Chapter 17
Case Study 6: Treatments for Alcohol Use Disorder

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Susan is a 20-year-old female college student with an alcohol use disorder, who was recently charged with driving under the influence (DUI). Over the course of the past year, she has blacked out on five separate occasions while intoxicated. After one of her blackouts, she awoke on an inpatient medical ward, where she was treated for alcohol poisoning.

A careful history reveals that Susan began drinking beer at the age of 15. Over the past year, her alcohol use has escalated from two to three bottles of beer (12 oz./bottle ≈ 5% alcohol) on one or two occasions per month to two to three glasses of distilled spirits (1.5 oz./glass ≈ 40% alcohol) 5 days per week. Her drink of choice is currently whiskey. She enjoys the smoky taste and usually has two to five glasses of whiskey after returning home at the end of the day. Her drinking has caused her to oversleep and miss class. On one occasion, she attended class while intoxicated. She often drinks before going out with friends, because she feels like alcohol decreases her social anxiety and allows her to be her "true self." She wants to stop using alcohol due to her recent legal trouble, but is worried that she will not have the strength to resist her alcohol cravings.

Susan's last drink was approximately 18 h ago, and her urine drug testing is unremarkable for other substances. On laboratory screening, her liver function tests are within normal limits, her creatinine is 1.0, and her glomerular filtration rate is >60 mL/min.

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Considerations

What medications would you consider prescribing to Susan for alcohol use disorder? Which medication is the most appropriate at this time (Table 17.1)?

Since Susan does not live with her family or a partner that is involved in her clinical care, there is nobody to supervise, support, and reinforce disulfiram adherence at home. This lack of medication oversight limits the effectiveness of disulfiram in the outpatient setting [9]. While acamprosate appears to be effective in adults, its three times daily dosing can make adherence challenging.

Given Susan's normal liver function, negative UDS, and recent alcohol use, her treatment team advises starting naltrexone. If Susan tolerates the oral formulation of naltrexone well, she will be offered naltrexone IM (Vivitrol®), which will likely facilitate medication adherence.

Table 17.1 Medications for alcohol use disorder

	Acamprosate	Naltrexone	Disulfiram
FDA approval	FDA-approved anti-craving agent for alcohol use disorder in adults ≥18 years.	FDA-approved anti-craving agent for alcohol use disorder and prevention of relapse in opioid dependence in adults ≥18 years.	FDA-approved aversive agent for alcohol use disorder in adults ≥18 years.
Mechanism of action	Reduces excitatory glutamate neurotransmission and increases inhibitory GABA neurotransmission. Binds to and blocks glutamate receptors, which can decrease the effects of excessive glutamate activity, while increasing GABA activity [1].	Reduces alcohol consumption through modulation of the opioid system, which is involved in the sensation of craving. May restore the central balance of the endogenous opioid system that is disrupted by prolonged alcohol exposure [2].	Inhibits the enzyme aldehyde dehydrogenase, which typically catalyzes the conversion of acetaldehyde to acetate. Causes levels of acetaldehyde to accumulate, leading to an uncomfortable and adverse experience: headache, flushing of the face, nausea, vomiting, and sweating. The negative experience ideally leads to conditioning in which the patient starts to avoid alcohol [3].

Table 17.1 (continued)

	Acamprosate	Naltrexone	Disulfiram
Evidence base	Preliminary evidence demonstrates that it is safe and well tolerated in adolescents. RCT $n = 26$ acamprosate (1332 mg Q day) demonstrated statistically higher abstinence rate in acamprosate group compared to placebo at 90 days (7/13 vs. 2/13) and greater mean cumulative abstinence duration in acamprosate group compared to placebo (79.8 days vs. 32.8 days) [4].[a]	Preliminary evidence demonstrates that it is safe and well tolerated in adolescents [5, 6]. Pilot study $n = 5$ (naltrexone 50 mg Q day) demonstrated an average reduction of 7.61 standard drinks/day from 8.94 drinks/day with a significant reduction in cravings over 6 weeks [7]. There are numerous case reports demonstrating prolonged abstinence, decreased number of drinking days, and decreased cravings with naltrexone [2].	Preliminary evidence demonstrates that it is safe and well tolerated in adolescents. RCT $n = 49$ (disulfiram 200 mg Q day) demonstrated that mean cumulative abstinence duration was significantly greater in the disulfiram group than the placebo group (68.5 days vs. 29.7 days) [8].
Dosing	Dosed 666 mg by mouth three times daily in adults (each tablet is 333 mg).	Dosed 50–100 mg by mouth daily or by a long-acting injectable 380 mg given intramuscularly every 4 weeks in adults. Tablets are 25 mg, 50 mg, or 100 mg.	Dosed 125–500 mg by mouth daily in adults. Tablets are 250 mg or 500 mg and scored. Give at least 12 h after the last alcoholic drink.
Additional considerations	Contraindicated in patients with severe renal impairment (creatinine clearance ≤30 mL/min) [1]; lower doses, such as 333 mg by mouth three times daily, may be used in patients with milder renal impairment. Three times daily dosing may be difficult for patients and limit medication adherence [1, 4].	Check hepatic function before initiation. Patients should be opioid-free for 7–10 days prior to initiation of treatment as confirmed by urine drug test to avoid inducing opioid withdrawal. Long-acting injectable formulation may be associated with improved medication adherence.	Most efficacious when daily self-administration is supervised and supported.

[a]The original article reporting on the efficacy of acamprosate for treating alcohol use disorder in adolescence was retracted due to copyright violation.

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