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Long-term treatment retention in West Virginia's comprehensive opioid addiction treatment (COAT) program

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Abstract

Background: The United States continues to experience an opioid epidemic of unprecedented proportions despite FDA approval of life saving medications, such as buprenorphine. This paper describes a novel group-based buprenorphine treatment model and summarizes patient characteristics and treatment retention. This model, known as the Comprehensive Opioid Addiction Treatment (COAT) program, was developed in West Virginia, the epicenter of the opioid epidemic.

Methods: Data on 454 patients actively enrolled in the COAT program were extracted from an administrative clinical data set and electronic medical records and analyzed using descriptive and quantitative analysis to determine long-term retention in treatment using frequencies and means.

Results: The characteristics of the 454 patients are as follows: average age of 39, 53% female, predominantly white (94%) and Medicaid was the primary insurance provider (68%). Analysis of retention showed 37.8% of patents were retained less than one year and 14.7% were retained 10 or more years. Initiating treatment at a younger age was associated with long-term retention.

Conclusion: Opioid use disorder is a chronic relapsing disease and treatment models that retain patients long-term have the greatest benefit. The COAT model has been successful in retaining patients long-term in a rural setting where barriers to treatment are many.

Keywords

Addiction treatment; Buprenorphine; Opioid use disorder (OUD); Patient outcomes; Medication for opioid use disorder (MOUD); Retention

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1. Introduction

1.1. Background

Nationally, it was estimated that 11.4 million people have misused opioids and there were more than 47,000 opioid-related overdose deaths in 2017 [2,20,26]. Currently, West Virginia has the highest opioid-related overdose mortality rate in the nation with 49.6 deaths per 100,000 population [26]. As a result of the current opioid epidemic, there have also been significant increases in infectious diseases associated with increases in intravenous drug use. Specifically, rates of Hepatitis C (HCV) have steadily increased over the past decade with West Virginia having the second highest rate of HCV in the nation (7.1 per 100,000 population), far greater than the national average (0.8 per 100,000) [33]. Despite the significant morbidity and mortality secondary to the overdose epidemic, and the chronic nature of addiction, access to treatment has fallen far short of need. In 2017 it is estimated that 80% of people who needed medication for opioid use disorder (OUD) did not receive it [23] and rural communities are even harder hit due to lack of waivered providers, restrictive treatment regulations and transportation difficulties [22]. The implementation of long-term comprehensive treatment programs for individuals seeking treatment for OUD is critical. The intensity of patient need combined with the rural landscape of West Virginia presents both unique challenges and opportunities that have helped foster innovative treatment strategies. The primary aims of this paper are to describe the development and expansion of a novel group-based model of buprenorphine treatment, referred to as the *Comprehensive Opioid Addiction Treatment model (COAT)*, and to summarize patient characteristics, levels of treatment and retention in treatment.

Prior to 2000, opioid agonist medication for the treatment for OUD was limited to federally regulated methadone clinics and the rural nature of West Virginia largely precluded those struggling with OUD from seeking treatment due to the daily dosing requirements and transportation challenges. An amendment to the Controlled Substances Act, the Drug Addiction Treatment Act of 2000 (DATA 2000 [P.L. 106–310 div. B]), allowed for office-based treatment options involving medication such as buprenorphine used to treat OUD, though best practices for treatment protocols were lacking. In 2002, after the DEA completed its evaluation and classification of buprenorphine as a schedule III drug, buprenorphine became the first FDA drug approved for office-based treatment of OUD [3]. These significant legislative changes paved the way to expand settings of care to treat OUD with agonist medication, the treatment modality referred to as Medication for Opioid Use Disorder (MOUD).

