

**The Provision of Mental Health Treatment after Screening: Exploring the Relationship  
between Treatment Setting and Treatment Intensity**

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Disclaimer: This is the authors' work and does not necessarily represent the views of the Department of Veterans Affairs or the VA Office of Quality, Safety, and Value.

**Acknowledgements:** This work was funded, in part, by the VA New England Veterans Engineering Resource Center. Dr. Shiner's time was funded through the VA New England Early Career Development Award Program (V1CDA2010-03). We would like to thank Sett Paing Oo, Lazaro Rodriguez, and Evren Simsek for their assistance.

## **ABSTRACT**

**Objective:** Primary care screening programs for mental health disorders are designed to detect patients who might benefit from treatment. As such, the utility of these programs is predicated on the actions that take place in response to a positive screen. Our objective was to characterize the cascade of care delivery steps following a positive screen for a mental health disorder.

**Method:** We examined the care received by primary care patients over the year following a new positive screen for depression, posttraumatic stress disorder (PTSD) or alcohol misuse. We characterized whether the care adhered to practice guidelines for related mental health disorders and whether involvement of mental health specialists led to higher use of guideline-adherent practices.

**Results:** Many patients received appropriate treatment in the primary care setting and those whose scores were consistent with more severe illness were more likely to receive care in a mental health setting. Patients with positive screens for depression and PTSD who went on to be seen in mental health clinics received care that was consistent with treatment guidelines for the related disorder most of the time. In the case of patients with positive screens for alcohol misuse, few received guideline-recommended medications in any setting. However, a substantial portion of patients received some alcohol-related counselling from their primary care physicians during the visit in which their alcohol misuse was detected.

**Conclusion:** It appears that the treatment system for mental health problems, which extends from primary care settings to mental health subspecialty settings, can provide adequate care when patients' mental health problems are identified through screening. The care provided in all settings

## INTRODUCTION

Mental health disorders are common and result in considerable distress and disability [1,2]. While effective treatments for mental health disorders have been developed, evidence suggests that patients who could benefit often go untreated [3,4]. Screening for mental health disorders has been proposed as a method to identify additional patients who might benefit from treatment. However, the use of mental health screening is controversial. The United States Preventive Services Task Force (USPSTF) is a panel of health care experts that makes evidence-based recommendations for mental health screening programs. Reviews by the USPSTF have found only equivocal evidence to support some mental health screening programs. For example, the USPSTF currently recommends screening for alcohol misuse and depression in primary care settings, but finds insufficient evidence to recommend screening for suicidal ideation in primary care settings and makes no statement regarding screening for posttraumatic stress disorder (PTSD) [5,6].

Because mental health screening recommendations have been limited, little is known about the likely result of screening in primary care settings. Furthermore, the overall recommendations for screening hinge on what actions are likely to be taken after screening [7]. For example, screening for depression receives a recommendation from the USPSTF only if “staff-assisted care supports” for depression are available [8]. These staff-assisted supports include nurse care managers and educational materials for primary care staff. In fact, the USPSTF specifically recommends against screening if these structures are not in place. While the seminal work in this area suggests that well-designed quality improvement activities can improve the post screening treatment of mental health disorders in primary care, these studies also acknowledge the often-lacking quality of treatment [9,10]. Other national bodies similarly recognize these limitations. The UK National Institutes for Health and Clinical Excellence recommends only targeted case finding in high-risk

populations, and the Canadian Task Force on Preventive Health Care recently reversed its recommendation for depression screening in primary care [11,12].

Despite the potential limitations of mental health screening in primary care, the Veterans Administration (VA) has instituted yearly primary care screening for depression, alcohol misuse and PTSD, given the high prevalence of mental health disorders among patients using VA health services [13]. We sought to understand practices in delivering treatment following mental health screening in primary care by examining a longitudinal cohort in detail. The only clinical rationale for screening for mental health disorders is to direct appropriate care to patients with mental health disorders. Therefore, we were interested in understanding the cascade of care delivery steps following a positive screen for a mental health disorder. Understanding steps in the delivery process could help improve the design of mental care delivery systems.

## **METHODS**

### **Setting**

This study was conducted at the White River Junction (WRJ) Veterans Affairs Medical Center (VAMC) in WRJ, Vermont, and was approved by the Dartmouth Center for Protection of Human Subjects. The WRJ VAMC is a comprehensive care hospital that provides a range of treatments for veterans' health needs including the provision of mental health services. Over the last decade, the hospital began routine screening for mental health disorders including depression, PTSD and alcohol misuse as part of national VA screening efforts. Adherence to screening protocols is closely monitored. By 2010, the year prior to our study, over 95% of patients treated at the WRJ VAMC received depression, alcohol misuse and PTSD screening at the required intervals.

