

Benzodiazepines

Benzodiazepines (BZDs) are a class of psychoactive drugs with anxiolytic, sedative, muscle relaxant, anticonvulsant, and hypnotic properties. They act by enhancing the effect of gamma-aminobutyric acid (GABA), the main inhibitory neurotransmitter in the central nervous system.

Classification

- **Drug class:** Central nervous system depressants
- **ATC code:** N05BA (anxiolytics), N05CD (hypnotics), N03AE (antiepileptics)
- **Schedule:** Controlled substances in most countries (e.g., Schedule IV in the U.S.)

Mechanism of Action

- Bind to the **benzodiazepine site** on the **GABA-A receptor**
- Increase the **frequency** of chloride channel opening → **hyperpolarization** of the neuron → reduced excitability

Clinical Uses

- **Anxiety disorders** (e.g., generalized anxiety disorder, panic disorder)
- **Insomnia** (short-term use)
- **Seizure control** (e.g., status epilepticus)
- **Muscle spasms**
- **Alcohol withdrawal**
- **Procedural sedation**
- **Adjunctive treatment in tinnitus-related distress** (off-label)

Common Benzodiazepines

- **Short-acting:** Midazolam, Triazolam
- **Intermediate-acting:** Lorazepam, Alprazolam, Oxazepam
- **Long-acting:** Diazepam, Clonazepam, Chlordiazepoxide

Adverse Effects

- **Common:** Drowsiness, dizziness, confusion, impaired coordination
- **Cognitive:** Anterograde amnesia, slowed psychomotor performance
- **Dependence and withdrawal** with long-term use
- **Risk of falls** and **delirium** in the elderly
- **Respiratory depression** in overdose or when combined with other CNS depressants

Contraindications

- History of **substance use disorder**
- Severe **hepatic impairment**
- **Sleep apnea**
- **Myasthenia gravis**
- Use with **opioids** (risk of fatal respiratory depression)

Monitoring

- Monitor sedation level, respiratory status (especially if IV)
- Reassess regularly for continued need
- Taper gradually to avoid withdrawal

Special Considerations

- Risk of **tolerance** and **dependence** increases with duration
- Should be **avoided in elderly** (Beers Criteria) unless clearly indicated
- Use lowest effective dose for the **shortest duration possible**

Reversal Agent

- **Flumazenil** (competitive antagonist of the BZD receptor) — used in overdose or procedural reversal; risk of seizures

Synonyms

- **BZD, benzos**
- Not to be confused with **barbiturates** (different receptor modulation)

Related Concepts

- [Antidepressants](#)
- [GABA-A receptor](#)
- [Dependence and withdrawal](#)

From:
<https://neurosurgerywiki.com/wiki/> - **Neurosurgery Wiki**

Permanent link:
<https://neurosurgerywiki.com/wiki/doku.php?id=benzodiazepine>

Last update: **2025/06/15 10:11**



