



## Forensic Drug Analysis Laboratory

# Fentanyl

Safety recommendations  
guide for first responders



This document is intended to help first responders (law enforcement, prison officers, customs, fire, rescue and emergency medical services) that may be likely to encounter fentanyl in your line of duty. This may be in cases where you respond to overdose calls, conducting traffic stops, arrests, and searches and opening of suspicious packets received through the post.

**This document provides scientific, evidence-based recommendations to protect yourself from exposure.**

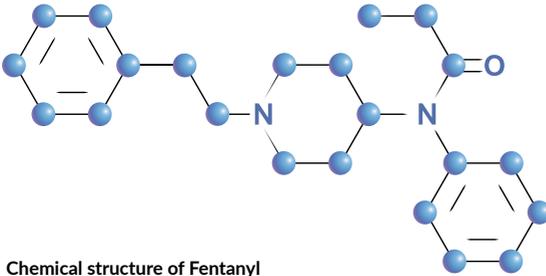
## TABLE OF CONTENTS

What is fentanyl?	3
How powerful is fentanyl?	3
What does fentanyl look like and where is fentanyl found?	4
What are the signs and symptoms of fentanyl overdose?	4
How can first responders be exposed to fentanyl?	5
What are the routes of exposure to fentanyl?	5
Safety recommendations for first responders	6
Treatment if an exposure occurs	7
What is naloxone?	7



## WHAT IS FENTANYL?

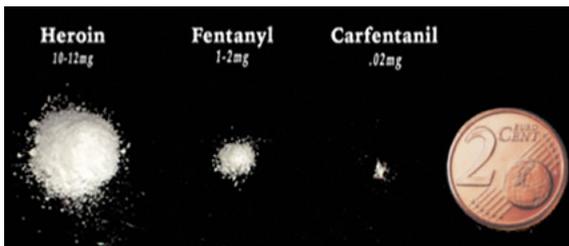
Fentanyl is a very potent synthetic opioid drug. It was initially prescribed to patients for the treatment of chronic, severe pain, nerve damage, major trauma and to manage pain following surgery. Additionally, it was used as an adjunct to general anesthetics. An abuse of this narcotic analgesic leads to addiction. Like all opioids, including heroin, fentanyl is a respiratory depressant, i.e. it interferes with the user's ability to breathe. It is quite common for users of this drug and other opioids to use fentanyl with other substances such as alcohol and benzodiazepines (e.g. diazepam found in Valium and alprazolam found in Xanax) which are also respiratory depressants, hence increasing the risk of death.



Chemical structure of Fentanyl

## HOW POWERFUL IS FENTANYL?

Fentanyl is around 100 times more powerful than morphine and approximately 50 times more potent than heroin. Hence, 2-3 milligrams (mg) of fentanyl would be enough to induce respiratory depression and possibly death through arrest. This is equivalent to 2 grains of salt.



Carfentanyl, an illicit synthetic analogue of fentanyl, is up to 100 times more powerful than fentanyl and 5,000 times more potent than heroin. It would take only 0.02mg of fentanyl (or 1 grain of salt) to induce respiratory depression. For these reasons, potential exposure to drugs containing fentanyl and its analogues, may pose a substantial threat not only to users but also to first responders.

## WHAT DOES FENTANYL LOOK LIKE AND WHERE IS IT FOUND?

Fentanyl can be present in a variety of forms - powder, tablets, capsules, solutions and rocks. The most dangerous form is the powder form and is usually a white powder.

Due to its cheap manufacturing cost, it is being mixed with many kinds of illicit drugs, including heroin and cocaine. Due to this, some users may not be aware that some substances contain fentanyl, which is why accidental overdoses have been seen to be increasing during the past several years.

