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| --- |
| **Gamma-hydroxybutyrate** **(GHB)/Sodium Oxybate** |
| * **Alternative names:** liquid ecstasy, liquid X, liquid F, goop, GBH= Grievous Bodily Harm, Easy lay, Ghost Breath, G, Somatomax, Gamma-G, Growth Hormone Booster, Georgia home boy, nature’s Quaalude, G-riffick, Soapy, Salty Water

https://wiki.tripsit.me/images/a/a7/GHB.jpg |
| **Characteristics** | * Produced naturally in the body and is a metabolite of gamma aminobutyric acid (GABA)1
* Stimulates slow-wave sleep (stages 3 and 4) and decreases stage 1 sleep; with continued use, decreases REM sleep. 1
* Shown to increase dopamine levels in the basal ganglia
* At 10mg/kg produces anxiolytic effect, muscle relaxation, and amnesia
* At 20-30mg/kg increases REM and slow-wave sleep
* Doses > 60mg/kg can result in anesthesia, respiratory depression and coma
* Onset of action is within 30min
* Elimination half-life is approximately 20-30min; no longer detected in blood after 2-8h and in urine after 8-12h 1
* GHB is absorbed rapidly and reaches peak plasma concentrations in 20–60 minutes. 3
 |
| **Presentation during intoxication**(Symptoms usually resolve within 7 hours, but dizziness can persist up to 2 weeks) | **Common signs and symptoms during intoxication can include 3**

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| --- | --- | --- |
| Disinhibition | Confusion | Amnesia |
| Euphoria | Hallucinations | Agitation |
| Placidity  | Feeling of well-being | Poor concentration |
| Relaxation of voluntary muscles |  |  |

**Adverse reactions may include3**

|  |  |  |
| --- | --- | --- |
| Drowsiness | Headache | Ataxia |
| Dizziness | Hypotension | Nystagmus |
| Nausea | Bradycardia | Hypotonia |
| Vomiting | Hypothermia | Tremors |
| Muscle spasms | Seizures | Decreased respiration |

**Extreme intoxication signs and symptoms may include3*** Bradycardia, seizures, apnea, sudden (reversible) comma with abrupt awakening and agitation1

\*Overdoses can occur due to unknown purity and concentration of ingested product |
| **Monitoring and support during intoxication****Monitoring and support during intoxication**(*Continued)* | **Goal11*** Prevent severe respiratory depression

**Monitor1,2,3,4,11*** Assess level of disorientation and if possible time of last ingestion and amount consumed
* Monitor for falls risk
* Monitor vitals every 15 minutes initially and less frequently as acute symptoms subside
* Ensuring adequate respiratory function
* Maintain comprehensive physiological and cardiac monitoring

**Supportive Interventions** * Ensure a quiet private space
* Frequently orient client to reality and surroundings
* Promote fluid and food intake as tolerated
* Atropine may be used for persistent symptomatic bradycardia
* If breathing is laboured, refer to an intensive care unit.
* No known antidote for toxicity
 |
| **Withdrawal presentation**1symptoms occur 1-6 hours after abrupt cessation and can last 5-15 days after chronic use | **Symptoms may include1**

|  |  |  |
| --- | --- | --- |
| Nausea | Insomnia | Confusion |
| Vomiting | Anxiety | Tremor  |

**After chronic use1*** Mild tachycardia and hypertension
* Can progress to delirium with auditory and visual hallucinations
 |
| **Monitoring and support during withdrawal** | **Monitor1,11*** Mental Status (include risk of self-harm and suicide, agitation, anxiety)
* Physical status (vital signs, GI distress, respiratory and cardiological function)
* Risk for falls
* Hydration/Nutrition

**Supportive Interventions1,11*** Provide reassurance and calming techniques.
* Encourage fluids and nutrition as tolerated
* Diazepam has been used to treat GHB withdrawal
 |
| **Potential Complications** | * Coma reported in doses > 60mg/kg 1
* **GHB** **overdose** is a real danger, usually occurring within 15–20 minutes of ingestion. Most fatalities associated with GHB occur when it is taken with other substances, most notably alcohol.3, 4
* Overdose may present as3, 4:

|  |  |  |
| --- | --- | --- |
| Nausea and vomiting | Respiratory depression | Aggressive outbursts |
| Seizures | Coma | Slowed heart rate  |

