



Same-day vs. delayed buprenorphine prescribing and patient retention in an office-based buprenorphine treatment program

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ABSTRACT

Background: Buprenorphine is a safe and effective treatment for opioid use disorder (OUD), yet a small fraction of people with OUD receive it, and rates of retention in treatment are suboptimal. Dropout most commonly occurs within 30 days of treatment initiation. Therefore, research needs to investigate modifiable factors contributing to early dropout. Requiring multiple visits for evaluation prior to providing an initial buprenorphine prescription (delayed prescription) may lead to more early dropout when compared with prescribing at the first medical visit (same-day prescription). Our objective was to determine whether same-day (vs. delayed) buprenorphine prescription was associated with 30-day retention in treatment.

Methods: We conducted a retrospective cohort study of 237 patients who initiated buprenorphine treatment at an urban federally qualified community health center (FQHC) between June 1, 2015, and December 31, 2017. We measured prescription delays by determining the time between patients' first request for buprenorphine treatment (by calling, presenting to the FQHC in-person, or requesting treatment during a visit) and when providers wrote buprenorphine prescriptions. We included only patients with prescription delays less than or equal to 30 days in the analysis. We defined same-day prescription as the patient experiencing no delays in starting treatment and receiving a prescription during the first medical visit. We examined whether patients who received same-day prescriptions had different socio-demographic and clinical characteristics than patients who received delayed prescriptions. We also evaluated whether there was an association between the initial provider who made the decision about same-day vs. delayed buprenorphine prescribing and same-day prescription. We built a multivariable logistic regression model to evaluate the independent association between same-day vs. delayed prescription receipt and odds of 30-day retention in treatment.

Results: Of the 237 patients who initiated buprenorphine treatment from June 1, 2015, to December 31, 2017, 222 had delays less than or equal to 30 days and we included them in the analysis. Of the 222 patients, the mean age was 46 (SD 10.4), the majority were Hispanic ($n = 160$, 72%), male ($n = 175$, 79%), and publicly insured ($n = 165$, 74%). The majority of patients experienced delayed buprenorphine prescription receipt ($n = 133$, 60%). The median time to buprenorphine prescription was 5 days (IQR 0–11). Of those who experienced a delay ($n = 133$), the median delay time was 8 days (IQR 5–20). Compared to those with same-day prescription receipt, more patients with delayed prescription receipt were non-Hispanic white (11% vs. 2%, $p = 0.01$), had a history of alcohol use (43% vs. 21%, $p < 0.01$) or benzodiazepine use (22% vs. 9%, $p = 0.01$), and had the buprenorphine coordinator as their initial provider (57 vs. 13%, $p < 0.01$). Same-day prescription receipt was not significantly associated with 30-day treatment retention in the adjusted analysis (AOR 1.92, 95% CI 0.81–4.56).

Conclusion: Patients who received buprenorphine prescriptions on the same day as their initial evaluation differed from those who received delayed prescriptions. After adjustment for these differences, same-day prescription was not significantly associated with higher 30-day treatment retention. Providers may be delaying treatment when there is concern about alcohol and/or benzodiazepine use; however, providers could institute enhanced monitoring based on clinical concern for sedation or overdose risk without delaying buprenorphine prescription. Prospective studies of same-day vs. delayed buprenorphine receipt would elucidate the association between delays and retention more definitively.

1. Introduction

In the U.S., buprenorphine treatment is a critical strategy for stemming the opioid overdose crisis; however, treatment dropout remains a serious problem. While the literature has documented a wide

variability in buprenorphine treatment retention rates, most studies show that in the U.S. less than two-thirds of patients who initiate buprenorphine treatment remain in treatment after 6 months (Timko, Schultz, Cucciare, Vittorio, & Garrison-Diehn, 2016), and a recent analysis of national prescription data showed that only 29% of

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buprenorphine treatment episodes lasted longer than 6 months (Olson, Zhang Shu, Schoenbaum, & King, 2020). The highest rate of dropout occurs during the first month of treatment (Hser et al., 2014; Soeffing, Martin, Fingerhood, Jasinski, & Rastegar, 2009; Stein, Cloe, & Friedmann, 2005). Therefore, clinical decisions made early in treatment likely have important implications for long-term success with treatment. Whether a prescription should be written at the first medical visit (hereafter "same-day prescribing") or at a subsequent visit is still unclear. The timing of the first prescription may be particularly important for treatment retention.

