World Health Organization

Critical Review Report:

ETHYLBROMAZOLAM

Expert Committee on Drug Dependence

This report contains the views of an international group of experts, and does not necessarily represent the decisions or the stated policy of the World Health Organization

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Executive Summary

Ethylbromazolam is a novel designer benzodiazepine of the triazolobenzodiazepine subclass. Ethylbromazolam is structurally similar to bromazolam, the most prevalent novel benzodiazepine between 2023 and 2025, and it differs chemically by the substitution of a methyl group for an ethyl group on the triazole ring. Ethylbromazolam first emerged on the recreational drug market in late 2024 and early 2025, identified by harm reduction organizations and forensic science laboratories in Canada, the United Kingdom, New Zealand, Australia, Germany, and the United States.

Pharmacologically, ethylbromazolam acts as a high-affinity positive allosteric modulator of the GABA-A receptor. Preclinical *in vitro* binding assays indicate a nanomolar affinity comparable to bromazolam. At higher doses, ethylbromazolam is reported to induce marked ataxia and motor impairment. While dedicated human pharmacokinetic and pharmacodynamic studies are currently lacking, forensic toxicology reports indicate that ethylbromazolam is being consumed unknowingly by people seeking alprazolam, as it is frequently pressed into falsified pharmaceutical tablets.

The primary public health concern regarding ethylbromazolam is its potential to cause severe central nervous system (CNS) depression effects. Concern for respiratory depression is also noted, which markedly increases when co-ingested with other CNS depressants such as opioids or alcohol. Ethylbromazolam is marked by its recent emergence, incorporation into the unregulated drug supply, and lack of verified human dosing guidelines. As a potent benzodiazepine, ethylbromazolam carries a high abuse liability and dependence potential. Ethylbromazolam currently has no recognized therapeutic applications and is not under international control.

1. Substance identification

A. International Nonproprietary Name (INN)

Not assigned.

B. Chemical Abstract Service (CAS) Registry Number

105470-75-5

C. Other Chemical Names

8-bromo-1-ethyl-6-phenyl-4H-benzo[f][1,2,4]triazolo[4,3-a][1,4]diazepine
Ethyl bromazolam
1-ethyl-bromazolam
N-ethylbromazolam

D. Trade Names

Sold as analytical standard under the name “Ethylbromazolam”.
Sold on unregulated markets as a "research chemical" or designer drug.

E. Street Names

Ethylbromazolam (frequently mis-sold as Xanax / alprazolam).

F. Physical Appearance

Ethylbromazolam has been detected as an off-white powder and pressed pill.

G. WHO Review History

Ethylbromazolam has not been previously reviewed by the WHO Expert Committee on Drug Dependence (ECDD) and is not currently under international control.

2. Chemistry

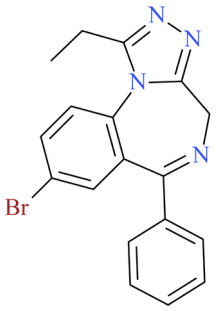
A. Chemical Name

IUPAC Name: 8-bromo-1-ethyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine

CA Index Name: Not assigned

B. Chemical Structure

Free base:



Molecular Formula: $C_{18}H_{15}BrN_4$
Molecular Weight: 367.25 g/mol

C. Stereoisomers

There are no stereoisomers described.

D. *Methods and Ease of Illicit Manufacturing*

Ethylbromazolam can be synthesized in manners similar to other triazolobenzodiazepines. Ethylbromazolam is likely synthesized via the alkylation and cyclization of the triazole ring using an ethyl group precursor rather than a methyl group. Forensic testing has detected ethylbromazolam alongside desalkylgidazepam, suggesting desalkylgidazepam may be used as a synthetic precursor in illicit manufacturing.

E. Chemical Properties

Melting point - No published data available.

Boiling point - No published data available.

Solubility - Soluble in common organic laboratory solvents (e.g., methanol, acetonitrile, DMSO, ethanol) used for analytical reference preparation *(1)*.

F. Identification and Analysis

Ethylbromazolam is available as a reference material from commercial suppliers to assist with the implementation of routine methods of analysis associated with forensic and clinical investigations *(1)*.

Analytical methodologies for the identification of ethylbromazolam in seized sample matrices include gas chromatography-mass spectrometry (GC-MS) and liquid chromatography coupled to high resolution mass spectrometry (LC-HRMS) *(2) (3)*. Ethylbromazolam has a parent mass [M+] of m/z 366 and a protonated mass [M+H]+ of 367.0553 Da.

