



# 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



<b>Characteristics</b>	<ul style="list-style-type: none"> <li>• Produced naturally in the body and is a metabolite of gamma aminobutyric acid (GABA)<sup>1</sup></li> <li>• Stimulates slow-wave sleep (stages 3 and 4) and decreases stage 1 sleep; with continued use, decreases REM sleep. <sup>1</sup></li> <li>• Shown to increase dopamine levels in the basal ganglia</li> <li>• At 10mg/kg produces anxiolytic effect, muscle relaxation, and amnesia</li> <li>• At 20-30mg/kg increases REM and slow-wave sleep</li> <li>• Doses &gt; 60mg/kg can result in anesthesia, respiratory depression and coma</li> <li>• Onset of action is within 30min</li> <li>• Elimination half-life is approximately 20-30min; no longer detected in blood after 2-8h and in urine after 8-12h <sup>1</sup></li> <li>• GHB is absorbed rapidly and reaches peak plasma concentrations in 20–60 minutes. <sup>3</sup></li> </ul>																											
<b>Presentation during intoxication</b> (Symptoms usually resolve within 7 hours, but dizziness can persist up to 2 weeks)	<p><b>Common signs and symptoms during intoxication can include</b> <sup>3</sup></p> <table style="width: 100%; border: none;"> <tr> <td>Disinhibition</td> <td>Confusion</td> <td>Amnesia</td> </tr> <tr> <td>Euphoria</td> <td>Hallucinations</td> <td>Agitation</td> </tr> <tr> <td>Placidity</td> <td>Feeling of well-being</td> <td>Poor concentration</td> </tr> <tr> <td>Relaxation of voluntary muscles</td> <td></td> <td></td> </tr> </table> <p><b>Adverse reactions may include</b><sup>3</sup></p> <table style="width: 100%; border: none;"> <tr> <td>Drowsiness</td> <td>Headache</td> <td>Ataxia</td> </tr> <tr> <td>Dizziness</td> <td>Hypotension</td> <td>Nystagmus</td> </tr> <tr> <td>Nausea</td> <td>Bradycardia</td> <td>Hypotonia</td> </tr> <tr> <td>Vomiting</td> <td>Hypothermia</td> <td>Tremors</td> </tr> <tr> <td>Muscle spasms</td> <td>Seizures</td> <td>Decreased respiration</td> </tr> </table> <p><b>Extreme intoxication signs and symptoms may include</b><sup>3</sup></p> <ul style="list-style-type: none"> <li>• Bradycardia, seizures, apnea, sudden (reversible) coma with abrupt awakening and agitation<sup>1</sup></li> </ul> <p>*Overdoses can occur due to unknown purity and concentration of ingested product</p>	Disinhibition	Confusion	Amnesia	Euphoria	Hallucinations	Agitation	Placidity	Feeling of well-being	Poor concentration	Relaxation of voluntary muscles			Drowsiness	Headache	Ataxia	Dizziness	Hypotension	Nystagmus	Nausea	Bradycardia	Hypotonia	Vomiting	Hypothermia	Tremors	Muscle spasms	Seizures	Decreased respiration
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<b>Monitoring and support during intoxication</b>	<p><b>Goal</b><sup>11</sup></p> <ul style="list-style-type: none"> <li>• Prevent severe respiratory depression</li> </ul> <p><b>Monitor</b><sup>1,2,3,4,11</sup></p> <ul style="list-style-type: none"> <li>• Assess level of disorientation and if possible time of last ingestion and amount consumed</li> <li>• Monitor for falls risk</li> <li>• Monitor vitals every 15 minutes initially and less frequently as acute symptoms subside</li> <li>• Ensuring adequate respiratory function</li> <li>• Maintain comprehensive physiological and cardiac monitoring</li> </ul> <p><b>Supportive Interventions</b></p> <ul style="list-style-type: none"> <li>• Ensure a quiet private space</li> </ul>																											



