

# Quality of Outpatient Depression Treatment in Patients With Comorbid Substance Use Disorder

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**Objective:** Clinical practice guidelines recommend concurrent treatment of co-occurring depression and substance use disorders; however, the degree to which patients with substance use disorders receive guideline-concordant treatment for depression is unknown. The authors investigated the provision of guideline-concordant depression treatment to patients with and without substance use disorders in a large integrated health care system.

**Methods:** In a retrospective cohort study of 53,034 patients diagnosed with a depressive disorder in fiscal year 2017 in the U.S. Veterans Health Administration, the authors assessed the association of comorbid substance use disorders with guideline-concordant depression treatment, including both medication and psychotherapy, while adjusting for patient demographic and clinical characteristics.

**Results:** Guideline-concordant depression treatment was lower across metrics for patients with co-occurring depression and substance use disorders compared to those without substance use disorders. Consistent findings

emerged in covariate-adjusted models of antidepressant treatment, such that patients with substance use disorders had 21% lower odds of guideline-concordant acute treatment (adjusted odds ratio=0.79, 95% CI=0.73, 0.84) and 26% lower odds of continuation of treatment (adjusted odds ratio=0.74, 95% CI=0.69, 0.79). With regard to psychotherapy, patients with co-occurring depression and substance use disorders had 13% lower odds (adjusted odds ratio=0.87, 95% CI=0.82, 0.91) of adequate acute-phase treatment and 19% lower odds (adjusted odds ratio=0.81, 95% CI=0.73, 0.89) of psychotherapy continuation.

**Conclusions:** Despite the availability of effective treatments for depression, patients with co-occurring substance use disorders are less likely to receive guideline-concordant depression treatment. Efforts to improve the provision of care to those with co-occurring substance use disorders should focus on clinician-based interventions and use of integrated care models to improve the quality of depression treatment.

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Depression commonly co-occurs with substance use disorders and contributes to poor outcomes (1–5), including increased substance use (6, 7), more severe illness trajectories (8, 9), higher rates of suicide (3, 10–13), fatal overdoses (14), and overall mortality (15). Antidepressants and psychotherapy are both effective, empirically supported treatments for depression; however, depression remains undertreated, with, on average, one-third of patients experiencing a major depressive episode receiving no treatment at all (16, 17). To ensure guideline-concordant depression treatment, initial treatment and continuation of treatment are critical for optimizing effectiveness and mitigating these poor outcomes, especially among patients with comorbid substance use disorders (18–21).

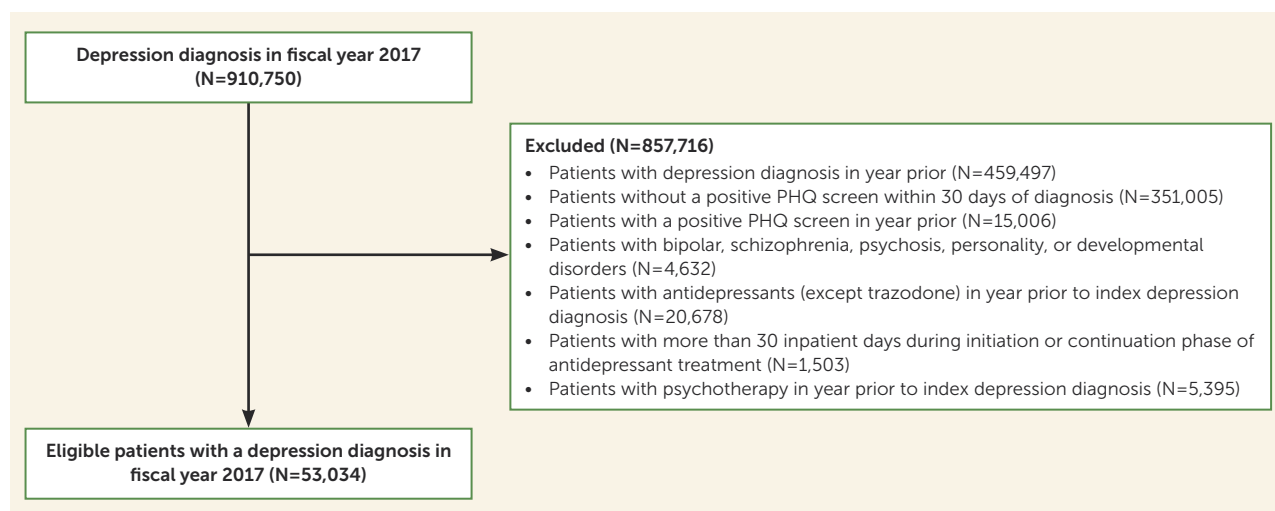
Best practices support providing individuals with depression and substance use disorders treatment for both disorders (18), with integrated or concurrent treatments to target both disorders simultaneously (22–26), with a focus on ensuring access to guideline-concordant treatment to optimize

effectiveness and reduce the public health burden of depression. Clinical practice guidelines issued by the American College of Physicians and the U.S. Veterans Health Administration (VHA) recommend treating depression with pharmacotherapy or psychotherapy (e.g., cognitive-behavioral therapy), with a combination of both in cases of severe depression (27, 28). However, co-occurring substance use disorders present additional barriers beyond those associated with the treatment of depression broadly (29, 30), in part as a result of inaccurate clinical beliefs about the need for abstinence to garner benefits of depression treatment (23, 31) and provider concerns about medication interactions, among other barriers. Previous work has shown that only about half (55.4%) of individuals in the United States with co-occurring substance use disorder and depression received any depression treatment (32).

Treatment of depression is a priority for patients with comorbid substance use disorders. However, no study to date has examined whether those with co-occurring substance

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**FIGURE 1.** Flow diagram of the study cohort in a study of the quality of depression treatment in patients with comorbid substance use disorder<sup>a</sup>



<sup>a</sup> PHQ=Patient Health Questionnaire.

use disorders and depression receive similar care to those without substance use disorders across both medication and psychotherapy-based treatment modalities or the degree to which specific substance use disorders are differentially associated with receipt of guideline-concordant depression treatment. As the largest provider of addiction treatment services in the United States, the VHA provides the opportunity to assess the quality of depression treatment between patients with and without substance use disorders, and with specific substance use disorders, across the nation.

## METHODS

### Design and Data Source

This retrospective cohort study identified veterans receiving care from the VHA who had a new depression diagnosis in fiscal year 2017, encompassing an observation period from fiscal years 2016 to 2018. Electronic medical record data were obtained from the VHA Corporate Data Warehouse. The Corporate Data Warehouse contains patient characteristics and treatment receipt for VHA patients. The Veterans Affairs Ann Arbor Healthcare System Institutional Review Board approved the study.

