Title

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Journal

Journal of general internal medicine, 30(3)

ISSN

0884-8734

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Publication Date

2015-03-01

DOI

10.1007/s11606-014-2968-9

Peer reviewed

INNOVATION AND IMPROVEMENT

An Inpatient Treatment and Discharge Planning Protocol for Alcohol Dependence: Efficacy in Reducing 30-Day Readmissions and Emergency Department Visits

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BACKGROUND: Alcohol dependence results in multiple hospital readmissions, but no discharge planning protocol has been studied to improve outcomes. The inpatient setting is a frequently missed opportunity to discuss treatment of alcohol dependence and initiate medication-assisted treatment, which is effective yet rarely utilized.

AIM: Our aim was to implement and evaluate a discharge planning protocol for patients admitted with alcohol dependence.

SETTING: The study took place at the San Francisco General Hospital (SFGH), a university-affiliated, large urban county hospital.

PARTICIPANTS: Learner participants included Internal Medicine residents at the University of California, San Francisco (UCSF) who staff the teaching service at SFGH. Patient participants included inpatients with alcohol dependence admitted to the Internal Medicine teaching service.

PROGRAM DESCRIPTION: We developed and implemented a discharge planning protocol for patients admitted with alcohol dependence that included eligibility assessment and initiation of medication-assisted treatment.

PROGRAM EVALUATION: Rates of medication-assisted treatment increased from 0 % to 64 % (p value < 0.001). All-cause 30-day readmission rates to SFGH decreased from 23.4 % to 8.2 % (p value=0.042). All-cause emergency department visits to SFGH within 30 days of discharge decreased from 18.8 % to 6.1 % (p value=0.056).

DISCUSSION: Through implementation of a discharge planning protocol by Internal Medicine residents for patients admitted with alcohol dependence, there was a statistically significant increase in medication-assisted treatment and a statistically significant decrease in both 30-day readmission rates and emergency department visits.

Electronic supplementary material *The online version of this article (doi:10.1007/s11606-014-2968-9) contains supplementary material, which is available to authorized users.*

Received December 7, 2013
Revised June 16, 2014
Accepted June 27, 2014
Published online August 5, 2014

KEY WORDS: alcoholism and addictive behavior; care transitions; medical student and residency education; substance abuse; medical education-clinical skills training.
J Gen Intern Med 30(3):365–70
DOI: 10.1007/s11606-014-2968-9

INTRODUCTION

Alcohol use disorders are a common problem in the United States and frequently go untreated. According to the National Survey on Drug Use and Health in 2012,[1] only 13.5 % of people with alcohol use disorders received any type of treatment, most of which were in self-help groups. Less than 10 % reported treatment in a hospital or clinic based setting.

At San Francisco General Hospital (SFGH), a large urban county hospital, patients with alcohol dependence have high admission and readmission rates. From 1 July 2010 to 30 June 2011, 24.5 % (973/3,967) of patients discharged from the Internal Medicine service had at least one ICD-9 code related to alcohol. These patients were 1.58 times more likely to be readmitted to SFGH within 30 days (19 % versus 12 %). Alcohol-related complications sit atop the list of reasons for readmission to SFGH, alongside congestive heart failure, chronic obstructive pulmonary disease (COPD) and diabetes-related complications. While the development of discharge planning bundles and systematic approaches have been studied extensively to tackle readmission rates for these other top reasons for readmission,[2–7] no such study exists for alcohol-related admissions. This is the first such paper to describe the design and implementation of a discharge planning protocol aimed to decrease readmission rates for those with alcohol dependence.

Inpatient hospitalization is a critical but frequently missed opportunity to discuss treatment of alcohol dependence. An inpatient stay addresses the acute illness, but often fails to tackle the underlying reason for admission: the alcohol dependence.[8] Referrals to social services or behavioral counseling may be offered, but these are often insufficient to treat dependence and ensure a safe discharge. Medication-assisted treatment is one important component of alcohol dependence

management. Compared to either alone, the addition of pharmacotherapy to psychosocial treatment improves outcomes.[9] Medications can help relieve cravings and symptoms of protracted withdrawal and allow neurons to readapt to a nonalcoholic state.[10] This helps patients increase motivational readiness for change, leading to longer periods of abstinence.[11]

