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## Documented brief intervention associated with reduced linkage to specialty addictions treatment in a national sample of VA patients with unhealthy alcohol use with and without alcohol use disorders

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### Abstract

**Background and aims:** Alcohol screening, brief intervention (BI), and referral to treatment is often considered stepped care, such that BI with referral links patients to treatment. A meta-analysis of randomized trials found no evidence that BI increases treatment for alcohol use disorder (AUD). This study aimed to determine whether BI is associated with receipt of treatment for AUD among patients receiving BI as part of routine care.

**Design:** Regression analysis.

**Setting:** U.S. Veterans Health Administration (VA), in which BI is supported by performance measurement and electronic clinical reminders.

**Participants:** VA outpatients with positive Alcohol Use Disorders Identification Test Consumption screens (  $\geq 5$ ) (n=830,825) documented nationally 10/01/09–5/30/13.

**Measurements:** Regression models estimated prevalence of receiving VA specialty addictions treatment within 0–365 days for patients with documented BI (advice to reduce/abstain within 0–14 days) compared with those without. Models, clustered on patient and adjusted for demographics and mental health and substance use conditions, were fit among all patients and

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Preliminary findings of this study were presented at the International Network on Brief Interventions for Alcohol & Other Drugs (INEBRIA) Conference in Santiago, Chile in September 2018.

stratified across documented past-year AUD diagnosis. Multiple secondary analyses assessed robustness of findings, including assessing repeated BI as a predictor.

**Findings:** Among 830,825 VA outpatients with unhealthy alcohol use (1,172,606 positive screens), documented BI was associated with lower likelihood of receiving VA specialty addictions treatment (adjusted incidence rate ratio [aIRR] 0.84, 95% confidence interval 0.83–0.84). Associations were similar for those with and without AUD (aIRR 0.83, 0.82–0.84 and 0.86, 0.83–0.88, respectively) and in most secondary analyses. However, among patients without AUD, documentation of >1 BI was associated with greater likelihood of treatment relative to no BI (aIRR 1.75, 1.68–1.83).

**Conclusions:** In a national sample of U.S. Veterans Health Administration patients with unhealthy alcohol use, documented brief intervention for alcohol use was associated with lower likelihood of receiving specialty addictions treatment regardless of alcohol use disorder diagnosis.

### Keywords

Alcohol; Alcohol Use Disorder; Brief Intervention; Treatment; SBIRT; Veterans Affairs

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### Introduction

Randomized trials have demonstrated efficacy of brief intervention for reducing self-reported drinking among adults with unhealthy alcohol use (1–6), and brief intervention is recommended for all primary care patients with unhealthy alcohol use identified through routine population-based screening (7–9). However, brief intervention alone has not been shown to be effective for patients with severe unhealthy alcohol use and/or alcohol use disorder (AUD) (10). For these patients, multiple effective treatment options exist including specialty addictions treatment and medications (8, 11–17). Repeated brief interventions have also shown promise for reducing consumption among patients with AUD (18–22).

To address the full spectrum of unhealthy alcohol use, the U.S. Substance Abuse and Mental Health Services Administration (SAMHSA) developed the Screening, Brief Intervention and Referral to Treatment (SBIRT) model. SBIRT is typically envisioned as stepped care, such that screening identifies the target population and level of severity, brief intervention alone is offered to patients with low-to-moderate-severity alcohol use with the intent of increasing awareness of risk and motivating behavior change, and brief intervention with referral to treatment is offered to those with severe alcohol use, with the intent of linking the patient to specialty treatment. Since 2003, SAMHSA has funded widespread implementation of the SBIRT model throughout the U.S. (23).

An underlying tenet of the SBIRT model is that brief intervention paired with treatment referral will increase receipt of specialty treatment for patients with severe unhealthy alcohol use identified through screening. With few exceptions (24, 25), most studies have found little to no support for this. A meta-analysis of randomized trials found no evidence that brief intervention was associated with increased receipt of specialty treatment, even when assessing only studies with formal referral to treatment components (26). Other reviews with broader inclusion criteria found limited evidence that more intensive interventions may be

linked to increased treatment utilization in emergency department and inpatient settings (27, 28). One study analyzing National Survey on Drug Use and Health (NSDUH) data found that report of a doctor asking about or providing advice to cut down on drinking in the past year was associated with self-reported past-year receipt of alcohol treatment (29). National SBIRT evaluations did not examine the association between brief intervention and treatment (30–32).

