

# ACAMPROSATE

## THERAPEUTICS

### Brands • Campral

see index for additional brand names

### Generic? Not in U.S.



### Class

- Alcohol dependence treatment

### Commonly Prescribed for

(bold for FDA approved)

- **Maintenance of alcohol abstinence**



### How the Drug Works

- Theoretically reduces excitatory glutamate neurotransmission and increases inhibitory gamma-aminobutyric acid (GABA) neurotransmission
- Binds to and blocks certain glutamate receptors, including metabotropic glutamate receptors
- Because withdrawal of alcohol following chronic administration can lead to excessive glutamate activity and deficient GABA activity, acamprosate can act as “artificial alcohol” to mitigate these effects

### How Long Until It Works

- Has demonstrated efficacy in trials lasting between 13 and 52 weeks

### If It Works

- Increases abstinence from alcohol

### If It Doesn't Work

- Evaluate for and address contributing factors
- Consider switching to another agent
- Consider augmenting with naltrexone



### Best Augmenting Combos for Partial Response or Treatment Resistance

- Naltrexone
- Augmentation therapy may be more effective than monotherapy
- Augmentation with behavioral, educational, and/or supportive therapy in groups or as an individual is probably key to successful treatment

## Tests

- None for healthy individuals

## SIDE EFFECTS

### How Drug Causes Side Effects

- Theoretically, behavioral side effects due to changes in neurotransmitter concentrations at receptors in parts of the brain and body other than those that cause therapeutic actions
- Gastrointestinal side effects may be related to large doses of a drug that is an amino acid derivative, increasing osmotic absorption in the GI tract

### Notable Side Effects

- Diarrhea, nausea
- Anxiety, depression



### Life-Threatening or Dangerous Side Effects

- Suicidal ideation and behavior (suicidality)

### Weight Gain



- Reported but not expected

### Sedation



- Reported but not expected

### What to Do About Side Effects

- Wait
- Adjust dose
- If side effects persist, discontinue use

### Best Augmenting Agents for Side Effects

- Dose reduction or switching to another agent may be more effective since most side effects cannot be improved with an augmenting agent

## ACAMPROSATE (continued)

### DOSING AND USE

#### Usual Dosage Range

- 666 mg three times daily (>60 kg)
- 666 mg two times daily (<60 kg)

#### Dosage Forms

- Tablet 333 mg

#### How to Dose

- Patient should begin treatment as soon as possible after achieving abstinence
- Recommended dose is 666 mg three times daily; titration is not required



#### Dosing Tips

- Providing educational materials and counseling in combination with acamprosate treatment can increase the chances of success
- Patients should be advised to continue treatment even if relapse occurs and to disclose any renewed drinking
- Although absorption of acamprosate is not affected by food, it may aid adherence if patients who regularly eat three meals per day take each dose with a meal
- Adherence with three times daily dosing can be a problem; having patient focus on frequent oral dosing of drug rather than frequent drinking may be helpful in some patients

#### Overdose

- Limited available data; diarrhea

#### Long-Term Use

- Has been studied in trials up to one year

#### Habit Forming

- No

#### How to Stop

- Taper not necessary

#### Pharmacokinetics

- Terminal half-life 20–33 hours
- Excreted unchanged via the kidneys



#### Drug Interactions

- Does not inhibit hepatic enzymes, and thus is unlikely to affect plasma concentrations of drugs metabolized by those enzymes

- Is not hepatically metabolized and thus is unlikely to be affected by drugs that induce or inhibit hepatic enzymes
- Concomitant administration with naltrexone may increase plasma levels of acamprosate, but this does not appear to be clinically significant and dose adjustment is not recommended



#### Other Warnings/ Precautions

- Monitor patients for emergence of depressed mood or suicidal ideation and behavior (suicidality)
- Use cautiously in individuals with known psychiatric illness

#### Do Not Use

- If patient has severe renal impairment
- If there is a proven allergy to acamprosate

### SPECIAL POPULATIONS

#### Renal Impairment

- For moderate impairment, recommended dose is 333 mg three times daily
- Contraindicated in severe impairment

