Three-Year Retention in Buprenorphine Treatment for Opioid Use Disorder Among Privately Insured Adults

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Objective: This study examined factors related to retention in buprenorphine treatment for opioid use disorder (OUD) among privately insured patients.

Methods: Patients with OUD who were newly started on buprenorphine during federal fiscal year (FY) 2011 were identified in a national private insurance claims database (MarketScan), and treatment retention (filled buprenorphine prescriptions) was evaluated through FY 2014. Proportional hazards models were used to examine demographic, clinical, and service use characteristics in FY 2011, including ongoing insurance coverage, associated with discontinuation of treatment.

Results: Of 16,190 patients with OUD newly started on buprenorphine in FY 2011, 45.0% were retained in treatment for more than one year, and 13.7% for more than three years (mean±SD duration of retention=1.23±1.16 years). During the first three years after buprenorphine initiation, 49.3% (N=7,988) disenrolled from their insurance plan. Cox proportional hazards models showed that for every 30 days of enrollment, the risk of discontinuation declined by 10% (hazard ratio [HR]=.90, 95% confidence interval [CI]=.90–.91). FY 2011 factors reducing discontinuation risk were age greater than the median (HR=.90, CI=.87–.93) and receipt of outpatient psychotherapy (HR=.90, CI=.86–.92); increased risk was associated with psychiatric hospitalization (HR=1.30, CI=1.24–1.36), emergency department visits (HR=1.07, CI=1.04–1.14), and additional substance use disorders (HR=1.05, CI=1.01–1.10).

Conclusions: Buprenorphine treatment retention declined markedly in the first year and was substantially lower than in comparable studies from publicly funded health care systems, apparently largely due to disenrollment. The association of psychotherapy with greater retention suggests that it may be an important complement to opioid agonist treatment.

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As the "epidemic" of opioid use disorder (OUD) sweeps through the United States, causing death and disability, enrollment and retention of people with OUD in opioid agonist treatment (OAT) have emerged as an important clinical objective (1,2). OAT retention is associated with substantial improvements in medical morbidity and social functioning as well as reduced HIV transmission and criminal behavior (3–6) and mortality (7), such that OAT with either buprenorphine or methadone has become the standard medical treatment for OUD (4,8). Although only a small proportion of eligible patients with OUD are engaged in either OAT or other treatments (9), OAT utilization has steadily increased over the past decade, mainly driven by the increased accessibility to buprenorphine that can be provided in less restrictive office-based practice, unlike methadone maintenance (6,10–15). On the other hand, it has been suggested that long-term retention may be lower in buprenorphine treatment compared with methadone treatment (16,17), which poses a significant clinical challenge because treatment retention is crucial for therapeutic success (7,18).

There are limited data on long-term retention in buprenorphine treatment for OUD beyond six and 12 months (17,19), and the influence of diverse sociodemographic, clinical, and service use characteristics on OAT retention has been examined in few large studies (20). A recent national study based on data from the Veterans Health Administration (VHA), an integrated health system caring for U.S. veterans at little or no copayment expense, showed 61% retention a year after buprenorphine initiation among mostly male veterans with OUD and high rates of general medical and psychiatric comorbidity (21). Among numerous sociodemographic and diagnostic characteristics that were evaluated, only black race had a discernible (and negative) independent association with buprenorphine treatment retention.

Data on buprenorphine treatment retention among privately insured patients are far more limited. Predictors of buprenorphine treatment retention among privately insured patients with OUD may be quite different from those in the VHA population because privately insured patients tend to be much younger and to have higher income, lower rates of disability, and fewer psychiatric comorbidities (22,23).

Recent insurance claims–based studies have suggested that buprenorphine treatment retention rates may be much lower in privately insured populations than in the VHA population, but these studies lacked detailed data on clinical correlates of better retention (24–27). Most important, the impact of insurance disenrollment on treatment retention has yet to be examined.

In this observational study, we used claims data from the MarketScan Commercial Claims and Encounters Database (IBM Watson Health) documenting sociodemographic and clinical characteristics, health service utilization, and prescription drug claims from a selection of insured individuals of large employers and private health plans. Among patients newly started on buprenorphine for OUD in federal fiscal year 2011 (FY 2011) and followed up through FY 2014, we examined the duration of buprenorphine treatment up to and beyond three years along with correlates, including sociodemographic and diagnostic characteristics, health service and psychotropic medication use, and insurance disenrollment. These data thus broaden the picture of the challenges facing efforts to increase buprenorphine treatment retention among patients with OUD.

METHODS

Sample and Data Source

The MarketScan database includes claims from commercial insurance companies representing insured employees and their dependents, early retirees, individuals with coverage through the Consolidated Omnibus Budget Reconciliation Act (COBRA), and Medicare-eligible retirees with employer-provided Medicare supplemental plans. For comparability, we followed the methods of an earlier published study of buprenorphine treatment retention in the VHA (21). We first selected patients with a diagnosis of OUD (*ICD-9-CM* codes 304.0x, 305.5x, and 304.7x—either opioid abuse or opioid dependence) from October 1, 2010, to September 30, 2011 (FY 2011) in the MarketScan database. We then excluded patients who filled at least one prescription for buprenorphine during the first 60 days of FY 2011, thus leaving a sample of patients with OUD who were not receiving buprenorphine at the beginning of FY 2011. We included only patients who filled prescriptions for buprenorphine or buprenorphine-naloxone tablets and excluded those receiving a buprenorphine transdermal patch indicated for pain management. Because OUD is considered a relapsing chronic disease requiring long-term treatment, we elected to consider both uninterrupted and interrupted participation in treatment as continued treatment engagement.