To our knowledge, the association between brief intervention and receipt of specialty addictions treatment has not been analyzed among patients receiving brief intervention in a healthcare setting as part of routine care, which may be a more generalizable sample (e.g., these patients may be less likely to be aware of alcohol use as a health problem than patients who enrolled in trials to address alcohol use). The U.S. Veterans Health Administration (VA) provides a unique opportunity to answer this question as the largest integrated healthcare system in the U.S. (33) and a recognized leader in implementing alcohol screening and brief intervention (34). Therefore, we evaluated whether documented brief intervention is associated with receipt of VA specialty addictions treatment among patients with unhealthy alcohol use receiving care in the national VA healthcare system. Because severity of unhealthy alcohol use is a strong determinant of receiving specialty treatment and this treatment is recommended specifically for persons with AUD, we also evaluated this question separately among patients with and without documented AUD.

## Methods

### Setting, data source, and study sample

The national VA healthcare system contains over 1,200 healthcare sites and serves over 9 million U.S. veterans (33). VA implemented annual screening using the Alcohol Use Disorders Identification Test Consumption (AUDIT-C) in 2003 (35), and subsequently implemented brief intervention for patients with unhealthy alcohol use in 2007 (36). Provision of these services is supported by national performance measures, and providers are prompted to document screening and brief intervention through clinical reminders in the electronic health record (EHR) (36, 37). Although AUD treatment is not similarly prompted, VA clinical practice guidelines recommend referral to specialty treatment and/or provision of medications to treat patients with AUD or severe unhealthy alcohol use (AUDIT-C 8) (7).

Data were extracted from VA's Corporate Data Warehouse—a repository of national VA EHR clinical and administrative data—for a previous study (38). The sample for this secondary analysis included all positive AUDIT-C screens ( 5) documented 10/01/09–5/30/13. Though validation studies have identified cut-points of 3 for women and 4 for men as optimally balancing sensitivity and specificity for identifying unhealthy alcohol use (39–41), the cut-point of 5 is aligned with the denominator specification (target population) for VA's national performance measure for brief intervention (36, 42). Patients could contribute multiple positive screens 9 months apart to the dataset, and screens were followed up to one year (until 5/30/14) to measure outcomes. Study procedures were approved by the VA Puget Sound IRB, including waivers of HIPAA authorization and consent.

## Measures

**Primary Independent Variable: Documented Brief Intervention**—The primary independent variable was 1 documented brief intervention within 0–14 days following a positive AUDIT-C screen, a timeframe consistent with VA’s brief intervention performance measure (36, 42). Documented brief intervention was measured as documentation of advice to reduce and/or abstain from drinking based on discrete data linked to text labels generated by provider documentation in an EHR clinical reminder. This measure has been used in previous VA studies (36, 38, 43, 44), and has moderate agreement with patient report (45, 46).

**Primary Outcome Variable**—The primary outcome of interest was receipt of VA specialty addictions treatment within 365 days following a positive AUDIT-C screen measured based on visit codes for inpatient/outpatient treatment with an accompanying substance use disorder diagnosis at time of visit (see prior study for complete code list) (38).

**Stratification variable**—Because specialty treatment and medications are indicated for patients with AUD (8), AUD diagnosis was considered a key stratification measure (defined as International Classification of Disease, Ninth Revision, Clinical Modification [ICD-9-CM] codes for active alcohol abuse or dependence in the year prior to screening).

