

U-47700 – Background

What is U-47700?

The drug U-47700 (3,4-Dichloro-N-[2-(dimethylamino)cyclohexyl]-N-methylbenzamide) is a synthetic analgesic opioid. It was first synthesized in 1978 by an employee of pharmaceutical manufacturer The Upjohn Company. References to U-47700 began appearing in academic literature in 1982, when research conducted by Upjohn was first published. U-47700 normally appears as a white powder or a liquid and can be used orally, intravenously, nasally, or inhaled. “U4”, “pink”, and “fake morphine” are common street names for this drug.

U-47700 acts as an agonist on the mu-opioid receptors in the central nervous system. This causes effects similar to other opioids such as euphoria, analgesia, and extreme sedation. It depresses the cough reflex, and constricts pupils, and can suppress the respiratory system to potentially fatal levels. Users may also experience itchiness, drowsiness, nausea, cyanosis, or constipation.

What is it used for?

Originally, U-47700 was developed to be a non-addicting analgesic as potent as morphine; however the drug was never brought to market and has not been studied in humans. There is little pharmacokinetic data available and it is not approved for any medical use in humans or veterinary practice.

Why is it dangerous?

Production of counterfeit oxycodone pills has been increasing, some of which have contained U-47700. Many of those who consume these pills may be unaware they are taking drugs other than oxycodone. Studies have shown U-47700 to be 7.5 times more potent than morphine and as a result, a usual dosage may be more likely to result in an overdose. Prolonged use can lead to dependence and high doses of U-47700 can result in coma and death.

Before it was listed in the Controlled Drugs and Substances Act in Canada, U-47700 was easily accessible for purchase online from various distributors of research chemicals. In 2017, U-47700 was detected in 223 drug seizure samples provided to Health Canada’s Drug Analysis Service (DAS).

Fatalities and treatment

Current data on deaths in Alberta linked to U-47700 overdoses is not available; however, there were five Canadian deaths reported in the media due to U-47700 between 2016 and 2017. In case studies and user reports, naloxone has been shown to reverse U-47700 overdoses; however, there is currently no approved reversal agent. Because U-47700 use in humans has not been studied, the dose of naloxone required to reverse an overdose may be different than the dose required for other opioid overdoses such as morphine or fentanyl.

U-47700 and the law

On December 8, 2017, U-47700 and its analogues became classified as a controlled schedule I drug in Canada. Unauthorized possession of a schedule I drug may result in a maximum of six months jail time and a \$1000

fine, if treated as a summary conviction offence. If treated as an indictable offence, the maximum penalty is seven years jail time. Those charged with trafficking also face lifetime imprisonment, with a mandatory one-year jail sentence for trafficking a Schedule I drug under 1 kilogram.

References

- Armenian, P., Olson, A., Anaya, A., Kurtz, A., Ruegner, R., & Gerona, R. R. (2017). Fentanyl and a novel synthetic opioid U-47700 masquerading as street "Norco" in Central California: a case report. *Annals of Emergency Medicine*, 69(1), 87-90.
- Canadian Community Epidemiology Network on Drug Use. (2016). *CCENDU Drug Bulletin: Novel synthetic opioids in counterfeit pharmaceuticals and other illicit street drugs*. Ottawa, Ont.: Canadian Centre on Substance Abuse.
- Cayman Chemical. U-47700. Retrieved from: <https://www.caymanchem.com/product/18596>
- Cheney, B. V., Szmuszkovicz, J., Lahti, R. A., & Zichi, D. A. (1985). Factors affecting binding of trans-N-[2-(methylamino) cyclohexyl] benzamides at the primary morphine receptor. *Journal of Medicinal Chemistry*, 28(12), 1853–1864.
- Domanski, K., Kleinschmidt, K. C., Schulte, J. M., Fleming, S., Frazee, C., Menendez, A., & Tavakoli, K. (2016). Two cases of intoxication with new synthetic opioid, U-47700. *Clinical Toxicology*, 1-5.
- Drug Enforcement Administration, Drug and Chemical Evaluation Section Office of Diversion Control. (2016). *U-47700 Background Information and Evaluation of 'Three Factor Analysis' (Factors 4, 5 and 6) for Temporary Scheduling*, 1-13.
- Fleming, S. W., Cooley, J. C., Johnson, L., Frazee, C. C., Domanski, K., Kleinschmidt, K., & Garg, U. (2016). Analysis of U-47700, a Novel Synthetic Opioid, in Human Urine by LC–MS–MS and LC–QToF. *Journal of Analytical Toxicology*. Retrieved from: <https://academic.oup.com/jat/article/doi/10.1093/jat/bkw131/2758296/Analysis-of-U-47700-a-Novel-Synthetic-Opioid-in>
- Government of Canada. (2017, December 27). *Order Amending Schedules I and VI to the Controlled Drugs and Substances Act (U-47700)*. Retrieved from: <http://gazette.gc.ca/rp-pr/p2/2017/2017-12-27/html/sor-dors277-eng.html>
- Helander, A., & Bäckberg, M. (2017). New Psychoactive Substances (NPS)—the Hydra monster of recreational drugs. *Clinical Toxicology*, 55(1), 1-3.
- World Health Organization. (2016, November 14). *U-47700: Critical Review Report*. Retrieved from: http://www.who.int/medicines/access/controlled-substances/4.1_U-47700_CritReview.pdf

© 2018 Alberta Health Services. This material is protected by Canadian and other international copyright laws. All rights reserved. This material may not be copied, published, distributed or reproduced in any way in whole or in part without the express written permission of Alberta Health Services (please contact David O'Brien, Community, Seniors, Addiction & Mental Health at patti.vandervelden@ahs.ca). This material is intended for general information only and is provided on an "as is", "where is" basis. Although reasonable efforts were made to confirm the accuracy of the information, Alberta Health Services does not make any representation or warranty, express, implied or statutory, as to the accuracy, reliability, completeness, applicability or fitness for a particular purpose of such information. This material is not a substitute for the advice of a qualified health professional. Alberta Health Services expressly disclaims all liability for the use of these materials, and for any claims, actions, demands or suits arising from such use.

For more information about this document, contact Knowledge Exchange, Provincial Addiction and Mental Health, Alberta Health Services at researchpartnership@ahs.ca. Updated: February 2018.