure the cuffs are fully extended and not bunched at the wrist.



Procedure for removing double nitrile gloves:**➤ STEP 1**

Pinch and hold the **outside** of the first outer glove at the top of the palm, just below the cuff, and pull it away from the wrist.

**➤ STEP 2**

Curl your fingers under the outside of the glove and pull the glove slowly down.

**➤ STEP 3**

As the gloves come away from the hands, make sure you **do not flick the gloves** by removing them too quickly.

**➤ STEP 4**

Bunch the removed glove securely in the palm of your remaining gloved hand.

**➤ STEP 5**

Pinch and hold the cuff of the second outer glove at the top of the palm, as you did for the first glove, and pull away it from the wrist.

**➤ STEP 6**

Curl your fingers under the cuff of the second outer glove and pull downward, enveloping the first glove in your palm.



STEP 7

As the gloves come away from the hands, make sure you **do not flick the gloves** by removing them too quickly.



Note: Always remove one layer of gloves at a time. To remove the inner gloves, follow the procedure for removing a single pair of gloves.

Instructional videos demonstrating the correct procedure for putting on and removing nitrile gloves (including single and double gloves) can be accessed through UNODC Laboratory and Scientific Service at www.unodc.org/lab.

STEP 8

After removal, place the gloves directly into a bag or bin for contaminated waste.



Nitrile rubber gloves should meet relevant local industrial standards such as ASTM D6319 [US] or BS EN 374:2003 and EN 420:2003 [EU]], or other comparable current standards. Gloves should have a minimum thickness of 0.12mm. Higher thickness of $\geq 0.16\text{mm}$ is recommended where additional protection is required. Long cuff gloves, where available, are recommended as these provide greater coverage and may be taped more easily to coveralls when used in conjunction with disposable coveralls.

2.4.3 Particulate masks



Where a synthetic opioid may be present as an uncontained powder or aerosol (fine suspended particulate in the air), there is risk of inhalation exposure, and respiratory protection is therefore required. In most routine operations, officers are unlikely to encounter this type of environment, however due to the high potency and bioavailability of many synthetic opioids via inhalation, a precautionary principle should always be applied.

In most routine operational environments where small volumes of synthetic opioid may be present, the inhalation exposure pathway can normally be mitigated using a disposable particulate mask certified to an N95 level of protection. In some countries, these are known as P2 particulate masks. Particulate masks are intended for single-use only and should be bagged and disposed of following use.

N95 or P2 particulate masks are not suitable for managing inhalation exposure in high-risk operational environments such as clandestine opioid manufacturing, milling and tableting laboratories or during confined space searches where an uncontained opioid may be present as a particulate, aerosol or residue. See section 2.5 for respiratory protection in high-risk operations.

The following slides demonstrate the correct procedure for putting on and removing a particulate mask. The technique for removing the mask is critical as this is where there is highest risk of accidental and secondary exposure, cross-contamination or infection in the case of a biological hazard.

Procedure for putting on a particulate mask:

➤ STEP 1

Wearing clean gloves, hold the mask in one hand with the elastic straps over the back of the hand, and place the mask in position over the nose and mouth.



➤ STEP 2

Lift the lower elastic strap over the head and position it below the ear.



➤ STEP 3

Lift the top elastic strap over the head and position it at the upper back of the head as shown. Adjust for comfort.



➤ STEP 4

Pinch or press the metal nose clip around the nose so that it moulds to the shape of the nose bridge to achieve a firm seal.



➤ STEP 5

Using both hands, check that the respirator mask is securely fitted around the shape of your face with no gaps.



Procedure for safely removing a particulate mask:

➤ STEP 1

Place one **gloved** hand over the front of the mask, hold it firmly and pull it forward so it is well clear of your head.



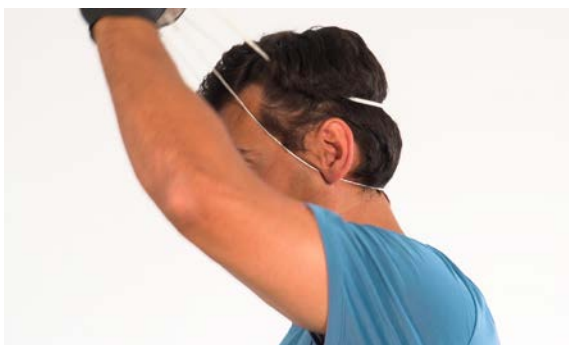
➤ STEP 2

Lift the mask upwards over your head until the elastic straps come away.



➤ STEP 3

Do not allow the mask to touch your head, hair, uniform, clothing or any other equipment.



➤ STEP 4

Once removed, place it directly into a bag or bin for contaminated waste for disposal.



If the mask has been used, regardless of whether it was used in a highly contaminated environment or not, it should always be assumed that the outside of the mask is contaminated and any contact with the outside of the mask should be avoided (other than with gloved hands).

Instructional videos demonstrating the correct procedure for putting on and removing an N95 or P2 particulate mask can be accessed through UNODC Laboratory and Scientific Service at www.unodc.org/lab.

Disposable particulate masks must provide a minimum of an N95 level of protection from airborne particulates and should also meet relevant local industrial standards such as NIOSH 42 CFR 84 N100 [US]; BS EN149:2001 for unvalved or BS EN405 for valved masks [EU and UK]; CE 0086 [EU]; AS/NZS 1716:2012 [Australia and New Zealand Standards], or other comparable current standards.

2.4.4 Eye protection



Eye protection for routine operations typically consists of safety glasses or goggles to assist in managing potential oculofacial exposure risk and is often worn in conjunction with an N95 or P2 particulate mask. When worn together, it is important to ensure that the eye protection does

not obstruct the seal of the mask against the face. Similarly, it is important that the mask does not displace or prevent the eye protection from forming an effective seal over the eyes and around the face.

Procedure for putting on safety glasses with a particulate mask:

➡ STEP 1

Always start by putting the mask on first.



➡ STEP 2

Put on the safety glasses.



➤ STEP 3

Make sure that the safety glasses do not interfere with the seal of the mask.



➤ STEP 4

Check that the safety glasses are sitting firmly against the face with no significant gaps.



➤ STEP 5

Using both hands, check the edges of the mask to make sure it is still sealed against the face with no gaps.



Procedure for removing safety glasses:

➤ STEP 1

Assume that the safety glasses are contaminated and only remove them while wearing gloves.



➤ STEP 2

Hold the front of the safety glasses, pull them forward and away from the head, making sure they do not touch the head or hair.



➤ STEP 3

If the safety glasses are to be disposed of, place them in a waste bag. If they are going to be decontaminated, place them directly into a designated decontamination receptacle.



Procedure for putting on safety goggles with a particulate mask:

➤ STEP 1

Always start by putting the mask on first.



➤ STEP 2

Place the goggles against the face in a comfortable position above the top of the mask.



➤ STEP 3

Using your free hand, lift the strap of the goggles over the top of the head and position at the back of the head.



➤ STEP 4

Check that the goggles are positioned above the mask and are not obstructing or breaking the seal.



Procedure for removing safety goggles:**➤ STEP 1**

Assume that the safety glasses are contaminated and only remove them while wearing gloves.

**➤ STEP 2**

Hold the front of the goggles and pull them directly forward and away from the head, minimizing contact with the head or hair.

**➤ STEP 3**

Lift the goggles upward and over the head, avoiding any contact with the head or hair.

**➤ STEP 4**

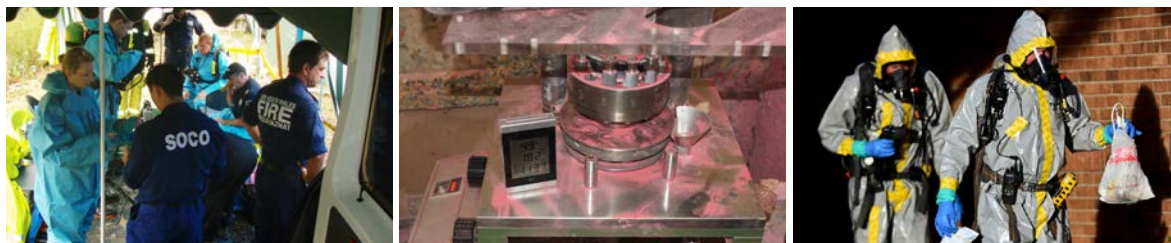
If they are to be disposed of, place them in a waste bag. If they are going to be decontaminated, place them directly into a designated decontamination receptacle.



Instructional videos demonstrating the correct procedure for putting on and removing eye protection when wearing an N95 or P2 particulate mask can be accessed through UNODC Laboratory and Scientific Service at www.unodc.org/lab.

Eye protection should meet relevant local industrial standards such as ANSI/ISEA Z87.1 [US] or EN 166: 2001 [EU], or other comparable current standards. Eye protection should also provide side (wrap-around) protection for the wearer and should also be operationally appropriate (i.e., suitable for the environment and hazards likely to be encountered). Polarized and tinted safety glasses are available for outdoor environments or bright/high glare conditions. Safety goggles should be non-vented.

2.5 Personal protective equipment for high-risk operations



As defined in section 2.3, in addition to hazards associated with clandestine manufacture activity, high-risk operations also include any activity in an environment where there is a likelihood of exposure to a large volume of known or suspected synthetic opioid, an aerosol (e.g., particulate suspended in the air), or particulate deposition (residues) in a contaminated environment or confined space including those used for concealments or trafficking.

Under these scenarios, inhalation exposure represents an increased risk due to the potential for concentrated exposures resulting in acute (rapid onset) effects. These exposures can occur from both inhalation of airborne particulates and disturbance or re-aerosolization of particulate deposition in such environments. Therefore, PPE which provides a higher level of inhalation protection, such as full-face air-purifying respirators (APRs) or self-contained breathing apparatus (SCBA), is recommended.

High-risk environments also pose an increased risk of body exposure (including dermal and

oculofacial exposure) as a result of the deposition of particulates onto the body or through contact transfer of contaminants. Therefore, a higher level of body protection is also required, which may include a combination of different PPE items such as APRs, SCBA systems, particulate or chemical-resistant suits and others. When used together in the correct combination, PPE ensembles are commonly referred to as Level A, B, C or D protection.

Levels A and B are normally used only by trained specialist units such as clandestine drug laboratory or hazardous materials (hazmat) teams. These levels of protection require specialist training and are not within the scope of these guidelines.

This section will focus on types of respiratory protection, as well as PPE Levels C and D, which are most commonly used in high-risk environments involving synthetic opioids.

2.5.1 Full-face air-purifying respirators



In high-risk environments, an increased level of respiratory or inhalation and oculofacial protection may be required. In such cases, an appropriately fitted full-face air-purifying respirator (APR) with a suitable canister should be used. One of the benefits of an APR is that it provides both respiratory and oculofacial protection, removing the need to wear both a particulate mask and eye protection.

APRs are referred to as negative pressure respiratory protection systems. An APR fitted with an appropriate canister provides highly effective protection from synthetic opioids present as a particulate in the atmosphere as well as from low to moderate chemical vapours, gases or other aerosols (depending on the canister fitted). APRs are not appropriate for use in oxygen deficient environments.

Canisters

An APR can be fitted with a range of different canisters depending on the threat, hazard or environment in which it will be used. Synthetic opioids are unlikely to be present in a gaseous state (due to their low vapour pressure) [10]. The primary inhalation risk associated with synthetic opioids arises from their potential presence as an aerosol or fine suspended particulate in the air. Therefore, canisters which provide a high level of particulate protection are recommended. Particulate canisters must be certified as P3 or P100 (indicating that they will remove up to 100 per cent of airborne particulates greater than 0.3 µm [or microns] in size). This is the highest particulate protection rating for an APR canister.

FIGURE III. P3 OR P100 PARTICULATE CANISTER SHOWING PARTICULATE PROTECTION RATING



P3 or P100 canisters also provide respiratory protection against a range of particulate and dust hazards as well as against some biological hazards such as aerosols containing bacteria or viruses.

In high-risk environments such as clandestine synthetic opioid manufacture, milling or tableting

laboratories, a combination canister, as shown in figure III, will provide protection against a range of organic and inorganic chemicals as well as particulates (indicated by the P3 designation).

FIGURE IV. COMBINATION CANISTER SHOWING PROTECTION RATINGS AND COLOUR CODING



Canister codes, such as the “A2B2E2K2-P3” canister shown in figure IV, identify the canister type and coloured bands indicate which chemical or chemical groups the canister provides protection against. Canister type designations (i.e., A, B, E, K) and colour-coding are standardized internationally, although they may vary in

some countries. Officers should check the canister manufacturer’s instructions to confirm which chemicals, chemical groups or hazards the canister provides protection against. Table 2 provides a general guide for the interpretation of canister markings and colour codes.

TABLE 2. CANISTER TYPE, COLOUR CODES AND MEANING

Type	Colour	Canister provides protection from:
A	Brown	Gases and vapours of organic compounds including solvents with boiling points > 65 °C
B	Grey	Acid gases including inorganic gases and vapours, e.g., chlorine, hydrogen sulphide or hydrogen cyanide
E	Yellow	Sulphur dioxide and hydrogen chloride
K	Green	Ammonia and organic ammonia derivatives
NO-P3	Blue	Nitrogen oxides, e.g., NO, NO ₂ , NOX
Hg-P3	Red	Mercury vapours

TABLE 3. NON-COLOUR-CODED CANISTER TYPES AND MEANING

Type	Meaning
R	Indicates that the canister can be reused (limited), subject to exposure and breakthrough times.
D	Indicates that the canister has passed a dolomite dust-clogging test. This is an additional test for the particulate filters and certifies that the filter has a very high absorption capacity for particles.
NBC	Indicates that the canister has passed testing for chemical warfare agents (CWAs).
1	Indicates a filter “Class 1” (or P1) low efficiency particulate filter. Generally suitable for mechanically generated dusts, e.g., wood or silica.
2	Indicates a filter “Class 2” (or P2) medium efficiency particulate filter. Generally suitable for mechanically and thermally generated particulates, e.g., metal fumes, as well as contaminant dusts and some biological hazards.
3	Indicates a filter “Class 3” (P3 or P100 equivalent) high efficiency particulate filter up to 100 per cent efficient for high toxicity or irritant substances when worn with a full-face respiratory mask (e.g., an APR).

It is important to remember that canisters have a limited service life. Additionally, each canister has a breakthrough time for each chemical or chemical type. This information will normally be provided in the manufacturer’s product information sheet. The breakthrough time is the amount of time a canister can be exposed to a chemical. Once this exposure time has been exceeded, the canister becomes saturated and can no longer prevent the chemical from coming through the canister into the mask.