3. Ease of Convertibility Into Controlled Substances

There is no evidence to suggest that ethylbromazolam is easily converted into currently controlled substances.

4. General Pharmacology

A. Routes of administration and dosage

Ethylbromazolam is typically administered orally via pressed pills or powder but can also appear in liquid solutions (commonly 5 mg/mL) *(4)*. There is no verified human clinical dosing data; illicit market potency is assumed to be parallel to bromazolam *(4)*. Unverified reports from drug use fora report ethylbromazolam is potent at very low doses, less than 1 mg *(4)*. Ethylbromazolam may be ingested intravenously or by other routes if mixed with opioids (e.g., ethylbromazolam appearing as an adulterant alongside cychlorphine) *(5)*.

Information posted on drug use forums describe dosage of ethylbromazolam; however, it is important to understand this information is unconfirmed *(4)*. One user reported taking 12 mg in an attempt to achieve a "euphoric high." They noted that while they definitely felt the effects, it lacked the "warm buzz" associated with traditional prescription benzodiazepines like alprazolam or bromazolam. Another user described taking one dropper from a 5 mg/mL solution (5 mg), followed shortly by a second dropper (another 5 mg). This quickly led to intoxication and a complete blackout. Users seeking anxiety relief or sleep (without blacking out) discuss much lower ranges. For example, one user who ordered a 5 mg/mL solution asked the community if they should start with half a milliliter (2.5 mg) or a full milliliter (5 mg), noting that they wanted to avoid the "blackout" they had experienced with other novel benzodiazepines in the past.

B. Pharmacokinetics

Information on the absorption and distribution of ethylbromazolam is not available. The metabolism of ethylbromazolam has not been reported in the peer reviewed literature; however, researchers propose that the metabolites of ethylbromazolam would be similar to that of bromazolam. Suspected metabolites include alpha-hydroxy ethylbromazolam, beta-hydroxy ethylbromazolam, and 4-hydroxy ethylbromazolam.

C. Pharmacodynamics

Ethylbromazolam binds to the benzodiazepine site of the GABA-A receptor, acting as a positive allosteric modulator. Receptor binding assays indicate high, nanomolar affinity (Ki ≈ 1–5 nM at α1β2γ2 GABA-A receptors) *(3)*. Ethylbromazolam exhibits in vitro potency (EC_{50}: 10.1 nM) comparable to bromazolam (EC_{50}: 15.2 nM), determined through use of an automated patch clamp assay *(3)*. Unverified information published online, suggested preclinical rodent studies demonstrate potent sedative, muscle relaxant, and anxiolytic-like effects at low doses (0.1–0.5 mg/kg), and marked ataxia and hypnosis at higher doses (≥1 mg/kg) *(6)*.

5. Toxicology

Information on acute or chronic preclinical toxicology studies involving ethylbromazolam could not be identified; however, ethylbromazolam has been detected in numerous forensic toxicology cases globally *(2, 7, 8)*. No LD_{50} data has been formally published for ethylbromazolam, and its toxicity is expected to mirror other potent novel benzodiazepines (e.g., central nervous system depression).

6. Adverse Reactions in Humans

Acute adverse reactions to consumption of ethylbromazolam may include heavy sedation, slurred speech, ataxia, motor impairment, and anterograde amnesia. The most severe adverse reaction may be life-threatening respiratory depression, which is highly exacerbated when ethylbromazolam is co-administered with opioids, alcohol, or other CNS depressants. Deaths have been reported involving ethylbromazolam; however, to the authors knowledge, no deaths involving ethylbromazolam alone have been reported *(3, 7, 8)*.

Unverified information posted on drug use forums describe adverse reactions associated with ethylbromazolam *(4)*. One user who took multiple droppers of ethylbromazolam reported waking up heavily confused, losing an entire day of memory ("thinking it was still yesterday"), and finding their brand-new bottle completely empty. This indicates severe amnesia, sudden loss of consciousness, and potentially compulsive redosing while blacked out. One user noted adverse effects consistent with withdrawal. A user explained that because ethylbromazolam binds to GABA receptors differently than established benzodiazepines, substituting it for another benzodiazepine (e.g., alprazolam) does not replace the chemical dependency. This can cause the user to experience sudden, dangerous benzodiazepine withdrawal symptoms even while actively under the influence of ethylbromazolam. Multiple posts act as harm-reduction warnings, emphasizing that ethylbromazolam is so new that its toxicity profile is entirely unknown. Users shared articles warning that the spread of this chemical is linked to an increased risk of drug-related deaths.