The structure of the clinical services at the WRJ VAMC includes a primary care clinic, a specialized mental health clinic and a primary care mental health integration (PC-MHI) clinic [14], which is part of a national program that aims to improve mental health access to patients seen in primary care [15]. The PC-MHI clinic is located within the primary care clinic and offers intake and follow-up appointments with mental health staff. The appointments are on an advanced access model and typically involve a 15- to 30-minute wait [16]. Services provided in the integrated clinic include psychiatric consultation, psychotherapy and mental health case management.

### **Screening Tests**

We examined the results of three mental health screening tests administered yearly at the WRJ VAMC: The Patient Health Questionnaire-2 (PHQ-2) [17], the Primary Care-PTSD Screen (PC-PTSD) [18,19] and the Alcohol Use Disorders Identification Test Consumption Module (AUDIT-C) [20]. We used screening results as a population-based measure of disease burden rather than as a marker of definitive diagnosis. Because screening tests were applied in a standardized and routine manner across the population, we preferred this method of measuring disease burden to clinical diagnosis, which could vary by clinician.

The PHQ-2 is used to screen patients for depression. The test consists of two questions with total scores ranging from 0 to 6. This scale was developed and validated using the first two items of the Patient Health Questionnaire-9, which was administered to over 6000 patients in eight primary care clinics and seven obstetrics-gynaecology clinics [21]. These two items pertain to depressed mood and anhedonia in the last 2 weeks. As scores on the PHQ-2 increased from 0 to 6, functioning decreased and disability, physician visits and symptom-related difficulty increased [17]. Among a subsample of 580 patients who also underwent a structured interview by a mental health

professional, the scale had sensitivity of 83% and a specificity of 92% at the recommended cut point of 3 or higher.

The PC-PTSD screens for PTSD and consists of four “yes” or “no” questions about re-experiencing traumatic events, avoidance of traumatic reminders, physiologic hyperarousal and emotional numbness in the past month. Scores range from 0 to 4. In the validation study, 188 primary care patients at one VA medical center completed the PC-PTSD [18,19]. Compared to a structured diagnostic interview, the scale had a sensitivity of 78% and a specificity of 87% at the recommended cut point of 3 or higher.

Finally, the AUDIT-C identifies patients with alcohol use disorders using three questions, with total scores ranging from 0 to 12. This scale was validated using the first three items of the 10-item AUDIT, a component of a drinking practices questionnaire mailed to 2875 primary care patients from three VA hospitals [22]. These three items pertain to patterns of alcohol consumption over the prior year. Among a subsample of 243 men who also underwent a structured telephone interview about alcohol consumption, the likelihood of heavy drinking and alcohol abuse or dependence increased as scores increased from 3 to 8 [20]. At the recommended cut point of 4 in men, the instrument had a sensitivity of 86% and a specificity of 72% in identifying heavy drinking and/or alcohol abuse or dependence. The AUDIT-C was validated separately among a sample of 393 women veterans in one VA health system that completed both the AUDIT-C and a structured clinical interview [23]. At the recommended cut point of 3 in women, the instrument had a sensitivity of 60% and a specificity of 96% in identifying hazardous drinking and/or alcohol abuse or dependence.

## **Data Source**

We retrieved clinical, pharmacy and mental health screening data for WRJ VA patients from the VA Corporate Data Warehouse (CDW). In order to avoid including patients who may have already received treatment in the past, we identified patients with mental health problems that were newly identified through primary care screening. Therefore, our study population included the following: (1) patients treated at the WRJ VA; (2) patients who received mental health screening in primary care using the PHQ-2, PC-PTSD or AUDIT-C tests in 2011; and (3) patients who had no history of positive screens or mental health treatment in 2009 or 2010. For each patient meeting our inclusion criteria, we obtained 1 year of records starting at the date of the positive screen.

## **Scales Measuring Intensity of Treatment**

Medication and psychotherapy are the main modalities for treating mental health disorders. We expected that a portion of patients with positive mental health screens would receive one of these treatment modalities in the subsequent year. To evaluate treatment intensity for both modalities, we developed a standardized framework. Specifically, we designed ratings that evaluate the intensity of medication and psychotherapy treatment for each mental health disorder the screening program is designed to identify. These ratings are consistent with the highest (A-level) treatment recommendations from guidelines published by the VA and Department of Defense (DoD) for the treatment of each disorder [24–26]. For major depressive disorder (MDD) and PTSD, A-level treatment recommendations include both medications and psychotherapy, whereas no A-level psychotherapeutic interventions are listed for alcohol abuse and dependence in the VA/DoD Substance Use Disorder guidelines. However, there is an A-level recommendation for brief counselling for alcohol misuse by in the primary care setting. Because this counselling would typically occur during the course of a primary care visit, there was no reliable way to assess

whether this service is provided using administrative data. Therefore, we conducted a manual review of clinical notes on the day of positive alcohol screens in 50 randomly selected patients with positive screens for alcohol misuse to assess whether brief counselling was routinely provided following a positive screen. As our method to assess the provision of brief counselling was different than that used for other treatment modalities, brief counselling was not included in the treatment intensity ratings.