Guidelines recommend a comprehensive medical assessment at the intake visit, which culminates in a decision about prescribing medication (Comer et al., 2015). Clinicians assess for opioid use disorder (OUD), medical and psychiatric co-morbidities, prior treatment episodes, and also likelihood of adhering to a treatment plan. Clinicians may supervise buprenorphine treatment initiation in their office, or have patients start treatment at home (Cunningham et al., 2011; Lee, Voci, & Fiellin, 2014). The benefit of prescribing buprenorphine during the first clinical encounter is unclear. In a recent review of 25 office-based buprenorphine treatment programs, only two described protocols for prescribing buprenorphine on the same day as intake (Lagisetty et al., 2017). One study of buprenorphine initiation found that higher dose and longer duration of the first prescription were associated with increased odds of 6-month treatment retention, but the study did not report time to receipt of the first prescription (Meinholer, Williams, Johnson, Schackman, & Bao, 2019). A study conducted in an office-based buprenorphine treatment program that required multiple visits before prescribing buprenorphine found that the majority of patients dropped out before ever receiving a prescription (Simon et al., 2017). Research has shown that minimizing delays in initiating methadone treatment can be associated with improved treatment outcomes (Dennis, Ingram, Burks, & Rachal, 1994). One small study showed that requiring 1–2 visits prior to giving a prescription was associated with higher 3-month retention compared to requiring 3 or more visits after clinic protocols were changed (Lee et al., 2019). However, to our knowledge, no studies have specifically investigated same-day buprenorphine prescribing and treatment outcomes.

There are several factors influencing why same-day buprenorphine prescribing has yet to become standard of care, including practice, patient, and provider factors. Practice factors—such as volume of patients, length of appointments, walk-in appointment availability, and availability of evening and weekend appointments—may influence whether patients receive a buprenorphine prescription on the same day as their first evaluation. Patients may not be ready to start buprenorphine treatment at their first evaluation. Provider factors include individual differences in experience with home-induction, perceptions of the importance of having urine drug testing and blood tests (i.e., liver function tests) results available before prescribing, and concerns about diversion. Providers commonly express concern about buprenorphine diversion and may delay prescribing to assure that patients are serious about treatment (Holly, Andrilla, Jones, & Patterson, n.d.; Huhn & Dunn, 2017). Delaying treatment initiation for a few days could help to select for patients best suited for buprenorphine treatment and thereby improve treatment outcomes. Alternatively, treatment delays may be destabilizing for patients who reduced their opioid use or stopped using opioids altogether in preparation for initiating buprenorphine treatment at the intake visit. Delays in buprenorphine prescribing could lead to patient frustration and increased opioid use while awaiting a prescription, increasing risk for opioid overdose and dropout risk once they do receive a prescription. Delaying treatment could also erode patients' trust in their providers, exacerbate perceptions of stigma, and impair engagement with the healthcare system (Van Boekel, Brouwers, Van Weeghel, & Garretsen, 2013). Thus, without evidence of harms from same-day prescribing, delaying treatment until a follow-up visit may impose unnecessary inconvenience and risk for patients.

We sought to determine whether same-day prescription (i.e., the

patient experienced no delays in starting treatment and receiving a prescription during the first medical visit) was associated with retention in buprenorphine treatment at 30 days. We hypothesized that same-day prescription receipt would be associated with higher 30-day retention than would delayed prescription receipt.

2. Methods

We conducted a secondary analysis of data from a retrospective medical record review of a single large primary care-based buprenorphine treatment program. The study received IRB approval from the Albert Einstein College of Medicine.

2.1. Setting

The buprenorphine treatment program is based in a federally qualified health center (FQHC) in an urban area with high rates of poverty and opioid overdose deaths. As described elsewhere, the program is over a decade old and has treated > 1000 patients (Cunningham et al., 2008, 2009, 2013). Currently, thirteen buprenorphine waivered primary care providers (PCPs), all general internists, prescribe buprenorphine. The buprenorphine coordinator (a clinical pharmacist) typically completed the standardized intakes, though PCPs may initiate buprenorphine before a standardized intake is completed.