#### Hepatic Impairment

- Dose adjustment not generally necessary

#### Cardiac Impairment

- Limited data available

#### Elderly

- Some patients may tolerate lower doses better
- Consider monitoring renal function



#### Children and Adolescents

- Safety and efficacy have not been established



#### Pregnancy

- Risk Category C [some animal studies show adverse effects; no controlled studies in humans]
- Pregnant women needing to stop drinking may consider behavioral therapy before pharmacotherapy

(continued) **ACAMPROSATE**

- Not generally recommended for use during pregnancy, especially during first trimester

**Breast Feeding**

- Unknown if acamprosate is secreted in human breast milk, but all psychotropics assumed to be secreted in breast milk
- Recommended either to discontinue drug or bottle feed

**THE ART OF PSYCHOPHARMACOLOGY****Potential Advantages**

- Individuals who have recently abstained from alcohol
- For the chronic daily drinker

**Potential Disadvantages**

- Individuals who are not abstinent at time of treatment initiation
- For binge drinkers

**Primary Target Symptoms**

- Alcohol dependence

**Pearls**

- Because acamprosate serves as “artificial alcohol,” it may be less effective in situations in which the individual has not yet abstained from alcohol or suffers a relapse
- Thus acamprosate may be a preferred treatment if the goal is complete abstinence, but may not be preferred if the goal is reduced-risk drinking

**Suggested Reading**

Anton RF, O'Malley SS, Ciraulo DA et al. Combined pharmacotherapies and behavioral interventions for alcohol dependence: the COMBINE study: a randomized controlled trial. *JAMA* 2006;295(17):2003–17.

Kranzler HR, Gage A. Acamprosate efficacy in alcohol-dependent patients: summary of results from three pivotal trials. *Am J Addictions* 2008; 17:70–6.

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Stephen M. Stahl

Excerpt

[More information](#)

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# AGOMELATINE

## THERAPEUTICS

**Brands** • Valdoxan  
*see index for additional brand names*

**Generic?** No



### Class

- Agonist at melatonergic 1 and melatonergic 2 receptors
- Antagonist at 5HT2C receptors

**Commonly Prescribed for**  
*(bold for FDA approved)*

- Depression
- Generalized anxiety disorder



### How the Drug Works

- Actions at both melatonergic and 5HT2C receptors may be synergistic and increase norepinephrine and dopamine neurotransmission in the prefrontal cortex; may resynchronize circadian rhythms that are disturbed in depression
- No influence on extracellular levels of serotonin

### How Long Until It Works

- Daytime functioning, anhedonia, and sleep can improve from the first week of treatment
- Onset of full therapeutic actions in depression is usually not immediate, but often delayed 2–4 weeks
- May continue to work for many years to prevent relapse of symptoms

### If It Works

- The goal of treatment is complete remission of current symptoms as well as prevention of future relapses
- Treatment most often reduces or even eliminates symptoms, but not a cure since symptoms can recur after medicine is stopped
- Continue treatment until all symptoms are gone (remission)
- Once symptoms gone, continue treating for 1 year for the first episode of depression

- For second and subsequent episodes of depression, treatment may need to be indefinite

### If It Doesn't Work

- Many patients have only a partial response where some symptoms are improved but others persist (especially insomnia, fatigue, and problems concentrating)
- Other patients may be nonresponders, sometimes called treatment-resistant or treatment-refractory
- Consider increasing dose as early as 2 weeks after initiating treatment if response is insufficient (decision on dose increase has to be balanced with a higher risk of transaminase elevation; any dose increase should be made on an individual patient benefit/risk basis and with strict respect of liver function tests monitoring)
- Consider switching to another agent or adding an appropriate augmenting agent
- Consider psychotherapy
- Consider evaluation for another diagnosis or for a comorbid condition (e.g., medical illness, substance abuse, etc.)
- Some patients may experience apparent lack of consistent efficacy due to activation of latent or underlying bipolar disorder, and require antidepressant discontinuation and a switch to a mood stabilizer



### Best Augmenting Combos for Partial Response or Treatment Resistance

- SSRIs (excluding fluvoxamine), SNRIs, bupropion, reboxetine, atomoxetine (use combinations of antidepressant with caution as this may activate bipolar disorder and suicidal ideation)
- Modafinil, especially for fatigue, sleepiness, and lack of concentration
- Mood stabilizers or atypical antipsychotics for bipolar depression, psychotic depression, or treatment-resistant depression
- Benzodiazepines