Table 1 lists the treatment intensity ratings used to assess whether patients who screened positive were provided with guideline-recommended treatment. For example, the medication column describes whether patients received an effective medication and whether patients were prescribed at least the minimum suggested dosage of medication for the guideline recommended duration.

The ratings range from 1 to 3, with 1 representing the receipt of an appropriate medication or psychotherapy, 2 representing an adequate amount of the treatment and 3 taking treatment duration into account. For a patient to be assigned a certain rating, the treatment he or she received has to satisfy the criteria for that rating and all lower ratings. For example, a patient with medication rating 3 received a guideline-recommended medication at an adequate total daily dosage for an adequate duration. In a similar fashion, the right column of Table 1 conveys the criteria for psychotherapy treatment intensity. Psychotherapy measures were designed to be consistent with VA performance measures for the provision of evidence-based treatment for depression and PTSD provided in the VA Mental Health Information System [27]. For both modalities, a rating of 3 represents the receipt of one or more adequate trials of guideline-recommended treatment. For this study, we considered all treatment provided in the year after a positive screen for any of the three disorders. Patients who screened positive for more than one mental health disorder were assigned



separate ratings for each disorder. We used pharmacy and outpatient data to track the treatments provided to patients and to assign ratings to individual patients.

Because patients can receive both medication and psychotherapy, we calculated separate ratings for each modality. In the case of depression and PTSD, results were combined for each patient to determine the highest treatment intensity across both modalities. Patients who screened positive for multiple disorders contributed to analyses for each disorder.

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Table 1: Treatment Intensity Rating Criteria

Rating	Medication Scale Definition	Psychotherapy Scale Definition
0	No Treatment	No Treatment
1	Any Psychiatric Medication	Any Individual Psychotherapy
2	Guideline-Recommended Medication	Session is 45 Minutes or Greater
3	Adequate Daily Dose	8 or More Sessions with Same Therapist
4	Adequate Duration	8 or More Sessions over 14 Weeks
5	2 or More Trials Rated 4 or Higher	2 or More Trials Rated 4 or Higher

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### **Assignment to Treatment Setting**

As we were interested in comparing the treatment provided in different settings, we categorized patients by the setting in which they received care. The WRJ VA has three distinct but interrelated clinical settings capable of providing mental health treatment: primary care, the PC-MHI clinic and specialty mental health care. Primary care included visits to primary care providers and associated staff. The PC-MHI clinic is a mental health clinic within a primary care clinic. It is physically located within the primary care clinic, but staffed by mental health providers to provide rapid access to patients who are referred from primary care. The specialty mental health clinic is

the traditional mental health service provider. It is staffed by a full range of mental health providers and is physically separate from the primary care clinic (although located on the same hospital campus).

We selected patients who were initially screened in primary care. These patients could ultimately transition from primary care to the integrated primary care-mental health clinic and finally to specialized mental health. As we were interested in the quality of care received at each clinic, we assigned patients to a clinic based on where they received the majority of their mental health care. We operationalized mental health utilization as visits linked to a mental health procedural code. Patients who completed no mental health visits were assigned to primary care. In order to assign patients to the clinic they utilized most, visits that included medication and psychotherapy were considered two separate visits. Patients who completed 75% or more of their mental health visits in one of the two mental health clinic settings were assigned to that setting for our analysis. Those patients who did not have 75% of mental health visits in any one setting were considered to be in the “combination” grouping in our analysis.

## **Analysis**

We provide basic descriptive statistics regarding the use of various treatments for the three disorders stratified by care setting. We compared scores on screening tests across the treatment settings using ANOVA and proceeding to pairwise t tests where we found significant differences. We compared the proportion of patients receiving treatments of varying quality across the treatment settings using chi-square and Fisher Exact Tests, beginning with omnibus tests and proceeding to pairwise tests where we found significant differences. We determined the likelihood of receiving mental health visits, receiving an adequate course of pharmacotherapy and receiving

an adequate course of psychotherapy as a function of scores on screening tests using logistic regression. All statistical analyses were completed in STATA (Version 12.0; College Station, TX, USA).

