Published in final edited form as:

Subst Abus. 2017 ; 38(4): 389–393. doi:10.1080/08897077.2017.1353570.

Overdose History Is Associated with Post-Detoxification Treatment Preference for Persons with Opioid Use Disorder

Michael D. Stein, M.D.^{a,b}, Jessica N. Flori, B.A.^a, Megan M. Risi, B.D.^a, Micah T. Conti, B.A.^a, Bradley J. Anderson, Ph.D.^a, and Genie L. Bailey, M.D.^{b,c}

^aGeneral Medicine Research Unit, Butler Hospital, Providence, Rhode Island, USA.

^bWarren Alpert Medical School of Brown University, Providence, Rhode Island, USA.

^cStanley Street Treatment and Resources, Inc., Fall River, Massachusetts, USA.

Abstract

Background: Without aftercare treatment, persons discharged from short-term inpatient detoxification for opioid use disorder are at high risk of relapse. In previous work, those who were recently homeless or had pending legal problems were more likely to prefer residential treatment for aftercare. Here, based on clinical experience, we hypothesize that a particular clinical factor, surviving an opioid overdose, will be associated with aftercare preference.

Methods: Between May and December 2015, we surveyed consecutive persons seeking inpatient opioid detoxification. To assess aftercare treatment preference, participants were asked, “If you had unlimited treatment options and all were free, which one would work best for you when you leave here?” To assess overdose history, participants were asked about overdose “since your first drug use,” and “in the last year.”

Results: Participants’ (n=440) mean age was 32.3 ($\pm$ 8.7) years; 70.7% were male. More than half (51.1%) of participants expressed an aftercare preference for medication-assisted treatment (MAT), 12.7% for outpatient counseling only, 10.7% for residential treatment, 18.6% for no formal treatment (NA/AA only or a halfway house), and 6.8% did not want any post-detoxification treatment. About 38.9% reported a history of overdose and 24.8% reported past year overdose. In the multivariate model, treatment preference was associated with sex ($p < .001$), homelessness ($p = .01$), and history of drug overdose ($p = .02$).

Conclusions: Although MAT was preferred by the majority of participants, the experience of a non-fatal overdose was associated with the choice of residential treatment as post-detoxification treatment.

Keywords

Opioids; detoxification; overdose; residential treatment

INTRODUCTION

Opioid abuse is a global problem affecting 30 million people ¹. In 2012, it was estimated that 2.1 million people in the United States reported opioid use disorders related to prescription opioids, and an additional 467,000 reported heroin addiction ². Opioid use and addiction pose serious threats to physical and mental health including increased risk for HIV, hepatitis C, trauma, and depression ³. Drug overdose deaths have more than doubled since 1999 ⁴ and are the leading cause of mortality among opioid users ^{5, 6}. In addition, non-fatal overdose among opioid users is extremely common ⁷⁻⁹ and puts the individual at greater risk of subsequent opioid overdose ^{10, 11}.

For persons with opioid use disorder, inpatient detoxification programs provide a short-term environment to begin a period of prolonged abstinence ¹²⁻¹⁴. However, detoxification alone is insufficient to sustain abstinence post-detoxification ¹⁵, making aftercare treatment essential to recovery. Post-detoxification aftercare treatment has been shown to prolong abstinence and reduce overdose rates among opioid dependent individuals ^{10, 16, 17}. Aftercare choice is a matter of self-selection, and the exploration of treatment preferences and the elements driving preferences are critical, particularly given the “revolving door” of detoxification admissions.

In our previous work we have reported that persons entering short-term opioid detoxification are divided in their perceptions about which one treatment—outpatient medication, psychosocial, or residential—would work best for them after discharge ^{14, 18, 19}. Persons who were recently homeless or had pending legal problems were more likely to prefer residential treatment for aftercare, but the clinical factors we examined—for instance, heroin vs. prescription opioid use, concurrent cocaine or benzodiazepine use, or history of medication-assisted treatment—were not associated with one aftercare preference over another ¹⁸.

Overdose is a salient life event, and opioid users are aware that overdose numbers are escalating. Based on our clinical experience and discussion with opioid users, we hypothesize that one previously unexamined clinical factor, a history of non-fatal overdose, will influence the aftercare treatment preference of persons with opioid use disorder seeking inpatient detoxification in the midst of the current opioid epidemic in the Northeastern United States ^{20, 21}.

