ORIGINAL RESEARCH

Impact of Multisite Patient Education on Pharmacotherapy for Veterans With Alcohol Use Disorder

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Background: Excessive alcohol use is a leading cause of preventable death in the United States. Despite the availability of effective alcohol use disorder (AUD) treatments, usage remain low. This quality improvement project explored the use of direct-to-consumer (DTC) patient education across multiple US Department of Veterans Affairs (VA) facilities to increase AUD treatment.

Methods: Patients with AUD or at high risk for AUD at 5 Veterans Integrated Service Network (VISN) 21 sites who were not receiving AUD pharmacotherapy were identified. Veterans were eligible for inclusion if they had an Alcohol Use Disorder Identification Test-Consumption (AUDIT-C) score ≥ 6 with an AUD diagnosis, or ≥ 8 without diagnosis, and a scheduled appointment with primary care, mental health, or a substance use disorder (SUD) health care practitioner between October 1, 2023, and January 31, 2024. The final cohort was mailed education materials about 2 weeks prior to their appointment. A comparator group from the previous year was identified using propensity score matching, and findings were assessed using logistic regression. The outcomes were assessed within 30 days of the scheduled visit, with the primary outcome being the initiation of pharmacotherapy and the secondary outcome being the placement of a consultation for mental health or SUD services.

Results: DTC education was mailed to 1260 veterans. Primary and secondary outcomes did not find statistically significant differences between patients that received DTC education and the comparator group ($P > .59$).

Conclusions: Although the results of this study were not statistically significant, this project initiated conversations at the VISN around AUD and available treatments. Future research should focus on addressing primary care involvement in AUD treatment, assessing different methods for delivering DTC education, and its potential long-term impact in the treatment of AUD.

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Excessive alcohol use is one of the leading preventable causes of death in the United States, responsible for about 178,000 deaths annually and an average of 488 daily deaths in 2020 and 2021.[1] Alcohol-related deaths increased by 49% between 2006 and 2019.[2] This trend continued during the COVID-19 pandemic, with death certificates that listed alcohol increasing by > 25% from 2019 to 2020, and another 10% in 2021.[3] This increase of alcohol-related deaths includes those as a direct result of chronic alcohol use, such as alcoholic cardiomyopathy, alcoholic hepatitis and cirrhosis, and alcohol-induced pancreatitis, as well as a result of acute use such as alcohol poisoning, suicide by exposure to alcohol, and alcohol-impaired driving fatalities.[4]

Excessive alcohol consumption poses other serious risks, including cases when intake is abruptly reduced without proper management. Alcohol withdrawal syndrome (AWS) can vary in severity, with potentially life-threatening complications such as hallucinations, seizures, and delirium tremens.[5] These risks highlight the importance of professional intervention and support, not only to mitigate risks associated with AWS, but provide a pathway towards recovery from alcohol use disorder (AUD).

According to the 2022 National Survey on Drug Use and Health, 28.8 million US adults had AUD in the prior year, yet only 7.6% of these individuals received treatment and an even smaller group (2.2%) received medication-assisted treatment for alcohol.[6,7] This is despite American Psychiatric Association guidelines for the pharmacological treatment of patients with AUD, including the use of naltrexone, acamprosate, disulfiram, topiramate, or gabapentin, depending on therapy goals, past medication trials, medication contraindications, and patient preference.[8] Several of these medications are approved by the US Food and Drug Administration (FDA) for the treatment of AUD and have support for effectiveness from randomized controlled trials and meta-analyses.[9-11]

Clinical practice guidelines for the management of substance use disorders (SUDs) from the US Department of Veterans Affairs