## WHAT ARE THE SIGNS AND SYMPTOMS OF FENTANYL OVERDOSE?

The signs and symptoms of a fentanyl overdose are not distinct from overdoses of other opioids. These include:

- ⊗ Trouble walking or talking
- ⊗ Slow heart rate
- ⊗ Drowsiness, dizziness, severe sleepiness, gurgling or snoring sounds
- ⊗ Not responding to noise or knuckles being rubbed hard on their breastbone (sternal rub)
- ⊗ Respiratory distress (slow, shallow breathing) and arrest-
- ⊗ Nausea/ vomiting
- ⊗ Disorientation
- ⊗ Seizures
- ⊗ Bluish lips and nails
- ⊗ Loss of consciousness
- ⊗ Cold and clammy skin
- ⊗ 'Pinpoint' pupils

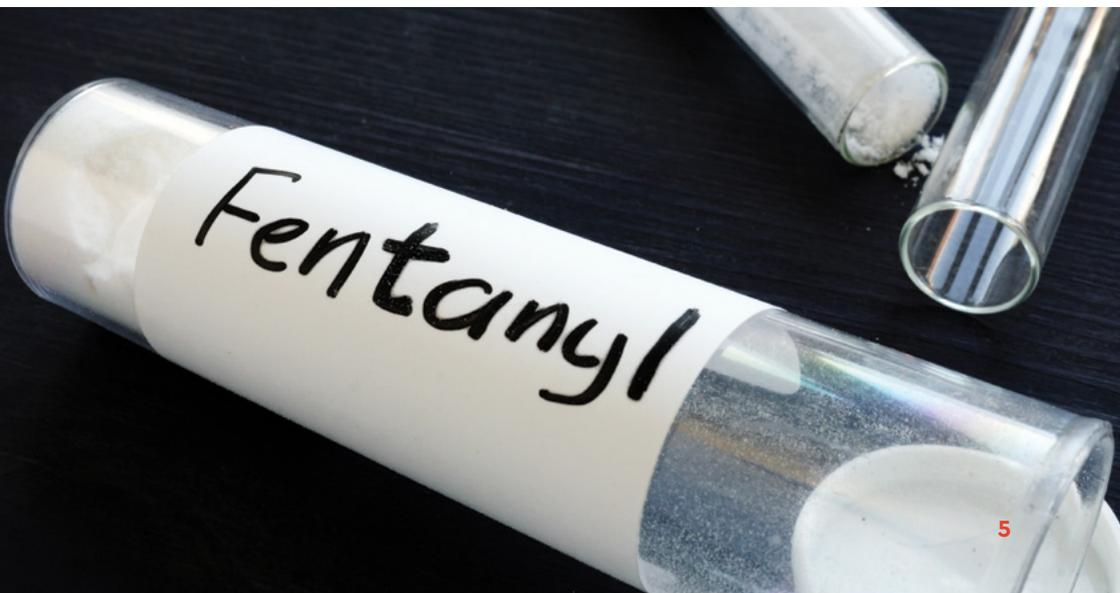
## HOW CAN FIRST RESPONDERS BE EXPOSED TO FENTANYL?

First responders may become accidentally exposed to fentanyl when working with an individual who has used or overdosed on the drug or its analogues (e.g. responding to overdose calls, conducting traffic stops, arrests, and opening of suspecting packets received through the post), or when conducting searches of individuals who have the drug with them.

Working dogs are also at risk of exposure to fentanyl and its analogues. Dogs should be removed from any area where fentanyl may be encountered. In the case of exposure, the canine's veterinarian should be contacted immediately. Naloxone (see below) may be administered under direction of a veterinarian to improve survival rate while the animal is being transported to receive veterinary care.

## WHAT ARE THE ROUTES OF EXPOSURE TO FENTANYL?

Due to the high potency of fentanyl or its analogues, adverse health effects can occur at lower doses than with other drugs. For this reason, extra precautions should be taken to avoid exposure. Fentanyl and its analogues can enter the body by inhalation, ingestion, or intravenous or intramuscular injection. Skin contact is also thought to be a potential exposure route but is not expected to lead to toxic effects provided that any visible contamination is immediately removed. Additionally, fentanyl may also be absorbed through the eyes. Overall, inhalation and incidental ingestion are the greatest threats to first responders.