METHODS

Recruitment

Between May 2015 and December 2015, consecutive persons seeking inpatient opioid detoxification were approached at the time of admission to Stanley Street Treatment and Resources, Inc. (SSTAR) in Fall River, Massachusetts to participate in a survey research study. SSTAR’s detoxification program provides evaluation and withdrawal management using a methadone taper protocol, individual and group counseling, and aftercare case management and has a mean length-of-stay of 4.9 days.

Of patients admitted to SSTAR during the recruitment period, 497 were opioid users who were 18 years or older, English-speaking, and able to provide informed consent as approved by the Butler Hospital Institutional Review Board. Twenty-five refused study participation or were discharged before staff could interview them. The remaining 472 persons completed a non-incentivized, face-to-face interview administered by non-treating research staff that required approximately 15 minutes. Data related to treatment preference were missing for 32 persons leaving a final sample size of 440.

Measures

Sample descriptors that served as covariates included age, sex, race/ethnicity, employment (part or full-time vs. unemployed), years of education, cocaine use in the past 30 days (yes/no), and homelessness (any nights on street or a shelter in the prior 90 days). We assessed “What is your legal status?” with response options: none, on probation, on parole, on pretrial release. Participants were asked if they had ever received buprenorphine, methadone, or Vivitrol treatment with each medication option described. We assessed whether participants had ever sought opioid detoxification in the past, and if so, when. Participants were asked if the primary opioid they were currently seeking detoxification from was heroin or prescription medication. To assess overdose history, participants were asked, “Since your first drug use, have you ever overdosed?” Respondents were informed that for this question, overdose was defined as “a period of time where the participant was unarousable with shaking or calling of name because of the drugs consumed.” For recent overdose, participants were asked, “How many times have you overdosed in the last year?” Based on responses to these two questions, we created three mutually exclusive overdose history categories: Past year, Prior to past year, Never.

To assess aftercare treatment preference, participants were asked, “If you had unlimited treatment options and all were free, which one would work best for you when you leave here?” Response options included “I’m not interested in more treatment after I leave detox”, “Long term residential treatment,” “Sober house or halfway house,” “Buprenorphine,” “Methadone,” “Vivitrol shots,” “Outpatient counseling by a mental health or substance abuse counselor with no medication,” and “NA/AA meetings only.” We categorized these response options into 5 treatment preference categories: Medication-assisted treatment (buprenorphine, methadone, or Vivitrol), Outpatient Counseling, Residential Treatment, No Formal Treatment (sober or halfway house, or NA/AA meetings only), and No Treatment.

Analytical Methods

We present simple descriptive statistics to summarize the characteristics of the sample. We present subgroup means and percentages to evaluate the unadjusted associations of treatment preference with demographic characteristics, treatment history, and history of drug overdose. We report F-tests and χ^2 -tests to evaluate the statistical significance of unadjusted associations. We used multinomial logistic regression to evaluate the adjusted association of treatment preference with background characteristics. In this exploratory analysis, we report model parameters treating preference for no treatment as the reference category. For each covariate, 4 coefficients are reported (MAT vs no treatment, residential vs no treatment,

counseling vs no treatment, and no formal treatment vs no treatment, however, with a 5-category outcome, the model implies 10 pairwise comparisons for each included covariate. To facilitate interpretation, we report all statistically significant contrasts. Tests of significance are based on the sequential Holm-Bonferroni corrected p-values²² that control for the overall family-wise error rate.

RESULTS

Participants averaged 32.3 ($\pm$ 8.67) years of age, 70.7% were male, and 82.1% were non-Latino White (Table 1). Mean educational attainment was 11.8 ($\pm$ 1.88) years. Only 18.4% were employed either full- or part-time and 12.3% had spent at least 1 night on the street or in a shelter in the past 90 days. Most (81.4%) had a history of MAT and 86.8% said they were detoxifying from heroin. About 48.4% reported they had been in opioid detoxification in the past year, 24.3% had previously been in detoxification but not within the past year, and 27.3% had no history of detoxification. Just over a third (35.7%) reported legal issues that included probation, parole, incarceration, or pending trial. About 40.9% reported recent cocaine use and 38.9% reported a history of drug overdose. Two hundred twenty-five (51.1%) persons expressed a preference for MAT, 47 (10.7%) for residential treatment, 56 (12.7%) for outpatient counseling, 82 (18.6%) wanted no formal treatment (41 reported a preference for NA/AA only and 41 expressed a preference for a halfway house), and 30 (6.8%) did not want any post-detoxification treatment.