The Food and Drug Administration (FDA) has approved four medications for the treatment of alcohol dependence: two forms of naltrexone (oral and extended-release injectable),[12–17] acamprosate,[18–21] and disulfiram.[22,23] There are data to support the safety and efficacy of all of these medications.[24] In particular, many experts consider naltrexone first-line therapy for alcohol dependence, given its proven efficacy and safety profile, both during supervised withdrawal and in the primary care setting.[25,26]

Despite availability, these medications are extremely underutilized. In a US Department of Veterans Affairs (VA) healthcare system, only 1.9 % of patients with alcohol dependence were prescribed naltrexone.[27] A national survey of US physicians who treat addictions showed that only 3–13 % use pharmacotherapy for the treatment of alcohol dependence.[28] Although physicians demonstrate low prescribing patterns, a majority of patients with alcohol dependence report an interest in medication-assisted treatment.[29]

Here we report on the design, implementation, and results of a discharge planning protocol that includes guidance on medication-assisted treatment, for Internal Medicine residents to use when discharging patients with alcohol dependence.

Setting and Participants

This study took place at the San Francisco General Hospital (SFGH), a 460-bed, university-affiliated, urban county hospital. Learner participants included Internal Medicine residents at the University of California, San Francisco (UCSF) who staff the teaching service at SFGH. Patient participants included SFGH patients with alcohol dependence admitted to the Internal Medicine teaching service in March 2012, when the discharge planning protocol was implemented. Admission data as well as data one month after discharge were collected for patients admitted to SFGH in June 2011 (pre-intervention) and March 2012 (post-intervention).

Project Description

Every month, 15 UCSF Internal Medicine residents admit an average of 275 patients to the teaching service at SFGH. As part of their ambulatory care didactics, residents receive a dedicated curriculum on Screening, Brief Intervention, and Referral to Treatment (SBIRT). SBIRT is an evidence-based, comprehensive, outpatient approach to identifying and treating persons with substance use disorders or those at risk of developing these disorders.[30–32]

To improve the treatment of alcohol dependence in the inpatient setting, a pilot educational intervention and discharge planning protocol was implemented in March 2012. This intervention was designed around information gathered during a focus group that sought to identify the biggest barriers to treatment of alcohol dependence in the inpatient setting. The focus group included Internal Medicine residents, attending physicians, pharmacists, medical social workers and substance abuse counselors in the community. The biggest barriers identified included lack of knowledge about efficacy and safety of medication options, availability of medications on hospital formulary, limited time to discuss with patients, and lack of primary care or follow-up.

To address these barriers, all 15 residents on the medicine service in March 2012 participated in an hour-long session, during regular didactic time, on treatment of alcohol dependence, including medication-assisted treatment. The education focused on the efficacy and safety of naltrexone, a medication already approved on formulary at SFGH. A partnership was also solidified with the Treatment Access Program (TAP), an assessment, referral and placement center in San Francisco for individuals with mental health and substance use disorders. If patients did not have a primary care provider or could not see their provider within 2 weeks, an appointment could be made with a TAP counselor for follow-up and medication refills.

During the month of March 2012, all residents were instructed to fill out the discharge planning tool (see online appendix) for all patients admitted with an alcohol-related diagnosis. The tool included an algorithm to prompt residents to discuss alcohol use, screen for naltrexone eligibility and contraindications (severe liver disease and opioid use/dependence), assess patient preferences and arrange follow-up. It included phone numbers to the Treatment Access Program for referrals and a detachable patient information sheet. Social workers also prompted the teams to complete these discharge planning tools during daily multidisciplinary/discharge planning rounds. As with all discharge medications at SFGH, a 30-day supply was given upon discharge to all patients who were prescribed naltrexone. The UCSF institutional review board approved of this study.