**Covariates**—Covariates included sociodemographic characteristics and mental health or substance use-related measures associated with brief intervention and receipt of specialty addictions treatment (42, 47–61). Sociodemographic characteristics were measured based on EHR documentation at the time of screening and included sex, age, race/ethnicity, marital status, and VA co-payment eligibility status/disability rating (proxy for socioeconomic status) (48, 62). Mental health diagnoses were based on ICD-9-CM codes documented in the year prior to screening, and included major depressive disorder, post-traumatic stress disorder, other mood disorder, anxiety disorder, and serious mental illness (schizophrenia, bipolar disorder, and/or psychosis). Drug use disorder diagnoses were based on ICD-9-CM codes for abuse or dependence in the prior year, and included stimulant (cocaine, methamphetamines), opioid, and other drug (cannabis, hallucinogens, sedatives) use disorders. Tobacco use was defined as either an ICD-9-CM code for tobacco use disorder or text data indicating past-year current smoking (63). AUDIT-C risk category was dichotomized as 5–7 and 8–12, based on VA clinical guidelines suggesting scores 8 indicate need for treatment (7). Alcohol-specific condition was defined as 1 ICD-9-CM code for an alcohol-related medical diagnosis in the prior year (e.g., alcoholic cardiomyopathy). Fiscal year of screening (2010, 2011, 2012, 2013) was measured to account for increased provision of alcohol-related care in VA over time (36).

## Analyses

Sociodemographic and clinical characteristics were described at the time of patients’ first positive AUDIT-C screen, in the overall sample and stratified by documented brief intervention. Chi-square tests of independence assessed differences in these characteristics across documented brief intervention.

Modified Poisson regression models (64) were fit with positive screens as the unit of analysis to estimate the relative rate (incidence rate ratio) of receiving VA specialty addictions treatment for screens followed by documented brief intervention relative to those without. Poisson regression models were used instead of logistic regression in order to directly estimate relative risk (64, 65), consistent with prior studies examining these outcomes in VA data (38, 61, 66). Regression analyses were clustered at the patient level, and standard errors were calculated with the robust sandwich estimator to correct for correlation between screens collected from the same patient and for misspecification of the Poisson model's variance structure (64, 65, 67). Marginal predicted prevalences with 95% confidence intervals were calculated to examine the magnitude of the association between documented brief intervention and VA specialty treatment receipt. Unadjusted models were fit to describe the prevalence of outcomes, then models were adjusted for covariates described above. Due to missing data for some covariates, the adjusted model included 93.1% of screens (N=1,091,127). Regression analyses were first conducted in the overall sample with adjustment for AUD, then subsequently stratified by AUD diagnosis in the year prior to screen. Effect modification by AUD status was tested using multiplicative interaction.

To gain a fuller understanding of findings, we undertook several sets of sensitivity and secondary analyses. First, because implementation of screening and brief intervention may vary by facility (68), we repeated primary analyses clustered on facility instead of patient. Second, to address missing data for three sociodemographic characteristics (see Table 1), we repeated primary analyses using 20 datasets created using multiple imputation with chained equations that considered all measured sociodemographic characteristics in the imputation model. Third, because under-diagnosis of AUD is common (69), we repeated primary analyses stratified by AUDIT-C risk categories instead of documented AUD as a clinical indicator of severity of unhealthy alcohol use. Fourth, because repeated brief interventions may be effective in reducing alcohol consumption among patients with AUD (18–22), and because more intensive interventions may increase likelihood of treatment receipt (27, 28), we repeated primary analyses (still at the screen level) using a 3-level indicator of 0, 1 or >1 brief interventions documented in the 365 days following each positive AUDIT-C screen as the independent variable. And finally, because VA clinical guidelines also recommend pharmacologic treatment for AUD (7), we repeated primary analyses assessing medication treatment of AUD as the outcome. This secondary outcome was measured as having 1 filled prescription for any of the three FDA-approved medications to treat AUD (acamprosate, disulfiram, and naltrexone) or topiramate because this medication has strong evidence for treating AUD (13, 70). All analyses were conducted in Stata 15 software (71).

