

Synthetic Opioids

A 27 year old man with a history of heroin abuse was found unresponsive and apneic in bed. Next to him were three small bags containing a white powder and labeled "100 mg PFBF". There was no response to 2 mg naloxone (intranasal) given by EMS, but he woke up and became agitated after a second 2 mg dose of naloxone given in the emergency department. He admitted to purchasing PFBF online and snorting it for its heroin-like effects. (Maryland Poison Center case).

PFBF (parafluorobutyrfentanyl) is a fentanyl analog that is sold as a powder or nasal spray, usually over the internet. It is one of several fentanyl analogs along with other synthetic opioids that are being marketed for their heroin-like effects. They are mostly made in China and sold online disguised as "research chemicals". Some fentanyl analogs (e.g. acetyl fentanyl, butyryl fentanyl, furanyl fentanyl, 4-methyl fentanyl) are added to heroin, often without the user's knowledge. Synthetic opioids may be used orally, parenterally, rectally, by nasal insufflation or by heating the drug and inhaling the vapor. Most of the synthetic opioids are sought after because they are more potent than heroin, but in many cases, little is known about their actual potency, kinetics or effects.

AH-7921 has mu opioid receptor activity, reportedly with analgesic potency similar to morphine. It was first synthesized in 1962 in Great Britain but was never marketed and has no commercial or medical use. The DEA designated it a Schedule I drug effective May 16, 2016 after being implicated and confirmed analytically in overdoses and deaths in Europe and the U.S. ^(1,2,3,4)

U-47700 is a synthetic opioid that in animal studies is 7.5 times more potent than morphine, but has never been studied in humans. It was discovered in the 1970's by the Upjohn Company and is derived from AH-7921. It is currently not named as an illegal drug in the U.S. except in Ohio; however, there is speculation that as an analog of the recently controlled AH-7921, it might fall under the Analog Enforcement Act as a controlled drug. There have been a number of overdoses and deaths in the U.S., including at least two unconfirmed overdose cases reported to the Maryland Poison Center in recent months. ^(5,6)

MT-45 was first produced in the 1970's for research purposes, being used in the development of other opioids. It has 80% the potency of morphine in animal studies. Recreational use of MT-45 has been associated with hearing loss and unconsciousness. ⁽⁷⁾ Overdoses and deaths have been reported in Europe and the U.S. ^(8,9,10)

It is suspected that synthetic opioids and fentanyl analogs have dependence liabilities and untoward adverse effects similar to other opioids. The clinical effects in overdoses are likely to be indistinguishable from the effects induced by heroin (e.g. lethargy, coma, respiratory depression, miosis). Naloxone is expected to reverse the effects; it is unknown if large doses (≥ 2 mg) might be required. Typical hospital urine drug screens will not test for the synthetic opioids and they are not expected to produce a positive opiate assay.

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Did you know?

W-18 is a synthetic drug recently found in counterfeit tablets sold as fentanyl in Canada and confiscated as a powder in the U.S.

W-18 is the most potent of a series of 32 analgesic compounds (W-1 to W-32) developed at the University of Alberta in the 1980's. In animal studies, it has 10,000 times the analgesic potency as morphine. Despite reports and news headlines that it is a potent opioid, little is known about the pharmacology of this drug. Preliminary information from the Department of Pharmacology at the University of North Carolina suggests that it does not possess any activity at opioid receptors. The physiological and toxicological properties of this compound in humans are not known. In the words of a forensic toxicologist, the "extreme lack of knowledge about the compound makes the drug potentially dangerous" (www.dosemakespoison.blogspot.com). W-18 is currently not a federally controlled substance in the U.S.



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