## **RESULTS**

Overall, 20,682 patients received primary care at the WRJ VAMC in 2011. Of that total, 3272 (16%) screened positive for one or more of the three mental health conditions and met the study inclusion criteria of not having had a positive screen or received mental health treatment in the prior two fiscal years. Of those patients with positive screens, 16% (n= 532) screened positive depression, 12% (n= 379) for PTSD and 84% (2,747) for alcohol misuse. These percentages include 10% (n= 325) that were positive for two or more disorders.

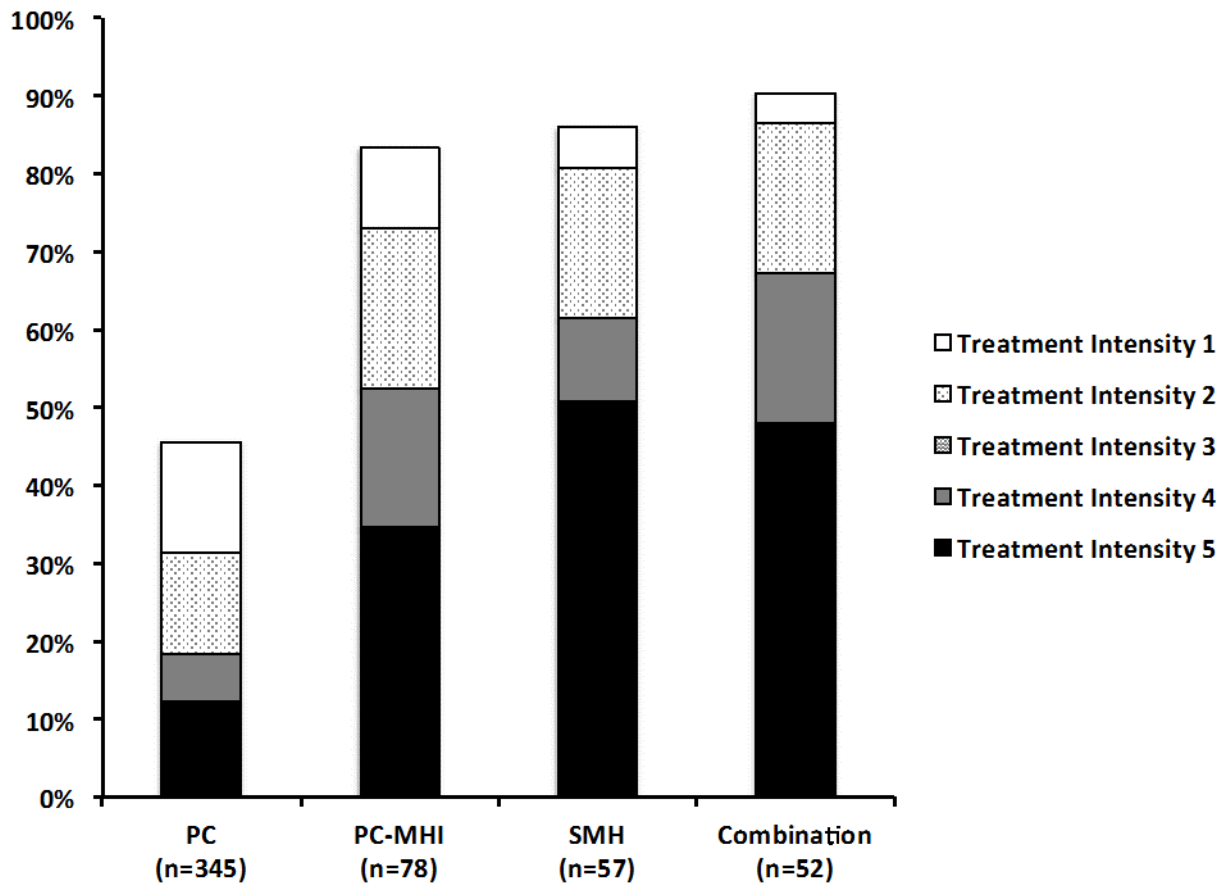
In the case of positive screens for depression and PTSD, most patients went on to receive some treatment. Of patients with positive depression screens, 54% went on to a treatment trial rated 1 or higher. Of patients with positive PTSD screens, 56% went on to a treatment trial rated 1 or higher. When patients with positive screens for depression received a single treatment modality, it was most commonly medication. Among patients with a positive depression screen, 27% received only medications and no sessions of psycho-therapy, while 6% received only psychotherapy and 21% received both modalities. When patients with positive screens for PTSD received a single treatment modality, it was most commonly psychotherapy. Among patients with a positive PTSD screen, 15% received only medications and no sessions of psychotherapy, while 17% received only psychotherapy and 25% received both modalities.