## Results

### Sample Description

During the study period (10/01/09–5/30/13), 1,172,606 positive screens documenting unhealthy alcohol use (AUDIT-C  $\geq 5$ ) were identified, representing 830,825 patients. Of these, 864,278 positive screens (73.7%) had documented brief intervention within 0–14 days of the screen, 421,244 positive screens (35.9%) had a clinically documented AUD diagnosis

in the prior year, and 440,102 positive screens (37.5%) had an AUDIT-C score  $\geq 8$ . Characteristics of patients at the time of first AUDIT-C screen are presented in Table 1. Overall, the sample was mostly male, aged 45 years or older, and white. The majority were married (43.0%) or divorced/separated (29.4%), and 17.6% had full VA eligibility. A majority (50.8%) had documented tobacco use disorder or current smoking and 32.2% had documented AUD, and only 1.7% had an alcohol-specific condition. The most common mental health disorders were mood disorders (22.5%) and post-traumatic stress disorder (16.9%), and the most common non-alcohol, non-tobacco substance use disorder was stimulant use disorder (4.6%). At the time of their first positive screen, differences in demographic and clinical characteristics between patients with documented brief intervention compared to those without were generally small (Table 1).

### **Association between Documented Brief Intervention and Receipt of Specialty Addictions Treatment**

Among all positive AUDIT-C screens, 127,259 (10.9%) received VA specialty addictions treatment within one year of screening. In the overall sample, documented brief intervention was associated with lower likelihood of receiving VA addictions treatment, compared to those with no documented brief intervention. The adjusted predicted prevalence of receiving VA addictions treatment was 12.6% (95% confidence interval 12.5–12.7) for those without documented brief intervention, and 10.5% (10.4–10.6) for those with documented brief intervention ( $p < 0.001$ ; Table 2).

AUD significantly modified the association between documented brief intervention and specialty addictions treatment ( $p = 0.044$  for interaction term in adjusted model). Documented brief intervention (compared no documented brief intervention) was associated with lower likelihood of VA addictions treatment for patients with and without AUD diagnosis, but the magnitude of the difference across documented brief intervention was greater for those with AUD (3.4% difference) compared to those without AUD (0.6% difference; Table 2).

### **Results of Sensitivity and Secondary Analyses**

In sensitivity analyses clustering on facility instead of patient, all associations had the same significance and direction as primary findings (overall sample aIRR 0.84, 0.79–0.88; AUD aIRR 0.83, 0.78–0.88; no AUD aIRR 0.86, 0.80–0.91). Results of models estimated from multiple imputation data mirrored the primary analyses. In secondary analyses stratifying by AUDIT-C risk categories instead of AUD, results also mirrored primary analyses (Table 2). Though only 3.1% of screens ( $n = 36,863$ ) received medication treatment for AUD within one year of screening, findings from secondary analyses assessing receipt of AUD medications also mirrored primary analyses (Supplementary Table 1).

Secondary analyses examining repeated brief intervention differed slightly from those of primary analyses. Repeated brief intervention was less common than single brief intervention: among all positive screens, 13.8% ( $n = 162,126$  screens) had no documented brief intervention, 72.2% ( $n = 846,241$  screens) had 1, and 14.0% ( $n = 164,239$  screens) had  $> 1$  in the 0–365 days following the screen. In the overall sample, positive screens followed by 1 documented brief intervention were less likely to receive specialty addictions treatment

compared to those with none, while positive screens followed by >1 documented brief intervention did not significantly differ from those with none (Supplementary Table 2). Among screens with documented prior AUD diagnosis, those with both 1 and >1 documented brief interventions had lower likelihood of receiving specialty addictions treatment than those with none. However, among screens with no documented prior AUD diagnosis, those with 1 documented brief intervention had lower likelihood than those with none, while those with >1 documented brief intervention had increased likelihood of specialty treatment (Supplementary Table 2).

## Discussion

In this large study of a national sample of VA outpatients who screened positive for unhealthy alcohol use, documented brief intervention was associated with significantly lower likelihood of receiving VA specialty addictions treatment, regardless of whether patients had a documented AUD diagnosis. Results were robust to sensitivity and secondary analyses.