Measures

We calculated the total duration of treatment as the number of days between the first day of buprenorphine fill in FY 2011 and the last date buprenorphine was filled through the end of FY 2014 (September 30, 2014). We defined four mutually exclusive groups on the basis of the duration of retention in treatment: 0–30 days, 31–365 days, one to three years, and more than three years, consistent with prior studies (28–33).

Sociodemographic characteristics included age, gender, and urban residence based on metropolitan statistical area codes. Race-ethnicity data were not available. Psychiatric and general medical diagnoses were identified by using *ICD-9* codes that were assigned to each patient at least once during baseline year FY 2011. We calculated the Charlson Index (34), an aggregate measure of medical comorbidity that has been shown to predict ten-year mortality (35). Patients were coded as having "any pain" if they had *ICD-9* codes indicating herpetic pain (053.12 and 729.2), fibromyalgia pain (729.1), musculoskeletal pain (338.xx, 719.4, and 780.96), muscolospasm pain (728.85 and 781.0), pain from diabetes (250.6, 337.1, and 357.2), migraine and headache (346.x and 784.0), and other sources of pain (350.1, 352.1, 357.2, 729.2, and 781.0).

Psychiatric disorders (*ICD-9* codes 290.00 through 319.99) coded into 11 classes (Table 1) (35) were used to identify outpatient visits for mental and substance use disorders, including OUD, in the baseline year FY 2011. Inpatient and outpatient service utilization codes were used to identify medical and surgical outpatient and emergency room visits. Duration of insurance enrollment was calculated as the number of months between first buprenorphine prescription and last date of enrollment.

The receipt of any outpatient psychotherapy in the baseline year of FY 2011 was identified by the following CPT encounter codes: outpatient psychotherapy, 90804–90815 and 90845; family therapy, 90846, 90847, and 90849; and group therapy, 90853 and 90857).

From the prescription drug claims, we identified psychiatric prescriptions filled in FY 2011 and divided them into five classes: antidepressants, antipsychotics, sedatives-hypnotics-anxiolytics, mood stabilizers (antiepileptics), and lithium. Then we summed the numbers of prescriptions in all of these classes to get the total number of psychotropic prescriptions filled by each patient (35).

Analysis

In the initial bivariate analysis, sociodemographic and diagnostic characteristics, health service use, psychotropic medication fills, and psychotherapy use during the baseline year of FY 2011 were compared between four groups: patients who received buprenorphine for 0–30 days or less (reference group) and those who received buprenorphine for 31–365 days, one to three years, and more than three years. To identify meaningful group differences, we used effect sizes rather than p values (that is, risk ratios for dichotomous measures and Cohen's d for continuous measures), because the sample was large and thus very small differences would be likely to be statistically significant but not of meaningfully different magnitude. Risk ratios >1.5 or $<.67$ were considered to represent substantial differences on dichotomous variables. The difference between means divided by the pooled standard deviation was used to calculate Cohen's d for continuous variables. Values $>.20$ were considered to represent more

TABLE 1. Baseline (fiscal year 2011) demographic and clinical characteristics of 16,190 patients, by time retained in buprenorphine treatment

	0–30 days (N=2,423, 15.0%)		31–365 days (N=6,476, 40.0%)		1–3 years (N=5,079, 31.4%)		>3 years (N=2,212, 13.7%)		Effect size vs. 0–30 days[a]		
Characteristic	N	%	N	%	N	%	N	%	31–365 days	1–3 years	>3 years
Male	1,502	62.0	4,261	65.8	3,352	66.6	1,442	65.2	1.1	1.1	1.1
Urban area resident	2,035	84.0	5,110	78.9	4,185	82.4	1,847	83.5	.9	1.0	1.0
Medical diagnosis											
Seizures	36	1.5	91	1.4	56	1.1	24	1.1	.9	.7	.7
Insomnia	143	5.9	382	5.9	305	6.0	111	5.0	1.0	1.0	.8
Myocardial infarction	7	.3	19	.3	15	.3	7	.3	.8	1.0	1.0
Congestive heart failure	17	.7	45	.7	20	.4	13	.6	1.0	.5	.9
Peripheral vascular disease	22	.9	45	.7	30	.6	18	.8	.8	.7	.9
Cerebrovascular accident	34	1.4	71	1.1	36	.7	15	.7	.8	.5	.5
Chronic obstructive airway disease	213	8.8	492	7.6	427	8.4	164	7.4	.9	1.0	.8
Hepatic disease	111	4.6	266	4.1	198	3.9	69	3.1	.9	.9	.7
Diabetes mellitus	111	4.6	240	3.7	178	3.5	84	3.8	.8	.8	.8
Renal disease	22	.9	26	.4	20	.4	11	.5	.5	.4	.5
Cancer	31	1.3	78	1.2	61	1.2	22	1.0	.9	.9	.7
Any pain	705	29.1	1,587	24.5	1,133	22.3	507	22.9	.8	.8	.8
Musculoskeletal pain	940	38.8	2,118	32.7	1,569	30.9	714	32.3	.8	.8	.8
Age (M±SD)	33.0±11.5		33.1±10.9		33.4±11.2		36.1±11.3		.01	.04	.3
Charlson Index (M±SD)[b]	.3±.9		.3±.8		.3±.8		.2±.7		−.1	−.1	−.1
Substance use disorder											
Alcohol	283	11.7	557	8.6	422	8.3	142	6.4	.7	.7	.6
Cocaine	61	2.5	84	1.3	66	1.3	15	.7	.5	.5	.3
Cannabis	80	3.3	155	2.4	127	2.5	40	1.8	.7	.8	.5
Sedatives	143	5.9	246	3.8	157	3.1	69	3.1	.6	.5	.5
Amphetamine	22	.9	52	.8	30	.6	2	.1	.9	.7	.2
Psychiatric diagnosis											
Bipolar disorder	233	9.6	525	8.1	371	7.3	135	6.1	.8	.8	.6
Major depression	453	18.7	1,094	16.9	782	15.4	325	14.7	.9	.8	.8
Other depression	594	24.5	1,457	22.5	1,051	20.7	400	18.1	.9	.8	.7
PTSD	56	2.3	130	2.0	76	1.5	24	1.1	.9	.6	.5
Anxiety disorder	700	28.9	1,800	27.8	1,351	26.6	526	23.8	1.0	.9	.8
Adjustment disorder	138	5.7	389	6.0	264	5.2	117	5.3	1.1	.9	.9
Personality disorder	29	1.2	58	.9	36	.7	13	.6	.7	.5	.5
Schizophrenia	12	.5	39	.6	15	.3	4	.2	1.3	.5	.5
Other	58	2.4	136	2.1	66	1.3	15	.7	.9	.6	.3
Any psychiatric diagnosis	1,781	73.5	4,494	69.4	3,413	67.2	1,402	63.4	.9	.9	.9
Any drug use disorder	848	35.0	2,008	31.0	1,458	28.7	504	22.8	.9	.8	.7
Any substance use disorder	967	39.9	2,254	34.8	1,630	32.1	573	25.9	.9	.8	.7