Without adjusting for covariates, treatment preference was associated significantly with sex ($\chi^2 = 21.86$, $df = 4$, $p < .001$), recent homelessness ($\chi^2 = 22.46$, $df = 4$, $p < .001$), and overdose history ($\chi^2 = 23.37$, $df = 8$, $p = .003$) (Table 1). Persons with a preference for no post detox treatment (93.3%) or no formal treatment (81.7%) were more likely male than those expressing a preference for formal treatments. Persons expressing a preference for residential treatment were more likely to have recently experienced homelessness (31.9%) than those expressing any other treatment preference. And rates of recent and lifetime drug overdose were highest among persons expressing a preference for residential treatment. Among persons reporting a preference for residential treatment, 31.9% reported no history of overdose, 23.4% reported an overdose but not in the past year, and 44.7% reported a past year drug overdose. MAT was the most preferred treatment even among persons with a history of overdose. About 48.6% of those with a past year overdose and 41.9% of those with a less recent overdose expressed a preference for MAT.

After adjusting for other covariates in the multivariate model, treatment preference was associated significantly with sex ($LR^2 = 20.36$, $df = 4$, $p < .001$), homelessness ($LR^2 = 13.00$, $df = 4$, $p = .011$), and history of drug overdose ($LR^2 = 17.73$, $df = 8$, $p = .023$) (Table 2). Because coefficients for all specific contrasts are not presented in Table 2, contrasts that are statistically significant at the .05 level using the Holm-Bonferroni correction are summarized here. Relative to females, males were significantly more likely ($OR = 0.09$, HB $p = .020$) to report a preference for counseling rather than for no formal treatment. Compared to persons with no history of overdose, those with a past-year overdose were estimated to be about 6.63 (HB $p = .032$) more likely to prefer residential treatment than no treatment, about 4.38 (HB $p = .020$) times more likely to prefer residential than no formal

treatment, about 5.15 (HB $p = .027$) times more likely to prefer residential treatment than counseling, and about 3.46 (HP $p = .032$) more likely to prefer residential treatment than MAT. Those with a past-year history of overdose and those with no history of overdose did not differ significantly with respect to specific pairwise comparisons involving preference for treatments other than residential treatment. And none of the comparisons contrasting those with an overdose more than 1-year ago with those with either past-year overdose or no history of overdose were statistically significant.

DISCUSSION

Medication treatment was the preferred treatment for slightly more than half the participants following inpatient detoxification discharge, while fewer than one in ten did not want any additional post-detoxification treatment. Treatment preference was significantly associated with sex, homelessness, and history of drug overdose, which two in five persons reported in their lifetime. While residential treatment was the treatment choice of only 11% of this cohort, persons who chose residential treatment were more likely to have experienced an overdose compared to persons who chose other aftercare options. This is the first study exploring the role that an overdose experience plays in the treatment preferences of persons with opioid use disorder.

Replicating our earlier findings¹⁸, the current analysis controlled for factors known to be associated with treatment choice following inpatient detoxification discharge. We speculate that opioid users who have survived an overdose and who are living in a region with high overdose rates may be particularly interested in residential treatment because they perceive this choice will offer the greatest likelihood of preventing a future overdose. At this cultural moment when opioid overdoses are escalating and receiving considerable media coverage, persons with overdose histories may consider themselves at particularly high risk. Persons in opioid detoxification recognize that their risk of relapse is high¹⁴—here 73% had been in detoxification before—and even though most overdoses are classified as accidental²⁴, residential treatment may be perceived as the “safe” aftercare option immediately following detoxification. Residential treatment following medication-assisted detoxification has been shown to improve abstinence rates in opioid dependent individuals^{16, 25, 26}. It is also possible that prior overdose and homelessness, two of the main predictors of residential preference are proxy measures of a greater history of treatment failure. Those who had more experiences of treatment failure are more interested in residential treatment as a “last resort.” Qualitative studies exploring how past overdose experience influences treatment preference would be an important next research step.

Residential treatment is heterogeneous, varying in duration, psychiatric care, counselor staffing, skills and vocational training, the provision of medication assistance, 12-step facilitation group presence, and theoretical approach offered. We did not have data to understand what exactly participants had in mind when stating a preference for “residential treatment” and what they believed that treatment entails. Residential treatment, known to have limited availability due to cost²⁷, was not the most popular treatment in this population with high rates of ongoing legal issues, homelessness, and high unemployment. Among homeless participant subgroup, only 28% selected residential treatment as their preferred

aftercare; another 20% selected sober housing which offers no formal treatment. Thus, interestingly, less than half the homeless participants chose a form of “housing” as their aftercare preference.