1.2 Development of the group-based. COAT model

In 2004, at an outpatient setting located within the West Virginia University (WVU) academic medical center, one doctor became waivered at the initial 30 patient limit and began to prescribe buprenorphine only as a detoxification medication for hospitalized patients with OUD. After detoxification occurred, attempts were then made to connect these individuals to outpatient treatment programs for ongoing psychosocial management of OUD. While buprenorphine for detoxification is an evidence-based treatment option [14], it quickly became clear that following detoxification, patients relapsed soon after

buprenorphine discontinuation, a finding which was eventually demonstrated in a large randomized clinical trial [29]. In response to the increasing demand of patients seeking treatment for OUD, and the realization that buprenorphine could be used as a long-term treatment medication, a group-based model of MOUD was implemented in 2005 and evolved into the COAT program. In the initial stages, the COAT program staff was comprised of one psychiatrist waivered to prescribe buprenorphine, a clinical therapist, a case manager, and a medical assistant. At an institution with its addiction treatment philosophy rooted in the Minnesota Model of Care [1], located in a rural state with an emerging opioid epidemic and a shortage of trained treatment providers, utilizing group-based opioid agonist medication management plus psychosocial group therapy was seen as natural fit to increase access to care.

Group treatment has been established as evidence-based care for the management of substance use disorders (SUD) [12]. The group modality unlike individual therapy, specifically assists with the development of interpersonal connections, provides positive social support and pressure to change, decreases stigma, and promotes the development of interpersonal skills as well as the practice of those skills in vivo, all of which are beneficial to individuals in SUD treatment ([31]; TIP 412005; [11,28,34]). Group-based care also allows for more patients to be treated by fewer providers.

1.3. Current COAT model structure

The current COAT model is characterized by a 30-minute shared medical group appointment (which includes medication management with a prescriber), directly followed by a 60-minute group-based psychosocial therapy session. Facilitated by a licensed clinical therapist, the therapy groups typically have 8–12 patients per group and integrate evidence-based practices including cognitive behavioral therapy (CBT), 12 step-facilitation and relapse prevention techniques. Group content is skills based, psychoeducational and structured. Patients are also required to attend weekly peer-based community support group meetings which consist of traditional Alcoholics Anonymous (AA), Narcotics Anonymous (NA), SMART Recovery, Celebrate Recovery and MOUD-specific peer support groups. In addition to being evidence-based for the treatment of SUDs, group-based treatment is critical in areas where the patient demand for treatment far exceeds clinician availability. Participation in individual psychotherapy occurs on a monthly basis or more frequently if clinically indicated. Patients can self-refer to the COAT program or they may be directly referred from an emergency department or inpatient facility. All new patients are required to sign a treatment agreement at intake to ensure that they understand the program guidelines.

The COAT program offers phase-based treatment determined by length of time abstinent (abstinence is defined as the non-use of alcohol, illicit substances, or licit substances not prescribed), treatment adherence, and patient readiness to advance phases. The first phase includes weekly visits until the patient achieves 90 consecutive days of abstinence. The second phase includes bi-weekly visits until 365 consecutive days of abstinence, the third phase consists of monthly visits until 3 years of abstinence, and the fourth phase consists of bi-monthly visits for those with over three years of time abstinent. Substance use is self-reported by the patient during each clinic visit and confirmed by urine drug screening.

Random pill counts and call-back urine drug screening are used to ensure medication compliance, detect potential buprenorphine diversion, or identify illicit substance use. At the end of each therapy group, buprenorphine prescriptions are provided to the patients with sufficient medication to last until the next medication management appointment. The combination buprenorphine/naloxone products are used almost exclusively, to reduce misuse and diversion [15]. This is also the case for pregnant women as the combination product has been shown to be safe for pregnant women and their neonates [10,16,21]. Patients remain on buprenorphine for as long as necessary to maintain recovery as determined by ongoing clinical assessment and patient preference. The most common reason for patient discharge from the COAT program is non-attendance or when patients feel buprenorphine is no longer needed to maintain their recovery and taper off the medication.