Some instruction, training and fit-testing is required for the proficient and effective use of an APR. However, in some emergency situations it may not be possible to provide all officers with specific instruction on the correct use of an APR. Therefore, the following slides demonstrate the correct procedure for putting on and removing an APR.

Procedure for putting on an air-purifying respirator:

➤ STEP 1

Select the **correct canister** for the threat or hazard, **check the expiry date** and fit the canister to the mask.



➤ STEP 2

Inspect the mask for any defects or damage and fit the canister to the mask.



➤ STEP 3

Holding the straps, place the chin into the chin cup at the bottom of the mask, pull the mask onto the face and the straps over the head.



➤ STEP 4

Holding the mask in place, tighten the lower two straps on either side of the mask below the ears.



➤ STEP 5

Check that the other straps are not twisted and are lying flat against the head.



➤ STEP 6

Progressively tighten each of the upper or temple straps and then the top straps, while still holding the mask in position.



STEP 7

Run your fingers around the seal of the mask and make sure that it is flush with the face and there are no obstructions, such as hair.

**STEP 8**

Perform a user fit-test: cover the front of the canister with the palm of your hand, breathe in and hold your breath. The mask should remain suctioned to your face until you remove your hand.



Note: If you do not have a seal, check the seal again. Readjust or reposition the mask, then repeat the user fit-test. If this fails, remove the mask and seek assistance. For an APR to seal efficiently, the wearer must be clean shaven.

Procedure for correctly removing an air-purifying respirator:**STEP 1**

Using gloved hands, hold the front of the mask with one hand on either side of the mask.

**STEP 2**

Using firm force, pull the mask forward stretching the rubber straps.

**STEP 3**

Holding the mask as far forward from the face as possible, lift the mask upwards and over the head until the rubber straps come away from the head.

**STEP 4**

Ensure that the mask **does not make contact with the head or hair** as this can result in contamination transfer.



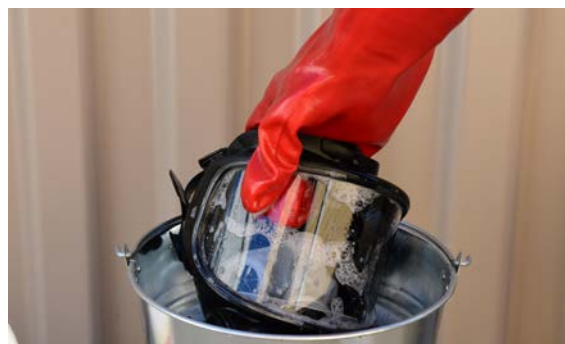
➤ STEP 5

Using a gloved hand, remove and discard the canister.



➤ STEP 6

Decontaminate or disinfect the APR mask in accordance with manufacturer's instructions.



Note: The above removal technique is used because the gloves and/or mask may be contaminated and loosening the straps may result in the transfer of contamination to the head or hair. This method, although uncomfortable, reduces the likelihood of secondary exposure or contamination.

An APR should normally be one of the last items of PPE to be removed and should only be taken off after the officer has been decontaminated. However, in some environments this may not be possible, such as where an APR is being used in conjunction with duty uniform or other clothing rather than a disposable particulate or chemical-resistant coverall. Nevertheless, an APR should never be removed in a contaminated environment, and wherever possible, an appropriate form of decontamination should be undertaken to prevent or minimize the risk of secondary exposure.

Instructional videos demonstrating the correct procedure for putting on and removing a full-face APR mask can be accessed through UNODC Laboratory and Scientific Service at www.unodc.org/lab.

Full-face APR masks should meet relevant local industrial standards including: NIOSH 42 CFR 84 [US]; NIOSH Standard for Chemical, Biological, Radiological, and Nuclear (CBRN) Full Facepiece Air Purifying Respirator, Revision 2 April 2003; BS EN 136:1998 [EU and UK]; AS/NZS 1716:2012 [Australia and New Zealand Standards], or other comparable current standards

WARNING

- Canisters must be appropriate for the hazards likely to be encountered. Used canisters must never be returned to a duty bag. This may result in secondary exposure or cross-contamination. Canisters should be single use only when used in the presence of an airborne synthetic opioid hazard, regardless of any reusable classification applied by the manufacturer. After removal, used canisters should be placed directly into a disposal bag for contaminated waste and disposed of appropriately. Training should be provided on the correct use of APR including regular fit-testing and decontamination.

2.5.2 Self-contained breathing apparatus systems



Self-contained breathing apparatus (SCBA) systems provide an exceptionally high level of respiratory protection and support in high-risk environments where large volumes or high concentrations of uncontained synthetic opioids or other high-risk inhalation hazards or toxic substances are present. This can include highly contaminated particulates, high concentrations of particulate deposition or residue, chemical vapours, gases or other chemical aerosols. SCBA should also be used in any known or potentially oxygen deficient environments, including for routine or high-risk confined space searches such as bulkheads and deep voids in vessels or any locations where displacement of oxygen may potentially occur.

SCBA equipment requires a high level of specialist operational training, maintenance, and support to be used safely and effectively, and should only be used by trained specialist or hazmat officers.

SCBA systems including respirator masks, harnesses, tanks and associated equipment should meet relevant local industrial standards including Personal Protective Equipment Directive (89/686/EEC) [EU]; BS EN 136:1998; EN 137:2007-01 [EU and UK]; NIOSH 42 CFR Part 84 certified; NFPA 1981: Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services or other comparable current standards.

2.5.3 Level C protection



Level C is the highest level of protection after Levels A and B and is commonly used in operational environments such as clandestine laboratory operations for evidence collection and processing activities, or in other environments with low to moderate chemical hazards including splash, aerosol and low to moderate vapour or gas hazards. Level C is also the minimum recommended level of protection for high-risk operational environments and is normally selected when an airborne contaminant is known or suspected, and an APR is required.

Level C PPE should provide full-body protection including all primary exposure routes or pathways (see section 1.3) leaving no exposed body areas.

In the context of synthetic opioid hazards, Level C protection should include the following as minimum:

- Category III type 5 and 6 protective coveralls for inward particulate protection and liquid chemical protection
- Full-face APR mask with an appropriate P3/P100 or combination canister

- Inner nitrile rubber chemical-resistant gloves
- Outer nitrile rubber chemical-resistant gloves (where double-gloving is required), *or*
- Heavy-duty chemical-resistant gloves (for chemical or manual handling)
- Category III type 6 chemical-resistant overboots or reusable rubber boots

The above PPE items reduce or prevent the risk of exposure posed by airborne particulates and chemical spills or splashes which may be encountered when operating in a high-risk operational environment, as defined in section 2.3.

Agencies should provide adequate training for officers who are required to use this level of protection, including correct procedures for putting on and removing PPE. The following slides demonstrate the most common procedure for correctly putting on Level C PPE. (for removal of Level C, see section 2.7.3).

Procedure for putting on Level C protection:

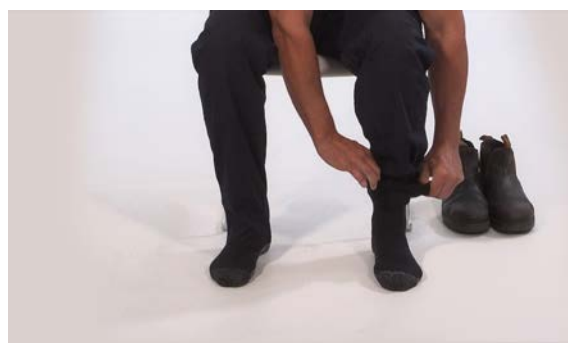
➤ STEP 1

Carefully select the correct size of chemical-resistant coveralls and check the expiry date.



➤ STEP 2

Remove any footwear and tuck any long trousers into your socks.



➤ STEP 3

Put on the suit starting with the legs. This is easier if you can sit down in a clean environment.



➤ STEP 4

Put on disposable overboots or reusable rubber boots (whichever is available).



➤ STEP 5

Pull the legs of the suit down over the top of the boots, and with assistance, tape these to the suit.



➤ STEP 6

Put on a pair of nitrile gloves; these will be referred to as the inner gloves.



➤ STEP 7

Insert your arms through the sleeves, lifting the suit up over your shoulders.



➤ STEP 8

With assistance, tape the inner gloves to the cuffs or sleeves of the suit.



➤ STEP 9

Put on the APR. **See section 2.5.1 for APR procedure.**



➤ STEP 10

Once the APR is in place and tested, pull the hood of the suit over your head.



➤ STEP 11

Zip the suit up to the top.



➤ STEP 12

The assistant should remove any adhesive backing and seal the flap to the suit, starting at the bottom and moving up to the top.



➤ STEP 13

The assistant should then ensure the hood of the coveralls is over the edge of the APR mask and tape the hood around the mask.



➤ STEP 14

Put on a second or outer pair of gloves.



➤ STEP 15

Finally, the assistant should perform a “buddy check” to make sure that all items of PPE are fitted correctly and the suit is fully sealed with no exposed skin, body areas, splits or tears.



See section 2.7.3: “Wet and dry decontamination” for information on the correct removal of Level C protection.

Instructional videos demonstrating the correct procedure for putting on and removing Level C protection can be accessed through UNODC Laboratory and Scientific Service at www.unodc.org/lab.

2.5.4 Level D protection



Level D is the minimum level of protection which should be worn where only nuisance contamination is present and there are no hazardous or corrosive substances or significant respiratory hazards.

Various items of PPE are combined to form Level D protection and vary significantly as they are selected based on an assessment of the specific risks, environment or the work being performed. In some investigative roles, such as fingerprinting or trace evidence collection, Level D often includes simple lightweight disposable paper fibre coveralls, P1 (low efficiency) particulate or surgical masks, gloves and shoe covers. However, for high-risk operations or environments involving synthetic opioids (as defined in section 2.3), the risk profile may be significantly different and require a higher level of respiratory, oculofacial or dermal protection.

Level D protection should only be used where the primary exposure risks have been assessed and managed and it is deemed safe to de-escalate the level of protection. Normally this involves reducing from a higher level of protection, such as Levels B or C, down to Level D. For instance, where exhibits have been removed from a crime scene using Level B or C, Level D may be deemed safe or appropriate for processing exhibits or evidence in an open-air processing area.

In the context of synthetic opioid hazards, Level D protection should include the following as minimum:

- Category III type 5 protective coverall for inward particulate protection, *or*
- Category III type 6 for liquid chemical protection (if chemical splash or spill hazards exist)
- N95 or P2 certified particulate mask
- Eye protection, ideally non-vented safety goggles, or alternatively safety glasses
- Inner chemical-resistant nitrile rubber chemical gloves
- Outer chemical-resistant nitrile rubber gloves (where double-gloving is required)
- Foot protection appropriate for the environment, where necessary including particulate or chemical-resistant overboots

Agencies should provide adequate training for officers who are required to use this level of protection, including correct procedures for putting on and removing PPE. The following slides demonstrate the most common procedure for putting on Level D protection correctly (see section 2.7.3 for removal of Level D protection).

Procedure for putting on Level D personal protective equipment:

➤ STEP 1

Carefully select the correct size of coveralls and check the expiry date.



➤ STEP 2

Remove any footwear and tuck any long trousers into your socks.



➤ STEP 3

Put on the suit starting with the legs. This is easier if you can sit down in a clean environment.



➤ STEP 4

Put on appropriate footwear for the environment, followed by disposable overboots.



➤ STEP 5

Pull the legs of the suit down over the top of the overboots, and if required, tape these to the suit.



➤ STEP 6

Put on a pair of nitrile gloves; these will be referred to as inner gloves.



STEP 7

Insert your arms through the sleeves, lifting the suit up over your shoulders.



STEP 8

Inner gloves can be taped to the suit at this point if required. This is recommended if you will be using double gloves.



STEP 9

Put on your respiratory protection.
See section 2.4.3 for N95/P2 procedure.



STEP 10

Put on your eye protection.
See section 2.4.4 for eye protection procedure.



STEP 11

Check the front and sides of the eye protection to make sure it is tightly fitted to the face and there are no significant gaps.



STEP 12

Once your respiratory and eye protection are in place, pull the hood of the suit over the head.



➤ STEP 13

Zip the suit up to the top.



➤ STEP 14

Tape down the front flap over the zip.



➤ STEP 15

If double-gloves will be used, put on the second pair of gloves.



➤ STEP 16

Finally, the assistant should perform a “buddy check” to make sure all items of PPE are fitted correctly with no splits or tears.



See section 2.7.3: “Wet and dry decontamination” for information on the correct removal of Level D protection.

Instructional videos demonstrating the correct procedure for putting on and removing Level D protection can be accessed through UNODC Laboratory and Scientific Service at www.unodc.org/lab.

WARNING

- Disposable PPE, once used, must not be placed back into a duty bag. After use it should be disposed of in an appropriate waste receptacle. If designated as reusable, it should be appropriately decontaminated before being returned to a duty bag or kit.

Disposable chemical-resistant coveralls should meet relevant local industrial standards such as ISO certified “Type 6” for liquid chemical protection, Category III, BS EN 13034:2005 [EU]; BS EN 1073-2; BS EN 14126; BS EN 1149-5; NFPA 1994 Class 3 [US]; ISO16602; GB 24504 [UK] or other comparable current standards.

Disposable particulate tight coveralls should meet relevant local industrial standards such as ISO certified as “Type 5” for inward particle leakage, Category III: EN/ISO 13982-1:2004 [EU]; NFPA 1994 Class 4 [US]; GB 29511 [UK] or other comparable current standards.

Disposable overboots should meet relevant local industrial standards for a minimum of Category III protection, Type 3, PB[3], EN 14126 or other comparable current standards.