### Tests

- Liver function tests at initiation of treatment, then regularly during treatment, and thereafter when clinically indicated
- When increasing the dose, liver function tests should be performed at the same frequency as when initiating treatment

## AGOMELATINE (continued)

### SIDE EFFECTS

#### How Drug Causes Side Effects

- Adverse reactions usually mild to moderate and occur within the first two weeks of treatment
- Actions at melatonergic receptors and at 5HT<sub>2C</sub> receptors could contribute to the side effects described below

#### Notable Side Effects

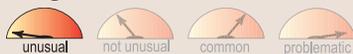
- Nausea and dizziness are most common
- Other adverse reactions are somnolence, fatigue, insomnia, headache, anxiety, diarrhea, constipation, upper abdominal pain, vomiting, hyperhidrosis
- Increase of transaminase levels



#### Life-Threatening or Dangerous Side Effects

- ✱ Rare hepatitis, hepatic failure
- Theoretically rare induction of mania (class warning)
- Rare activation of suicidal ideation and behavior (suicidality) (short-term studies did not show an increase in the risk of suicidality with antidepressants compared to placebo beyond age 24) (class warning)

#### Weight Gain



- Reported but not expected

#### Sedation (Somnolence)



- Occurs in significant minority
- Generally transient
- May be more likely to cause fatigue than sedation

#### What to Do About Side Effects

- Wait
- Wait
- Stop if transaminase levels reach 3 times the upper limit of normal
- Switch to another drug

#### Best Augmenting Agents for Side Effects

- Often best to try another antidepressant monotherapy prior to resorting to augmentation strategies to treat side effects

- Many side effects are time-dependent (i.e., they start immediately upon dosing and upon each dose increase, but go away with time)
- Many side effects cannot be improved with an augmenting agent
- Theoretically activation and agitation may represent the induction of a bipolar state, especially a mixed dysphoric bipolar II condition sometimes associated with suicidal ideation, and require the addition of lithium, a mood stabilizer or an atypical antipsychotic, and/or discontinuation of agomelatine (class warning)

### DOSING AND USE

#### Usual Dosage Range

- 25–50 mg/day at bedtime

#### Dosage Forms

- Tablet 25 mg

#### How to Dose

- Initial 25 mg/day at bedtime; after 2 weeks can increase to 50 mg/day at bedtime



#### Dosing Tips

- If intolerable anxiety, insomnia, agitation, akathisia, or activation occur either upon dosing initiation or discontinuation, consider the possibility of activated bipolar disorder and switch to a mood stabilizer or an atypical antipsychotic

#### Overdose

- Drowsiness and epigastralgia; fatigue, agitation, anxiety, tension, dizziness, cyanosis, or malaise have also been reported

#### Long-Term Use

- Treatment up to 12 months has been found to decrease rate of relapse

#### Habit Forming

- No

#### How to Stop

- No need to taper dose

**Pharmacokinetics**

- Half-life 1–2 hours
- Metabolized primarily by CYP450 1A2

**Drug Interactions**

- Use of agomelatine with potent CYP450 1A2 inhibitors (e.g., fluvoxamine) is contraindicated
- Tramadol increases the risk of seizures in patients taking an antidepressant (class warning)

**Other Warnings/  
Precautions**

- Use with caution in patients with hepatic injury risk factors, such as obesity/overweight/non-alcoholic fatty liver disease, diabetes, patients who drink large quantities of alcohol or who take medication associated with risk of hepatic injury
- If symptoms or signs of potential liver injury (dark urine, light-colored stools, yellow skin/eyes, pain in upper right belly, sustained new-onset and unexplained fatigue) are present, agomelatine should be discontinued immediately
- Use caution in patients with pre-treatment elevated transaminases (> the upper limit of the normal range and <3 times the upper limit of the normal range)
- Discontinue treatment if serum transaminases increase to 3 times the upper limit of normal; liver function tests should be performed regularly until serum transaminases return to normal
- Agomelatine should be administered at bedtime
- Use with caution in patients with bipolar disorder unless treated with concomitant mood-stabilizing agent
- When treating children off label (an unapproved use), carefully weigh the risks and benefits of pharmacological treatment against the risks and benefits of nontreatment with antidepressants and make sure to document this in the patient's chart
- Warn patients and their caregivers about the possibility of activating side effects and advise them to report such symptoms immediately