1.4. Innovative characteristics of the model

In addition to the group-based structure, a foundational element of the program is the interdisciplinary treatment team consisting of a case manager (BA/BS), a prescriber (MD, DO, NP or PA), a therapist (MSW, LPC, PhD), and a medical assistant. Interdisciplinary trainees from these professions are also included as part of the team. The treatment team works collaboratively and is intimately involved in various aspects of treatment planning and care coordination. The treatment team meets for 30 min prior to COAT groups to discuss treatment planning and assess individual patients' overall progress, challenges and needs. This is a critical component of the program that ensures strong communication across the interdisciplinary team and facilitates any modifications to individual patients' treatment plans. The clinical team emphasizes honesty about drug use as part of the recovery process and refrains from using stigmatizing language (e.g., "dirty" urine).

1.5. Expansion of the model

Over the last 14 years, the COAT program has evolved to include higher intensity care groups that meet 2 and 3 times weekly for those who struggle with frequent relapses or program adherence, in an effort to increase retention and reduce administrative dismissal associated with increased risk of overdose and death [17,25]. Content of these higher intensity groups focuses on Relapse Prevention [8,18] and identifying and reducing psychosocial barriers to treatment such as lack of substance free housing and transportation. Specialized groups in the weekly and bi-weekly levels of care include women's only, pregnancy specific, yoga, chronic pain, mindfulness, and teleCOAT delivered via tele-medicine [13,35–37].

Over time the COAT program has grown to meet the increasing demand for access to quality treatment combining the benefit of medication with full integration of psychosocial interventions. The program currently has 8 prescribes, 17 therapists, 5 case managers and 4 medical assistants working in 3 different locations with an average census of ~450 patients. The following sections will summarize the development and expansion of the treatment model, patient characteristics, levels of treatment, and retention in treatment. Outcomes presented highlight the long-term treatment retention capacity of this model which if replicated can address MOUD treatment shortages nationally.

2. Methods

A secondary analysis was conducted using clinical data from the Electronic Medical Record (EMR) and the COAT clinical administrative dataset, which is used to track progress in the treatment program. The COAT administrative dataset is updated every treatment visit and it contains information on the patient's first visit date, recent urine drug screening results, days abstinent (calculated manually) and buprenorphine product/dose. It also contains patient's names, date of birth, medical record number and insurance information.

2.1. Participants, measures & data collection

At the time of data extraction there were 48 active groups at 3 different clinical sites in Morgantown, WV and 454 unique patients were enrolled in the COAT buprenorphine program. The frequency of visits ranges from 3 times per week to once every 8 weeks, depending on the patient's phase of treatment. Most recent clinic visit information from the COAT administrative dataset was merged with their EMR data. Data was restricted to patients with visit dates between 3/7/19 and 4/29/19, who were 18 years of age or older as a snapshot of current patients. The two-month time period was chosen to account for patients seen bi-monthly groups. Due to the fact that different groups have different most recent visit dates, the "current" abstinence time reflects the information recorded on the most recent visit date, which varies by treatment level.

Insurance type was recoded as public, private or self-pay/other. Retention in treatment was calculated as the number of days between their most recent visit date and their treatment start date. The number of days in treatment was then recoded into less than 90 days, 90–365 days, and then years up to 10 + years. The year intervals reflect the 365 days within that interval (e.g., 1.0–1.9 years). Abstinence was defined as absence of use of alcohol or any illicit drug and was measured by both self-report and by routine urine drug screening.

2.2. Data analysis

Stata/MP Version 15.1 was used to run descriptive statistics (StataCorp 2017). The West Virginia University Institutional Review Board approved this project. Frequencies were used to summarize dichotomous and categorical variable and means are reported for continuous variables. Chi-square, Fisher's exact and t-tests were used to identify statistically significant differences in characteristics by treatment level.

3. Results

In the period of time under study, between 3/7/19 and 4/29/19, 454 patients had 1862 scheduled visits in the outpatient MOUD COAT clinic. 60% of patients traveled outside of the county to attend treatment, 17% traveling greater than 80 miles each way and 4% traveling from out of state.