A prior meta-analysis found no evidence that randomization to receipt of brief intervention was associated with greater linkage to specialty treatment in trials (26), even when assessing only interventions that explicitly incorporated referral to treatment. Other reviews found limited evidence that more intensive interventions may increase likelihood of treatment receipt (27, 28) and a U.S. general population study (29) found self-reported brief intervention was associated with increased self-reported treatment receipt. In contrast, results of the present study found that documented brief intervention was significantly associated with lower (not higher) likelihood of receiving effective treatments, including medications for AUD which can be provided in outpatient settings, potentially lowering barriers to treatment (72–74). Differences in findings from previous studies may relate to differences in study design (e.g. observational study in a pragmatic clinical setting vs. controlled trials), populations (e.g., all outpatients receiving care versus patients recruited to trials or with targeted screening), healthcare settings (e.g., VA outpatient setting versus hospital inpatient/emergency department settings), mode of data collection (e.g., EHR data versus self-reported survey measures), and/or interventions (brief intervention documented as part of routine care by a primary care provider versus brief intervention offered by trained study staff).

The negative association between documented brief intervention and receipt of specialty addiction treatment observed in the present study was unexpected, particularly when restricted to patients with documented AUD in the prior year, for whom AUD treatment is clearly indicated. Though the utility of brief intervention has been questioned (10, 75–81), to our knowledge, no prior study has found significantly lower likelihood of addiction treatment in patients offered brief interventions. It is unclear what accounts for this unexpected finding, and multiple mechanisms may be at play. For example, providers may feel that brief intervention without treatment is adequate because they are unaware of the presence of AUD, or unaware that a single brief intervention alone is not efficacious for AUD. Alternately, providers may skip or not document brief intervention when offering treatment referrals.

However, results of our study may also reflect limitations related to measurement that may be contributing to the observed association. Specifically, though use of national EHR data enabled measurement of key variables in a very large sample, the quality and comprehensiveness of measures may be limited, and unmeasured confounding is likely. Both mental health and substance use disorders, including alcohol-related medical complications, were slightly more prevalent among patients with no brief intervention compared to those with brief intervention (Table 1), suggesting the possibility patients with and without brief intervention may have differed in other important ways that were unmeasured. Additionally, we did not capture whether patients received a new AUD diagnosis following brief intervention, which might have impacted willingness to receive treatment, and as the parent study dataset did not include current or prior-year VA addiction treatment, we were not able to adjust for these measures nor to understand whether or how they influenced documentation of brief intervention. It is possible that some sites turned off EHR prompts for providers to offer brief intervention to patients with current or recent treatment. Further, because the national VA EHR does not systematically document treatment referral, we were unable to explore mechanisms related to treatment referral that may be driving observed associations. Additionally, brief intervention may have been documented when it was not delivered or delivered but not documented (46), and quality of brief intervention and treatment received outside of VA were not captured. Finally, results may not be generalizable outside of the VA integrated healthcare system, where rates of screening and brief intervention may be higher than in other healthcare settings, though other healthcare systems are implementing similar care (82–84).

Further research is needed to better understand patterns of prior treatment receipt among patients screening positive for unhealthy alcohol use in routine care as well as treatment referral practices of providers, including whether and how they are providing brief intervention in combination with referrals. Qualitative research with patients and providers may provide insight into how brief intervention and/or treatment referral do or do not facilitate linkage to specialty treatment or medications for AUD, and whether this varies based on prior treatment receipt. Interventions to improve the linkage of screening and brief intervention with AUD treatment through improved referral and handoff processes and/or increased integration of evidence-based behavioral and medication AUD treatment into primary care settings (72, 83, 85–88) are likely needed. Experts have called for the provision of AUD treatment in primary care as a key means of increasing treatment receipt (89–94), and some studies have found that primary care-based care management interventions increase alcohol treatment receipt (86, 87, 95). Consistent with prior studies (38, 49, 96, 97), the very low rates of AUD pharmacotherapy observed here suggest this is a particularly important area for improvement (74).