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| **Notable** **Drug interactions****Notable****Drug interactions***(Continued)* | **HIV medications (Ritonavir and Saquinavir)5*** Interferes with the metabolism of GHB via CYP3A4 enzymes, amplifying GHB-depressant effects which may lead to loss of consciousness

**With Benzodiazepines5*** GHB may alter the response of midazolam at the GABA receptors, leading to agitation and confusion
* Enhance CNS depressant effects of GHB

**With Sedating antidepressants, Antipsychotics, General anesthetics, Hypnotics, Opioids, Muscle Relaxants6*** May enhance the CNS depressant effect of GHB leading to impaired consciousness and respiratory depression

**With Valproate and Ethosuximide7,8*** Inhibition of GHB-dehydrogenase
* Increased serum concentration of GHB --> Increased sleepiness, dizziness, nausea and cognitive impairment

**With Alcohol9*** Enhanced respiratory depression, greater decreases in O2 sat, and hypotension
* Adverse effects are more pronounced at higher GHB doses

**With Topiramate10*** Topiramate increases GABA activity at its neuroceptors
* May increase serum concentration of GHB --> Myoclonic jerks, miosis, rapid onset of coma

**With Cannabis*** Increased pharmacological effects1

**With Stimulants*** Increased pharmacological effects 1
 |
| **Psychiatric effects** | * In small doses, it leads to feelings of well-being, lowered inhibitions, sedation, poor concentration, confusion, amnesia, euphoria and hallucinations. It may lead to agitation and aggression1
 |

**References**

1. Bezchlibnyk-Butler, K., Jeffries, J., Procyshyn, R., Virani, A. (2014). *Clinical Handbook of Psychotropic Drugs* (20th ed). Toronto: Hogrefe Publishing
2. National Centre for Education and Training on Addiction (NCETA) Consortium. (2004), *Alcohol and Other Drugs: A Handbook for Health Professionals*. Retrieved on April 2, 2015, from http://www.health.gov.au/internet/main/ publishing.nsf/Content/E5203E6D5CBAA696CA257BF0001E02ED/$File/aodgp.pdf
3. Drug Enforcement Agency. (2011). *Drugs of Abuse*. Retrieved on April 1, 2015 from http://www.dea.gov/pr/multimedia-library/publications/drug\_of\_abuse.pdf#page=54 5. Lindsey WT, Stewart D, Childress D. Drug interactions between common illicit drugs and prescription therapies. *Am J Drug Alcohol Abuse*. 2012;38(4):334-43.
4. Lindsey, W. T., Stewart, D., & Childress, D. (2012). Drug interactions between common illicit drugs and prescription therapies. *The American journal of drug and alcohol abuse*, *38*(4), 334-343.
5. Food and Drug Administration. (2012). *Xyrem (sodium oxybate): Drug Safety Communication - Warning Against Use With Alcohol or Drugs Causing Respiratory Depression*. Retrieved on April 3, 2015, from http://www.fda.gov/Safety/MedWatch/SafetyInformation/SafetyAlertsforHumanMedicalProducts/ucm332430.htm
6. Eller, M., Wang, Y., Wesnes, K., Alvarez-Horine, S., Benson, B., & Black, J. (2013). Evaluation of drug–drug interactions of sodium oxybate with divalproex: Results from a pharmacokinetic/pharmacodynamic study. *Sleep Medicine*, 14(1), e302-e303.
7. Hechler, V., Ratomponirina, C., & Maitre, M. (1997). γ-Hydroxybutyrate conversion into GABA induces displacement of GABAB binding that is blocked by valproate and ethosuximide. *Journal of Pharmacology and Experimental Therapeutics*, *281*(2), 753-760.
8. Thai, D., Dyer, J. E., Benowitz, N. L., & Haller, C. A. (2006). GHB and ethanol effects and interactions in humans. *Journal of clinical psychopharmacology*,*26*(5), 524.
9. Weiss, T., Müller, D., Marti, I., Happold, C., & Russmann, S. (2013). Gamma-hydroxybutyrate (GHB) and topiramate—clinically relevant drug interaction suggested by a case of coma and increased plasma GHB concentration.*European journal of clinical pharmacology*, *69*(5), 1193-1194.
10. Townsend, M.C. (2015). *Psychiatric Nursing: Assessment, Care Plans, and Medications.* Oklahoma: F.A. Davis Company.