3.1. Demographics

Among the 454 patients, the mean age was 39 and 47% were male. The vast majority were white (94%) and had either Medicaid or Medicare insurance (74%). The majority

of patients (84.0%) were prescribed buprenorphine/naloxone film, 13.4% were prescribed buprenorphine/naloxone tablets, and 2.7% were prescribed mono-buprenorphine tablets The mean buprenorphine dose, across the different products was 12.3 mg (See Table 1). None of the patients had a buprenorphine dose above 16 mg; 50% of patients in the Intensive group were on 16 mg and percent of patients on 16 mg in the other groups ranged from 18.5%–38.9% (see Fig. 1). Patients in the bimonthly group were significantly younger when they started treatment compared to patients in the intensive groups (mean age 32.6 versus 40.9, p = .01). There were no significant differences between groups for any of the other demographic characteristics including buprenorphine dose. A greater proportion of patients in the bimonthly group had private insurance (49.6%), whereas private insurance ranged from 6.3%–24.0% in the other groups.

3.2. Outcomes

The median days retained in treatment was 483.5 (1.3 years) and retention ranged from 0 days to nearly 12 years. A little more than a third (37.3%) of patients had been in treatment for less than a year and nearly a quarter had been in treatment at least 5 years. Among the active patients, the longest reported period of consecutive days abstinence was 6080 (16 years 8 months). 51.1% of patients had more than a 1 year of continuous abstinence, with only 22.1% of individuals having fewer than 91 days of abstinence (see Fig. 2). Days of abstinence are both self-reported and confirmed by urine drug screening. Fig. 2 shows days of sobriety by group assignment and numbers of patients in each phase of treatment. Notably, 23.7% patients were retained in treatment more than 5 years and 14.7% (n = 66) were retained for more than 10 years.

4. Discussion

This is one of the few studies to report long-term retention in buprenorphine treatment using a clinical sample and the first study to report retention over 10 years. While 37.3% of patients had been retained less than one year, surprisingly 14.7% had been retained 10 or more years. Once a patient has attained one year of continuous abstinence, clinicians may ask patients if they want to continue receiving buprenorphine. Presumably patients choose to be continued on buprenorphine treatment because they perceive the medication to be important for their sustained recovery and they find value in the COAT program structure, helping patients be accountable for their recovery.

The benefits of long-term utilization of buprenorphine and the characteristics of individuals retained in long-term treatment has not been well studied, in part because buprenorphine is relatively new in the long-term treatment of OUD. Weiss et al. [30] followed patients with OUD who initiated MOUD over 42 months. 36% of participants remained on MOUD and engagement in long-term MOUD which was associated with greater likelihood of illicit opioid abstinence [30]. Additional studies also indicate continuous retention in MOUD over 3–5 years is associated with improved psychosocial outcomes such as employment, reduced financial stress, decrease hospitalizations and emergency room visits, and improved relationships in addition to reduced illicit opioid use [7,9,24]. Being white, female and of older age has been associated with better long-term retention in treatment [27]. In our study

cohort, 62.7% of patients had remained in treatment for 1 year or greater and 33.9% of patients had remained in treatment for 3 years or greater. However, there were no significant differences in gender or race across the treatment phases. A greater proportion of the bi-monthly patients had private insurance (49.6% vs. 6.3%–24.0%) compared to those in the other phases of treatment suggestive of higher socioeconomic status and increased rates of employment in the long-term groups. It is unknown if this difference existed at baseline or was achieved as a result of the benefits of being in long-term treatment.

The COAT group-based phased treatment model allows the treatment team to engage more patients in a clinical session than if patients were seen individually. The phase-based component allows the treatment team to adjust intensity of care by seeing patients who have achieved long-term abstinence less often and seeing those who are struggling with relapse and/or have greater treatment needs more often. What started as a program one afternoon per week, has grown to a program with clinics held on every day of the work week, evenings, at three locations, and two tele-locations. This program has been able to retain patients long-term, which, supported by the available body of evidence cited above, is increasingly becoming the necessary standard of care to promote long-term health gains and decrease mortality.