[a] Effect sizes are risk ratios, except for variables measured as M±SD, for which effect sizes are Cohen's d values.
[b] Possible scores range from 0 to 32, with a score of ≥5 indicating 100% risk of mortality in a year.

than small differences (36). Variables were included in survival analyses only if they met these effect size criteria and if the base rate was more than 5%.

We first included variables found to demonstrate substantial differences between groups in bivariate analyses in subsequent multivariate analyses. We used Kaplan-Meier curves and Cox proportional hazards models to identify variables independently associated with the discontinuation of buprenorphine treatment. We repeated the analyses including a variable representing months of insurance enrollment.

TABLE 2. Baseline (fiscal year 2011) use of health care, psychotropic medication, and psychotherapy, by time retained in buprenorphine treatment

	0–30 days (N=2,423, 15.0%)		31–365 days (N=6,476, 40.0%)		1–3 years (N=5,079, 31.4%)		>3 years (N=2,212, 13.7%)		Effect size vs. 0–30 days[a]		
Characteristic	N	%	N	%	N	%	N	%	31–365 days	1–3 years	>3 years
Psychotropic prescription											
Antidepressant	1,270	52.4	3,212	49.6	2,443	48.1	1,026	46.4	1.0	.9	.9
Antipsychotic	446	18.4	971	15.0	681	13.4	257	11.6	.8	.7	.6
Anxiolytic-sedative-hypnotic	1,151	47.5	2,739	42.3	2,113	41.6	796	36.0	.9	.9	.8
Stimulant	199	8.2	576	8.9	462	9.1	188	8.5	1.1	1.1	1.0
Anticonvulsant or mood stabilizer	523	21.6	1,101	17.0	797	15.7	323	14.6	.8	.7	.7
Lithium	46	1.9	91	1.4	61	1.2	22	1.0	.7	.6	.6
Any psychotropic medication	1,725	71.2	4,410	68.1	3,362	66.2	1,391	62.9	1.0	.9	.9
Psychotherapy											
Outpatient	734	30.3	2,286	35.3	1,910	37.6	867	39.2	1.2	1.2	1.3
Inpatient	73	3.0	104	1.6	81	1.6	22	1.0	.5	.6	.3
Family therapy, outpatient	46	1.9	155	2.4	157	3.1	58	2.6	1.3	1.6	1.3
Group therapy, outpatient	317	13.1	777	12.0	589	11.6	221	10.0	.9	.9	.8
Any mental health inpatient treatment	838	34.6	1,515	23.4	1,001	19.7	347	15.7	.7	.6	.5
Prescriptions (M±SD)											
Antidepressant	2.5±4.1		2.6±4.2		2.5±4.1		2.7±4.3		.03	.02	.10
Antipsychotic	.6±2.0		.6±2.1		.5±2.0		.5±2.0		−.01	−.10	−.10
Anxiolytic-sedative-hypnotic	3.1±5.5		2.9±5.3		2.8±5.2		2.6±5.2		−.04	−.04	−.1
Stimulant	.4±1.9		.5±2.2		.6±2.3		.6±2.3		.1	.1	.1
Anticonvulsant or mood stabilizer	.8±2.2		.7±2.1		.6±2.0		.7±2.3		−.1	−.1	−.1
Lithium	.1±.6		.1±.5		.03±.4		.03±.4		−.02	−.1	−.1
All psychotropic medications	7.4±10.5		7.3±10.1		7.1±9.8		7.1±9.9		−.02	−.03	−.04
Psychotherapy episodes (M±SD)											
Outpatient	1.8±5.7		2.3±6.1		2.7±6.5		2.9±5.9		.1	.2	.2
Inpatient	.2±1.3		.1±1.1		.1±1.2		.1±1.1		−.1	−.1	−.1
Family therapy, outpatient	.1±.5		.1±1.0		.1±1.1		.1±.9		.04	.1	.04
Group therapy, outpatient	1.5±6.7		1.6±7.5		1.7±8.5		1.1±5.7		.01	.03	.1
Health care visits (M±SD)											
Emergency room	8.7±25.7		6.3±20.5		5.0±23.5		3.9±10.4		−.1	−.2	−.2
Medical-surgical	35.9±58.5		30.2±51.2		28.0±54.0		28.6±43.9		−.1	−.1	−.1
All outpatient visits	60.8±77.0		58.2±68.4		57.6±72.3		57.5±58.1		−.03	−.04	−.1
Any psychiatric or substance abuse visits	24.9±39.3		28.1±37.3		29.6±43.1		28.4±34.9		.1	.1	.1