Several trends emerged in the treatment of patients screening positive for depression (Fig. 1). Most patients were seen in primary care only (65%). In this setting, just over 30% received any treatment

and less than 20% of patients received care with an intensity rating of 3, which reflects adequate depression treatment aligned with practice guidelines. In contrast, nearly all patients seen in either the PC-MHI clinic or the specialty mental health clinic received some treatment. In these settings, over half of these patients received adequate treatment aligned with practice guidelines. Screening PHQ-2 scores were not significantly different between patients seen only in primary care and those who went on to the PC-MHI setting (Table 2). However, PHQ-2 scores were significantly higher among patients who went on to receive most of their treatment in the specialized mental health setting, and those patients were significantly more likely to receive an adequate course of psychotherapy. Overall, a higher PHQ-2 score was a significant predictor of the receipt of any mental health visits, the receipt of an adequate course of medication and the receipt of an adequate course of psychotherapy (Table 3).

Patients screening positive for PTSD were more likely to be seen by a mental health provider than patients with depression, with less than half seen mainly in primary care (Fig. 2). In this setting, less than 20% received any treatment and 11% received care with an intensity rating of 3 (reflecting adequate treatment aligned with practice guidelines). Over 80% of patients with a positive PTSD screen who went on to one of the mental health settings received treatment, and about half received treatment aligned with practice guidelines. Patients who went on to receive care in one of the mental health settings had higher screening PC-PTSD scores (Table 2), and a higher PC-PTSD score was a significant predictor of the receipt of any mental health visits. Patients were most likely to receive an adequate course of psychotherapy when mental health treatment was focused in the SMH clinic. A higher PC-PTSD score was a significant predictor of receipt of any mental health visits, the receipt of an adequate course of medication and the receipt of an adequate course of psychotherapy (Table 3).

Figure 1: Medication Treatment Intensity for Patients with Positive Depression Screens

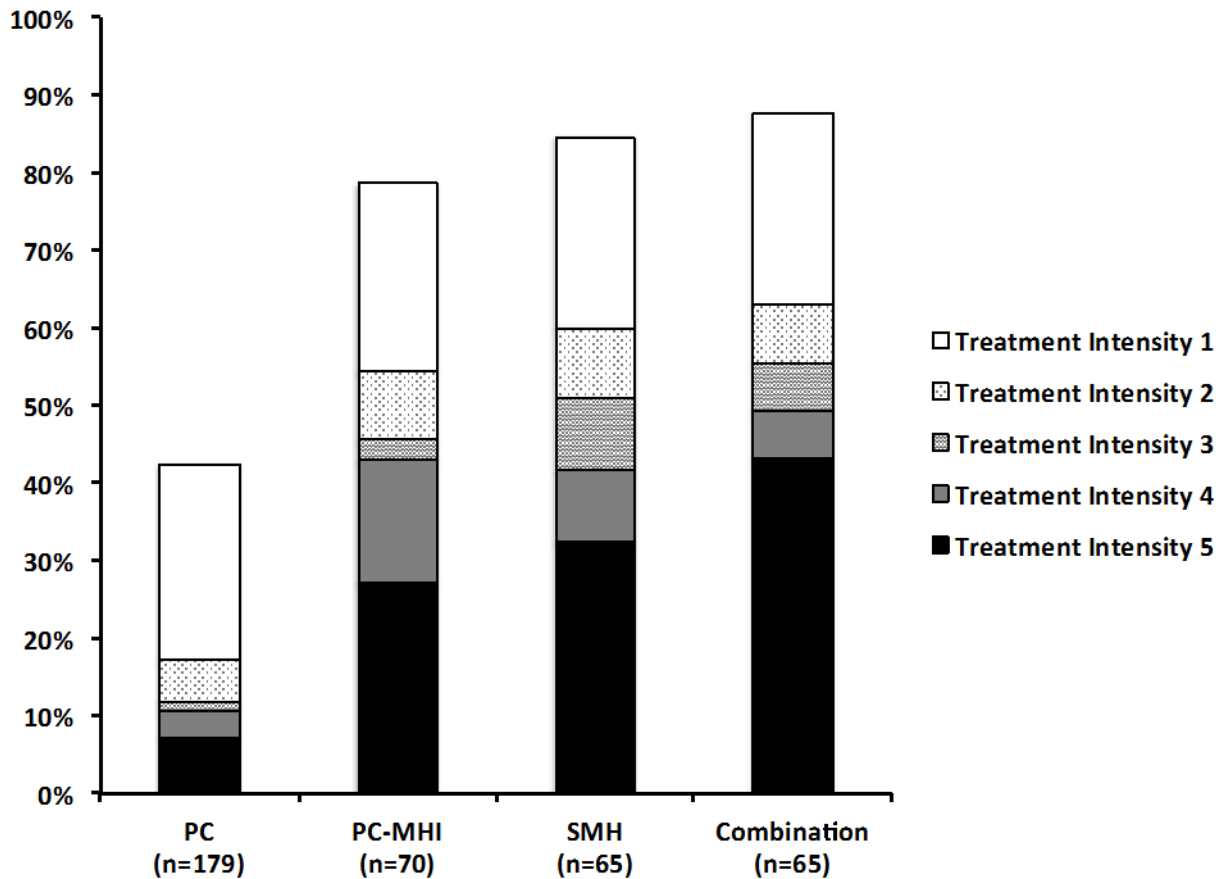


Note. PC = Primary Care, PC-MHI = Primary Care Mental Health Integration, SMH = Specialized Mental Health