### Sample

Veterans were included if they had a new episode of depression in fiscal year 2017 (Figure 1). Depression was defined as an inpatient or outpatient encounter for depression using ICD-10 codes F32.0–F32.5, F32.9, F33.0–F33.3, F33.40–F33.42, F33.9, or F34.1 and a Patient Health Questionnaire (PHQ-2 or HQ-9) screen within a 30-day window of the depression diagnosis that was indicative of active depression (PHQ-2 score >2 or PHQ-9 score >9). We included only patients with a positive PHQ screen to focus on patients with active symptoms of depression, which would indicate a need for

treatment. To obtain a cohort of patients with a new or index depression episode, we excluded patients who had a depression diagnosis, received a prescription for antidepressant medications (except trazodone, which is commonly prescribed for sleep), or received psychotherapy treatment in the 12 months before the index diagnosis date. Patients must have had a positive PHQ screen in the 30 days before or after the depression diagnosis but were excluded if they had a positive screen in the 12 months to 30 days prior to their index diagnosis, to capture new episodes of depression. Patients with bipolar disorder, schizophrenia, psychosis, personality disorders, or developmental disorders and patients who had more than 30 inpatient days during the 231 days following the depression diagnosis (encompassing the complete treatment window for medication-based treatment) were also excluded, to focus on outpatient depression treatment.

Patients with a comorbid substance use disorder were defined as those who received a substance use disorder diagnosis during the year prior to the depression diagnosis. Substance use disorders were identified using ICD-10 codes for alcohol use disorder (F10.x), opioid use disorder (F11.1 and F11.2), cannabis use disorder (F12.x), cocaine use disorder (F14.x), stimulant use disorder (F15.x), or other substance use disorders (F13.x, F16.x, F18.x, F19.x).

### Measures

**Outcome variables.** To help assess guideline-concordant care, the Healthcare Effectiveness Data and Information Set (HEDIS) provides widely used depression metrics in the United States. We applied two HEDIS-based measures related to medication treatment among patients who received an initial prescription within 90 days of the index depression diagnosis: adequate acute-phase treatment, defined as receiving an antidepressant prescription within 90 days of the depression diagnosis that provides antidepressant

medication for at least 84 of the 114 days following the initial prescription; and adequate continuation-phase treatment, which is defined as continuing antidepressant medication for 180 of the first 231 days following the initial prescription (33). Evaluation of both acute and continuation phases of depression treatment is a critical target for improving the quality of depression care. Antidepressant medications included are listed in the online supplement.

Psychotherapy for depression is also an empirically supported treatment for depression (27, 28, 34). We examined receipt of psychotherapy for depression using measures consistent with previous quality-of-care metrics for psychotherapy (35) that were constructed to be conceptually analogous to the HEDIS medication-based measures. We assessed both acute-phase treatment, defined as a psychotherapy session for depression that occurred within 90 days of the index depression diagnosis, and continuation-phase treatment, defined as at least three psychotherapy sessions occurring in the 12 weeks following the first therapy session. Psychotherapy treatment was defined using Current Procedural Terminology (CPT) codes (see the online supplement). To account for concerns that psychotherapy visits can target a variety of conditions, including substance use disorders and other psychiatric conditions, we included psychotherapy sessions only if a depressive disorder was the primary diagnosis.

*Covariates.* Demographic characteristics included age, gender, race, Hispanic ethnicity, and geographic locality (i.e., urban or rural). Additional patient characteristics included distance from the treatment facility where patients received the majority of depression treatment ( $\leq 30$  miles, or  $> 30$  miles), VHA service-connected disability, and homelessness, which have been associated with mental health treatment utilization (36–40). Facility type was also assessed (Veterans Affairs Medical Center, community-based outpatient clinic, and other sites). Comorbid mental health diagnoses assessed included posttraumatic stress disorder (PTSD; ICD-10 codes F43.1, F43.10, F43.11, F43.12) and anxiety disorders (ICD-10 codes F40.x, F41.x, F42.x). The Elixhauser score, categorized as 0, 1, 2, or  $\geq 3$  comorbid diagnoses, was included to indicate the severity of comorbid medical conditions (41–43). ICD-10-CM codes were used to identify these psychiatric and medical conditions in the year prior to the index depression episode, with depression and substance use disorders excluded from the Elixhauser score.

### Statistical Analysis

All analyses were performed using SAS Enterprise Guide, version 7.1 (44). Sample characteristics across all covariates were compared between patients with and without substance use disorders. We conducted four multivariate logistic regression models examining associations between the presence of a substance use disorder diagnosis and adequate acute- and continuation-phase antidepressant or psychotherapeutic treatment. Listwise deletion was used in the

models to handle missing data; a total of 579 patients (1%) were excluded because of missingness. All models are presented with adjustment for all covariates. To illustrate our findings, we estimated the percentage of people receiving treatment, across each of the depression care metrics, for those with and without comorbid substance use disorders as the marginal means of balanced populations based on the model. The marginal means (percentages) in each group were obtained as the model-based predicted percentages across the underlying covariate combinations, assuming balanced distribution across all covariates. The associations of specific substance use disorders with depression treatment were examined by evaluating the above four models with each substance use disorder considered individually (alcohol, opioid, cannabis, cocaine or other stimulant, and other substance use disorders). In sensitivity analyses, psychotherapy was defined more broadly, without the requirement of a primary depressive disorder diagnosis. Finally, we also descriptively examined where patients with substance use disorders were receiving depression treatment.

