

THERAPEUTICS

Brands • Restoril
see index for additional brand names

Generic? Yes



Class

- Neuroscience-based Nomenclature: GABA positive allosteric modulator (GABA-PAM)
- Benzodiazepine (hypnotic)

Commonly Prescribed for

(bold for FDA approved)

- **Short-term treatment of insomnia**
- Catatonia



How the Drug Works

- Binds to benzodiazepine receptors at the GABA-A ligand-gated chloride channel complex
- Enhances the inhibitory effects of GABA
- Boosts chloride conductance through GABA-regulated channels
- Inhibitory actions in sleep centers may provide sedative hypnotic effects

How Long Until It Works

- Generally takes effect in less than an hour, but can take longer in some patients

If It Works

- Improves quality of sleep
- Effects on total wake-time and number of nighttime awakenings may be decreased over time

If It Doesn't Work

- If insomnia does not improve after 7–10 days, it may be a manifestation of a primary psychiatric or physical illness such as obstructive sleep apnea or restless leg syndrome, which requires independent evaluation
- Increase the dose
- Improve sleep hygiene
- Switch to another agent



Best Augmenting Combos for Partial Response or Treatment Resistance

- Generally, best to switch to another agent
- Trazodone
- Agents with antihistamine actions (e.g., diphenhydramine, TCAs)

Tests

- In patients with seizure disorders, concomitant medical illness, and/or those with multiple concomitant long-term medications, periodic liver tests and blood counts may be prudent

SIDE EFFECTS

How Drug Causes Side Effects

- Same mechanism for side effects as for therapeutic effects – namely due to excessive actions at benzodiazepine receptors
- Actions at benzodiazepine receptors that carry over to the next day can cause daytime sedation, amnesia, and ataxia
- Long-term adaptations in benzodiazepine receptors may explain the development of dependence, tolerance, and withdrawal

Notable Side Effects

- * Sedation, fatigue, depression
- * Dizziness, ataxia, slurred speech, weakness
- * Forgetfulness, confusion
- * Hyperexcitability, nervousness
- Rare hallucinations, mania
- Rare hypotension
- Hypersalivation, dry mouth
- Rebound insomnia when withdrawing from long-term treatment



Life-Threatening or Dangerous Side Effects

- Respiratory depression, especially when taken with CNS depressants in overdose
- Rare hepatic dysfunction, renal dysfunction, blood dyscrasias

Weight Gain



- Reported but not expected

Sedation



- Many experience and/or can be significant in amount

What to Do About Side Effects

- Wait
- To avoid problems with memory, only take temazepam if planning to have a full night's sleep
- Lower the dose
- Switch to a shorter-acting sedative hypnotic
- Switch to a non-benzodiazepine hypnotic
- Administer flumazenil if side effects are severe or life-threatening

Best Augmenting Agents for Side Effects

- Many side effects cannot be improved with an augmenting agent

DOSING AND USE

Usual Dosage Range

- 15 mg/day at bedtime

Dosage Forms

- Capsule 7.5 mg, 15 mg, 30 mg

How to Dose

- 15 mg/day at bedtime; may increase to 30 mg/day at bedtime if ineffective



Dosing Tips

- Use lowest possible effective dose and assess need for continued treatment regularly
- Temazepam should generally not be prescribed in quantities greater than a 1-month supply
- Patients with lower body weights may require lower doses
- ✳ Because temazepam is slowly absorbed, administering the dose 1–2 hours before bedtime may improve onset of action and shorter sleep latency
- Risk of dependence may increase with dose and duration of treatment

Overdose

- Can be fatal in monotherapy; slurred speech, poor coordination, respiratory depression, sedation, confusion, coma

Long-Term Use

- Not generally intended for long-term use

Habit Forming

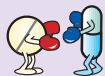
- Temazepam is a Schedule IV drug
- Some patients may develop dependence and/or tolerance; risk may be greater with higher doses
- History of drug addiction may increase risk of dependence

How to Stop

- If taken for more than a few weeks, taper to reduce chances of withdrawal effects
- Patients with history of seizure may seize upon sudden withdrawal
- Rebound insomnia may occur the first 1–2 nights after stopping
- For patients with severe problems discontinuing a benzodiazepine, dosing may need to be tapered over many months (i.e., reduce dose by 1% every 3 days by crushing tablet and suspending or dissolving in 100 mL of fruit juice and then disposing of 1 mL while drinking the rest; 3–7 days later, dispose of 2 mL, and so on). This is both a form of very slow biological tapering and a form of behavioral desensitization