TABLE 1. Demographics and Baseline Characteristics

Criteria	Intervention, No. (%) (n = 1260)	Matched control, No. (%) (n = 1260)
Sex		
Male	1173 (93.1)	1165 (92.5)
Female	87 (6.9)	95 (7.5)
Age		
≤ 40 y	343 (27.2)	371 (29.4)
41-60 y	474 (37.6)	418 (33.2)
> 60 y	443 (35.2)	471 (37.4)
Race		
White	675 (53.6)	670 (53.2)
American Indian or Alaska Native	13 (1.0)	12 (1.0)
Asian	43 (3.4)	48 (3.8)
Black or African American	120 (9.5)	121 (9.6)
Hispanic or Latino	236 (18.7)	230 (18.3)
Multiple	24 (1.9)	25 (2.0)
Native Hawaiian or Other Pacific Islander	21 (1.7)	22 (1.7)
Not reported	128 (10.2)	132 (10.5)
Time between study start and appointment, d		
1-30 (November)	523 (41.5)	525 (41.7)
31-61 (December)	371 (29.4)	402 (31.9)
62-92 (January)	366 (29.0)	333 (26.4)
Site		
Northern California	514 (40.8)	478 (37.9)
Central California	127 (10.1)	133 (10.6)
Palo Alto	191 (15.2)	197 (15.6)
Reno	99 (7.9)	101 (8.0)
Southern Nevada	329 (26.1)	351 (27.9)
Baseline AUDIT-C Score		
6	139 (11.0)	173 (13.7)
7	123 (9.8)	125 (9.9)
8	337 (26.7)	290 (23.0)
9	198 (15.7)	185 (14.7)
10	222 (17.6)	247 (19.6)
11	111 (8.8)	116 (9.2)
12	130 (10.3)	124 (9.8)

Abbreviation: AUDIT-C, Alcohol Use Disorder Identification Test-Consumption.

(VA) and US Department of Defense have strong recommendations for naltrexone and topiramate as first-line pharmacotherapies for moderate to severe AUD. Acamprosate and disulfiram are weak recommendations as alternative options. Gabapentin is a weak recommendation for cases where first-line treatments are contraindicated or ineffective. The guidelines emphasize the importance of a comprehensive approach to AUD treatment, including psychosocial interventions in addition to pharmacotherapy.[12]

A 2023 national survey found veterans reported higher alcohol consumption than nonveterans.[13] At the end of fiscal year 2023, > 4.4 million veterans—6% of Veterans Health Administration patients—had been diagnosed with AUD.[14] However, > 87% of these patients nationally, and 88% of Veterans Integrated Service Network (VISN) 21 patients, were not receiving naltrexone, acamprosate, disulfiram, or topiramate as part of their treatment. The VA Academic Detailing Service (ADS) now includes AUD pharmacotherapy as a campaign focus, highlighting its importance. The ADS is a pharmacy educational outreach program that uses unbiased clinical guidelines to promote aligning prescribing behavior with best practices. Academic detailing methods include speaking with health care practitioners (HCPs), and direct-to-consumer (DTC) patient education.

ADS campaigns include DTC educational handouts. Past ADS projects and research using DTC have demonstrated a significant improvement in outcomes and positively in-

TABLE 2. Regression Analysis for Alcohol Use Disorder-Related Prescription Within 30 Days

Variable	Matched				
	Outcome, yes (n = 65)	Outcome, no (n = 2455)	Multivariate odds ratio (CI)	Univariate *P* value	Multivariate *P* value
Intervention group, No. (%)					
No (comparator group)	33 (50.8)	1227 (50.0)	NA	NA	NA
Yes (direct-to-consumer group)	32 (49.2)	1228 (50.0)	0.96 (0.58-1.58)	.90	.88
Sex, No. (%)					
Male	62 (95.4)	2276 (92.7)	NA		
Female	3 (4.6)	179 (7.3)	0.51 (0.12-1.43)	.42	.27
Age, mean (SD), y	48.1 (14.9)	52 (15.6)	0.98 (0.96-1.00)	.05	.02
Race and ethnicity, No. (%)				.50	.44
White	39 (60.0)	1306 (53.2)	NA		
American Indian or Alaska Native	0 (0)	25 (1.0)	0 (0-82x10^{10})		
Asian	1 (1.5)	90 (3.7)	0.33 (0.02-1.58)		
Black or African American	5 (7.7)	236 (9.6)	0.83 (0.28-1.99)		
Hispanic or Latino	10 (15.4)	456 (18.6)	0.63 (0.28-1.30)		
Multiple	2 (3.1)	47 (1.9)	1.52 (0.24-5.34)		
Native Hawaiian or other Pacific Islander	0 (0)	43 (1.8)	0 (0-635.13)		
Not reported	8 (12.3)	252 (10.3)	1.01 (0.43-2.11)		
Time to appoint from baseline, mean (SD), d	37.4 (27.6)	40.8 (27.3)	1 (0.99-1.01)	.32	.45
Site, No. (%)				.08	.12
Northern California	22 (33.8)	970 (39.5)	NA		
Central California	5 (7.7)	255 (10.4)	0.83 (0.27-2.13)		
Palo Alto	15 (23.1)	373 (15.2)	1.82 (0.90-3.58)		
Reno	10 (15.4)	190 (7.7)	2.13 (0.93-4.54)		
Southern Nevada	13 (20.0)	667 (27.2)	0.88 (0.43-1.75)		
Baseline AUDIT-C Score, mean (SD)	9.4 (2.0)	8.8 (1.8)	1.18 (1.02-1.35)	.02	.02