### RESULTS

The study cohort included 53,034 patients diagnosed with a new episode of depression during fiscal year 2017; 28,081 (52.9%) of these patients received any antidepressant treatment, and 18,484 (34.9%) received any psychotherapy for depression within 90 days following their diagnosis. Of this cohort, 7,516 (14.2%) had a substance use disorder diagnosis in the year before the depressive disorder diagnosis. Despite patients with substance use disorders having more visits in mental health and primary care settings in the year following the depression diagnosis (an average of 14.1 visits [SD=18.1] compared with 10.2 visits [SD=10.9] among those without substance use disorders), providing more opportunity for depression treatment, patients with substance use disorders received less guideline-concordant depression treatment across all metrics. Observed rates without adjusting for covariates show that acute- and continuation-phase antidepressant treatment was provided to 59.4% and 36.3%, respectively, of those with co-occurring substance use disorder and depression, compared with 66.2% and 44.8%, respectively, of those without substance use disorders. With regard to psychotherapy, 31.6% and 26.8% of those with substance use disorders received acute and continuation phases of depression treatment, respectively, compared with 35.4% and 32.2% of those without substance use disorders. Among those with substance use disorders, the vast majority received most of their psychotherapy or medication-based depression treatment in mental health clinics (47.0% of psychotherapy [N=1,117], 59.1% of antidepressants [N=2,390]) or in primary care/primary care mental health integration clinics (42.7% of psychotherapy [N=1,014], 31.8% of antidepressants [N=1,287]), with only a small minority of patients receiving depression care in substance use disorder

**TABLE 1. Characteristics of patients with depression diagnosis with and without substance use disorders in a Veterans Health Administration cohort<sup>a</sup>**

Characteristic	Substance Use Disorder		No Substance Use Disorder		$\chi^2$	p	Total N
	N	%	N	%			
Age range (years)							
18–64	6,401	85.2	35,043	77.0	252.6	<0.0001	53,034
≥65	1,115	14.8	10,475	23.0			
Male	6,922	92.1	37,251	81.8	487.9	<0.0001	53,034
Race							
White	4,668	62.1	29,164	64.1	65.8	<0.0001	53,034
American Indian/Alaskan Native	83	1.1	433	1.0			
Asian/Pacific Islander/ Native Hawaiian	134	1.8	1,262	2.8			
Black	2,065	27.5	10,922	24.0			
Multiracial	92	1.2	553	1.2			
Unknown	474	6.3	3,184	7.0			
Hispanic	749	10.0	4,508	9.9	0.03	0.8684	53,034
Rural geographic locality	1,942	25.9	12,836	28.3	18.0	<0.0001	52,812
Service-connected disability	4,082	54.3	28,499	62.6	187.5	<0.0001	53,034
Number of Elixhauser comorbidities							
0	3,933	52.3	21,474	47.2	81.5	<0.0001	53,034
1	1,797	23.9	11,309	24.9			
2	984	13.1	6,801	14.9			
≥3	802	10.7	5,934	13.0			
Homeless	758	10.1	2,017	4.4	415.9	<0.0001	53,034
PTSD	2,254	30.0	10,455	23.0	174.5	<0.0001	53,034
Anxiety disorder	2,090	27.8	10,952	24.1	48.8	<0.0001	53,034
Facility							
VAMC	4,348	57.9	23,287	51.2	117.1	<0.0001	53,012
CBOC	2,770	36.9	19,564	43.0			
Other	392	5.2	2,651	5.8			
Distance from treatment facility							
≤30 miles	6,096	81.8	37,581	83.1	8.3	0.004	52,666
>30 miles	1,359	18.2	7,630	16.9			

<sup>a</sup> CBOC=community-based outpatient clinic; PTSD=posttraumatic stress disorder; VAMC=Veterans Administration Medical Center.

specialty clinics (3.5% of psychotherapy [N=83], 2.5% of antidepressants [N=102]) or other clinics (6.9% of psychotherapy [N=163], 6.6% of antidepressants [N=265]). Patient characteristics by substance use disorder status are summarized in Table 1 for all covariates. In brief, patients with substance use disorders were slightly younger on average and were more likely to be male, Black, homeless, and have comorbid psychiatric conditions. Those without a comorbid substance use disorder were more likely to have a service-connected disability, have more comorbid medical conditions, and live in a rural area.

Table 2 presents the results of the multivariate logistic regression models for guideline-concordant depression treatment for patients with and without substance use disorders. Figure 2 shows the covariate-adjusted results by specific substance use disorders (see also Table S1 in the online supplement). Patients with substance use disorders had lower odds of receiving guideline-concordant care, including lower odds of receiving adequate acute and continuation phases of antidepressant and psychotherapy

treatment (antidepressant: acute phase, adjusted odds ratio=0.79, 95% CI=0.73, 0.84,  $p<0.001$ ; continuation phase, adjusted odds ratio=0.74, 95% CI=0.69, 0.79,  $p<0.001$ ; psychotherapy: acute phase, adjusted odds ratio=0.87, 95% CI=0.82, 0.91,  $p<0.001$ ; continuation phase, adjusted odds ratio=0.81, 95% CI=0.73, 0.89,  $p<0.001$ ).

The lower odds of guideline-concordant care correspond to 21% lower odds of receiving acute antidepressant treatment, 13% lower odds of initial psychotherapy treatment, 26% lower odds of adequate continuation of antidepressants and 19% lower odds of continuation of psychotherapy. Based on the predicted probabilities of receipt of guideline-concordant depression treatment, an estimated 55% of people with comorbid substance use, compared with 61% without, received adequate acute antidepressant treatment and 27% of people with comorbid substance use disorders, compared with 29% without, received initial psychotherapy. With regard to continuation of treatment, 33% of people with comorbid substance use, compared with 40% without, received adequate continuation of antidepressants and 22% of

**TABLE 2. Model-adjusted depression treatment among those with and without substance use disorders in a Veterans Health Administration cohort<sup>a</sup>**