Program Evaluation

Patient data was gathered from the electronic health record and compared before and after implementation of the discharge planning protocol (June 2011 versus March 2012). Baseline patient characteristics were similar in both groups (see Table 1). Most of the patients were male and white, though Hispanic patients made up a large minority. More than half of patients were homeless or marginally housed. Most patients consumed greater than 21 drinks per week and more than 20 % had received prior alcohol treatment. Both groups

Table 1. Characteristics of the Patients at Baseline

Characteristics	Pre-intervention Group (June 2011) N=64	Intervention Group (March 2012) N=49	p Values*
Age – year (mean +/− SD)	47.1+/−11.2	48.9 +/− 10.5	0.23
Male Sex – no. (%)	53 (82.8)	44 (89.8)	0.43
Race or ethnic group – no. (%)			0.19
Black	12 (18.8)	4 (8.2)	
Native American	1 (1.6)	4 (8.2)	
Asian or Pacific	2 (3.1)	3 (6.1)	
White	34 (53.1)	21 (42.9)	
Hispanic	13 (20.3)	14 (28.6)	
Other	2 (3.1)	3 (6.1)	
Housing – no. (%)			0.99
Housed	23 (35.9)	18 (36.7)	
Marginally Housed	13 (20.3)	10 (20.4)	
Homeless	28 (43.8)	21 (42.9)	
Alcohol use upon admission – no. (%)			0.78
< 7 drinks/week	5 (7.8)	2 (4.1)	
7–14 drinks/week	0 (0)	0 (0)	
14–21 drinks/week	6 (9.4)	3 (6.1)	
> 21 drinks/week	44 (68.8)	39 (79.6)	
Not Recorded	9 (14.1)	5 (10.2)	
Prior Alcohol Treatment† – no. (%)	15 (23.4)	11 (22.4)	0.92
Opioid abuse/dependence – no. (%)			
Past	8 (12.5)	3 (6.1)	0.49
Current	5 (7.8)	3 (6.1)	
None	51 (79.7)	43 (87.8)	
Stimulant use – no. (%)			0.36
Past	4 (6.3)	2 (4.1)	
Current	12 (18.8)	5 (10.2)	
None	48 (75.0)	42 (85.7)	
Mood Disorder – no. (%)	19 (29.7)	12 (24.5)	0.69
Anxiety Disorder – no. (%)	8 (12.5)	5 (10.2)	0.77
Human immunodeficiency virus (HIV) – no (%)	8 (12.5)	4 (8.2)	0.55
Diabetes – no. (%)	5 (7.8)	9 (18.4)	0.15
Hypertension – no. (%)	10 (15.6)	13 (26.5)	0.23

* *p values are based on F-tests for the continuous variables and on Fisher's exact tests or chi-square tests for the categorical variables*
† *Prior alcohol treatment includes pharmacotherapy, rehabilitation, peer support groups and/or other counseling specifically around alcohol use*

had similar rates of comorbid disorders, including opioid and stimulant use disorders, mood or anxiety disorders, diabetes, hypertension, and human immunodeficiency virus (HIV).

The total number of patients with alcohol dependence was identified through chart review according to the Diagnostic and Statistical Manual of Mental Disorders IV (DSM IV) criteria. Of those patients with alcohol dependence, the number of patients who would be candidates for naltrexone pharmacotherapy (based on documentation of liver function tests and no recent opioid use) was also compared before and after intervention. (see Fig. 1a). Pre-intervention, 39.1 % (25/64) of patients were not eligible for naltrexone (20 due to opioid dependence or short-term opioid use, three due to severe liver function test abnormalities, and two due to both contraindications). The remaining 60.9 % (39/64) of patients were eligible for naltrexone.

After implementation of the discharge planning tool in March 2012 (see Fig. 1b), 49.0 % (24/49) of patients were not eligible for naltrexone (15 due to opioid dependence or short-term opioid use, seven due to severe liver function test abnormalities, and two due to both contraindications). The remaining 51.0 % (25/49) of patients were eligible for naltrexone.

The primary process measure compared the rate of prescription of naltrexone pharmacotherapy among those eligible patients. Pre-intervention, 0 % (0/39) of eligible patients were prescribed naltrexone during the inpatient stay or upon discharge. After the intervention, 64 % (16/25) of eligible patients were prescribed naltrexone ($p<0.001$). All of the remaining eligible patients declined the medication, either because they preferred other treatment options or were not yet ready to change their alcohol use.

The primary outcome measures compared rates of all-cause emergency department (ED) visits and inpatient readmissions within 30 days of discharge. Of all patients with alcohol dependence discharged pre-intervention, 23.4 % (15/64) were readmitted to SFGH within 30 days of discharge, compared with 8.2 % (4/49) post-intervention (p value=0.042). Before the intervention, 18.8 % (12/64) of patients had visits to the SFGH ED within 30 days (but were not readmitted), compared with 6.1 % (3/49) after intervention (p value=0.056).