Abbreviation: AUDIT-C, Alcohol Use Disorder Identification Test-Consumption; NA, not applicable.

fluencing patients' pharmacotherapy treatment.[15,16] A VA quality improvement project found a positive correlation between the initiation of AUD pharmacotherapy and engagement with mental health care following the distribution of AUD DTC patient education.[17] This project aimed to apply the same principles of prior research to explore the use of DTC across multiple facilities within VISN 21 to increase AUD pharmacotherapy. VISN 21 includes VA facilities and clinics across the Pacific Islands, Nevada, and California and serves about 350,000 veterans.

METHODS

A prospective cohort of VISN 21 veterans with or at high risk for AUD was identified using the VA ADS AUD Dashboard. The cohort included those not on acamprosate, disulfiram, naltrexone, topiramate, or gabapentin for treatment of AUD and had an elevated Alcohol Use Disorder Identification Test-Consumption (AUDIT-C) score of ≥ 6 (high risk) with an AUD diagnosis or ≥ 8 (severe risk) without a diagnosis. The AUDIT-C scores used in the dashboard are supported by the VA AUD clinician guide as the minimum scores when AUD pharmacotherapy should be offered to patients.[18] Prescriptions filled outside the VA were not included in this dashboard.

Data and patient information were collected using the VA Corporate Data Warehouse. To be eligible, veterans needed a valid mailing address within the VISN 21 region and a primary care, mental health, or SUD clinician prescriber visit scheduled between October 1, 2023, and January 31, 2024. Veterans were excluded if they were in hospice, had a 1-year mortality risk score > 50% based on their Care Assessment Need (CAN) score, or facility leadership opted out of project involvement. Patients with both severe renal and hepatic impairments were excluded because they were ineligible for AUD pharmacotherapy. However, veterans with either

TABLE 3. Regression Analysis for Mental Health or SUD Services Consult Within 30 Days

	Matched				
Variable	**Outcome, yes (n = 331)**	**Outcome, no (n = 2189)**	**Multivariate odds ratio (CI)**	**Univariate *P* value**	**Multivariate *P* value**
Intervention group, No. (%)					
No (comparator group)	160 (48.3)	1100 (50.3)	NA	NA	NA
Yes (direct-to-consumer group)	171 (51.7)	1089 (49.7)	1.07 (0.84-1.36)	.52	.59
Sex, No. (%)					
Male	301 (90.9)	2037 (93.1)	NA		
Female	30 (9.1)	152 (6.9)	1.01 (0.65-1.54)	.17	.96
Age, mean (SD), y	45.5 (13.5)	52.9 (15.7)	0.97 (0.96-0.98)	< .001	< .001
Race				.12	.26
White	173 (52.3)	1172 (53.5)	NA		
American Indian or Alaska Native	1 (0.3)	24 (1.1)	0.32 (0.02-1.56)		
Asian	13 (3.9)	78 (3.6)	0.84 (0.43-1.52)		
Black or African American	26 (7.9)	215 (9.8)	0.91 (0.57-1.41)		
Hispanic or Latino	70 (21.1)	396 (18.1)	0.85 (0.61-1.18)		
Multiple	12 (3.6)	37 (1.7)	1.99 (0.95-3.89)		
Native Hawaiian or other Pacific Islander	3 (0.9)	40 (1.8)	0.44 (0.10-1.25)		
Not reported	33 (10)	227 (10.4)	0.88 (0.58-1.32)		
Time to appoint from baseline, mean (SD), d	42.1 (28.1)	40.5 (27.2)	1 (1.00-1.01)	.33	.10
Site, No. (%)				< .001	< .001
Northern California	115 (34.7)	877 (40.1)	NA	NA	NA
Central California	44 (13.3)	216 (9.9)	1.26 (0.84-1.88)	.02	.25
Palo Alto	68 (20.5)	320 (14.6)	1.55 (1.10-2.17)	.004	.01
Reno	49 (14.8)	151 (6.9)	2.09 (1.41-3.08)	< .001	< .001
Southern Nevada	55 (16.6)	625 (28.6)	0.65 (0.46-0.91)	.02	.01
Baseline AUDIT-C Score, mean (SD)	9.1 (1.9)	8.8 (1.8)	1.1 (1.03-1.18)	.02	.004