2.6 Minimum recommended PPE by activity type where synthetic opioids are known or suspected

Personal protective equipment (PPE)	Personal (body), bag and vehicle searches		Building searches (including open door, systematic, managed searches and evidence collection - does not include initial entry)		Confined space searches (Note: all confined space searches considered high risk)		Mallroom examinations and deconstructions		Clandestine opioid laboratories (including manufacture, milling or tabletting)		Evidence handling (including logging and processing of exhibits)		Laboratory (including all sample preparation [in fume hoods] and analysis)	
	Routine	High*	Routine	High*	Routine	High*	Routine	High*	Routine	High*	Routine	High*	Routine	High*
EXPOSURE RISK														
RESPIRATORY PROTECTION														
Disposable particulate respirator mask (minimum N95 or P2 certified)		✓	✓		NA		✓				✓			✓
Full face air-purifying respirator fitted with P100 or P3 filter ¹				✓	NA			✓						
Full face air-purifying respirator fitted with a combination canister ¹				Alt	NA			Alt	✓					
Self-contained breathing apparatus (SCBA) ²					NA	✓				✓				
FACE AND EYE PROTECTION														
Non-vented safety goggles or safety glasses with side protection		✓	✓		NA		✓				✓		✓	✓
HAND PROTECTION														
Scenario gloves (minimum thickness 0.12 to 0.16mm)	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	✓	✓	✓	✓
Search gloves (cut or puncture resistant)	Alt	Alt		Alt	NA									
BODY PROTECTION														
Uniform (or role specific clothing including laboratory coats for lab officers)	✓	✓	✓		NA	✓	✓				✓		✓	✓
Disposable particulate tight coverall (minimum category III: Type 5)				✓	NA	✓		✓				✓	Alt	Alt
Disposable chemical resistant coverall (minimum category III: Type 5 and 6)					NA	Alt		Alt	✓				Alt	Alt
Disposable overboots or reusable rubber boots (minimum category III)				✓	NA	✓		✓	✓					
RECOMMENDED PPE PROTECTION LEVELS														
Minimum recommended protection levels, including Level A, B and D	NA	NA	NA	Level D	NA	Level B	NA	Level D	Level C	Level B	Level D	Level C	NA	NA

Explanatory note: This table shows the recommended minimum PPE for each of the activities listed. This should be used as a guide only with final PPE selections based on an operational risk assessment. Where required the level of protection may be escalated or de-escalated accordingly.

- * High exposure risk scenarios are considered any scenario where a synthetic opioid is known or reasonably suspected to be present.
- ✓ Indicates the minimum recommended level of PPE for the role or activity shown.
- Alt Indicates an alternative type of PPE where appropriate, based on availability or risk.

- NA Not applicable
- 1 P100 or P3 particulate canisters are appropriate for particulate hazards only. Combination canisters (such as AZBZE2K2-P3) should be used where chemical hazards are present.
- 2 SCBA should be used in high-risk or oxygen deficient atmospheres. SCBA should only be used by trained and supported officers or units.

2.7 Decontamination



There is no single decontamination method which will work for every contaminant or exposure scenario. Different decontamination methods are required depending on the type or form of drug or chemicals present, the environment and the type of equipment, uniform or clothing which may be contaminated.

This section provides guidance on decontamination for routine operational exposure scenarios, such as low-level, small volume dermal exposures and exposures involving contamination of uniform or non-disposable clothing. Decontamination procedures for PPE protection Levels C and D will also be addressed, as well as decontamination of APRs and other equipment. Decontamination is critical for reducing exposure risk resulting from the transfer of contaminants from a scene where a synthetic opioid or other contaminant may be present, to other personnel, areas or objects such as evidence, equipment, vehicles or offices. Decontamination methods can generally be divided into two categories: physical and chemical.

Physical methods involve removing the contaminant from a person or object, or the safe removal of PPE or protective clothing without cross-contamination. Examples of physical decontamination can be as simple as washing exposed skin through to wet or dry decontamination methods. Chemical methods generally involve removing or reacting the contaminant with another chemical to deactivate or neutralize it, for example,

spraying contaminated equipment or areas, such as vehicles or holding cells, with a neutralizing chemical or commercial decontamination product. The following recommendations apply to the decontamination of personnel, uniforms and non-disposable clothing, PPE and other equipment where exposure or contamination from a synthetic opioid is suspected.

2.7.1 Decontamination following dermal exposure

The risk of a clinically significant effect as a result of dermal exposure to a synthetic opioid is relatively low. However, if an officer comes into direct dermal contact with a known or suspected synthetic opioid, the exposed skin should be rinsed immediately with copious amounts of water. As soon as possible, the skin should be additionally washed with soap and water [22]. The objective is to remove any residual contamination from the skin as soon as possible in order to reduce direct contact time and also to reduce the risk of secondary exposure or cross-contamination. Alcohol-based hand sanitizers or washing solutions containing bleach must not be used as these may increase or facilitate the absorption of the opioid or other contaminants through the skin [9,22]. The following slides demonstrate the correct procedure for handwashing after dermal exposure to a synthetic opioid.

Procedure for washing hands following dermal exposure:**➤ STEP 1**

Safely remove any excess substance taking care not to aerosolize or transfer contamination to other areas, e.g., a vehicle or clothing.

**➤ STEP 2**

Remove any gloves following the procedure described in section 2.4.2 and place them directly into a bag or bin for contaminated waste.

**➤ STEP 3**

Do not use any alcohol-based hand sanitizers or bleach (hypochlorite) solutions either before or after washing.

**➤ STEP 4**

Rinse off any excess solid/powder or liquid material under large amounts of running water.

**➤ STEP 5**

Do use normal soap under running water.

**➤ STEP 6**

Wash the hands and any exposed skin such as wrists or arms thoroughly with soap and water for at least one minute.



STEP 7

Rinse well to remove all remaining soap and lather, then dry the hands.



WARNING

⚠ If skin exposure occurs, alcohol-based hand washes, disinfectants or bleach (e.g., chlorhexidine or hypochlorite) solutions must not be used, as these may increase dermal absorption of the opioid or other contaminants into the body.

2.7.2 Decontamination of uniform or non-disposable clothing



Items of uniform or non-disposable clothing may become contaminated by a synthetic opioid through inadvertent occupational exposure. If this occurs, it is important to remove the items as soon as practical or safe in order to reduce the duration of any direct skin contact.

Contaminated uniform or clothing should be isolated to prevent secondary exposure, cross-contamination or “take home contamination” which occurs when contaminated uniforms or equipment is transferred to an officer’s home environment, such as by mixing contaminated uniforms with other household laundry.

Contaminated uniforms or clothing should be removed slowly and carefully avoiding rapid movements to reduce or prevent aerosolizing any residual contaminants. Heavily contaminated uniforms should be considered for approved disposal subject to agency requirements. Uniforms or clothing with only low to moderate contamination can be carefully washed using the procedure and cleaning chemicals indicated below.

Several oxidative and hypochlorite-based cleaning agents can effectively degrade synthetic opioids such as fentanyl [23]. These chemicals are commonly available both commercially and domestically in most countries and are typically branded as “Oxy-” action or stain-removing laundry powders. These include sodium percarbonate (SPC) and hydrogen peroxide-based laundry powders, either individually or in combination with bleach activators such as tetraacetyl-ethylenediamine (TAED). Many oxidative laundry powders are colour-safe and therefore suitable for use on most uniforms and clothing subject to the manufacturer’s instructions.

Hypochlorite, trichloroisocyanuric acid and peracetic acid-based laundry sanitizers may also be effective at degrading fentanyl.

The following slides demonstrate the key isolation actions and procedures for washing uniforms or non-disposable clothing following exposure to a synthetic opioid.

Procedure for isolating and washing contaminated uniforms or clothing:**STEP 1**

Safely remove excess material by slowly brushing off (using gloved hand or other non-agitating methods) into a safe location e.g., into a sink or evidence bag (for small areas), taking care not to produce or breathe any aerosolized powder.

**STEP 2**

Carefully remove contaminated uniform or clothing and place into a polyethylene or plastic bag, or alternatively a large paper evidence bag, and seal securely. Minimize movement or agitation of the bag. **Do not** place contaminated uniforms into a duty bag.

**STEP 3**

Wearing nitrile gloves, remove contaminated clothing from the sealed bag and place directly into an **empty** washing machine. Keep any contaminated clothing separate from other laundry.

**STEP 4**

Add a normal amount of washing powder containing the chemicals mentioned in the box below which have been shown to degrade synthetic opioids such as fentanyl for decontamination purposes.

**STEP 5**

Select a **heavy-duty** or **heavily soiled** wash programme using hot water if possible and a minimum **60-minute cycle**.

**STEP 6**

Clothing may be dried as normal using drip, line or tumble dryer options as appropriate.



Recommended oxidative and hypochlorite-based chemicals for washing low to moderately contaminated uniforms and non-disposable clothing, in order of highest efficiency, include peroxides and hypochlorites.

Peroxides: sodium percarbonate (SPC) in combination with bleach activators such as tetraacetyl-ethylenediamine (TAED) or benzenesulfonate-based activators, peracetic acid solutions (as laundry sanitizers) and SPC as a single entity product.

Hypochlorites: trichloroisocyanuric acid or calcium hypochlorite (bleach). Note that calcium hypochlorite may have a lower efficacy compared to SPC and may require multiple washes.

2.7.3 Wet and dry decontamination




Decontamination procedures help reduce or prevent the risk of occupational exposure. This is particularly important for synthetic opioids due to their high potency and often finely divided powder form which allows them to disperse easily through the air and adhere to clothing, PPE and other equipment.

“Wet” and “dry” are two common decontamination methods. In the context of drug contamination, wet decontamination is normally used for

high-level exposure scenarios where Levels A or B, and occasionally also Level C, protection is required. It is recommended that wet decontamination is undertaken with the support of a trained emergency response unit, such as a fire brigade or hazmat unit. It is carried out as officers are about to leave the “hot zone” or contaminated environment, normally just prior to entering the “warm zone” for removal of PPE. Wet decontamination involves the following key stages:

TABLE 4. WET DECONTAMINATION PROCEDURE

Decontamination stages	
	<ul style="list-style-type: none"> Initial gross washdown/decontamination – shower with large amounts of water.
	<ul style="list-style-type: none"> Scrub down and rinse – a second decontamination officer will normally perform this with detergent and water or a decontamination solution.
	<ul style="list-style-type: none"> Footbath – officers normally exit the hot zone through a footbath containing a detergent and water or a decontamination solution.
	<ul style="list-style-type: none"> Officers enter the warm zone for removal of PPE (normally using a dry decontamination procedure).

Dry decontamination, in the context of drug contamination, involves the removal of PPE in a careful manner to reduce the potential for exposure to contaminants which may be present on external surfaces of the PPE. While dry decontamination methods can be used following a wet decontamination procedure, it is more commonly used when removing Level C or D protection, or in environments where wet decontamination is not possible. The principles of dry decontamination

can also be applied when removing contaminated uniforms or clothing to reduce potential exposure.

Dry decontamination normally requires assistance from another officer wearing an appropriate level of PPE to perform several of the essential elements of the dry decontamination procedure. The following slides show the dry decontamination procedures for Levels C and D protection.

Removing Level C protection using dry decontamination procedure:

➤ STEP 1

Stand in a designated decontamination area, or inside a decontamination bag placed on the ground.



➤ STEP 2

Remove any outer gloves.



➤ STEP 3

Remove the tape from the inner gloves and suit.



➤ STEP 4

Remove the tape from around the hood, mask and front flap.



➤ STEP 5

Open the front flap and unzip.



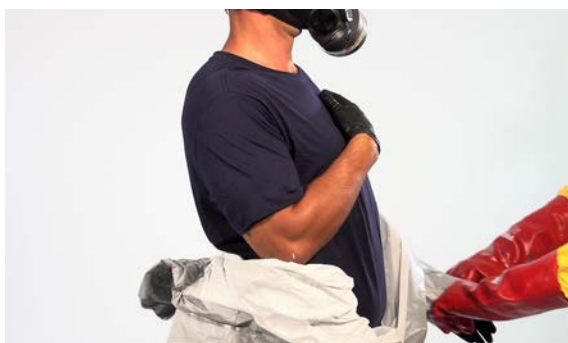
➤ STEP 6

The decontamination officer should remove the hood from your head, **turning it inside out** and **rolling** the suit downward.



➤ STEP 7

With the decontamination officer holding each sleeve, pull your hands and arms out of your suit, cross your arms over your chest and keep them in this position.



➤ STEP 8

Once the suit has been pulled below the knees by the decontamination officer, sit down on a clean surface. The decontamination officer may now remove the tape from the overboots or reusable rubber boots.



➤ STEP 9

When using disposable coveralls and overboots, it often easier to use trauma shears to cut or rip away the legs and overboots.



➤ STEP 10

If wearing reusable rubber boots, leave the tape in place and pull your feet out of the boots and suit together while the decontamination officer holds the boots.



➤ STEP 11

The APR mask can now be removed and decontaminated. See section 2.5.1 for APR removal procedure.

**➤ STEP 12**

Finally, remove the inner nitrile gloves. See section 2.4.2 for nitrile glove removal procedure.

**➤ STEP 13**

Once all PPE has been removed, always wash your face and hands before drinking or eating.



Instructional videos demonstrating the correct procedure for putting on and removing Level C protection using a dry decontamination procedure can be accessed through UNODC Laboratory and Scientific Service at www.unodc.org/lab.

Removing Level D personal protective equipment using dry decontamination procedure:**➤ STEP 1**

Stand in a designated decontamination area or inside a decontamination bag placed on the ground.

**➤ STEP 2**

Remove any outer gloves.



➤ STEP 3

Remove the tape from the inner gloves and suit.



➤ STEP 4

Open the front flap and unzip.



➤ STEP 5

The decontamination officer should remove the hood from your head, **turning it inside out** and **rolling** the suit downward.



➤ STEP 6

With the decontamination officer holding each sleeve, pull your hands and arms out of your suit, cross your arms over your chest and keep them in this position.



➤ STEP 7

Once the suit has been pulled below the knees by the decontamination officer, sit down on a clean surface. The decontamination officer may now remove the tape from the overboots.



➤ STEP 8

When using disposable coveralls and overboots it often easier to use trauma shears to cut or rip away the legs and overboots.



➤ STEP 9

Pull your feet out of the boots and suit together while the decontamination officer holds the boots (depending on footwear type).

**➤ STEP 10**

Eye protection can now be removed. See section 2.4.4 for eye protection procedure.

**➤ STEP 11**

Remove the respiratory protection. See section 2.4.3 for N95/P2 procedure.

**➤ STEP 12**

Finally, remove the inner nitrile gloves. See section 2.4.2 for nitrile glove removal procedure.

**➤ STEP 13**

Once all PPE has been removed, you should always wash your face and hands before drinking or eating.



Instructional videos demonstrating the correct procedure for putting on and removing Level D protection using a dry decontamination procedure can be accessed through UNODC Laboratory and Scientific Service at www.unodc.org/lab.