[a] Effect sizes are risk ratios, except for variables measured as M±SD, for which effect sizes are Cohen's d values.

RESULTS

We identified 61,447 patients with an OUD diagnosis who did not receive a buprenorphine prescription during the first 60 days of FY 2011, of whom 16,190 (26.3%) filled at least one buprenorphine prescription later in FY 2011. Among those initiated on buprenorphine, the proportion who remained engaged in treatment steadily declined with time, with 85% engaged for 31–365 days, 45.0% for one to three years, and only 13.7% for more than three years (mean±SD duration of retention=1.23±1.16 years).

FY 2011 Characteristics and Subsequent Retention

Mean age was higher in the group with retention for more than three years, compared with the group engaged for

TABLE 3. Mean buprenorphine dose at three time points, by treatment retention group[a]

	Month 1		31–365 days		1–3 years	
Group	Mean dose (mg)	95% CI	Mean dose (mg)	95% CI	Mean dose (mg)	95% CI
0–30 days	16.3	14.3–18.3				
31–365 days	15.3	14.1–16.5	15.0	14.1–16.0		
1–3 years	16.2	14.9–17.6	15.3	14.2–16.4	14.5	12.6–16.4
>3 years	14.9	12.8–17.0	14.8	13.1–16.5	12.8	10.0–15.7

[a] No comparisons were statistically significant.

30 days or less. No substantial differences between groups were found in gender, urban residence, medical comorbidities, or pain diagnosis. Medical comorbidity burden as indicated by Charlson Index was low, reflecting the young age of the study sample (Table 1).

Substance use disorder diagnoses other than OUD were generally less frequent among the groups with longer retention, and especially uncommon in the group with retention for more than three years (Table 1). Other psychiatric diagnoses were also lower among those retained for more than three years (Table 1).

Emergency room visits were lower in the group with retention for more than three years, compared with group engaged for 30 days or less (Table 2). All outpatient visits and any psychiatric or substance use disorder outpatient visits did not vary much between the different retention groups. Over two-thirds (67.3%) of the entire sample received some psychotropic medications, with no substantial differences across groups (Table 2). About a third of all patients received some form of psychotherapy in FY 2011, with higher-retention groups receiving outpatient psychotherapy at a slightly higher rate and number of episodes.

No statistically significant differences in the mean dose of buprenorphine were found between the four retention groups (Table 3).

Insurance Continuation

During the first three years after buprenorphine initiation, 49.3% (N=7,988) disenrolled from their insurance plan. The mean enrollment periods and disenrollment rates in each retention groups are shown in Table 4.

TABLE 4. Insurance enrollment duration and disenrollment rates after buprenorphine treatment initiation, by treatment retention group

	Duration of enrollment (days)		Disenrolled during period	
Group	M	SD	N	%
0–30 days	464.5	444.2	394	16.3
31–365 days	470.7	388.2	3,757	58.0
1–3 years	825.7	288.3	3,837	75.6
>3 years	1,286.1	82.5		

Survival Analysis and Multivariate Cox Proportional Hazards Analysis

In a multivariate Cox proportional hazards analysis (Table 5), being older than the median age of 31 years (hazard ratio [HR]=.82) and receiving any outpatient psychotherapy in FY 2011 (HR=.86) were strongly associated with lower risk of disengagement from buprenorphine treatment, whereas receiving any inpatient mental health treatment in FY 2011 was associated with increased risk of disengagement (HR=1.20). Having any emergency room visits or a diagnosis of any substance use disorder in addition to OUD or having any psychiatric diagnoses in FY2011 were also associated with elevated risk of disengagement.

When we added "each 30 days of continuous insurance enrollment" as a variable, the effect of FY 2011 predictors of treatment disengagement were largely unchanged. However, for each 30 days of additional enrollment in the insurance plan, there was a 10% lower risk of treatment disengagement (Table 5). [Kaplan-Meier survival curves of retention in buprenorphine treatment based on receipt of inpatient mental health admission and outpatient psychotherapy in FY 2011 are included in an online supplement to this article.]

DISCUSSION

In this study of a large privately insured cohort of patients initiated on buprenorphine for OUD in FY 2011, fewer than half were retained in treatment for more than one year and fewer than 15% for more than three years. Nearly half of the patients who initiated buprenorphine treatment disenrolled from their insurance plan in the next three years, and this was one of the stronger correlates of treatment disengagement. Mental health inpatient admissions and emergency room visits also predicted early treatment disengagement, whereas older age and receipt of psychotherapy in the year of buprenorphine initiation were associated with lower risk of treatment disengagement.