Alcohol misuse was the problem most commonly identified through screening (n= 2747). Because we assessed medication provision using administrative data and used chart review to assess provision of brief counselling, we will address the two modalities separately. A total of 11 patients received a medication recommended by practice guidelines. All 11 prescriptions received a treatment intensity rating of 3, reflecting an adequate dose for an adequate duration. At least one patient received a prescription in each setting, although patients were more likely to receive a prescription in one of the mental health settings (Table 2). Patients who went on to receive care in

one of the mental health settings had significantly higher screening AUDIT-C scores, and a higher AUDIT-C score was a significant predictor of both being seen in a mental health setting and receiving pharmacologic treatment (Table 3).

Figure 2: Medication Treatment Intensity for Patients with Positive PTSD Screens



Note. PC = Primary Care, PC-MHI = Primary Care Mental Health Integration, SMH = Specialized Mental Health

**Table 2: Treatment Adequacy by Care Setting**

Positive Screen	PC	PC-MHI	SMH	Comb.	Pairwise Equivalence
Depression	345	78	57	52	
Adequate Medication	18% (63)	53% (41)	61% (35)	67% (35)	PC ≠ PC-MHI, SMH, Comb.
Adequate Psychotherapy	0% (0)	1% (1)	28% (16)	12% (6)	PC, PC-MHI ≠ SMH ≠ Comb.
Any Adequate Treatment	18% (63)	54% (42)	70% (40)	69% (36)	PC ≠ PC-MHI, SMH, Comb.
PTSD	179	70	65	65	
Adequate Medication	11% (19)	43% (30)	42% (27)	49% (32)	PC ≠ PC-MHI, SMH, Comb.
Adequate Psychotherapy	0% (0)	1% (1)	25% (16)	9% (6)	PC, PC-MHI ≠ SMH ≠ Comb.
Any Adequate Treatment	11% (19)	44% (31)	52% (34)	54% (35)	PC ≠ PC-MHI, SMH, Comb.
Alcohol Misuse	2498	110	80	59	
Adequate Medication	0% (1)	2% (2)	6% (5)	5% (3)	PC ≠ PC-MHI, SMH, Comb.

Note. PC = Primary Care, PC-MHI = Primary Care Mental Health Integration, SMH = Specialized Mental Health, Comb. = Combination. In the omnibus test, the four settings significantly differed with  $p < 0.0001$  on all measures. For each scale, the pairwise equivalence column indicates settings differed with  $p < 0.05$

**Table 3: Effect of baseline scores on mental health visits and treatment adequacy**

Predictor	Coefficient	S.E.	z	p	95% Confidence interval	
Receipt of any mental health visits						
PHQ-2	0.28	0.08	3.67	b.001	0.13	0.43
PC-PTSD	0.74	0.21	3.48	.001	0.32	1.16
AUDIT-C	0.39	0.03	13.32	b.001	0.33	0.45
Receipt of adequate medication for the related disorder						
PHQ-2	0.18	0.08	2.31	.021	0.03	0.33
PC-PTSD	0.42	0.24	1.96	.050	0.00	0.94
AUDIT-C	0.99	0.19	5.31	b.001	0.63	1.37
Receipt of adequate psychotherapy for the related disorder						
PHQ-2	0.32	0.18	1.78	.074	-0.03	0.68
PC-PTSD	1.18	0.56	2.11	.035	0.08	2.28

S.E.=standard error.

To assess the provision of brief counselling for alcohol misuse, we reviewed notes written on the day of a positive AUDIT-C screen for 50 randomly selected patients. Primary care clinicians documented the delivery of brief counselling in a total of 21 cases (42%). In this sample, there were no cases where other same-day services, such as use of the PC-MHI clinic, were used to address alcohol consumption.

## DISCUSSION

The treatment system generally responded rationally to new positive mental health screens in the primary care setting. Given the imperfect specificity of mental health screening tests, we would not expect nor would it be appropriate for all patients with positive results to receive mental health treatment. However, many patients received appropriate treatment in the primary care setting, and those whose scores were consistent with more severe illness were more likely to receive care in a mental health setting. Patients with positive screens for depression and PTSD who went on to be seen in mental health clinics received care that was consistent with treatment guidelines for the related disorder most of the time. In the case of patients with positive screens for alcohol misuse, few received guideline-recommended medications in any setting. However, 42% of patients received counselling from their primary care physicians during the visit in which their alcohol misuse was detected through the screening program.