Variable	Antidepressants				Psychotherapy for Depression			
	Acute Phase (N=27,813)		Continuation Phase (N=27,813)		Acute Phase (N=52,455)		Continuation Phase (N=18,318)	
	Adjusted Odds Ratio	95% CI	Adjusted Odds Ratio	95% CI	Adjusted Odds Ratio	95% CI	Adjusted Odds Ratio	95% CI
Substance use disorder	0.79***	0.73, 0.84	0.74***	0.69, 0.79	0.87***	0.82, 0.91	0.81***	0.73, 0.89
Age ≥65 years (ref: 18–64 years)	0.97	0.90, 1.04	1.03	0.96, 1.11	0.75***	0.71, 0.79	0.94	0.86, 1.03
Gender (ref: male)	1.13***	1.06, 1.21	1.12***	1.05, 1.19	1.08**	1.03, 1.13	1.20***	1.10, 1.30
Race (ref: White)								
American Indian/Alaskan Native	0.74*	0.57, 0.95	0.87	0.67, 1.11	0.90	0.74, 1.09	0.98	0.70, 1.36
Asian/Pacific Islander/Native Hawaiian	0.89	0.76, 1.04	0.85*	0.73, 0.98	1.02	0.91, 1.14	1.00	0.83, 1.22
Black	0.53***	0.50, 0.56	0.50***	0.47, 0.53	1.09***	1.04, 1.14	0.86***	0.80, 0.93
Multiracial	0.71**	0.58, 0.89	0.82	0.66, 1.01	1.15	0.98, 1.36	0.88	0.67, 1.16
Unknown	0.79***	0.71, 0.88	0.69***	0.63, 0.77	0.83***	0.77, 0.90	0.89	0.78, 1.02
Hispanic	0.74***	0.68, 0.80	0.78***	0.72, 0.85	1.10**	1.03, 1.17	0.88*	0.79–0.99
Elixhauser score								
1 vs. 0 comorbidities	1.10**	1.04, 1.17	1.15***	1.08, 1.22	0.91***	0.87, 0.95	0.98	0.91, 1.06
2 vs. 0 comorbidities	1.09*	1.00, 1.18	1.16***	1.07, 1.25	0.98	0.93, 1.04	1.08	0.98, 1.18
≥3 vs. 0 comorbidities	1.18***	1.08, 1.30	1.30***	1.19, 1.41	0.99	0.93, 1.05	0.99	0.89, 1.10
Geographic locality (ref: urban)	1.10**	1.03, 1.17	1.10**	1.04, 1.17	0.99	0.95, 1.04	1.01	0.94, 1.10
Service-connected disability	1.03	0.97, 1.08	1.03	0.98, 1.09	1.01	0.97, 1.05	1.06	0.99, 1.13
Homeless	0.75***	0.67, 0.84	0.69***	0.62, 0.78	1.05	0.97, 1.14	0.93	0.81–1.07
PTSD	0.99	0.93, 1.04	1.01	0.96, 1.07	0.47***	0.45, 0.50	0.77***	0.70–0.84
Anxiety disorder	1.02	0.97, 1.08	1.07*	1.01, 1.13	0.97	0.93, 1.01	0.81***	0.75, 0.87
Facility								
CBOC vs. VAMC	1.19***	1.13, 1.25	1.16***	1.10, 1.22	0.99	0.95, 1.03	0.97	0.91, 1.04
Other vs. VAMC	1.05	0.94, 1.17	1.07	0.96, 1.19	1.17***	1.08, 1.26	0.87*	0.76, 0.99
Distance >30 miles (ref: ≤30)	1.07	1.00, 1.15	1.01	0.94, 1.08	0.81***	0.76, 0.85	0.78***	0.71, 0.86

<sup>a</sup> Patients were included in the models for adequate acute and continuation phase antidepressant treatment if they received an index antidepressant prescription (N=27,813 with complete data). All participants, after listwise deletion of missing data, were included in the acute phase psychotherapy model (N=52,455), which required only a single therapy session. The continuation phase psychotherapy model included only those patients with an index therapy session (N=18,318 with complete data). CBOC=community-based outpatient clinic; PTSD=posttraumatic stress disorder; VAMC=Veterans Administration Medical Center.

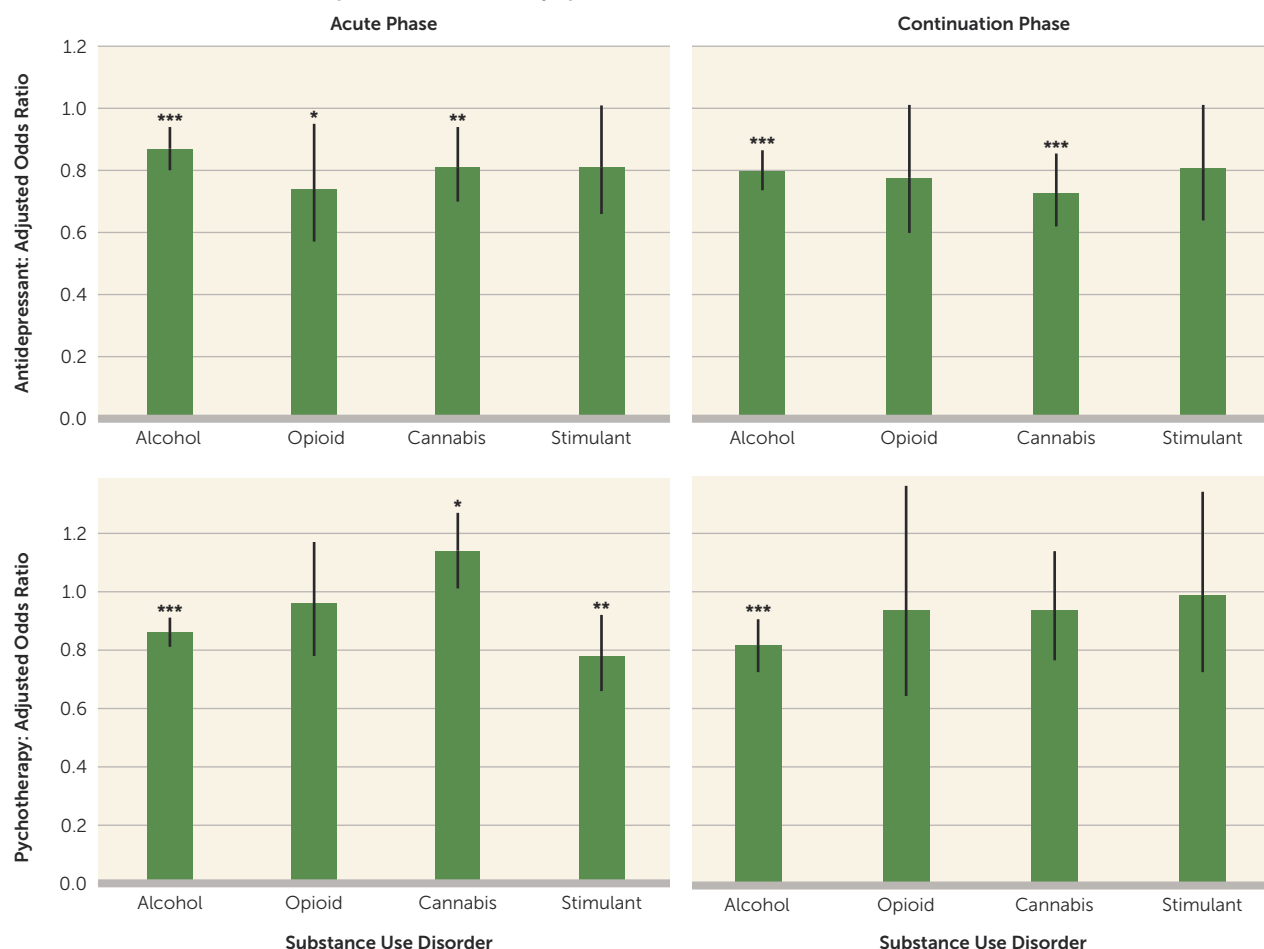
\* $p < 0.05$ . \*\* $p < 0.01$ . \*\*\* $p < 0.001$ .

people with substance use disorders, compared with 25% without, received adequate continuation of psychotherapy.