Buprenorphine treatment retention in this study (45.0% at one year) is similar to that reported in prior studies of commercially insured populations (24–27) but considerably lower than that observed at VHA facilities (61.6% with comparable methods) (21) and also considerably lower than that in a statewide public initiative in Massachusetts (65%) (37). Most important, VHA patients experienced no risk of disenrollment from their health care plan. In addition, compared with patients with commercial insurance, they were a decade older, had greater access to comprehensive care for substance use disorders, and were likely to have far lower copays (38,39). Higher age, a consistent predictor of better buprenorphine treatment retention (21,40–43), may also have contributed to better retention in the VHA. However, in the Massachusetts study that showed high retention (37), the

age distribution was similar to that in the study reported here. In addition, patients with more severe mental health issues may seek more care, especially in the VHA system, where mental health care is relatively accessible at little or no cost (44).

Both the VHA and the Massachusetts studies followed well-supported comprehensive systemwide buprenorphine implementation efforts (37,45), which are often unavailable in outpatient practices funded by commercial insurance. Offering comprehensive psychosocial care for patients with OUD, along with buprenorphine treatment, may help providers funded by commercial insurance improve buprenorphine treatment retention (24,25).

We are not aware of prior studies that addressed continuity of insurance coverage as a factor in continued buprenorphine treatment in a commercially insured population (24–27). This is not an issue in the VHA, where entitlement is based on past military service, and this may largely explain the higher VHA retention rates. The association of continued insurance coverage with buprenorphine treatment retention is impressive and worrisome during this period of changes in health care laws and policies. OUD is a chronic disease that can have disastrous consequences without long-term treatment (46). Our data suggest that unavailability of buprenorphine treatment with loss of insurance coverage (which may itself result from continued opiate use) poses a major threat to effective treatment. Further studies are needed to identify the reasons for loss of insurance coverage among adults with OUD and whether OAT is continued in some cases through other types of financing.

In addition, insurance plans typically impose significant out-of-pocket costs and burdensome requirements for prior authorizations for buprenorphine, posing significant barriers to continued engagement. Although commercial insurance plans were not excluding buprenorphine by 2010, most plans still included buprenorphine in the high cost-sharing tiers, and 38% of the plans required preapproval, substantially higher than in 2003 (7%) (47,48). Insurance plans also restrict the duration of buprenorphine treatment, especially in managed Medicaid plans, and demand onerous counseling requirements (49,50). The effects of the Affordable Care Act that were intended to increase accessibility to substance abuse treatments are still evolving and implementation of the ACA, while currently (2017) in jeopardy, differs across participating states (51). These data suggest that although access to buprenorphine has increased over the past decade (6,10–15), there are still multiple financial barriers. Despite such barriers, patients with high motivation and financial means seem to be accessing buprenorphine treatment (50). The highly restrictive response to the opioid crisis among payers is of concern and deserves more detailed study and documentation.

TABLE 5. Multivariate Cox survival analysis of predictors of buprenorphine treatment discontinuation at three-year follow-up

Variable	Hazard ratio	95% CI	p	Parameter estimate
Without insurance enrollment variable				
Inpatient mental health treatment in fiscal year 2011 (FY 2011)	1.20	1.19–1.30	<.001	.2
Emergency department visits in FY 2011	1.10	1.06–1.14	<.001	.1
Any substance use disorder diagnosis	1.06	1.02–1.10	.007	.1
Any psychiatric diagnosis	1.05	1.01–1.09	.028	.1
Above median age of 31 years	.82	.80–.85	<.001	−.2
Any psychotherapy in FY 2011	.86	.83–.89	<.001	−.2
With insurance enrollment variable				
Inpatient mental health treatment in FY 2011	1.30	1.24–1.36	<.001	.26
Emergency department visits in FY 2011	1.07	1.04–1.14	<.001	.07
Any substance use disorder diagnosis	1.05	1.01–1.10	.012	.05
Any psychiatric diagnosis	1.05	1.01–1.10	.018	.04
Above median age of 31 years	.90	.87–.93	<.001	−.10
Any psychotherapy in FY 2011	.90	.86–.92	<.001	−.07
Each 30 days of insurance enrollment after buprenorphine initiation	.90	.90–.91	<.001	−.10

Altogether, 26.3% of privately insured patients with a diagnosis of OUD initiated buprenorphine in the index year, compared with only 6% initiation of OAT, including buprenorphine (3.4%), in VHA in FY 2012 (unpublished data available on request). The reasons for differences in initiation rates likely involve major differences in case finding, eligibility, enrollment, and diagnostic documentation procedures. In addition, while the vast majority of buprenorphine in the VHA is provided through specialized substance abuse treatment clinics (45,52), buprenorphine provision among privately insured patients is mostly through office-based, nonpsychiatrist physicians (27), who are generally more permissive of buprenorphine prescription than psychiatrists (53). Also, VHA providers do not have the financial incentives that play a prominent part in increasing buprenorphine prescription in non-VHA settings (54,55). VHA is currently implementing programs to increase access to buprenorphine in primary care settings.

This is the first major, large-scale observational study to specifically examine the association of receipt of psychotherapy with buprenorphine treatment retention; both psychotherapy and buprenorphine are perceived as essential components of comprehensive OUD treatment (4). However, the need for psychotherapy or formal counseling with buprenorphine treatment is unclear (56). Psychotherapy or formal counseling yielded no additional benefits over standard physician counseling with regard to illicit opioid use, abstinence, or treatment retention in many recent buprenorphine clinical trials (57–60), whereas other studies have demonstrated added benefit (61–64). Our observational study suggests that receipt of psychotherapy in the first year

of treatment was associated with greater retention. This might be a direct effect of psychotherapy, although it may also reflect a selection bias that is not accounted for by the variables available in the study (that is, patients with a better chance of sustained retention might have been selected for or chosen to receive psychotherapy).