WARNING

- ✎ Where decontamination is required following a significant exposure to personnel, equipment or environment, trained hazmat or other appropriately trained officers or units should be notified and consulted.
- ✎ The effects of decontamination on multi-use PPE items (e.g., respirator masks or garment seams) using some commercial decontamination solutions is not fully known. After decontamination, multi-use PPE should be carefully inspected before reuse for any sign of deterioration or damage.
- ✎ When using commercial decontamination solutions, it is important to follow the manufacturer's instructions for dilution, as decreasing the dilution may damage multi-use PPE due to the increased concentration of the decontaminant.

2.7.4 Decontamination of air-purifying respirators and equipment



An APR mask should be decontaminated after every use in order to remove or destroy any residual contaminants, as well as for disinfection and hygiene purposes.

Before decontaminating an APR mask, it is important to review the mask manufacturer's instructions regarding the decontamination chemicals compatible with the mask and the recommended methods of decontamination. Mask manufacturers often recommend specific or proprietary chemicals which may not be available in all locations. In such cases, common alternatives such as dilute solutions of kitchen detergent or a 1000ppm solution of household bleach may also be effective.

A bleach solution at 1000ppm may also be effective for the decontamination of any synthetic opioids remaining on the mask and also has the advantage of being readily available, easily prepared and effective against a broad range of microbial pathogens, bacteria and blood-borne viruses [24].

Household bleach (sodium hypochlorite) commonly ranges in strength from 2 to 5 per cent, with the strength printed on the product label. The following table can be used as a guide for preparing a 1000ppm bleach solution:

TABLE 5. DILUTION TABLE FOR PREPARATION OF 1000PPM BLEACH SOLUTION

Strength of bleach	Dilution to achieve 1000ppm available chlorine		Volume of bleach to be added to standard 10L bucket of water
	Parts of bleach	Parts of water	
2%	1	19	500 mL
3%	1	29	330 mL
4%	1	39	250 mL
5%	1	49	200 mL

WARNING

- ⚠ Quaternary ammonium compounds, commonly used as disinfectants, must not be used for the decontamination of APR masks, as these can damage metals components in the mask and pose a potential inhalation risk for the mask wearer.

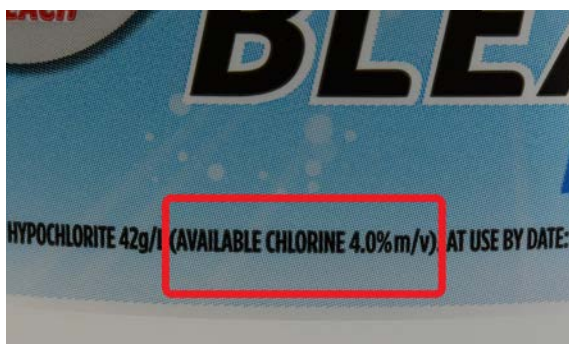
The following slides show the procedure for preparing a 1000ppm bleach solution and decontaminating an APR mask using a “three-bucket” method.

Procedure for disinfecting an APR mask with 1000ppm bleach solution:**STEP 1**

Fill three 10-litre standard buckets with clean water.

**STEP 2**

Identify bleach strength from the product label and consult the dilution table (table 5) to determine the amount of bleach required for 10 litres of water.

**STEP 3**

Wearing eye protection and gloves, measure the correct volume of bleach into a measuring cup.



STEP 4

Add the bleach to the **first** bucket filled with clean water.



STEP 5

Submerge the mask in the first bucket (containing the 1000ppm bleach solution) for five minutes.



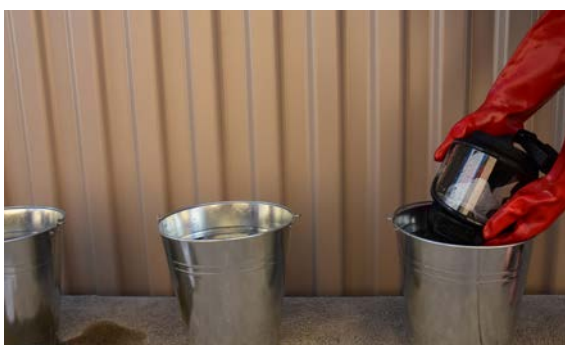
STEP 6

Using gloves, remove the mask from the first bucket and place it into the second bucket (containing clean water).



STEP 7

After five minutes, using gloves, remove the mask from the second bucket and place it into the third bucket (also containing clean water).



STEP 8

After five minutes, using gloves, remove the mask from the third bucket, drain any excess water from the mask and hang to air-dry avoiding direct sunlight.



Decontamination of other equipment

There is no single decontamination method effective for all equipment; different methods are required depending on the type of equipment and the drug, chemical or contaminant involved. It is best to review manufacturer's instructions to determine if any decontamination instructions or chemical decontaminants are recommended.

Wherever possible, equipment contaminated with synthetic opioid residues should be decontaminated using an appropriate decontamination method or a commercial decontamination solution with a demonstrated efficacy or specifically indicated for synthetic opioid contamination. The following decontamination products and

solutions have been demonstrated to be effective in neutralizing synthetic opioid contamination [22]:

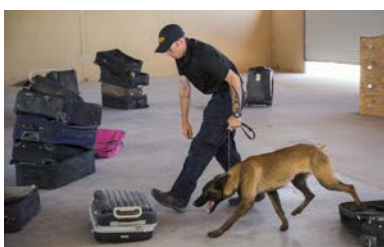
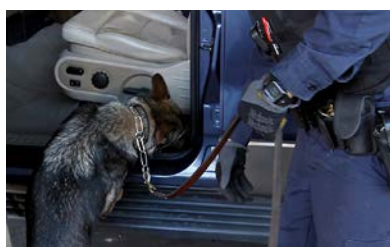
- Dahlgren decontamination solution
- 5 per cent peracetic acid solution
- 10 per cent hydrogen peroxide solution
- 12 per cent dichlor/trichlor solution (dichloro- or trichloroisocyanuric acids)

When using a commercial decontamination solution, always ensure that it is indicated for use on the type of surface or equipment to be decontaminated.

WARNING

- The effects of decontamination on multi-use PPE items (e.g., respirator masks or garment seams) using some commercial decontaminating solutions is not fully known. After decontamination, multi-use PPE should be carefully inspected before reuse for any sign of deterioration or damage.
- When using commercial decontamination solutions, it is important to follow the manufacturer's instructions for dilution, as decreasing the dilution may damage multi-use PPE due to the increased concentration of the decontaminant.

2.7.5 Canine decontamination



While a canine's coat provides some dermal protection, it can also act as a vector for secondary exposure and cross-contamination of other areas, individuals or equipment. This is particularly relevant where a canine may rub against personnel or shake and aerosolize any residual synthetic opioid material which may have been deposited onto its coat. Decontamination procedures for canines are similar to those employed for humans, however there are several differences which require special consideration.

It is generally recommended that canines should not be deployed in high-risk operational environments where synthetic opioids are known or suspected to be present in uncontained form. However, where incidental or unexpected exposure occurs, the following recommendations for decontamination of canines apply [25]:

TABLE 6. DECONTAMINATION OF CANINES BASED ON EXPOSURE TYPE

Exposure type	Recommendation
Inhalation, oral, oculofacial	<ul style="list-style-type: none"> Remove the canine immediately from the contaminated area to a fresh air environment. Wearing nitrile gloves, use a moist towel (not anti-bacterial, moisturising or scented wipes) to remove any residual powder or other material from around the face, nose and mouth, then place the used towel directly into a durable bag for contaminated waste for disposal. Flush the eyes, nose and mouth with copious amounts of water or saline (ophthalmic if available for eyes). Follow <i>Emergency protocol: canine opioid exposure or overdose</i>, as referred to in annex C, section C.5, observing for signs of opioid toxicity. Transport the canine immediately to a veterinarian for review.
Injection	<ul style="list-style-type: none"> Remove the canine from the contaminated area. Flush any wounds with copious amounts of water or saline, if available. Follow <i>Emergency protocol: canine opioid exposure or overdose</i>, as referred to in annex C, section C.5, observing for signs of opioid toxicity. Transport the canine immediately to a veterinarian for review.
Dermal	<ul style="list-style-type: none"> Remove the canine from the contaminated area. Wearing nitrile gloves, use a moist towel to remove any residual powder or other material from the coat, then place the used towel directly into a durable bag for contaminated waste for disposal. Wash thoroughly with high volume, low pressure water, using soap if available. Wearing nitrile gloves, lather soap into the coat to ensure penetration of the outer coat. Using a soft-bristled brush, ensure adequate decontamination of the paws, including the deep-crevassed pad edges where particles can be trapped. Repeat the wash and rinse cycle again if required (such as for heavy contamination), washing again with high volume, low pressure water and soap, followed by a further rinse with high volume, low pressure clean water. Follow <i>Emergency protocol: canine opioid exposure or overdose</i>, as referred to in annex C, section C.5, observing for signs of opioid toxicity.
Ingestion	<ul style="list-style-type: none"> Follow <i>Emergency protocol: canine opioid exposure or overdose</i>, as referred to in annex C, section C.5, observing for signs of opioid toxicity. Transport the canine immediately to a veterinarian for review.

WARNING

- ⚠ Canines should not be deployed in high-risk operational environments where an uncontained synthetic opioid is known or suspected to be present. Where a canine is contaminated with a synthetic opioid powder, brushing is not recommended as this may aerosolize the opioid and result in further inhalation and/or secondary exposure for the handler. Handlers undertaking decontamination should wear appropriate PPE including, as a minimum, eye protection, nitrile gloves and, where a powder opioid is known or suspected, an N95/P2 mask or other appropriate respiratory protection.

Annexes

A.

Precautions for routine and high-risk search activities

IMPORTANT NOTE

Law enforcement and customs agencies normally have established procedures for most types of searches, from personal, bag, vehicle and building searches through to more complex search procedures for vessels, shipping containers, vehicle deconstructions and clandestine laboratories. The following precautions and recommendations are not intended to replace existing or established procedures, rather they are intended to provide precautionary recommendations to be considered when developing procedures, or where appropriate, incorporated into existing procedures to further mitigate the potential for occupational exposure to synthetic opioids for law enforcement, customs and other officers.

A.1 Precautionary principle

Where there is a threat of serious injury or harm and a lack of certainty regarding the identity, potency or the presence or absence of a substance, a precautionary approach is always recommended.

The application of the precautionary principle applies to the handling of synthetic opioids and other drugs and related exhibits, as well as to the development of operational procedures and management decisions which should be guided by:

- A careful evaluation of risk to avoid, wherever possible, serious injury or harm to officers
- An assessment of uncertainty and the risk-weighted consequences of various options, taking into account the likelihood and magnitude of adverse effects

The precautionary principle is particularly relevant when applied to synthetic opioids because potency, which is a significant factor in relation to exposure risk, can vary from as low as one per cent up to almost 100 per cent. In most cases, when dealing with synthetic opioids in powder form, or when they are combined with other drugs, there is often no visual differentiation between a low-purity and high-purity substance. Additionally, when encountered in the field, the identity and potency of the substance is normally unknown.

Applying the precautionary principle to the development of operational procedures is important for officer safety. For example, the use of nitrile gloves, the immediate bagging and sealing of seized substances (outside patrol vehicles), and the immediate transport of samples to a laboratory for examination or identification are examples of applying a precautionary approach in an operational context.

A.2 Personal (body) searches



PRIMARY EXPOSURE RISK

- When undertaking a personal (body) search, direct and often close physical and manual contact with an individual is necessary. The primary exposure risk from this type of search with respect to synthetic opioids arises from the potential for injection, inhalation, ocular or dermal exposure resulting from reaerosolization or contact with any residual drug product which may be present on the individual's clothing or person. Deliberate exposure may also occur where an individual attempts to dispose of a substance by ingesting it or tearing open the packaging and attempting to throw the substance away.

While there are significant variables related to personal searches, the primary opioid exposure risks are relatively consistent. These include the risk of injection, inhalation, dermal or ocular exposure arising from manual contact or handling of an individual or their clothing. However, unless an individual is in possession of a large volume of synthetic opioids or there is visible drug or powder residue on the person, any low volume opioid contamination on an individual's skin or clothing is unlikely to result in a clinically significant exposure for officers.

Section 2.6 sets out the minimum recommended PPE to be used for undertaking personal searches under both routine and high exposure risk scenarios. The selected PPE must be operationally appropriate and should not represent any additional risk, such as restricting officers' ability to undertake their duties safely. If there is reason to believe that an individual may be contaminated (e.g., he or she is in distress and residual powder is visible on the person), then increasing the level of protection is warranted.

The majority of law enforcement and customs agencies have well-developed personal search training and procedures. The following recommendations represent additional precautions which may be considered for personal searches where synthetic opioids are known or suspected, in addition to the minimum PPE recommended in section 2.6.

TABLE A1. RECOMMENDED PRECAUTIONS FOR PERSONAL SEARCHES

Search type	Recommendations
Personal searches	<ul style="list-style-type: none"> • Where an individual is visually contaminated with a low to moderate volume of a suspected opioid or other unknown powder, a search should not proceed without respiratory, eye and dermal protection. • Where an individual is visually contaminated with a large volume of a suspected opioid or other unknown powder, the level of protection should be escalated to a minimum of Level D protection, and specialist advice may be required. • When in close facial proximity to an individual, such as when searching the lower body, be mindful of exposure potential and seek to maintain a maximal distance where practical. • It is recommended to search items of clothing in a slow and systematic manner to minimize rapid movements or manipulation which may result in reaerosolization of any contaminants.

Further information and training resources on personal searches is available through the UNODC Global eLearning portal at: www.unodc.org/elearning/.

A.3 Bag searches



PRIMARY EXPOSURE RISK

- Dermal or injection exposures represent the primary exposure risks when undertaking a bag search. The removal of the contents is normally required for the purpose of the search which may also introduce potential oculofacial or inhalation exposure from aerosolization of any drugs or opioid residues present.

Bag searches are undertaken in different types of environments which can include controlled environments such as customs facilities, airports and other transport hubs, or uncontrolled environments such as field operations, vehicle stops or targeted stop and search activities. As such, it is difficult to account for all circumstances or variables which may be encountered. In addition to routine occupational hazards, bag searches introduce several additional risk

factors because the contents of the bag cannot normally be seen. Therefore, a bag may potentially contain packaged drugs and/or uncontained residual drug product. While packaged drugs represent a relatively low exposure risk, any uncontained residual drug or synthetic opioid may have contaminated the contents of the bag and represent a higher exposure risk.

