

ACETYL FENTANYL

(Chemical name: *N*-(1-phenethylpiperidin-4-yl)-*N*-phenylacetamide)

Introduction:

Acetyl fentanyl, similar to the schedule II opioid fentanyl, is a potent opioid analgesic. The abuse of acetyl fentanyl has been linked to overdose deaths in the United States.

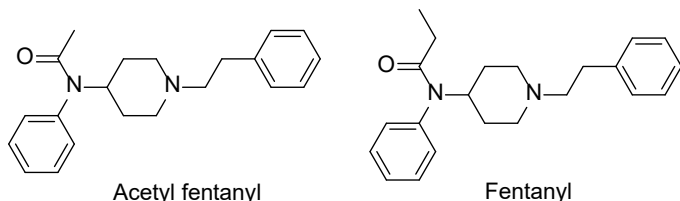
Immunoassays (e.g., ELISA) for fentanyl do not differentiate fentanyl and acetyl fentanyl; confirmatory analysis (e.g., gas chromatography/mass spectrometry [GC/MS]) is required to confirm the presence of acetyl fentanyl.

Licit Uses:

Acetyl fentanyl has not been approved for medical use in the United States. There are no published studies on safety for human use of this substance.

Chemistry:

The chemical structure of acetyl fentanyl and the schedule II substance fentanyl are shown below:



Acetyl fentanyl and fentanyl are in the phenylpiperidine class of synthetic opioids. Acetyl fentanyl contains a phenylacetamide group, whereas fentanyl has a phenylpropanamide group at the corresponding position. Acetyl fentanyl is occasionally referred to as desmethyl fentanyl.

Pharmacology:

Acetyl fentanyl, similar to fentanyl, possesses opioid-like in vitro binding affinity to mu-opioid receptors (MOR) and produces MOR agonist effects. Acetyl fentanyl has also been shown to inhibit the twitch response in electrically stimulated vas deferens preparation.

In mice, in a study using tail flick and phenylquinone writhing tests, acetyl fentanyl produced an analgesic response. In morphine-dependent monkeys, acetyl fentanyl was shown to completely suppress the signs of withdrawal. Furthermore, acetyl fentanyl produced morphine-like subjective effects in drug discrimination studies. Moreover, in acute toxicity studies in mice, the LD₅₀ (i.e., the dose causing death of 50% of test animals) of acetyl fentanyl and fentanyl are 9.3 mg/kg and 62 mg/kg, respectively. Significant bleeding in the small intestines of mice was observed in acetyl fentanyl-administered mice.

Fentanyl-like substances, similar to other opioid analgesics, produce a variety of pharmacological effects, including alteration in mood, euphoria, drowsiness, respiratory depression, suppression of cough reflex, constriction of pupils (miosis), and impaired gastrointestinal motility.

Clinical studies evaluating the pharmacological effects of acetyl fentanyl in humans have not been reported in scientific literature.

Illicit Uses:

As an MOR agonist, acetyl fentanyl may serve as a direct substitute for heroin or other MOR agonist substances in opioid-dependent individuals. Acetyl fentanyl has been detected in tablets that mimic pharmaceutical opioid products, in powder form, and spiked on blotter papers.

Illicit Distribution:

According to DEA's National Forensic Laboratory Information System (NFLIS) Drug database—which collects scientifically verified data on drug items and cases submitted to and analyzed by participating federal, state, and local forensic laboratories—the first reported identification of acetyl fentanyl was in 2013. In recent years, the number of acetyl fentanyl reports to NFLIS-Drug are approximately 4,800 in 2020; 4,000 in 2021; 2,800 in 2022; and 3,600 in 2023.

DEA is aware of numerous fatalities involving acetyl fentanyl in the United States. These fatalities have been confirmed in several states.

Control Status

Acetyl fentanyl is a schedule I substance under the federal Controlled Substances Act.