## SAFETY RECOMMENDATIONS FOR FIRST RESPONDERS

In situations where there is a risk of exposure to fentanyl and its analogues, precautions should be applied. It is important for first responders to avoid hazardous exposure by:

- ⊙ Avoiding actions that may cause even small amounts of drug powder to become airborne when possible e.g. removing the clothing, searching, reviving, and transferring of a patient who has used the drug or has the drug in their possession.
- ⊙ Not eating, drinking, smoking or using the bathroom while working in an area with known or suspected fentanyl.
- ⊙ Not touching the eyes, mouth, nose or any skin after touching any potentially contaminated surface.
- ⊙ Washing hands thoroughly after leaving a scene where fentanyl is known or suspected to be present to prevent potential exposure and to avoid cross contamination.

Furthermore, it is recommended that first responders wear the appropriate level of personal protective equipment (PPE) while working in an area with known or suspected fentanyl. These may include:

- ⊙ Dermal protection: – Wearing (double) nitrile gloves when at the scene – Wearing coveralls in heavily contaminated areas.
- ⊙ Eye protection: – Wearing safety glasses if face splashing is expected.
- ⊙ Respiratory protection: – Wearing N95 or P100 dust masks only if there are significant amounts of powder in the air.

***By following good practices, such as the appropriate use of PPE, first responders are not likely to be exposed to fentanyl.***

## TREATMENT IF AN EXPOSURE OCCURS

- ⦿ After a potential skin exposure, the skin should be washed thoroughly with large amounts of soap and water as soon as possible. It is important NOT to use hand sanitizers, alcohol or bleach as they may enhance skin absorption. To prevent further contamination, it is important to wash hands thoroughly after the incident and before eating, drinking, smoking, or using the restroom.
- ⦿ If an exposure occurs, immediate response to any of the above-mentioned symptoms is very important. The exposed individual should be moved from the contaminated environment to an area with fresh air and medical assistance should be requested. If the individual exhibits overdose symptoms, the emergency department should be informed immediately in order to provide guidance. In such instances, trained personnel should immediately administer naloxone if available.

## WHAT IS NALOXONE?

Naloxone is a safe and effective medication used as an antidote to reverse the effects of fentanyl and other opioids. Naloxone is indicated only for individuals who have respiratory depression. Due to the high potency of fentanyl and its analogues, multiple doses of naloxone may be needed to successfully treat a fentanyl overdose to restore a normal breathing rate. Since naloxone blocks the effects of a respiratory depression only temporarily, for around 30-90 minutes, medical attention is still required following its administration.



## UNIVERSITY OF MALTA

The University of Malta traces its origins to the founding of the Collegium Melitense which was set up in 1592. Today, it hosts over 11,000 students following full-time and part-time degree and diploma courses. The University of Malta is the highest teaching institution in Malta. It is publicly funded and its structures are in line with the Bologna Process and the European Higher Education Area. It strives to provide courses that are relevant to contemporary needs of the industry and employers.

## FORENSIC DRUG ANALYSIS LABORATORY

The laboratory at University works together with the The Maltese National Focal Point (NFP) which is part of the National Coordinating Unit on Drugs and Alcohol within the Ministry for the Family, Children's Rights and Social Solidarity. The role of the NFP is provided by the Regulation (EC) No 1920/2006 of the European Parliament and of the Council of 12 December 2006 on the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA).

Should you have any queries or need to know more please do not hesitate to contact Prof. E. Sinagra:

✉ [emmanuel.sinagra@um.edu.mt](mailto:emmanuel.sinagra@um.edu.mt)

or Godwin Sammut:

✉ [godwin.sammut@um.edu.mt](mailto:godwin.sammut@um.edu.mt)



**L-Università ta' Malta**  
Faculty of Science

Department  
of Chemistry

**FACULTY OF SCIENCE**  
DEPARTMENT OF CHEMISTRY  
University of Malta  
Msida MSD 2080

📍 [um.edu.mt/science/chemistry](http://um.edu.mt/science/chemistry)  
☎ (+356) 2340 2275  
✉ [chemistry.sci@um.edu.mt](mailto:chemistry.sci@um.edu.mt)