Although the proportion of patients with psychiatric disorders was lower in the commercially insured population than in the VHA population (21), psychiatric disorders and their severity, as reflected in emergency room visits and mental health inpatient admissions, were associated with lower retention. Unlike the VHA study, which involved an older population (21), this analysis of data from a younger sample of patients showed that older age reduced the risk of dropout.

The data in this study are observational, which limits causal conclusions about determinants of buprenorphine treatment retention. We lacked data on several factors that have been shown to effect treatment retention, including duration and severity of OUD, type of opioid abused, certain psychosocial factors, nature and duration of treatment interruptions, adherence, and loss of patients because of death (20,24,25). As in the previous VHA-based study (21), we did not have information on the reasons for discontinuation. It is possible that a proportion of patients successfully tapered off buprenorphine with complete resolution of their OUD, although prior studies have suggested that most discontinuations likely represent premature treatment dropout, with a high risk of relapse (33,65,66). Although only outpatient prescriptions were included in the study, we cannot completely exclude the possibility that a proportion of buprenorphine disengagement in the first 30 days occurred after short-term "detox." In addition, buprenorphine treatment can be influenced by physician characteristics, such as attitudes toward buprenorphine, and by organizational support (67–70). We also lacked information about whether patients disengaged from treatment first and then disenrolled from insurance (perhaps because of relapse and job loss), lost insurance first and discontinued treatment as a result, or received treatment from other sources after disengagement.

CONCLUSIONS

This national study of privately insured adults showed that among young patients with OUD who had a low burden of comorbid psychiatric disorders, retention appeared to be low, specifically compared with the VHA system, which offers unbroken enrollment, requires lower out-of-pocket costs, provides integrated care, and serves an older patient population with a high level of psychiatric comorbidity. Our data suggest that loss of insurance coverage is one of the major impediments to buprenorphine treatment retention in the privately insured population. Increasing comprehensive care of substance use disorders and psychiatric disorders at lower cost and without risk of coverage loss is likely to increase treatment retention, improving survival and general well-being.

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REFERENCES

1. Rudd RA, Seth P, David F, et al: Increases in drug and opioid-involved overdose deaths—United States, 2010–2015. Morbidity and Mortality Weekly Report 65:1445–1452, 2016
2. Presidential Memorandum–Addressing Prescription Drug Abuse and Heroin Use. Washington, DC, White House, 2015
3. Gowing L, Farrell MF, Bornemann R, et al: Oral substitution treatment of injecting opioid users for prevention of HIV infection. Cochrane Database of Systematic Reviews (8):CD004145, 2011
4. Clinical Guidelines for the Use of Buprenorphine in the Treatment of Opioid Addiction. Treatment Improvement Protocol series, no 40. Rockville, MD, Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Treatment, 2004
5. Saxon AJ: Commentary on Burns et al (2015): retention in buprenorphine treatment. Addiction 110:656–657, 2015
6. Bell J, Trinh L, Butler B, et al: Comparing retention in treatment and mortality in people after initial entry to methadone and buprenorphine treatment. Addiction 104:1193–1200, 2009
7. Sordo L, Barrio G, Bravo MJ, et al: Mortality risk during and after opioid substitution treatment: systematic review and meta-analysis of cohort studies. BMJ 357:j1550, 2017
8. Medication-Assisted Treatment for Opioid Addiction in Opioid Treatment Programs. Treatment Improvement Protocol series, no 43. Rockville, MD, Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Treatment, 2005
9. Results From the 2013 National Survey on Drug Use and Health: Summary of National Findings. NSDUH series H-48, HHS pub no (SMA) 14-4863. Rockville, MD, Substance Abuse and Mental Health Services Administration, 2014
10. Burns L, Randall D, Hall WD, et al: Opioid agonist pharmacotherapy in New South Wales from 1985 to 2006: patient characteristics and patterns and predictors of treatment retention. Addiction 104:1363–1372, 2009
11. Riksheim M, Gossop M, Clausen T: From methadone to buprenorphine: changes during a 10 year period within a national opioid maintenance treatment programme. Journal of Substance Abuse Treatment 46: 291–294, 2014
12. Jones CM, Campopiano M, Baldwin G, et al: National and state treatment need and capacity for opioid agonist medication-assisted treatment. American Journal of Public Health 105:e55–e63, 2015
13. Trends in the Use of Methadone and Buprenorphine at Substance Abuse Treatment Facilities: 2003 to 2011. Rockville, MD, Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality, 2013
14. Turner L, Kruszewski SP, Alexander GC: Trends in the use of buprenorphine by office-based physicians in the United States, 2003–2013. American Journal on Addictions (Epub ahead of print, Nov 19, 2014)