7. Dependence Potential

A. Animal Studies

Ethylbromazolam has not been explicitly studied for dependence. However, as a potent GABA-A positive allosteric modulator, it is expected to exhibit the same dependence liabilities as other triazolobenzodiazepines.

B. Human Studies

No formal human studies involving ethylbromazolam were identified. Regular, sustained use of high-potency designer benzodiazepines carries a high risk of physical dependence *(9)*. Drug use reports suggest ethylbromazolam can cause dependence and withdrawal *(4)*. Abrupt cessation can trigger a severe benzodiazepine withdrawal syndrome, which includes a risk of fatal seizures.

8. Abuse Potential

A. Animal Studies

No animal studies examining the abuse potential of ethylbromazolam were identified.

B. Human Studies

No specific human studies on the abuse potential of ethylbromazolam were identified. Ethylbromazolam is currently sought after on gray markets for its strong anxiolytic, disinhibiting, and sedative effects, acting as a direct replacement for other scheduled benzodiazepines *(4)*.

9. Therapeutic Applications and Extent of Therapeutic Use and Epidemiology of Medical Use

Ethylbromazolam has no approved therapeutic applications and is not used in human or veterinary medicine.

10. Listing on the WHO Model List of Essential Medicines

Ethylbromazolam is not listed on the 24th WHO Essential Medicines List (EML) or the 10th WHO Essential Medicines List for Children (EMLc) updated in September 2025.

11. Marketing Authorizations (as a Medicinal Product)

Information on marketing authorization of ethylbromazolam as a medicinal product could not be identified.

12. Industrial Use

Information about recorded industrial use was not identified, aside from the small-scale synthesis of analytical reference standards for forensic and laboratory use.

13. Non-Medical Use, Abuse and Dependence

Ethylbromazolam is consumed for non-medical, recreational purposes. Ethylbromazolam was first detected in Canada in November 2024, followed by rapid global emergence in the United Kingdom (January 2025), New Zealand (March 2025), Germany (March 2025), Australia (April 2025), and the United States (June 2025) *(3)*. It is frequently ingested unknowingly by people who purchase falsified alprazolam (Xanax) on the illicit market.

According to the UNODC Early Warning Advisory (EWA) on New Psychoactive Substances (NPS), ethylbromazolam was detected in 825 drug samples in 2025 and 49 to date in 2026 [at the time of reporting]. Ethylbromazolam was first reported to the UNODC EWA in 2024 in a drug sample, and for the first time in a toxicology case in 2025. Three counties have reported toxicology cases containing ethylbromazolam, including postmortem and drug facilitated crimes circumstances.

14. Nature and Magnitude of Public Health Problems Related to Misuse, Abuse and Dependence

Ethylbromazolam poses a significant public health threat due to its high potency, unregulated manufacturing, and frequent appearance in falsified pharmaceuticals. According to data available through WEDINOS, ethylbromazolam is being pressed into falsified pills specifically masquerading as alprazolam and clonazepam, and there are explicit warnings about "deep blue" falsified pills currently circulating *(10)*. Toxicology reports routinely identify ethylbromazolam alongside other substances like fentanyl, synthetic opioids (e.g., nitazene analogues, orphine analogues), methamphetamine, cocaine, and other novel benzodiazepines. UNODC's EWA on NPS reporting 874 detection of ethylbromazolam in drug materials in 2025 and 2026 *(7)*. Because of its suggested high potency, unpredictable dosing in illicitly pressed pills significantly elevates adverse effects and overdose risks associated with ethylbromazolam.

15. Licit Production, Consumption and International Trade

Ethylbromazolam is used as reference material for scientific research. It is not known to have any agricultural, industrial or cosmetic uses. Some Internet retailers have advertised it for sale as a "research chemical" or similar type of substance.

16. Illicit Manufacture and Traffic and Related Information

Ethylbromazolam is synthesized in illicit laboratories and distributed globally via clear-net "research chemical" vendors and darknet markets. It is trafficked predominantly as a bulk powder and subsequently pressed into falsified pharmaceutical tablets closer to consumer markets *(10)*.

17. Current International Controls and Their Impact

Ethylbromazolam is not currently scheduled under the 1961, 1971 or 1988 United Nations Conventions.

18. Current and Past National Controls

Ethylbromazolam remains largely unregulated in most international jurisdictions, though it may be restricted under individual country or local analogue acts.

Refer to Annex 1: Report on WHO questionnaire for review of psychoactive substances.

19. Other Medical and Scientific Matters Relevant for a Recommendation on the Scheduling of the Substance

Detections of ethylbromazolam may be under-reported if this substance is not routinely screened for in all laboratories receiving samples for analysis.

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