Lower-quality depression care was evident across multiple specific substance use disorders. Alcohol (adjusted odds ratio=0.87, 95% CI=0.80, 0.94,  $p < 0.001$ ), opioid (adjusted odds ratio=0.74, 95% CI=0.57, 0.95,  $p < 0.05$ ), and cannabis use disorders (adjusted odds ratio=0.81, 95% CI=0.70, 0.94,  $p < 0.01$ ) were all associated with lower odds of adequate acute-phase antidepressant treatment. Alcohol (adjusted odds ratio=0.81, 95% CI=0.75, 0.88,  $p < 0.001$ ) and cannabis (adjusted odds ratio=0.74, 95% CI=0.63, 0.87,  $p < 0.001$ ) use disorders were also associated with significantly lower odds of adequate continuation of antidepressants. Similarly, alcohol (adjusted odds ratio=0.86, 95% CI=0.81, 0.91,  $p < 0.001$ ), cocaine (adjusted odds ratio=0.78, 95% CI=0.66, 0.92,  $p < 0.01$ ), and other substance use disorders (adjusted odds ratio=0.71, 95% CI=0.56, 0.89,  $p < 0.01$ ) were associated with

lower odds of an initial psychotherapy session for depression. Only veterans with alcohol use disorders (adjusted odds ratio=0.81, 95% CI=0.72, 0.90,  $p < 0.001$ ) were at lower odds of adequate continuation of psychotherapy for depression. Cannabis use disorder diagnosis was associated with slightly higher odds of psychotherapy for depression (adjusted odds ratio=1.14, 95% CI=1.01, 1.27,  $p < 0.05$ ). In a sensitivity analysis where psychotherapy sessions were defined broadly, regardless of the treatment target, there was no detected difference in the acute phase but lower odds of continuation of psychotherapy (adjusted odds ratio=0.89, 95% CI=0.82, 0.96,  $p < 0.01$ ) among patients with a substance use disorder compared with those without a substance use disorder (see Table S2 in the online supplement).

Several demographic characteristics, psychiatric and medical comorbidities, and contextual factors were also associated with lower odds of receiving guideline-concordant

**FIGURE 2. Guideline-concordant depression treatment by specific substance use disorders in a Veterans Health Administration cohort<sup>a</sup>**

<sup>a</sup> The graphs show covariate-adjusted odds ratios and 95% confidence intervals for receiving acute and continuation phases of depression treatment by substance use disorder. The adjusted odds ratios for each substance use disorder are based on a comparison to those without the specific substance use disorder. Asterisks indicate a significant difference between those with the substance use disorder and those without the substance use disorder.

\*p < 0.05. \*\*p < 0.01. \*\*\*p < 0.001.

depression treatment (see Table 2). In general, racial and ethnic minorities and those experiencing homelessness had lower odds of receiving guideline-concordant antidepressant treatment. Those from rural areas and those with medical comorbidities, as measured by the Elixhauser score, had higher odds of adequate antidepressant treatment. Those with additional psychiatric comorbidities (i.e., PTSD or anxiety disorders) and those who lived farther away from a health care facility had lower odds of receiving adequate psychotherapy.

## DISCUSSION

In this large national sample, we found that patients with comorbid depression and substance use disorders receive lower quality care than those with depression but without substance use disorders. After accounting for demographic, medical, psychiatric, and contextual factors, we found that patients with substance use disorders had lower odds of

adequate acute-phase treatment (21% and 13% lower for antidepressant and psychotherapy, respectively) and lower odds of adequate continuation of treatment (26% and 19% lower for antidepressant and psychotherapy, respectively) for depression. Despite having higher overall health care utilization, patients with substance use disorders still received less guideline-concordant care for depression. These results are consistent with previous work showing lower rates of any depression treatment among patients with comorbid substance use disorders (32), including less guideline-concordant antidepressant treatment (45). By assessing both antidepressant medications and psychotherapy for depression, we found that psychotherapy does not account for the lower utilization of medication-based interventions among patients with comorbid substance use. Indeed, receipt of guideline-concordant antidepressant and psychotherapy treatments is consistently lower across depression care metrics among those with comorbid substance use disorders. Although the magnitude of difference (approximately 20% lower odds)



may seem modest, both depression and substance use disorders are highly prevalent, such that even modest differences amount to large numbers of individuals. These findings highlight the opportunity for increased depression treatment across both treatment modalities for those with substance use disorders to achieve guideline-concordant care.

Increased identification of those in need of treatment through universal screenings, the establishment of clinical practice guidelines, and development of quality metrics for care have led to substantial progress in depression care (22, 23, 33, 46). Nonetheless, depression remains vastly undertreated (16, 46), with observed rates of guideline-concordant depression care in the present study ranging from 66.2% of patients without substance use disorders receiving adequate acute-phase antidepressant treatment to 32.2% of these patients receiving adequate continuation of psychotherapy. The unmet treatment need is even greater among those with co-occurring substance use disorders. Substance use disorders and depression affect each other bidirectionally (47, 48) and are most effectively treated concurrently (18, 49, 50). Meta-analytic work has shown that receipt of high-quality depression care improves depression outcomes across different substance use disorders (23, 34). The most improvement from treating depression (i.e., the largest effects) is seen in patients with co-occurring alcohol use disorders (23). Despite this evidence of improved outcomes with depression treatment, we found markedly lower odds of depression treatment for those with co-occurring alcohol use disorder and depression (see Figure 2).

Inequity in guideline-concordant care is likely related to multiple factors, including both patient and structural barriers. Patients with co-occurring depression and substance use disorder often suffer from complex psychological presentations characterized by multiple symptoms, such as reduced motivation, low energy, impaired cognition, and disorganization, as well as continued use or relapse to substance use. These symptoms, in addition to experiencing stigma related to both depression and substance use disorders, can impede a patient's ability to engage with treatment plans and can lead to lower treatment retention (51–53). Barriers to retention are well documented in treatments for substance use disorders (54, 55) and may be captured in part by the lower rates of depression treatment continuation among patients with comorbid substance use disorders. As these patients may be more likely to drop out or be non-adherent with treatment, interventions are needed that target improved treatment retention and/or reduce barriers to treatment, such as telemedicine, especially for high-risk patients, such as those with co-occurring substance use and mental health disorders. Of note, individuals with co-occurring depression and substance use disorders report more unmet need for mental health services than those without substance use disorders despite receiving higher rates of mental health services in general, including both psychotherapy and medication (56). Receipt of less guideline-concordant depression

treatment in those with co-occurring depression and substance use disorders may paradoxically contribute to greater mental health utilization as a result of receiving inadequate or piecemeal services that fail to achieve treatment goals, resulting in a continued need for care.