Our findings are in one setting that is well resourced for mental health care and has a tradition of innovation in promoting access to these services [28]. We do not know whether screening programs would have similar downstream effects in other settings, especially those in which primary care and mental health are not well integrated. Within the VA, efforts have been made to standardize mental health services across facilities, with specific service requirements, support and monitoring efforts [27]. While there may be variation in processes and resources across the system, our evaluative model relies on standardized data elements from the VA CDW and thus provides a model for larger-scale evaluation.

To our knowledge, this is the first study to investigate follow-up treatment in response to these three screening programs within a single population. However, previous studies have examined



follow-up care in response to VA mental health screening programs individually. Our finding for depression screening is consistent with findings from a national study of VA depression screening [29]. In that study, same-day use of PC-MHI clinics was associated with a higher rate of treatment initiation among patients screening positive for depression. While we did not examine time to treatment initiation as a variable, patients who used PC-MHI clinics were over twice as likely to receive an adequate course of treatment for depression as those seen only in primary care during the year following their positive screen. Our finding for PTSD screening is consistent with findings previously reported for VA PTSD screening [30]. In that regional study, 35% of patients with a positive PTSD screen received an adequate course of antidepressant treatment in the year following a positive PTSD screen and 12% received enough mental health visits that they could have received an adequate course of psychotherapy. Treatment adequacy was lower in our population (28% for medications and 6% for psychotherapy), but this may be due to our more stringent adequacy criteria, which required medications to be prescribed at an adequate dose and which required the psychotherapy sessions to be conducted with the same therapist. Our findings regarding follow-up alcohol misuse screening should be considered separately in the case of brief counselling and medication treatment. In the case of brief counselling, a national study of the VA alcohol misuse screening program found that follow-up action in response to screening ranged from 46% to 71% across VA facilities [31]. In that study, the authors used a dataset containing a sample of chart reviews that counted any follow-up action, including alcohol-related advice or feedback, referral to addiction treatment or discussion of referral within 30 days of a positive alcohol misuse screen. As our chart review only examined brief counselling and was limited to the day of the positive screen, it is not surprising that our estimate was lower. Our finding for medication treatment does parallel that of others who have studied patients with diagnoses of

alcohol abuse and dependence and found low use of appropriate pharmacotherapy in that population [32–34]. Given that clinicians are already appropriately more likely to provide these treatments to patients with higher AUDIT-C scores, it is possible that electronic clinical decision support could be tailored to facilitate this process. In this way, providing clinicians with screening scores and guidance based on severity level (rather than simple notification of a positive or negative screen and blanket recommendations for all patients with positive screens) could facilitate more patient-centered and effective care.

The treatment provided in the integrated primary care–mental health clinic and the specialty mental health clinic was generally of comparable intensity for all disorders. The clinics saw a similar volume of patients with new positive mental health screens and delivered similar quality psychopharmacological treatments for each of the disorders. An adequate course of psychotherapy was more common if patients received treatment in the specialized mental health clinic. Overall, this finding suggests the value of primary care–mental health integration model.

There are limitations to our work. First, our findings are based on a single clinic location. It is possible that the observed trends are only representative of this site. Second, while we considered both medications and psychotherapy for MDD and PTSD, we only considered medications for alcohol misuse disorder. Although consistent with the current VA/DoD practice guidelines, it may have impacted our results. Importantly we did not evaluate referral to community resources such as Alcoholics Anonymous. Third, we examined the use of effective treatments in those who had a positive screening test. It is possible that some patients did not want treatment or declined to accept treatment. It is also likely that some patients who screened positive for the various disorders did not have the disorder confirmed after a clinical examination. This may especially explain some of the nontreatment in primary care. Fourthly, our treatment intensity rating requires additional

evaluation. While it would have been ideal to relate treatment intensity ratings to patient outcomes, outcomes data were not available in a uniform manner across the treatment settings. It is also possible that our treatment adequacy criteria may be too stringent as some patients may benefit from less intensive treatment. The need for continuous, rather than categorical, measures of treatment receipt may justify additional study of our treatment intensity rating criteria. Fifthly, it is probable that the psychometrics of the screening tests were affected by the method in which they were administered. In validation studies, participants completed pen and paper assessments. In VA practice, the screening tools are typically read to patients in the process of completing multiple clinical reminders using the electronic medical record, a process that may vary across VA facilities. Prior studies have shown that this may lead to under identification of depression and implausible variation in the rate of alcohol misuse [31,35]. However, our chart review revealed a high degree of standardization in how screening was administered within the facility we examined, with mental health screening tests administered by health technicians and related “follow-up” reminders completed by clinicians. Finally, additional qualitative research is needed to understand how primary care clinicians use mental health screening results in practice. In this sample, it appears that among patients with positive screens, those with the highest scores are most likely to receive referrals and treatment. Whether primary care clinicians actually use these scores along with their examinations to facilitate clinical decision making is currently unknown.