There are other study limitations. First, this cohort was assembled from a single detoxification program, and may not be representative of programs nationally. Second, treatment preferences were enunciated in the first 24 hours of detoxification, and might change later in treatment. Third, replicating our previous research regarding treatment preferences¹⁸, participants could choose only a single treatment option when asked “what would work best for you when you leave here?” It’s possible that some participants might have chosen a combination of treatments, such as residential or outpatient counseling *plus* medication-assisted treatment if given the choice. Of note, the phrase “would work best for you” may have been interpreted in many ways; we chose this phrase over “would you prefer” because in our earlier work, the word “prefer” seemed to be influenced by what a patient believed was available and likely to receive. Our treatment preference question also did not get at the rationale behind a participant’s choice of what “would work best.” Such qualitative work is worthy of future study. Fourth, we do not know if study participants in fact entered their preferred treatment after detoxification discharge; capacity limits within our treatment system, and other societal constraints (affordable housing, transportation, prior treatment experience) affect treatment entry. Fifth, we did not ask participants their perceptions of their future overdose risk. Finally, the study offers no direction about how to facilitate residential treatment access among opioid overdosers, or others, who want it.

Conclusions

The goal of detoxification programs is to link patients to aftercare¹³. Yet seamless linkage does not always occur, and because the period immediately after release from sequestered settings such as prison and inpatient programs^{28, 29} is a high-risk period for overdose because opioid tolerance is low, education regarding overdose prevention should be part of every program. Regardless of discharge destination, naloxone instruction³⁰ can now be included in aftercare planning.

In this sample of patients with past experience with MAT, MAT remained the preferred aftercare for the majority. While residential treatment was the treatment choice of only 11% of this cohort, persons who chose residential treatment were significantly more likely to have an overdose history (68%) compared to persons who chose other treatment preferences (overdose history percentages ranged from 30%–43%). Honoring patient preferences for aftercare may enhance transition to and engagement in aftercare. For those able to enter a residential facility, time spent in such protected living situations will eventually come to an end, and whether persons who move from inpatient detoxification to residential settings are better able to avoid subsequent overdose, compared to other aftercare treatments, is unknown and worthy of future research.

Acknowledgments

FUNDING

This study was funded by the National Institute on Drug Abuse (RO1 DA034261). Trial registered at clinicaltrials.gov; Clinical Trial # NCT01751789. The funding organization had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

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Table 1.**Background Characteristics by Preferred Treatment**

	Sample (n = 440)	Preferred Treatment					F or χ^2 (p =)
		MAT (n = 225)	Residential (n = 47)	Counseling (n = 56)	No Formal ^a (n = 82)	None (n = 30)	
Yrs. Age	32.3 (± 8.67)	32.2 (± 8.48)	34.3 (± 8.92)	30.9 (± 8.43)	31.8 (± 8.21)	33.2 (± 11.0)	1.13 (.340)
Gender (Male)	311 (70.7%)	151 (67.1%)	35 (74.5%)	30 (53.6%)	67 (81.7%)	28 (93.3%)	21.86 (<.001)
Non-Latino White	361 (82.1%)	183 (81.3%)	36 (76.6%)	49 (87.5%)	68 (82.9%)	25 (83.3%)	2.23 (.693)
Yrs. Education	11.8 (± 1.88)	11.8 (± 1.75)	11.9 (± 2.02)	12.3 (± 1.99)	11.7 (± 1.74)	11.4 (± 2.65)	1.37 (.242)
Employed (Yes)	81 (18.4%)	42 (18.7%)	5 (10.7%)	14 (25.0%)	14 (17.1%)	6 (20.0%)	3.67 (.453)
Homelessness (Yes)	54 (12.3%)	20 (8.9%)	15 (31.9%)	4 (7.1%)	13 (15.6%)	2 (6.7%)	22.46 (<.001)
Ever MAT (Yes)	358 (81.4%)	181 (80.4%)	38 (80.6%)	50 (89.3%)	62 (75.6%)	27 (90.0%)	5.71 (.221)
Detox from Heroin (Yes)	382 (86.8%)	201 (89.3%)	40 (85.1%)	42 (75.0%)	73 (89.0%)	26 (86.7%)	8.55 (.073)
Detox History							
Never	120 (27.3%)	71 (31.6%)	6 (12.8%)	19 (33.9%)	17 (20.7%)	7 (23.3%)	15.03 (.058)
12 Months	213 (48.4%)	97 (43.1%)	28 (59.6%)	24 (42.9%)	50 (61.0%)	14 (46.7%)	
> 12 months	107 (24.3%)	57 (25.3%)	13 (27.7%)	13 (23.2%)	15 (18.3%)	9 (30.0%)	
Legal Issues (Yes)	157 (35.7%)	72 (32.0%)	15 (31.9%)	23 (41.1%)	36 (43.9%)	11 (36.7%)	4.76 (.313)
Recent Cocaine Use (Yes)	180 (40.9%)	83 (36.9%)	20 (42.6%)	21 (37.5%)	42 (51.2%)	14 (46.7%)	5.84 (.211)
Overdose History							
Never	269 (61.1%)	146 (64.9%)	15 (31.9%)	40 (71.4%)	47 (57.3%)	21 (70.0%)	23.37 (.003)
Yes (> 1 Year)	62 (14.1%)	26 (11.6%)	11 (23.4%)	7 (12.5%)	14 (17.1%)	4 (13.3%)	
Yes (Past Year)	109 (24.8%)	53 (23.6%)	21 (44.7%)	9 (16.1%)	21 (25.6%)	5 (16.7%)	