2.2. Treatment initiation

Patients can request to initiate buprenorphine treatment three ways: 1) by phone, 2) in-person, or 3) during primary care visits. New patients who call the FQHC or request an appointment in-person are typically scheduled to see the buprenorphine coordinator to complete a standardized intake visit. During the intake visit, the buprenorphine coordinator may ask a PCP onsite to provide a buprenorphine prescription for the patient the same day, or schedule the patient for a follow-up visit with a PCP to receive a prescription. Alternatively, patients who are already established at the FQHC may initiate treatment with their PCP, or their PCP may refer the patient to the buprenorphine coordinator for an intake visit. When PCPs initiate treatment, they may provide patients with a buprenorphine prescription on the same day or require a follow-up visit. After patients receive and fill their buprenorphine prescription, they take their first dose of the medication at home (Cunningham et al., 2011). At the beginning of treatment, patients typically have follow-up visits with their PCP every one to two weeks, until they have stabilized on a dose of medication that alleviates withdrawal symptoms and opioid cravings. After stabilization, patients are typically seen monthly.

2.3. Patients

We collected data on all patients who initiated buprenorphine treatment at the FQHC from June 1, 2015, through December 31, 2017, and received at least one buprenorphine prescription. We excluded patients from the study if they 1) received a buprenorphine prescription at the FQHC within 90 days before the start of the study period; or 2) experienced delays in prescription receipt > 30 days, because delays of this length were unlikely to represent the initial provider's treatment decisions. Consistent with national guidelines (Comer et al., 2015), the FQHC does not offer buprenorphine treatment to patients: 1) with hypersensitivity to buprenorphine or naloxone; 2) with severe alcohol or benzodiazepine use disorder, and 3) who take > 60 mg of methadone daily.

2.4. Outcomes

The primary outcome was 30-day retention in treatment, defined as having an active buprenorphine prescription between 30 and 90 days

after the first day of the first prescription (Weinstein et al., 2017).

2.5. Independent variables

The main independent variable was same-day prescription receipt, defined as patients experiencing no delays in starting treatment and receiving a prescription during the first medical visit (dichotomous, yes/no). We defined delays as the time between the first request for buprenorphine treatment and receipt of a prescription. To determine requests for buprenorphine treatment, one author (AJ) reviewed all PCP notes and phone calls documented in the medical record. In a second exploratory analysis, we used the duration of treatment delay as the independent variable. We categorized the number of days between the first documented request for buprenorphine treatment and receipt of a buprenorphine prescription as 0, 1–7, 8–14, or 15–30 days, corresponding to short, medium, and long treatment delays. We used the term “delay” only to quantify the time the patient had to wait to receive a prescription, not to judge whether waits were appropriate or avoidable.

2.6. Covariates

Using a standardized buprenorphine treatment intake form and demographic information in the medical record, we collected information on: age; race/ethnicity (Hispanic, non-Hispanic white, non-Hispanic Black, non-Hispanic other, missing); sex (male, female); insurance status (publicly insured with Medicaid or Medicare, privately insured, uninsured); self-reported housing status (housed, homeless, unstable housing, shelter, transitional); any documented history of buprenorphine treatment (yes/no); documented transfer from another program, defined as having received buprenorphine treatment from another program within the past two weeks (yes/no); and the name of the initial provider who made the decision about same-day vs. delayed buprenorphine prescribing. Substance use variables were dichotomous (yes/no) and we defined them using either self-reported use of the substance during the previous 30 days or positive urine toxicology test during the intake visit (from the medical record). Substances included cocaine, alcohol, cannabis, amphetamines, and benzodiazepines.

2.7. Statistical methods

We used frequencies to describe the number of patients experiencing same-day vs. delayed buprenorphine prescription receipt. To determine potential differences between patients with same-day vs. delayed buprenorphine prescription receipt, first we conducted bivariate analyses using *t*-tests, chi-squared tests, and Fisher's Exact tests, where appropriate. Then, to examine whether patients with same-day vs. delayed buprenorphine prescription receipt had differences in 30-day treatment retention, we conducted a multivariable logistic regression with 30-day treatment retention as the dependent variable and same-day prescription receipt as the independent variable. Covariates that we considered clinically relevant (age, sex, race/ethnicity), were selected a priori to be included in the multivariable logistic regression model, as well as other variables significant in bivariate analyses at an alpha of < 0.2 . We dropped alcohol use due to a large amount of missing data. We used backward elimination (removing variables with $p > 0.10$ that had not been selected a priori) to arrive at the final model, which included same-day prescription receipt, age, sex, race/ethnicity, initial provider, and benzodiazepine use. To explore whether short, medium, or long delays were associated with 30-day treatment retention, we conducted a second multivariable regression with 30-day retention as the dependent variable and the duration of treatment delay as the independent variable.