This large national study is the first to our knowledge to evaluate whether brief interventions offered as part of routine care are associated with increased receipt of specialty addictions treatment. Consistent with previous findings that brief intervention offered in randomized trials is not associated with increased linkage to treatment (26), we found no support for the notion that brief intervention increases treatment receipt. Specifically, the likelihood of VA specialty addictions treatment was not higher among those with documented brief intervention (except for those without AUD documented in the prior year with more than



one documented brief intervention) and was in fact lower among patients with unhealthy alcohol use who had documented brief intervention compared to those without—even in analyses restricted to patients with documented AUD. Future research is needed to understand the implications and underlying mechanisms of these findings. Findings add to prior work highlighting the limitations of brief intervention as currently implemented in healthcare settings and suggest a need for improved linkage to evidence-based treatments.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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**Table 1.**

Characteristics of VA outpatients with AUDIT-C 5 at time of first AUDIT-C screen: Overall and across documented brief intervention 0–14 days following positive screen

	Documented BI (N=594,700 patients)		No Documented BI (N=236,125 patients)		Chi- Square value	p-value	Total (N=830,825 patients)	
	N	(%)	N	(%)			N	(%)
Female	17,835	(3.0)	7,859	(3.3)	61.17	<0.001	25,694	(3.1)
Age					185.67	<0.001		
18–29	71,765	(12.1)	28,654	(12.1)			100,419	(12.1)
30–44	86,729	(14.6)	34,631	(14.7)			121,360	(14.6)
45–64	305,275	(51.3)	123,999	(52.5)			429,274	(51.7)
65+	130,931	(22.0)	48,841	(20.7)			179,772	(21.6)
Race/ethnicity <sup>a</sup>					1.6e+3	<0.001		
American Indian/Alaska Native	6,319	(1.1)	2,656	(1.2)			8,975	(1.2)
Asian American/Pacific Islander	9,733	(1.8)	3,690	(1.7)			13,423	(1.7)
Black/African American	87,983	(15.8)	43,494	(19.5)			131,477	(16.9)
Hispanic/Latino	40,469	(7.3)	15,218	(6.8)			55,687	(7.2)
White	411,944	(74.0)	157,535	(70.1)			569,479	(73.1)
Marital status <sup>a</sup>					487.19	<0.001		
Divorced/Separated	169,369	(28.9)	70,878	(30.6)			240,247	(29.4)
Married	256,518	(43.7)	95,220	(41.1)			351,738	(43.0)
Never married/Single	139,321	(23.8)	56,830	(24.5)			196,151	(24.0)
Widowed	21,365	(3.6)	8,794	(3.8)			30,159	(3.7)
VA eligibility status <sup>a</sup>					121.85	<0.001		
Full VA coverage	102,836	(17.3)	43,123	(18.4)			145,959	(17.6)
Service connection <50%	133,639	(22.5)	52,333	(22.3)			185,972	(22.5)
Non-service connected	357,064	(60.2)	139,542	(59.4)			496,606	(59.9)
Major depression	39,150	(6.6)	18,512	(7.8)	413.33	<0.001	57,662	(6.9)
Anxiety disorder	60,459	(10.2)	25,357	(10.7)	59.81	<0.001	85,816	(10.3)
Post-Traumatic Stress Disorder	100,387	(16.9)	40,001	(16.9)	0.44	0.508	140,388	(16.9)
Other mood disorder	131,162	(22.1)	55,457	(23.5)	198.76	<0.001	186,619	(22.5)
Serious mental illness <sup>b</sup>	27,327	(4.6)	14,567	(6.2)	874.63	<0.001	41,894	(5.0)
Opioid use disorder	9,344	(1.6)	5,303	(2.3)	444.17	<0.001	14,647	(1.8)
Stimulant use disorder	24,362	(4.1)	14,152	(6.0)	1.4e+3	<0.001	38,514	(4.6)
Other drug use disorder <sup>c</sup>	24,418	(4.1)	13,085	(5.5)	808.19	<0.001	37,503	(4.5)
Tobacco <sup>d</sup>	302,323	(50.8)	119,594	(50.7)	2.38	0.123	421,917	(50.8)
AUDIT-C category (first screen)					0.37	0.541		
5–7	381,327	(64.1)	151,574	(64.2)			532,901	(64.1)
8–12	213,373	(35.9)	84,551	(35.8)			297,924	(35.9)