Of those patients who were eligible for naltrexone pre-intervention, 38.5 % (15/39) were readmitted or had an ED visit versus 12.0 % (3/25) post-intervention (p value=0.025). Two of three in the latter group had been prescribed naltrexone. Of those patients who were not eligible for naltrexone pre-intervention, 48 % (12/25) were readmitted or had an ED visit versus 16.7 % (4/24) post-intervention (p value=0.032).

Most of the reasons for readmission or presentation to the ED were alcohol-related: 74.1 % (20/27) in the pre-

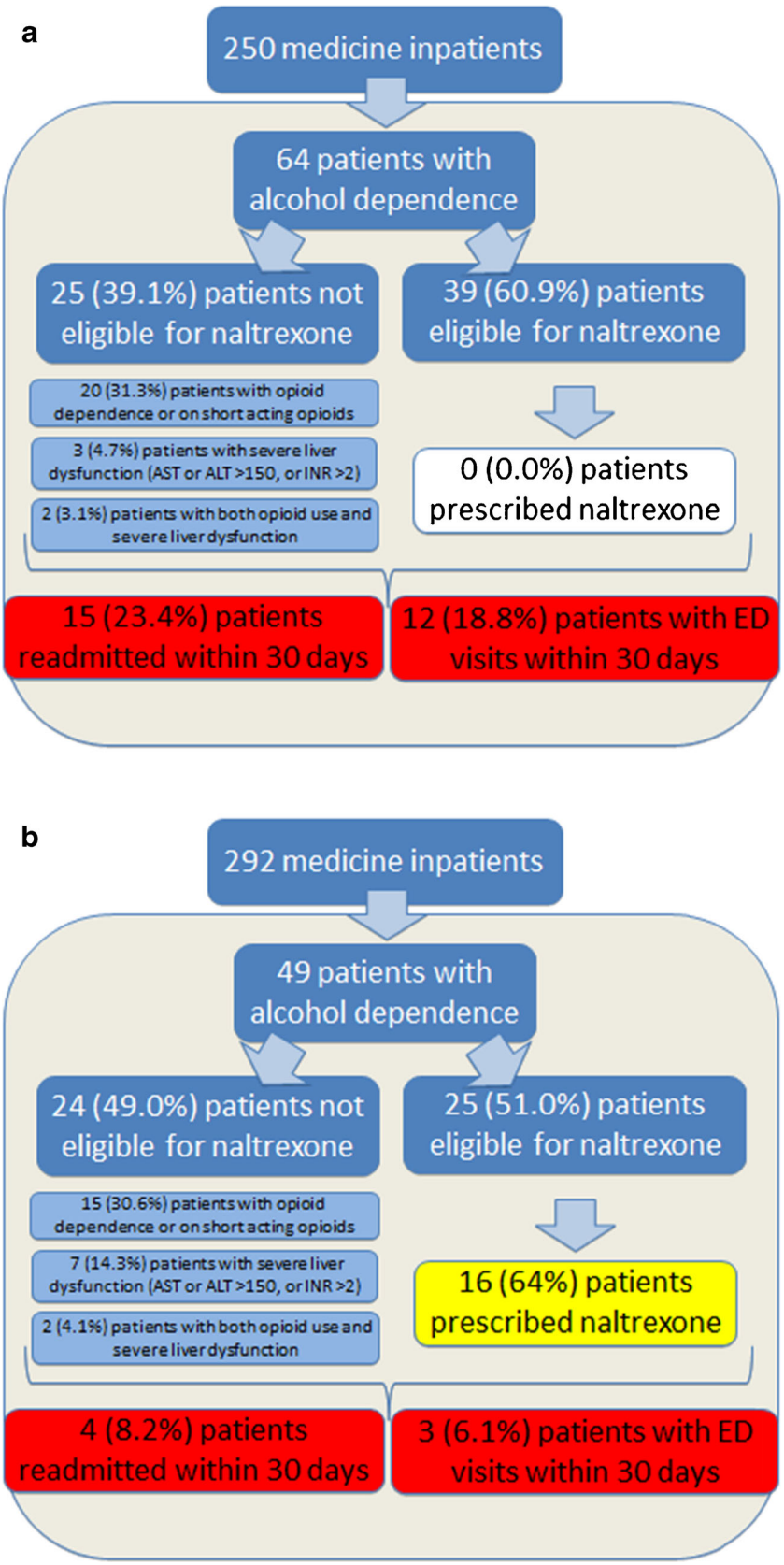

Figure 1. Comparison of pre-intervention group (June 2011) (a), and post-intervention group (March 2012) (b). This figure breaks down the characteristics of all patients with alcohol dependence admitted during the two comparison months. Regarding eligibility criteria for treatment with naltrexone, over 50 % of patients in both groups were eligible for treatment. The primary process measure was the percent of those patients eligible for naltrexone who were prescribed naltrexone. This increased from 0 % to 64 % ($p<0.001$) after the intervention. For the primary outcome measures, the rate of readmissions within 30 days decreased from 23.4 % to 8.2 % ($p=0.042$) and the rate of patients with emergency department (ED) visits within 30 days decreased from 18.8 % to 6.1 % ($p=0.056$).

intervention group compared to 85.7 % (6/7) in the post-intervention group (p value=1.0).

Among those with mood and/or anxiety disorders, high rates of readmission or ED visits within 30 days were seen both pre-intervention (44.4 %, 12/27) and post-intervention (46.2 %, 6/13) (p value=1.0).

DISCUSSION

This is the first paper to describe an intervention in which Internal Medicine residents were able to implement a discharge planning protocol to improve treatment of alcohol dependence in the inpatient setting. After the intervention, rates of naltrexone prescription increased significantly, and readmission rates and ED visits within 30 days of discharge decreased by two-thirds. Although the decrease in readmissions and ED visits was greatest in the group eligible for naltrexone, there was a statistically significant decrease in those who were not eligible as well. This suggests that there were multiple factors contributing to improved outcomes. The protocol not only promoted increased rates of medication-assisted treatment, but also improved interdisciplinary collaboration and streamlined outpatient referrals. It enhanced patient–provider communication around alcohol use and allowed residents to employ motivational interviewing techniques learned during the SBIRT curriculum. A combination of all of these elements played a role in decreasing readmission rates and visits to the ED. This study, however, also shows that the discharge planning protocol was not as effective in improving outcomes for the subset of patients with mood and/or anxiety disorders, suggesting that these groups have unique needs that may require a modified discharge protocol.