Most agencies have well-developed search training and procedures for undertaking bag searches. The following recommendations represent additional precautions which may be considered for both routine and high exposure risk bag searches. The minimum PPE recommended in section 2.6 for personal searches (both routine and high exposure risk) should also be applied to bag searches.

TABLE A2. RECOMMENDED PRECAUTIONS FOR BAG SEARCHES

Search type	Recommendations
Routine bag search	<ul style="list-style-type: none"> • If a known or suspected synthetic opioid, or an unknown or uncontained powder, is identified, search precautions should be immediately escalated to those found in the section “High-risk bag searches”. • Be mindful of exposure potential and seek to maintain a maximal distance during the search where practical. • Inspect the outside of the bag, observing for visible powder or other obvious residue or gross contamination. • If it is necessary to empty the bag, place the contents onto a flat level surface, keeping a maximal distance (arm’s length) and if outdoors, be mindful of wind direction and position yourself upwind if possible. • If bags cannot be emptied and a layer-by-layer search is required, do so in a slow and systematic manner to minimize rapid movements or manipulation of the contents which may result in re-aerosolization of any contaminants.
High-risk bag search	<ul style="list-style-type: none"> • Use the minimum PPE recommended in section 2.6. • If an uncontained powder, or suspected drug-related liquid, is identified, the PPE level may require escalation. • Avoid shaking or agitating the bag as far as possible. • Where intelligence or an admission suggests the presence of a moderate to large volume of an uncontained synthetic opioid, a field search is not recommended. • If an uncontained or unknown powder, or suspected drug-related liquid, is identified, the bag should be carefully placed into an evidence bag, sealed and transported to a forensic laboratory or suitable evidence handling facility for examination. • For laboratory-based examinations, the contents of the bag should be emptied onto clean paper inside an operating fume hood without shaking or agitating the bag to the extent possible. • If a fume hood is not available, empty the bag carefully, without shaking, onto a clean piece of paper on a clean bench. The officer emptying the bag should use a minimum of Level D protection, but preferably Level C protection if available, with particulate tight coveralls.

WARNING

- ➡ Do not squeeze or compress bags in a manner which may expel air from the bag, as this may result in exposure if an uncontained synthetic opioid or related residue is present inside the bag. If reusable search gloves become contaminated as a result of contact with a known or suspected synthetic opioid, these should be sealed in a bag (such as an evidence bag) and not reused or returned to a duty bag until decontaminated.

A.4 Vehicle searches



While there is risk of incidental **dermal exposure**, this is relatively low. During a search of the inside of a vehicle, the disturbance of residual powder in carpets or upholstery has the potential to re-aerosolize the powder resulting in an **inhalation exposure** risk. Additional opioid exposure risks may be present in the form of **injection exposure** from concealed contaminated objects (e.g., hypodermic needles). Concealed bulk drugs are normally securely packaged and are unlikely to pose a significant exposure risk unless compromised.

Routine “non-invasive” searches normally involve a visual or manual search of a vehicle and may also include a canine search. Although small volume packaged drugs or drug paraphernalia represent a relatively low risk, a higher exposure risk may exist where an uncontained opioid is present as respirable powder residue in carpet or upholstery which may be disturbed

during the search. This risk may increase if the opioid becomes re-aerosolized within the relatively confined space inside a vehicle, including areas such as footwells, under seats, in passenger compartments, or in the boot space of the vehicle.

“Invasive” searches focus on locating bulk drugs concealed within a vehicle and involve deconstructing all or part of the vehicle, such as removing tyres, panels, seats, mechanical components and fuel tanks, or cutting portions of the chassis or frame. Bulk drugs concealed for trafficking are normally heavily packaged and as such are unlikely to pose an immediate exposure risk unless the packaging is compromised. However, a potential inhalation exposure risk may occur where abrasive cutting tools are used as part of the vehicle deconstruction, since cutting into a concealment of bulk drugs with such tools has the potential to aerosolize a significant quantity of drug which may result in exposure to the operator and anyone else within the immediate vicinity.

Most agencies have existing vehicle search procedures. The following recommendations represent additional precautions related to the potential presence of synthetic opioids which may be considered when developing or reviewing procedures for routine or invasive vehicle searches.

TABLE A3. RECOMMENDED PRECAUTIONS FOR NON-INVASIVE AND INVASIVE VEHICLE SEARCHES

Search type	Recommendations
Non-invasive vehicle search	<ul style="list-style-type: none"> • Use the minimum PPE recommended for routine vehicle searches as shown in section 2.6. • Before physically entering a vehicle, look for any uncontained powders, residue, drugs, packaging or drug paraphernalia. • If a small volume of uncontained synthetic opioid is suspected, open the doors and boot of the vehicle to assist in dispersing any gross airborne hazards. • If any unknown or uncontained powder is observed, suspend the search if possible and request specialist advice. If it is not possible to suspend the search, the minimum PPE should be escalated from routine to high, as shown in section 2.6. • Use caution when searching footwells, under seats, boot spaces or other confined or semi-confined areas so as not disturb carpets, especially when in close proximity to the face or head, as this could aerosolize any contaminants. • When searching a boot space, do not lean into the boot as this is a confined atmosphere where particulates or gaseous contaminants could concentrate. Keep at arm's length when removing items, linings or matting as this may disturb or aerosolize any residual contaminants or powders.
Invasive vehicle search or deconstruction	<ul style="list-style-type: none"> • Use the minimum PPE recommended for routine vehicle searches as shown in section 2.6. However, where an unknown or uncontained powder is present or a concealment is identified, the minimum PPE should be escalated from routine to high, as shown in section 2.6. • Where a significant exposure hazard is identified, or a large volume of synthetic opioid as uncontained powder is suspected, escalation to minimum Level C PPE protection should be considered, subject to a risk assessment. • Use caution when removing any carpets, as these can contain particulates which may become aerosolized when disturbed or removed. • If an angle grinder or other abrasive cutting equipment is used to cut into the chassis or frame of the vehicle, a higher level of PPE should be used, such as Level C protection with full-face APR, especially where x-ray or other detection equipment indicates a bulk concealment. • Where possible, use hydraulic cutting equipment rather than abrasive cutting equipment to reduce the risk of disturbing or aerosolizing a concealed substance. • When removing panelling or structural components, or cutting or opening a concealment from underneath the vehicle, for example where the vehicle is elevated on a hydraulic hoist, care should be taken to ensure that officers working beneath the vehicle are not exposed to any drug or residue which may drop from the concealment.

WARNING

- Vehicle stops can be dynamic, high-threat, high-risk operational activities and officer safety must be the highest priority. In circumstances where any of the recommendations made in this section may expose an officer to an increased threat, the recommended activity should be avoided. Detection dogs should not be deployed in vehicles for the purpose of undertaking a search where synthetic opioids are known or suspected to be present. However, searching the external areas of a vehicle should pose no significant risk.

A.5 Building searches



PRIMARY EXPOSURE RISK

- The most significant opioid exposure risk when undertaking a building search is inhalation exposure as a result of airborne particulates within fully or partially enclosed spaces such as individual rooms inside the building. Building searches also involve manual interaction with the environment which may also introduce potential injection or dermal exposure risks.

This section outlines precautions for searching buildings where synthetic opioids are known or suspected to be present, such as drug houses or other locations where drugs may be adulterated, repackaged, sold or used. This section does not apply to high exposure risk locations such as clandestine opioid laboratories or locations used

for tableting or milling operations. It is recommended that officers undertaking building searches are trained to identify drug manufacture and tableting equipment, chemicals, and associated materials and activities.

Occasionally routine building searches can result in the identification of high-risk materials or activities which were not previously known or anticipated. Agencies should develop procedures for managing such scenarios appropriate to their particular resourcing and operating environments. Procedures should include contingencies and triggers for the escalation and de-escalation of safety measures and PPE protection levels in response to the identification of high-risk materials or activities, such as synthetic opioid hazards.

Many agencies have existing building search procedures. The following recommendations represent additional precautions related to the potential presence of synthetic opioids. These may be considered when developing or reviewing procedures for building search activities.

TABLE A4. RECOMMENDED PRECAUTIONS FOR BUILDING SEARCHES

Search type	Recommendations
Building search	<ul style="list-style-type: none"> Where an operational risk assessment identifies the potential presence of a synthetic opioid, a minimum of Level D protection is recommended (see section 2.6). Where a routine search results in the identification of a large volume of a synthetic opioid, procedures and contingencies should exist to guide the escalation and de-escalation of PPE protection levels, as well as any necessary variation to search procedures. If not already existing, agency-specific evidence handling procedures for synthetic opioid seizures, including storage and transport arrangements, should be developed. If possible, an initial short duration search should be undertaken to identify any obvious unpackaged drugs, uncontained powders or chemicals. This may be done as part of a building clearance. Note: a higher level of PPE protection may be required depending on the operational risk assessment. Confined spaces commonly used for concealments include ceilings, crawl spaces, roof spaces, attics, ventilation ducts and understairs storage areas. These locations require specific safety considerations or the escalation of respiratory protection if an uncontained synthetic opioid is suspected to be present. Search officers should be trained in the identification of drugs, drug manufacture equipment and tablet pressing equipment. Naloxone should be available on-site to manage any clinically significant exposures, and officers should be trained in its administration.

WARNING

- ➡ Where unpackaged or uncontained drugs are identified, the level of protection should be re-evaluated and escalated to adequately manage potential exposure risk. Buildings which have been closed or sealed for a length of time may pose additional inhalation risks and should be ventilated prior to any intensive search by opening doors and windows to reduce or mitigate potential accumulated particulate risk. Ventilating a building is unlikely to result in any exposure risk for nearby residents.

A.6 Confined space searches



PRIMARY EXPOSURE RISK

➤ Confined space searches represent one of the highest occupational risks for inhalation exposure where a synthetic opioid is present as an airborne particulate. Although the risk of ocular or dermal exposure is lower, this increases if an appropriate level of PPE is not used, particularly if residues are present.

- Ducting, ventilation and air-handling systems and rooms
- Understairs or underfloor storage areas
- Buried or below ground structures including bunkers or buried shipping containers
- Road transport tankers, e.g., bulk fuel, chemical or water tankers
- Shipping containers, especially if they have been sealed for an extended period, and large truck trailer units (although these are generally lower risk)
- Voids within large machinery or plant and equipment
- Voids or storage areas within large and small vessels

Confined spaces are generally defined as enclosed or partially enclosed areas with limited entry and exit points which are not intended for continuous human occupancy. Strict occupational health and safety regulations exist in most countries for entry into a confined space, which often require specialist training and certification.

A range of confined spaces are routinely encountered during law enforcement and customs search activities, and the risk profile of each can vary significantly. They are typically associated with concealments of drugs or other contraband as well as various illegal operations such as clandestine drug laboratories or tableting operations. Confined spaces encountered by law enforcement and customs can include:

- Ceiling spaces such as suspended ceilings
- Roof spaces and attics including crawl spaces

In addition to exposure risks posed by uncontained or airborne synthetic opioids or residue deposited on surfaces, confined spaces have the potential to be oxygen-deficient, particularly underground structures or other confined spaces with low air turnover such as bunkers and tanks, or deep voids and storage areas on large vessels. Any environment which is potentially oxygen-deficient requires SCBA equipment and trained specialist officers or teams.

If the location to be searched meets the definition of a confined space, additional precautions are needed. Rendering the confined space safe can sometimes be accomplished by creating a second opening into the space to create or allow increased airflow. Airflow can also be increased using fans and flexible ducting to direct fresh air into the confined space. These approaches may allow lower risk confined spaces such as concealed rooms or attics to be searched more safely.

When conducting a confined space search, air monitoring is recommended for both oxygen and Lower Explosive Limit (LEL) as a minimum. Ideally, a rapid intervention team equipped with SCBA should supervise officers working in the space and be prepared to undertake a rescue if necessary. Confined space searches may present significant challenges for smaller agencies or remote operations. However, every effort

should be made to obtain the appropriate support, logistics and expert advice prior to undertaking any such search.

The following recommendations represent additional precautions related to the potential presence of synthetic opioids which may be considered when developing or reviewing procedures for confined space search activities.

TABLE A5. RECOMMENDED PRECAUTIONS FOR CONFINED SPACE SEARCHES

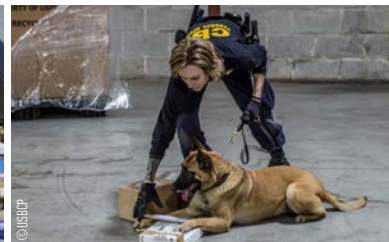
Search type	Recommendations
Confined space	<ul style="list-style-type: none"> Any confined space search where a synthetic opioid is known or suspected should be planned. If a large volume concealment of a known or suspected synthetic opioid is identified, specialist advice should be obtained as part of the search planning process. SCBA should be considered based on an operational risk assessment by a qualified and experienced confined space coordinator or search officer. Confined and concealed spaces used for synthetic opioid tableting can contain significant residue deposits which may be re-aerosolized if disturbed and result in significant transfer of contamination to officers and equipment. Such environments may require specific consideration in relation to decontamination measures for officers and equipment. Although shipping containers do not necessarily meet the definition of a confined space, they can pose similar inhalation risks if they have been sealed in transit for an extended period of time and caution should be used when undertaking a search. SCBA is unlikely to be required for container searches unless a significant inhalation hazard is identified or suspected. However, containers should not be entered immediately upon opening and should remain open for a period to allow adequate air exchange. If the contents of a container cannot be unpacked from the door and entry into the container is required, such as climbing into the container to undertake a search, a minimum of Level D protection should be considered. This also applies to truck trailers. Establishing ventilation and air exchange in a confined space, particularly below ground, can reduce the risk of encountering an oxygen-deficient environment, and may also reduce the risk of encountering an airborne particulate hazard. Where a confined space is ventilated by fans and/or ducting of external air, this should be continually monitored by an officer throughout the search. Air monitoring should be conducted within any confined space prior to entry and for the duration of the search and should include a minimum of oxygen and Lower Explosive Limit monitoring. Additional monitoring may be required where other risk factors are identified and may include carbon monoxide, hydrogen sulphide as well as other explosive, flammable or asphyxiant gases (including any gases which may displace oxygen). An SCBA-equipped rapid intervention team should be on-site during a confined space search and on standby for rescue or emergency intervention.

Further information and training resources related to the examination and searching of shipping containers is available through the UNODC Global eLearning portal at: www.unodc.org/elearning/.