Structural barriers contribute to inequality of depression treatment for those with substance use disorders, including barriers related to the availability of depression treatment and how depression care is provided in both substance use disorder specialty and other settings (57). Insufficient provider training in the assessment and treatment of complex presentations, such as patients with comorbid depression and substance use disorders, may contribute to inaccurate beliefs and stigmas, an inability to accurately identify co-occurring disorders (58–60), a lack of awareness of appropriate referral sources (61, 62), and a lack of preparedness to treat co-occurring disorders (63). For example, among medical residents, approximately 1 in 10 report feeling unprepared to treat patients with substance use disorder and/or depression (63). Lack of training may lead to contraindicated treatment plans, such as stipulations that patients complete substance use disorder treatment and achieve a period of abstinence before addressing depression, limiting access to guideline-concordant depression treatment for patients with substance use disorders. Training, targeted feedback, and facilitation strategies for providers to reduce stigma, correct inaccurate beliefs, and increase awareness of best practices for co-occurring substance use disorders and depression are needed to improve the provision of depression treatment.

Institutional barriers, such as factors that systematically impair access for certain groups of patients, also contribute to disparities in depression treatment for those with substance use disorders. Organizational configuration in health care settings may be a barrier to concurrent treatment of depression and substance use disorders. Disorder-specific clinics (e.g., substance use disorder specialty clinics) can make it challenging to integrate treatment approaches. Previous work found antidepressant treatment predominantly in primary care for those with co-occurring depression and alcohol use (58), and we find that antidepressant treatment, as well as psychotherapy, is also often provided in mental health and integrated primary care and mental health clinics.

To maximize improvements in depression care for the sizable number of patients with comorbid substance use disorders, efforts must target general mental health and integrated primary care and mental health clinics, because these settings have much more expertise in behavioral health (compared with primary care) and are where many of these patients are being seen. However, historically, clinicians in these clinics have reported a lack of comfort in addressing the needs of patients with substance use disorders without additional training (64). One potential model for improvement is care management, which facilitates patient care with structured coordination and communication between treating providers and improves depression treatment outcomes in general (60), with initial evidence that specifically designed

collaborative care models improve outcomes for those with substance use disorders and depression (61). Noteworthy barriers to scalable collaborative care models, particularly outside of the VHA, include insufficient reimbursement for care management services that are needed to facilitate effective treatment across disorders and specialties (60) and ongoing concerns about the cost-effectiveness of these models. Collaborative care models identify unmet treatment needs, lead to additional service provision, and thus require large up-front costs for downstream improvements in overall health and subsequent service utilization reductions (61). At the same time, depression-specific treatment should also be further enhanced in existing substance use specialty settings and dual-diagnosis clinics specializing in depression and substance use disorders, similar to the integrated PTSD and substance use disorder clinic model currently available in the VHA system.

Several characteristics other than co-occurring substance use disorders were also associated with quality depression treatment. Consistent with findings from previous work on initiation of depression treatment in primary care mental health integration clinics (65), we found that patients who were younger and female had higher odds of guideline-concordant depression treatment, across medication or psychotherapy modalities. Lower odds of psychotherapy but not antidepressants were observed for patients with co-occurring psychiatric disorders and those living farther from a health care treatment setting. People living in more rural settings, farther from medical centers, may experience fewer barriers to medication-based treatments, which are frequently received from general medicine providers, than psychotherapy, which may require access to specialty mental health providers and require burdensome frequent office visits. Nearly all racial and ethnic minority groups were less likely to receive adequate medication-based treatment. This relationship was most pronounced among those identifying as Black, who were half as likely to receive guideline-concordant antidepressant treatment compared with individuals who identified as White. This pattern may be due in part to patient preference (64, 65) but is likely compounded by less frequent assessment and less treatment of co-occurring mental health problems among marginalized groups (59–63).

Our study has several limitations. First, the sample is limited to veterans in care within the VHA system, which may limit the generalizability of our findings. However, the VHA is the largest single health care provider in the United States, and it offers a granular look at services rendered otherwise unavailable through any other health care data set. Second, this analysis does not include services received outside the VHA system (e.g., through a community health care setting). Third, the sample selection criteria (i.e., new depression diagnosis in fiscal year 2017 and a positive PHQ depression screen within 30 days of the diagnosis) may limit the generalizability of findings to the degree that these criteria may not capture some people with depression (e.g., preexisting diagnosis, noncompletion of depression screen). Fourth,

although the indicators of adequate acute and continuation phases of care are the most often used measures of the quality of depression care, they do not encapsulate all features relevant to high-quality depression care.

In summary, our study of patients in a national health care system indicates a treatment gap in guideline-concordant depression treatment among those with substance use disorders compared with those without. Future research should focus on ways to increase delivery of empirically supported depression treatment to patients with substance use disorders, including targeted interventions for patients and clinicians and implementation of care models to reduce barriers for concurrent treatment. Together, these strategies will promote more equitable provision of medication and therapy for patients with depression, including those with substance use disorders.