Abbreviations: AUDIT-C, Alcohol Use Disorder Identification Test-Consumption; NA, not applicable; SUD, substance use disorder.

renal or hepatic impairment (but not both) were included, as they could be potential candidates for ≥ 1 AUD pharmacotherapy option.

Initial correspondence with facilities was initiated through local academic detailers. A local champion was identified for the 1 facility without an academic detailer. Facilities could opt in or out of the project. Approval was provided by the local pharmacy and therapeutics committee, pharmacy, primary care, or psychiatry leadership. Approval process and clinician involvement varied by site.

Education

The selected AUD patient education was designed and approved by the national VA ADS (eAppendix available at doi:10.12788/fp.0562). The DTC patient education provided general knowledge about alcohol, including what constitutes a standard amount of alcohol, what is considered heavy drinking, risks of heavy drinking, creating a plan with a clinician to reduce and manage withdrawal symptoms, and additional resources. The DTC was accompanied by a cover letter that included a local facility contact number.

A centralized mailing facility was used for all materials. VA Northern California Health Care System provided the funding to cover the cost of postage. The list of veterans to be contacted was updated on a rolling basis and DTC education was mailed 2 weeks prior to their scheduled prescriber visit.

The eligible cohort of 1260 veterans received DTC education. A comparator group of 2048 veterans that did not receive DTC education was obtained retrospectively by using the same inclusion and exclusion criteria with a scheduled primary care, mental health, or SUD HCP visit from October 1, 2022, to January 31, 2023. The outcomes assessed were within 30 days of the scheduled visit, with the primary outcome as the initiation of AUD-related pharmacotherapy

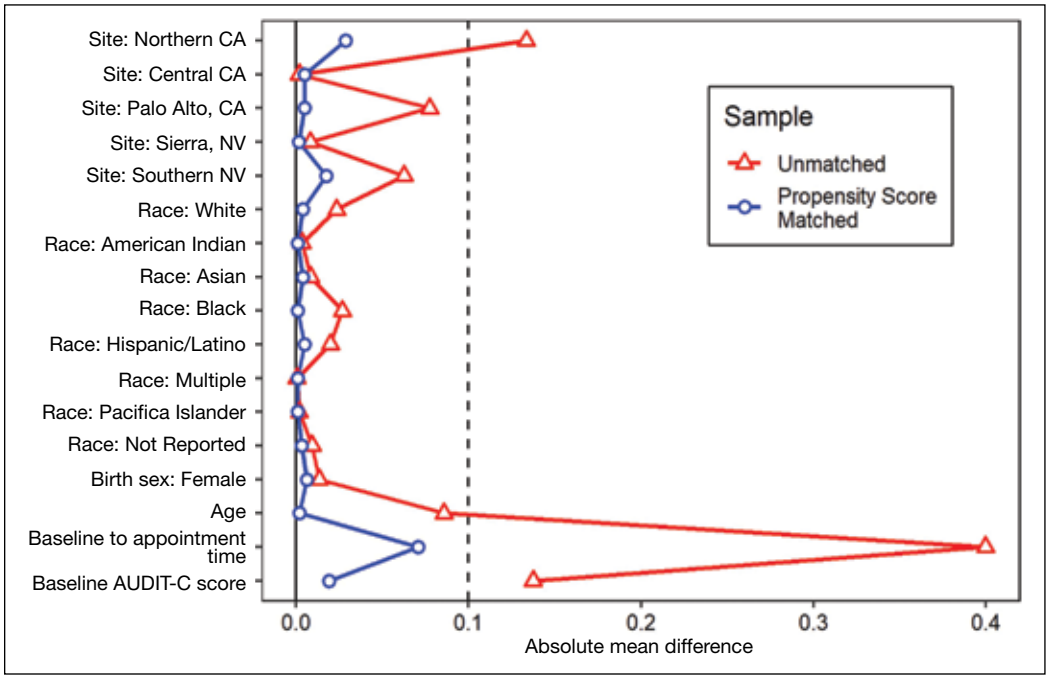

FIGURE. Covariate Imbalance for Unmatched and Matched Samples

Abbreviation: AUDIT-C, Alcohol Use Disorder Identification Test-Consumption.