	Documented BI (N=594,700 patients)		No Documented BI (N=236,125 patients)		Chi- Square value	p-value	Total (N=830,825 patients)	
	N	(%)	N	(%)			N	(%)
Alcohol use disorder	191,534	(32.2)	75,673	(32.1)	1.96	0.162	267,207	(32.2)
Alcohol-specific condition	8,690	(1.5)	5,113	(2.2)	512.93	<0.001	13,803	(1.7)
Fiscal year of first AUDIT-C					9.7e+3	<0.001		
2010	226,442	(38.1)	117,473	(49.8)			343,915	(41.4)
2011	178,159	(30.0)	59,821	(25.3)			237,980	(28.6)
2012	138,614	(23.3)	42,302	(17.9)			180,916	(21.8)
2013	51,485	(8.7)	16,529	(7.0)			68,014	(8.2)
Specialty addictions treatment 0–365 days after screen	62,950	(10.6)	32,364	(13.7)	1.6e+3	<0.001	95,314	(11.5)

VA, Veterans Affairs; AUDIT-C, Alcohol Use Disorders Identification Test Consumption; BI, brief intervention

<sup>a</sup>Missing for some patients

<sup>b</sup>Includes schizophrenia, psychoses, and/or bipolar

<sup>c</sup>Includes cannabis, hallucinogen, and/or sedative

<sup>d</sup>Includes documented tobacco use disorder or current smoking



**Table 2.**

Receipt of specialty addictions treatment among VA patients with and without documented brief intervention 0–14 days following positive AUDIT-C screen, overall and stratified by AUD and AUDIT-C score

	Unadjusted				Adjusted <sup>d</sup>			
	%	95% CI	IRR <sup>b</sup>	p-value <sup>c</sup>	%	95% CI	IRR <sup>b</sup>	p-value <sup>c</sup>
<b>Overall Sample (N=1,172,606 screens)<sup>d</sup> (Primary Analysis)</b>								
No Documented BI (ref)	13.6	(13.4–13.7)	--	--	12.6	(12.5–12.7)	--	--
Documented BI	9.9	(9.8–10.0)	0.73	(0.72–0.74) <0.001	10.5	(10.4–10.6)	0.84	(0.83–0.84) <0.001
<b>Stratified by AUD Diagnosis (Primary Analysis)</b>								
<b>Without AUD (N=751,362 screens)</b>								
No Documented BI	3.6	(3.5–3.7)	--	--	4.6	(4.5–4.7)	--	--
Documented BI	2.9	(2.9–3.0)	0.82	(0.79–0.84) <0.001	4.0	(3.9–4.0)	0.86	(0.83–0.88) <0.001
<b>With AUD (N=421,244 screens)</b>								
No Documented BI	31.9	(31.6–32.1)	--	--	19.9	(19.7–20.1)	--	--
Documented BI	22.2	(22.0–22.3)	0.70	(0.69–0.70) <0.001	16.5	(16.4–16.6)	0.83	(0.82–0.84) <0.001
<b>Stratified by AUDIT-C Score (Secondary Analysis)</b>								
<b>AUDIT-C 5–7 (N=732,504 screens)</b>								
No Documented BI	7.9	(7.9–8.0)	--	--	9.6	(9.4–9.7)	--	--
Documented BI	5.5	(5.4–5.6)	0.70	(0.68–0.71) <0.001	7.6	(7.5–7.7)	0.80	(0.78–0.81) <0.001
<b>AUDIT-C 8–12 (N=440,102 screens)</b>								
No Documented BI	23.2	(22.9–23.4)	--	--	15.3	(15.2–15.5)	--	--
Documented BI	17.1	(17.0–17.3)	0.74	(0.73–0.75) <0.001	13.2	(13.1–13.3)	0.86	(0.85–0.87) <0.001

VA, Veterans Affairs; AUD, alcohol use disorder; AUDIT-C, Alcohol Use Disorders Identification Test Consumption; BI, brief intervention

<sup>a</sup> Adjusted for sex, age, race/ethnicity, marital status, VA eligibility status, mental health and drug use disorder diagnoses, tobacco use, AUDIT-C category, alcohol use disorder diagnosis, alcohol-specific condition, and fiscal year in which positive AUDIT-C screen occurred.

<sup>b</sup> Incidence Rate Ratio.

<sup>c</sup> p-value from test to evaluate if IRR is equal to one.  
<sup>d</sup> Due to missing data for some covariates, the adjusted model included 93.1% of screens (N=1,091,127)

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