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## REFERENCES

1. Lai HMX, Cleary M, Sitharthan T, et al: Prevalence of comorbid substance use, anxiety, and mood disorders in epidemiological surveys, 1990–2014: a systematic review and meta-analysis. *Drug Alcohol Depend* 2015; 154:1–13
2. Kessler RC, Berglund P, Demler O, et al: The epidemiology of major depressive disorder: results from the National Comorbidity Survey Replication (NCS-R). *JAMA* 2003; 289:3095–3105
3. Davis LL, Frazier E, Husain MM, et al: Substance use disorder comorbidity in major depressive disorder: a confirmatory analysis of the STAR\*D cohort. *Am J Addict* 2006; 15:278–285
4. Zimmerman M, Chelminski I, McDermet W: Major depressive disorder and axis I diagnostic comorbidity. *J Clin Psychiatry* 2002; 63:187–193
5. Mueller TI, Lavori PW, Keller MB, et al: Prognostic effect of the variable course of alcoholism on the 10-year course of depression. *Am J Psychiatry* 1994; 151:701–706
6. Hasin D, Liu X, Nunes E, et al: Effects of major depression on remission and relapse of substance dependence. *Arch Gen Psychiatry* 2002; 59:375–380
7. Greenfield SF, Weiss RD, Muenz LR, et al: The effect of depression on return to drinking: a prospective study. *Arch Gen Psychiatry* 1998; 55:259–265
8. Conner KR, Pinquart M, Duberstein PR: Meta-analysis of depression and substance use and impairment among intravenous drug users (IDUs). *Addiction* 2008; 103:524–534
9. Conner KR, Pinquart M, Gamble SA: Meta-analysis of depression and substance use among individuals with alcohol use disorders. *J Subst Abuse Treat* 2009; 37:127–137



10. Davis LL, Rush JA, Wisniewski SR, et al: Substance use disorder comorbidity in major depressive disorder: an exploratory analysis of the Sequenced Treatment Alternatives to Relieve Depression cohort. *Compr Psychiatry* 2005; 46:81–89
11. Sher L, Oquendo MA, Galfalvy HC, et al: The relationship of aggression to suicidal behavior in depressed patients with a history of alcoholism. *Addict Behav* 2005; 30:1144–1153
12. Murphy GE, Wetzel RD, Robins E, et al: Multiple risk factors predict suicide in alcoholism. *Arch Gen Psychiatry* 1992; 49:459–463
13. Cornelius JR, Salloum IM, Mezzich J, et al: Disproportionate suicidality in patients with comorbid major depression and alcoholism. *Am J Psychiatry* 1995; 152:358–364
14. Bohnert ASB, Ilgen MA, Ignacio RV, et al: Risk of death from accidental overdose associated with psychiatric and substance use disorders. *Am J Psychiatry* 2012; 169:64–70
15. Trivedi RB, Post EP, Piegari R, et al: Mortality among veterans with major mental illnesses seen in primary care: results of a national study of veteran deaths. *J Gen Intern Med* 2020; 35:112–118
16. Substance Abuse and Mental Health Services Administration: Key Substance Use and Mental Health Indicators in the United States: Results From the 2017 National Survey on Drug Use and Health (HHS Publication No SMA 18-5068, NSDUH Series H-53). Rockville, Md, Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality, 2018
17. Institute of Medicine, Committee on Quality of Health Care in America: Crossing the Quality Chasm: A New Health System for the 21st Century. Washington, DC, National Academies Press, 2014
18. Watkins KE, Hunter SB, Burnam MA, et al: Review of treatment recommendations for persons with a co-occurring affective or anxiety and substance use disorder. *Psychiatr Serv* 2005; 56:913–926
19. Rosenthal RN: Basic treatment techniques for persons with mental disorders and co-occurring substance use disorders, in *Handbook of Community Psychiatry*. Edited by McQuistion HL, Sowers WE, Ranz JM, et al. New York, Springer, 2012, pp 257–273 ([http://dx.doi.org/10.1007/978-1-4614-3149-7\\_22](http://dx.doi.org/10.1007/978-1-4614-3149-7_22))
20. Carey TL: Use of antidepressants in patients with co-occurring depression and substance use disorders. *Handb Exp Pharmacol* 2019; 250:359–370
21. Whooley MA, Simon GE: Managing depression in medical outpatients. *N Engl J Med* 2000; 343:1942–1950
22. Agosti V, Levin FR: The effects of alcohol and drug dependence on the course of depression. *Am J Addict* 2006; 15:71–75
23. Nunes EV, Levin FR: Treatment of depression in patients with alcohol or other drug dependence: a meta-analysis. *JAMA* 2004; 291:1887–1896
24. Foulds JA, Adamson SJ, Boden JM, et al: Depression in patients with alcohol use disorders: systematic review and meta-analysis of outcomes for independent and substance-induced disorders. *J Affect Disord* 2015; 185:47–59
25. Hesse M: Achieving abstinence by treating depression in the presence of substance-use disorders. *Addict Behav* 2004; 29:1137–1141
26. Torrens M, Fonseca F, Mateu G, et al: Efficacy of antidepressants in substance use disorders with and without comorbid depression: a systematic review and meta-analysis. *Drug Alcohol Depend* 2005; 78:1–22
27. Qaseem A, Barry MJ, Kansagara D, Clinical Guidelines Committee of the American College of Physicians: Nonpharmacologic versus pharmacologic treatment of adult patients with major depressive disorder: a clinical practice guideline from the American College of Physicians. *Ann Intern Med* 2016; 164:350–359
28. Management of Major Depressive Disorder Working Group: VA/DoD Clinical Practice Guideline for the Management of Major Depressive Disorder. Washington, DC, US Department of Veterans Affairs, US Department of Defense, 2016 (<https://www.health-quality.va.gov/guidelines/MH/mdd/>)
29. Nutting PA, Rost K, Dickinson M, et al: Barriers to initiating depression treatment in primary care practice. *J Gen Intern Med* 2002; 17:103–111
30. Rost K, Nutting P, Smith J, et al: The role of competing demands in the treatment provided primary care patients with major depression. *Arch Fam Med* 2000; 9:150–154
31. DeVido JJ, Weiss RD: Treatment of the depressed alcoholic patient. *Curr Psychiatry Rep* 2012; 14:610–618
32. Han B, Olsson M, Mojtabai R: Depression care among adults with co-occurring major depressive episodes and substance use disorders in the United States. *J Psychiatr Res* 2017; 91:47–56
33. National Committee for Quality Assurance: HEDIS: Healthcare Effectiveness Data and Information Set: Technical Specifications for Physician Measurement. Washington, DC, National Committee for Quality Assurance, 2009
34. Hesse M: Integrated psychological treatment for substance use and co-morbid anxiety or depression vs treatment for substance use alone: a systematic review of the published literature. *BMC Psychiatry* 2009; 9:6
35. Levine DS, McCarthy JF, Cornwell B, et al: Primary care-mental health integration in the VA health system: associations between provider staffing and quality of depression care. *Psychiatr Serv* 2017; 68:476–481
36. Pfeiffer PN, Glass J, Austin K, et al: Impact of distance and facility of initial diagnosis on depression treatment. *Health Serv Res* 2011; 46:768–786
37. Pfeiffer PN, Ganoczy D, Bowersox NW, et al: Depression care following psychiatric hospitalization in the Veterans Health Administration. *Am J Manag Care* 2011; 17:e358–e364
38. LePage JP, Bradshaw LD, Cipher DJ, et al: The effects of homelessness on veterans' health care service use: an evaluation of independence from comorbidities. *Public Health* 2014; 128:985–992
39. Gabrielian S, Yuan AH, Andersen RM, et al: VA health service utilization for homeless and low-income veterans: a spotlight on the VA Supportive Housing (VASH) program in greater Los Angeles. *Med Care* 2014; 52:454–461
40. Maynard C, Batten A, Liu C-F, et al: The burden of mental illness among veterans: use of VHA Health Care services by those with service-connected conditions. *Med Care* 2017; 55:965–969
41. Quan H, Sundararajan V, Halfon P, et al: Coding algorithms for defining comorbidities in ICD-9-CM and ICD-10 administrative data. *Med Care* 2005; 43:1130–1139
42. van Walraven C, Austin PC, Jennings A, et al: A modification of the Elixhauser comorbidity measures into a point system for hospital death using administrative data. *Med Care* 2009; 47:626–633
43. Menendez ME, Neuhaus V, van Dijk CN, et al: The Elixhauser comorbidity method outperforms the Charlson index in predicting inpatient death after orthopaedic surgery. *Clin Orthop Relat Res* 2014; 472:2878–2886
44. SAS Institute: SAS/ACCESS 9.4 Interface to ADABAS: Reference. Cary, NC, SAS Institute, 2013
45. Jordan N, Sohn M-W, Bartle B, et al: Association between chronic illness complexity and receipt of evidence-based depression care. *Med Care* 2014; 52(suppl 3):S126–S131
46. Mojtabai R: Unmet need for treatment of major depression in the United States. *Psychiatr Serv* 2009; 60:297–305
47. Blanco C, Alegria AA, Liu S-M, et al: Differences among major depressive disorder with and without co-occurring substance use disorders and substance-induced depressive disorder: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *J Clin Psychiatry* 2012; 73:865–873
48. Mojtabai R, Chen L-Y, Kaufmann CN, et al: Comparing barriers to mental health treatment and substance use disorder treatment among individuals with comorbid major depression and substance use disorders. *J Subst Abuse Treat* 2014; 46:268–273