^a Includes 41 persons who expressed a preference for a sober/halfway house and 41 persons who expressed a preference for attending NA or AA meetings only.

Table 2.

Multinomial Logit Model Estimating the Effect on the Expected Odds of Preferred Treatment to no Treatment (n = 440)

	Odds (95% CI) of Preferring Designated Treatment to No Treatment.				
	MAT	Residential	Counseling	No Formal	LR ²
Yrs. Age	0.98 (0.94; 1.03)	1.00 (0.94; 1.05)	0.96 (0.91; 1.02)	0.97 (0.93; 1.02)	2.75 (.600)
Gender (Male)	0.15 (0.35; 0.67)	0.20 * (0.04; 0.99)	0.09 (0.02; 0.40)	0.32 (0.07; 1.50)	20.36 (<.001)
Non-Latino White	1.03 (0.45; 3.04)	0.61 (0.16; 2.18)	1.53 (0.41; 5.77)	1.09 (0.33; 3.57)	2.74 (.602)
Yrs. Education	1.13 (0.91; 1.41)	1.23 (0.94; 1.61)	1.25 (0.35; 3.78)	1.10 (0.87; 1.39)	4.10 (.393)
Employed (Yes)	0.99 (0.35; 2.82)	0.69 (0.17; 2.86)	1.14 (0.35; 3.78)	1.10 (0.35; 3.47)	0.77 (.942)
Homelessness (Yes)	1.43 (0.30; 6.72)	5.71 * (1.13; 28.95)	1.21 (0.19; 7.50)	2.72 (0.55; 13.39)	13.00 (.011)
Ever MAT (Yes)	0.31 (0.08; 1.19)	0.48 (0.10; 2.27)	0.58 (0.12; 2.85)	1.47 (0.55; 3.92)	6.55 (.162)
Detox from Heroin (Yes)	1.20 (0.36; 4.04)	0.52 (0.12; 2.23)	0.43 (0.12; 1.62)	0.26 (0.24; 3.55)	7.27 (.122)
Detox History					
12 Months	0.68 (0.25; 1.90)	1.80 (0.45; 7.16)	0.91 (0.27; 2.98)	1.25 (0.41; 3.86)	10.70 (.219)
> 12 Months	0.59 (0.18; 1.89)	1.63 (0.34; 7.81)	0.64 (0.16; 2.50)	0.49 (0.13; 1.84)	
Never [REF]	[1.00]	[1.00]	[1.00]	[1.00]	
Legal Issues (Yes)	0.77 (0.33; 1.79)	0.74 (0.26; 2.08)	1.23 (0.46; 3.28)	1.09 (0.44; 2.71)	3.31 (.508)
Recent Cocaine Use (Yes)	0.57 (0.25; 1.28)	0.56 (0.21; 1.54)	0.63 (0.24; 1.66)	1.02 (0.42; 2.46)	5.74 (.220)
Overdose History					
> 12 Months	1.08 (0.32; 3.59)	3.98 (0.97; 16.17)	1.35 (0.33; 5.54)	1.54 (0.43; 5.54)	17.73 (.023)
12 Months	1.91 (0.65; 5.68)	6.63 * (1.84; 23.91)	1.29 (0.35; 4.75)	1.51 (0.47; 4.88)	
Never [REF]	[1.00]	[1.00]	[1.00]	[1.00]	
Constant	53.2	0.96	7.64	13.87	
Model LR ² = 105.64, df = 56, p < .001					

* p < .05