This study has several limitations. First, this is not a randomized controlled trial, as we compared two groups at different points in time. Thus, the implementation of the discharge planning protocol and the decrease in readmission rates and ED visits cannot be proven as causally related. There were no statistically significant differences between the two groups based on measured baseline characteristics, but it is possible that there were unmeasured variables that may have contributed to the differences in outcomes. In addition, the outcomes were measured immediately after initiation of the intervention, which does not allow for extrapolation to a sustained or longer-term outcome. Finally, the primary outcome measures of readmission rates and visits to the ED only apply to SFGH. We were unable to determine if patients presented to other hospitals in San Francisco. Data, however, was collected using the SFGH electronic health records in the same way before and after intervention, presumably excluding similar data in both sets.

Despite these limitations, this study of a discharge planning protocol for alcohol dependent patients is one of the first to tackle the problem of alcohol dependence in the inpatient setting using the same systems-based approaches being studied for other leading reasons for hospital readmission. Our discharge planning protocol builds on the SBIRT curriculum to help teach Internal Medicine residents how to address alcohol dependence in the inpatient setting through combined use of counseling and pharmacotherapy. With these tangible tools in hand, providers can be a more active part of the solution. Alcohol dependence needs to be treated like other medical diseases, utilizing evidence-based approaches to treatment and prevention. This study is an additional step in that direction.

Acknowledgements: *We would like to thank the University of California, San Francisco Internal Medicine residents for their participation. We would also like to thank Jenee Bryant, MSW, Katie Luttrell, MSW, Amy Logan, Pharm.D., David Hersh, MD, Paula Lum, MD, and Richard Brooks, MD for their support throughout this project.*

Funders: *None.*

Prior Presentations: *We presented an earlier version of the manuscript as a poster for the University of California, San Francisco Quality and Safety Symposium on 29 May 2012. This abstract was also presented for the Association of Medical Education and Research in Substance Abuse (AMERSA) conference on 3 November 2012.*

Conflict of Interest: *The authors declare that they do not have a conflict of interest.*

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