<p><b>Monitoring and support during intoxication</b> (Continued)</p>	<ul style="list-style-type: none"> <li>• Frequently orient client to reality and surroundings</li> <li>• Promote fluid and food intake as tolerated</li> <li>• Atropine may be used for persistent symptomatic bradycardia</li> <li>• If breathing is laboured, refer to an intensive care unit.</li> <li>• No known antidote for toxicity</li> </ul>						
<p><b>Withdrawal presentation<sup>1</sup></b> symptoms occur 1-6 hours after abrupt cessation and can last 5-15 days after chronic use</p>	<p><b>Symptoms may include<sup>1</sup></b></p> <table border="0"> <tr> <td>Nausea</td> <td>Insomnia</td> <td>Confusion</td> </tr> <tr> <td>Vomiting</td> <td>Anxiety</td> <td>Tremor</td> </tr> </table> <p><b>After chronic use<sup>1</sup></b></p> <ul style="list-style-type: none"> <li>• Mild tachycardia and hypertension</li> <li>• Can progress to delirium with auditory and visual hallucinations</li> </ul>	Nausea	Insomnia	Confusion	Vomiting	Anxiety	Tremor
Nausea	Insomnia	Confusion					
Vomiting	Anxiety	Tremor					
<p><b>Monitoring and support during withdrawal</b></p>	<p><b>Monitor<sup>1,11</sup></b></p> <ul style="list-style-type: none"> <li>• Mental Status (include risk of self-harm and suicide, agitation, anxiety)</li> <li>• Physical status (vital signs, GI distress, respiratory and cardiological function)</li> <li>• Risk for falls</li> <li>• Hydration/Nutrition</li> </ul> <p><b>Supportive Interventions<sup>1,11</sup></b></p> <ul style="list-style-type: none"> <li>• Provide reassurance and calming techniques.</li> <li>• Encourage fluids and nutrition as tolerated</li> <li>• Diazepam has been used to treat GHB withdrawal</li> </ul>						
<p><b>Potential Complications</b></p>	<ul style="list-style-type: none"> <li>• Coma reported in doses &gt; 60mg/kg<sup>1</sup></li> <li>• <b>GHB overdose</b> 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.<sup>3,4</sup></li> <li>• Overdose may present as<sup>3,4</sup>: <table border="0"> <tr> <td>Nausea and vomiting</td> <td>Respiratory depression</td> <td>Aggressive outbursts</td> </tr> <tr> <td>Seizures</td> <td>Coma</td> <td>Slowed heart rate</td> </tr> </table> </li> </ul>	Nausea and vomiting	Respiratory depression	Aggressive outbursts	Seizures	Coma	Slowed heart rate
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<p><b>Notable Drug interactions</b></p>	<p><b>HIV medications (Ritonavir and Saquinavir)<sup>5</sup></b></p> <ul style="list-style-type: none"> <li>• Interferes with the metabolism of GHB via CYP3A4 enzymes, amplifying GHB-depressant effects which may lead to loss of consciousness</li> </ul> <p><b>With Benzodiazepines<sup>5</sup></b></p> <ul style="list-style-type: none"> <li>• GHB may alter the response of midazolam at the GABA receptors, leading to agitation and confusion</li> <li>• Enhance CNS depressant effects of GHB</li> </ul> <p><b>With Sedating antidepressants, Antipsychotics, General anesthetics, Hypnotics, Opioids, Muscle Relaxants<sup>6</sup></b></p> <ul style="list-style-type: none"> <li>• May enhance the CNS depressant effect of GHB leading to impaired consciousness and respiratory depression</li> </ul> <p><b>With Valproate and Ethosuximide<sup>7,8</sup></b></p> <ul style="list-style-type: none"> <li>• Inhibition of GHB-dehydrogenase</li> <li>• Increased serum concentration of GHB --&gt; Increased sleepiness, dizziness, nausea and cognitive impairment</li> </ul> <p><b>With Alcohol<sup>9</sup></b></p> <ul style="list-style-type: none"> <li>• Enhanced respiratory depression, greater decreases in O<sub>2</sub> sat, and hypotension</li> <li>• Adverse effects are more pronounced at higher GHB doses</li> </ul> <p><b>With Topiramate<sup>10</sup></b></p>						



<b>Notable Drug interactions</b> <i>(Continued)</i>	<ul style="list-style-type: none"><li>• Topiramate increases GABA activity at its neuroreceptors</li><li>• May increase serum concentration of GHB --&gt; Myoclonic jerks, miosis, rapid onset of coma</li></ul> <b>With Cannabis</b> <ul style="list-style-type: none"><li>• Increased pharmacological effects<sup>1</sup></li></ul> <b>With Stimulants</b> <ul style="list-style-type: none"><li>• Increased pharmacological effects <sup>1</sup></li></ul>
<b>Psychiatric effects</b>	<ul style="list-style-type: none"><li>• 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 aggression<sup>1</sup></li></ul>



## References

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