and the secondary outcome as the placement of a consultation for mental health or SUD services. Any consultations sent to Behavioral Health, Addiction, Mental Health, Psychiatric, and SUD services following the HCP visit, within the specified time frame, were used for the secondary outcome.

Matching and Analysis

A 1-to-1 nearest neighbor propensity score (PS) matching without replacement was used to pair the 1260 veterans from the intervention group with similarly scored comparator group veterans for a PS-matched final dataset of 2520 veterans. The PS model was a multivariate logistic regression with the outcome being exposure and comparator group status. Baseline characteristics used in the PS model were age, birth sex, race, facility of care, baseline AUDIT-C score, and days between project start and scheduled appointment. Covariate imbalance for the PS-matched sample was assessed to ensure the standardized mean difference for all covariates fell under a 0.1 threshold (Figure).[19]

A frequency table was provided to compare the discrete distributions of the baseline characteristics in the intervention and comparator groups. Logistic regression analysis was performed to evaluate the association between DTC education exposure and pharmacotherapy initiation, while controlling for potential confounders. Univariate and multivariate *P* value results for each variable included in the model were reported along with the multivariate odds ratios (ORs) and their associated 95% CIs. Logistic regression analyses were run for both outcomes. Each model included the exposure and comparator group status as well as the baseline characteristics included in the PS model. Statistical significance was set at $P < .05$. All statistical analyses were performed with R version 4.2.1.

RESULTS

Two of 7 VISN 21 sites did not participate, and 3 had restrictions on participation. DTC education was mailed about 2 weeks prior to scheduled visit for 1260 veterans; 53.6% identified as White, 37.6% were aged 41 to 60 years, and 79.2% had an AUDIT-C ≥ 8 (Table 1). Of those mailed education, there were 173 no-show appointments (13.7%). Thirty-two veterans (2.5%) in the DTC group and 33 veterans (2.6%) in the comparator group received an AUD-related pharmacotherapy prescription

(P = .88) (Table 2). One hundred seventy-one veterans (13.6%) in the DTC group and 160 veterans (12.7%) in the comparator group had a consult placed for mental health or SUD services within 30 days of their appointment (P = .59) (Table 3).

DISCUSSION

This project did not yield statistically significant differences in either the primary or secondary outcomes within the 30-day follow-up window and found limited impact from the DTC educational outreach to veterans. The percentage of veterans that received AUD-related pharmacotherapy or consultations for mental health or SUD services was similarly low in the DTC and comparator groups. These findings suggest that although DTC education may raise awareness, it may not be sufficient on its own to drive changes in prescribing behavior or referral patterns without system-level support.

Addiction is a complex disease faced with stigma and requiring readiness by both the HCP and patient to move forward in support and treatment. The consequences of stigma can be severe: the more stigma perceived by a person with AUD, the less likely they are to seek treatment.[20] Stigma may exist even within HCPs and may lead to compromised care including shortened visits, less engagement, and less empathy.[19] Cultural attitude towards alcohol use and intoxication can also be influenced through a wide range of sources including social media, movies, music, and television. Studies have shown targeted alcohol marketing may result in the development of positive beliefs about drinking and expand environments where alcohol use is socially acceptable and encouraged.[21] These factors can impact drinking behavior, including the onset of drinking, binge drinking, and increased alcohol consumption.[22]

Three VISN 21 sites in this study had restrictions on or excluded primary care from participation. Leadership at some of these facilities were concerned that primary care teams did not have the bandwidth to take on additional items and/or there was variable primary care readiness for initiating AUD pharmacotherapy. Further attempts should be made to integrate primary care into the process of initiating AUD treatment as significant research suggests that integrated care models for AUD may be associated with improved process and outcome measures of care.[23]