- Monitor patients for activation of suicidal ideation, especially children and adolescents

**Do Not Use**

- If patient has hepatic impairment
- If patient has transaminase levels >3 times the upper limit of normal
- If patient is taking a potent CYP450 1A2 inhibitor (e.g., fluvoxamine, ciprofloxacin)
- If patient is taking an MAO inhibitor
- If patient has galactose intolerance, Lapp lactase deficiency, or glucose-galactose malabsorption
- If there is a proven allergy to agomelatine

**SPECIAL POPULATIONS****Renal Impairment**

- Drug should be used with caution

**Hepatic Impairment**

- Contraindicated

**Cardiac Impairment**

- Dose adjustment not necessary

**Elderly**

- Efficacy and safety have been established (<75 years old)
- Dose adjustment not necessary
- Should not be used in patients age 75 years and older
- Should not be used in elderly patients with dementia

**Children and Adolescents**

- Carefully weigh the risks and benefits of pharmacological treatment against the risks and benefits of nontreatment with antidepressants and make sure to document this in the patient's chart
- Monitor patients face-to-face regularly, particularly during the first several weeks of treatment
- Safety and efficacy have not been established and it is not recommended

**Pregnancy**

- No controlled studies in humans
- Not generally recommended for use during pregnancy, especially during first trimester

**AGOMELATINE** (continued)

- Must weigh the risk of treatment (first trimester fetal development, third trimester newborn delivery) to the child against the risk of no treatment (recurrence of depression, maternal health, infant bonding) to the mother and child
- For many patients this may mean continuing treatment during pregnancy

**Breast Feeding**

- Unknown if agomelatine is secreted in human breast milk, but all psychotropics assumed to be secreted in breast milk
- Therefore, breast feeding or drug needs to be discontinued
- Immediate postpartum period is a high-risk time for depression, especially in women who have had prior depressive episodes, so drug may need to be reinstated late in the third trimester or shortly after childbirth to prevent a recurrence during the postpartum period

**THE ART OF PSYCHOPHARMACOLOGY****Potential Advantages**

- Patients with lack of energy, anhedonia, anxious comorbidity, and sleep-wake disturbances

- Patients particularly concerned about sexual side effects or weight gain

**Potential Disadvantages**

- Patients with hepatic impairment

**Primary Target Symptoms**

- Depressed mood, anhedonia
- Daytime functioning

**Pearls**

- Agomelatine represents a novel approach to depression through a novel pharmacologic profile, agonist at melatonergic MT1 / MT2 receptors and antagonist at 5HT2C receptors acting synergistically
- This synergy provides agomelatine with a distinctive efficacy profile, different from conventional antidepressants with potentially an early and continuous improvement over time
- Agomelatine improves anhedonia early in treatment
- Agomelatine may improve sleep quality by promoting proper maintenance of circadian rhythms underlying a normal sleep-wake cycle

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Demyttenaere K, Corruble E, Hale A, et al. A pooled analysis of six month comparative efficacy and tolerability in four randomized clinical trials: agomelatine versus escitalopram, fluoxetine, and sertraline. *CNS Spectr* 2013;18:163–70.

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Martinotti G, Sepede G, Gambi F, et al. Agomelatine versus venlafaxine XR in the treatment of anhedonia in major depressive disorder: a pilot study. *J Clin Psychopharmacol* 2012;32(4):487–91.

Racagni G, Riva MA, Molteni R, et al. Mode of action of agomelatine: synergy between melatonergic and 5-HT<sub>2C</sub> receptors. *World J Biol Psychiatry* 2011;12(8):574–87.

Stahl SM, Fava M, Trivedi M, Caputo A, Shah A, Post A. Agomelatine in the treatment of major depressive disorder. An 8 week, multicenter, randomized, placebo-controlled trial. *J Clin Psychiatry* 2010;71(5):616–26.

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