Table 1
Characteristics of patients by buprenorphine prescription receipt $N = 222$.

	Same-day prescription receipt, n (%)	Delayed prescription receipt, n (%)	p-Value ^a
Total	89 (100)	133 (100)	
Age, mean (SD)	46 (10)	46 (11)	0.89
Race			0.01
Hispanic	66 (74)	94 (71)	
Non-Hispanic black	16 (18)	21 (16)	
Non-Hispanic white	2 (2)	14 (11)	
Non-Hispanic other	0 (0)	3 (2)	
Missing	5 (6)	1 (1)	
Male sex	74 (83)	101 (76)	0.20
Insurance status			
Public	65 (73)	100 (75)	0.92
Private	12 (13)	17 (13)	
Uninsured	12 (13)	16 (12)	
Initial provider			< 0.01
Buprenorphine coordinator	12 (13)	76 (57)	
PCP 1	34 (38)	20 (15)	
PCP 2	15 (17)	1 (1)	
PCP 3	2 (2)	9 (7)	
Other PCP	26 (29)	27 (20)	
Substance use ^b			
Cannabis	25 (28)	52 (39)	0.10
Cocaine	30 (34)	34 (26)	0.17
Alcohol	10 (21)	50 (43)	< 0.01
Benzodiazepine	8 (9)	29 (22)	0.01
Amphetamine	0 (0)	3 (2)	0.28
History of buprenorphine treatment	24 (27)	49 (37)	0.13
Transfer from another program (< 90 days) ^b	4 (9)	6 (5)	0.47
Housing ^b			0.13
Housed	29 (67)	77 (66)	
Shelter	4 (9)	17 (15)	
Unstable	5 (12)	9 (8)	
Transitional	3 (7)	13 (11)	
Homeless	1 (2)	0 (0)	

^a p-Values for comparison between Same-day and Delayed prescription receipt. ^b t-tests, Pearson's chi squared, and Fischer's exact test used where appropriate.

^a Missing data: $N = 221$ for Cannabis, Cocaine, and Benzodiazepine; $N = 165$ for Alcohol; $N = 163$ for Transfer from another program; $N = 159$ for Housing.

3. Results

3.1. Prescription delays and demographics

Of the 237 patients who initiated buprenorphine treatment from June 1, 2015, through December 31, 2017, 222 had delays less than or equal to 30 days and we included them in the analysis. Eighty-nine (40%) had same-day prescription receipt, 61 (27%) had delays of 1–7 days, 41 (18%) had delays of 8–14 days, and 31 (14%) had delays of 15–30 days. The median time to buprenorphine prescription for the whole sample was 5 days (IQR 0–11). Of those who experienced a delay ($n = 133$), the median delay time was 8 days (IQR 5–20). Compared to those with same-day prescription receipt, more patients with delayed prescription receipt were non-Hispanic white (11% vs. 2%, $p = 0.01$), and had a history of alcohol use (43% vs. 21%, $p < 0.01$) or benzodiazepine use (22% vs. 9%, $p = 0.01$) (see Table 1).

3.2. Prescription delays and initial provider

The majority of patients saw the buprenorphine coordinator as the initial provider ($n = 98$, 41%), followed by PCP 1 ($n = 54$, 23%), PCP 2 ($n = 16$, 7%), and PCP 3 ($n = 11$, 5%). All other PCPs saw 10 or fewer patients during the study period, thus we combined them into a single

Table 2

Odds of retention in treatment at 30 days by same-day buprenorphine prescription receipt and other characteristics.