Over the last 14 years, the COAT program has continued to grow, adapting to the change in payer mix following ACA 2008, which gave West Virginian's increased access to treatment, increasing clinical demand. We have added staff to the interdisciplinary care team of all professions including medical assistants, prescribers and therapists. Specifically, 2 nurse practitioners have been added as prescribers and 2 treatment locations were successfully added, This model has been successfully deployed to 14 sites around the state, in some of the most rural locations, with ongoing training and telementoring using Extensions for Community Healthcare Outcomes (ECHO) [32] proving the scalability of the model. Given that OUD is a chronic relapsing illness, there is no definitive length of time an individual should remain on medication, and the model under study allows for long-term retention in treatment which is associated with better outcomes [6,19].

4.1. Lessons learned

As the opioid overdose death rate has continued to climb every year in West Virginia, retention in treatment has become increasingly critical as retention in MOUD is associated reduced overdose rates [17,25]. In response, we developed our program to include an intensive phase of treatment where patients attend 2–3 times a week even if they have violated the agreement they signed at the onset regarding program compliance. This contributed to in improved retention in treatment and reduced risk of overdose deaths.

Another lesson learned in the development of the model was the value of having trainees from multiple disciplines participate in COAT. Given the lack of addiction training (especially in MOUD) afforded to medical students, resident physicians, nursing students, pharmacy students, psychology, counseling and social work students, the interdisciplinary team-based nature of COAT provided a ready opportunity for these trainees to witness treatment firsthand and contributed to needed workforce development. Many of these trainees cited the COAT experience as formative in better understanding addiction,

decreasing their stigma of OUD and its treatment and a greater degree of confidence in delivering MOUD treatment.

4.2. Limitations

Both the EMR and the administrative data used here were collected for clinical, rather than research purposes and the consistent quality and reliability of these sources is unknown. EMR data lacks psychosocial measures administered over time which could help to identify characteristics associated with long-term clinical outcomes. Further, the administrative data included days of abstinence, which is calculated manually. COAT recently implemented a patient-reported outcome monitoring system and is working to improve EMR reporting capabilities in order to facilitate future analysis of treatment outcomes. With regard to the generalizability of the findings, West Virginia is a rural, Appalachian state with limited racial/ethnic diversity; hence the results may not generalize to urban areas or non-urban areas with more diverse patient populations. Finally, it is unknown whether a single point in time patient census accurately reflects COAT treatment retention.

4.3. Conclusions

Two thirds of buprenorphine patients in this study chose to continue buprenorphine treatment for more than 1 year and nearly a third for more than five years. Previous longitudinal studies of MOUD treatment suggests that, on average, an individual may have three to four treatment admissions over a period of years to achieve one year of abstinence and that the odds of sustained abstinence increase the longer an individual remains abstinent [4],5]. For this reason, increasing retention in treatment is essential and can help to minimize the damage that occurs in the lives of individuals in the wake of a relapse. Our findings and the chronic nature of the disease of OUD, drive home the need for treatment programs to support long-term recovery management. Additional research is needed to understand the factors associated with long-term retention in buprenorphine treatment. The structure of EMR data may be modified to facilitate ongoing clinical monitoring of retention.