15. Nosyk B, Anglin MD, Brissette S, et al: A call for evidence-based medical treatment of opioid dependence in the United States and Canada. Health Affairs 32:1462–1469, 2013
16. Mattick RP, Breen C, Kimber J, et al: Buprenorphine maintenance versus placebo or methadone maintenance for opioid dependence. Cochrane Database of Systematic Reviews (2):CD002207, 2014
17. Timko C, Schultz NR, Cucciare MA, et al: Retention in medication-assisted treatment for opiate dependence: a systematic review. Journal of Addictive Diseases 35:22–35, 2016
18. National Consensus Development Panel on Effective Medical Treatment of Opiate Addiction: Effective medical treatment of opiate addiction. JAMA 280:1936–1943, 1998
19. Bart G: Maintenance medication for opiate addiction: the foundation of recovery. Journal of Addictive Diseases 31:207–225, 2012
20. Dreifuss JA, Griffin ML, Frost K, et al: Patient characteristics associated with buprenorphine/naloxone treatment outcome for prescription opioid dependence: results from a multisite study. Drug and Alcohol Dependence 131:112–118, 2013
21. Manhapra A, Petrakis I, Rosenheck R: Three-year retention in buprenorphine treatment for opioid use disorder nationally in the Veterans Health Administration. American Journal on Addictions 26:572–580, 2017
22. Busch SH, Leslie DL, Rosenheck RA: Comparing the quality of antidepressant pharmacotherapy in the Department of Veterans Affairs and the private sector. Psychiatric Services 55:1386–1391, 2004
23. Rosenheck RA: Mental health and substance abuse services for veterans: experience with mental health performance evaluation in the Department of Veterans Affairs; in Improving the Quality of Health Care for Mental and Substance-Use Conditions. Washington, DC, National Academies Press, 2006
24. Clay E, Khemiri A, Zah V, et al: Persistence and healthcare utilization associated with the use of buprenorphine/naloxone film and tablet formulation therapy in adults with opioid dependence. Journal of Medical Economics 17:626–636, 2014
25. Khemiri A, Kharitonova E, Zah V, et al: Analysis of buprenorphine/naloxone dosing impact on treatment duration, resource use and costs in the treatment of opioid-dependent adults: a retrospective study of US public and private health care claims. Postgraduate Medicine 126:113–120, 2014
26. Lo-Ciganic WH, Gellad WF, Gordon AJ, et al: Associations between trajectories of buprenorphine treatment and emergency department and in-patient utilization. Addiction 111:892–902, 2016
27. Morgan JR, Schackman BR, Leff JA, et al: Injectable naltrexone, oral naltrexone, and buprenorphine utilization and discontinuation among individuals treated for opioid use disorder in a United States commercially insured population. Journal of Substance Abuse Treatment 85:90–96, 2018
28. Ling W, Wesson DR, Charuvastra C, et al: A controlled trial comparing buprenorphine and methadone maintenance in opioid dependence. Archives of General Psychiatry 53:401–407, 1996
29. Fiellin DA, Moore BA, Sullivan LE, et al: Long-term treatment with buprenorphine/naloxone in primary care: results at 2–5 years. American Journal on Addictions 17:116–120, 2008
30. Haddad MS, Zelenev A, Altice FL: Integrating buprenorphine maintenance therapy into federally qualified health centers: real-world substance abuse treatment outcomes. Drug and Alcohol Dependence 131:127–135, 2013
31. Parran TV, Adelman CA, Merkin B, et al: Long-term outcomes of office-based buprenorphine/naloxone maintenance therapy. Drug and Alcohol Dependence 106:56–60, 2010
32. Soeffing JM, Martin LD, Fingerhood MI, et al: Buprenorphine maintenance treatment in a primary care setting: outcomes at 1 year. Journal of Substance Abuse Treatment 37:426–430, 2009
33. Alford DP, LaBelle CT, Kretsch N, et al: Collaborative care of opioid-addicted patients in primary care using buprenorphine: five-year experience. Archives of Internal Medicine 171:425–431, 2011
34. Charlson ME, Pompei P, Ales KL, et al: A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. Journal of Chronic Diseases 40:373–383, 1987
35. Wiechers IR, Kirwin PD, Rosenheck RA: Increased risk among older veterans of prescribing psychotropic medication in the absence of psychiatric diagnoses. American Journal of Geriatric Psychiatry 22: 531–539, 2014
36. Ferguson CJ: An effect size primer: a guide for clinicians and researchers. Professional Psychology, Research and Practice 40: 532–538, 2009
37. LaBelle CT, Han SC, Bergeron A, et al: Office-based opioid treatment with buprenorphine (OBOT-B): statewide implementation of the Massachusetts Collaborative Care Model in community health centers. Journal of Substance Abuse Treatment 60: 6–13, 2016
38. The N-SSATS Report: Substance Abuse Treatment Facilities Operated by the Department of Veterans Affairs. Rockville, MD, Substance Abuse and Mental Health Services Administration, Office of Applied Studies, 2009
39. Peters R, Wengle E: ACA Implementation—Monitoring and Tracking: Coverage of Substance-Use Disorder Treatments in Marketplace Plans in Six Cities. Washington, DC, Urban Institute, 2016
40. Hser YI, Saxon AJ, Huang D, et al: Treatment retention among patients randomized to buprenorphine/naloxone compared to methadone in a multi-site trial. Addiction 109:79–87, 2014
41. Hui D, Weinstein ZM, Cheng DM, et al: Very early disengagement and subsequent re-engagement in primary care office based opioid treatment (OBOT) with buprenorphine. Journal of Substance Abuse Treatment 79:12–19, 2017
42. Stein MD, Cioe P, Friedmann PD: Buprenorphine retention in primary care. Journal of General Internal Medicine 20:1038–1041, 2005
43. Weinstein ZM, Kim HW, Cheng DM, et al: Long-term retention in office based opioid treatment with buprenorphine. Journal of Substance Abuse Treatment 74:65–70, 2017
44. Harpaz-Rotem I, Rosenheck RA: Serving those who served: retention of newly returning veterans from Iraq and Afghanistan in mental health treatment. Psychiatric Services 62:22–27, 2011
45. Oliva EM, Trafton JA, Harris AH, et al: Trends in opioid agonist therapy in the Veterans Health Administration: is supply keeping up with demand? American Journal of Drug and Alcohol Abuse 39: 103–107, 2013
46. Manhapra A, Rosenheck R, Fiellin DA: Opioid substitution treatment is linked to reduced risk of death in opioid use disorder. BMJ 357:j1947, 2017
47. Horgan CM, Reif S, Hodgkin D, et al: Availability of addiction medications in private health plans. Journal of Substance Abuse Treatment 34:147–156, 2008
48. Reif S, Horgan CM, Hodgkin D, et al: Access to addiction pharmacotherapy in private health plans. Journal of Substance Abuse Treatment 66:23–29, 2016
49. Schackman BR, Merrill JO, McCarty D, et al: Overcoming policy and financing barriers to integrated buprenorphine and HIV primary care. Clinical Infectious Diseases 43(suppl 4):S247–S253, 2006
50. Saloner B, Daubresse M, Caleb Alexander G: Patterns of buprenorphine-naloxone treatment for opioid use disorder in a multistate population. Medical Care 55:669–676, 2017
51. Knudsen HK, Studts JL: Perceived impacts of the Affordable Care Act: perspectives of buprenorphine prescribers. Journal of Psychoactive Drugs 49:111–121, 2017
52. Gordon AJ, Kavanagh G, Krumm M, et al: Facilitators and barriers in implementing buprenorphine in the Veterans Health Administration. Psychology of Addictive Behaviors 25:215–224, 2011