WARNING

- ⚠ Confined spaces represent extremely hazardous work environments, even in the absence of synthetic opioids. Confined spaces with a potential for oxygen deficiency, such as below ground confined spaces, confined storage spaces or deep voids on vessels, should only be entered by appropriately trained, qualified and SCBA-equipped officers. Full-face air-purifying respirators (APRs) fitted with appropriate canisters offer superior protection over particulate masks. However, APRs are ineffective in an oxygen-deficient environment.

A.7 Mail room examinations and deconstructions



PRIMARY EXPOSURE RISK

- ⚠ Most synthetic opioids encountered in customs and mail screening facilities are contained within packaging, and the primary exposure risks arises when the packages are opened for examination or during deconstruction. Dermal exposure is the primary risk with a lower risk of oculofacial or inhalation exposure if uncontained powders are released or become airborne during the examination.

Due to their availability on the Dark Web and other online sources, synthetic opioids are routinely encountered or intercepted in customs and mail screening facilities arriving through national and international mail, express consignment carriers, private courier or mail consolidator companies.

A wide variety of hazards can be encountered in a mail screening facility, and in most countries, there are well developed procedures and processes to manage the identification, isolation, handling and examination of packages or shipments. Additionally, international best practice guidance is available to assist in the development of screening and handling processes [21].

However, examinations or deconstructions (such as invasive testing or internal examination) of packages containing a synthetic opioid pose

several challenges beyond the exposure risk alone. Synthetic opioids have the potential to pose a significant strategic risk through extended process disruption and denial of area as a result of a widespread contamination incident (similar to a “white powder” incident). The primary means of mitigating this risk are administrative controls, i.e., well-developed safety procedures and engineering controls to isolate and contain any identified or suspicious items for further examination (see section 2.1 for further information).

All facilities should have an up-to-date emergency response plan for managing both small and large volume exposure incidents involving

synthetic opioids which includes exit/evacuation routes, exposure management and decontamination procedures for personnel and the facility.

The following recommendations represent additional precautions and apply specifically to packages or shipments which have been identified for further examination or deconstruction (such as invasive testing or internal examination), where synthetic opioids are known or suspected to be present. These precautions and recommendations may be considered when developing or reviewing procedures for mail examinations or deconstructions and should be read in conjunction with section 2.1.

TABLE A6. RECOMMENDED PRECAUTIONS FOR MAIL EXAMINATIONS OR DECONSTRUCTIONS

Search type	Recommendations
<p>Examination or deconstruction of small volume mail consignments</p>	<ul style="list-style-type: none"> • Routine examinations of items suspected to contain a synthetic opioid should be undertaken using the minimum routine level of PPE recommended in section 2.6. • Where an item has been identified for further examination or screening and a synthetic opioid is known or suspected to be present, it should be immediately isolated and contained by being placed into a suitable sealed container or bag and safely transported to the examination location. • Ideally, examination and/or deconstructions of items suspected of containing synthetic opioids should not be conducted within the main mail screening or processing areas. • Where possible, examinations should be undertaken in a dedicated “safe area” or enclosed room with a suitable air extraction system which is not connected to the facility’s main HVAC system (see section 2.1). • Manual manipulation or disturbance of the item should be minimized during handling and examination. • Where any presumptive testing results in a positive test, it is recommended that the item be placed in an evidence bag, sealed, labelled and transported directly to a forensic laboratory for further examination or testing within a fume hood or other suitable containment facility (subject to agency procedures). • If the item is known to contain a synthetic opioid, a minimum of Level D protection should be considered for carrying out any examination or deconstruction.

Deconstruction of large volume consignments

- For deconstructions involving shipping containers, see annex A, section A.6 for confined space searches.
- The primary risk with the examination or deconstruction of large shipments is the potential presence of larger volumes of synthetic opioids and the corresponding increase in risk management requirements.
- If a suitable or dedicated examination location with a separate HVAC system is not available for the examination or deconstruction of a large shipment, it is recommended to carry out the examination in a controlled area where some form of isolation or containment is possible, away from main processing or handling areas.
- Manual manipulation or disturbance of items to be examined or deconstructed should be kept to a minimum.
- Where a large volume consignment is known to contain a synthetic opioid, a minimum of Level D protection should be considered for undertaking any examination or deconstruction. Where necessary, or based on an assessment of risk, this may be increased to Level C protection, particularly if positive containment or engineering controls are not available.

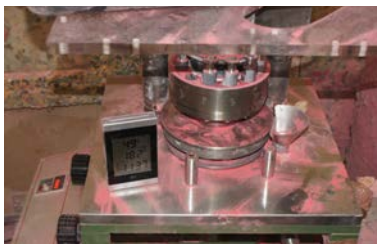
Examination or deconstruction in facilities without engineering controls

- Where engineering controls are not available and there is an operational need to undertake an examination or deconstruction involving a known or suspected synthetic opioid, administrative and PPE controls are essential.
- Procedures should include undertaking examinations in a designated area away from the main screening or processing areas.
- The examination area should be protected from sudden air movement or disturbance (i.e., no open windows or external doors), including no HVAC outlets/intakes and no fans or similar air-cooling/movement units.
- Procedures, training and emergency response contingencies should be developed to guide examination processes.
- Abrasive or electrically powered cutting tools should not be used. Only manual tools such as boxcutters or similar bladed tools are recommended for opening items.
- Provided adequate PPE is available, high-risk or hazardous examinations may be undertaken outdoors in remote areas to minimize potential exposures. In such cases, close attention should be paid to wind direction, downwind populations or officers and forecasted weather changes.

WARNING

- ⚠ Detection dogs should not be used where uncontained powders are present. The use of canines on mail screening lines is generally low risk, however handlers should be observant for visual indicators of contamination. Abrasive cutting equipment should not be used to open or deconstruct packages or consignments where a synthetic opioid is suspected, as this may facilitate the aerosolization of powders.

A.8 Clandestine synthetic opioid laboratories



PRIMARY EXPOSURE RISK

- Primary exposure risks in a clandestine laboratory include inhalation, dermal and oculofacial exposure risks. However, these risks can vary significantly depending on the processing being undertaken and the precursors, chemicals and reagents present as well as the nature of the equipment (including improvised equipment) and the individual offender.

Whether undertaking an initial or tactical entry, searching, investigating, collecting or processing evidence, a clandestine opioid laboratory represents one of the most hazardous environments which officers may encounter. For this reason, most agencies have specially trained officers or units to manage such high-risk operational environments.

Exposure risks in a clandestine opioid laboratory are similar to those encountered in clandestine laboratories manufacturing amphetamine, methamphetamine or MDMA, but with one important difference. The finished product of a clandestine opioid laboratory is significantly more potent and hazardous than any more commonly encountered drugs. To adequately manage this risk, all operational procedures including entry, processing, PPE and decontamination must be more rigorous.

Tableting laboratories are a subset of clandestine drug laboratories and should be treated in the same manner as clandestine drug synthesis laboratories. Due to the potency of some

synthetic opioids and the mechanical nature of tableting operations and equipment, such laboratories represent a high risk of encountering an airborne particulate or significant volume of powder residue. The presence of an airborne particulate or residue deposit on surfaces in these laboratories may pose a significant inhalation exposure risk.

The selection of PPE for any operations involving a clandestine opioid laboratory should be determined by specialist officers trained in clandestine laboratory operations and subject to an operational risk assessment. This is necessary since no two laboratories are identical, and hazards vary significantly between laboratories regardless of any operational similarities such as the type of drug manufactured or reaction method used.

Subject to a risk assessment, a minimum of Level B protection is generally recommended for initial entry and appraisal. However, where a tactical entry is required, specialist units may utilize other protective clothing, such as flame-retardant coveralls, in conjunction with SCBA equipment. Following the initial entry and management of any significant airborne hazards, a minimum of Level C protection is recommended for all subsequent entry, investigation and evidentiary processes until the scene has been declared safe.

Agencies are recommended to have established standard operating procedures for activities related to clandestine drug laboratories. If no procedures exist, the development of such procedures should be considered. The following recommendations represent additional precautions which may be considered when developing or reviewing procedures for responding to clandestine synthetic opioid laboratories.

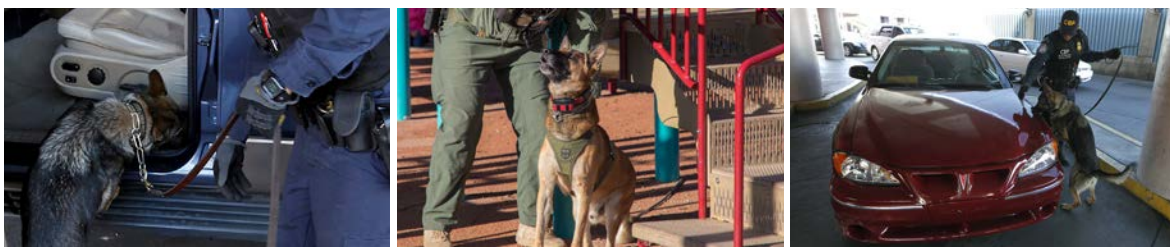
TABLE A7. RECOMMENDED PRECAUTIONS FOR CLANDESTINE SYNTHETIC OPIOID LABORATORIES

Search type	Recommendations
Clandestine synthetic opioid manufacturing or tableting laboratory	<ul style="list-style-type: none"> • If possible, enter the location of the suspected laboratory when it is unoccupied or non-operational. • Due to increased risk of inhalation exposure, PPE protection should not generally be de-escalated below Level C (which includes a full-face APR providing both respiratory and oculofacial protection) until the scene has been declared safe. • Laboratories should be examined by a trained chemist or forensic officer checking for additional chemical and other process-specific hazards. This is normally an “open door” search in which all doors, cupboards and other areas are opened and inspected. For this reason, a higher level of protection is warranted. • During the collection of evidence, following any evidentiary photography or recording, drug products, equipment or other exhibits suspected to contain or to be contaminated by synthetic opioids, should preferably be bagged and sealed to reduce exposure and cross-contamination risks. • Samples or evidence should be transported directly to an appropriate laboratory facility for further examination, evidentiary sampling or analysis, or to a suitable evidence storage facility (for exhibits). • All evidence bags, samples or other evidence containers which contain a known or suspected synthetic opioid or contaminated exhibits should be clearly labelled, e.g., “Caution: Sample contains fentanyl” or similar notation as appropriate. • Field testing should only be undertaken by appropriately trained and equipped officers. • Specific consideration should be given to decontamination facilities and procedures required for synthetic opioid laboratories, and specialist hazmat advice and support may be required. • Wet decontamination procedures should always be used for personnel exiting a synthetic opioid laboratory. This is particularly important for tableting laboratories where there is higher risk of particulate deposition onto personnel. • Where civilian contractors are engaged to remove contaminated waste, they should be made aware of the required PPE level for handling the contaminated items. • Any non-evidentiary contaminated items removed for disposal as waste should be taken directly to a facility and destroyed or interred directly into an approved landfill. They must not be placed where they may be repurposed or recycled. • Where residual contamination remains in a residential property used as a clandestine synthetic opioid laboratory, public health reporting and control measures may apply. Where possible, following completion of evidentiary processes, these locations should be handed over to the relevant public health or other public safety authorities for management. Handover should include an appraisal of any exposure risks which may remain.

WARNING

- ⚠ Hazards related to clandestine synthetic opioid laboratories can vary significantly and are likely to be multiple hazard environments which can include both chemical and particulate hazards. As such, all operational planning, resourcing, emergency response, PPE and decontamination requirements should be assessed on a site-specific and ongoing basis.

A.9 Searches or operations involving canines



PRIMARY EXPOSURE RISK

- ⚠ The primary exposure risk for canines is **inhalation exposure** of drug particulate through the mouth or nose. Synthetic opioid absorption via this route may occur across the surface of the nasal cavity (intranasal) and/or across the alveolar barrier (intrapulmonary). Canine units are also at increased risk of synthetic opioid exposure by **ingestion, oculo-facial and dermal exposure** although it is difficult to mitigate these risks while maintaining operational effectiveness.

There is limited protective equipment for operational canines as this would restrict airflow into the nose and mouth impacting the ability to detect and respond to scents or to undertake apprehensions or other tasks. Therefore, the most effective means of preventing and managing exposures is to control the environments in which canines are deployed to the extent possible, and to develop training and procedures for responding to any exposure incidents. Similar to humans, exposure alone will not necessarily result in a toxic effect; the degree and duration of exposure play a significant role in determining overall exposure risk and any clinically significant effects.

Agencies are recommended to have established standard operating procedures for canine searches and operations which reflect the risks and available resources in the agency or operating environment. The following recommendations are of a general nature and represent additional precautions to be considered when developing or reviewing procedures for the use of canines in environments where synthetic opioids are known or suspected to be present.

TABLE A8. RECOMMENDED PRECAUTIONS FOR CANINE SEARCHES AND OPERATIONS

Search type	Recommendations
Canine searches and operations	<ul style="list-style-type: none"> • Detection training involving scent recognition for synthetic opioids should consider stand-off indication, where a canine is trained to indicate without close contact with a substance. • Canines should not be deployed in high-risk operational environments (as defined in section 2.3) where large volume synthetic opioids are suspected including clandestine synthetic opioid manufacture, tableting or milling laboratories. • Canines should not be deployed in operational environments where an unknown or uncontained powder, or an airborne particulate is visible. • Where synthetic opioids or other drugs are known or suspected inside a vehicle, a “free air” search around the exterior of the vehicle is unlikely to pose a significant risk. • Prior to undertaking any canine vehicle search, handlers should undertake a detailed visual inspection of the vehicle to observe for any indications of unpackaged or uncontained powders, drug use paraphernalia or other material or objects which may pose a risk to the canine or indicate the potential presence of a synthetic opioid. • Handlers should be trained to identify opioid intoxication symptoms in canines and to administer naloxone, as well as general canine first aid and life support. • Naloxone nasal pump sprays should be considered as these may have administration advantages for handlers, particularly where a canine may be distressed.

WARNING

- ✎ Canines should not be deployed into a clandestine opioid manufacture, tableting or milling laboratory or any environment where unknown or uncontained powders are visible.
- ✎ Canines exhibiting objective symptoms of opioid intoxication should be administered naloxone in accordance with the emergency protocol provided in these guidelines, or other approved agency guidelines. Exposed or symptomatic canines should be transported to a veterinarian for immediate assessment and further treatment if necessary.
- ✎ When treating a canine with a suspected synthetic opioid overdose, mouth-to-snout (human mouth to dog nose) ventilation should never be attempted.
- ✎ When undertaking the decontamination of a canine, all personnel should wear minimum of Level D protection to avoid secondary exposure.
- ✎ Naloxone dosing rates may vary depending on canine weight, among other factors. Handlers should be aware of the correct dose rate for their canines and should carry multiple doses.