Pharmacokinetics

- No active metabolites
- Half-life approximately 8–15 hours



Drug Interactions

- Increased depressive effects when taken with other CNS depressants (see Warnings below)
- If temazepam is used with kava, clearance of either drug may be affected



Other Warnings/Precautions

- Boxed warning regarding the increased risk of CNS depressant effects when benzodiazepines and opioid medications are used together, including specifically the risk of slowed or difficulty breathing and death
- If alternatives to the combined use of benzodiazepines and opioids are not available, clinicians should limit the dosage and duration of each drug to the minimum

possible while still achieving therapeutic efficacy

- Patients and their caregivers should be warned to seek medical attention if unusual dizziness, lightheadedness, sedation, slowed or difficulty breathing, or unresponsiveness occur
- Insomnia may be a symptom of a primary disorder, rather than a primary disorder itself
- Some patients may exhibit abnormal thinking or behavioral changes similar to those caused by other CNS depressants (i.e., either depressant actions or disinhibiting actions)
- Some depressed patients may experience a worsening of suicidal ideation
- Use only with extreme caution in patients with impaired respiratory function or obstructive sleep apnea
- Temazepam should only be administered at bedtime

Do Not Use

- If patient is pregnant
- If patient has angle-closure glaucoma
- If there is a proven allergy to temazepam or any benzodiazepine

SPECIAL POPULATIONS

Renal Impairment

- Recommended dose: 7.5 mg/day

Hepatic Impairment

- Recommended dose: 7.5 mg/day

Cardiac Impairment

- Dosage adjustment may not be necessary
- Benzodiazepines have been used to treat insomnia associated with acute myocardial infarction

Elderly

- Recommended dose: 7.5 mg/day



Children and Adolescents

- Safety and efficacy have not been established
- Long-term effects of temazepam in children/adolescents are unknown
- Should generally receive lower doses and be more closely monitored



Pregnancy

- Contraindicated for use in pregnancy
- Effective June 30, 2015, the US FDA requires changes to the content and format of pregnancy and lactation information in prescription drug labels, including the elimination of the pregnancy letter categories; the Pregnancy and Lactation Labeling Rule (PLLR or final rule) applies only to prescription drugs and will be phased in gradually for drugs approved on or after June 30, 2001
- Infants whose mothers received a benzodiazepine late in pregnancy may experience withdrawal effects
- Neonatal flaccidity has been reported in infants whose mothers took a benzodiazepine during pregnancy

Breast Feeding

- Unknown if temazepam is secreted in human breast milk, but all psychotropics assumed to be secreted in breast milk
- ✳ Recommended either to discontinue drug or bottle feed
- Effects on infant have been observed and include feeding difficulties, sedation, and weight loss

THE ART OF PSYCHOPHARMACOLOGY

Potential Advantages

- Patients with middle insomnia (nocturnal awakening)

Potential Disadvantages

- Patients with early insomnia (problems falling asleep)

Primary Target Symptoms

- Time to sleep onset
- Total sleep time
- Nighttime awakenings



Pearls

- If tolerance develops, it may result in increased anxiety during the day and/or increased wakefulness during the latter part of the night

TEMAZEPAM (continued)

* Slow gastrointestinal absorption compared to other sedative benzodiazepines, so may be more effective for nocturnal awakening than for initial insomnia unless dosed 1–2 hours prior to bedtime

- * Notable for delayed onset of action compared to some other sedative hypnotics
- Though not systematically studied, benzodiazepines have been used effectively to treat catatonia and are the initial recommended treatment



Suggested Reading

Ashton H. Guidelines for the rational use of benzodiazepines. When and what to use. *Drugs* 1994;48:25–40.

Fraschini F, Stankov B. Temazepam: pharmacological profile of a benzodiazepine and new trends in its clinical application. *Pharmacol Res* 1993;27:97–113.

Heel RC, Brogden RN, Speight TM, Avery GS. Temazepam: a review of its pharmacological

properties and therapeutic efficacy as an hypnotic. *Drugs* 1981;21:321–40.

McElnay JC, Jones ME, Alexander B. Temazepam (Restoril, Sandoz Pharmaceuticals). *Drug Intell Clin Pharm* 1982;16:650–6.