53. Walley AY, Alperen JK, Cheng DM, et al: Office-based management of opioid dependence with buprenorphine: clinical practices and barriers. Journal of General Internal Medicine 23:1393–1398, 2008
54. Parran TV, Muller JZ, Chernyak E, et al: Access to and payment for office-based buprenorphine treatment in Ohio. Substance Abuse: Research and Treatment (Epub ahead of print June 13, 2017)
55. Wisniewski AM, Dlugosz MR, Blondell RD: Reimbursement and practice policies among providers of buprenorphine-naloxone treatment. Substance Abuse 34:105-7, 2013
56. Dugosh K, Abraham A, Seymour B, et al: A systematic review on the use of psychosocial interventions in conjunction with medications for the treatment of opioid addiction. Journal of Addiction Medicine 10:93–103, 2016
57. Fiellin DA, Pantalon MV, Chawarski MC, et al: Counseling plus buprenorphine-naloxone maintenance therapy for opioid dependence. New England Journal of Medicine 355:365–374, 2006
58. Fiellin DA, Barry DT, Sullivan LE, et al: A randomized trial of cognitive behavioral therapy in primary care-based buprenorphine. American Journal of Medicine 126:74.e11-7, 2013
59. Weiss RD, Potter JS, Fiellin DA, et al: Adjunctive counseling during brief and extended buprenorphine-naloxone treatment for prescription opioid dependence: a 2-phase randomized controlled trial. Archives of General Psychiatry 68:1238–1246, 2011
60. Ling W, Hillhouse M, Ang A, et al: Comparison of behavioral treatment conditions in buprenorphine maintenance. Addiction 108:1788–1798, 2013
61. Christensen DR, Landes RD, Jackson L, et al: Adding an Internet-delivered treatment to an efficacious treatment package for opioid dependence. Journal of Consulting and Clinical Psychology 82: 964–972, 2014
62. Bickel WK, Marsch LA, Buchhalter AR, et al: Computerized behavior therapy for opioid-dependent outpatients: a randomized controlled trial. Experimental and Clinical Psychopharmacology 16:132–143, 2008
63. Miotto K, Hillhouse M, Donovick R, et al: Comparison of buprenorphine treatment for opioid dependence in 3 settings. Journal of Addiction Medicine 6:68–76, 2012
64. Schottenfeld RS, Chawarski MC, Pakes JR, et al: Methadone versus buprenorphine with contingency management or performance feedback for cocaine and opioid dependence. American Journal of Psychiatry 162:340–349, 2005
65. Gryczynski J, Mitchell SG, Jaffe JH, et al: Leaving buprenorphine treatment: patients' reasons for cessation of care. Journal of Substance Abuse Treatment 46:356–361, 2014
66. Kornør H, Waal H: From opioid maintenance to abstinence: a literature review. Drug and Alcohol Review 24:267–274, 2005
67. Thomas CP, Reif S, Haq S, et al: Use of buprenorphine for addiction treatment: perspectives of addiction specialists and general psychiatrists. Psychiatric Services 59:909–916, 2008
68. Duncan LG, Mendoza S, Hansen H: Buprenorphine maintenance for opioid dependence in public sector healthcare: benefits and barriers. Journal of Addiction Medicine and Therapeutic Science 1:31–36, 2015
69. Oliva EM, Maisel NC, Gordon AJ, et al: Barriers to use of pharmacotherapy for addiction disorders and how to overcome them. Current Psychiatry Reports 13:374–381, 2011
70. Weber EM: Failure of physicians to prescribe pharmacotherapies for addiction: regulatory restrictions and physician resistance. Journal of Health Care Law and Policy 13:49, 2010