B.

Precautions for
forensic officers and
evidence handling

B.1 Safe handling of evidence



PRIMARY EXPOSURE RISK

✎ The primary exposure risk during evidence handling is **dermal exposure**, predominantly through secondary exposure to contaminated exhibits or evidence bags. Additionally, both **dermal** and **oculofacial exposure** risks exist when opening evidence bags or containers, processing exhibits, subsampling for forensic analysis or during other forensic procedures such as fingerprinting or DNA collection. If correct PPE is not used, a **dermal** and **inhalation exposure** risk can also occur when handling heavily contaminated exhibits, samples or bulk drug exhibits or when undertaking work within a drug vault or evidence storage facility.

Exposure controls, including administrative and engineering controls, as well as PPE controls, are critical for the safe handling and storage of evidence. Commonly, powders, tablets and other forms of suspected opioids or other drugs are seized by law enforcement and customs officers and sent to forensic laboratories for analysis. Seizing officers, as well as forensic or laboratory officers, therefore tend to perform more manual handling of exhibits or suspected drugs and interact with these items for a longer duration which represents greater potential for accidental exposure for these occupational groups compared to most other officers.

After transportation and logging at the laboratory, forensic officers must physically access the exhibit or sample, depending on the type of forensic procedure to be performed. This involves opening the seal on the evidence bag or container, and in most cases, removing the item to some degree. As this process represents a significant risk of accidental exposure, these activities should always be undertaken within a fume hood. The most common forms of synthetic opioids encountered are solid or powder as a bulk drug or as tablets, or residual contaminant on an exhibit. Fume hoods represent a minimum level of engineering control which can mitigate most accidental exposure risks when handling exhibits or samples.

It is also important to understand how accidental exposures occur during the evidence handling chain, from point of seizure to laboratory, particularly when developing or implementing safe handling procedures. Opportunities for accidental exposure include:

- During the seizure and subsequent packaging of an exhibit or suspected drug.
- In some jurisdictions, procedures require suspected drugs to be weighed prior to packaging. This necessitates manual handling and the use of equipment which can become contaminated and result in secondary exposure and cross-contamination.
- Leakage of sealed packages during transportation to or within the analysis facility. This applies not only to liquid samples but also to solid or powder samples which can leak inside an evidence bag.
- Forensic analysts need to open sealed packages to withdraw small amounts for analysis. In addition, samples need to be

weighed and may have to be mixed prior to quantification.

- Preparing exhibits to be resealed or packaged for destruction or returning.
- Leakage of sealed packages during transportation to a waste destruction facility or during return of the sample to the submitting agency.
- Leakage from or deterioration of sealed packaging during storage in a drug vault, evidence storage facility or waste

destruction facility. This is particularly relevant where evidence is stored for long periods of time.

The following recommendations represent additional precautions related specifically to synthetic opioid hazards. These precautions and recommendations may be considered when developing or reviewing procedures for the safe handling of exhibits or evidence associated with synthetic opioids.

TABLE B1. RECOMMENDED PRECAUTIONS FOR EVIDENCE HANDLING

Activity	Recommendations
On-scene evidence handling	<ul style="list-style-type: none"> • When performing the role of evidence officer or any crime scene role which requires physical interaction with seized exhibits known or suspected to contain or be contaminated with a synthetic opioid (high exposure risk scenario), a minimum of Level D protection is recommended (see section 2.6). • Field testing should only be undertaken by appropriately trained and equipped officers. • Large volume synthetic opioids should be double-bagged and, where possible, transported in sealed containers such as evidence tins or similar appropriate containers. • Small volume synthetic opioids should be double-bagged. • All evidence bags, samples or other evidence containers which contain a known or suspected synthetic opioid or contaminated exhibit should be clearly labelled, e.g., "Caution: Sample contains fentanyl" or similar notation as appropriate. • Manual handling and manipulation of known or suspected synthetic opioid exhibits should be minimized to the extent possible. • Exhibits should be processed in a "warm zone", and not removed until processed, bagged and rendered safe. • When handling exhibits, officers should be observant for powder residue or leaking liquids. • Where fingerprinting is performed on-scene, exhibits should first be assessed for visible residues as these can become aerosolized. Although unlikely to pose a significant inhalation exposure risk, this has the potential to result in cross-contamination. • Crime scene officers undertaking on-scene forensic examination such as fingerprinting or DNA collection should wear a minimum of Level D protection. Higher levels of protection are required if working in the "hot zone" area, unless declared safe. • When transporting large volume synthetic opioids or other or contaminated exhibits, ensure that they are contained inside the transporting vehicle so that they cannot move or be disturbed. • For bulk synthetic opioids, the use of an overdrum during transport may provide an additional level of protection.

TABLE B1. RECOMMENDED PRECAUTIONS FOR EVIDENCE HANDLING (*continued*)

Activity	Recommendations
Evidence handling in laboratories or evidence storage facilities	<ul style="list-style-type: none"> • Once transported to a laboratory or evidence handling and storage facility, all manipulations of the evidence should be performed within a controlled environment (i.e., fume hood or other containment system). • Minimize the number of manipulations of the exhibit or suspected opioid sample. • When undertaking any examination, sampling or preparation of samples in a laboratory, analysts should wear a minimum of eye protection and nitrile gloves, and where necessary, sleeve or arm covers. • When transporting large volume samples internally within a laboratory, analysts should wear a minimum of Level D or equivalent level of protection to prevent or mitigate any accidental exposure. • When transporting samples internally within a laboratory, a suitable sample trolley or cart should be used. • Exhibits should be received and processed in an area which ideally has an independent HVAC system, not connected to the facility's main HVAC system (see section 2.1). • Where exhibits are stored for long periods of time, these should be clearly labelled as containing a synthetic opioid. • Long-term storage of exhibits and/or bulk drugs is not recommended. However, where necessary, these should be stored in a secure well-ventilated location with an independent HVAC system with a sufficient number of air changes per hour (ACH) to prevent accumulation of particulates or other volatile substances (see section 2.1). • Where appropriate HVAC systems are in place, officers entering these locations should wear minimum or "routine" level PPE as indicated in section 2.6. • If there are no HVAC systems in drug vaults or evidence storage facilities, a minimum of Level D protection should be considered. If volatile substances or chemicals are stored in the facility, this may require escalation to Level B protection. • Officers handling large volume synthetic opioid samples or exhibits in a drug vault or evidence storage facility containing synthetic opioid or other drug exhibits should wear a minimum of Level D protection.

WARNING

- 🔔 PPE levels recommended in this section, as summarized in section 2.6, represent the minimum protection advised for each task. A final decision on the appropriate level of PPE for any given situation should be made based on the particular threats or hazards present. As inhalation exposure is the highest risk exposure route under most normal circumstances in large volume drug vaults or storage facilities, appropriate respiratory protection should always be considered during any handling or processing activity in such environments.

B.2 Safe handling of large volume seizures



PRIMARY EXPOSURE RISK

- Exposure risks associated with the handling of large volume seizures vary depending on factors such as the type, volume, form and containment (packaging) of the drugs or chemicals. Primary exposure risks include potentially high inhalation, dermal and oculofacial exposure risks, particularly if the packaging or containment of the substances is ineffective or compromised.

Large volume seizures of synthetic opioids or other synthetic drugs including precursors and other chemicals can range from kilograms to multiple tons. Large volume seizures have the potential to introduce increased exposure risks as well as significant logistical challenges in relation to the handling and storage of evidence or seized exhibits.

Short-term evidence handling and the storage of large volume seizures of solid drug products in a heavily packaged form, such as wrapped and sealed kilogram “bricks”, may pose a relatively low exposure risk. However, appropriate protection equivalent to Level D should be used due to

the potential exposure risk from any compromised packaging, as well as residues and secondary exposure risks.

The handling of large volumes of liquid chemicals or drugs poses similar hazards and exposure risks to those encountered in large-scale clandestine drug laboratories, where large volumes of unknown or mislabelled chemicals, as well as mixtures of chemicals, may be present. In many cases, chemicals and other substances commonly seized, including cutting agents such as dipyrone, may also pose significant hazards for officers processing, transporting or otherwise managing these exhibits.

The following recommendations represent additional precautions related specifically to large volume seizures involving synthetic opioids or associated chemicals. These precautions and recommendations may be considered when developing or reviewing procedures for the safe handling and storage of exhibits or evidence.

TABLE B2. RECOMMENDED PRECAUTIONS FOR LARGE VOLUME SEIZURES

Activity	Recommendations
Evidence handling and storage for large volume seizures	<ul style="list-style-type: none"> • It is important to assess risks and manage large volume seizures from a chemical hazard (hazmat) perspective, and not solely from a drug seizure or security perspective. • Where possible, preliminary identification at the seizure location is recommended to inform operational risk assessment and planning for the movement, transport or storage of exhibits. • Finished drug products may not represent the only or highest exposure risk in a seizure involving drugs and chemicals. Many chemicals associated with drug manufacture have the potential to pose a high risk and should be appropriately assessed and managed. • Heavily wrapped and packaged units of drugs, such as sealed kilogram “bricks” generally represent a lower exposure risk. However, when handling these, a minimum of Level D protection is recommended (see recommended PPE for routine evidence handling, section 2.6). • Where possible, packaged drugs should be transferred to overdrums to ensure safety during movement and transport. • Overdrums should be used for the transport of liquids in their containers where practical. • Large volume liquids including drugs, precursors or any associated chemicals should be assessed in-situ by a suitably trained chemist or hazmat officer prior to movement to assess safety, stability, reactivity and integrity (ensuring they are safe to move). • Large volume chemical seizures should be processed and managed using similar procedures to those for large-scale clandestine drug laboratories, including use of Level B or C protection where required by an operational risk assessment. • During large volume seizures, there is potential for incompatible chemicals to be seized, transported or stored together. Where possible and safe, preliminary identification of chemicals should be undertaken by trained officers to determine the hazard class. • Care should be taken to segregate chemicals into their respective hazard classes for both transport and storage. • Field testing should only be undertaken by appropriately trained and equipped officers. • Storage locations for large volumes of chemicals or precursors should be appropriate and safe, including being cool, out of direct sunlight, segregated into hazard classes and with adequate ventilation to prevent the accumulation of potentially hazardous vapours or gases. • Manual handling and manipulation of all exhibits should be minimized where possible.

The UNODC publication *Illustrated guide to the disposal of chemicals used in the illicit manufacture of drugs*, which can be accessed through UNODC Laboratory and Scientific Service at www.unodc.org/lab, provides additional information on the safe handling, transport and storage of drug-related chemicals and precursors.

B.3 Preventing secondary exposure and cross-contamination



Due to the potency and common physical forms of synthetic opioids, particularly when present as fine powders, the potential for secondary exposure and cross-contamination is generally greater than for other more common drugs. Administrative controls, such as well-developed procedures and training, play an important role in reducing or preventing these risks. Exposure is not the primary risk however since secondary exposure and cross-contamination are likely to involve only minimal or trace amounts of these substances. The more significant risk relates to the contamination of individuals, evidentiary samples, other evidence, equipment or work areas where prolonged or ongoing passive exposure can occur if not identified or decontaminated.

The integrity of the packaging is key to preventing secondary exposure for those handling bagged exhibits and transporting samples between the seizing officer and the forensic laboratory, and between the forensic analyst and the destruction location. Crime scene, evidence and forensic officers should all be trained in the proper packaging, handling and transportation of samples and exhibits.

In addition to the evidence handling precautions outlined in annex B, section B.1, the risk of secondary exposure or cross-contamination may be further reduced or prevented by:

- Strict adherence to the minimum or appropriate PPE protection levels recommended for a particular activity (see section 2.6)
- Strict adherence to the correct procedures for removal and disposal of PPE as outlined in section 2.4, especially for the use and removal of nitrile rubber gloves and double gloves, as well appropriate decontamination procedures
- Operationally appropriate administrative controls, procedures and training supported

by ongoing regular role-specific training for officers in at-risk occupational groups, such as crime scene, evidence or forensic/laboratory officers

- Undertaking the transfer of exhibits in a protective enclosure such as a fume hood or by wearing proper respiratory protection as described in section 2.6
- Minimizing the number of transfers of exhibits or samples
- Recording the gross weight of exhibits (drug and packaging) rather than the net weight (drug only) where possible
- Packaging samples appropriately and securely for transportation such that package leakage will not occur without deliberate intervention

Cross-contamination occurs when a contaminated person or object makes contact with another person or object that is not contaminated, thereby transferring the contamination.

Cross-contamination is typically the result of poor evidence handling procedures, the incorrect use and removal of PPE or inadequate decontamination or site safety and management procedures. Cross-contamination is a greater risk when dealing with liquids and solids and can spread from one object to another, resulting in the cross-contamination of a number of evidentiary items or samples. Similarly, contamination can be transferred from one officer to another and result in the contamination or secondary exposure of multiple officers. This can cause a cross-contamination cycle and result in the contamination not only of exhibits or samples, but also other work areas such as vehicles or offices if good hygiene and decontamination processes are not followed.

B.4 Sample preparation, analysis and analytical standards



The following recommendations apply specifically to the handling, analysis and management of synthetic opioid samples in a laboratory environment. This includes precautions for the preparation of samples, analysis and the use and storage of analytical standards to reduce or eliminate the risk of both secondary exposure and cross-contamination.

The primary and most effective means of managing exposure and cross-contamination risk in a laboratory is through the development and implementation of detailed quality management and quality control procedures. Most agencies have laboratory quality management procedures

as part of their jurisdictional or international laboratory accreditation schemes or standards. In addition to these procedures and standards, or where no such systems are in place, agencies may refer to the UNODC publication *Guidance for the implementation of quality management systems in drug testing laboratories*, which can be accessed through UNODC Laboratory and Scientific Service at www.unodc.org/lab.

The following recommendations represent additional precautions which may be considered when developing or reviewing procedures for the safe handling and management of synthetic opioids in laboratories.