There are several differences between this quality improvement project and prior research investigating the impact of DTC education for other conditions, such as the EMPOWER randomized controlled trial and VISN 22 project, which both demonstrated effectiveness of DTC education for reducing benzodiazepine use in geriatric veterans.[15,16] These studies focused on reducing or stopping pharmacotherapy use, whereas this project sought to promote the initiation of AUD pharmacotherapy. These studies evaluated outcomes at least 6 months postindex date, whereas this project evaluated outcomes within 30 days postappointment. Furthermore, the educational content varied significantly. Other projects provided patients with information focused on specific medications and interventions, such as benzodiazepine tapering, while this project mailed general information on heavy drinking, its risks, and strategies for cutting back, without mentioning pharmacotherapy. The DTC material used in this project was chosen because it was a preapproved national VA ADS resource, which expedited the project timeline by avoiding the need for additional approvals at each participating site. These differences may impact the observed effectiveness of DTC education in this project, especially regarding the primary outcome.

Strengths and Limitations

This quality improvement project sent a large sample of veterans DTC education in a clinical setting across multiple sites. Additionally, PS matching methods were used to balance covariates between the comparator and DTC education group, thereby simulating a randomized controlled trial and reducing selection bias. The project brought attention to the VISN 21 AUD treatment rates, stimulated conversation across sites about available treatments and resources for AUD, and sparked collaboration between academic detailing, mental health, and primary care services. The time frame for visits was selected during the winter; the National Institute on Alcohol Abuse and Alcoholism notes this is a time when people may be more likely to

engage in excessive alcohol consumption than at other times of the year.[24]

The 30-day time frame for outcomes may have been too short to observe changes in prescribing or referral patterns. Additionally, the comparator group was comprised of veterans seen from October 1, 2022, to January 31, 2023, where seasonal timing may have influenced alcohol consumption behaviors and skewed the results. There were also no-show appointments in the DTC education group (13.7%), though it is likely some patients rescheduled and still received AUD pharmacotherapy within 30 days of the original appointment. Finally, it was not possible to confirm whether a patient opened and read the education that was mailed to them. This may be another reason to explore electronic distribution of DTC education. This all may have contributed to the lack of statistically significant differences in both the primary and secondary outcomes.

There was a high level of variability between facility participation in the project. Two of 7 sites did not participate, and 3 sites restricted primary care engagement. This represents a significant limitation, particularly for the secondary outcome of placing consultations for MH or SUD services. Facilities that only included mental health or SUD HCPs may have resulted in lower consultation rates due to their inherent specialization, reducing the likelihood of self-referrals.

The project may overestimate prescribed AUD pharmacotherapy in the primary outcome due to potential misclassification of medications. While the project adhered to the national VA ADS AUD dashboard's definition of AUD pharmacotherapy, including acamprosate, disulfiram, naltrexone, topiramate, and gabapentin, some of these medications have multiple indications. For example, gabapentin is commonly prescribed for peripheral neuropathy, and topiramate is used to treat migraines and seizures. The multipurpose use adds uncertainty about whether they were prescribed specifically for AUD treatment, especially in cases where the HCP is responsible for treating a broad range of disease states, as in primary care.

CONCLUSIONS

Results of this quality improvement project did not show a statistically significant difference between patients sent DTC education and the comparator group for the initiation of AUD pharmacotherapy or placement of a consult to mental health or SUD services within 30 days of their scheduled visit. Future studies may seek to implement stricter criteria to confirm the intended use of topiramate and gabapentin, such as looking for keywords in the prescription instructions for use, performing chart reviews, and/or only including these medications if prescribed by a mental health or SUD HCP. Alternatively, future studies may consider limiting the analysis to only FDA-approved AUD medications: acamprosate, disulfiram, and naltrexone. It is vital to continue to enhance primary care HCP readiness to treat AUD, given the existing relationships and trust they often have with patients. Electronic methods for distributing DTC education could also be advantageous, as these methods may have the ability to track whether a message has been opened and read. Despite a lack of statistical significance, this project sparked crucial conversations and collaboration around AUD, available treatments, and addressing potential barriers to connecting patients to care within VISN 21.

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Ethics and consent

This quality improvement project was reviewed and ruled exempt by the Veterans Affairs Sierra Nevada Health Care System Associate Chief of Staff for Research.

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