	Unadjusted OR, N = 222	Adjusted OR ^a , N = 221
Same-day prescription receipt	1.78 (0.87–3.62)	1.92 (0.81–4.56)
Time to prescription receipt		
0 days	Ref	
1–7 days	0.44 (0.20–1.00)	
8–14 days	0.83 (0.30–2.27)	
15–30 days	0.59 (0.21–1.64)	
Age	1.01 (0.98–1.04)	1.01 (0.98–1.04)
Female sex	1.06 (0.47–2.39)	1.20 (0.49–2.94)
Race		
Non-Hispanic White	Ref	Ref
Hispanic	1.97 (0.64–6.09)	1.2 (0.34–4.33)
Non-Hispanic black	1.95 (0.51–7.44)	0.91 (0.20–4.09)
Non-Hispanic other	0.91 (0.07–12.52)	1.24 (0.07–20.94)
Missing	2.27 (0.21–24.88)	0.73 (0.05–10.55)
Insurance		
Public	Ref	
Private	0.85 (0.32–2.27)	
Uninsured	0.56 (0.22–1.38)	
Initial provider		
Buprenorphine coordinator	Ref	Ref
PCP 1	1.38 (0.55–3.45)	0.83 (0.29–2.35)
PCP 2	1.68 (0.35–8.08)	0.85 (0.14–5.21)
PCP 3	2.39 (0.29–20.00)	2.23 (0.25–19.66)
Other PCP	0.55 (0.25–1.22)	0.36 (0.14–0.88)
Substance use ^b		
Cannabis	0.72 (0.37–1.42)	
Cocaine	1.28 (0.60–2.73)	
Alcohol	1.00 (0.45–2.21)	
Benzodiazepine	0.37 (0.17–0.81)	0.38 (0.15–0.93)
Amphetamine	0.49 (0.04–5.55)	
History of buprenorphine treatment	1.06 (0.52–2.15)	
Transfer from another program (< 90 days) ^b	2.38 (0.29–19.48)	
Housing ^b		
Housed	Ref	
Shelter	1.85 (0.50–6.81)	
Unstable	1.13 (0.29–4.38)	
Transitional	4.63 (0.58–36.81)	
Homeless	0.31 (0.02–5.11)	

^a Adjusted for age, race, sex, and benzo use.

^b Missing data: N = 221 for Cannabis, Cocaine, and Benzodiazepine; N = 165 for Alcohol; N = 163 for Transfer from another program; N = 159 for Housing.

category, Other PCP. Fifty-eight patients (24%) had Other PCP as the initial provider. Compared to those with same-day prescription receipt, more patients with delayed prescription receipt had the buprenorphine coordinator as the initial provider (57 vs. 13%, $p < 0.01$) (See Table 1).

3.3. 30-Day treatment retention

Overall, 30-day treatment retention was 80%. In bivariate analyses, a higher proportion of patients with same-day (vs. delayed) prescription receipt were retained in treatment at 30 days (85 vs. 77%, $p = 0.11$). In the multivariable model, patients with same-day prescription receipt did not have significantly higher odds of 30-day retention than those who had delayed receipt (AOR 1.92, 95% CI 0.81–4.56) (see Table 2). Two covariates were significantly associated with 30-day retention. Patients with benzodiazepine use had lower 30-day retention compared to patients without benzodiazepine use in unadjusted (OR 0.37, 95% CI 0.17–0.81) and adjusted (AOR 0.38, 95% CI 0.15–0.93) analyses. Patients whose initial provider was one of the low volume providers had lower 30-day retention in the adjusted analysis compared to patients whose initial provider was the buprenorphine coordinator (AOR 0.36, 95% CI 0.14–0.88).

4. Discussion

In a retrospective study of patients initiating buprenorphine treatment at an urban FQHC, 40% of patients received a same-day prescription. Those patients receiving same-day prescriptions had greater 30-day retention than patients with delayed prescriptions, but the association was not statistically significant. After adjustment for socio-demographic variables, provider effects, and benzodiazepine use, there were no significant differences in 30-day retention between patients who received same-day prescriptions and those with delayed prescriptions. In our exploratory analysis, patients with short delays (1–7 days) were least likely to be retained in treatment at 30 days, so it is possible there were some destabilizing effects from requiring multiple visits prior to providing a prescription. Overall, our findings did not support our hypothesis that same-day prescribing would improve 30-day retention. However, the null findings also suggest that same-day prescribing did not harm 30-day retention.