These results have significant implications for health systems considering institution of mental health screening or systems seeking improved treatment for mental health disorders. It appears that screening for disorders in a setting with access to mental health providers is likely to result in substantial numbers of patients receiving high-quality treatment. Our findings suggest that the care provided in integrated primary care-mental health could help meet this need. Results suggest that

the treatment provided in integrated mental health is of similar quality to that of specialty mental clinics. However, patients seen in specialty mental health were more likely to receive adequate psychotherapy for depression or PTSD. Pharmacologic care for patients with positive screens for alcohol misuse disorders was low regardless of treatment setting. The explanation for this shortfall deserves additional exploration. It is possible that some knowledge gap exists regarding the effectiveness of medications for alcohol misuse disorders.

It appears that the treatment system for mental health problems, which extends from primary care settings to mental health sub-specialty settings, can respond when patients' mental health problems are identified through screening. The care provided in all settings can be improved, and additional steps to enhance the quality of care are warranted. This should include additional efforts to align screening and treatment.

### **Acknowledgments**

This work was funded, in part, by the VA New England Veterans Engineering Resource Center. Dr. Shiner's time was funded through the VA New England Early Career Development Award Program (VICDA2010-03). We would like to thank Sett Paing Oo, Lazaro Rodriguez and Evren Simsek for their assistance.

Appendix 1. Medication names, dose and duration thresholds used in treatment intensity ratings

**MDD medications**

Rating	Definition	Use
1	Guideline-recommended psychiatric medication	Amitriptyline Citalopram Desipramine Doxepin Duloxetine Escitalopram Fluoxetine Imipramine Isocarboxazid Mirtazepine Nefazodone Nortriptyline Fluvoxamine Paroxetine Phenelzine Selegiline Sertraline Trazodone Venlafaxine
2	Adequate total daily dose	Amitriptyline 200 mg Bupropion 300 mg Citalopram 20 mg

		Desipramine 200 mg
		Doxepin 200 mg
		Duloxetine 60 mg
		Escitalopram 10 mg
		Fluoxetine 20 mg daily or 90 mg weekly
		Imipramine 200 mg
		Isocarboxazid 41 mg
		Mirtazepine 30 mg
		Nefazedone 300 mg
		Nortriptyline 76 mg
		Fluvoxamine 200 mg
		Paroxetine 20 mg
		Phenelzine 61 mg
		Selegiline 41 mg oral or 6 mg transdermal
		Sertraline 100 mg
		Trazodone 400 mg
		Venlafaxine 225 mg
3	Adequate duration	4 weeks or more

Note. Agent names were abstracted from Appendix D-1 in the 2009 VA-DoD Guidelines for MDD [1]. Because the table lists only initial dose and maximum dose, we abstracted adequate dosage information from the antidepressant treatment history form [2].

## PTSD medications

Rating	Definition	Use
1	Guideline-recommended psychiatric medication	Citalopram Duloxetine Escitalopram Fluoxetine Fluvoxamine Paroxetine Sertraline Venlafaxine
2	Adequate total daily dose	Citalopram 20 mg Duloxetine 60 mg Escitalopram 10 mg Fluoxetine 20 mg Fluvoxamine 150 mg Paroxetine 20 mg Sertraline 100 mg Venlafaxine 150 mg
3	Adequate duration	8 weeks or more

Note. The 2010 VA-DoD guidelines recommend two classes of antidepressant medications, selective serotonin reuptake inhibitors and serotonin norepinephrine reuptake inhibitors, for the treatment of PTSD [3]. A recent meta-analysis showed that fluoxetine, paroxetine, sertraline and venlafaxine specifically are effective at the doses listed [4]. For the other agents, we listed adequate doses as per the antidepressant treatment history form [2].

### Alcohol dependence medications

Rating	Definition	Use
1	Guideline-recommended psychiatric medication	Naltrexone Acamprosate
2	Adequate total daily dose	Naltrexone 50 mg oral daily Naltrexone 380 mg intramuscular monthly Acamprosate 1998 mg
3	Adequate duration	4 weeks or more

Note. The 2009 VA-DoD guidelines recommend naltrexone and acamprosate for alcohol dependence [5]. Dosage information was abstracted from Table P-5.



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