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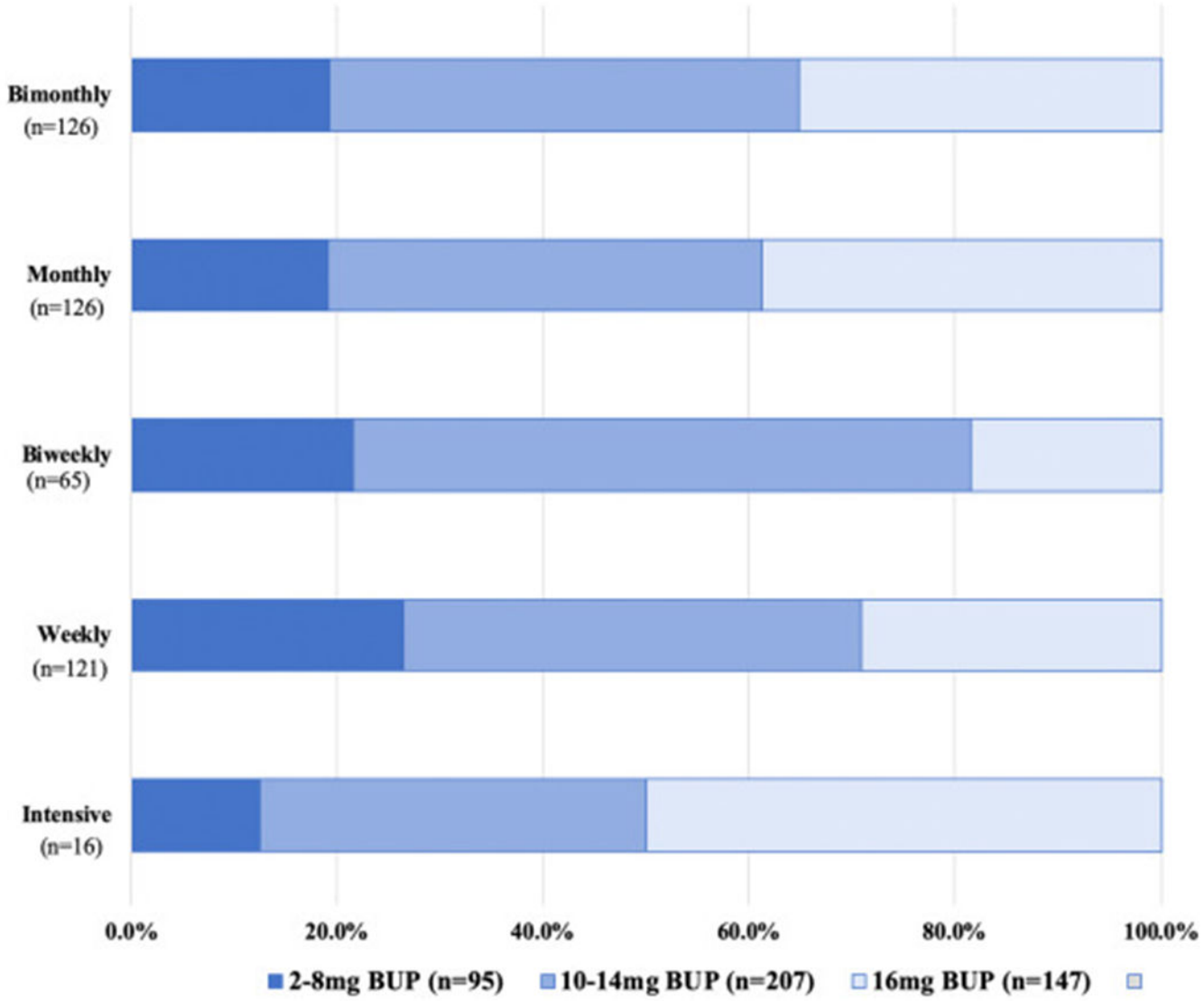

Fig. 1.
Buprenorphine dose by tratment group.

