

Drug Status Report

Drug: Thienylfentanyl

Drug Name Status: Thienylfentanyl is the common name.

Chemical Name: N-Phenyl-N-[1-(2-thienylmethyl)-4-piperidinyl]propanamide

Other Name: Thienyl Fentanyl

Chemical structure:



Thiofentanyl

Molecular Formula: C₁₉H₂₄N₂OS

CAS Number (Thienyl Fentanyl Hydrochloride): 117332-93-1

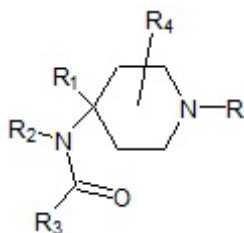
Pharmacological class / Application: Fentanyl

International status:

US: Thienylfentanyl is not currently listed on the US Controlled Substances Act and is not mentioned on the DEA website. However, the substance may be considered controlled as a fentanyl under the analogue provision of the CSA.

United Nations: The substance is not listed on the Yellow List - List of Narcotic Drugs under International Control nor the Green List - List of Psychotropic Substances under International Control.

Canadian Status: Thienylfentanyl is not currently listed in the Schedules to the CDSA. A review of the current family of fentanyls revealed that substances included under item 16 of Schedule I to the CDSA all contain the following root structure:



R=ethyl group substituted variously at the 1 and 2 position
R₁=hydrogen, methoxymethyl or carboxylate alkyl ester
R₂=phenyl or substituted phenyl
R₃=alkyl
R₄=hydrogen or alkyl

Note, however, that the pharmacological activities of the substances were not considered in the earlier reviews.

According to above root structure, thienylfentanyl would *not* be considered to contain all the essential structural elements, as it does not contain a substituted ethyl group at the R position. However, it is well-established in the scientific literature that thienylfentanyl is an analogue of thiofentanyl that was synthesized as a “designer drug”¹⁻⁴.

The term “analogue” in relation to a controlled substance means a substance that has a substantially similar chemical structure and as shown above, the structures of thienylfentanyl and thiofentanyl are substantially similar. Given that thienylfentanyl is an analogue of thiofentanyl and that the substance displays the pharmacological properties^{5,6} of the fentanyls, the substance should be included under the heading “Fentanyls, their salts, derivatives, and analogues and salts of derivatives and analogues, including” of item 16 of Schedule I to the CDSA, despite not having all the elements of the core root structure that has been used previously to review similar substances.

Recommendation: Thienylfentanyl is included under item 16 of Schedule I to the CDSA and is a controlled substance.

July 14th 2010

¹Mao C-L. *et al.* (2006) Development of an enzyme-linked immunosorbent assay for fentanyl and applications of fentanyl antibody-coated nanoparticles for sample preparation, *J. Pharm. Biomed. Anal.* **41**:1332-1341.

²Jerrad, DA. (1990) “Designer Drugs” - A current perspective, *The J Emergency Med.* **8**:733-741.

³Henderson, GL. *et al.* (1990) Rapid Screening of Fentanyl (China White) powder samples by solid-phase radioimmunoassay, *J. Anal. Toxicol.*, **14**:172-175.

⁴Skulska, A. *et al.* (2004) Fentanyl and its Analogues in the Forensic Laboratory. Medical and Analytical problems, available at http://www.forensicscience.pl/pfs/59_skulska.pdf.

⁵Leikin, JB. *et al.* (2007) Poisoning and toxicology handbook, 4th edition, Informa Health Care, pp. 1023.

⁶Bryson, PD.(1996) Comprehensive review in toxicology for emergency clinicians, 3rd edition, CRC Press, pp.445-446, Available from http://books.google.ca/books?id=f7009NkJv70C&pg=PA446&lpg=PA446&dq=%22thienyl+fentanyl%22&source=bl&ots=IFiWpnFBA_&sig=io6G26rrCa-Fsn_k9sue4NVZThk&hl=en&ei=3No9TOefCsyNnQeJvaHeDg&sa=X&oi=book_result&ct=result&resnum=1&ved=0CAYQ6AEwAA#v=onepage&q=%22thienyl%20fentanyl%22&f=false