49. Pettinati HM, O'Brien CP, Dundon WD: Current status of co-occurring mood and substance use disorders: a new therapeutic target. *Am J Psychiatry* 2013; 170:23–30
50. Volkow ND: Personalizing the treatment of substance use disorders. *Am J Psychiatry* 2020; 177:113–116
51. Priester MA, Browne T, Iachini A, et al: Treatment access barriers and disparities among individuals with co-occurring mental health and substance use disorders: an integrative literature review. *J Subst Abuse Treat* 2016; 61:47–59
52. Drake RE, Morse G, Brunette MF, et al: Evolving US service model for patients with severe mental illness and co-occurring substance use disorder. *Acta Neuropsychiatr* 2004; 16:36–40
53. Palmer RS, Murphy MK, Piselli A, et al: Substance user treatment dropout from client and clinician perspectives: a pilot study. *Subst Use Misuse* 2009; 44:1021–1038
54. Dreifuss JA, Griffin ML, Frost K, et al: Patient characteristics associated with buprenorphine/naloxone treatment outcome for prescription opioid dependence: results from a multisite study. *Drug Alcohol Depend* 2013; 131:112–118
55. Morgan JR, Schackman BR, Leff JA, et al: Injectable naltrexone, oral naltrexone, and buprenorphine utilization and discontinuation among individuals treated for opioid use disorder in a United States commercially insured population. *J Subst Abuse Treat* 2018; 85: 90–96
56. Chen L-Y, Crum RM, Martins SS, et al: Service use and barriers to mental health care among adults with major depression and comorbid substance dependence. *Psychiatr Serv* 2013; 64: 863–870
57. Committee on Monitoring Access to Personal Health Care Services, Institute of Medicine: *Access to Health Care in America*. Washington, DC, National Academies Press, 1993
58. Hawkins EH: A tale of two systems: co-occurring mental health and substance abuse disorders treatment for adolescents. *Annu Rev Psychol* 2009; 60:197–227
59. Carey KB, Purnine DM, Maisto SA, et al: Treating substance abuse in the context of severe and persistent mental illness: clinicians' perspectives. *J Subst Abuse Treat* 2000; 19:189–198
60. Foster S, LeFauve C, Kresky-Wolff M, et al: Services and supports for individuals with co-occurring disorders and long-term homelessness. *J Behav Health Serv Res* 2010; 37:239–251
61. Sterling S, Weisner C, Hinman A, et al: Access to treatment for adolescents with substance use and co-occurring disorders: challenges and opportunities. *J Am Acad Child Adolesc Psychiatry* 2010; 49:637–646
62. Clark HW, Power AK, Le Fauve CE, et al: Policy and practice implications of epidemiological surveys on co-occurring mental and substance use disorders. *J Subst Abuse Treat* 2008; 34:3–13
63. Blumenthal D, Gokhale M, Campbell EG, et al: Preparedness for clinical practice: reports of graduating residents at academic health centers. *JAMA* 2001; 286:1027–1034
64. Zubkoff L, Shiner B, Watts BV: Staff perceptions of substance use disorder treatment in VA primary care-mental health integrated clinics. *J Subst Abuse Treat* 2016; 70:44–49
65. Szymanski BR, Bohnert KM, Zivin K, et al: Integrated care: treatment initiation following positive depression screens. *J Gen Intern Med* 2013; 28:346–352

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### Examination Questions: Coughlin et al.

1. **Best practices for people with co-occurring depression and substance use disorders recommend treating the disorders in what order?**
  - a. Sequentially, first treating the substance use disorder then the depressive disorder.
  - b. Sequentially, first treating the depressive disorder then the substance use disorder.
  - c. Concurrently, treating both disorders simultaneously.
  - d. Treatment depends on if the substance use or depression presented first.
2. **In what clinical setting do people with substance use disorder receive most of their depression treatment?**
  - a. Primary care clinics.
  - b. Mental health clinics.
  - c. Substance use clinics.
  - d. Hospital outpatient units.
3. **Compared with people with a depressive disorder but without a substance use disorder, those with a co-occurring substance use disorder were:**
  - a. More likely to receive psychotherapy for depression but less likely to receive medication for depression.
  - b. More likely to receive either psychotherapy or medication for depression.
  - c. Less likely to receive either psychotherapy or medication for depression.
  - d. Less likely to receive psychotherapy for depression but more likely to receive medication for depression.