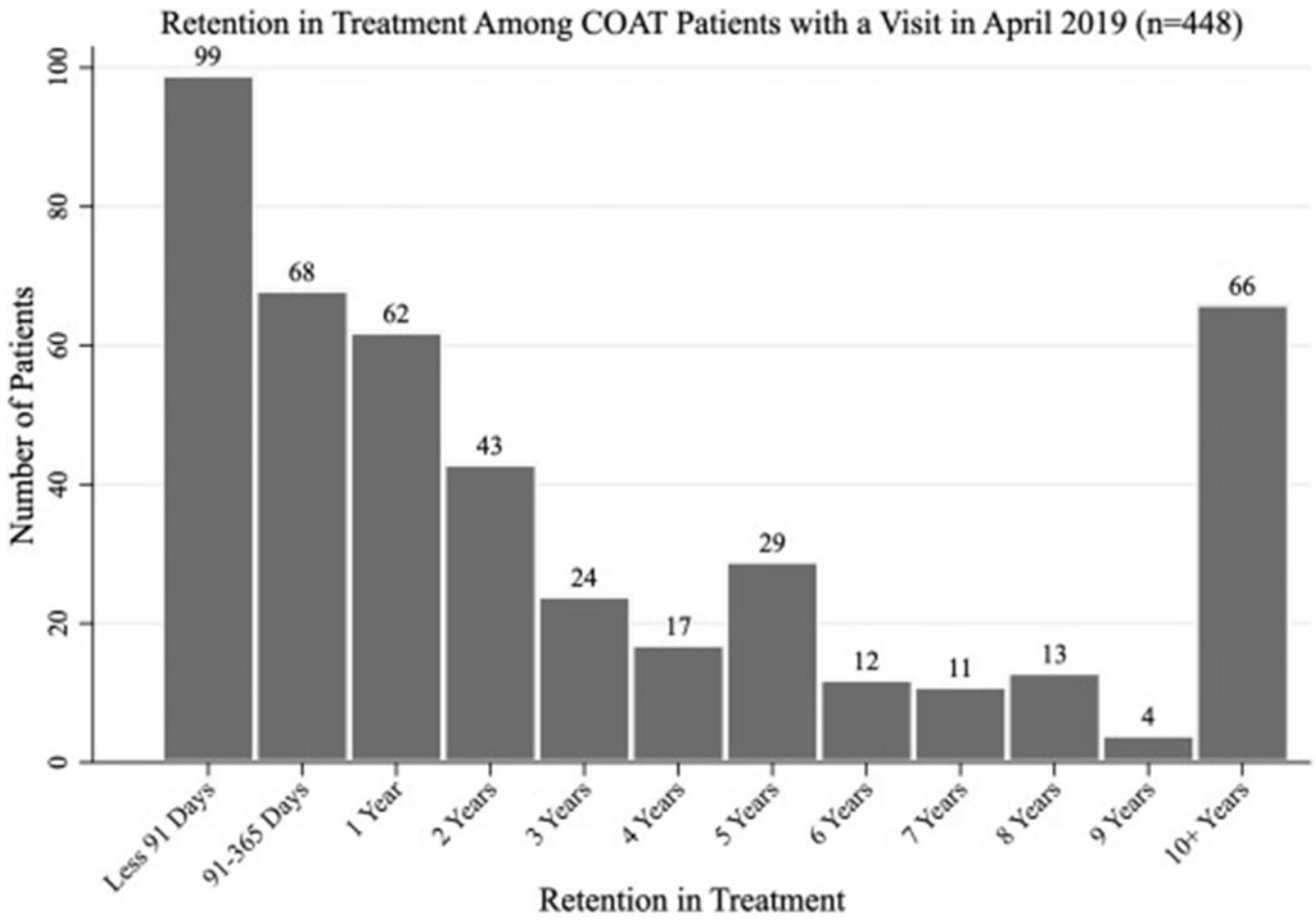

Fig. 2.
Years of abstinence.

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Table 1

Demographic data on patients in cohort.

	Overall (n = 454)	Intensive (n = 16)	Weekly (n = 121)	Biweekly (n = 65)	Monthly (n = 126)	Bimonthly (n = 126)	Pvalue
Male	46.5%	50.0%	48.3%	55.4%	46.8%	39.7%	0.32
Mean Age Visit Date	38.6	41.0	36.4	36.7	39.2	40.7	0.01
Mean Age Started COAT	35.6	40.9	36.4	35.5	36.1	32.6	0.01[a]
White	94.3%	87.5%	92.3%	95.1%	94.2%	96.8%	0.42
Black	3.6%	6.3%	6.0%	1.6%	3.3%	2.4%	
Other	2.1%	6.3%	1.7%	3.3%	2.5%	0.8%	
Insurance							< 0.00
Public	74.0%	93.8%	90.8%	84.6%	75.2%	48.8%	
Private	24.9%	6.3%	8.4%	13.9%	24.0%	49.6%	
Self-Pay/Other	1.1%	0.0%	0.8%	1.5%	0.8%	1.6%	
Mean Buprenorphine Dose	12.3 mg	13.4	12.0	11.9	12.7	12.4	0.30

[a]Statistically significant difference between Bimonthly & Intensive.