TABLE B3. RECOMMENDED PRECAUTIONS FOR THE MANAGEMENT OF SYNTHETIC OPIOID SAMPLES IN LABORATORIES

Activity type	Recommendations
Sample movement	<ul style="list-style-type: none"> Where appropriate, use carts or trolleys to move samples around the laboratory. Large volume samples should not be carried by officers, including up or down stairs. Receive all samples through the shipping and receiving area and transfer them to the laboratory via the shortest route. Samples should be transported in suitable packaging and containment.
Sample storage before analysis	<ul style="list-style-type: none"> Small volume samples should be stored in cardboard boxes or sealed evidence envelopes/bags to prevent spills or the cross-contamination of samples. Large volume samples should be transferred to a laboratory using a trolley or storage bin. Samples that exhibit an odour should be stored in a fume hood. Samples suspected of being a synthetic opioid or other low-dose high-potency drug should be clearly labelled with an appropriate "Caution" label.

Sample inspection and opening	<ul style="list-style-type: none"> • Open samples, packages or containers in a fume hood if possible. Note that large packages can be opened in the laboratory area outside the fume hood if required. However, the risk should be assessed on a case-by-case basis and appropriate PPE used. • Do not weigh samples that have contamination on the packaging or on the outside of the item. • Lay out samples on paper on a bench or in a fume hood. • Unknown powders should always be handled in a fume hood and with an appropriate level of PPE. • Use double gloves when handling potential low-dose high-potency drug samples. • Use a buddy or communication system when working on potential low-dose high-potency samples. • Use disposable laboratory coats, disposable sleeves or long-cuff gloves when opening potential low-dose high-potency drug samples. • Use disposable spatulas to weigh and handle samples. • Place used spatulas on a paper wipe or towel to facilitate clean-up. • Laboratory benches and fume hoods should be cleaned regularly with a soap and water solution or a suitable substance-specific decontamination solution.
Instrumental analysis (in general)	<ul style="list-style-type: none"> • Transport samples to instruments in closed containers and limit the quantity transported in any single movement. • Indicate to the instrument technologist that the suspected drug sample may be hazardous. • Clean the outside of vials and tubes prior to bringing into the laboratory or submitting for analysis.
Infrared (IR) specific recommendations (first point of analysis for most samples)	<ul style="list-style-type: none"> • Where available, use an infrared (IR) spectrometer in a fume hood for potential low-dose high-potency drug samples. • Search spectra on instrument before sample clean-up. • Where possible, bring 10 mg or less of material to the IR spectrometer in a small vial. • Test only one unknown powder sample at a time when running IR. • All users should wear gloves and a laboratory coat when using the instrument due to the possibility of contamination. • Users should use double gloves when running potential low-dose high-potency drug samples. • Remove outer gloves when typing and dispose of immediately. • Use keyboard covers to reduce likelihood of contamination. • Covers should be cleaned or replaced after handling low-dose high-potency drug samples or other hazardous chemicals.
Handling and storage of analytical standards	<ul style="list-style-type: none"> • Analytical standards should be managed using a written custody process, and signed in and out of storage, noting all volumes consumed. • Standards and dilution series should be prepared in a contained environment such as a fume hood. • Eye protection, disposable laboratory coats, double gloves and sleeve-covers or long-cuff gloves should be used when handling, measuring and running analytical standards. • Analytical standards should be moved directly from the fume hood back to their storage location after use. • No specific additional security requirements are required for synthetic opioid standards beyond what is required for other drug standards. Generally, these should be kept in a secured drug vault or security locker in the laboratory with appropriate access controls and monitoring in place.

C.

Emergency medical
and synthetic opioid
overdose response

C.1 Considerations for first responders



While synthetic opioids, and particularly high-purity synthetic opioids, can pose a range of operational risks for law enforcement and customs officers, in most cases these risks can be managed through the application of exposure control measures, including training and the correct selection and use of PPE. However, responding to synthetic opioid exposures presents a range of specific hazards which vary from those encountered in other medical emergencies.

It is recommended that agencies undertake a risk assessment of their particular operating environments to identify officers or operations which are most likely to encounter synthetic opioids and prioritize practical role-specific training for such personnel. While specific training needs depend on the level of operational risk and the operating environments, it is recommended that as a minimum, training should include the following key areas:

- Identifying synthetic opioid hazards, high-risk environments, exposure routes and preventing or managing exposure
- Identifying objective symptoms of opioid intoxication
- When to seek EMS assistance
- Rapid assessment of a scene for physical, biological or drug-related hazards
- Selection and correct use of PPE and management strategies to reduce secondary exposure risk for responding officers when providing first aid
- Decontamination procedures for officers and patients
- Managing opioid overdose including primary care and life support priorities
- Cardiopulmonary resuscitation (CPR), rescue breathing and the use of manual respirators.
- Administering naloxone (including the frequency of this training)
- Availability of naloxone, including maintenance and replacement upon expiration, or as waived by medical direction
- Availability, serviceability and composition of medical kits including naloxone, basic PPE items, manual respirators, bag valve mask (BVM) respirators and resuscitation masks

C.2 Indications of exposure or overdose

In cases of mild to moderate exposure, the following symptoms may be observed [7]:

- Lethargy (sleepy, slow to react to stimulus, blank stare)
- Pupils constricted (almost pinpoint sized)
- Lowered blood pressure and pulse rate
- Flaccid muscles (limbs may appear limp or floppy)
- Slow or shallow breathing or difficulty breathing

In cases of higher doses, whether from drug use or high-level (acute) exposure, these symptoms may progress over time (depending on the route of exposure) and result in:

- Coma (patient will be unresponsive to all stimuli, i.e., unconscious)

- **Respiratory depression and/or failure** (patient will have significantly reduced breathing and may cease breathing. The chest may cease to rise and fall; fingernails, toenails and/or lips may appear blue, pale, or purple with cold skin)

C.3 Priorities for primary care

The primary care priorities to consider when confronted with an exposure or overdose scenario include [26]:

- **Assessing the scene:** For any hazards which may pose a risk to the responding officer(s). In addition to any physical or biological hazards, this may include residual drugs, contamination on or near the patient or injection hazards/sharps.
- **Airways:** The most common factor contributing to death from opioid overdose is loss of the airway-protective reflexes with subsequent airway obstruction caused by a flaccid tongue and pulmonary aspiration of gastric contents, where an unconscious person vomits and inhales the gastric material into their respiratory tract. It may be necessary to remove the obstruction and reposition the patient, such as by rolling the person onto their side and tilting the head back, to maximize or open the airway.
- **Breathing:** Breathing difficulties are a major cause of death in patients experiencing an opioid overdose. They may experience respiratory arrest and stop breathing or breathe ineffectively and experience hypoxia (oxygen deprivation). Rescue breathing, usually combined with CPR, may be required to supply adequate oxygen to the lungs and bloodstream. The use of a bag valve mask (BVM) type resuscitator is recommended. Although rare, rigid chest syndrome may occur after fentanyl exposure, and possibly after fentanyl analogue exposure. Rigid chest syndrome can make resuscitation and chest compressions difficult.
- **Circulation:** Blood pressure and circulatory rates will be depressed due to the strong sedative effect of synthetic opioids and their effect on the heart. Combined with respiratory failure and hypoxia, this will result in an inadequate supply of oxygenated blood to organs, including the brain. CPR may be required to support or maintain circulation of blood in conjunction with rescue breathing until the arrival of emergency medical services (EMS).

C.4 Exposure and overdose response

For incidental dermal or other incidental exposures, please refer to the decontamination procedures in section 2.7. For the purposes of this section, an exposure refers to an individual who has been exposed to a known or suspected opioid and is exhibiting **objective symptoms** of opioid exposure, as described in annex C, section C.2.

The following contains general information and recommendations only and may not be suitable or applicable in all circumstances. This information is based on the five-step process developed for first responders and published in the “Opioid overdose prevention toolkit” by the United States Department of Health and Human Services – Substance Abuse and Mental Health Services Administration (SAMHSA).

➤ Step 1

Evaluate for signs of opioid intoxication or overdose

It is important to remember that exposure alone will not necessarily result in opioid intoxication or overdose. However, if a high-level exposure such as inhalation of a synthetic opioid or inadvertent injection is experienced, the following actions are recommended [26]:

- If safe to do so, remove the individual from the contaminated environment or hazard, using appropriate PPE to avoid potential secondary exposure.

- If the individual is grossly contaminated (e.g., visible particulate or liquid opioid), decontamination of the individual should be considered if practical. Note: although a responder may potentially receive some secondary exposure (e.g., dermal), as outlined in sections 1.2 and 1.3, this exposure risk is low provided PPE is used, and any effects are reversible; the priority should be the preservation of human life.
- Assess the person for any of the objective indications of opioid intoxication or overdose listed in annex C, section C.2 (lethargy, constricted pupils, lowered pulse, limp muscles or shallow breathing).
- Call the person's name.
- If there is no response, grind the knuckles vigorously into the sternum (the breastbone in the middle of the chest) or pinch lightly.
- If the person responds, assess whether he/she can maintain responsiveness and breathing.
- Continue to monitor, including breathing and alertness, and try to keep the person awake and alert.
- If there is no response to any of these stimuli, or if symptoms such as alertness or breathing deteriorate, immediately request emergency medical services (EMS) attendance, provide rescue breathing if the person is not breathing independently and administer one dose of naloxone or another opioid antagonist (e.g., NARCAN® nasal spray or EVZIO® autoinjector).

➤ Step 2

Call emergency medical services

If an individual is exhibiting objective symptoms of opioid intoxication or overdose, this is a medical emergency and the following actions are recommended:

- Where the person is impaired and showing objective symptoms of opioid intoxication but is not unresponsive, contact EMS and

advise that an opioid exposure or overdose is suspected.

- If the person is not breathing and unresponsive, contact EMS and advise that an opioid overdose is suspected.
- If the person is not breathing, this is a **critical** element of triage information and should be communicated immediately and clearly to the EMS operator.
- Follow all instructions given by the EMS operator. Begin CPR and rescue breathing using a manual respirator, bag valve mask (BVM) type respirator or resuscitation mask.

➤ Step 3

Administer subsequent naloxone

- If the person does not respond within two to three minutes after administering a dose of naloxone, administer a second dose.

NOTE

- The safety profile of naloxone is very high, especially when used in low doses and in accordance with instructions [27].
- When given to individuals who are not opioid intoxicated or opioid dependent, naloxone produces no clinical or adverse effects, even at high doses.
- All naloxone products are effective at reversing opioid overdose, including of fentanyl, although such overdoses involving high-potency synthetic opioids such as fentanyl, or large quantities of opioids, may require further doses of naloxone.
- Because of the higher potency of synthetic opioids such as fentanyl and fentanyl analogues compared to heroin, multiple doses of naloxone may be required to reverse opioid induced respiratory depression [28].

➤ Step 4

Support breathing

Respiratory support is an important intervention and can be lifesaving. Officers should be trained in the correct administration of CPR. Rescue breathing can be highly effective in supporting respiration, and chest compressions can provide further respiratory support. Rescue breathing for adults involves the following steps [26]:

- Ensure the airway is clear; check that nothing is inside the person's mouth or throat blocking the airway.
- Place one hand on the person's chin, tilt the head back, and pinch the nose closed.
- Using a manual respirator, breathing mask or BVM where possible, place the breathing mask over the mouth to make a seal and give two slow breaths.
- Squeeze the bag slowly over one second until the patient's chest (but not the stomach) starts to rise.
- Repeat with one breath or squeeze every five seconds.

If the patient does not have a pulse, chest compressions for adults involve the following steps:

- Place the person on his/her back on a firm flat surface.
- Press hard and fast on the centre of the chest.
- Keep your arms extended and elbows locked.
- Attempt to achieve 100–120 compressions per minute and a depth of 5 cm or 2 inches.
- Allow the chest to fully recoil between compressions.
- Two breaths should be given after every 30 compressions (30:2).
- If possible, switch compression roles every two minutes or when an officer becomes fatigued.

➤ Step 5

Monitor the patient's response

All individuals who have been exposed to or suffered the effects of opioid intoxication or overdose should be monitored for recurrence of symptoms for at least four hours from the last dose of naloxone, or as determined by an emergency medicine physician.

Most people respond to naloxone by returning to spontaneous breathing within two to three minutes of naloxone administration. Continue resuscitation while waiting for the naloxone to take effect.

Because naloxone has a relatively short duration of effect, overdose symptoms may return. Therefore, it is essential to transfer the individual to an emergency department or other source of medical care as quickly as possible, even if the person responds well after the initial dose of naloxone and seems to feel better.

NOTE

- If you must leave the person unattended for any reason, put him/her in the recovery position on his/her side.
- Stay with the person and keep him/her warm if possible.

C.5 Exposure and overdose treatment for canines



Canines, due to their detection, apprehension and search and rescue roles, are at an increased risk of exposure to synthetic opioids, as outlined in section 1.3. This is compounded by a lack of operationally functional protective equipment which can be used by canines and their handlers. However, canines tend to be less susceptible to opioid-induced respiratory depression compared to humans and therefore require a higher exposure to an opioid to induce the same clinical symptoms which might be observed in a human at a significantly lower dose [19]. The opioid antagonist, naloxone, used to reverse opioid overdose in humans, is also effective in canines with no adverse effect on detection ability [29].

Where inadvertent exposure of a canine occurs, the objective symptoms of opioid intoxication or overdose will be similar to those observed in humans and normally appear within 15 minutes of exposure. These may include:

- Dysphoria (vocalizing, agitation, appearing frantic) may be an early indicator of exposure
- Lethargy (may appear sedated)
- Constricted pupils and a blank stare
- Low blood pressure (< 90 mm Hg systolic BP and/or < 60 mm Hg mean BP)
- Unresponsive (may fail to respond to commands in conjunction with one or more of the above symptoms)
- Progressive respiratory depression and hypoventilation (slow to absent breathing)

Where these symptoms are observed, it will be necessary to administer naloxone. Recommended doses and monitoring procedures for the management of opioid overdose in canines are provided in an “Emergency protocol for canine exposure or overdose” developed specifically for law enforcement, customs and other emergency services canines, which can be accessed at <https://workingdoghq.com/>.

NOTE

- Naloxone has a very wide margin of safety in canines and is considered a relatively safe intervention for treating opioid overdose [29].
- If unsure about an exposure to a canine, the administration of naloxone will not cause any harm. At worst, administering naloxone will simply have no effect, however it can also save the canine’s life [29].
- The recommended dose of naloxone for canines is 4 mg, which is the normal dose for human administration.
- Canine handlers are recommended to carry a 4 mg nasal pump as the pump delivery system may be easier to administer to a canine.
- Exposed canines should be transported to a treating veterinarian as soon as possible for assessment and further management if required.

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