

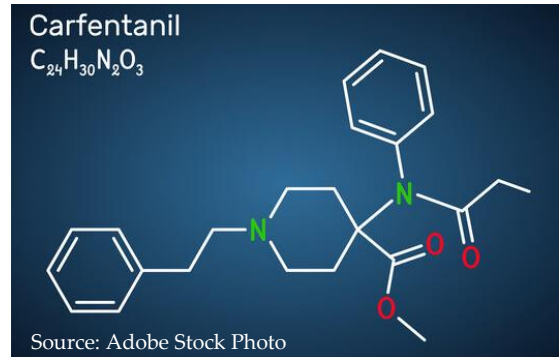


Objective: The goal of this, and subsequent bulletins, is to provide information regarding identified changes in drug trends, and/or to educate and forewarn about newly identified substances.

Subject Matter: This release provides information regarding the synthetic opioid carfentanil, a well-known substance, experiencing a recent resurgence in the illicit synthetic drug market in the United States. As its presence appears to be on the rise, this information is presented to provide guidance on understanding carfentanil, and its potential threat to public health and safety.

Carfentanil's Origin and Potency

Carfentanil, an analogue of fentanyl, was first synthesized by Janssen Pharmaceuticals in 1974, exclusively for veterinary use in large animals such as elephants.^[1] Carfentanil is extraordinarily potent, it is 10,000 times more powerful than morphine and 100 times more potent than fentanyl.^[2] Carfentanil is a Schedule II substance under the Controlled Substance Act.



Identifying Carfentanil

Today, carfentanil manifests as a white powder that closely resembles other substances.^[3] The powder's visual similarity to cocaine or heroin poses a significant challenge in its identification solely based on appearance.^[3] As with fentanyl, drug distributors will adulterate other substances with carfentanil, to enhance its potency and profitability.^[3]

FORM ^[2]	DESCRIPTION	RISK LEVEL
Powder	White, Crystalline Substance	Extremely High
Pills	Pressed Tablets, Often Mixed	Very High
Patches	Skin-Absorbent Delivery	High
Sprays	Aerosolized Form	High

Understanding Lethal Doses

The exact lethal dose of carfentanil in humans remains unknown.^[4] Research indicates that as little as 20 micrograms, about the size of a single grain of salt, could be fatal. Consequently, 2 milligrams of carfentanil could potentially cause 50 fatalities.^[5] These microscopic amounts, though potentially fatal, makes it especially dangerous when mixed with other substances as standard drug testing kits may have difficulty detecting its presence.

Source: San Diego Tribune



Fatal dose of fentanyl
(2 mg or 2000 mcg)



Fatal dose of carfentanil
(0.02 mg or 20 mcg)



Carfentanil Side Effects and Time Frame of Manifestation

What makes carfentanil especially dangerous is its rapid onset. Research shows that symptoms can develop within minutes of exposure.^[6] Postmortem concentrations as low as 0.10 ng/mL were found to be lethal.^[7]

TIME FRAME	SYMPTOMS	INCREASED OVERDOSE RISK CRITICAL FACTORS
Immediate	Dizziness, Shallow Breathing	Change in Tolerance After Periods of Abstinence
Within Minutes	Pinpoint Pupils, Cold/Clammy Skin	Mixing Carfentanil with Other Substances, Especially:
Rapid Progression	Respiratory Depression, Unconsciousness	Alcohol / Benzodiazepines / Cocaine / Methamphetamine
Critical Stage	Cardiovascular Failure, Unconsciousness	Pre-existing Health Conditions (i.e. Respiratory Issues)

The human body cannot safely tolerate any amount of carfentanil.^[4] The toxicity of carfentanil in humans has raised concerns over its potential use as a chemical weapon of mass destruction by rogue nations and terrorist groups. Even minute amounts can be lethal to humans through skin contact or inhalation. The toxicity of carfentanil has been compared to that of nerve gas, with experts warning that its weaponization could have devastating consequences in terms of mass casualties.^[8]

Current Death Toll Statistics

The data shows that 86.9% of carfentanil-related deaths also involved illicitly manufactured fentanyl (IMF).^[9] Carfentanil's emergence in the drug supply chain has the potential to follow the same pattern as fentanyl, an alarming trend, due to its substantially higher potency level as compared to fentanyl.^[2]

Although still rare, recent carfentanil-related fatalities paint a disconcerting picture. Here are some key statistics:

- The average number of monthly deaths jumped from 3.3 (January 2021-June 2023) to 34.4 (July 2023-June 2024)^[9]
- A dramatic 720.7% (29 to 238) increase occurred from early 2023 to early 2024^[9]
- 37 states reported carfentanil-related deaths, to include Kansas, Missouri^[9], and South Dakota.^[10]



Source: CBC News

As with the carfentanil-related fatalities, seizures have not been widely documented. However, this could be attributed to classification upon seizure, with “fentanyl” commonly being used as an umbrella term for synthetic opiate categorization, leading to the actual number of carfentanil seizures potentially being underreported. Despite this, seizures and lab submissions have been reported in Iowa, Kansas, Missouri, Nebraska, and South Dakota in 2024.

"HOT SHEET"



1ST QUARTER - 2025

FAQs

Q1. How potent is carfentanil compared to other opioids? Carfentanil is extremely potent, being 10,000 times stronger than morphine and 100 times more powerful than fentanyl.^[2] As little as 20 micrograms of carfentanil, approximately the size of a single grain of salt, could potentially be fatal to humans.^[5]

Q2. What are the signs of a carfentanil overdose? Signs of a carfentanil overdose include immediate dizziness and shallow breathing, followed by pinpoint pupils and cold, clammy skin. Rapid progression leads to severe respiratory depression and unconsciousness. Other symptoms include gurgling or snoring sounds, blue or gray lips/nails, and profound drowsiness or confusion.^[6]

Q3. How effective is naloxone in treating carfentanil overdoses? Naloxone can be effective in treating carfentanil overdoses, but multiple doses are often necessary due to carfentanil's extreme potency. The recommended protocol includes initial doses of 0.4 to 2.0 mg intravenously^[11], repeated every 2-3 minutes until breathing stabilizes^[6], with a maximum cumulative dose of 10 mg.^[12]

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