Our study offers novel insight into an area of practice—initiating office-based buprenorphine treatment—where there are few evidence-based recommendations. Guidelines have shifted over time from emphasizing caution with prescribing soon after buprenorphine's FDA approval (McNicholas & Consensus Panel Chair, 2004) to recognizing a need to expand access to medication treatment for OUD during the current overdose crisis (Cunningham et al., 2019). Home inductions have expanded, as data have demonstrated that this practice is safe (Cunningham et al., 2011; Lee et al., 2014). Our current study demonstrates that same-day prescribing can also be conducted effectively.

Our finding that more patients who experienced delayed prescription receipt had histories of alcohol and/or benzodiazepine use may reflect provider hesitancy to prescribe buprenorphine to patients with alcohol or benzodiazepine use. It is possible that providers chose to delay treatment to derive additional clinical information, such as urine drug testing results, but our study cannot elucidate the providers' intentions. While patients with benzodiazepine use did have worse retention in treatment, the need for treatment delays is unclear, especially in the absence of benzodiazepine use disorder. Treatment facilities can institute procedures to closely monitor and support patients with co-occurring substance use disorders at treatment intake, even with same-day prescribing.

Comorbid alcohol misuse is common—38% of patients seeking treatment for OUD have a history of alcohol use disorder (Hartzler, Donovan, & Huang, 2010). Concomitant use of benzodiazepines and buprenorphine is also highly prevalent (Park, Bohnert, Austin, Saitz, & Pizer, 2014), and findings are inconsistent regarding the associations between benzodiazepine use and opioid overdose (Abrahamsson, Berge, Öjehagen, & Håkansson, 2017; Bakker & Strel, 2017; Dupouy et al., 2017; Martin, Chiodo, Bosse, & Wilson, 2018; Park et al., 2020; Schuman-Olivier et al., 2013). Recent communication from the Food and Drug Administration regarding prescribing buprenorphine to patients who use sedatives highlights that the risks of untreated OUD will outweigh the risks of concomitant sedative use with buprenorphine in many patients (Center for Drug Evaluation and Research, 2017). While we found worse treatment retention among patients who use benzodiazepines, the literature is also mixed on the association between benzodiazepine use and buprenorphine treatment retention. Some studies show no association and others show higher retention among participants who use benzodiazepines compared to those who do not (Bakker & Strel, 2017; Park et al., 2020; Schuman-Olivier et al., 2013). We did not collect information about mental health diagnoses, but patients who use benzodiazepines may have had high rates of comorbid anxiety, which is associated with treatment dropout (Ferri, Finlayson, Wang, & Martin, 2014).

There are potential alternative strategies to manage risk for patients who use alcohol and benzodiazepines. If providers are concerned about patient safety or likelihood of treatment success, providing short prescriptions with more frequent follow-up, offering peer support, and

integrating medical and mental health treatment may be beneficial. Additional research is necessary to inform best practices toward balancing risks and benefits of buprenorphine treatment among patients who use benzodiazepines, but interventions such as those we listed could address heightened risk while still avoiding treatment delays.

4.1. Limitations

Our dataset only included patients who received a buprenorphine prescription. It is possible that delayed prescribing led to patients dropping out of treatment without ever receiving a prescription, but we were unable to evaluate this in the current study. Our study was also conducted at a single site, limiting generalizability. We were not able to confirm the date that the pharmacy dispensed buprenorphine, but only the date that the provider wrote the prescription. Therefore, we may have missed some delays (e.g., pharmacies not stocking buprenorphine). We were also unable to distinguish between licit and illicit benzodiazepine use due to incomplete data. Providers in the study setting do not prescribe benzodiazepines, so a history of prescribed benzodiazepine use is based on patient self-report and is not well-captured in the electronic health record. Finally, our study was under-powered to detect small differences in 30-day retention between patients with same-day vs. delayed prescription receipt.

4.2. Conclusion

We found that 30-day buprenorphine treatment retention was high even when patients received prescriptions at their initial encounter. While prospective studies still need to examine the safety and effectiveness of same-day prescribing, treatment programs may, nevertheless, be justified in same-day prescribing to prioritize patient convenience and minimize treatment barriers. Our finding that same-day prescribing was not associated with worse retention, coupled with the risk of early patient dropout and opioid overdose when prescribing is delayed, suggests that structuring buprenorphine treatment programs to allow for same-day treatment should become the standard of care.

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Declaration of competing interest

None.

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